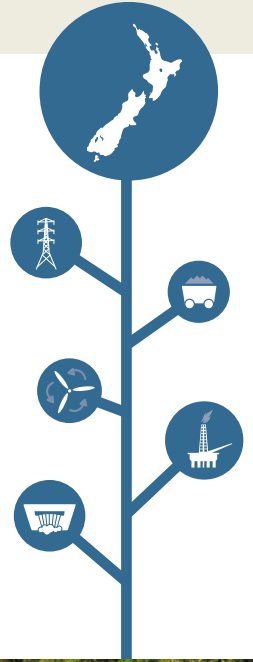
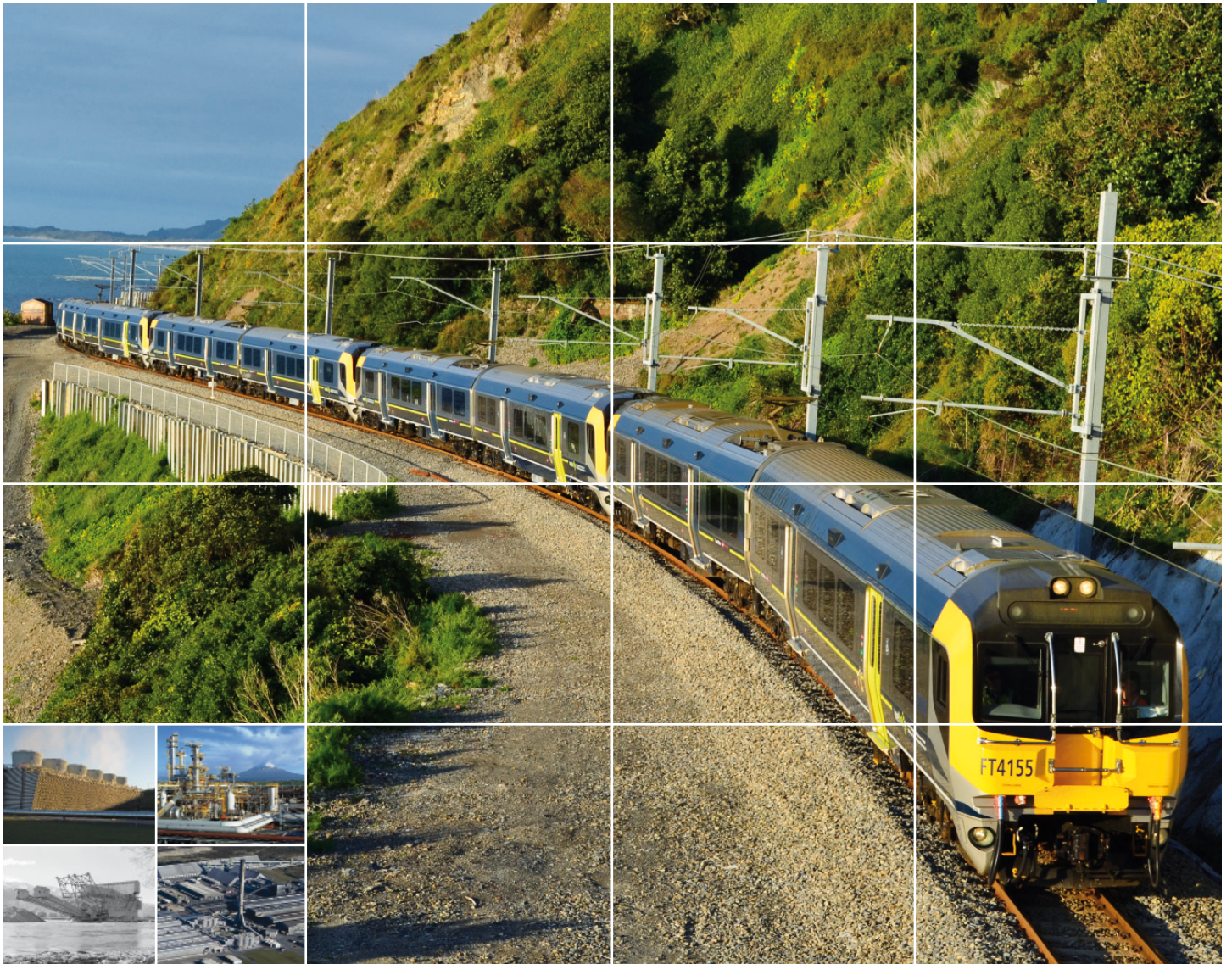


The *New Zealand Energy Data File* is an annual publication that provides comprehensive statistics and supporting information on New Zealand's energy supply, demand and prices.



New Zealand Energy Data File



New Zealand Energy Data File

2012

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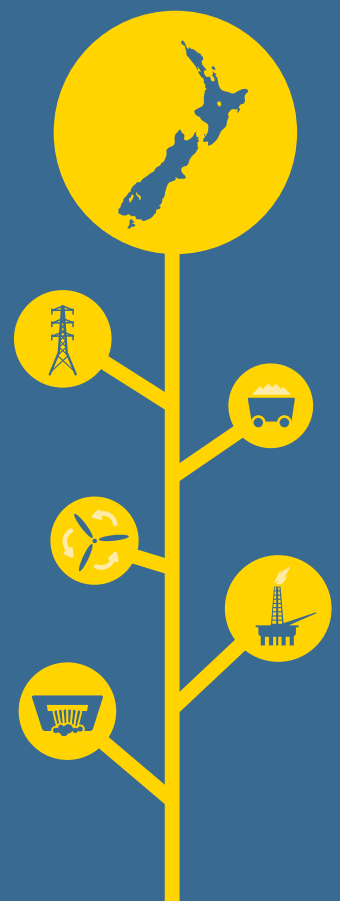
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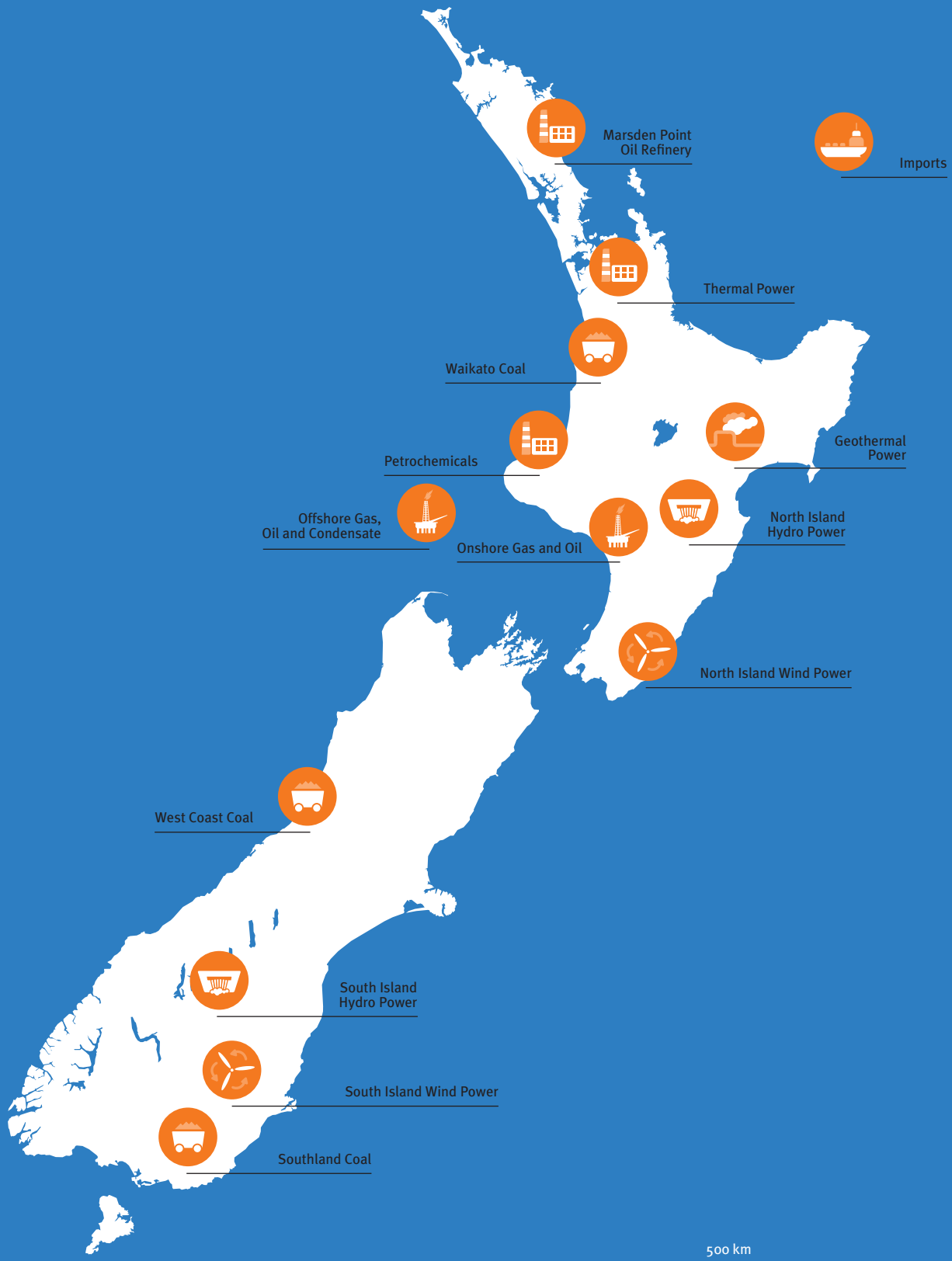
M. Glossary

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167

New Zealand Energy Sources



17 million

1. New Zealand produced 17 million barrels of oil in 2011.



43%

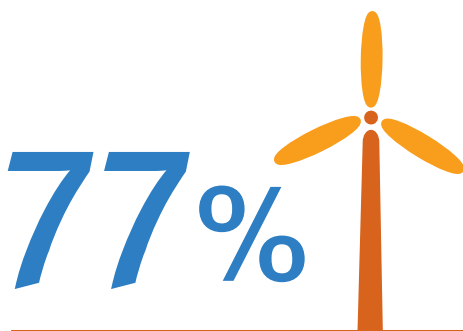
1866

19%

2. This was equivalent to 43% of domestic oil product demand.

3. The first oil well in New Zealand was drilled in 1866 at Moturoa.

4. Wind electricity generation increased by 19% in 2011.



5. In 2011 77% of New Zealand's electricity generation came from renewable sources. This is one of the highest levels of renewable electricity generation in the OECD.



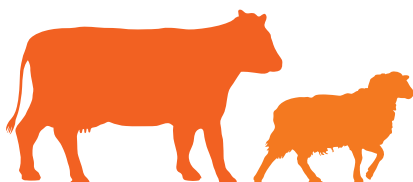
6. THE AVERAGE PRICE FOR NEW ZEALAND CRUDE ON THE INTERNATIONAL MARKET WAS \$US111 PER BARREL IN 2011.

7. New Zealand households spent, on average, \$190/month on electricity and gas combined in 2011.

\$190



8. NEW ZEALAND HAD THE 6TH LOWEST PETROL PRICE IN THE OECD IN 2011.



4 MJ

52



10. Meat and dairy industries in New Zealand consumed about 12 MJ per dollar of GDP they produced in 2011.

9. All sectors combined consumed approximately 4 MJ per dollar of GDP in 2011.

11. 52 oil and gas exploration and development wells were drilled in 2011.

A. Energy Overview

Introduction

The Energy Overview section of the *Energy Data File* considers New Zealand's whole energy system. Key data presented in this section includes Total Primary Energy Supply and Total Consumer Energy. Also presented is data that compares growth in Total Consumer Energy with growth in population and Gross Domestic Product (GDP).

Energy Supply and Demand Overview

Energy supply and demand is summarised as an energy balance in Table A.1. This table shows the dominance of fossil fuels, particularly oil — almost all of which is used for transport. It also shows the large amount of energy converted into electricity for final consumption.

Table A.1: Energy Supply and Demand Balance 2011 (Gross PJ)

Petajoules (Gross Calorific Values)		Coal	Oil	Natural Gas	Renewables	Electricity	Waste Heat	Total
SUPPLY	TOTAL PRIMARY ENERGY	60.74	276.21	158.68	320.60	-	1.52	817.75
	Energy Transformation	-35.64	-15.32	-78.33	-255.19	144.17	-1.52	-241.83
	Non-energy Use	-	-11.92	-24.41	-	-	-	-36.33
CONSUMER ENERGY (calculated)		25.10	248.97	55.94	65.41	144.17	-	539.58
DEMAND	Agriculture, Forestry and Fishing	2.77	18.52	1.67	0.68	6.97	-	30.61
	Industrial	19.19	14.84	45.03	54.28	54.60	-	187.92
	Commercial	1.28	6.35	5.54	2.38	32.71	-	48.26
	Transport	0.04	206.15	0.05	-	0.21	-	206.46
	Residential	0.75	3.23	5.70	8.08	46.36	-	64.13
CONSUMER ENERGY (observed)		24.03	249.08	58.00	65.41	140.86	-	537.38
Statistical Differences		1.07	-0.11	-2.06	-	3.31	-	2.21

A. Energy Overview

Primary Energy Supply

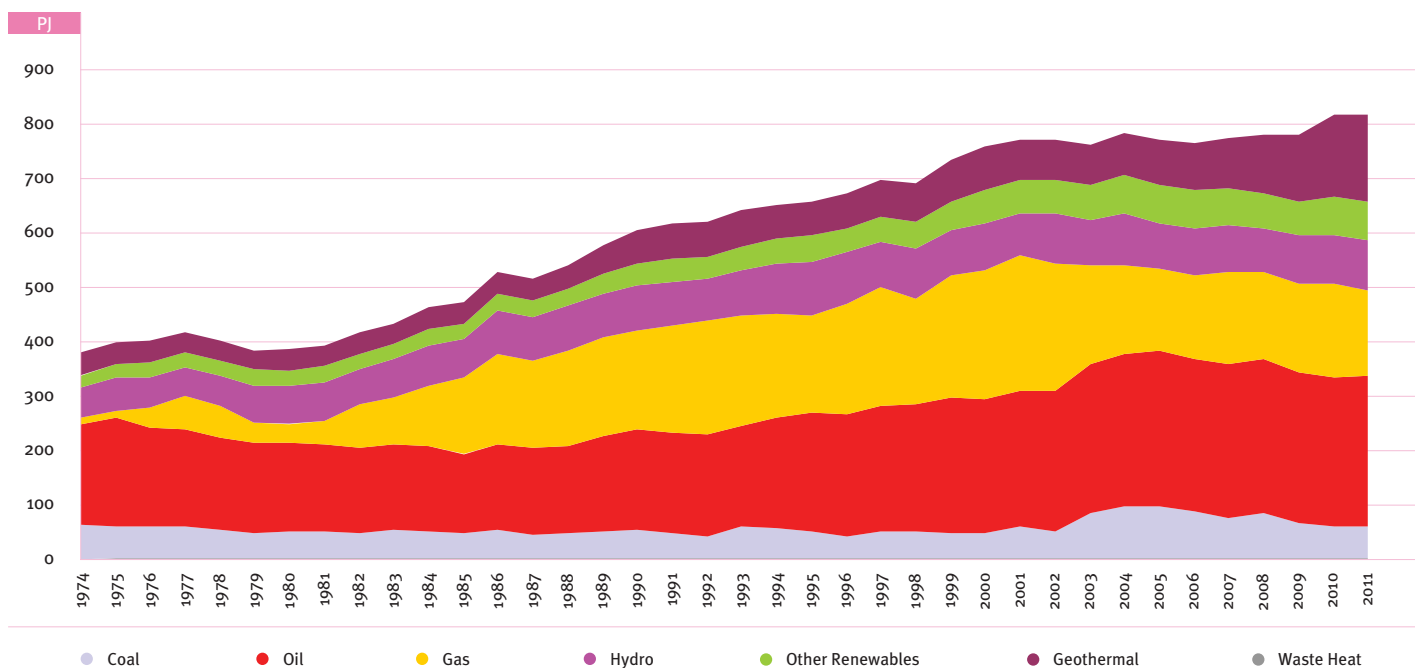
Total Primary Energy Supply (TPES) is the total amount of energy supplied for use in New Zealand. This is calculated as domestic production¹, plus imports, less exports and energy used for international transport.

In 2011, renewable energy made up 39% of New Zealand's Total Primary Energy Supply. This level of contribution from renewable energy surpassed last year's record (of 38%). The latest international comparison shows that New Zealand has the second highest contribution of renewable energy to Total Primary Energy Supply in the OECD² (behind Iceland, and ahead of Norway).

The rapid increase in renewable energy's share of TPES in the last few years has been driven by increased electricity generation from geothermal energy and reduced electricity generation from coal. As geothermal fluid is much lower in temperature than steam produced by a coal or gas boiler, the transformation efficiency of geothermal energy is significantly lower. The low transformation efficiency of geothermal energy (approximately 15%) contributes to New Zealand's relatively high renewable TPES when compared with most other countries.

Although geothermal energy's share has increased rapidly in the last three years, oil continues to dominate New Zealand's TPES. In 2011, for the first time on record, the geothermal share of TPES was higher than the natural gas share of TPES. Oil accounted for 34%, geothermal energy for 19% and gas for 19% in 2011. TPES was flat in 2011, and has increased by an average 1.4% per annum since 2007. See Figure A.2 and Table A.2 for Total Primary Energy Supply.

Figure A.2: Total Primary Energy Supply (Gross PJ)



Note to Figure A.2: "Other Renewables" in this instance refers to wind, bioenergy and solar.

¹ Including stock changes.

² At the time of writing the latest statistics available were from the 2010 calendar year. See Renewables Information 2011 (International Energy Agency).

A. Energy Overview

Table A.2: Total Primary Energy Supply (Gross PJ)

Calendar Year	Renewable				Non-renewable					TOTAL	% Renewable
	Hydro	Geothermal	Other Renewables	Sub-total	Coal	Oil	Gas	Waste Heat	Sub-total		
1974	54.67	41.12	22.79	118.58	62.80	184.99	12.92	0.47	261.18	379.76	31%
1975	59.98	41.66	24.27	125.91	59.10	199.46	14.03	1.08	273.67	399.58	32%
1976	55.79	39.96	26.59	122.34	60.90	179.12	37.54	1.28	278.84	401.18	30%
1977	52.99	38.15	27.34	118.48	58.00	178.63	61.67	1.28	299.59	418.06	28%
1978	56.37	38.70	26.23	121.30	53.50	169.30	57.92	1.28	282.00	403.30	30%
1979	66.39	35.89	29.55	131.83	47.70	165.24	38.20	1.28	252.43	384.26	34%
1980	69.71	39.15	28.67	137.52	49.06	163.91	35.35	1.28	249.60	387.12	36%
1981	70.84	37.76	29.64	138.24	48.88	160.56	43.64	1.67	254.75	392.99	35%
1982	65.89	38.15	27.84	131.87	47.92	155.88	78.60	1.80	284.20	416.07	32%
1983	71.10	38.25	27.66	137.01	53.10	156.12	85.24	1.80	296.26	433.27	32%
1984	73.35	42.34	29.96	145.65	49.38	158.49	109.18	1.68	318.73	464.38	31%
1985	70.94	38.58	29.45	138.97	45.60	147.05	139.39	1.61	333.65	472.62	29%
1986	79.54	40.75	29.70	149.99	52.40	156.11	167.90	1.61	378.02	528.01	28%
1987	78.93	39.82	30.94	149.70	43.74	158.79	162.47	1.61	366.62	516.32	29%
1988	82.66	40.68	31.26	154.59	47.40	159.13	176.32	1.61	384.45	539.05	29%
1989	81.20	53.48	36.90	171.58	51.51	172.93	181.04	1.61	407.09	578.68	30%
1990	83.46	61.81	40.05	185.32	52.22	186.62	180.14	1.61	420.58	605.90	31%
1991	82.41	64.87	41.03	188.31	46.71	184.10	195.80	1.61	428.22	616.53	31%
1992	75.93	64.23	41.06	181.21	40.04	189.69	207.82	1.61	439.16	620.37	29%
1993	84.57	67.57	43.21	195.35	60.08	182.94	202.09	1.61	446.72	642.07	30%
1994	93.00	63.26	45.36	201.63	54.82	204.81	188.50	1.61	449.74	651.37	31%
1995	99.12	62.36	46.71	208.19	49.55	219.18	178.03	1.61	448.37	656.56	32%
1996	94.25	63.46	44.80	202.51	39.49	225.21	203.32	1.62	469.64	672.15	30%
1997	83.72	65.95	46.84	196.52	49.30	231.65	217.73	1.61	500.30	696.81	28%
1998	91.14	70.13	49.54	210.82	48.73	236.12	193.44	1.61	479.89	690.71	31%
1999	82.50	74.45	54.72	211.67	48.16	248.02	223.68	1.61	521.47	733.14	29%
2000	87.96	81.64	59.76	229.36	47.32	245.83	235.33	1.61	530.08	759.44	30%
2001	78.04	75.93	59.08	213.06	59.50	250.37	247.51	1.21	558.60	771.65	28%
2002	89.53	74.08	63.84	227.46	48.83	258.36	235.29	2.39	544.87	772.33	29%
2003	85.03	73.64	64.59	223.27	81.95	276.18	179.45	2.17	539.75	763.01	29%
2004	96.94	75.29	70.22	242.45	94.38	281.62	161.25	2.13	539.38	781.83	31%
2005	83.97	82.99	70.85	237.81	96.77	284.62	150.18	1.95	533.53	771.34	31%
2006	84.86	86.35	70.65	241.86	85.41	281.82	154.03	1.83	523.10	764.96	32%
2007	85.10	90.64	68.97	244.71	74.06	283.83	169.52	1.36	528.77	773.48	32%
2008	80.41	107.16	64.98	252.55	84.26	281.67	159.97	1.44	527.34	779.89	32%
2009	87.19	124.15	62.14	273.48	64.37	278.55	163.16	1.37	507.45	780.93	35%
2010	88.98	152.55	69.43	310.96	57.93	273.99	173.45	1.47	506.84	817.80	38%
2011	90.28	159.05	71.27	320.60	60.74	276.21	158.68	1.52	497.17	817.75	39%
Δ2007/2011 p.a.	1.5%	15.1%	0.8%	7.0%	-4.8%	-0.7%	-1.6%	2.8%	-1.5%	1.4%	
Δ2010/2011	1.5%	4.3%	2.6%	3.1%	4.9%	0.8%	-8.5%	3.4%	-1.9%	0.0%	

Note to Table A.2: "Other Renewables" in this instance refers to wind, bioenergy and solar.

A. Energy Overview

Energy Transformation

Energy transformation refers to the conversion of energy from one form to another. It includes electricity generation, petroleum refining and other transformation (including coal for steel production).

Electricity generation is the main form of energy transformation in New Zealand and comes from a range of energy sources. In 2011, a net total of 43,138 GWh of electricity was generated, 77% of which was from renewable sources. Hydro was the major source of electricity generation at 58%, followed by gas at 18%, geothermal at 13%, with coal, wind, wood, biogas, oil and waste heat making up the balance. Electricity generation from wind was up 19% from 2010 levels. In 2011, almost as much electricity was generated by wind (1,931 GWh) as was generated by coal (2,026 GWh).

In 2011, 98% of refinery input was from imported crude and feedstocks, with the remaining 2% being from indigenous crude and condensate.

Non-energy Use

Non-energy use refers to use of fuels to produce non-energy products. Non-energy products are products where neither the raw energy source used to produce the product nor the product itself is combusted.

In New Zealand non-energy use is typically one third oil (e.g. bitumen for roads) and two thirds natural gas (conversion of natural gas to methanol or urea). In 2011, total non-energy use was 36 PJ, of which 12 PJ was from oil and 24 PJ was from natural gas.

Non-energy use of natural gas was down by 4% in 2011 (to 24 PJ) on the back of a drop in urea production. Methanol production in New Zealand in 2011 remained at 2010 levels. Although methanol can be combusted for energy purposes, the methanol produced in New Zealand is mainly used as chemical feedstock (e.g. to make plastic).

Gas combusted during the production of petrochemicals such as methanol, urea and ammonia is included as industrial sector demand within total consumer energy. Only gas used as a feedstock (and therefore not combusted) in petrochemical production is classified as non-energy use.

Consumer Energy Demand

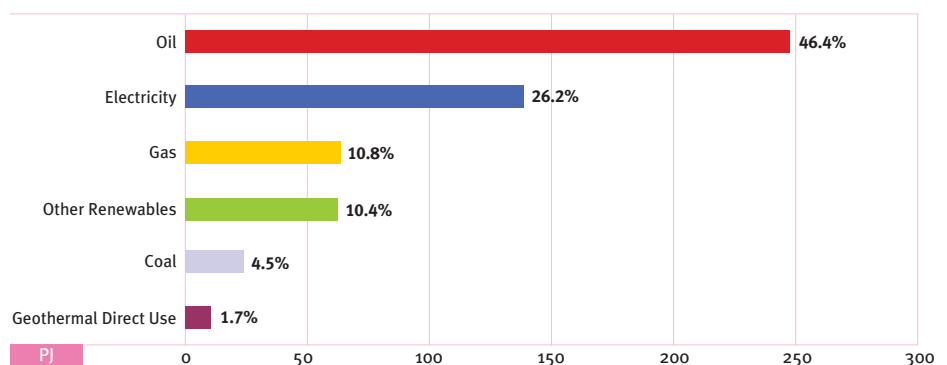
Total Consumer Energy (TCE) is energy used by final consumers. It excludes energy used for energy transformation (e.g. electricity generation) and that used for non-energy purposes.

Compared with 2010, New Zealand's TCE increased by 0.5% to 538 PJ in 2011. Figure A.3a shows Total Consumer Energy by fuel type for 2011. Figure A.3b shows a time series of consumer energy by fuel since 1990, with the corresponding data in Table A.3.

Like TPES, consumer energy in 2011 was dominated by oil at 46%. This was primarily oil used for transport purposes, although oil is also the dominant energy source for the agriculture, forestry and fishing sector. The other major contributor to TCE was electricity, which made up 26% of final consumer demand in 2011. Electricity is the dominant (non-transport) fuel for industrial, commercial and residential consumers.

TCE by sector is shown in Figure A.4a and Figure A.4b for 2011, with the corresponding data in Table A.4.

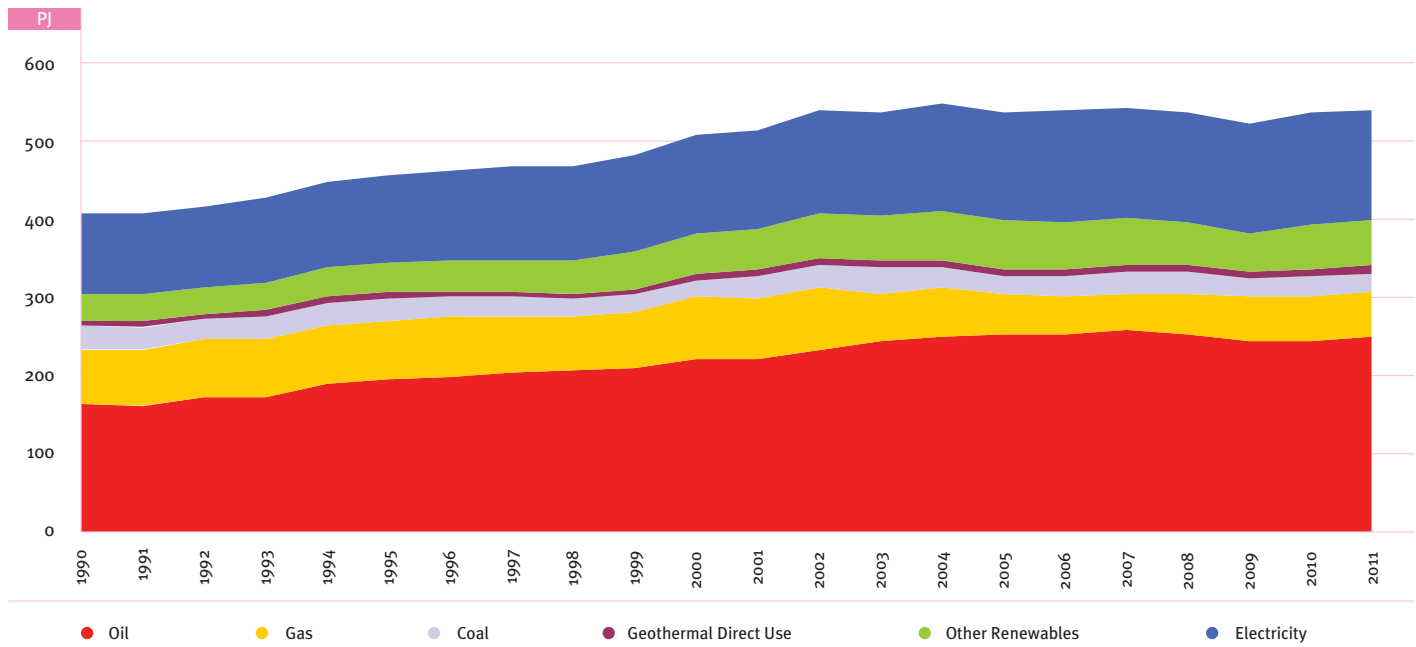
Figure A.3a: Total Consumer Energy by Fuel for 2011 (Gross PJ)



Notes to Figure A.3a: "Other Renewables" in this instance refers to bioenergy and solar thermal.

A. Energy Overview

Figure A.3b: Total Consumer Energy by Fuel (Gross PJ)



Notes to Figure A.3b: Cogeneration by individual fuel types is included in electricity.

"Other Renewables" in this instance refers to wind, bioenergy and solar.

A. Energy Overview

Table A.3: Total Consumer Energy by Fuel (Gross PJ)

Calendar Year	Coal	Oil	Gas	Geothermal Direct Use	Electricity ¹	Other Renewables ²	Total
1990	29.27	164.03	69.86	7.10	102.51	33.19	405.95
1991	28.89	161.91	71.93	7.04	104.59	33.90	408.26
1992	25.50	172.69	73.46	7.01	103.18	33.88	415.72
1993	29.53	172.67	74.00	7.24	106.92	36.03	426.40
1994	28.47	188.48	76.35	7.51	109.74	38.09	448.64
1995	27.52	196.99	73.94	7.48	111.98	39.32	457.23
1996	25.75	199.15	75.94	7.50	115.67	38.12	462.14
1997	24.68	203.39	72.08	7.54	118.94	40.20	466.84
1998	23.28	206.13	68.20	7.80	120.04	41.47	466.92
1999	20.75	210.52	71.68	7.96	122.44	47.30	480.65
2000	21.20	220.94	79.21	8.12	125.22	51.42	506.12
2001	26.80	222.77	77.02	8.17	127.16	52.21	514.14
2002	27.29	232.79	80.61	8.88	130.18	58.35	538.09
2003	32.91	243.53	61.19	9.01	130.88	59.04	536.56
2004	25.33	249.90	63.06	9.29	136.68	62.93	547.19
2005	23.65	252.87	50.47	9.40	138.52	62.33	537.23
2006	24.96	253.76	47.41	9.38	141.84	61.46	538.80
2007	27.58	257.26	47.44	9.56	141.99	58.44	542.27
2008	28.89	253.89	48.30	9.62	139.50	53.92	534.13
2009	22.69	245.67	55.15	9.84	138.75	49.02	521.10
2010	25.28	244.56	57.36	9.48	142.70	55.50	534.89
2011	24.03	249.08	58.00	9.30	140.86	56.12	537.38
Δ2007/2011 p.a.	-3.4%	-0.8%	5.1%	-0.7%	-0.2%	-1.0%	-0.2%
Δ2010/2011	-4.9%	1.8%	1.1%	-2.0%	-1.3%	1.1%	0.5%

Notes to Table A.3: ¹ Includes calculated onsite consumption as well as consumption observed from sales data. See Table G.1 for further details.

² "Other Renewables" in this instance refers to biogas, solar and wood.

A. Energy Overview

Figure A.4a: Total Consumer Energy by Sector for 2011 (Gross PJ)

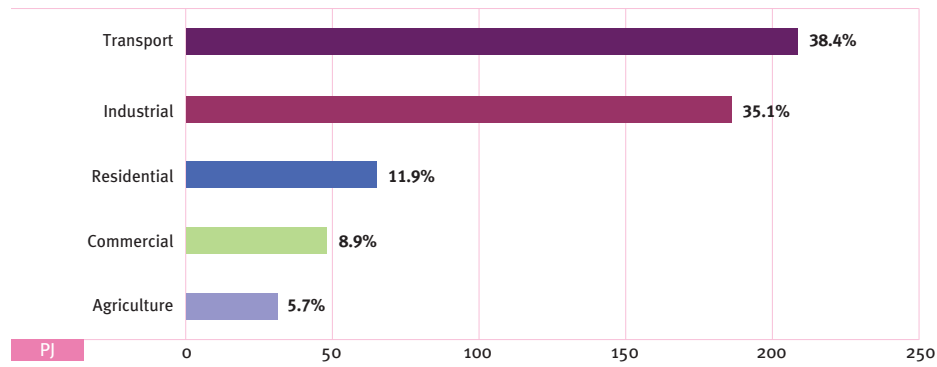
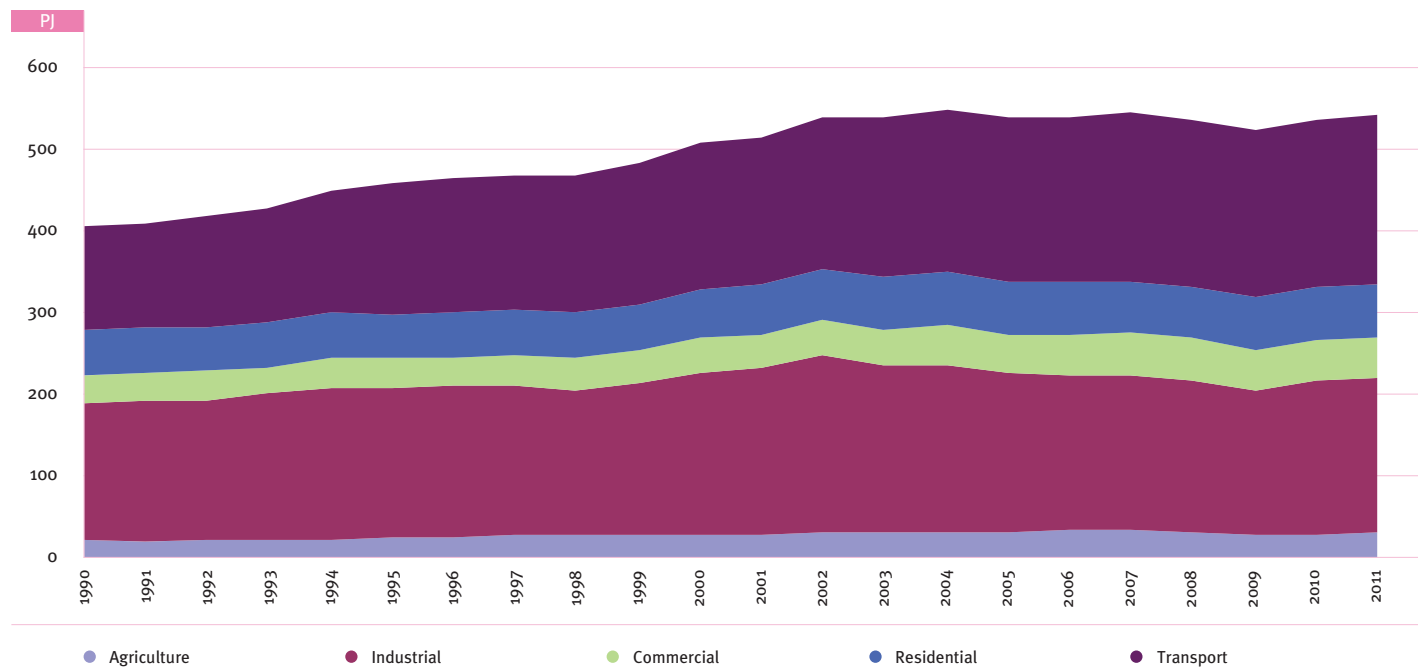


Figure A.4b: Total Consumer Energy by Sector (Gross PJ)



A. Energy Overview

Table A.4: Total Consumer Energy by Sector (Gross PJ)

Calendar Year	Agriculture	Industrial	Commercial	Residential	Transport	Total
1990	20.99	166.89	34.50	55.16	128.41	405.95
1991	19.38	170.76	34.50	55.32	128.30	408.26
1992	21.17	171.21	36.14	53.82	133.38	415.72
1993	21.32	179.31	32.08	53.62	140.06	426.40
1994	22.50	185.12	36.39	54.60	150.02	448.64
1995	23.59	182.30	37.33	54.64	159.37	457.23
1996	24.38	184.39	36.02	56.04	161.31	462.14
1997	26.27	182.88	37.13	55.75	164.81	466.84
1998	27.26	176.85	38.34	56.88	167.58	466.92
1999	28.17	184.22	39.94	57.37	170.94	480.65
2000	27.51	199.33	40.74	59.83	178.70	506.12
2001	28.22	203.13	41.52	61.18	180.08	514.14
2002	30.36	217.05	42.10	61.48	187.11	538.09
2003	31.87	201.41	45.15	63.22	194.90	536.56
2004	29.29	204.88	48.72	64.83	199.47	547.19
2005	31.92	192.39	48.99	63.63	200.30	537.23
2006	32.66	188.54	49.42	65.69	202.49	538.80
2007	32.35	191.35	50.31	63.93	204.32	542.27
2008	31.05	184.27	50.77	63.73	204.31	534.13
2009	28.50	175.71	48.77	66.54	201.54	521.06
2010	28.31	188.01	49.76	65.14	203.66	534.89
2011	30.61	187.92	48.26	64.13	206.46	537.38
Δ2007/2011 p.a.	-1.4%	-0.5%	-1.0%	0.1%	0.3%	-0.2%
Δ2010/2011	8.1%	0.0%	-3.0%	-1.5%	1.4%	0.5%

A. Energy Overview

Impact of the Christchurch Earthquake on the Energy Sector

On 22 February 2011 a magnitude 6.3 earthquake rocked Christchurch, with devastating effect. Nearly 200 lives were lost, and there was widespread destruction to homes and businesses across the city. This earthquake was an aftershock of a much larger (M 7.1) but less damaging quake that occurred on 4 September 2010. After the February earthquake, energy infrastructure and demand for energy in the region were affected severely.

Most of the city's electricity distribution network lost power after the quake. The network owner, Orion Networks, reconnected about half the city by nightfall. In the following days, electricity was brought back to the city, with power restored to about 85% of the city within six days³.

The port terminal facility at the Port of Lyttelton closed for about a week after the earthquake, which affected the supply of petrol and diesel into the city. As an interim solution, fuel was transported by road tanker from Timaru instead. Although some service stations were damaged, there were no fuel shortages in the city in the days after the quake.

On a brighter note, the reticulated LPG network in Christchurch, operated by Contact Energy, came through the earthquake in relatively good shape. There were outages initially, but service to most of the network (with the exception of the Central Business District) was restored within a few days. The network is thought to have survived so well because it consists of (flexible) plastic pipes laid through the old galvanised coal gas pipes.

Energy demand in Christchurch was also affected heavily. Electricity demand was around 10% lower in 2011 than in 2010, and petrol demand in Christchurch city was 6% lower in 2011 than it was in 2010. At the same time, diesel demand increased by 5% from 2010 to 2011. Figures A.4c and A.4d show the petrol and diesel demand in Christchurch, by month, for 2008–2011⁴.

Figure A.4c illustrates the significant drop in petrol demand after the earthquakes. This is probably a consequence of people leaving Christchurch city after the earthquakes.

This is in contrast to Figure A.4d, which shows increased diesel demand after both the September 2010 Darfield Earthquake (M7.1) and the February 2011 Christchurch Earthquake (M6.3), compared with the same periods a year prior to each quake. This is likely due to an influx of heavy machinery in the city as part of the recovery effort. This was particularly significant in the latter half of 2011.

Figure A.4c: Petrol Demand in Christchurch, 2008–2011 (Gross TJ/day)

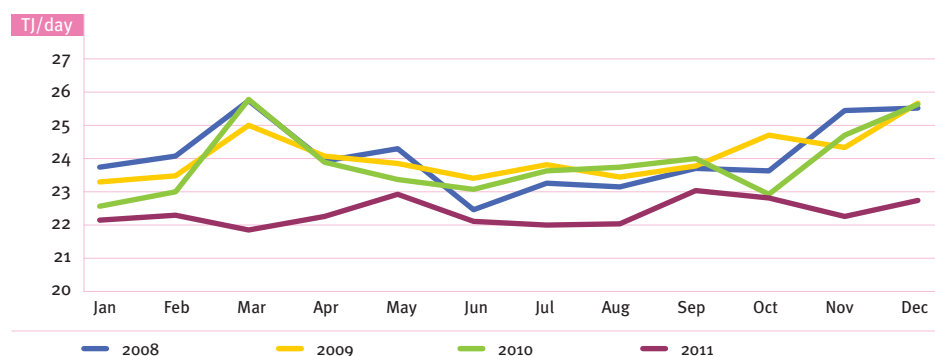
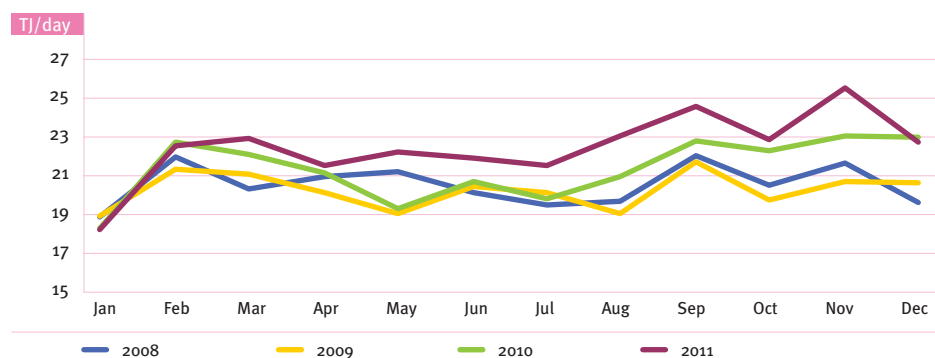


Figure A.4d: Diesel Demand in Christchurch, 2008–2011 (Gross TJ/day)



³ www.oriongroup.co.nz/downloads/Position_statement_280211_3_30pm.pdf

⁴ Data courtesy of the Christchurch Agency for Energy (www.cafe.gen.nz/).

A. Energy Overview

Consumer Energy Intensity, Gross Domestic Product and Population

Since 1990, Gross Domestic Product (GDP) has grown by over 68%, much faster than Total Consumer Energy (TCE), which grew by only 33%. In 2011, New Zealand consumed approximately 4 GJ per thousand dollars of GDP⁵. This is down from over 5 GJ per thousand dollars of GDP in 1990 and represents a 21% improvement in New Zealand's energy intensity since then.

New Zealand's Total Consumer Energy in 2011 was still less than the all-time TCE high recorded in 2004. Since 2008, the global financial crisis has impacted heavily on GDP. Movement in GDP relative to TCE since then shows the interdependence between energy consumption and the economy. In 2011 GDP was above the peak in 2007 for the first time since the global financial crisis.

Figure A.5: Percentage Change in New Zealand's GDP, Population and Consumer Energy Demand since 1990



Note to Figure A.5: GDP and Total Consumer Energy are for calendar years. Population is as at 30 June.

⁵ Statistics New Zealand Chain-Volume Series 95/96 Price – Gross Domestic Product by Industry.

B. Energy Balances

Introduction

This section presents annual energy supply and demand balance tables for New Zealand. Energy balances using Gross Calorific Values (GCV)¹ are presented in petajoules for the calendar years 2007 to 2011 (Tables B.2–B.6). The 2011 data is also displayed using net calorific values² (Table B.7). The energy balances focus on commercial energy – energy forms that are typically produced and sold as a fuel. There is not enough reliable data to include other forms of energy, such as passive solar heating. The entry “0.00” in an energy balance table indicates the figure is less than 0.005 PJ but greater than 0 PJ, with zero PJ indicated by a blank entry (this includes where no reliable data is available).

¹ Also known as higher heating value (HHV) – see Glossary for details.

² Also known as lower heating value (LHV) – see Glossary for details.

Supply

Total Primary Energy is the amount of energy available for use in New Zealand. Much of it is converted into other forms of energy before it is used. By convention, fuel used for international transport is excluded from total primary energy. Indigenous gas production is given after any gas is flared or reinjected and any LPG extracted. The primary energy figures presented are actual data, except for some that go into electricity generation as detailed under “Energy Transformation”.

Energy Transformation includes generation of electricity (including cogeneration), oil production (including refinery operations and the manufacture of synthetic fuel from natural gas – Methanex ceased methanol to petrol production in April 1999) and other transformation, which is primarily steel production.

In the Energy Transformation section of the balance tables, “energy in” is shown as negative values and “energy out” as positive values in the appropriate fuel columns. Transformation of energy from one form to another always results in conversion losses, particularly in thermal electricity generation, where much energy is lost as heat.

Transformation losses in electricity generation are derived from the net electricity generated, with the actual fuel input being used where available and the conversion factors shown in Table B.1 used otherwise. Fuel input to biogas, hydro, wind and waste heat are fully estimated. Quarterly figures for electricity generation are made up of actual data from major generators and the Electricity Authority. Estimates are made where actual data is unavailable at the time of publishing.

Table B.1: Default Electrical Transformation Factors¹

Fuel	Net to Gross Factor	Default Efficiency
Biogas	1.07	30%
Coal	1.07	30%
Gas (Single Cycle) ²	1.07	30%
Geothermal	1.06	15%
Hydro	1.01	100%
Oil	1.07	30%
Waste Heat	1.07	15%
Wind	1.01	100%
Wood	1.07	25%

Notes to Table B.1: ¹ Default efficiencies are only used where real data is unavailable.

² For combined cycle plants the assumed efficiency is 55%. Currently however actual fuel input data is collected for all combined cycle plants.

B. Energy Balances

Liquid Biofuel production (bio-ethanol and biodiesel) appears as renewable energy supply in the energy balance tables. As bio-ethanol and biodiesel are generally blended with motor petrol and diesel before consumption³, this also appears in energy transformation under oil production.

Losses and Own Use in the energy balances include losses both before and after transformation, losses and own use in production, transmission and distribution losses, electricity own use free of charge, and oil industry losses and own use (which includes distribution tankage losses, stocks, accounts adjustment and own consumption). Transformation losses are excluded.

Non-energy Use is primary thermal energy used for purposes other than combustion: e.g. bitumen for roads and natural gas used as feedstock for the production of methanol and ammonia/urea.

Demand

Consumer Energy is the amount of energy consumed by final users. It excludes energy used or lost in the process of transforming energy into other forms and in bringing the energy to the final consumers. For example, natural gas is a primary energy source (see page 9), some of which is transformed into electricity, some of which is lost in transmission to consumers.

Consumer energy statistics can be either calculated from supply-side data or observed from usage data.

Consumer energy (calculated) forms the top half of the energy balance tables and is calculated as Total Primary Energy supply, less Energy Transformation, less Non-energy Use.

Consumer energy (observed) forms the bottom half of the energy balance tables and it represents reported demand in the agriculture, forestry, fishing, industrial, commercial, transport and residential sectors. With the exception of domestic/national use of energy for on-road, rail, sea and air transport in the transport sector, these sectors follow the Australia New Zealand Standard Industrial Classification (ANZSIC) 2006.

Annual figures presented for Consumer Energy (observed) are actual data except for: thermal fuels used for cogeneration in the industrial and commercial sectors; biogas; wastes; and wood. Estimates of on-site cogeneration demand are included in electricity end use.

Where the energy use is not available or confidential, the “unallocated” category is used.

There is little data available on LPG consumption in the agricultural sector. The 2011 figure presented in the balance tables to follow in the Oil section (D) is from a survey of agricultural fuel use in New Zealand. Historical figures are estimates based upon the 2011 figure and agricultural production figures.

Electricity used for motive power in the transport sector is difficult to separate from electricity used to heat and light buildings owned by companies operating in the transport sector. The figures presented in this section are estimates based upon data collected from bus and train companies along with outputs from the Ministry of Transport’s Vehicle Fleet Model (VFM).

International Transport includes international sea and air transport. It excludes coastal shipping, national air transport, and all land transport.

Statistical Differences shows the difference between the “Consumer Energy (calculated)” and “Consumer Energy (observed)”. This difference is shown at the bottom of the energy balance tables.

For further definitions, see the Glossary.

³ A very small amount of liquid biofuel is consumed unblended. However, insufficient data is available on use of unblended liquid biofuel to include in this publication.

B. Energy Balances

Table B.2: Energy Supply and Demand Balance Calendar Year 2011

Converted into Petajoules using Gross Calorific Values		Coal			Oil					
		Bituminous & Sub-bitum.	Lignite	Total	Crudes/ Feedstocks/ NGL	LPG	Petrol	Diesel	Fuel Oil	Av. Fuel/ Kero ¹
SUPPLY	Indigenous Production	122.87	4.90	127.77	99.05	7.32				
	+ Imports	3.98	0.00	3.98	240.05	0.32	43.29	31.39	-	1.16
	- Exports	67.24	-	67.24	95.51	0.65	-	-	11.55	0.56
	- Stock Change	3.75	0.01	3.76	-7.78	-0.02	-2.75	3.45	5.12	-0.62
	- International Transport						-	1.74	11.13	34.26
	TOTAL PRIMARY ENERGY	55.85	4.89	60.74	251.38	7.00	46.04	26.20	-27.79	-33.05
	ENERGY TRANSFORMATION	-35.40	-0.24	-35.64	-248.45	-0.16	62.64	84.34	32.68	48.14
	Electricity Generation	-16.52	-	-16.52				-0.01	-0.00	
	Cogeneration	-6.80	-0.24	-7.04						
	Oil Production				-248.33		62.46	83.98	32.66	48.60
	Other Transformation	-11.41	-	-11.41						
Losses and Own Use	-0.66	-	-0.66	-0.12	-0.16	0.18	0.38	0.03	-0.47	
Non-energy Use										
CONSUMER ENERGY (calculated)		20.45	4.65	25.10	2.93	6.85	108.68	110.54	4.89	15.09
DEMAND	Agriculture, Forestry and Fishing	2.74	0.03	2.77		0.06	1.42	14.49	2.42	0.12
	Agriculture	2.74	0.02	2.76		0.06	1.42	9.88	-	0.11
	Forestry and Logging	-	0.01	0.01			0.00	2.92	0.01	0.00
	Fishing	-	-	-			0.00	1.69	2.41	0.01
	Industrial	15.53	3.65	19.19		2.49	0.13	11.11	1.02	0.09
	Mining	0.02	-	0.02			0.00	3.42	0.01	0.00
	Food Processing	9.86	3.62	13.48			-	-	-	-
	Textiles	0.11	-	0.11						
	Wood, Pulp, Paper and Printing	0.84	0.02	0.86						
	Chemicals	-	-	-						
	Non-metallic Minerals	3.50	0.01	3.51						
	Basic Metals	-	-	-						
	Mechanical/Electrical Equipment	0.03	-	0.03						
	Building and Construction	0.00	-	0.00			0.01	4.15	0.02	0.08
	Unallocated	1.18	-	1.18		2.49	0.12	3.54	1.00	0.00
Commercial	0.62	0.66	1.28		1.08	0.09	5.01	0.05	0.11	
Transport	0.04	-	0.04		0.45	107.07	79.78	4.00	14.84	
Residential	0.44	0.31	0.75		2.75	0.00	0.34	-	0.13	
CONSUMER ENERGY (observed)		19.38	4.65	24.03	-	6.85	108.71	110.75	7.49	15.29
Statistical Differences		1.06	0.00	1.07	2.93	0.00	-0.03	-0.21	-2.60	-0.20

Notes to Table B.2: ¹ The IEA considers all aviation fuel consumption to be "transport use". Here an aviation fuel use is reported in the sector to which it is sold.

B. Energy Balances

Others	Total	Natural Gas	Renewables							Electricity	Waste Heat	TOTAL	
		Total	Hydro	Geothermal	Solar	Wind	Liquid Biofuels	Biogas	Wood				Total
	106.36	161.96	90.28	159.05	0.36	7.02	0.19	3.04	60.60	320.55		1.52	718.16
7.14	323.35						0.05			0.05			327.37
-	108.26												175.51
0.71	-1.89	3.28											5.15
-	47.13												47.13
6.43	276.21	158.68	90.28	159.05	0.36	7.02	0.25	3.04	60.60	320.60		1.52	817.75
5.49	-15.32	-78.33	-90.28	-149.75		-7.02	-0.25	-2.76	-5.12	-255.19	144.17	-1.52	-241.83
	-0.02	-51.57	-90.28	-148.45		-7.02		-1.95		-247.70	150.50		-165.30
		-18.65		-1.31				-0.82	-5.12	-7.25	9.68	-1.52	-24.78
13.12	-7.52	-					-0.25			-0.25			-7.76
													-11.41
-7.63	-7.78	-8.12									-16.01		-32.58
-11.92	-11.92	-24.41											-36.33
-	248.97	55.94		9.30	0.36	-	-	0.28	55.47	65.41	144.17	-	539.58
	18.52	1.67		0.68						0.68	6.97		30.61
	11.47	1.65		0.68						0.68	6.25		22.81
	2.94	0.02									0.19		3.16
	4.10	-									0.54		4.64
	14.84	45.03		6.21					48.07	54.28	54.60		187.92
	3.43	0.00									1.47		4.92
	-	14.72									6.78		34.98
		0.84									0.43		1.37
		5.13									11.61		17.60
		18.86									2.46		21.32
		0.74									0.95		5.21
	-	2.95									24.90		27.85
		1.55									0.65		2.22
	4.26	0.04									0.65		4.95
	7.16	0.20		6.21					48.07	54.28	4.71		67.52
	6.35	5.54		2.10				0.28		2.38	32.71		48.26
	206.15	0.05						-		-	0.21		206.46
	3.23	5.70		0.31	0.36				7.40	8.08	46.36		64.13
-	249.08	58.00	-	9.30	0.36	-		0.28	55.47	65.41	140.86	-	537.38
-	-0.11	-2.06		0.00	-	-		-	-	-	3.31	-	2.21

B. Energy Balances

Table B.3: Energy Supply and Demand Balance Calendar Year 2010

Converted into Petajoules using Gross Calorific Values		Coal			Oil					
		Bituminous & Sub-bitum.	Lignite	Total	Crudes/ Feedstocks/ NGL	LPG	Petrol	Diesel	Fuel Oil	Av. Fuel/ Kero ¹
SUPPLY	Indigenous Production	134.02	4.51	138.53	115.81	7.34				
	+ Imports	5.84	0.00	5.85	232.65	0.37	42.89	26.21	-	2.73
	- Exports	75.29	-	75.29	110.52	0.70	1.63	0.01	2.75	-
	- Stock Change	11.11	0.04	11.15	1.64	0.03	0.92	-3.45	-1.74	-0.24
	- International Transport						-	1.40	13.08	33.95
	TOTAL PRIMARY ENERGY	53.46	4.47	57.93	236.31	6.98	40.34	28.25	-14.09	-30.98
	ENERGY TRANSFORMATION	-32.90	-0.25	-33.15	-236.78	-0.00	65.25	81.33	22.75	45.11
	Electricity Generation	-13.91	-	-13.91				-0.02	-0.00	
	Cogeneration	-7.82	-0.25	-8.07						
	Oil Production				-236.33		64.50	81.74	22.68	45.93
	Other Transformation	-10.58	-	-10.58						
Losses and Own Use	-0.59	-	-0.59	-0.45	-0.00	0.75	-0.39	0.07	-0.81	
Non-energy Use										
CONSUMER ENERGY (calculated)		20.56	4.22	24.78	-0.47	6.98	105.59	109.59	8.66	14.14
DEMAND	Agriculture, Forestry and Fishing	1.89	0.02	1.91		0.06	1.38	13.27	2.44	0.06
	Agriculture	1.89	0.02	1.91		0.06	1.37	8.93	-	0.05
	Forestry and Logging	-	-	-			0.01	2.57	-	0.00
	Fishing	-	-	-			0.00	1.77	2.44	0.00
	Industrial	18.35	3.00	21.35		2.59	0.09	11.29	1.27	0.11
	Mining	0.01	-	0.01			0.00	3.63	-	0.00
	Food Processing	11.40	2.94	14.34			-	-	-	-
	Textiles	0.24	-	0.24						
	Wood, Pulp, Paper and Printing	0.64	0.05	0.69						
	Chemicals	-	-	-						
	Non-metallic Minerals	4.16	0.01	4.17						
	Basic Metals	-	-	-						
	Mechanical/Electrical Equipment	0.02	-	0.02						
	Building and Construction	0.08	-	0.08			0.01	3.97	0.02	0.10
	Unallocated	1.80	-	1.80		2.59	0.08	3.69	1.25	0.01
Commercial	0.89	0.54	1.43		1.05	0.05	4.43	0.09	0.05	
Transport	0.05	-	0.05		0.64	108.81	75.87	3.51	14.53	
Residential	0.24	0.30	0.54		2.65	0.04	0.30	-	-	
CONSUMER ENERGY (observed)		21.42	3.86	25.28	-	6.98	110.36	105.15	7.31	14.75
Statistical Differences		-0.85	0.36	-0.49	-0.47	0.00	-4.77	4.43	1.35	-0.62

Notes to Table B.3: ¹ The IEA considers all aviation fuel consumption to be "transport use". Here an aviation fuel use is reported in the sector to which it is sold.

B. Energy Balances

Others	Total	Natural Gas	Renewables								Electricity	Waste Heat	TOTAL
		Total	Hydro	Geothermal	Solar	Wind	Liquid Biofuels	Biogas	Wood	Total	Total	Total	
	123.16	179.34	88.98	152.55	0.35	5.88	0.15	3.07	59.95	310.94		1.47	753.43
7.43	312.29						0.03			0.03			318.16
-	115.60												190.90
0.26	-2.58	5.89											14.46
0.01	48.43												48.43
7.17	273.99	173.45	88.98	152.55	0.35	5.88	0.18	3.07	59.95	310.96		1.47	817.81
7.66	-14.69	-89.82	-88.98	-143.07		-5.88	-0.18	-2.79	-5.08	-245.98	145.28	-1.47	-239.82
	-0.02	-62.58	-88.98	-141.76		-5.88		-1.95		-238.57	151.51		-163.57
		-19.40		-1.31				-0.84	-5.08	-7.22	10.06	-1.47	-26.11
15.03	-6.45	-					-0.18			-0.18			-6.63
													-10.58
-7.37	-8.22	-7.84									-16.28		-32.92
-14.82	-14.82	-25.50											-40.33
-	244.48	58.12		9.48	0.35	-	-	0.28	54.87	64.98	145.28	-	537.66
	17.21	1.47		0.73						0.73	7.00		28.31
	10.41	1.46		0.73						0.73	6.26		20.76
	2.59	0.01									0.21		2.81
	4.21	-									0.54		4.75
	15.35	42.99		6.10					47.35	53.45	54.87		188.01
	3.63	0.01									1.57		5.23
	-	13.15									7.12		34.60
		0.38									0.43		1.05
		4.85									11.95		17.48
		18.80									2.48		21.28
		0.83									0.93		5.92
	-	3.00									24.35		27.36
		1.39									0.67		2.08
	4.10	0.03									0.67		4.88
	7.61	0.56		6.10					47.35	53.45	4.70		68.12
	5.66	6.87		2.34				0.28		2.62	33.18		49.76
	203.37	0.03						-		-	0.21		203.66
	2.99	5.99		0.31	0.35				7.52	8.18	47.44		65.14
-	244.56	57.36	-	9.48	0.35	-		0.28	54.87	64.98	142.70	-	534.89
-	-0.08	0.76		-	-	-		-0.00	-	-	2.58	-	2.77

B. Energy Balances

Table B.4: Energy Supply and Demand Balance Calendar Year 2009

Converted into Petajoules using Gross Calorific Values		Coal			Oil					
		Bituminous & Sub-bitum.	Lignite	Total	Crudes/ Feedstocks/ NGL	LPG	Petrol	Diesel	Fuel Oil	Av. Fuel/ Kero ¹
SUPPLY	Indigenous Production	113.47	3.97	117.44	121.11	3.62				
	+ Imports	15.58	-	15.58	218.27	4.70	47.13	32.60	0.01	8.91
	- Exports	65.13	-	65.13	107.38	0.00	0.24	-	8.83	-
	- Stock Change	3.52	-	3.52	0.49	0.02	1.53	-0.91	-0.63	-0.35
	- International Transport						0.06	1.26	13.55	32.12
	TOTAL PRIMARY ENERGY	60.40	3.97	64.36	231.53	8.29	45.30	32.25	-21.74	-22.86
	ENERGY TRANSFORMATION	-44.50	-0.28	-44.79	-228.04	-0.00	66.79	72.90	31.02	39.29
	Electricity Generation	-27.72	-	-27.72				-0.08	-0.02	
	Cogeneration	-6.82	-0.28	-7.10						
	Oil Production				-227.42		66.53	72.41	31.19	40.28
	Other Transformation	-9.69	-	-9.69						
Losses and Own Use	-0.27	-	-0.27	-0.62	-0.00	0.26	0.57	-0.16	-0.99	
Non-energy Use										
CONSUMER ENERGY (calculated)		15.89	3.68	19.58	3.49	8.29	112.09	105.15	9.28	16.43
DEMAND	Agriculture, Forestry and Fishing	0.85	0.00	0.85		0.06	1.76	13.94	2.50	0.12
	Agriculture	0.85	0.00	0.85		0.06	1.72	10.20	-	0.09
	Forestry and Logging	-	-	-			0.02	1.73	-	0.00
	Fishing	-	-	-			0.02	2.00	2.50	0.02
	Industrial	16.43	3.25	19.67		3.13	0.28	13.45	0.91	0.10
	Mining	0.12	0.01	0.13			0.00	4.63	-	-
	Food Processing	8.11	3.09	11.19			-	0.01	0.02	-
	Textiles	0.12	-	0.12						
	Wood, Pulp, Paper and Printing	0.72	0.08	0.79						
	Chemicals	-	-	-						
	Non-metallic Minerals	3.40	-	3.40						
	Basic Metals	0.01	-	0.01			-	-	-	-
	Mechanical/Electrical Equipment	0.01	-	0.01						
	Building and Construction	0.01	-	0.01				0.02	4.37	0.02
	Unallocated	3.94	0.07	4.00		3.13	0.25	4.44	0.87	0.01
Commercial	1.09	0.20	1.29		1.15	0.11	2.77	0.05	0.52	
Transport	0.02	-	0.02		0.76	108.11	74.75	4.10	13.59	
Residential	0.56	0.30	0.86		3.19	0.00	0.31	-	-	
CONSUMER ENERGY (observed)		18.94	3.75	22.69	-	8.29	110.26	105.22	7.57	14.33
Statistical Differences		-3.04	-0.07	-3.11	3.49	0.00	1.83	-0.08	1.71	2.09

Notes to Table B.4: ¹ The IEA considers all aviation fuel consumption to be "transport use". Here an aviation fuel use is reported in the sector to which it is sold.

B. Energy Balances

Others	Total	Natural Gas	Renewables							Electricity	Waste Heat	TOTAL	
		Total	Hydro	Geothermal	Solar	Wind	Liquid Biofuels	Biogas	Wood				Total
	124.73	167.24	87.19	124.15	0.34	5.32	0.12	3.05	53.32	273.50		1.37	684.27
5.93	317.54												333.12
-	116.45												181.57
0.14	0.28	4.08											7.87
-	47.00												47.00
5.79	278.55	163.16	87.19	124.15	0.34	5.32	0.12	3.05	53.32	273.50		1.37	780.94
6.33	-11.71	-77.67	-87.19	-114.31		-5.32	-0.12	-2.77	-4.93	-214.64	140.72	-1.37	-209.46
	-0.10	-53.97	-87.19	-113.02		-5.32		-1.89		-207.42	147.17		-142.05
		-17.26		-1.29				-0.88	-4.93	-7.10	9.27	-1.37	-23.56
13.67	-3.33	-					-0.12			-0.12			-3.45
													-9.69
-7.34	-8.28	-6.44									-15.71		-30.70
-12.12	-12.12	-25.46											-37.58
-	254.72	60.03		9.84	0.34	-	-	0.28	48.40	58.85	140.72	-	533.90
	18.37	1.94		0.73						0.73	6.61		28.50
	12.07	1.94		0.73						0.73	5.87		21.47
	1.76	0.00									0.24		2.00
	4.54	-									0.50		5.04
	17.87	39.49		6.31					40.76	47.06	51.62		175.71
	4.64	0.01									1.76		6.54
	0.03	9.65									7.75		28.63
		0.56									0.44		1.12
		5.00									12.04		17.83
		18.54									2.44		20.98
		1.67									0.82		5.89
	-	2.94									20.24		23.18
		0.45									0.74		1.20
	4.51	0.05									0.68		5.25
	8.70	0.62		6.31					40.76	47.06	4.71		65.10
	4.61	7.30		2.52				0.28		2.80	32.77		48.77
	201.32	0.04						-		-	0.20		201.57
	3.49	6.38		0.28	0.34				7.64	8.26	47.55		66.54
-	245.67	55.15	-	9.84	0.34	-		0.28	48.40	58.85	138.75	-	521.10
-	9.05	4.89		-	-	-		-	-	-0.00	1.97	-	12.81

B. Energy Balances

Table B.5: Energy Supply and Demand Balance Calendar Year 2008

Converted into Petajoules using Gross Calorific Values		Coal			Oil					
		Bituminous & Sub-bitum.	Lignite	Total	Crudes/ Feedstocks/ NGL	LPG	Petrol	Diesel	Fuel Oil	Av. Fuel/ Kero ¹
SUPPLY	Indigenous Production	121.25	3.80	125.05	128.26	4.21				
	+ Imports	13.85	0.00	13.85	224.23	4.99	40.21	38.00	0.34	11.53
	- Exports	78.51	-	78.51	119.83	0.00	1.31	0.01	7.78	-
	- Stock Change	-23.87	-	-23.87	-1.83	-0.01	-0.11	-1.49	1.75	1.52
	- International Transport						0.04	1.58	13.59	33.75
	TOTAL PRIMARY ENERGY	80.46	3.80	84.26	234.49	9.21	38.96	37.90	-22.79	-23.74
	ENERGY TRANSFORMATION	-59.66	-0.29	-59.95	-234.77	-0.00	69.65	73.29	29.66	41.05
	Electricity Generation	-43.00	-	-43.00				-1.43	-	
	Cogeneration	-7.07	-0.29	-7.36						
	Oil Production				-234.13		70.62	74.31	29.65	41.40
	Other Transformation	-9.17	-	-9.17						
	Losses and Own Use	-0.43	-	-0.43	-0.65	-0.00	-0.98	0.41	0.01	-0.35
Non-energy Use										
CONSUMER ENERGY (calculated)		20.80	3.51	24.31	-0.28	9.21	108.61	111.19	6.87	17.31
DEMAND	Agriculture, Forestry and Fishing	1.73	0.01	1.74		0.06	1.99	16.11	2.02	0.15
	Agriculture	1.73	0.01	1.74		0.06	1.95	11.98	0.00	0.14
	Forestry and Logging	-	-	-			0.01	1.54	0.16	0.00
	Fishing	-	-	-			0.03	2.58	1.86	0.01
	Industrial	20.57	3.79	24.36		3.27	0.37	14.90	1.15	0.11
	Mining	-	-	-			0.00	4.12	0.15	-
	Food Processing	-	-	-			0.00	0.05	0.08	-
	Textiles	-	-	-						
	Wood, Pulp, Paper and Printing	-	-	-						
	Chemicals	-	-	-						
	Non-metallic Minerals	-	-	-						
	Basic Metals	-	-	-			-	0.00	-	-
	Mechanical/Electrical Equipment	-	-	-						
	Building and Construction	-	-	-			0.04	4.10	0.01	0.05
	Unallocated	20.57	3.79	24.36		3.27	0.32	6.63	0.90	0.06
Commercial	1.80	0.55	2.35		1.32	0.13	3.61	0.27	0.56	
Transport	0.08	-	0.08		0.93	109.42	75.14	3.46	15.02	
Residential	0.15	0.22	0.36		3.63	0.00	0.28	-	0.00	
CONSUMER ENERGY (observed)		24.33	4.56	28.89	-	9.20	111.91	110.04	6.90	15.84
Statistical Differences		-3.53	-1.04	-4.58	-0.28	0.00	-3.30	1.15	-0.03	1.47

Notes to Table B.5: ¹ The IEA considers all aviation fuel consumption to be "transport use". Here an aviation fuel use is reported in the sector to which it is sold.

B. Energy Balances

Others	Total	Natural Gas	Renewables							Electricity	Waste Heat	TOTAL	
		Total	Hydro	Geothermal	Solar	Wind	Liquid Biofuels	Biogas	Wood				Total
	132.48	159.99	80.41	107.16	0.32	3.81	0.09	2.91	57.85	252.55		1.44	671.50
7.28	326.57												340.42
-	128.94												207.45
-0.37	-0.54	0.02											-24.39
0.01	48.98												48.98
7.64	281.67	159.97	80.41	107.16	0.32	3.81	0.09	2.91	57.85	252.55		1.44	779.89
6.08	-15.05	-89.02	-80.41	-97.54		-3.81	-0.09	-2.63	-4.53	-189.00	141.04	-1.44	-213.43
	-1.43	-60.77	-80.41	-96.29		-3.81		-1.82		-182.32	146.17		-141.34
		-23.41		-1.25				-0.81	-4.53	-6.59	11.64	-1.44	-27.15
13.22	-4.93	-					-0.09			-0.09			-5.02
													-9.17
-7.14	-8.70	-4.85									-16.78		-30.76
-13.72	-13.72	-18.12											-31.84
-	252.89	52.84		9.62	0.32	-	-	0.28	53.32	63.55	141.04	-	534.62
	20.32	1.73		0.73						0.73	6.53		31.05
	14.13	1.73		0.73						0.73	5.82		24.15
	1.72	0.00									0.23		1.95
	4.47	-									0.48		4.95
	19.79	34.54		6.09					45.58	51.68	53.91		184.27
	4.27	0.11									1.51		5.89
	0.13	9.02									7.62		16.77
		0.69									0.49		1.19
		4.92									12.05		16.97
		14.01									2.65		16.66
		1.60									0.92		2.52
	0.00	3.01									22.69		25.71
		0.61									0.86		1.47
	4.20	0.11									0.71		5.02
	11.18	0.45		6.09					45.58	51.68	4.41		92.08
	5.89	6.53		2.52				0.28		2.80	33.19		50.77
	203.96	0.04						-		-	0.22		204.31
	3.92	5.47		0.28	0.32				7.74	8.34	45.64		63.73
-	253.89	48.30	-	9.62	0.32	-		0.28	53.32	63.55	139.50	-	534.13
-	-0.99	4.53		-	-	-		-	-	-	1.53	-	0.49

B. Energy Balances

Table B.6: Energy Supply and Demand Balance Calendar Year 2007

Converted into Petajoules using Gross Calorific Values		Coal			Oil					
		Bituminous & Sub-bitum.	Lignite	Total	Crudes/ Feedstocks/ NGL	LPG	Petrol	Diesel	Fuel Oil	Av. Fuel/ Kero ¹
SUPPLY	Indigenous Production	120.70	4.12	124.82	88.43	5.45				
	+ Imports	16.85	0.00	16.85	212.06	4.13	47.92	40.60	0.01	11.89
	- Exports	63.67	-	63.67	75.18	0.00	0.68	-	4.68	-
	- Stock Change	3.94	-	3.94	4.65	0.01	2.02	0.67	-1.31	0.19
	- International Transport						0.00	1.34	12.17	33.54
	TOTAL PRIMARY ENERGY	69.93	4.13	74.06	220.66	9.57	45.21	38.59	-15.53	-21.85
	ENERGY TRANSFORMATION	-43.88	-0.27	-44.15	-219.86	-0.00	66.35	73.71	24.28	38.75
	Electricity Generation	-26.07	-	-26.07				-0.01	-0.00	
	Cogeneration	-7.46	-0.27	-7.73						
	Oil Production				-219.12		66.84	72.68	24.32	38.94
Other Transformation	-9.92	-	-9.92							
Losses and Own Use	-0.43	-	-0.43	-0.75	-0.00	-0.49	1.04	-0.03	-0.19	
Non-energy Use										
CONSUMER ENERGY (calculated)		26.05	3.86	29.91	0.80	9.57	111.57	112.30	8.76	16.91
DEMAND	Agriculture, Forestry and Fishing	1.45	0.01	1.46		0.06	2.23	17.40	2.01	0.22
	Agriculture	1.45	0.01	1.46		0.06	2.19	13.32	0.01	0.22
	Forestry and Logging	-	-	-			0.01	1.35	0.37	0.00
	Fishing	-	-	-			0.03	2.73	1.64	0.00
	Industrial	19.90	3.45	23.35		3.31	0.45	15.88	1.15	0.15
	Mining	-	-	-			0.00	3.61	0.35	-
	Food Processing	-	-	-			0.00	0.04	0.10	-
	Textiles	-	-	-						
	Wood, Pulp, Paper and Printing	-	-	-						
	Chemicals	-	-	-						
	Non-metallic Minerals	-	-	-						
	Basic Metals	-	-	-				0.00	-	-
	Mechanical/Electrical Equipment	-	-	-						
	Building and Construction	-	-	-			0.03	3.57	0.01	0.08
	Unallocated	19.90	3.45	23.35		3.31	0.42	8.66	0.69	0.07
Commercial	1.64	0.50	2.13		1.34	0.38	3.21	0.32	0.69	
Transport	0.08	-	0.08		1.01	110.80	73.70	4.90	13.57	
Residential	0.25	0.30	0.55		3.85	0.00	0.64	-	0.00	
CONSUMER ENERGY (observed)		23.32	4.26	27.58	-	9.56	113.86	110.83	8.38	14.63
Statistical Differences		2.73	-0.40	2.33	0.80	0.00	-2.29	1.47	0.38	2.27

Notes to Table B.6: ¹ The IEA considers all aviation fuel consumption to be "transport use". Here an aviation fuel use is reported in the sector to which it is sold.

B. Energy Balances

Others	Total	Natural Gas	Renewables							Electricity	Waste Heat	TOTAL	
		Total	Hydro	Geothermal	Solar	Wind	Liquid Biofuels	Biogas	Wood	Total	Total		Total
	93.88	169.57	85.10	90.64	0.30	3.35	0.05	3.03	62.24	244.71		1.36	634.34
6.79	323.40												340.25
-	80.55												144.22
-0.38	5.85	0.05											9.85
-	47.05												47.05
7.17	283.83	169.52	85.10	90.64	0.30	3.35	0.05	3.03	62.24	244.71		1.36	773.48
6.58	-10.18	-104.09	-85.10	-81.09		-3.35	-0.05	-2.75	-4.38	-176.71	141.32	-1.36	-195.17
	-0.01	-75.35	-85.10	-79.84		-3.35		-1.90		-170.18	146.02		-125.59
		-22.58		-1.25				-0.85	-4.38	-6.48	11.48	-1.36	-26.66
13.91	-2.43	-					-0.05			-0.05			-2.47
													-9.92
-7.33	-7.75	-6.16									-16.18		-30.52
-13.75	-13.75	-15.35											-29.10
-	259.90	50.08		9.56	0.30	-	-	0.28	57.86	68.00	141.32	-	549.21
	21.92	1.81		0.56						0.56	6.61		32.35
	15.78	1.80		0.56						0.56	5.79		25.39
	1.73	0.01									0.36		2.10
	4.40	-									0.46		4.86
	20.93	33.39		6.09					50.06	56.15	57.53		191.35
	3.96	0.22									1.34		5.51
	0.14	10.08									7.79		18.01
		0.76									0.55		1.31
		5.30									12.40		17.70
		11.06									2.81		13.87
		1.75									0.92		2.67
	0.00	3.00									24.73		27.73
		0.68									0.91		1.59
	3.69	0.13									0.79		4.60
	13.15	0.41		6.09					50.06	56.15	5.29		98.35
	5.94	6.57		2.62				0.28		2.90	32.78		50.31
	203.99	0.02						-		-	0.23		204.32
	4.49	5.65		0.30	0.30				7.80	8.40	44.84		63.93
-	257.26	47.44	-	9.56	0.30	-		0.28	57.86	68.00	141.99	-	542.27
-	2.64	2.64	-	-	-	-		-	-	-	-0.68	-	6.93

B. Energy Balances

Table B.7: Energy Supply and Demand Balance Calendar Year 2011 NET

Converted into Petajoules using Net Calorific Values		Coal			Oil					
		Bituminous & Sub-bitum.	Lignite	Total	Crudes/ Feedstocks/ NGL	LPG	Petrol	Diesel	Fuel Oil	Av. Fuel/ Kero ¹
SUPPLY	Indigenous Production	116.79	4.39	121.18	91.82	6.75				
	+ Imports	3.75	0.00	3.75	222.53	0.29	40.39	29.46	-	1.09
	- Exports	64.55	-	64.55	88.53	0.60	-	-	10.88	0.53
	- Stock Change	3.52		3.52	-7.21	-0.02	-2.56	3.23	4.82	-0.58
	- International Transport						-	1.64	10.49	32.14
	TOTAL PRIMARY ENERGY	52.46	4.39	56.86	233.03	6.46	42.95	24.59	-26.18	-31.00
	ENERGY TRANSFORMATION	-33.23	-0.22	-33.45	-230.31	-0.14	58.44	79.17	30.78	45.16
	Electricity Generation	-15.51	-	-15.51				-0.01	-0.00	
	Cogeneration	-6.38	-0.22	-6.60						
	Oil Production				-230.20		58.27	78.83	30.76	45.60
	Other Transformation	-10.71	-	-10.71						
Losses and Own Use	-0.63	-	-0.63	-0.11	-0.14	0.17	0.35	0.03	-0.44	
Non-energy Use										
CONSUMER ENERGY (calculated)		19.23	4.18	23.41	2.71	6.32	101.39	103.76	4.60	14.16
DEMAND	Agriculture, Forestry and Fishing	2.58	0.02	2.60			1.33	13.61	2.28	0.11
	Agriculture	2.58	0.02	2.59			1.32	9.28	-	0.10
	Forestry and Logging	-	0.01	0.01			0.00	2.74	0.01	0.00
	Fishing	-	-	-			0.00	1.59	2.27	0.01
	Industrial	14.65	3.28	17.93		2.30	0.12	10.43	0.96	0.08
	Mining	0.02	-	0.02			0.00	3.21	0.01	0.00
	Food Processing	9.26	3.25	12.51			-	-	-	-
	Textiles	0.10	-	0.10						
	Wood, Pulp, Paper and Printing	0.79	0.01	0.80						
	Chemicals	-	-	-						
	Non-metallic Minerals	3.33	0.01	3.34						
	Basic Metals	-	-	-						
	Mechanical/Electrical Equipment	0.03	-	0.03						
	Building and Construction	0.00	-	0.00			0.01	3.90	0.02	0.08
	Unallocated	1.13	-	1.13		2.30	0.11	3.33	0.94	0.00
Commercial	0.59	0.59	1.18		1.00	0.08	4.71	0.05	0.11	
Transport	0.04	-	0.04		0.42	99.89	74.89	3.77	13.92	
Residential	0.42	0.28	0.69		2.54	0.00	0.32	-	0.13	
CONSUMER ENERGY (observed)		18.27	4.17	22.44	-	6.25	101.42	103.95	7.05	14.35
Statistical Differences		0.96	0.01	0.98	2.71	0.06	-0.03	-0.19	-2.45	-0.19

Notes to Table B.7: ¹ The IEA considers all aviation fuel consumption to be "transport use". Here an aviation fuel use is reported in the sector to which it is sold.

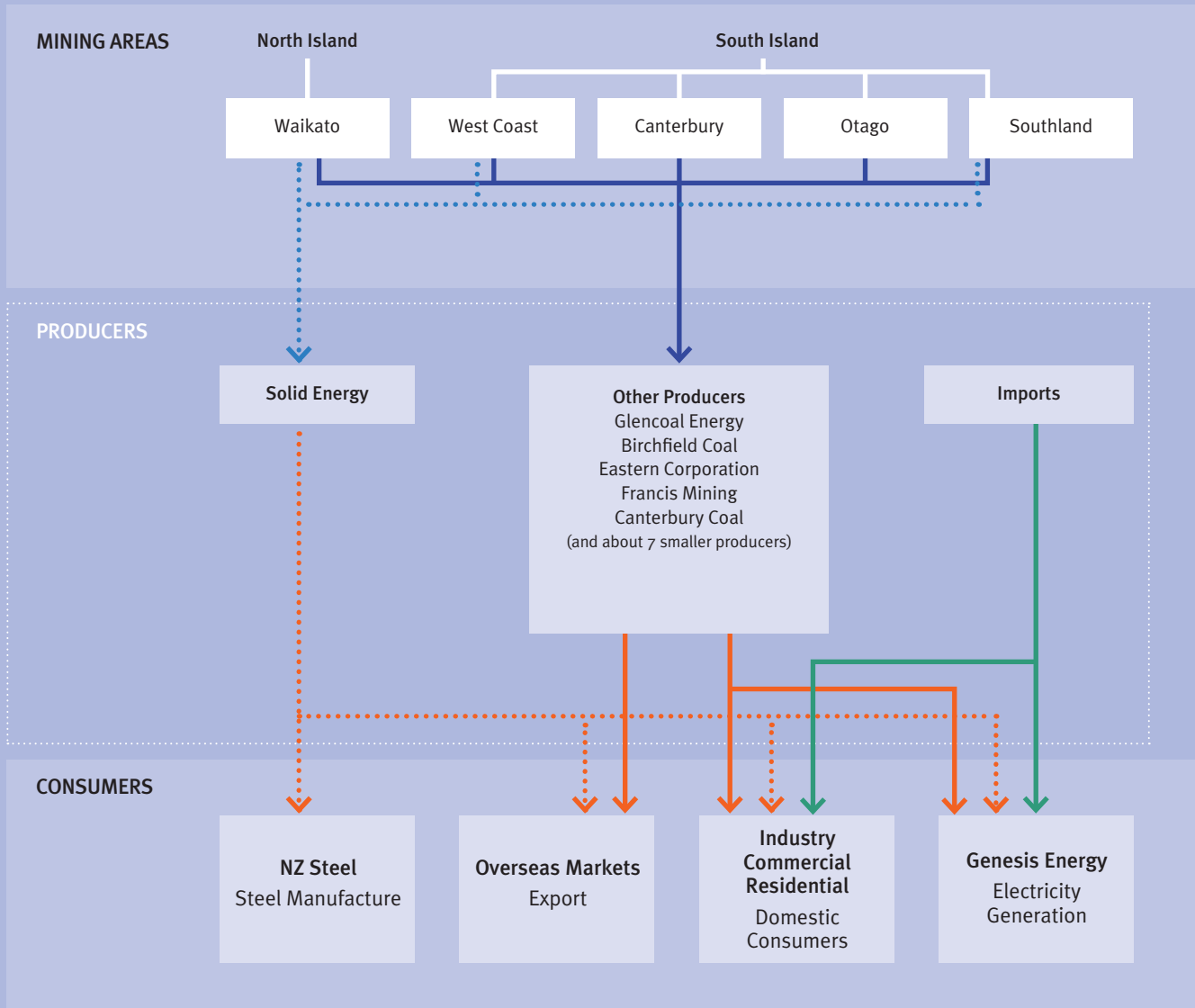
B. Energy Balances

NET

Others	Total	Natural Gas	Renewables							Electricity	Waste Heat	TOTAL	
		Total	Hydro	Geothermal	Solar	Wind	Liquid Biofuels	Biogas	Wood				Total
	98.56	144.31	90.28	159.05	0.36	7.02	0.18	2.75	47.45	307.10		1.06	672.21
6.77	300.53						0.05			0.05			304.33
-	100.53												165.09
0.67	-1.65	2.92											4.80
-	44.26												44.26
6.10	255.94	141.38	90.28	159.05	0.36	7.02	0.23	2.75	47.45	307.15		1.06	762.40
5.21	-11.70	-69.79	-90.28	-149.75		-7.02	-0.23	-2.50	-4.01	-253.80	144.17	-1.06	-225.64
	-0.01	-45.95	-90.28	-148.45		-7.02		-1.76		-247.51	150.50		-158.47
		-16.62		-1.31				-0.74	-4.01	-6.06	9.68	-1.06	-20.66
12.44	-4.31	-					-0.23			-0.23			-4.54
													-10.71
-7.23	-7.37	-7.23									-16.01		-31.25
-11.30	-11.30	-21.75											-33.05
-	232.94	49.84		9.30	0.36	-	-	0.25	43.44	53.35	144.17	-	503.71
	17.32	1.49		0.68						0.68	6.97		29.07
	10.70	1.47									6.25		21.01
	2.76	0.02									0.19		2.98
	3.86	-									0.54		4.40
	13.89	40.12		6.21					37.64	43.85	54.60		170.38
	3.22	0.00									1.47		4.70
	-	13.11									6.78		32.40
		0.75									0.43		1.27
		4.57									11.61		16.98
		16.81									2.46		19.27
		0.66									0.95		4.96
	-	2.62									24.90		27.53
		1.38									0.65		2.05
	4.00	0.03									0.65		4.68
	6.68	0.18		6.21					37.64	43.85	4.71		56.55
	5.94	4.94		2.10				0.25		2.35	32.71		47.11
	192.89	0.05						-		-	0.21		193.19
	2.99	5.08		0.31	0.36				5.80	6.47	46.36		61.60
-	233.03	51.68	-	9.30	0.36	-		0.25	43.44	53.35	140.86	-	501.35
-	-0.09	-1.84		0.00	-	-		-	-	-	3.31	-	2.36

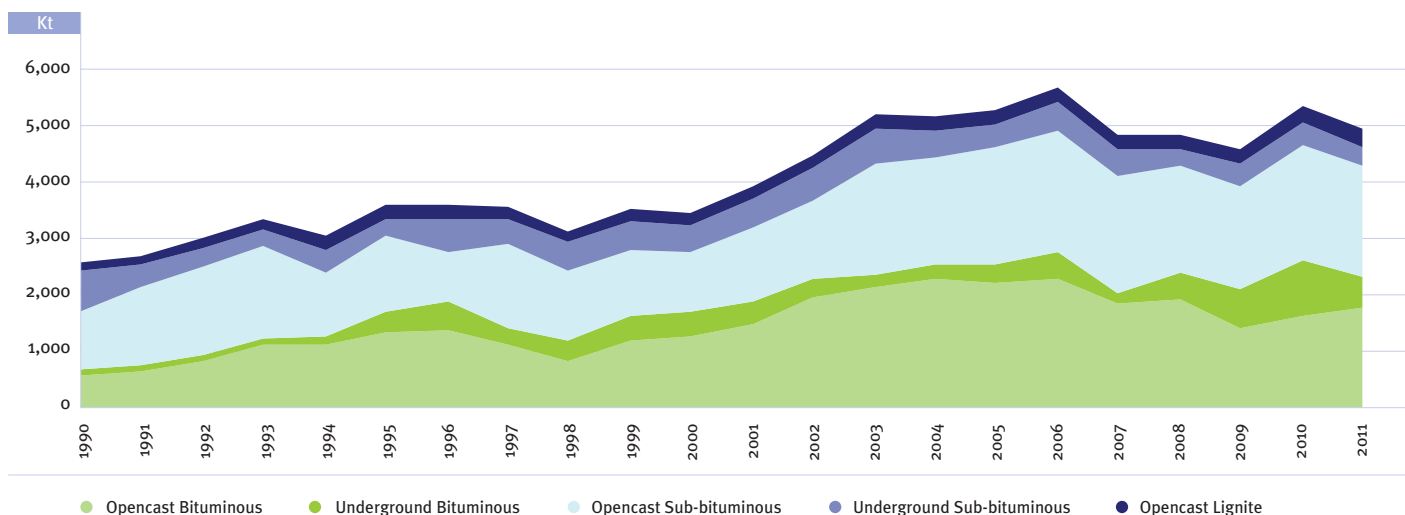
C. Coal

Figure C.1: Coal Industry Summary for 2011



Company names are listed without the suffixes "Limited" and "New Zealand Limited" where applicable.

Figure C.2: Annual Coal Production by Rank and Mining Method



Overview of New Zealand's Coal Industry

Introduction

This section of the *Energy Data File* contains information about coal production (supply) and sales to consumers (demand). All statistics apply to the 2011 calendar year. Comparisons are made with the 2010 calendar year, and are calculated from energy units, unless otherwise specified.

In 2011, New Zealand produced 4.9 million tonnes of coal, of which over 2.1 million tonnes were exported. The total amount of coal used in 2011 was 2.8 million tonnes, of which over 0.2 million tonnes were imported, with the remainder coming from local production.

Resources

New Zealand has extensive coal resources, mainly in the Waikato and Taranaki regions of the North Island, and the West Coast, Otago and Southland regions of the South Island. It has been estimated that national in-ground resources of all coals are over 15 billion tonnes, of which 80% are South Island lignites.

New Zealand's coal resources are generally well-explored. Between 1975 and 1989, a major government-funded coal-exploration programme, known as the New Zealand Coal Resources Survey, explored almost all of New Zealand's realistic coal prospects. More than 1,800 holes were drilled, and extensive resource-evaluation, geotechnical, geophysical, utilisation, environmental and mining-feasibility studies were carried out. The discovery of very large resources of lignite in Otago and Southland also led to a series of investigations in the 1980s by the Liquid Fuels Trust Board to evaluate the potential of the lignites for conversion to transport fuels.

Lignite is New Zealand's largest fossil fuel energy resource. The main deposits are well-known, with technically and economically recoverable quantities in the 10 largest deposits established at over 6 billion tonnes.

Sub-bituminous and bituminous in-ground resources are around 3.5 billion tonnes, but recoverable quantities of these coals are uncertain.

Recoverable coal estimates are dependent on assessment of a complex mix of factors, including:

- resource size and location;
- geological conditions;
- technical constraints on mining;
- mining economics;
- access to resources;
- project consents;
- market size and certainty;
- market price, which is itself partly set by import substitute price for some markets; and
- distribution costs and infrastructure.

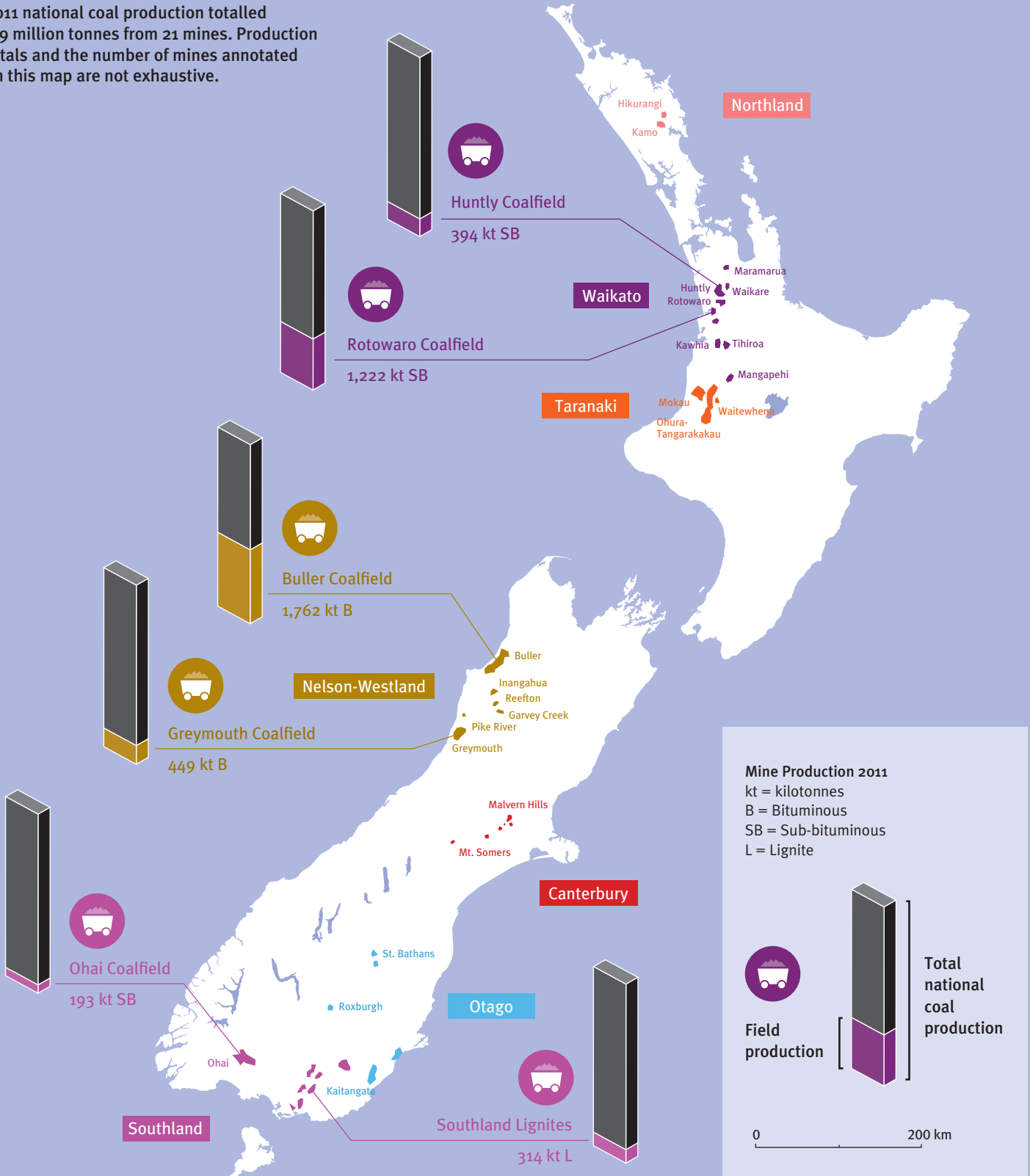
Recoverable coal quantities are thus not simple to assess, and will change depending on market conditions and as a result of ongoing exploration and feasibility studies into converting resources to reserves.

Figure C.1 shows a summary of the coal industry in New Zealand for 2011. Figure C.3 shows the locations of New Zealand's main coalfields.

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Figure C.3: Location of New Zealand Coal Resources and 2010 Coal Production

2011 national coal production totalled 4.9 million tonnes from 21 mines. Production totals and the number of mines annotated on this map are not exhaustive.



C. Coal

Production

New Zealand coal production in 2011 was 4.9 million tonnes, down 7% from 2010's production of 5.3 million tonnes. This was mostly due to reduced production at Rotowaro and Spring Creek, our second- and third-largest producing mines. Table C.1 shows coal production by mining method, rank and region in 2011. All lignite was produced in the lower South Island.

Over 93% of all production is of bituminous and sub-bituminous coals. Lignite makes up 80% of national coal resources, but lignite production in 2011 represented only 6.5% of total production, mostly as a consequence of its high moisture content and distance from the main centres of energy demand. However, lignite production in 2011 increased 9% compared to 2010, to a record 320,000 tonnes.

Production is centred in the Waikato (1.8 million tonnes, mainly for several major industrial users and the Huntly power station), on the West Coast (2.5 million tonnes, mainly for export), and in Southland (0.5 million tonnes, mainly for local industrial markets). The remaining production is from Otago and Canterbury.

Four underground and 17 opencast mines were operating in 2011. Over 58% of national production was from two large opencast operations, at Rotowaro and Stockton. State-owned Solid Energy was responsible for over 80% of national production. A number of smaller private coal-mining companies produced the remainder.

There are 34 current permits and 15 licences issued by New Zealand Petroleum and Minerals to mine coal, many of which cover small mines that are not producing, and 28 coal-exploration permits. The Crown owns only about half of New Zealand's coal resources, and mining of privately owned coal is not subject to the Crown Minerals Act 1991, although earlier legislation covers mining of some privately owned coal.

Table C.1: Production by Mining Method, Rank and Region for 2011 (kt)

	2011											
	Rank						Method				Total	
	Bituminous		Sub-bituminous		Lignite		Opencast		Underground			
	kt	Δ 2010/2011	kt	Δ 2010/2011	kt	Δ 2010/2011	kt	Δ 2010/2011	kt	Δ 2010/2011	kt	Δ 2010/2011
Waikato	-	0%	1,813.8	-11%	-	0%	1,468.5	-11%	345.3	-12%	1,813.8	-11%
NORTH ISLAND	-	0%	1,813.8	-11%	-	0%	1,468.5	-11%	345.3	-12%	1,813.8	-11%
West Coast	2,330.4	-10%	155.1	37%	-	0%	1,913.3	9%	572.2	-40%	2,485.5	-8%
Canterbury	-	0%	41.1	12%	-	0%	41.1	12%	-	0%	41.1	12%
Otago	-	0%	90.9	26%	5.7	45%	96.5	27%	-	0%	96.5	27%
Southland	-	0%	193.4	12%	314.5	8%	507.9	9%	-	0%	507.9	9%
SOUTH ISLAND	2,330.4	-10%	480.5	21%	320.1	9%	2,558.8	10%	572.2	-40%	3,131.0	-5%
NEW ZEALAND	2,330.4	-10%	2,294.2	-6%	320.1	9%	4,027.3	1%	917.5	-32%	4,944.8	-7%

C. Coal

Exports

Most of New Zealand's premium bituminous coal production is exported. These coals are valued internationally for their low ash and sulphur contents, and other characteristics such as high swelling, fluidity and reactivity, which allow them to be blended with other coals for use in the steel industry¹.

¹ West Coast bituminous coals are not suitable for use at the New Zealand Steel plant.

Exports of bituminous coal, produced entirely from the West Coast, were 67.2 PJ or 2.1 million tonnes for 2011, down 10% from 2010 levels mainly due to reduced production at Solid Energy's Spring Creek mine. New Zealand coal is exported mainly to India and Japan, with smaller quantities going to Chile, South Africa, Brazil, China, USA and Australia. Most exports are of coking coal, with smaller amounts of thermal and specialist coals.

Imports

The shortfall of North Island production over demand was met by imports of 4.0 PJ or 0.17 million tonnes, in 2011, virtually all for the Huntly power station. This was 32% lower than 2010, due to the consumption of previously purchased coal (Figure C.4).

Figure C.4: Coal Imports and Exports

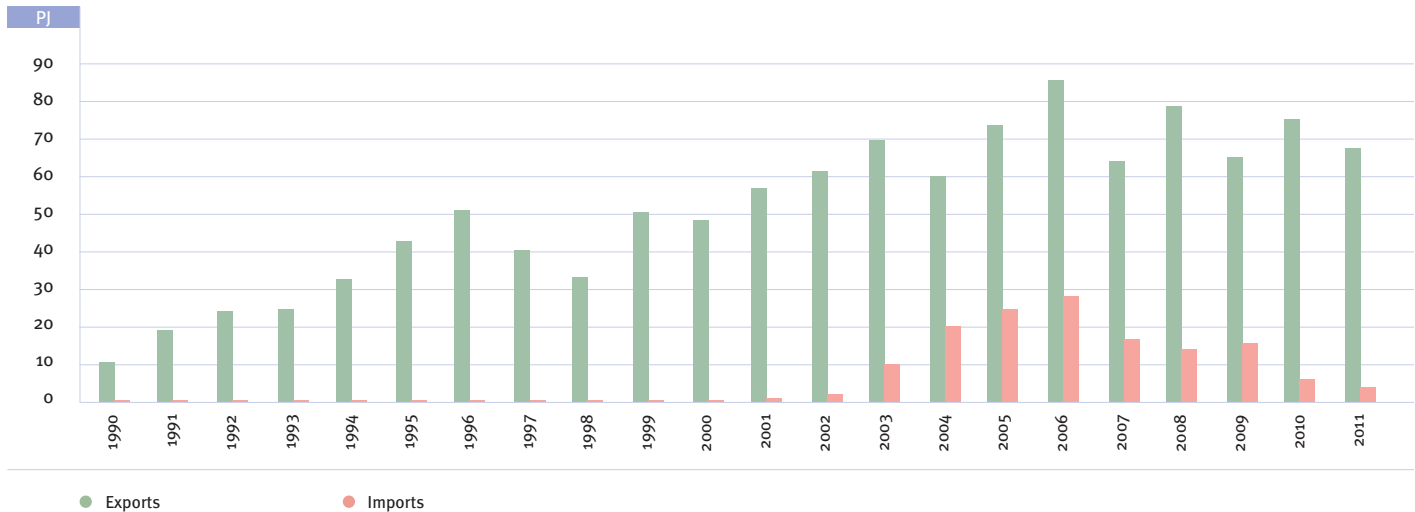
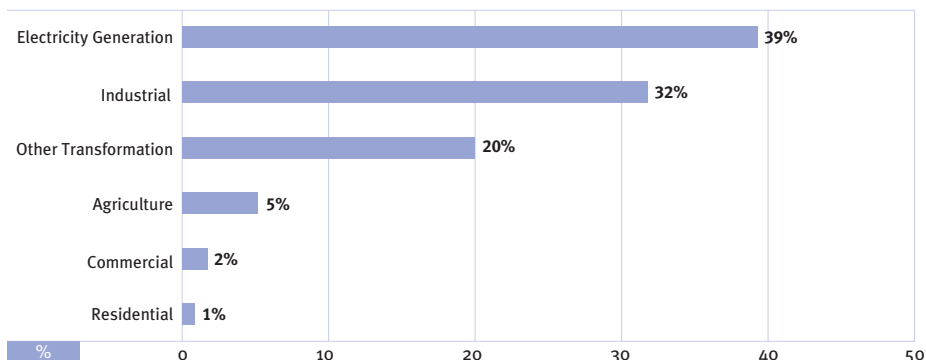


Figure C.5: Coal Consumption by Sector for 2011



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Consumption

Coal accounts for approximately 4% of New Zealand's total consumer energy. New Zealand consumed 2.8 million tonnes (59.3 PJ) of coal in 2011, an increase of 2% on the previous year. The biggest domestic users in 2011 were the Huntly power station (around 0.7 million tonnes) and the Glenbrook steel mill (around 0.8 million tonnes). Table C.2 shows coal consumption by sector.

In 2011, electricity generation (including cogeneration) accounted for 39% of domestic coal use, with other transformation (including losses and own use) at 19%, the industrial sector 32%, and the commercial sector 2%. Industrial coal use was primarily for: cement, lime and plaster; meat, dairy; and other food processing; wool; timber, and pulp; and paper products. Commercial coal use was mainly for heating accommodation and service buildings in central and local government, hospitals, rest homes and educational institutions. The remaining 6% was used by the agricultural (mainly horticulture), transport and residential sectors.

The South Island lignites are being evaluated for their potential as a feedstock for large-scale petrochemical processing into a range of possible energy products, including transport fuels, briquettes and fertilizers.

Lignite to liquids conversion offers a long-term option for achieving a secure supply of transport fuels, upon which New Zealand is heavily reliant.

A large portion of New Zealand's coal production for domestic use in 2011 was from the Waikato, underlining the regional interdependence of coal supply, industry and electricity supply. Waikato coal resources are becoming increasingly difficult and expensive to access, and remaining resources for opencast mining are limited.

More information on the New Zealand coal industry is available on the New Zealand Petroleum and Minerals website: www.nzpam.govt.nz/cms/coal/

Table C.2: Coal Energy Balance (Gross PJ)

Converted into Petajoules using Gross Calorific Values		2007	2008	2009	2010	2011	Δ 2007/2011 p.a.	Δ 2010/2011
SUPPLY	Indigenous Production	124.82	125.05	117.44	138.53	127.77	1%	-8%
	+ Imports	16.85	13.85	15.58	5.85	3.98	-30%	-32%
	- Exports	63.67	78.51	65.13	75.29	67.24	1%	-11%
	- Stock Change	3.94	-23.87	3.52	11.15	3.76	n.a.	n.a.
	TOTAL PRIMARY ENERGY	74.06	84.26	64.36	57.93	60.74	-5%	5%
	ENERGY TRANSFORMATION	-44.15	-59.95	-44.79	-33.15	-35.64	-5%	8%
	Electricity Generation	-26.07	-43.00	-27.72	-13.91	-16.52	-11%	19%
	Cogeneration	-7.73	-7.36	-7.10	-8.07	-7.04	-2%	-13%
	Other Transformation	-9.92	-9.17	-9.69	-10.58	-11.41	4%	8%
	Losses and Own Use	-0.43	-0.43	-0.27	-0.59	-0.66	12%	13%
CONSUMER ENERGY -calculated)		29.91	24.31	19.58	24.78	25.10	-4%	1%
DEMAND	Agriculture	1.46	1.74	0.85	1.91	2.77	17%	45%
	Industrial	23.35	24.36	19.67	21.35	19.19	-5%	-10%
	Commercial	2.13	2.35	1.29	1.43	1.28	-12%	-11%
	Transport	0.08	0.08	0.02	0.05	0.04	-15%	-14%
	Residential	0.55	0.36	0.86	0.54	0.75	8%	40%
CONSUMER ENERGY -observed)		27.58	28.89	22.69	25.28	24.03	-3%	-5%
Statistical Differences		2.33	-4.58	-3.11	-0.49	1.07	n.a.	n.a.

Notes to Table C.2: n.a. = Not applicable.

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Figure C.6: Coal Energy Flow Diagram for 2011



Notes to Figure C.6: ¹ Includes use at production sites and distribution losses.

² Includes commercial, residential, agriculture and transport.

C. Coal

Table C.3: Coal Supply and Calculated Consumption (Gross PJ)

Calendar Year or Quarter	Bituminous Production	Sub-bituminous Production	Lignite Production	Total Production	Imports ¹	Exports ²	Stock Change ^{3 R}	Energy Transformation ^{4,5}	Consumer Energy		Statistical Difference	
									Calculated	Observed		
1975	14.35	40.88	2.10	57.33								
1976	13.98	42.07	2.61	58.66								
1977	12.20	40.83	2.51	55.54								
1978	11.41	37.49	2.32	51.22								
1979	12.04	30.46	3.21	45.71								
1980	15.10	33.12	3.19	51.42								
1981	14.91	33.94	3.26	52.10		3.66						
1982	13.42	35.85	3.41	52.68		5.29						
1983	15.57	39.39	3.46	58.42		5.87						
1984	18.27	38.42	3.61	60.30		11.68						
1985	20.03	33.85	3.78	57.65		13.04						
1986	18.48	37.91	3.72	60.11		8.84						
1987	14.22	34.47	3.60	52.29		9.40						
1988	18.85	37.16	2.83	58.84		11.44						
1989	24.25	40.03	2.45	66.73		15.24						
1990	20.80	39.48	2.45	62.73	0.02	10.53		20.89	31.32			
1991	23.18	40.00	2.62	65.80	0.02	19.12		18.93	27.77	28.89	-1.12	
1992	29.52	42.65	2.76	74.93	0.02	24.15		27.16	23.65	25.50	-1.86	
1993	38.31	43.43	2.82	84.56	0.02	24.71		22.34	37.52	29.53	7.99	
1994	39.69	34.09	3.86	77.64	0.01	32.74	-9.90	20.57	34.25	28.47	5.78	
1995	54.04	37.28	3.90	95.21	0.00	42.71	2.96	23.26	26.29	27.52	-1.23	
1996	59.17	33.61	4.43	97.21	0.00	50.90	6.83	23.49	16.00	25.75	-9.76	
1997	43.61	44.49	3.36	91.47	0.00	40.20	1.96	28.25	21.05	24.68	-3.63	
1998	36.39	39.80	3.26	79.44	0.00	33.33	-2.61	24.85	23.87	23.28	0.59	
1999	50.80	37.58	3.32	91.71	0.00	50.62	-7.07	28.59	19.57	20.75	-1.18	
2000	53.07	34.94	3.33	91.35	0.48	48.48	-3.97	25.79	21.52	21.20	0.32	
2001	59.75	40.85	3.18	103.79	0.91	56.85	-11.66	31.75	27.75	26.80	0.95	
2002	71.41	44.39	3.52	119.32	2.28	61.02	11.75	31.25	17.58	27.29	-9.71	
2003	73.73	57.77	3.99	135.49	10.13	69.46	-5.79	51.10	30.85	32.91	-2.06	
2004	79.51	53.61	3.86	136.98	20.06	60.13	2.52	61.27	33.12	25.33	7.78	
2005	79.96	55.54	3.93	139.43	24.75	73.45	-6.04	72.10	24.68	23.65	1.03	
2006	86.59	59.44	4.01	150.03	28.07	85.24	7.46	69.11	16.31	24.96	-8.65	
2007	63.57	57.13	4.12	124.82	16.85	63.67	3.94	44.15	29.91	27.58	2.33	
2008	73.24	48.01	3.80	125.05	13.85	78.51	-23.87	59.95	24.31	28.89	-4.58	
2009	65.09	48.38	3.97	117.44	15.58	65.13	3.52	44.79	19.58	22.69	-3.11	
2010	80.88	53.14	4.51	138.53	5.85	75.29	11.15	33.15	24.78	25.28	-0.49	
2011	73.01	49.86	4.90	127.77	3.98	67.24	3.76	35.64	25.10	24.03	1.07	
2010	Mar	20.65	11.93	1.35	33.93	1.26	17.75	2.92	10.00	4.53	6.41	-1.88
	Jun	20.15	17.55	0.93	38.62	2.68	18.20	4.82	7.93	10.35	7.47	2.88
	Sep	22.22	11.61	0.85	34.68	1.89	20.15	4.42	6.82	5.18	5.61	-0.43
	Dec	17.87	12.06	1.37	31.30	0.01	19.20	-1.01	8.40	4.73	5.79	-1.06
2011	Mar	14.61	13.10	1.39	29.10	0.92	11.39	5.88	7.31	5.44	6.57	-1.12
	Jun	20.27	11.47	1.09	32.83	1.65	16.93	5.60	7.57	4.38	4.88	-0.50
	Sep	18.36	12.31	0.91	31.58	0.70	18.70	-4.93	10.78	7.73	4.48	3.25
	Dec	19.78	12.97	1.51	34.26	0.71	20.22	-2.78	9.98	7.55	8.10	-0.55
Δ2007/2011 p.a.		3.5%	-3.3%	4.4%	0.6%	-30.3%	1.4%	-1.2%	-5.2%	-4.3%	-3.4%	n.a.
Δ 2010/2011		-9.7%	-6.2%	8.6%	-7.8%	-32.0%	-10.7%	-66.2%	7.5%	1.3%	-4.9%	n.a.

Notes to Table C.3: ¹ Imports are bituminous and sub-bituminous coal.

² Majority of coal exports are bituminous rank.

³ Stock change figures include coal at Huntly power station, NZ Steel and coal production sites.

⁴ Includes electricity generation, cogeneration, and losses and own use.

⁵ Revised from 1989 to 2008.

n.a. = Not applicable.

^R = Revised figures.

C. Coal

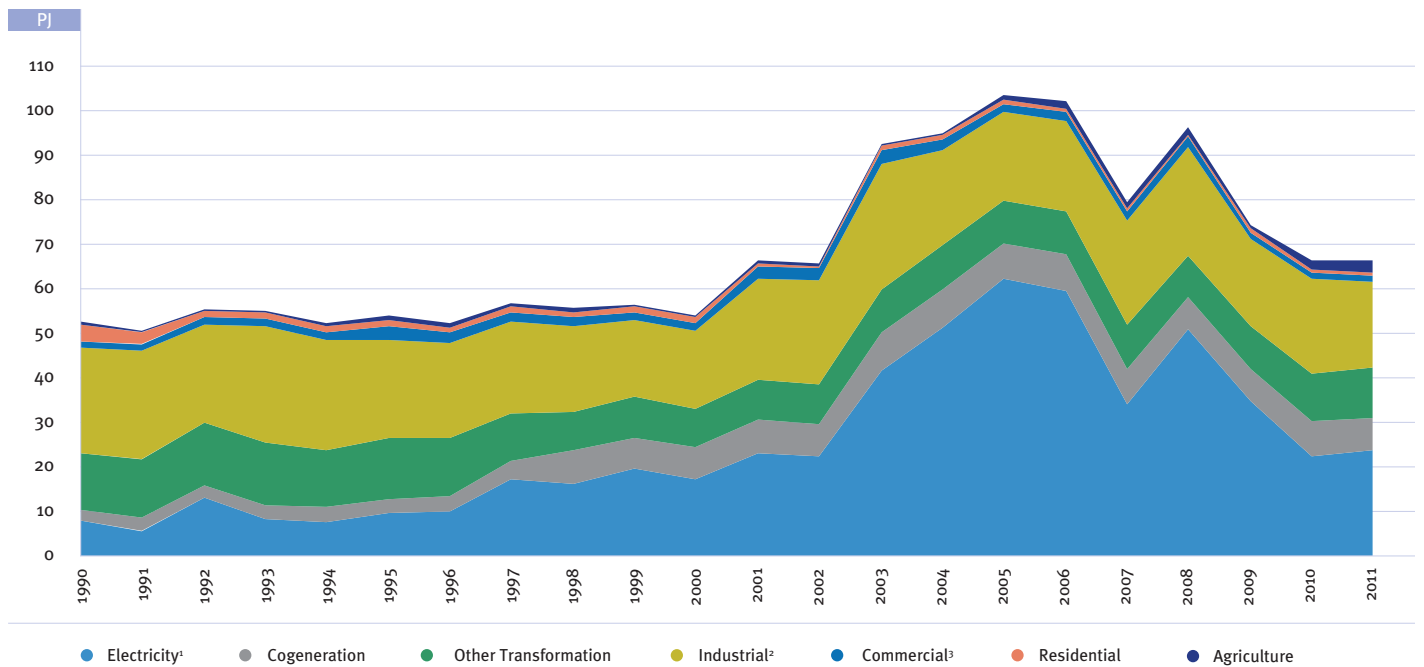
Table C.4: Summary of Observed Coal Consumption by Sector (Gross PJ)

Calendar Year or Quarter	Energy Transformation					Consumer Energy						Total
	Electricity Generation	Cogeneration	Other Transformation	Losses and Own Use ¹	Total	Agriculture	Industrial	Commercial	Residential	Transport ¹	Total	
1990	5.21	2.37	12.89	0.43	20.89	0.39	23.40	1.55	3.84	0.08	29.27	50.16
1991	2.42	2.87	13.22	0.43	18.93	0.38	24.20	1.58	2.65	0.08	28.89	47.83
1992	9.68	2.87	14.18	0.43	27.16	0.35	22.10	1.45	1.53	0.08	25.50	52.66
1993	4.73	3.10	14.09	0.43	22.34	0.37	26.14	1.70	1.24	0.08	29.53	51.88
1994	4.12	3.21	12.82	0.43	20.57	0.72	24.74	1.65	1.28	0.08	28.47	49.04
1995	6.04	3.20	13.59	0.43	23.26	0.99	22.15	3.03	1.26	0.08	27.52	50.78
1996	6.62	3.15	13.30	0.43	23.49	1.03	21.22	2.22	1.20	0.08	25.75	49.25
1997	12.90	3.96	10.97	0.43	28.25	0.91	20.39	2.05	1.25	0.08	24.68	52.93
1998	8.26	7.50	8.67	0.43	24.85	0.76	19.31	1.82	1.31	0.08	23.28	48.14
1999	12.01	7.13	9.02	0.43	28.59	0.49	17.31	1.70	1.17	0.08	20.75	49.34
2000	9.69	7.14	8.54	0.43	25.79	0.58	17.57	1.89	1.08	0.08	21.20	47.00
2001	14.83	7.79	8.70	0.43	31.75	0.59	22.73	2.68	0.72	0.08	26.80	58.55
2002	14.87	7.23	8.72	0.43	31.25	0.63	23.33	2.65	0.60	0.08	27.29	58.54
2003	32.53	8.64	9.51	0.43	51.10	0.55	28.42	3.03	0.82	0.08	32.91	84.01
2004	42.58	8.44	9.82	0.43	61.27	0.53	21.37	2.48	0.87	0.08	25.33	86.60
2005	53.94	7.88	9.85	0.43	72.10	1.22	19.58	1.88	0.88	0.08	23.65	95.74
2006	50.99	8.23	9.47	0.43	69.11	1.98	20.47	1.74	0.69	0.08	24.96	94.06
2007	26.07	7.73	9.92	0.43	44.15	1.46	23.35	2.13	0.55	0.08	27.58	71.73
2008	43.00	7.36	9.17	0.43	59.95	1.74	24.36	2.35	0.36	0.08	28.89	88.84
2009	27.72	7.10	9.69	0.27	44.79	0.85	19.67	1.29	0.86	0.02	22.69	67.48
2010	13.91	8.07	10.58	0.59	33.15	1.91	21.35	1.43	0.54	0.05	25.28	58.43
2011	16.52	7.04	11.41	0.66	35.64	2.77	19.19	1.28	0.75	0.04	24.03	59.67
2010 Mar	5.11	2.05	2.59	0.25	10.00	0.52	5.59	0.21	0.07	0.02	6.41	16.41
2010 Jun	2.95	2.13	2.81	0.04	7.93	0.78	6.04	0.44	0.20	0.01	7.47	15.40
2010 Sep	2.15	2.01	2.60	0.07	6.82	0.57	4.40	0.44	0.18	0.01	5.61	12.43
2010 Dec	3.70	1.89	2.58	0.23	8.40	0.04	5.32	0.34	0.08	0.01	5.79	14.19
2011 Mar	2.46	1.92	2.61	0.32	7.31	0.33	5.73	0.18	0.32	0.01	6.57	13.88
2011 Jun	2.81	1.88	2.76	0.12	7.57	0.75	3.58	0.39	0.16	0.01	4.88	12.45
2011 Sep	6.11	1.40	3.13	0.14	10.78	0.50	3.35	0.43	0.19	0.01	4.48	15.26
2011 Dec	5.14	1.85	2.92	0.08	9.98	1.18	6.53	0.28	0.09	0.01	8.10	18.08
Δ2007/2011 p.a.	-10.8%	-2.3%	3.6%	11.6%	-5.2%	17.3%	-4.8%	-11.9%	8.1%	-15.4%	-3.4%	-4.5%
Δ 2010/2011	18.8%	-12.8%	7.9%	13.1%	7.5%	45.0%	-10.1%	-10.5%	39.7%	-14.3%	-4.9%	2.1%

Notes to Table C.4: ¹ Estimated up to, and including, 2008

C. Coal

Figure C.7: Summary of Observed Coal Consumption by Sector (Gross PJ)



Notes to Figure C.7: ¹Includes losses and own use.

²Excludes cogeneration.

³Includes transport.

C. Coal

Table C.5: Coal Consumption – Breakdown by Sector for 2011¹ (Gross TJ)

	ANZSIC 2006 ¹	Bituminous	Sub-bituminous	Lignite	Total
Energy Transformation of which:		416.90	34,982.80	241.49	35,641.20
Electricity Generation	D2611	-	16,522.68	-	16,522.68
Cogeneration	n.a.	-	6,802.26	241.49	7,043.75
Other Transformation	n.a.	-	11,412.65	-	11,412.65
Losses and Own Use	n.a.	416.90	245.22	-	662.12
Agriculture	A01, A02 & A05	40.34	2,703.60	25.01	2,768.95
Industrial use of:		3,868.23	11,662.39	3,654.41	19,185.03
Mining	B	-	19.26	-	19.26
Steel manufacturing	C211	-	-	-	-
Non-Steel Metal manufacturing	C213	-	-	-	-
Metal Product manufacturing	C22, C212 & C214	-	-	-	-
Wood, Pulp and Paper Product manufacturing	C14 & C15	-	840.82	15.95	856.77
Non-Metallic Mineral Product manufacturing	C20	2,304.27	1,191.57	13.86	3,509.69
Chemical Product manufacturing	C18	-	-	-	-
Meat manufacturing	C111 & C112	0.58	1,092.46	796.68	1,889.73
Dairy manufacturing	C113	384.65	7,794.89	2,658.54	10,838.07
Other Food Product manufacturing	C112, C114 - C122	-	586.00	169.38	755.38
Textile, Leather, Clothing, Footwear manufacturing	C13	-	105.86	-	105.86
Mechanical/Electrical Equipment manufacturing	C23-C24	-	28.12	-	28.12
Furniture and Other manufacturing	C25	1,178.73	-	-	1,178.73
Building and Construction	E	-	3.41	-	3.41
Gas and water supply, sewerage and drainage services	D27-D28	-	-	-	-
Commercial use of which:		4.77	619.75	659.11	1,283.63
Health Care and Social Assistance	Q	-	245.59	518.82	764.41
Education and Training	P	-	23.15	2.98	26.13
Other Services ²	D28-29,F-S excl P,Q	4.77	351.01	137.31	493.09
Transport	n.a.	3.36	37.52	-	40.89
Residential	n.a.	8.22	434.66	307.32	750.20
Total Consumer Energy -observed)		3,924.92	15,457.93	4,645.85	24,028.70

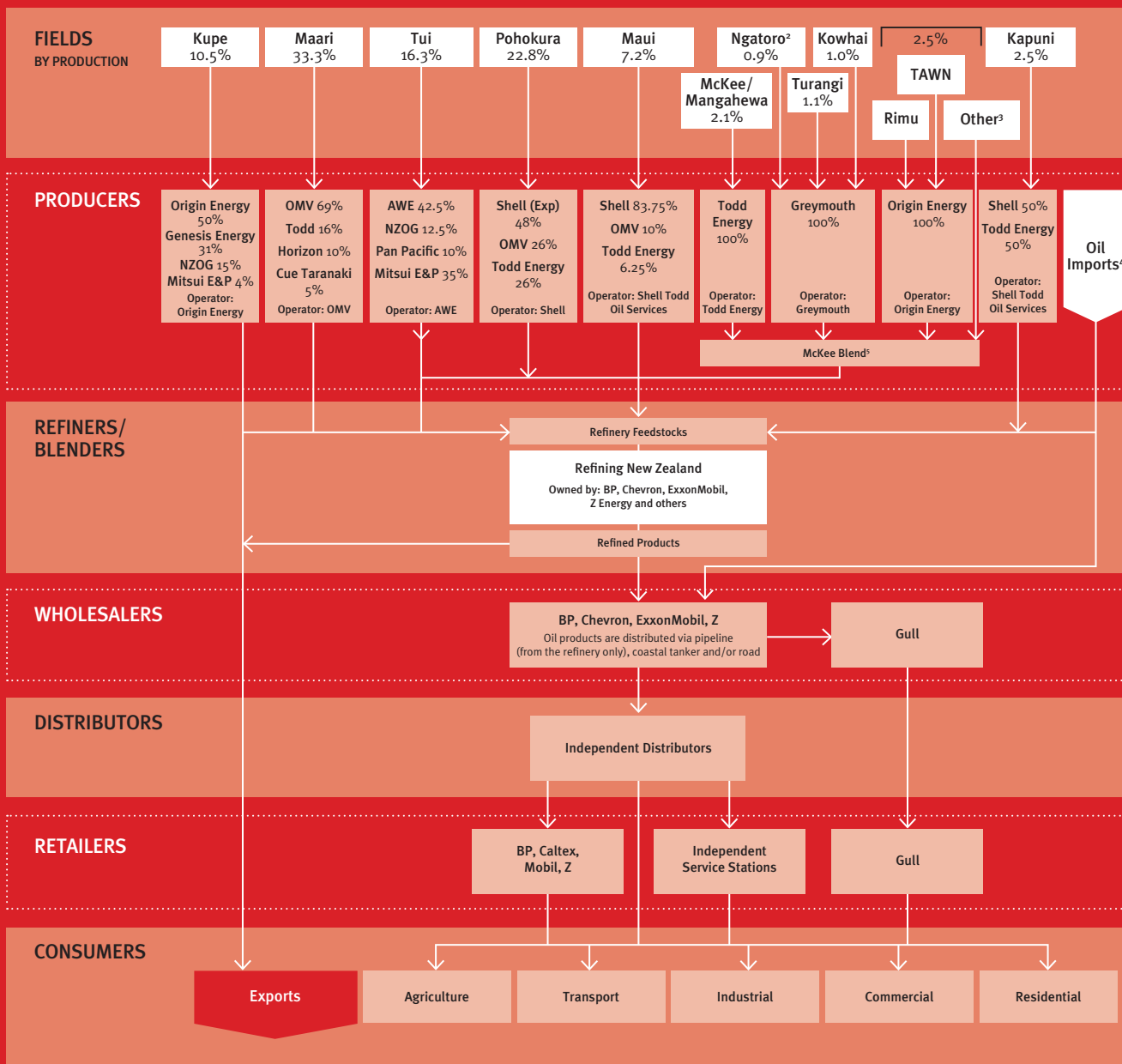
Notes to Table C.5: ¹ MED has been collecting a sectorial breakdown at this level since 2009.

² Too many ANZSIC codes to list.

n.a. = Not applicable.

D. Oil

Figure D.1a: Oil Industry Summary for 2011¹



Company names are listed without the suffixes "Limited" and "New Zealand Limited" where applicable and subsidiaries are listed as the parent company. The companies are: **AWE** is AWE NZ Limited, **Chevron** is Chevron NZ (includes Caltex New Zealand Limited), **Greymouth** is Greymouth Petroleum Holdings Limited, **Mitsui E&P** is Mitsui E&P Australia Pty, **ExxonMobil** is ExxonMobil New Zealand Holdings (includes Mobil Oil New Zealand Limited), **NZOG** is New Zealand Oil and Gas, **OMV** is OMV New Zealand Limited (Österr Mineralöl Verwaltung), **Origin Energy** is Origin Energy New Zealand Ltd and Contact Energy (51% owned by Origin), **Shell** is Shell NZ Limited (includes Shell Exploration NZ Limited, Shell (Petroleum Mining) Energy Petroleum Holdings Limited, Energy Petroleum Investments Ltd, Energy Petroleum Taranaki Ltd and Taranaki Offshore Petroleum Company), **TAWN** comprises the Tariki, Ahuroa, Waihapa and Ngaere fields.

Notes to Figure D.1a: ¹ Ownership as at 31 December 2011.

² Kaimiro, Ngatoro and Windsor fields were combined as a single permit area in 2010. All these fields are included here, as is Moturoa.

³ Includes Cheal, Sidewinder, Copper Moki and Surrey fields, and Radnor well. Cheal and Sidewinder are owned by TAG Oil Limited. Surrey is owned and operated by Greymouth Petroleum. Copper Moki is owned by New Zealand Energy Corporation.

⁴ Crude and refined product are imported by the four large oil companies. Bio-ethanol is imported by Gull Petroleum.

⁵ Source: Shell NZ Limited.

Overview of New Zealand's Oil Industry

Introduction

Oil is New Zealand's largest source of energy and it has a strong influence on all parts of our economy. While there are a number of producing oil fields in New Zealand, most of our oil is imported. This section of the *Energy Data File* covers all aspects of oil, from production to consumption. Units of volume (usually million barrels) are used for the discussion of oil production statistics alongside the energy units, because this allows comparison with the Reserves section (Section H). Energy units (petajoules) are used for the discussion of transformation and consumption statistics because this allows comparison between the different oil product types (i.e. a litre of petrol and a litre of diesel have different energy contents. Percentage changes between annual statistics were calculated from gross petajoules for consistency.

Total oil production in New Zealand, defined as including condensate, naphtha, natural gas liquids and crude oil, decreased by 14.5% in the 2011 calendar year to 99 PJ (17 million barrels or 45,500 barrels per day). Maari oil field continues to lead New Zealand's oil production, but decreased 14% in 2011.

Pohokura, Tui and Kupe were other significant contributors to oil production in 2011. Production at Tui oil field was down by 24% in 2011, while two new small oil fields (Sidewinder and Copper Moki) began production late in 2011.

Observed oil consumption data for 2011 increased 2% from 2010. Petrol and diesel continue to dominate oil product consumption in New Zealand; in 2011 41% of total oil consumer energy was from petrol, and 42% of total oil consumer energy was from diesel. Aviation fuels (6%), fuel oil (3%), LPG (3%) and other oil products¹ (6%) made up the remaining consumption.

The data used to compile this publication is available online at: www.med.govt.nz/sectors-industries/energy/energy-modelling/data/oil

Crude Oil

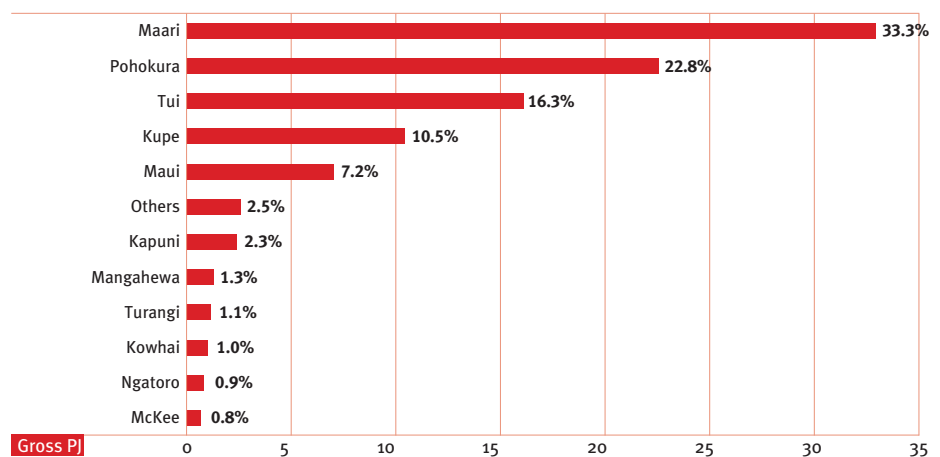
Ownership

Most of the mining permits for the large fields are jointly owned, with the bulk of investment coming from foreign companies. There were no significant changes of ownership at producing fields in 2011. Two new oil fields started producing in 2011, Sidewinder (TAG Oil Limited) and Copper Moki (New Zealand Energy Corp). A full breakdown of (producing) field ownership is shown in Figure D.1a.

Production

New Zealand's oil is extracted from 19 fields in the Taranaki region. Total oil production in 2011 was the lowest in the last four years, down 15% from 2010. New Zealand's mean production rate was 45,500 barrels per day in 2011 (down from the peak production of 58,700 barrels per day in 2008). Maari and Pohokura dominated production in 2011; these fields contributed 56% of New Zealand's oil. Figure D.1b shows the percentage of oil production by field.

Figure D.1b: Oil Production by Field in 2011



¹ Other oil products consumption is mostly non-energy use. This includes bitumen, waxes, lubricants and solvents, as well as by-products of oil refining (sulphur and carbon dioxide gas).

D. Oil

Historically, New Zealand's oil consisted mostly of condensate, with some crude oil and naphtha. Recently, however, crude oil production has accounted for 52% of the total production, with condensate (46%) and naphtha (2%) making up the balance.

Exploration, Developments and Permitting

Permitting information can be found in the Oil and Gas Reserves section (H). Detailed information on current and historical petroleum permits can be found on the New Zealand Petroleum and Minerals website, www.nzpam.govt.nz. The website also contains industry overviews, free technical data, maps, and latest news from the industry.

For information regarding oil and gas exploration and new field developments, please see Section H (Oil and Gas Reserves).

Imports and Exports

Figure D.1c shows imports of crude oil by country of origin for the 2011 calendar year. Over half (58%) of all imported oil in 2011 was produced in the Middle East, 21% was produced in Russia, 19% originated in Asia, and the balance (3%) was produced in the United Kingdom. Overall, crude oil and blendstock imports were up by 3% (to 240 PJ or 110,000 barrels per day) from the 2010 calendar year.

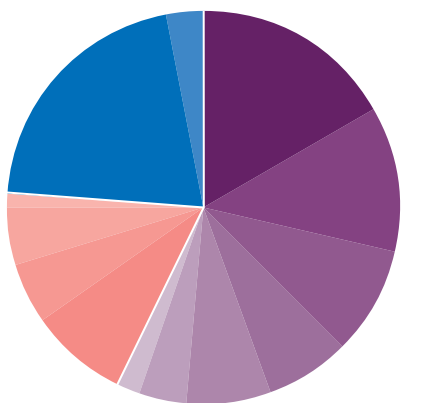
New Zealand's oil exports dropped 14% from 2010 to 95 PJ (16 million barrels or 44,000 barrels per day) due to decreased production across most fields. New Zealand's locally produced crude oil is generally exported because of its high quality and therefore high value on the international market. Australia purchased the majority of this oil.

Refinery

The Marsden Point Oil Refinery is New Zealand's only oil refinery. It is operated by Refining NZ (formerly New Zealand Refining Company) and is located near Whangarei. It started operating in 1964 and has had two major expansions, in 1985 and 2009. The refinery is now capable of processing around 135,000 barrels of crude oil per day.

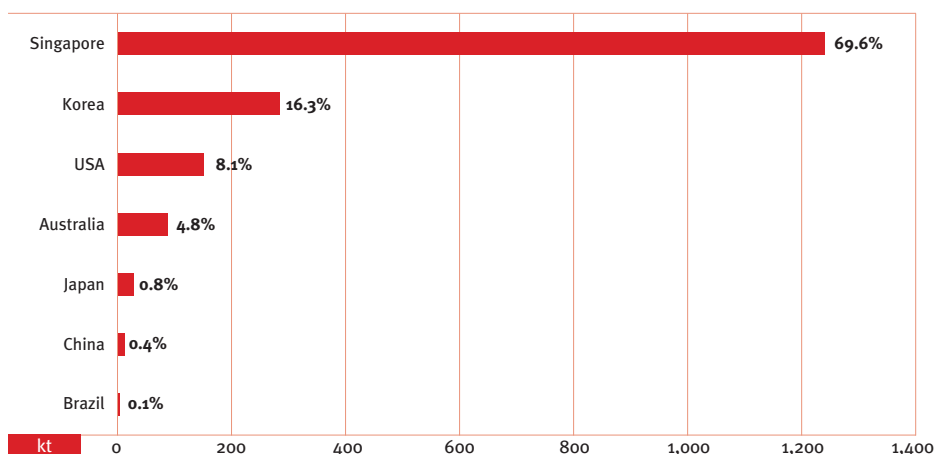
Refining NZ announced plans for a \$365 million upgrade project in May 2012². These plans include the installation of a Continuous Catalyst Regeneration (CCR) Platformer.

Figure D.1c: 2011 Crude Oil Imports by Country of Origin



Middle East 57%	Asia 19%
● Qatar 17%	● Brunei 8%
● Saudi Arabia 12%	● Malaysia 5%
● Other Middle East 9%	● Indonesia 5%
● Abu Dhabi 7%	● Korea 1%
● Kuwait 7%	● Russia 21%
● United Arab Emirates 4%	● United Kingdom 3%
● Iraq 2%	

Figure D.1d: 2011 Oil Product Imports by Country of Origin



² www.refiningnz.com/our-investors/growth/ccr-project.aspx

Refining NZ processes crude oil and condensate for the four major oil companies active in New Zealand: BP, Chevron (Caltex), ExxonMobil (Mobil) and Z Energy (formerly Shell). Each of the major oil companies has a stake in Refining NZ, with a combined shareholding of just under 73% of the company's 240 million shares. The refinery produces petrol, diesel, jet-A1, fuel oil, bitumen and other petroleum products — but not aviation gasoline or lubricants. Sulphur is recovered as a by-product and sold as a feedstock to the fertiliser industry. Carbon dioxide is also recovered and sold to the beverage industry. The majority of Refining NZ products are consumed in New Zealand; in 2011 the refinery supplied approximately 70% of New Zealand's oil product consumption.²

In 2011, the refinery had a total intake of 248 PJ (40.6 million barrels or 111,000 barrels per day), of which 4 PJ (2%) was New Zealand crude and condensate. Both total refinery intake and domestic production of oil products were up 5% from 2010.

Net Oil Import Dependency

For this publication net oil import dependency is calculated as one minus the ratio of indigenous production to observed consumption³. This indicator represents the portion of oil consumption that cannot be satisfied by domestic oil production. Typically, very little (2% in 2011) domestic oil is used at the refinery due to its high quality and high value on the international market — it is beneficial for New Zealand to export valuable domestic oil and import cheaper, lower grade, foreign oil. As New Zealand exports most of its locally produced oil, this import dependency indicator should be interpreted with care. Figure D.1e shows the net oil import dependency for New Zealand since 1990.

New Zealand became generally less reliant on imported oil between 1990 and 1997. Between 1997 and 2006 New Zealand became increasingly dependent on imported oil as oil production from the Maui field declined. Net oil import dependency peaked at 82% in 2006, before dropping in 2007 and 2008. In 2011, net oil import dependency was 57%, slightly higher than it was in 2010 (50%).

Deregulation

Deregulation of the oil industry in 1988 removed price controls, government involvement in the refinery, licensing of wholesalers and retailers, and restrictions on imports of refined products.

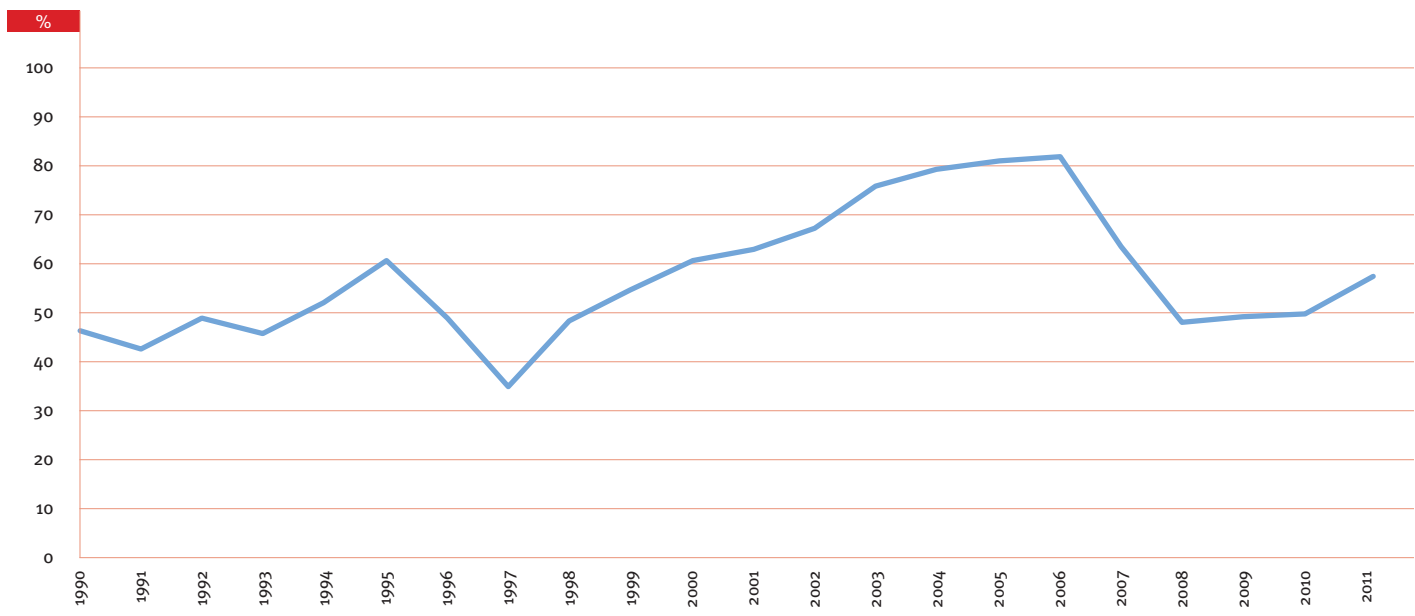
Petroleum Products

Petroleum Product Wholesalers in New Zealand

The petroleum product wholesalers in New Zealand comprise five companies: BP, Chevron (Caltex and Challenge), ExxonMobil (Mobil), Z Energy (formerly Shell) and Gull. BP, Caltex, Mobil and Z dominate the market and supply a full range of products. Gull has a smaller market share and has limited its participation to petrol, diesel and blended biofuel sales.

Biofuels play a very small part in the New Zealand petroleum fuels market. Gull was the first oil company to sell biofuels in New Zealand — a 10% blend of bio-ethanol and petrol. Mobil has since made blends of petrol and bio-ethanol available in the lower North Island (a 10% blend of bio-ethanol and petrol, and a 3% blend of bio-ethanol and petrol).

Figure D.1e: Net Oil Import Dependency



² Calculated as:

$$\frac{\text{refinery output} - \text{product exports} - \text{international transport}}{\text{Total oil product consumption}}$$

³ Net oil import dependency is calculated as:

$$1 - \left(\frac{\text{indigenous production}}{\text{observed consumption}} \right)$$

Biodiesel producers also distribute their products directly to some customers. The available blends include B20 (20% biodiesel), B5 (5% biodiesel), and B100 (pure biodiesel).

The total consumption of biofuels in New Zealand in 2011 was 9.0 million litres (2 million litres of biodiesel and 7 million litres of bio-ethanol). Consumption of biodiesel and bio-ethanol in New Zealand was up by 43% and 30% respectively from 2010, but was still 0.3% of diesel and 1.2% of petrol consumption.

Production, Imports and Exports

Refining NZ produces a full range of petroleum products and supplied approximately 70% of the New Zealand market in 2011. The remaining product is imported from foreign refineries, predominately located in Singapore and South Korea. There are around 15-20 tanker movements per month importing crude oil, feedstocks and refined products to New Zealand.

Refinery production of petroleum products increased by 12 PJ (or 5%) to 233 PJ (104,000 barrels of oil per day) in 2011. Imports of refined petroleum products nevertheless increased by 2% as imports were required to meet significant growth in diesel demand since 2010. Observed domestic demand for refined oil products in 2011 was very similar to 2010 (up by 0.2%) at 266 PJ (119,000 barrels of oil per day).

Distribution and Storage

The four major oil companies own bulk storage facilities throughout New Zealand and have agreements in place that allow access to other companies' storage facilities. This enables the companies to draw stock from any location, if they have authorisation and sufficient stock in another location. This pooled storage system allows the companies to jointly manage stock levels and coordinate import shipments.

Coastal tankers and import vessels are used to move bulk shipments of product around the country to various port storage facilities. Refining NZ also owns and operates a 170 km long petroleum pipeline that runs from Marsden Point to the Wiri depot, located in South Auckland near Auckland International Airport. Wiri Oil Services operates a second pipeline that carries jet fuel from Wiri to Auckland International Airport.

Road tankers are used to distribute products from bulk storage facilities to service stations and major users. This final stage of distribution is run in two ways: oil companies employing independent distributors to distribute fuel on their behalf, and independent distributors purchasing fuel from bulk storage facilities at wholesale prices, and then selling this fuel to their own customers. Independent distributors who purchase fuel and then on-sell it are referred to as "resellers".

Gull Petroleum Limited operates its own independent petroleum storage terminal at Mount Maunganui. Products are transported from Mount Maunganui to Gull's retail outlets by road tanker.

Consumption

Total domestic consumption of oil products in 2011 showed little difference from the 2010 consumption. However, demand by fuel varied more substantially with petrol demand falling by 2 PJ (1.5%) in 2011 and diesel demand increasing more than 5 PJ (5.3%).

The increase in diesel demand indicates a return to levels observed prior to the 2008 economic downturn. Diesel is the primary fuel for commercial land transport so is strongly linked to economic performance. New Zealand's Gross Domestic Product (GDP)⁴, a widely used economic indicator, was up 1.2% in 2011 after two consecutive years of negative growth. Average oil prices in 2011 were also higher than in 2010 — the average regular petrol and diesel retail prices were up by 22 cents per litre and 26 cents per litre in real terms in 2011 (December 2011 dollars).

Oil Consumption Statistical Methodologies

New Zealand's oil consumption statistics are primarily collected via the Delivery of Petroleum Fuel by Industry (DPFI) survey — a survey of fuel deliveries by our five large oil companies (BP, Z, Chevron, ExxonMobil and Gull) to economic sectors. This survey measures the total fuel deliveries in New Zealand. A second survey, the Annual Liquid Fuel Survey (ALFS)⁵, measures annual deliveries to economic sectors made by independent distributor companies. The ALFS data is used to reallocate fuel that the oil companies sell to "resellers" to the correct economic sector. Fuel deliveries made by independent distributors between 1990 and 2006 were estimated (no information was available for these years). The report *Delivering the Diesel – Liquid Fuel Deliveries in New Zealand 1990–2008* outlines the methodology employed to perform this calculation; it is available for download from the MED website⁶.

In 2011, the independent distributors delivered 24% (655 million litres) of New Zealand's diesel demand, and 5% (162 million litres) of petrol demand in New Zealand. Figure D.1f shows the time-series of the independent distributors' diesel deliveries from 1990 to 2011. Data before 2007 consists of estimates.

The strong growth of the independent distributors' deliveries (up by 16% and 56% in diesel and petrol respectively) matched an 8% and 22% increase in the oil companies, deliveries to resellers. This is further evidence of the oil companies pulling out of the fuel distribution market.

LPG demand data by sector is a calculated consumption figure disaggregated to a sectorial level using data collected by the LPG Association of New Zealand.

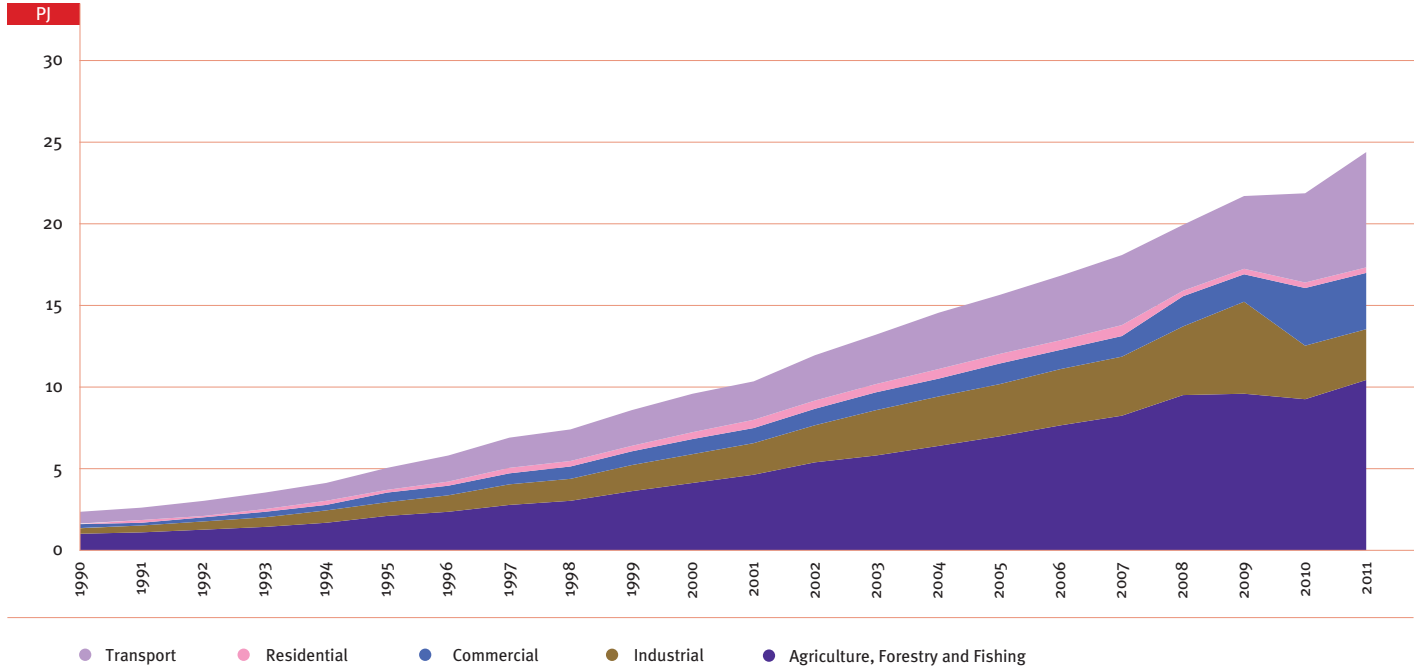
⁴ March year end data. Statistics NZ December Quarter 2011 GDP update — Series ref: S1RB01S.

⁵ This began in 2009, for the 2008 calendar year.

⁶ www.med.govt.nz/sectors-industries/energy/energy-modelling/technical-papers/delivering-the-diesel-liquid-fuel-deliveries-in-new-zealand-1990-2008

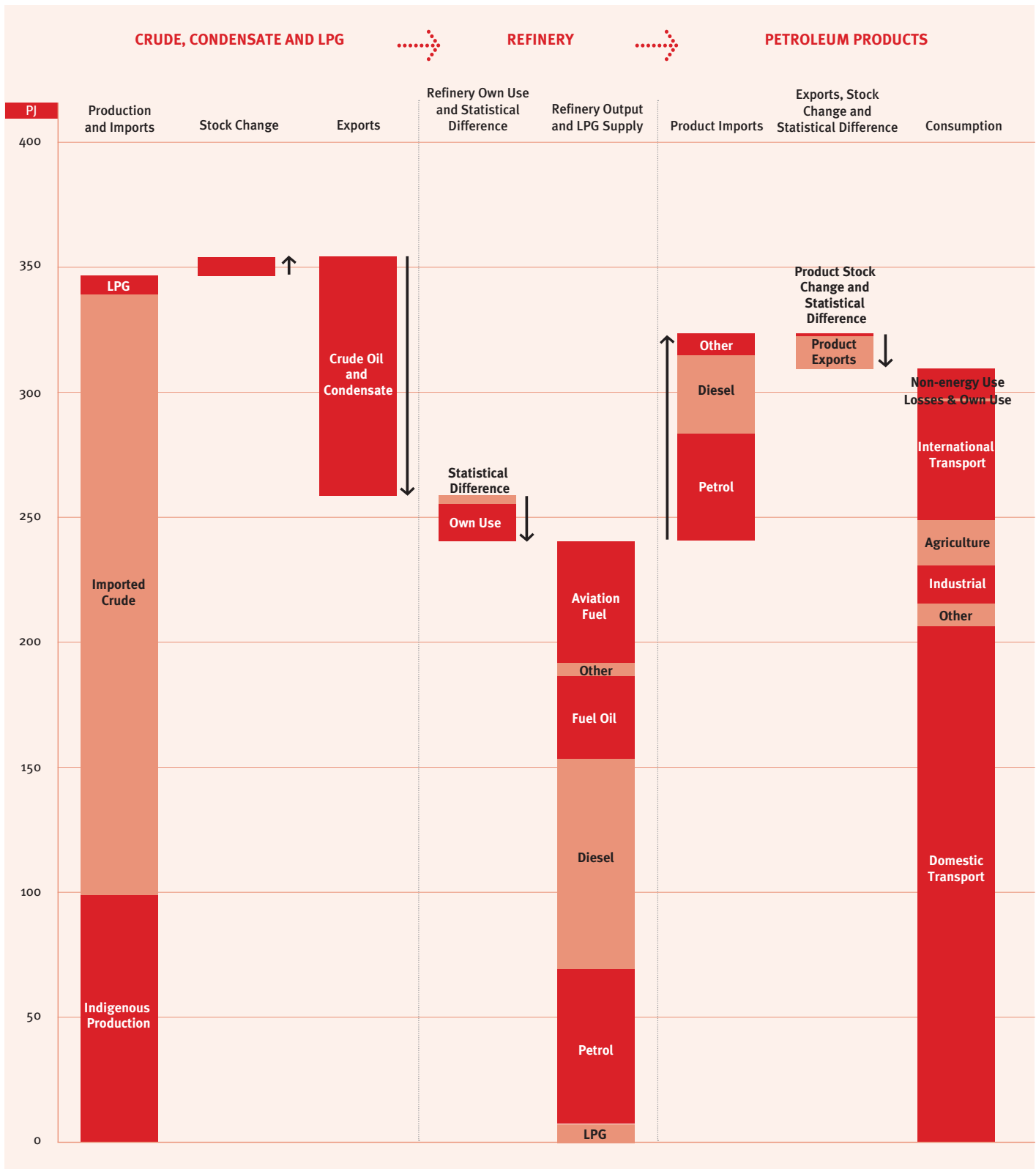
D. Oil

Figure D.1f: Independent Distributor Companies' Diesel Deliveries by Sector



D. Oil

Figure D.1g: Oil Energy Flow Summary for 2011



D. Oil

Table D.1: Oil Energy Balance 2007–2011 (Gross PJ)

Converted into Petajoules using Gross Calorific Values		Calendar Year					Δ 2007/2011 p.a.	Δ 2010/2011
		2007	2008	2009	2010	2011		
SUPPLY	Indigenous Production	93.88	132.48	124.73	123.16	106.36	3.2%	-13.6%
	+ Imports	323.40	326.57	317.54	312.29	323.35	0.0%	3.5%
	- Exports	80.55	128.94	116.45	115.60	108.26	7.7%	-6.4%
	- Stock Change	5.85	-0.54	0.28	-2.58	-1.89	n.a.	n.a.
	- International Transport	47.05	48.98	47.00	48.43	47.13	0.0%	-2.7%
	TOTAL PRIMARY ENERGY	283.83	281.67	278.55	273.99	276.21	-0.7%	0.8%
	ENERGY TRANSFORMATION	-10.18	-15.05	-11.71	-14.69	-15.32	10.8%	4.3%
	Electricity Generation	-0.01	-1.43	-0.10	-0.02	-0.02	21.3%	-15.0%
	Cogeneration						n.a.	n.a.
	Oil Production	-2.43	-4.93	-3.33	-6.45	-7.52	32.7%	16.6%
Other Transformation						n.a.	n.a.	
Losses and Own Use	-7.75	-8.70	-8.28	-8.22	-7.78	0.1%	-5.3%	
Non-energy Use		-13.75	-13.72	-12.12	-14.82	-11.92	-3.5%	-19.6%
CONSUMER ENERGY (calculated)		259.90	252.89	254.72	244.48	248.97	-1.1%	1.8%
DEMAND	Agriculture, Forestry and Fishing	21.92	20.32	18.37	17.21	18.52	-4.1%	7.6%
	Industrial	20.93	19.79	17.87	15.35	14.84	-8.2%	-3.3%
	Commercial	5.94	5.89	4.61	5.66	6.35	1.7%	12.2%
	Transport	203.99	203.96	201.32	203.37	206.15	0.3%	1.4%
	Residential	4.49	3.92	3.49	2.99	3.23	-7.9%	8.2%
CONSUMER ENERGY (observed)		257.26	253.89	245.67	244.56	249.08	-0.8%	1.8%
Statistical Differences		2.64	-0.99	9.05	-0.08	-0.11		

D. Oil

Table D.2a: Crude Oil, Condensate, Naphtha and Natural Gas Liquids Production by Field (Mm³)

Calendar Year	Maui ¹	Kapuni	Pohokura	Tui	Maari	Kupe	McKee	Mangahewa	Turangi	Kowhai	Ngatoro ²	Others ³	Total
1970	-	0.067	-	-	-	-	-	-	-	-	-	-	0.067
1971	-	0.128	-	-	-	-	-	-	-	-	-	-	0.128
1972	-	0.178	-	-	-	-	-	-	-	-	-	-	0.178
1973	-	0.205	-	-	-	-	-	-	-	-	-	-	0.205
1974	-	0.219	-	-	-	-	-	-	-	-	-	-	0.219
1975	-	0.226	-	-	-	-	-	-	-	-	-	-	0.226
1976	-	0.600	-	-	-	-	-	-	-	-	-	-	0.600
1977	-	0.861	-	-	-	-	-	-	-	-	-	-	0.861
1978	-	0.727	-	-	-	-	-	-	-	-	-	-	0.727
1979	0.124	0.343	-	-	-	-	-	-	-	-	-	-	0.467
1980	0.184	0.235	-	-	-	-	0.000	-	-	-	-	-	0.419
1981	0.265	0.285	-	-	-	-	0.015	-	-	-	-	-	0.565
1982	0.507	0.359	-	-	-	-	0.006	-	-	-	-	-	0.871
1983	0.483	0.363	-	-	-	-	0.007	-	-	-	0.001	0.006	0.859
1984	0.587	0.375	-	-	-	-	0.126	-	-	-	0.001	0.073	1.161
1985	0.688	0.403	-	-	-	-	0.455	-	-	-	0.005	0.003	1.554
1986	0.829	0.375	-	-	-	-	0.504	-	-	-	0.004	0.002	1.714
1987	0.791	0.329	-	-	-	-	0.510	-	-	-	0.004	-	1.634
1988	0.859	0.357	-	-	-	-	0.581	-	-	-	0.004	0.157	1.959
1989	0.870	0.353	-	-	-	-	0.615	-	-	-	0.004	0.330	2.172
1990	0.867	0.323	-	-	-	-	0.579	-	-	-	0.007	0.436	2.212
1991	0.898	0.314	-	-	-	-	0.511	-	-	-	0.011	0.598	2.333
1992	0.981	0.310	-	-	-	-	0.410	-	-	-	0.032	0.489	2.222
1993	1.016	0.286	-	-	-	-	0.387	-	-	-	0.056	0.610	2.355
1994	0.964	0.275	-	-	-	-	0.357	-	-	-	0.057	0.577	2.230
1995	1.091	0.226	-	-	-	-	0.356	-	-	-	0.083	0.184	1.940
1996	1.782	0.232	-	-	-	-	0.316	-	-	-	0.114	0.143	2.587
1997	2.641	0.192	-	-	-	-	0.298	0.001	-	-	0.140	0.144	3.417
1998	2.002	0.180	-	-	-	-	0.293	0.005	-	-	0.108	0.140	2.728
1999	1.749	0.162	-	-	-	-	0.272	-	-	-	0.090	0.107	2.379
2000	1.602	0.139	-	-	-	-	0.191	-	-	-	0.084	0.076	2.092
2001	1.471	0.131	-	-	-	-	0.178	0.008	-	-	0.110	0.092	1.989
2002	1.372	0.123	-	-	-	-	0.098	0.022	-	-	0.084	0.091	1.790
2003	1.027	0.102	-	-	-	-	0.091	0.017	-	-	0.058	0.091	1.386
2004	0.814	0.141	-	-	-	-	0.080	0.016	-	-	0.073	0.086	1.211
2005	0.758	0.119	-	-	-	-	0.071	0.011	0.000	-	0.069	0.102	1.130
2006	0.609	0.123	0.149	-	-	-	0.056	0.011	0.011	-	0.047	0.077	1.082
2007	0.341	0.105	0.747	1.007	-	-	0.043	0.014	0.036	-	0.036	0.058	2.387
2008	0.293	0.088	0.730	2.138	-	-	0.030	0.018	0.034	-	0.030	0.048	3.408
2009	0.297	0.069	0.685	0.997	0.904	0.015	0.028	0.041	0.056	0.020	0.032	0.042	3.184
2010 ^R	0.308	0.068	0.672	0.551	0.954	0.307	0.022	0.033	0.046	0.038	0.029	0.041	3.069
2011	0.203	0.065	0.627	0.418	0.823	0.289	0.020	0.033	0.036	0.027	0.027	0.069	2.638

Notes to Table D.2a: Natural Gas Liquids are included in Kapuni's production.

¹ Includes condensate, naphtha (from April 1999) and crude oil production from Maui and Maui F Sands. Maui F Sands commenced production in September 1996.

² Also includes Moturoa field and Goldie well.

³ Comprises Waihapa/Ngaere, Copper Moki, Stratford (ceased production in September 1992), Piakau (ceased production in September 1999), Rimu, Cheal, Sidewinder and Tariki/Ahuroa fields, and Kauri, Surrey and Radnor (ceased production in 2006) wells.

^R = Revised figures.

D. Oil

Table D.2b: Crude Oil, Condensate, Naphtha and Natural Gas Liquids Production by Field (mmbbls)

Calendar Year	Maui ¹	Kapuni	Pohokura	Tui	Maari	Kupe	McKee	Mangahewa	Turangi	Kowhai	Ngatoro ²	Others ³	Total
1970	-	0.421	-	-	-	-	-	-	-	-	-	-	0.421
1971	-	0.805	-	-	-	-	-	-	-	-	-	-	0.805
1972	-	1.120	-	-	-	-	-	-	-	-	-	-	1.120
1973	-	1.289	-	-	-	-	-	-	-	-	-	-	1.289
1974	-	1.378	-	-	-	-	-	-	-	-	-	-	1.378
1975	-	1.423	-	-	-	-	-	-	-	-	-	-	1.423
1976	-	3.776	-	-	-	-	-	-	-	-	-	-	3.776
1977	-	5.415	-	-	-	-	-	-	-	-	-	-	5.415
1978	-	4.573	-	-	-	-	-	-	-	-	-	-	4.573
1979	0.783	2.155	-	-	-	-	-	-	-	-	-	-	2.937
1980	1.155	1.480	-	-	-	-	0.001	-	-	-	-	-	2.636
1981	1.667	1.793	-	-	-	-	0.093	-	-	-	-	-	3.553
1982	3.187	2.256	-	-	-	-	0.036	-	-	-	-	-	5.479
1983	3.036	2.281	-	-	-	-	0.041	-	-	-	0.005	0.040	5.403
1984	3.692	2.357	-	-	-	-	0.790	-	-	-	0.004	0.458	7.301
1985	4.325	2.534	-	-	-	-	2.863	-	-	-	0.029	0.020	9.772
1986	5.214	2.361	-	-	-	-	3.172	-	-	-	0.023	0.012	10.783
1987	4.977	2.067	-	-	-	-	3.205	-	-	-	0.028	-	10.276
1988	5.405	2.247	-	-	-	-	3.653	-	-	-	0.027	0.988	12.320
1989	5.473	2.222	-	-	-	-	3.868	-	-	-	0.027	2.074	13.664
1990	5.453	2.030	-	-	-	-	3.642	-	-	-	0.046	2.744	13.915
1991	5.651	1.974	-	-	-	-	3.214	-	-	-	0.070	3.762	14.671
1992	6.168	1.952	-	-	-	-	2.581	-	-	-	0.201	3.074	13.977
1993	6.389	1.800	-	-	-	-	2.432	-	-	-	0.353	3.839	14.814
1994	6.065	1.728	-	-	-	-	2.248	-	-	-	0.361	3.627	14.028
1995	6.864	1.419	-	-	-	-	2.237	-	-	-	0.521	1.159	12.200
1996	11.206	1.458	-	-	-	-	1.988	-	-	-	0.719	0.902	16.273
1997	16.613	1.206	-	-	-	-	1.876	0.007	-	-	0.882	0.908	21.492
1998	12.595	1.130	-	-	-	-	1.844	0.029	-	-	0.681	0.882	17.161
1999	11.001	1.018	-	-	-	-	1.712	-	-	-	0.565	0.671	14.966
2000	10.077	0.875	-	-	-	-	1.201	-	-	-	0.529	0.479	13.161
2001	9.254	0.825	-	-	-	-	1.118	0.050	-	-	0.691	0.576	12.513
2002	8.627	0.776	-	-	-	-	0.619	0.138	-	-	0.529	0.570	11.259
2003	6.457	0.643	-	-	-	-	0.574	0.108	-	-	0.366	0.571	8.719
2004	5.123	0.888	-	-	-	-	0.504	0.100	-	-	0.458	0.542	7.615
2005	4.770	0.746	-	-	-	-	0.444	0.072	0.001	-	0.436	0.642	7.110
2006	3.829	0.773	0.937	-	-	-	0.352	0.067	0.070	-	0.298	0.482	6.808
2007	2.147	0.658	4.696	6.335	-	-	0.272	0.085	0.227	-	0.225	0.367	15.012
2008	1.845	0.551	4.589	13.450	-	-	0.188	0.113	0.214	-	0.187	0.300	21.437
2009	1.865	0.437	4.308	6.268	5.683	0.093	0.174	0.256	0.355	0.126	0.199	0.263	20.026
2010 ^R	1.938	0.427	4.228	3.464	5.997	1.931	0.139	0.209	0.289	0.239	0.183	0.258	19.301
2011	1.277	0.408	3.947	2.631	5.177	1.819	0.124	0.206	0.229	0.170	0.172	0.431	16.590

Notes to Table D.2b: Natural Gas Liquids are included in Kapuni's production.

¹ Includes condensate, naphtha (from April 1999) and crude oil production from Maui and Maui F Sands. Maui F Sands commenced production in September 1996.

² Also includes Motorua field and Goldie well.

³ Comprises Waihapa/Ngaere, Copper Moki, Stratford (ceased production in September 1992), Piakau (ceased production in September 1999), Rimu, Cheal, Sidewinder and Tariki/Ahuroa fields, and Kauri, Surrey and Radnor (ceased production in 2006) wells.

^R = Revised figures.

D. Oil

Table D.2c: Crude Oil, Condensate, Naphtha and Natural Gas Liquids Production by Field (Thousand Tonnes)

Calendar Year	Maui ¹	Kapuni	Pohokura	Tui	Maari	Kupe	McKee	Mangahewa	Turangi	Kowhai	Ngatoro ²	Others ³	Total
1970	-	52	-	-	-	-	-	-	-	-	-	-	52
1971	-	98	-	-	-	-	-	-	-	-	-	-	98
1972	-	137	-	-	-	-	-	-	-	-	-	-	137
1973	-	158	-	-	-	-	-	-	-	-	-	-	158
1974	-	168	-	-	-	-	-	-	-	-	-	-	168
1975	-	174	-	-	-	-	-	-	-	-	-	-	174
1976	-	462	-	-	-	-	-	-	-	-	-	-	462
1977	-	662	-	-	-	-	-	-	-	-	-	-	662
1978	-	559	-	-	-	-	-	-	-	-	-	-	559
1979	94	263	-	-	-	-	-	-	-	-	-	-	358
1980	137	180	-	-	-	-	0	-	-	-	-	-	317
1981	198	218	-	-	-	-	12	-	-	-	-	-	427
1982	375	273	-	-	-	-	5	-	-	-	-	-	653
1983	356	276	-	-	-	-	5	-	-	-	1	5	643
1984	432	286	-	-	-	-	105	-	-	-	1	60	884
1985	509	308	-	-	-	-	379	-	-	-	4	3	1,203
1986	619	286	-	-	-	-	420	-	-	-	3	2	1,330
1987	590	250	-	-	-	-	424	-	-	-	4	-	1,267
1988	640	272	-	-	-	-	483	-	-	-	3	132	1,531
1989	648	271	-	-	-	-	512	-	-	-	3	285	1,719
1990	657	246	-	-	-	-	482	-	-	-	6	384	1,775
1991	663	238	-	-	-	-	425	-	-	-	9	530	1,865
1992	722	235	-	-	-	-	341	-	-	-	27	433	1,758
1993	738	215	-	-	-	-	322	-	-	-	47	541	1,863
1994	734	205	-	-	-	-	297	-	-	-	48	511	1,795
1995	802	168	-	-	-	-	296	-	-	-	68	163	1,497
1996	1,322	172	-	-	-	-	263	-	-	-	94	124	1,975
1997	1,978	142	-	-	-	-	248	1	-	-	116	122	2,608
1998	1,479	133	-	-	-	-	244	4	-	-	90	118	2,068
1999	1,317	120	-	-	-	-	226	-	-	-	75	89	1,827
2000	1,234	103	-	-	-	-	159	-	-	-	70	63	1,629
2001	1,116	98	-	-	-	-	148	6	-	-	91	75	1,533
2002	1,051	91	-	-	-	-	82	18	-	-	70	74	1,384
2003	787	76	-	-	-	-	76	14	-	-	48	73	1,073
2004	617	105	-	-	-	-	67	13	-	-	60	69	931
2005	572	89	-	-	-	-	59	9	0	-	58	84	872
2006	463	91	116	-	-	-	47	9	9	-	40	62	835
2007	257	77	580	819	-	-	36	11	31	-	30	49	1,891
2008	220	65	567	1,739	-	-	25	14	28	-	25	41	2,725
2009	225	51	532	810	764	11	23	33	47	16	27	36	2,574
2010 ^R	231	51	522	448	803	237	18	27	35	30	25	35	2,463
2011	152	48	485	340	692	221	16	27	28	21	23	59	2,111

Notes to Table D.2c: Natural Gas Liquids are included in Kapuni's production.

¹ Includes condensate, naphtha (from April 1999) and crude oil production from Maui and Maui F Sands. Maui F Sands commenced production in September 1996.

² Also includes Motorua field and Goldie well.

³ Comprises Waihapa/Ngaere, Copper Moki, Stratford (ceased production in September 1992), Piakau (ceased production in September 1999), Rimu, Cheal, Sidewinder and Tariki/Ahuroa fields, and Kauri, Surrey and Radnor (ceased production in 2006) wells.

^R = Revised figures.

D. Oil

Table D.2d: Crude Oil, Condensate, Naphtha and Natural Gas Liquids Production by Field (Gross PJ)

Calendar Year	Maui ¹	Kapuni	Pohokura	Tui	Maari	Kupe	McKee	Mangahewa	Turangi	Kowhai	Ngatoro ²	Others ³	Total
1970	-	2.41	-	-	-	-	-	-	-	-	-	-	2.41
1971	-	4.60	-	-	-	-	-	-	-	-	-	-	4.60
1972	-	6.40	-	-	-	-	-	-	-	-	-	-	6.40
1973	-	7.37	-	-	-	-	-	-	-	-	-	-	7.37
1974	-	7.88	-	-	-	-	-	-	-	-	-	-	7.88
1975	-	8.14	-	-	-	-	-	-	-	-	-	-	8.14
1976	-	21.58	-	-	-	-	-	-	-	-	-	-	21.58
1977	-	30.95	-	-	-	-	-	-	-	-	-	-	30.95
1978	-	26.14	-	-	-	-	-	-	-	-	-	-	26.14
1979	4.44	12.31	-	-	-	-	-	-	-	-	-	-	16.75
1980	6.47	8.41	-	-	-	-	0.01	-	-	-	-	-	14.89
1981	9.31	10.17	-	-	-	-	0.57	-	-	-	-	-	20.05
1982	17.68	12.76	-	-	-	-	0.22	-	-	-	-	-	30.65
1983	16.78	12.90	-	-	-	-	0.25	-	-	-	0.03	0.24	30.20
1984	20.38	13.37	-	-	-	-	4.79	-	-	-	0.03	2.77	41.33
1985	24.01	14.41	-	-	-	-	17.36	-	-	-	0.17	0.12	56.06
1986	29.17	13.39	-	-	-	-	19.23	-	-	-	0.14	0.07	62.00
1987	27.80	11.69	-	-	-	-	19.43	-	-	-	0.16	-	59.08
1988	30.17	12.70	-	-	-	-	22.15	-	-	-	0.16	5.93	71.10
1989	30.55	12.65	-	-	-	-	23.45	-	-	-	0.16	12.77	79.57
1990	30.95	11.48	-	-	-	-	22.08	-	-	-	0.27	17.23	82.01
1991	31.23	11.13	-	-	-	-	19.48	-	-	-	0.41	23.73	85.99
1992	34.01	11.00	-	-	-	-	15.65	-	-	-	1.09	19.40	81.15
1993	34.78	10.06	-	-	-	-	14.74	-	-	-	1.85	24.22	85.67
1994	34.57	9.60	-	-	-	-	13.63	-	-	-	1.91	22.89	82.59
1995	37.78	7.84	-	-	-	-	13.56	-	-	-	2.86	7.31	69.36
1996	62.28	8.04	-	-	-	-	12.05	-	-	-	3.92	5.59	91.88
1997	93.22	6.66	-	-	-	-	11.37	0.05	-	-	4.72	5.54	121.56
1998	69.71	6.24	-	-	-	-	11.18	0.18	-	-	3.65	5.37	96.34
1999	62.05	5.61	-	-	-	-	10.38	-	-	-	2.98	4.05	85.07
2000	58.13	4.82	-	-	-	-	7.28	-	-	-	2.81	2.88	75.93
2001	52.57	4.56	-	-	-	-	6.78	0.32	-	-	3.51	3.44	71.18
2002	49.50	4.25	-	-	-	-	3.75	0.88	-	-	2.74	3.39	64.52
2003	37.07	3.54	-	-	-	-	3.48	0.69	-	-	2.01	3.37	50.16
2004	29.07	4.93	-	-	-	-	3.06	0.64	-	-	2.46	3.19	43.35
2005	26.97	4.14	-	-	-	-	2.69	0.46	0.00	-	2.32	3.73	40.31
2006	21.80	4.26	5.39	-	-	-	2.13	0.43	0.35	-	1.56	2.82	38.74
2007	12.10	3.60	27.01	38.98	-	-	1.65	0.54	1.24	-	1.18	2.13	88.43
2008	10.37	3.06	26.39	82.75	-	-	1.14	0.72	1.12	-	0.99	1.71	128.26
2009	10.60	2.40	24.78	38.56	36.36	0.54	1.05	1.63	1.85	0.78	1.04	1.53	121.11
2010 ^R	10.89	2.38	24.32	21.31	38.24	11.17	0.84	1.33	1.40	1.48	0.95	1.49	115.81
2011	7.15	2.25	22.57	16.17	32.94	10.42	0.75	1.32	1.11	1.03	0.86	2.49	99.05
Δ2007/2011 p.a.	-12.3%	-11.1%	-4.4%	-19.7%	n.a.	n.a.	-17.9%	24.9%	-2.7%	n.a.	-7.7%	4.0%	2.9%
Δ2010/2011	-34.4%	-5.4%	-7.2%	-24.1%	-13.9%	-6.8%	-11.3%	-0.9%	-20.8%	-29.9%	-10.3%	66.5%	-14.5%

Notes to Table D.2d: Natural Gas Liquids are included in Kapuni's production.

¹ Includes condensate, naphtha (from April 1999) and crude oil production from Maui and Maui F Sands. Maui F Sands commenced production in September 1996.

² Also includes Motorua field and Goldie well.

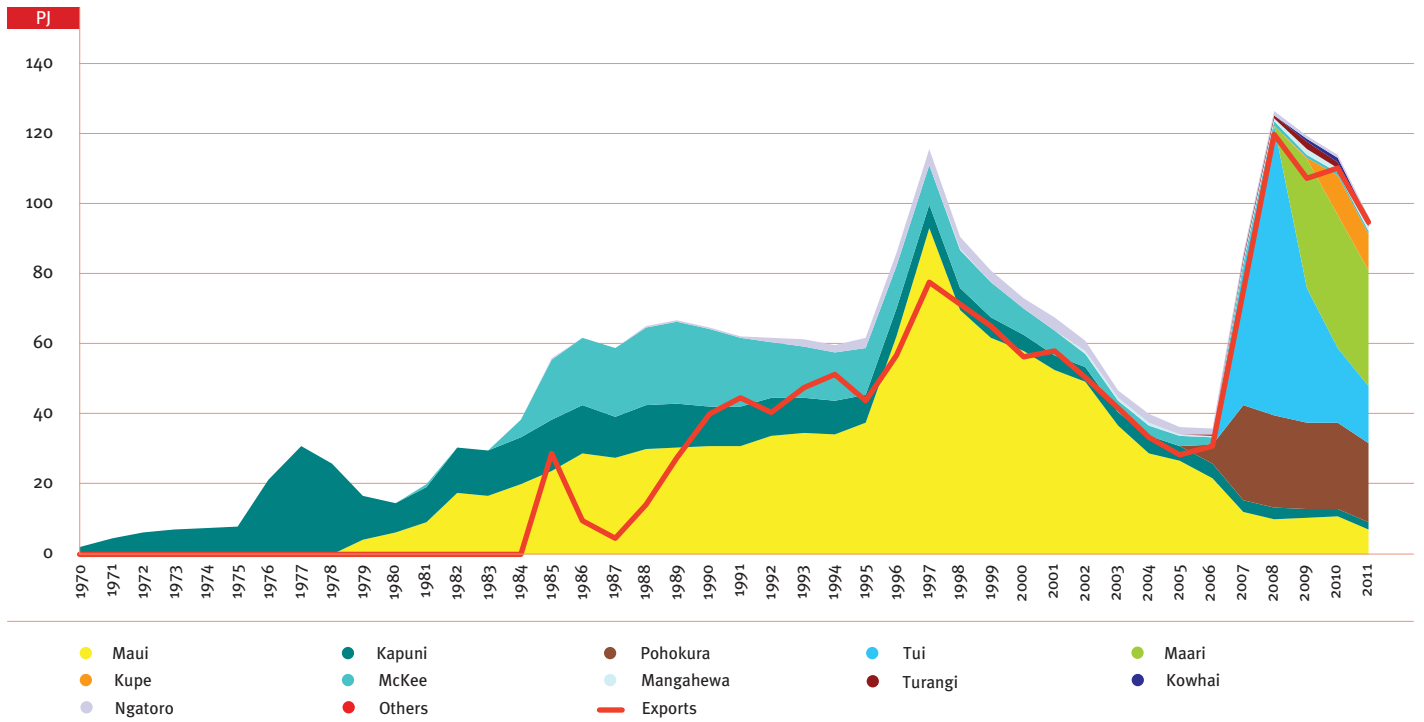
³ Comprises Waihapa/Ngaere, Copper Moki, Stratford (ceased production in September 1992), Piakau (ceased production in September 1999), Rimu, Cheal, Sidewinder and Tariki/Ahuroa fields, and Kauri, Surrey and Radnor (ceased production in 2006) wells.

^R = Revised figures.

n.a. = Not applicable.

D. Oil

Figure D.2: Annual Crude Oil, Condensate, Naphtha and Natural Gas Liquids Production by Field



Supply of Crude Oil and Refinery Feedstocks

Table D.3: Supply of Crude Oil and Refinery Feedstocks (Gross PJ)

Calendar Year or Quarter	Feedstocks				Total Refinery Intake, Production and Losses		
	Indigenous Crude Oil Production ¹	Imports	Exports	Stock Change ⁸	Total Refinery Intake	Oil Products Production	Calculated Own Use and Losses
1974	7.88	155.53	0.00	0.05	163.47	154.98	-8.49
1975	8.14	134.23	0.00	3.39	138.79	130.02	-8.77
1976	21.58	136.14	0.00	-4.13	162.28	153.09	-9.19
1977	30.95	123.29	0.00	3.40	150.91	142.27	-8.64
1978	26.14	106.57	0.00	-4.46	137.89	129.57	-8.32
1979	16.75	124.78	0.00	-1.30	143.00	133.45	-9.55
1980	14.89	121.06	0.00	1.76	134.09	126.24	-7.84
1981	20.05	106.36	0.00	-1.55	127.57	119.74	-7.83
1982	30.65	82.45	0.00	6.42	106.60	100.36	-6.24
1983	30.20	79.14	0.00	-5.17	114.13	107.66	-6.47
1984	41.33	80.48	0.00	3.84	116.42	110.06	-6.36
1985	56.06	43.62	29.02	1.10	69.43	66.66	-2.77
1986	62.00	48.65	9.95	-21.00	123.17	120.13	-3.05
1987	59.08	105.18	4.66	-7.61	165.94	166.00	0.06
1988	71.10	112.81	14.46	-20.06	190.08	188.25	-1.83
1989	79.57	138.65	27.56	-19.44	210.02	206.35	-3.68
1990	82.01	145.23	40.24	-27.97	214.56	207.43	-7.13
1991	85.99	149.40	44.88	-17.14	206.98	202.02	-4.96
1992	81.15	145.15	40.53	-17.32	203.80	206.27	2.46
1993	85.67	162.32	47.58	-5.65	202.11	211.84	9.73
1994	82.59	178.86	51.35	-8.34	217.20	219.55	2.35
1995	69.36	174.49	44.12	-12.56	211.90	204.33	-7.57
1996	91.88	176.48	56.83	6.43	199.96	197.65	-2.31
1997	121.56	181.71	77.74	-2.46	227.05	213.18	-13.86
1998	96.34	219.05	71.56	5.72	236.25	221.87	-14.39
1999	85.07	210.64	65.42	3.84	223.90	210.98	-12.92
2000	75.93	213.14	56.63	1.23	230.63	219.18	-11.45
2001	71.18	210.93	58.12	-6.12	228.07	215.72	-12.35
2002	64.52	225.34	50.52	-2.34	240.01	230.03	-9.98
2003	50.16	235.31	41.90	3.06	240.17	224.63	-15.54
2004	43.35	217.01	33.51	-1.37	227.97	220.88	-7.09
2005	40.31	218.72	28.61	-5.36	235.36	224.75	-10.61
2006	38.74	215.83	31.25	-7.81	231.52	217.95	-13.57
2007	88.43	212.06	75.18	4.65	219.12	208.79	-10.33
2008	128.26	224.23	119.83	-1.83	234.13	221.23	-12.89
2009	121.11	218.27	107.38	0.49	227.42	215.92	-11.50
2010 ^R	115.81	232.65	110.52	1.64	236.33	221.56	-14.77
2011	99.05	240.05	95.12	-7.78	248.33	233.12	-15.21
2010 Mar	29.18	60.88	28.91	-2.12	63.01	59.37	-3.64
2010 Jun	30.70	58.58	30.75	5.10	53.85	49.46	-4.39
2010 Sep	29.79	53.03	26.98	-7.61	62.67	59.53	-3.14
2010 Dec	26.14	60.16	23.87	6.28	56.81	53.20	-3.61
2011 Mar	25.75	62.07	27.99	-2.65	60.53	55.46	-5.07
2011 Jun	24.38	62.54	21.77	1.45	63.76	60.84	-2.92
2011 Sep	26.61	60.94	24.21	1.43	61.75	58.05	-3.70
2011 Dec	22.31	54.51	21.14	-8.01	62.29	58.78	-3.52
Δ2007/2011 p.a.	2.9%	3.1%	6.1%	n.a.	3.2%	2.8%	10.2%
Δ2010/2011	-14.5%	3.2%	-13.9%	n.a.	5.1%	5.2%	2.9%

Note to Table D.3: ¹ Includes Natural Gas Liquids.^R = Revised figures.

D. Oil

Production of Crude Oil and Oil Products

Table D.4: Production of Crude Oil and Oil Products (Gross PJ)

Calendar Year or Quarter	Indigenous Production		Refinery Output						Total Oil Products	
	Crude Oil ¹	LPG ²	Regular Unleaded 91	Premium Unleaded 95-98	Total Petrol ²	Diesel	Fuel Oil	Aviation Fuel		Other Petroleum Products ^{3, R}
1974	7.88	0.11			58.95	27.63	63.13	0.00	5.27	154.98
1975	8.14	0.15			57.20	25.50	43.81	0.00	3.51	130.02
1976	21.58	0.39			66.07	31.01	51.31	0.00	4.69	153.09
1977	30.95	0.55			60.28	30.14	47.18	0.00	4.67	142.27
1978	26.14	0.68			58.64	28.91	37.67	0.00	4.35	129.57
1979	16.75	1.17			60.47	29.97	38.79	0.00	4.22	133.45
1980	14.89	0.85			57.13	30.07	34.62	0.00	4.42	126.24
1981	20.05	1.30			59.58	31.17	25.16	0.00	3.83	119.74
1982	30.65	1.54			54.46	25.45	17.51	0.00	2.95	100.36
1983	30.20	1.74			59.24	28.09	15.51	0.00	4.82	107.66
1984	41.33	2.59			60.82	28.32	15.25	0.00	5.67	110.06
1985	56.06	4.66			34.44	15.08	13.31	0.00	3.83	66.66
1986	62.00	5.44			76.93	28.21	9.22	0.99	4.77	120.13
1987	59.08	5.44	4.08		76.49	46.06	14.15	22.54	6.75	166.00
1988	71.10	5.78	6.37		82.80	54.81	13.22	30.46	6.96	188.25
1989	79.57	5.74	10.73		87.43	62.70	14.99	35.41	5.82	206.35
1990	82.01	6.01	17.90		85.44	62.11	17.20	36.58	6.10	207.43
1991	85.99	7.08	22.28		81.37	65.84	16.81	33.19	4.83	202.02
1992	81.15	7.69	23.79		84.46	64.56	18.24	32.52	6.49	206.27
1993	85.67	7.98	25.69		85.31	68.40	16.97	34.69	6.46	211.84
1994	82.59	8.14	30.52		80.38	72.15	22.44	37.74	6.84	219.55
1995	69.36	7.61	38.52		74.53	71.17	17.69	34.83	6.12	204.33
1996	91.88	8.94	38.51	30.90	69.40	66.85	19.69	35.09	6.61	197.65
1997	121.56	9.78	53.42	19.41	72.84	74.16	21.55	38.45	6.19	213.18
1998	96.34	9.54	53.17	21.57	74.74	81.30	22.04	37.71	6.07	221.87
1999	85.07	10.02	46.33	18.12	64.45	78.85	22.24	38.91	6.53	210.98
2000	75.93	10.47	49.74	17.44	67.18	84.38	22.53	38.93	6.15	219.18
2001	71.18	11.53	52.95	17.54	70.49	81.32	20.82	37.93	5.16	215.72
2002	64.52	11.38	53.05	18.86	71.90	87.75	25.04	40.43	4.90	230.03
2003	50.16	9.09	56.39	15.05	71.44	85.14	23.16	38.73	6.15	224.63
2004	43.35	9.11	59.69	16.78	76.47	74.90	21.30	43.26	4.96	220.88
2005	40.31	8.76	60.53	16.78	77.31	75.26	25.93	40.75	5.50	224.75
2006	38.74	7.84	57.02	12.61	69.62	76.27	23.93	42.23	5.89	217.95
2007	88.43	5.53	54.56	12.29	66.84	72.68	24.32	38.94	6.00	208.79
2008	128.26	4.23	57.02	13.61	70.62	74.31	29.65	41.40	5.26	221.23
2009	121.11	3.62	51.19	15.34	66.53	72.41	31.19	40.28	5.51	215.92
2010 ^R	115.81	7.34	49.05	15.46	64.50	81.74	22.68	45.93	6.70	221.56
2011	99.05	7.33	51.19	11.27	62.46	83.98	32.66	48.60	5.43	233.12
2010 Mar	29.18	1.36	12.19	4.54	16.73	23.26	4.85	12.71	1.83	59.37
2010 Jun	30.70	1.93	11.56	3.78	15.34	16.42	5.72	10.34	1.64	49.46
2010 Sep	29.79	2.32	13.33	3.28	16.61	23.31	6.02	12.06	1.53	59.53
2010 Dec	26.14	1.73	11.97	3.86	15.83	18.76	6.09	10.82	1.70	53.20
2011 Mar	25.75	1.46	13.50	1.55	15.04	18.55	8.27	12.09	1.51	55.46
2011 Jun	24.38	1.68	12.73	3.85	16.57	23.38	7.95	11.56	1.38	60.84
2011 Sep	26.61	2.28	13.10	2.62	15.72	20.43	8.29	12.39	1.22	58.05
2011 Dec	22.31	1.90	11.79	3.34	15.12	21.62	8.14	12.57	1.32	58.78
Δ2007/2011 p.a.	2.9%	7.3%	-1.6%	-2.1%	-1.7%	3.7%	7.6%	5.7%	-2.5%	2.8%
Δ2010/2011	-14.5%	-0.2%	4.4%	-27.1%	-3.2%	2.7%	44.0%	5.8%	-19.1%	5.2%

Note to Table D.4: ¹ Crude oil includes Natural Gas Liquids.

² Petrol includes premium leaded, premium unleaded (from January 1996), premium unleaded 98, regular leaded (to December 1986) and regular unleaded (from January 1987).

³ Includes bitumen, lubricants, solvents, waxes, petroleum coke, white spirit and other liquid fuels.

^R = Revised figures.

D. Oil

Figure D.4a: Indigenous Oil Production

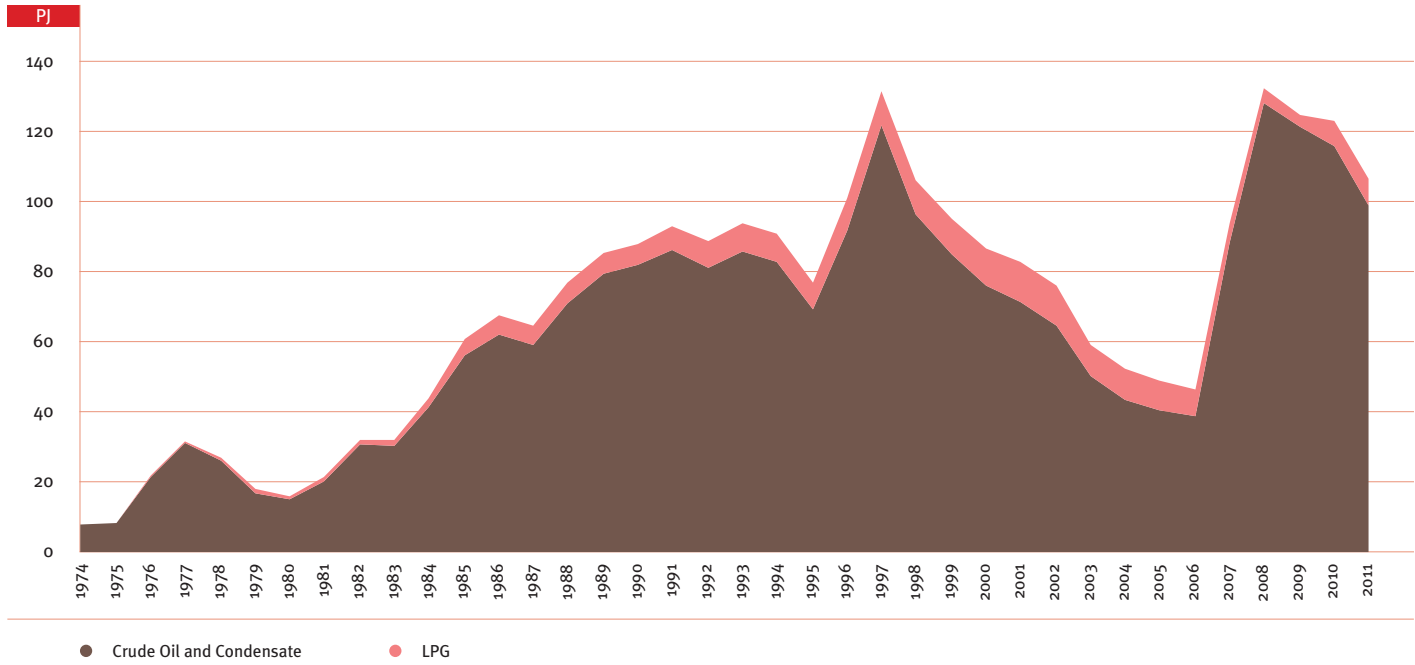
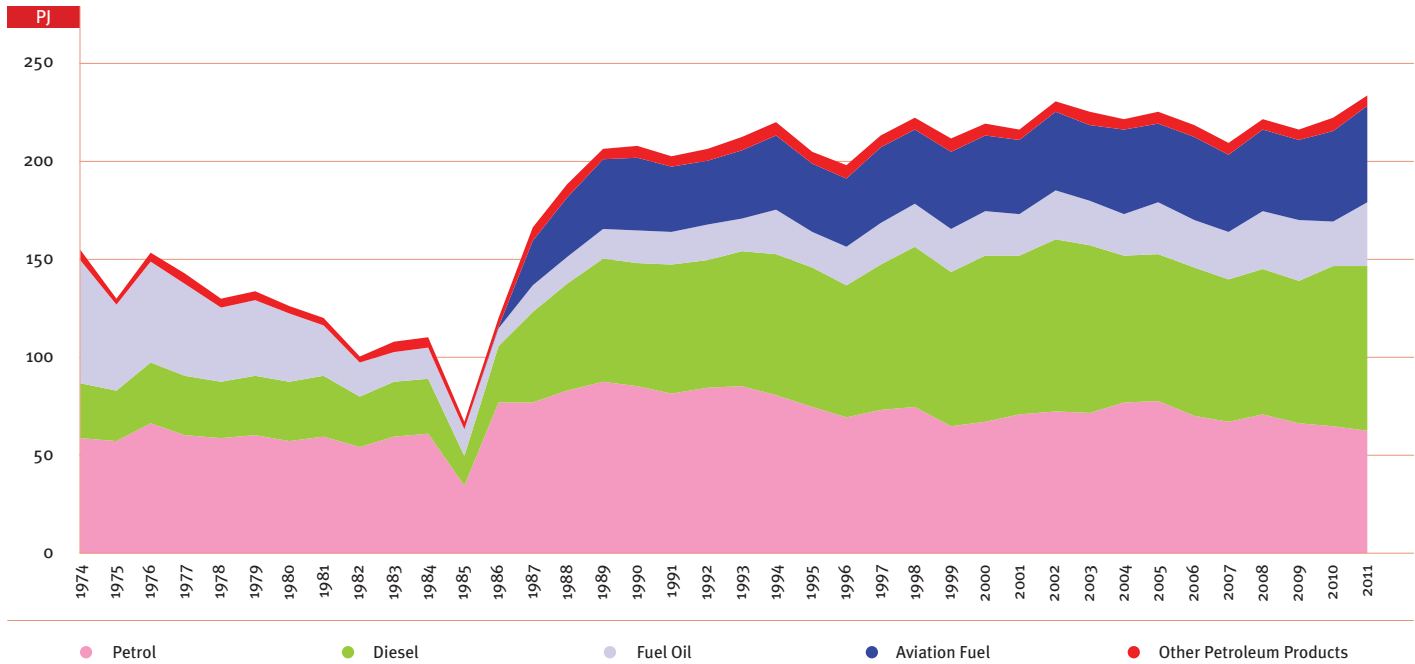


Figure D.4b: Production of Oil Products



D. Oil

Imports of Crude Oil and Oil Products

Table D.5: Imports of Crude Oil and Oil Products (Gross PJ)

Calendar Year or Quarter	Imports of:								Total	
	Crude Oil ¹	LPG	Regular Unleaded 91	Premium Unleaded 95-98	Total Petrol ²	Diesel	Fuel Oil	Aviation Fuel		Other Petroleum Products ³
1974	155.53	0.00			17.56	13.20	0.20	12.00	0.77	199.27
1975	134.23	0.00			33.10	20.52	5.41	20.55	1.39	215.18
1976	136.14	0.00			12.76	15.02	0.00	13.06	0.00	176.98
1977	123.29	0.00			20.06	19.84	0.00	14.67	0.00	177.85
1978	106.57	0.00			20.18	17.56	0.00	16.15	0.10	160.56
1979	124.78	0.00			19.32	18.37	0.00	17.82	1.75	182.03
1980	121.06	0.00			20.07	16.80	0.03	17.67	3.24	178.88
1981	106.36	0.00			17.70	12.06	0.03	14.21	2.99	153.34
1982	82.45	0.00			19.04	19.89	1.53	13.73	2.89	139.53
1983	79.14	0.00			25.14	19.34	1.58	13.21	2.96	141.38
1984	80.48	0.00			21.69	20.35	2.17	15.57	2.19	142.46
1985	43.62	0.00			38.78	31.57	3.60	17.27	3.95	138.79
1986	48.65	0.00			5.22	20.43	3.53	17.65	1.81	97.29
1987	105.18	0.00	0.00		22.42	2.54	0.00	4.22	1.83	136.18
1988	112.81	0.00	0.00		10.37	0.23	0.50	1.01	2.27	127.19
1989	138.65	0.00	0.00		12.80	0.01	0.24	1.82	2.70	156.22
1990	145.23	0.00	1.37		13.26	0.43	0.00	1.83	8.70	169.45
1991	149.40	0.00	1.36		14.12	0.18	0.39	0.82	7.38	172.29
1992	145.15	0.00	0.38		10.59	1.54	2.28	2.15	7.37	169.08
1993	162.32	0.00	0.54		14.97	0.02	0.13	0.98	7.25	185.66
1994	178.86	0.00	1.10		18.69	1.83	0.04	1.08	7.91	208.41
1995	174.49	0.00	7.47		25.42	3.88	0.10	3.87	9.09	216.85
1996	176.48	0.00	20.54	10.13	30.67	11.77	0.82	5.15	7.88	232.77
1997	181.71	0.00	21.76	10.22	31.98	12.23	0.00	5.71	8.04	239.67
1998	219.05	0.00	21.68	6.49	28.17	2.72	0.00	4.73	7.25	261.92
1999	210.64	0.00	31.57	10.49	42.06	10.83	0.00	5.38	6.93	275.84
2000	213.14	0.00	27.78	7.18	34.95	6.84	0.00	5.51	7.05	267.49
2001	210.93	0.00	30.07	6.43	36.50	10.95	0.00	6.20	5.83	270.40
2002	225.34	0.00	30.44	7.02	37.46	12.20	0.00	5.77	6.38	287.15
2003	235.31	0.54	27.50	8.97	36.47	15.26	1.17	8.91	6.57	304.23
2004	217.01	0.39	29.72	11.31	41.03	36.22	0.00	13.80	7.30	315.76
2005	218.72	0.57	28.25	11.20	39.45	32.62	0.00	10.63	7.08	309.07
2006	215.83	1.91	29.68	11.18	40.85	34.43	0.00	9.73	6.77	309.52
2007	212.06	4.13	36.02	11.90	47.92	40.60	0.01	11.89	6.79	323.40
2008	224.23	4.99	30.28	9.92	40.21	38.00	0.34	11.53	7.28	326.57
2009	218.27	4.70	37.77	9.36	47.13	32.60	0.01	8.91	5.93	317.54
2010 ^R	232.65	0.37	34.38	8.51	42.89	26.21	0.00	2.73	7.43	312.29
2011	240.05	0.32	33.22	10.07	43.29	31.39	0.00	1.16	7.14	323.35
2010 Mar	60.88	0.28	9.95	2.68	12.63	3.51	0.00	0.65	1.60	79.56
Jun	58.58	0.09	9.20	1.97	11.16	12.45	0.00	0.81	1.44	84.52
Sep	53.03	0.00	5.75	2.01	7.76	3.15	0.00	0.20	1.35	65.50
Dec	60.16	0.00	9.48	1.85	11.33	7.10	0.00	1.07	3.04	82.71
2011 Mar	62.07	0.00	7.01	2.75	9.75	8.46	0.00	0.08	1.41	81.77
Jun	62.54	0.18	8.00	2.91	10.91	8.31	0.00	0.57	1.11	83.61
Sep	60.94	0.14	6.63	1.61	8.24	3.92	0.00	0.38	2.00	75.61
Dec	54.51	0.00	11.58	2.81	14.39	10.70	0.00	0.13	2.63	82.36
Δ2007/2011 p.a.	3.1%	-47.3%	-2.0%	-4.1%	-2.5%	-6.2%	n.a.	-44.1%	1.3%	0.0%
Δ2010/2011	3.2%	-14.8%	-3.4%	18.4%	0.9%	19.8%	n.a.	-57.6%	-4.0%	3.5%

Notes to Table D.5: ¹ Crude oil includes refinery blendstocks and other feedstocks.

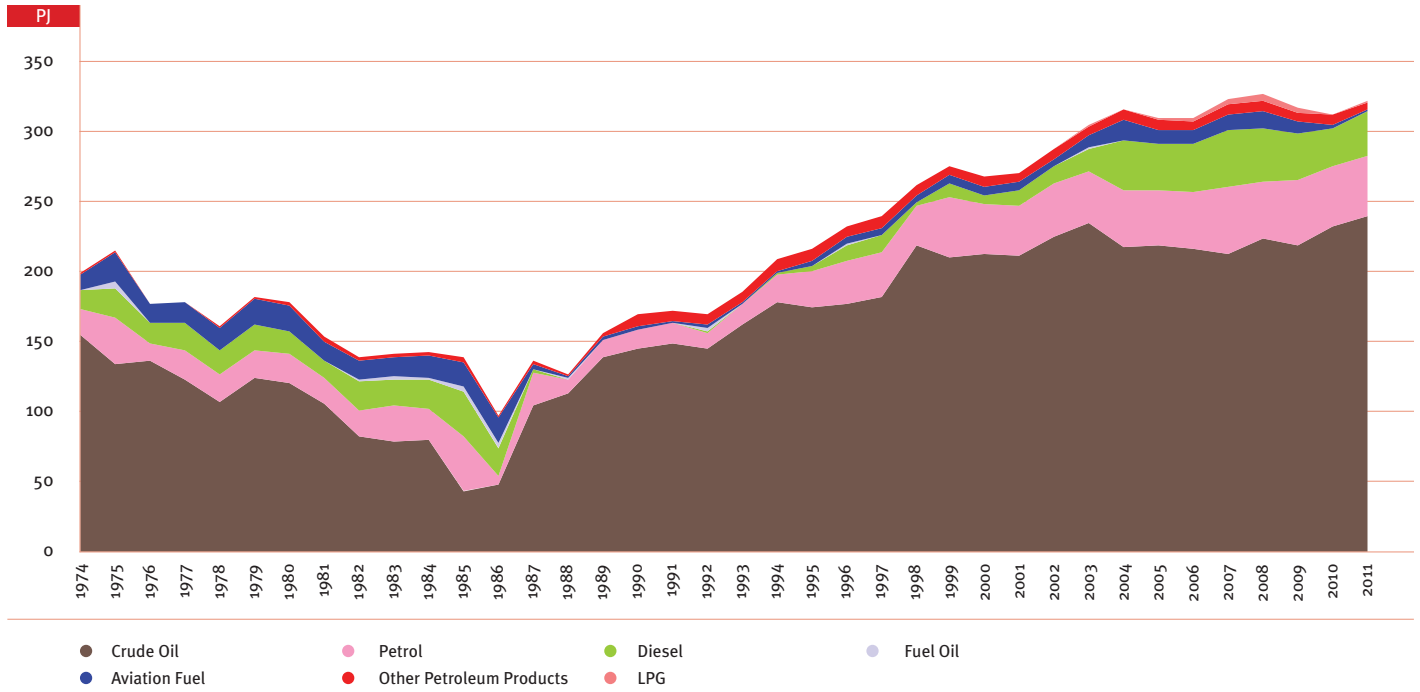
² Petrol includes premium leaded, premium unleaded (from January 1996), premium unleaded 98, regular leaded (to December 1986) and regular unleaded (from January 1987).

³ Includes bitumen, lubricants, solvents, waxes, petroleum coke, white spirit and other liquid fuels.

^R = Revised figures.

D. Oil

Figure D.5: Imports of Crude Oil and Oil Products



D. Oil

Exports of Crude Oil and Oil Products

Table D.6: Exports of Crude Oil and Oil Products (Gross PJ)

Calendar Year or Quarter	Exports of:								Total	
	Crude Oil	LPG	Regular Unleaded 91	Premium Unleaded 95-98	Total Petrol ¹	Diesel	Fuel Oil	Aviation Fuel		Other Petroleum Products ²
1974	-	-			-	-	-	-	-	-
1975	-	-			-	-	-	-	-	-
1976	-	-			-	-	-	-	-	-
1977	-	-			-	-	1.48	-	-	1.48
1978	-	-			-	-	1.81	-	-	1.81
1979	-	-			-	-	1.80	-	0.85	2.65
1980	-	-			-	-	0.88	-	-	0.88
1981	-	-			-	-	0.88	-	-	0.88
1982	-	-			-	-	-	-	-	-
1983	-	-			-	-	0.61	-	-	0.61
1984	-	-			-	-	3.43	-	-	3.43
1985	29.02	-			-	-	3.52	-	-	32.54
1986	9.95	-			3.56	-	0.78	-	-	14.29
1987	4.66	0.05	11.80		11.87	1.53	0.59	1.02	-	19.71
1988	14.46	0.12	9.25		10.35	10.27	-	5.64	-	40.84
1989	27.56	0.36	9.78		11.71	15.82	1.16	5.49	-	62.09
1990	40.24	0.53	3.58		5.58	10.79	0.70	4.83	-	62.67
1991	44.88	0.89	2.07		3.83	14.05	1.06	2.47	-	67.18
1992	40.53	1.21	2.78		3.50	4.43	1.61	1.51	0.01	52.80
1993	47.58	1.33	3.56		5.74	8.57	1.16	3.06	0.15	67.58
1994	51.35	1.17	0.01		1.07	3.97	0.73	1.80	0.01	60.10
1995	44.12	0.67	0.10		0.58	0.01	-	0.00	0.10	45.48
1996	56.83	1.94	-	1.97	1.97	0.09	2.21	0.00	0.13	63.17
1997	77.74	3.11	-	2.73	2.73	1.99	1.63	0.60	0.33	88.13
1998	71.56	3.64	0.00	1.39	1.40	2.89	1.97	0.10	0.08	81.63
1999	65.42	4.35	0.00	0.71	0.72	0.93	3.17	0.14	-	74.73
2000	56.63	4.00	0.61	-	0.61	0.22	4.32	-	0.00	65.79
2001	58.12	4.18	-	-	-	-	2.38	-	-	64.68
2002	50.52	3.36	0.05	0.60	0.65	0.32	5.27	0.19	-	60.31
2003	41.90	1.24	-	0.62	0.62	0.30	1.85	-	-	45.91
2004	33.51	0.68	-	-	-	0.24	3.32	-	-	37.75
2005	28.61	0.55	-	0.57	0.57	0.15	6.75	-	-	36.63
2006	31.25	0.30	-	-	-	0.01	3.85	-	-	35.41
2007	75.18	0.00	-	0.68	0.68	-	4.68	-	-	80.55
2008	119.83	0.00	-	1.31	1.31	0.01	7.78	-	-	128.94
2009	107.38	0.00	0.24	-	0.24	-	8.83	-	-	116.45
2010 ^R	110.52	0.70	-	1.63	1.63	0.01	2.75	-	-	115.60
2011	95.51	0.65	-	-	-	-	11.55	0.56	-	108.26
2010 Mar	28.91	0.02	-	1.63	1.63	-	0.39	-	-	30.94
2010 Jun	30.75	0.25	-	-	-	-	-	-	-	31.00
2010 Sep	26.98	0.11	-	-	-	0.00	1.35	-	-	28.46
2010 Dec	23.87	0.32	-	-	-	0.01	1.01	-	-	25.20
2011 Mar	27.99	0.12	-	-	-	-	2.31	-	-	30.42
2011 Jun	21.77	0.20	-	-	-	-	2.43	-	-	24.41
2011 Sep	24.21	0.16	-	-	-	-	3.31	0.56	-	28.24
2011 Dec	21.53	0.16	-	-	-	-	3.50	-	-	25.19
Δ2007/2011 p.a.	6.2%	260.5%	n.a.	-100.0%	-100.0%	n.a.	25.3%	n.a.	n.a.	7.7%
Δ2010/2011	-13.6%	-8.1%	n.a.	-100.0%	-100.0%	n.a.	319.7%	n.a.	n.a.	-6.4%

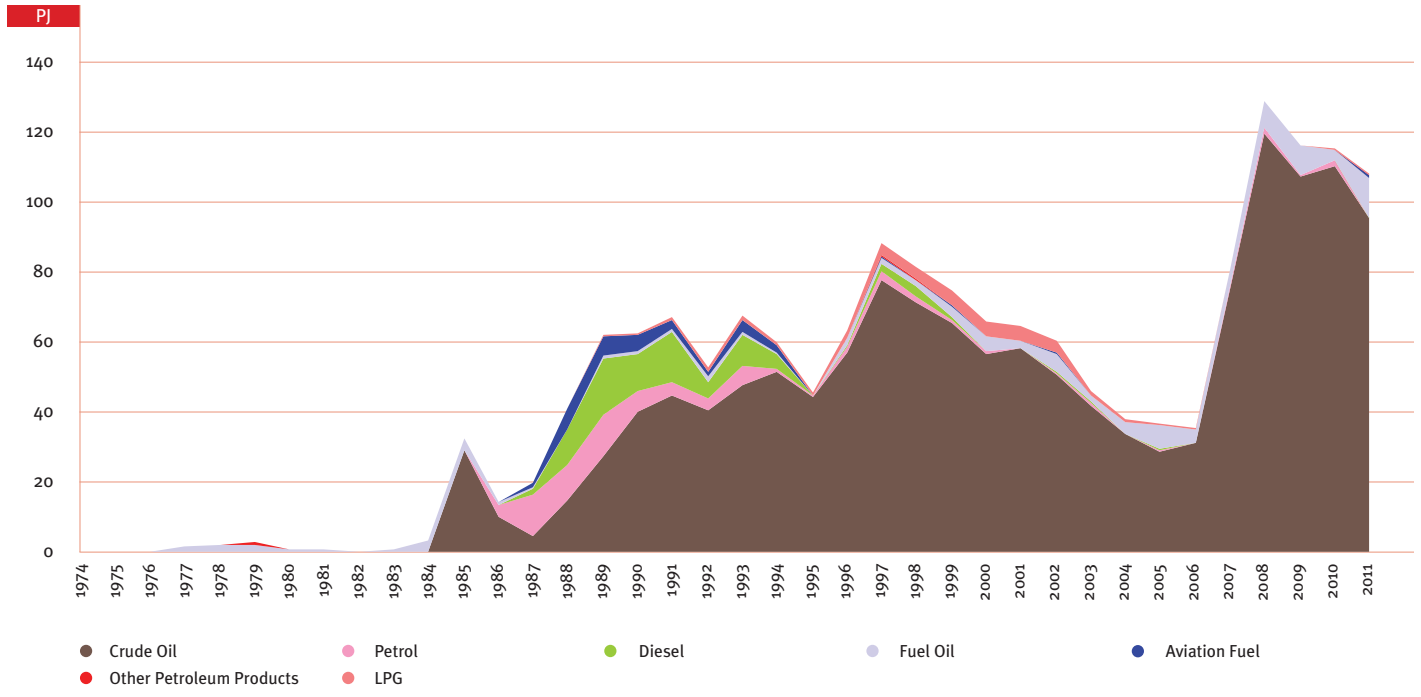
Notes to Table D.6: ¹ Petrol includes premium leaded, premium unleaded (from January 1996), premium unleaded 98, regular leaded (to December 1986) and regular unleaded (from January 1987).

² Includes bitumen, lubricants, solvents, waxes, petroleum coke, white spirit and other liquid fuels.

^R = Revised figures.
n.a. = Not applicable.

D. Oil

Figure D.6: Exports of Crude Oil and Oil Products



D. Oil

Observed Oil Products Consumption

Table D.7: Observed Oil Products Consumption¹ (Gross PJ)

Calendar Year or Quarter	Domestic Consumption of:								Total Oil Products ⁵
	Regular Unleaded g1	Premium Unleaded 95-98	Total Petrol ²	Diesel ³	Fuel Oil ³	Aviation Fuel	Other Petroleum Products ^{3, R}	LPG ³	
1974			77.25	40.71	21.89	7.06	5.85	0.11	152.86
1975			78.46	40.77	25.67	7.10	5.28	0.15	157.43
1976			77.38	41.40	23.84	7.51	4.12	0.39	154.63
1977			78.66	43.31	28.37	7.95	4.80	0.55	163.64
1978			79.84	42.38	25.37	7.95	4.28	0.68	160.49
1979			77.82	40.98	22.90	8.11	5.34	1.17	156.33
1980			77.80	45.50	20.43	7.05	6.46	0.85	158.09
1981			77.89	41.11	17.20	6.32	6.76	1.30	150.59
1982			79.50	42.87	15.93	6.34	6.80	1.54	152.98
1983			79.09	41.39	11.02	6.09	6.87	1.74	146.21
1984			80.40	43.02	8.90	6.68	8.20	2.59	149.79
1985			76.60	42.50	8.70	6.79	6.05	4.66	145.30
1986			79.24	42.19	7.90	6.65	7.30	5.44	148.72
1987	3.74		85.24	41.13	8.13	7.61	8.05	5.40	155.57
1988	6.03		84.39	41.12	8.67	8.59	8.71	5.66	157.15
1989	9.54		88.16	42.74	6.95	11.13	8.57	5.38	162.94
1990	17.60		90.97	46.29	7.42	13.87	13.98	5.48	178.01
1991	28.00		90.40	46.49	6.84	12.03	12.66	6.14	174.57
1992	33.19		92.89	53.65	8.46	11.93	12.88	5.77	185.56
1993	37.51		92.15	55.20	5.83	13.78	13.59	5.71	186.26
1994	42.90		97.53	61.08	8.03	15.89	14.48	5.94	202.96
1995	48.04		98.69	69.59	7.27	16.36	14.36	5.08	211.35
1996	65.53	32.07	97.59	72.00	8.77	16.05	13.69	4.74	212.84
1997	72.36	27.71	100.07	76.53	7.57	15.53	13.86	3.69	217.25
1998	74.54	26.60	101.14	78.11	6.97	16.10	12.92	3.81	219.06
1999	76.47	26.14	102.61	80.92	7.03	15.85	13.19	4.12	223.71
2000	77.98	23.62	101.60	87.26	9.84	17.23	13.73	5.01	234.67
2001	79.57	22.66	102.23	87.56	8.76	17.65	10.20	6.56	232.96
2002	82.24	23.43	105.67	94.00	9.23	16.37	11.63	7.51	244.42
2003	85.21	24.08	109.29	97.69	10.79	18.23	12.02	7.53	255.55
2004	87.16	26.64	113.80	101.13	7.72	18.77	13.28	8.48	263.17
2005	87.80	23.19	110.99	106.66	9.18	17.45	12.50	8.59	265.37
2006	89.56	22.32	111.88	107.51	7.51	17.77	14.09	9.08	267.85
2007	90.92	22.94	113.86	110.83	8.38	14.63	13.75	9.56	271.01
2008	90.15	21.76	111.91	110.04	6.90	15.84	13.72	9.20	267.61
2009	87.40	22.85	110.26	105.22	7.57	14.33	12.12	8.29	257.79
2010 ^R	87.91	22.45	110.36	105.15	7.31	14.75	14.82	6.98	259.39
2011	87.97	20.74	108.71	110.75	7.49	15.29	11.92	6.85	261.01
2010 Mar	22.37	5.77	28.15	25.50	2.01	3.22	4.34	1.53	64.73
2010 Jun	21.40	5.47	26.87	24.84	1.94	3.68	2.65	1.82	61.80
2010 Sep	21.44	5.42	26.86	25.90	1.94	3.79	3.21	2.23	63.93
2010 Dec	22.70	5.79	28.48	28.91	1.43	4.06	4.63	1.40	68.92
2011 Mar	22.13	5.68	27.82	28.25	1.69	5.08	2.88	1.33	67.05
2011 Jun	21.47	4.92	26.38	26.91	1.80	4.49	2.46	1.57	63.61
2011 Sep	21.95	4.74	26.69	26.75	2.02	3.51	2.51	2.17	63.66
2011 Dec	22.42	5.40	27.82	28.83	1.98	2.21	4.06	1.78	66.68
Δ2007/2011 p.a.	-0.8%	-2.5%	-1.2%	0.0%	-2.8%	1.1%	-3.5%	-8.0%	-0.9%
Δ2010/2011	0.1%	-7.6%	-1.5%	5.3%	2.4%	3.7%	-19.6%	-1.9%	0.6%

Notes to Table D.7: ¹ Diesel and Fuel Oil used for electricity generation have been excluded.

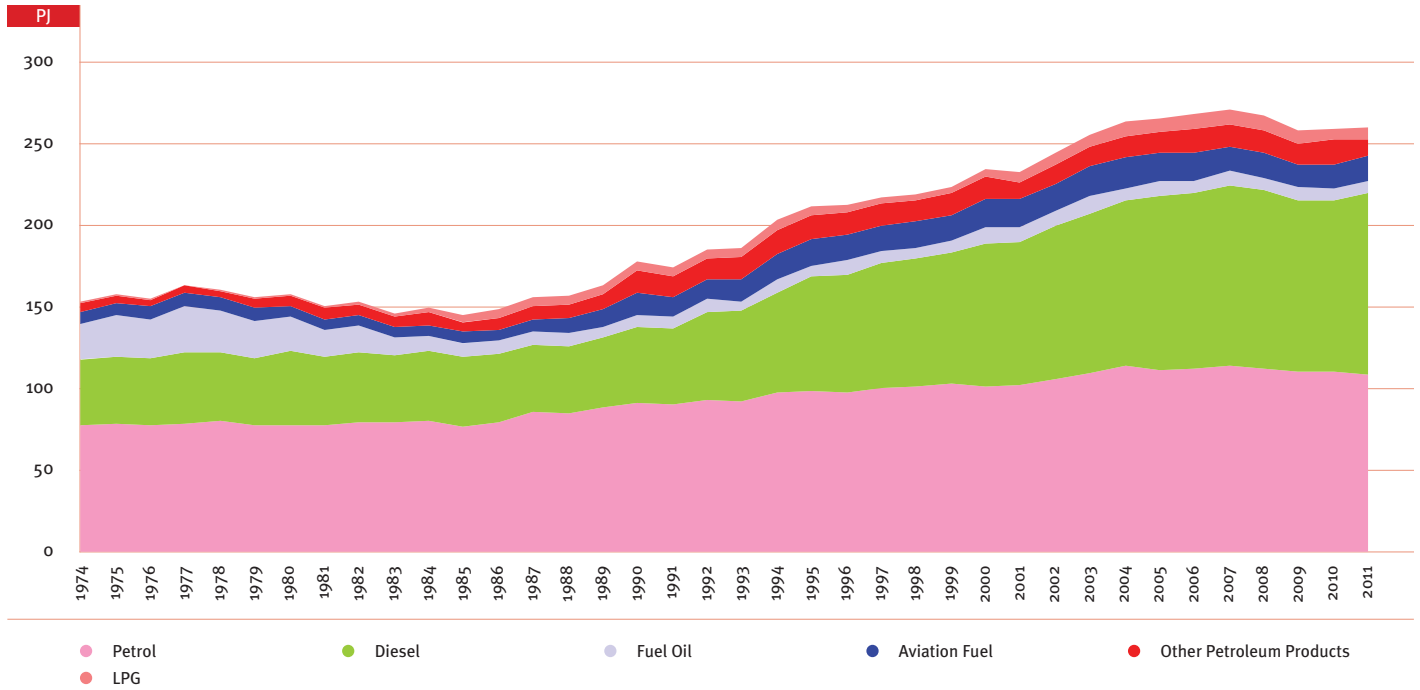
² Petrol includes premium leaded, premium unleaded (from January 1996), premium unleaded g8, regular leaded (to December 1986) and regular unleaded (from January 1987).

³ Includes bitumen, lubricants, solvents, waxes, petroleum coke, white spirit, refinery by-products, and other liquid fuels.

^R = Revised figures.

D. Oil

Figure D.7: Observed Oil Products Consumption



D. Oil

Observed Petrol Consumption by Sector

Table D.8: Observed Petrol Consumption by Sector (Gross PJ)

Calendar Year or Quarter	Domestic Petrol Consumption by Sector:						Observed Consumption	Calculated Consumption ¹	Statistical Difference
	Agriculture, Fishing and Forestry	Industrial	Commercial	Residential	Transport				
1974	5.64	2.26	3.10	0.03	66.21	77.25	77.36	0.11	
1975	5.89	2.35	3.25	0.00	66.97	78.46	93.08	14.62	
1976	5.61	2.24	3.14	0.00	66.38	77.38	77.37	-0.01	
1977	5.84	2.23	3.19	0.01	67.39	78.66	79.83	1.17	
1978	5.73	2.10	3.61	0.02	68.37	79.84	79.24	-0.60	
1979	5.39	2.35	3.19	0.07	66.82	77.82	78.29	0.47	
1980	5.50	2.32	2.67	0.76	66.55	77.80	77.26	-0.54	
1981	5.24	2.00	3.07	0.03	67.56	77.89	78.07	0.18	
1982	5.53	2.03	3.42	0.08	68.43	79.50	79.36	-0.14	
1983	5.22	1.83	3.12	0.10	68.81	79.09	79.21	0.12	
1984	5.14	1.76	2.97	0.09	70.45	80.40	80.93	0.52	
1985	5.08	1.60	2.59	0.07	67.27	76.60	74.53	-2.08	
1986	4.36	1.37	2.17	0.03	71.32	79.24	80.68	1.44	
1987	6.44	1.52	1.38	0.03	75.89	85.24	84.86	-0.38	
1988	3.58	0.93	1.21	0.02	78.64	84.39	85.00	0.61	
1989	3.72	0.93	1.11	0.01	82.39	88.16	88.15	-0.01	
1990	3.65	0.82	1.09	0.01	85.40	90.97	90.47	-0.50	
1991	3.38	0.64	0.91	0.01	85.46	90.40	92.21	1.81	
1992	3.10	1.32	1.52	0.05	86.89	92.89	92.71	-0.18	
1993	2.91	0.46	0.84	0.05	87.89	92.15	93.95	1.80	
1994	2.75	0.34	3.70	0.03	90.71	97.53	95.61	-1.92	
1995	2.62	0.28	2.07	0.02	93.70	98.69	99.10	0.41	
1996	2.24	0.47	0.62	0.01	94.26	97.59	99.55	1.96	
1997	2.16	0.29	0.68	0.01	96.94	100.07	101.35	1.28	
1998	2.17	0.18	0.33	0.01	98.44	101.14	101.83	0.69	
1999	2.21	0.15	0.18	0.03	100.04	102.61	104.44	1.83	
2000	2.17	0.19	0.15	0.01	99.08	101.60	101.38	-0.22	
2001	2.20	0.18	0.18	0.00	99.67	102.23	102.74	0.51	
2002	2.29	0.18	0.18	0.00	103.02	105.67	107.16	1.48	
2003	2.24	0.18	0.15	0.00	106.72	109.29	110.83	1.55	
2004	2.25	0.42	0.52	0.00	110.61	113.80	111.05	-2.75	
2005	2.29	0.50	0.17	0.00	108.02	110.99	111.56	0.57	
2006	2.34	0.51	0.13	0.00	108.90	111.88	110.82	-1.06	
2007	2.23	0.45	0.38	0.00	110.80	113.86	111.57	-2.29	
2008	1.99	0.37	0.13	0.00	109.42	111.91	108.65	-3.26	
2009	1.76	0.28	0.11	0.00	108.11	110.26	112.15	1.90	
2010	1.38	0.09	0.05	0.04	108.81	110.36	105.52	-4.85	
2011	1.42	0.12	0.09	0.00	107.07	108.70	108.04	-0.66	
2010	Mar	0.34	0.02	0.01	27.75	28.15	27.76	-0.38	
	Jun	0.34	0.02	0.01	26.48	26.87	25.27	-1.60	
	Sep	0.34	0.02	0.01	26.48	26.86	27.10	0.24	
	Dec	0.34	0.02	0.01	28.10	28.48	25.39	-3.10	
2011	Mar	0.36	0.02	0.02	27.42	27.82	27.44	-0.37	
	Jun	0.36	0.02	0.01	26.00	26.38	26.44	0.05	
	Sep	0.36	0.02	0.02	26.29	26.69	24.21	-2.48	
	Dec	0.36	0.06	0.04	27.36	27.82	29.96	2.14	
Δ2007/2011 p.a.		-10.6%	-27.5%	-30.7%	-66.9%	-0.9%	-1.2%	-0.8%	n.a.
Δ2010/2011		3.1%	37.3%	87.7%	-99.9%	-1.6%	-1.5%	2.4%	n.a.

Note to Table D.8: ¹ Calculated consumption is calculated as Production + Imports - Exports - Stock Change - International Transport - Losses and Own Use.

D. Oil

Figure D.8a: Observed Petrol Consumption by Sector

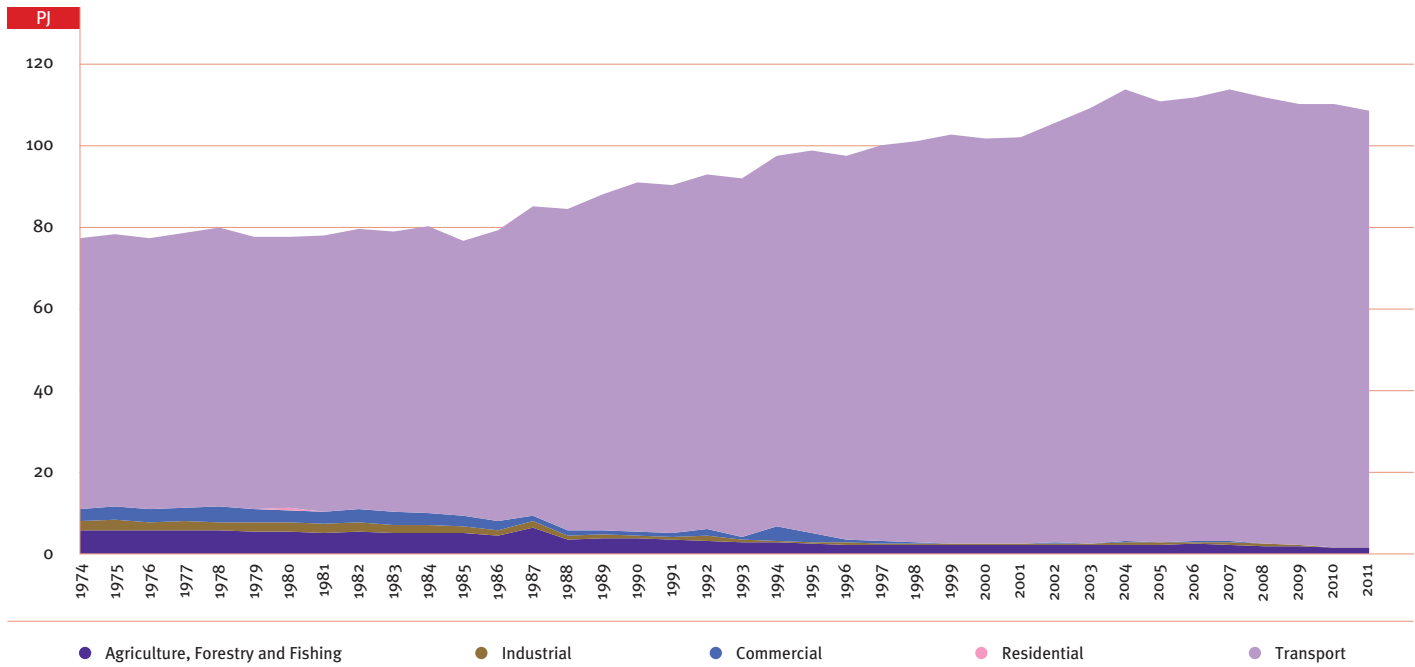
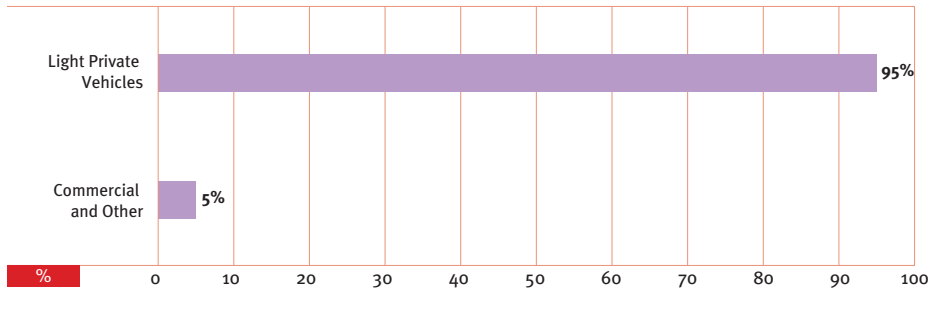


Figure D.8b: Transport Petrol by Mode in 2011¹



Notes to Figure D.8b: ¹ This chart was constructed by disaggregating the transport figure for 2011 using data from the Ministry of Transport's Vehicle Fleet Model (VFM).

D. Oil

Observed Diesel Consumption by Sector

Table D.9: Observed Diesel Consumption by Sector (Gross PJ)

Calendar Year or Quarter	Domestic Diesel Consumption by Sector:						Observed Consumption	Calculated Consumption ²	Statistical Difference
	Agriculture, Fishing and Forestry	Industrial ¹	Commercial	Residential	Transport				
1974	6.00	11.03	7.47	2.30	13.91	40.71	38.15	-2.56	
1975	6.09	10.01	7.55	1.95	15.17	40.77	40.94	0.17	
1976	6.26	10.02	7.31	1.66	16.15	41.40	40.56	-0.84	
1977	6.80	11.10	7.58	1.58	16.25	43.31	42.13	-1.18	
1978	6.50	10.66	7.69	1.19	16.33	42.38	42.65	0.27	
1979	7.48	10.00	6.02	0.79	16.69	40.98	38.42	-2.56	
1980	9.21	10.13	9.68	0.56	15.93	45.50	40.67	-4.83	
1981	8.37	10.19	6.29	0.46	15.81	41.11	40.58	-0.52	
1982	9.19	10.63	7.41	0.36	15.27	42.87	40.14	-2.73	
1983	8.73	9.37	6.91	0.33	16.05	41.39	40.30	-1.09	
1984	8.94	9.85	6.32	0.27	17.64	43.02	41.49	-1.53	
1985	8.72	9.37	5.29	0.20	18.92	42.50	41.71	-0.79	
1986	8.75	8.50	5.48	0.21	19.24	42.19	44.02	1.83	
1987	8.29	8.07	3.86	0.17	20.75	41.13	42.46	1.33	
1988	7.88	7.72	3.80	0.11	21.61	41.12	40.78	-0.34	
1989	9.73	8.33	3.28	0.15	21.25	42.74	43.68	0.94	
1990	10.88	8.29	4.94	0.15	22.02	46.29	46.16	-0.12	
1991	9.79	7.93	5.22	0.17	23.38	46.49	47.85	1.36	
1992	11.24	8.74	5.65	0.26	27.75	53.65	55.24	1.60	
1993	11.53	8.39	3.18	0.28	31.82	55.20	56.48	1.28	
1994	12.06	8.70	3.85	0.30	36.18	61.08	63.16	2.08	
1995	12.89	9.58	4.05	0.30	42.76	69.59	68.90	-0.69	
1996	13.14	9.53	3.67	0.30	45.35	72.00	74.03	2.04	
1997	14.26	9.71	3.53	0.35	48.68	76.53	77.93	1.40	
1998	14.58	9.09	3.99	0.40	50.06	78.11	79.57	1.46	
1999	16.09	8.18	3.87	0.45	52.33	80.92	84.02	3.10	
2000	15.61	10.10	3.89	0.42	57.24	87.26	87.57	0.31	
2001	15.78	10.16	3.12	0.44	58.06	87.56	91.56	4.00	
2002	17.77	10.81	2.83	0.47	62.12	94.00	96.64	2.64	
2003	17.76	11.66	3.34	0.52	64.41	97.69	100.61	2.91	
2004	17.08	13.90	4.54	0.57	65.04	101.13	105.80	4.67	
2005	18.55	14.50	3.94	0.61	69.06	106.66	107.05	0.39	
2006	17.75	14.72	3.26	0.61	71.18	107.51	107.75	0.24	
2007	17.40	15.88	3.21	0.64	73.70	110.83	112.31	1.48	
2008	16.11	14.90	3.61	0.28	75.14	110.04	112.61	2.58	
2009	13.94	13.45	2.77	0.31	74.75	105.22	105.23	0.01	
2010	13.27	11.29	4.43	0.30	75.87	105.15	109.60	4.45	
2011	14.49	11.11	5.01	0.34	79.78	110.75	110.55	-0.20	
2010 Mar	3.36	2.94	1.06	0.08	18.06	25.50	27.92	2.42	
2010 Jun	3.41	2.72	1.04	0.08	17.60	24.84	26.03	1.18	
2010 Sep	3.25	2.79	1.05	0.08	18.74	25.90	25.29	-0.61	
2010 Dec	3.25	2.84	1.28	0.08	21.47	28.91	30.37	1.46	
2011 Mar	3.64	2.82	1.31	0.09	20.40	28.25	26.99	-1.26	
2011 Jun	3.58	2.82	1.32	0.09	19.11	26.91	27.28	0.37	
2011 Sep	3.60	2.80	1.20	0.09	19.06	26.75	26.19	-0.56	
2011 Dec	3.67	2.68	1.18	0.09	21.22	28.83	30.08	1.26	
Δ2007/2011 p.a.	-1.2%	-4.3%	12.4%	-0.4%	0.4%	0.0%	1.0%	n.a.	
Δ2010/2011	9.2%	-1.5%	13.3%	13.2%	5.2%	5.3%	0.9%	n.a.	

Notes to Table D.9: ¹ Excludes diesel used for electricity generation.

² Calculated consumption is calculated as Production + Imports - Exports - Stock Change - International Transport - Losses and Own Use.

n.a. = Not applicable.

D. Oil

Figure D.9a: Observed Diesel Consumption by Sector

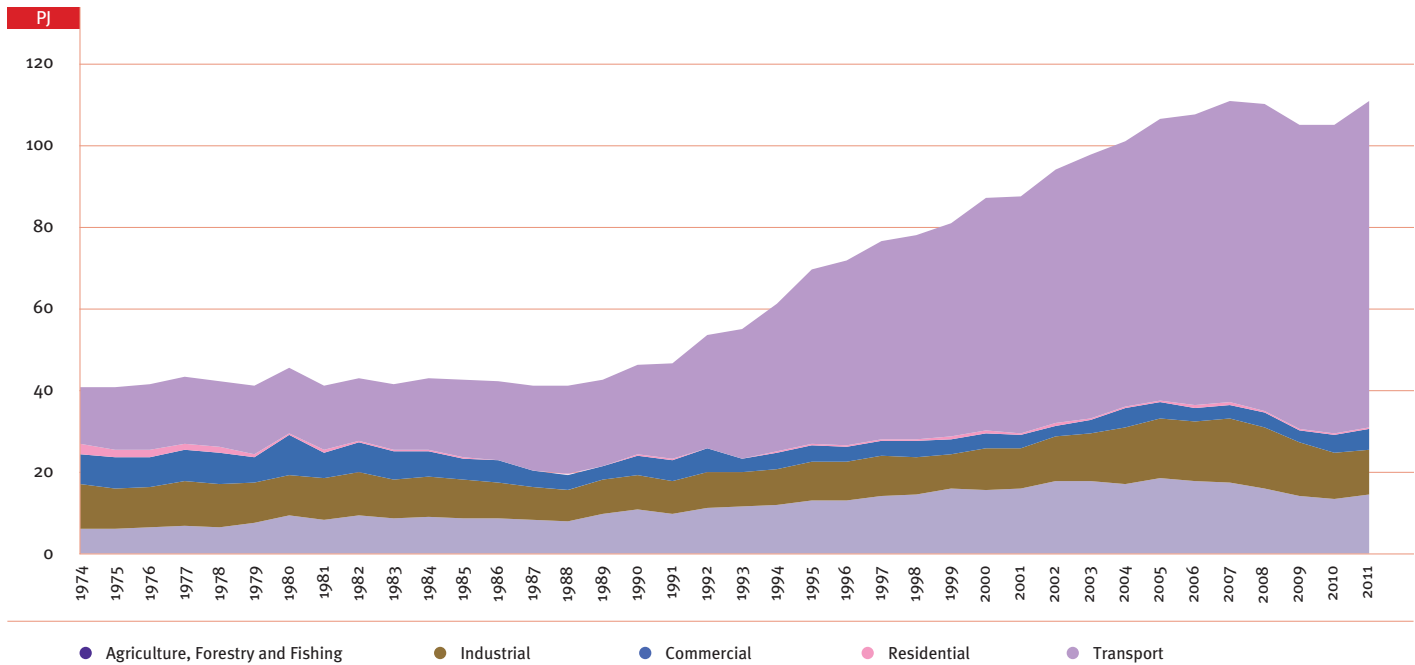
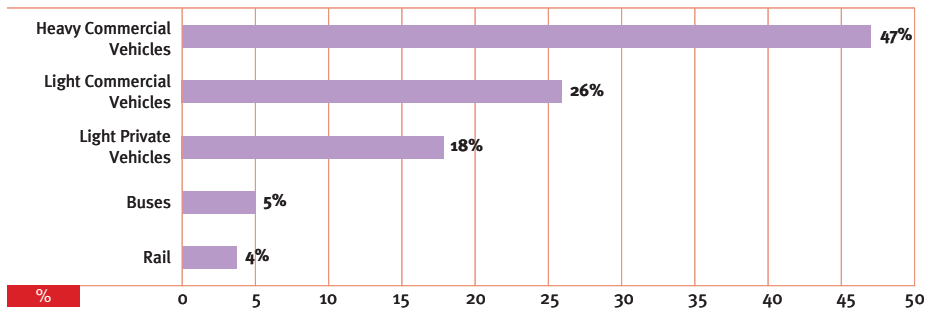


Figure D.9b: Transport Diesel Use by Mode in 2011¹



Notes to Figure D.9b: ¹ This chart was constructed by disaggregating the transport figure for 2011 using data from the Ministry of Transport's Vehicle Fleet Model (VFM).

D. Oil

Observed Total Oil Consumption by Sector

Table D.10: Observed Total Oil Consumption by Sector (Gross PJ)

Calendar Year or Quarter	Domestic Oil Consumption by Sector:							Total Oil Consumption ^R
	Agriculture, Fishing and Forestry ¹	Industrial ²	Commercial	Residential	Transport	Observed Energy Use	Non-energy Use ³	
1974	12.92	27.37	15.90	2.43	88.38	147.02	5.85	152.86
1975	13.19	29.87	15.34	2.06	91.69	152.15	5.28	157.43
1976	13.27	27.68	15.22	1.89	92.46	150.52	4.12	154.63
1977	14.95	33.79	15.27	1.93	92.89	158.83	4.80	163.64
1978	13.33	33.30	14.62	1.55	93.40	156.21	4.28	160.49
1979	13.82	31.69	11.60	1.44	92.43	150.99	5.34	156.33
1980	15.63	29.08	15.07	1.75	90.10	151.64	6.46	158.09
1981	14.66	25.90	12.20	1.12	89.95	143.82	6.76	150.59
1982	15.92	25.25	13.73	1.19	90.08	146.18	6.80	152.98
1983	15.07	20.05	12.43	1.27	90.51	139.34	6.87	146.21
1984	15.16	18.20	11.03	1.60	95.61	141.59	8.20	149.79
1985	15.03	16.68	10.00	2.49	95.06	139.25	6.05	145.30
1986	14.30	15.04	8.87	2.83	100.38	141.41	7.30	148.72
1987	16.79	14.81	6.15	2.77	106.99	147.52	8.05	155.57
1988	12.75	13.70	6.12	2.83	113.04	148.43	8.71	157.15
1989	14.66	12.87	5.69	2.72	118.42	154.37	8.57	162.94
1990	15.84	12.30	7.68	2.76	125.46	164.03	13.98	178.01
1991	14.13	11.78	7.58	3.05	125.37	161.91	12.66	174.57
1992	15.84	13.43	9.78	2.99	130.64	172.69	12.88	185.56
1993	15.87	11.38	4.98	2.96	137.49	172.67	13.59	186.26
1994	16.44	12.79	8.33	3.03	147.87	188.48	14.48	202.96
1995	17.02	12.85	6.84	2.65	157.63	196.99	14.36	211.35
1996	17.49	14.21	5.10	2.42	159.93	199.15	13.69	212.84
1997	18.83	14.19	4.68	1.97	163.72	203.39	13.86	217.25
1998	19.85	12.33	5.16	2.05	166.75	206.13	12.92	219.06
1999	20.81	11.15	5.79	2.36	170.43	210.52	13.19	223.71
2000	19.82	14.19	5.96	2.60	178.36	220.94	13.73	234.67
2001	20.04	14.42	5.45	3.12	179.74	222.77	10.20	232.96
2002	22.10	15.38	4.95	3.58	186.77	232.79	11.63	244.42
2003	23.54	15.66	6.24	3.53	194.57	243.53	12.02	255.55
2004	21.18	18.16	7.43	3.99	199.13	249.90	13.28	263.17
2005	22.76	19.01	7.11	4.03	199.96	252.87	12.50	265.37
2006	22.22	19.36	5.66	4.36	202.17	253.76	14.09	267.85
2007	21.92	20.93	5.94	4.49	203.99	257.26	13.75	271.01
2008	20.32	19.79	5.89	3.92	203.96	253.89	13.72	267.61
2009	18.37	17.87	4.61	3.49	201.32	245.67	12.12	257.79
2010 ^R	17.21	15.35	5.66	2.99	203.37	244.56	14.82	259.39
2011	18.52	14.84	6.37	3.23	206.13	249.08	11.92	261.01
2010 Mar	4.43	3.87	1.32	0.66	50.12	60.40	4.34	64.73
2010 Jun	4.36	3.81	1.37	0.78	48.83	59.16	2.65	61.80
2010 Sep	4.24	4.15	1.43	0.93	49.97	60.72	3.21	63.93
2010 Dec	4.17	3.51	1.54	0.62	54.45	64.29	4.63	68.92
2011 Mar	4.73	3.45	1.58	0.62	53.79	64.17	2.88	67.05
2011 Jun	4.59	3.69	1.62	0.72	50.54	61.15	2.46	63.61
2011 Sep	4.62	4.05	1.59	0.96	49.93	61.15	2.51	63.66
2011 Dec	4.58	3.66	1.57	0.93	51.87	62.62	4.06	66.68
Δ2007/2011 p.a.	-4.1%	-8.2%	1.8%	-7.9%	0.3%	-0.8%	-3.5%	-0.9%
Δ2010/2011	7.6%	-3.3%	12.5%	8.2%	1.4%	1.8%	-19.6%	0.6%

Notes to Table D.10: ¹ LPG demand for the Agriculture, Forestry and Fishing sector (1990–2011) has been estimated using a single point figure from the Statistics New Zealand Primary Energy End Use Survey, converted to a time series using agricultural production statistics.

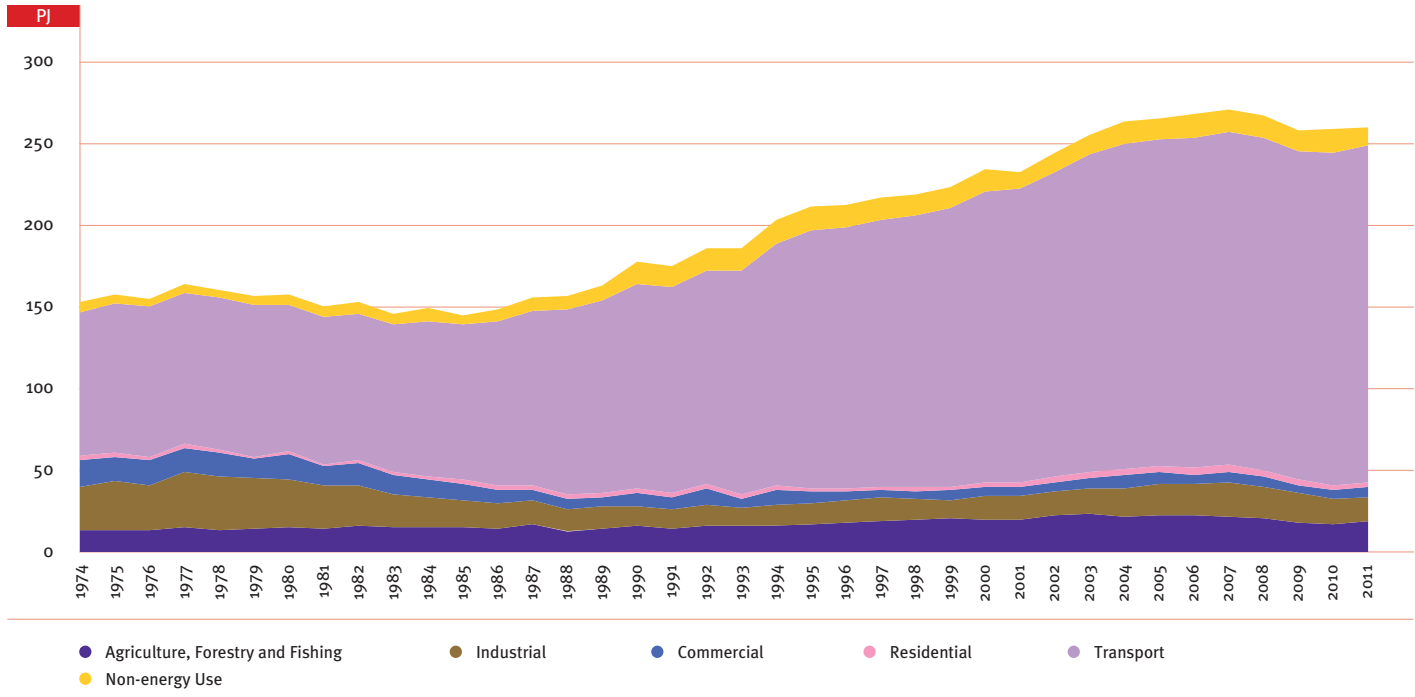
² Diesel and Fuel Oil used for electricity generation have been excluded.

³ Non-energy Use represents use of oil for non-combustion purposes such as bitumen for roads, lubricants and solvents. This is a calculated consumption: see Glossary for more details.

^R = Revised figures.

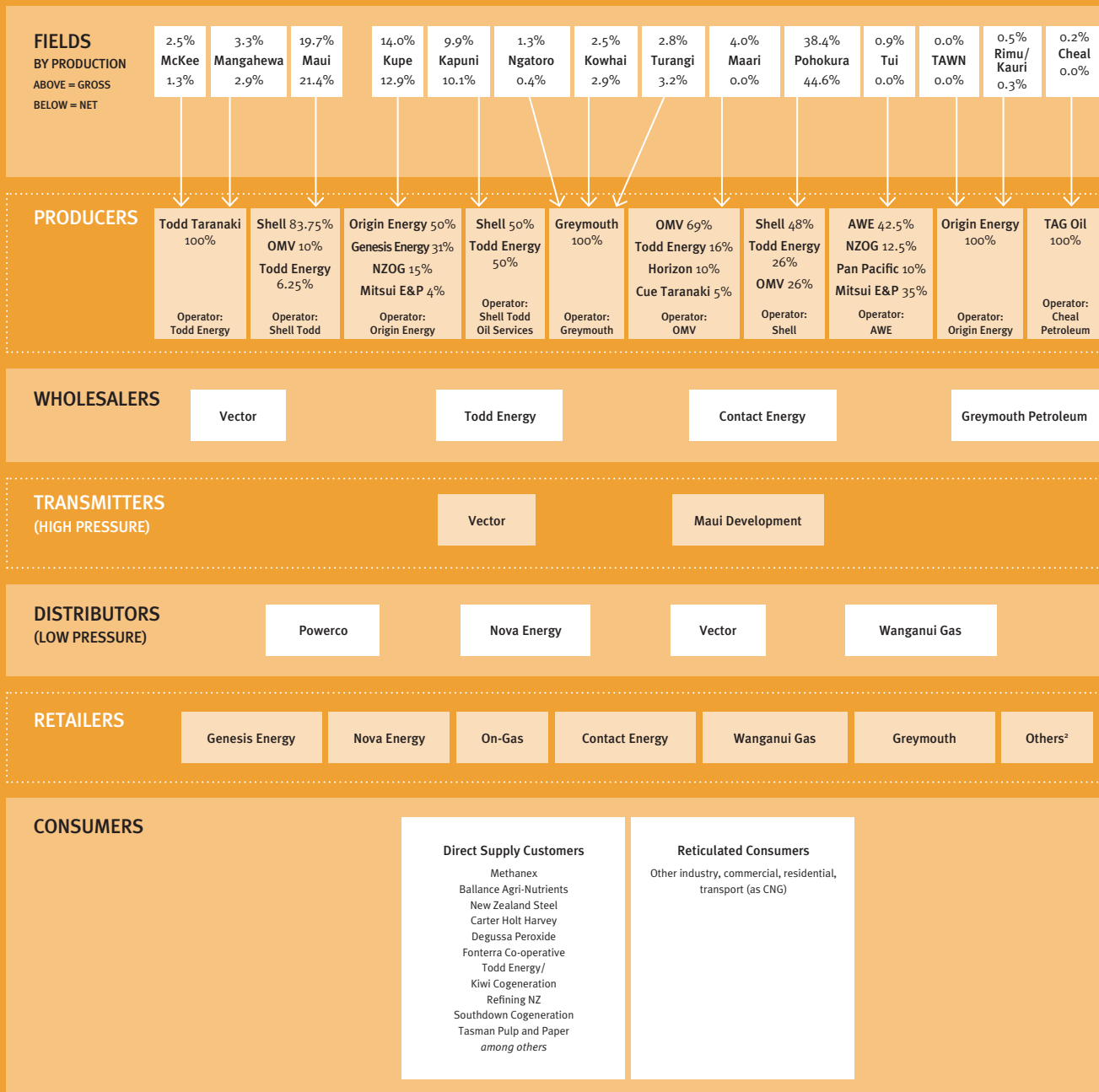
D. Oil

Figure D.10a: Observed Total Oil Consumption by Sector



E. Natural Gas

Figure E.1a: Natural Gas Industry Summary for 2011¹



Company names are listed without the suffixes "Limited" and "New Zealand Limited" where applicable. **AWE** is Australian Worldwide Exploration Limited, **Greymouth** is Greymouth Petroleum Limited, **Mitsui E&P** is Mitsui E&P New Zealand Limited, **NZOG** is New Zealand Oil & Gas Limited, **OMV** is OMV New Zealand Limited, **Contact Energy** is Contact Energy Limited, **Origin Energy** is Origin Energy New Zealand Ltd and ContactEnergy (51% owned by Origin), **Pan Pacific** is Pan Pacific Petroleum, **Shell** is Shell NZ Limited (includes Shell Exploration NZ Limited, Shell (Petroleum Mining) Co Limited, Energy Petroleum Holdings Limited, Energy Petroleum Investments Ltd, Energy Petroleum Taranaki Ltd, Energy Finance New Zealand Limited and Taranaki Offshore Petroleum Company), **TAWN** comprises the Tariki, Ahuroa, Waihapa and Ngaere fields, **Todd Energy** is Todd Energy Limited and includes Nova Gas, **Vector** is Vector Limited and includes OnGas, **Wanganui Gas** is Wanganui Gas Company Limited, and **Nova Energy** is Nova Energy Limited.

¹ Notes to Figure E.1a: ¹ Gas ownership as at year end 2011; excludes LPG.

² Others include Mercury Energy, Bay of Plenty Electricity, Energy Online and Auckland Gas Company. Bay of Plenty Energy, Nova Energy and Auckland Gas Company are part of Todd Energy.

Overview of New Zealand's Natural Gas Industry

Introduction

This section of the *Energy Data File* contains information about the production, transmission, distribution and sales to end consumers of natural gas. Customer numbers are at a specified time, and estimates are made where actual figures were not available at the time of publishing.

All statistics apply to the 2011 calendar year. Comparisons are made with the 2010 calendar year, unless otherwise specified, and any percentages are calculated from energy, rather than volume, units.

Ownership

Gas industry reforms began in 1987, when the Crown publicly floated 30% of Petrocorp. The Government had used Petrocorp to manage its interests in gas production, transmission and distribution. In March 1988, the Government sold its remaining interest in Petrocorp and the Natural Gas Corporation Limited (NGC) to Fletcher Challenge. In September 1992, Fletcher Challenge sold one third of NGC to the public and one third to Australian Gas Light Company (AGL). AGL acquired Fletcher Challenge's remaining one-third share in July 1999. In October 2004, AGL sold its 66% interest in NGC to Auckland-based energy networks company Vector. Vector acquired full ownership of NGC Holdings in August 2005.

Powerco was formed in 1993 from the corporatisation of the Wanganui Rangatikei Electric Power Board and in 1998 took over NGC's gas distribution activities in Taranaki. By 2004 Powerco had acquired the Hutt Valley and Porirua gas distribution networks from AGL, and the distribution networks in Manawatu, Hawke's Bay and Wellington from United Networks Ltd.

In July 2004, Australian company Origin Energy acquired a 50% interest in the Kupe gas field, which began producing in 2009, and bought California-based Edison Mission Energy's 51% stake in Wellington-based Contact Energy.

In December 2008, Contact Energy, in partnership with its majority owner Origin Energy, purchased a range of oil and gas assets from Swift Energy. These included the Tariki/Ahuroa (which is now a gas storage facility), Waihapa/Ngaere (TAWN), Rimu, Kauri and Manutahi fields and wells.

Permitting, Exploration and Development

For commentary on permitting, exploration and development, see the Oil and Gas Reserves section (Section H). Further information on gas explorations is available on the New Zealand Petroleum and Minerals website: www.nzpam.govt.nz.

Taxation

There is a Gas Levy of 2 cents per gigajoule and, for fields that commenced production prior to 1986, an Energy Resources Levy of 45 cents per gigajoule. The Gas Industry Company also levies industry participants to fund its operations. In FY2010/11 there was a wholesale levy of 1.84 cents per gigajoules applicable to all gas purchased from producers, and a retail levy of \$6.40 per interconnection point per annum.

Government's Measures to Encourage Gas Exploration

The Government recently undertook a \$25.4 million seismic acquisition programme. As a result, over the summer of 2008/09 CGG Veritas and MED acquired almost 6,000 km of 2D seismic over the Reinga basin. In the 2009/10 summer, MED undertook a seismic campaign over the Pegasus basin and the Bounty Trough.

Among recent changes to gas-exploration taxation, the exemption from the New Zealand tax levy on income for non-resident offshore rig operators carrying out exploration work in New Zealand has been extended from 31 December 2009 to 31 December 2014.

E. Natural Gas

Storage

The Contact Energy Ahuroa gas storage facility had over 5PJ pumped into it during 2011. This will support the 200 MW gas peaking electricity generation plant at the Stratford site, commissioned in 2011, as well as higher demand for gas in the winter quarters. Ahuroa is New Zealand's first large-scale gas storage facility and has the potential to improve the flexibility of New Zealand's gas supply.

Deregulation and Governance

The Government first released a Government Policy Statement (GPS) on gas governance in 2003, which was then revised and updated in October 2004 at the same time as amendments were made to the Gas Act 1992 to provide for a co-regulatory model of gas governance. The amendments set up an industry body, the Gas Industry Company (GIC), which makes recommendations to the Minister on improved gas industry arrangements such as rules and regulations in wholesaling, processing, transmission and retailing. The GPS was revised again in 2008 to reflect policy directions set out in the 2007 New Zealand Energy Strategy.

Production

Gas is produced entirely in the Taranaki region. Figure E.1a summarises the New Zealand gas industry in 2011, showing current producing fields and their percentage of total gas produced; consumption by major user/supplier categories is also shown in this figure.

There were 17 fields that produced gas in New Zealand in 2011, with total production dominated by the Pohokura field (38%) and the Maui field (20%), as shown in Figure E.1b. Total gas production dropped by nearly 18% in 2011, with most of the decrease due to declining output from the Maui field, which was 26% lower than the previous year.

Companies involved in the production of gas are also shown in Figure E.1a, with Shell and Todd Energy-owned subsidiaries controlling a large portion of the market.

Figures E.2 and E.3 show total gas production and net gas production by field respectively, from 1971 to 2011. Total gas production is gas production after the first separation point (see Oil and Gas Reserves section, Figure H.1). Net gas production is the amount that can be sold for use, that is – the difference between total gas production and the amount of gas flared, gas reinjected, LPG extracted, own use and losses. Note that net gas production for the Kapuni field from 1971 to 1973 has been estimated, using the assumption that net gas production was 95% of total gas production.

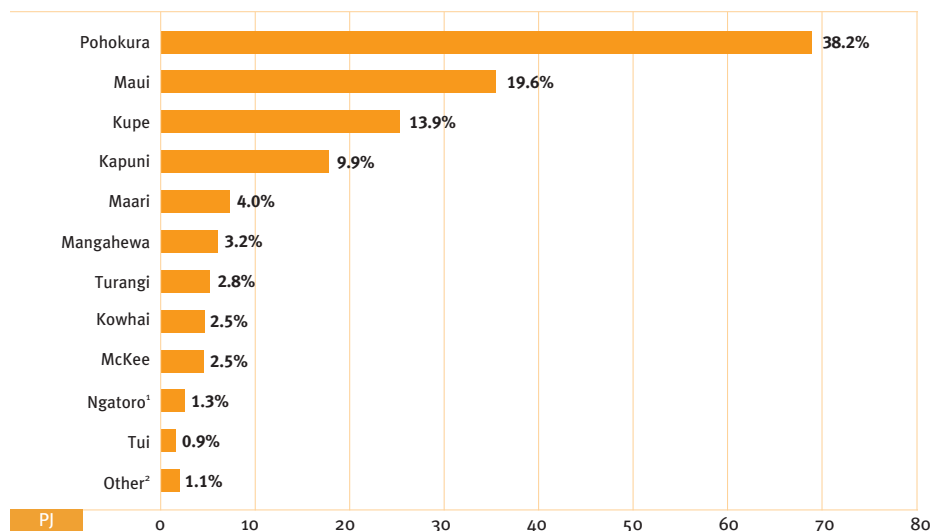
Liquefied Petroleum Gas (LPG)

LPG statistics are included in the Oil section (D).

Compressed Natural Gas (CNG)

CNG is supplied to the automotive market through some North Island service stations. The CNG market has decreased markedly since government subsidies were removed in 1987.

Figure E.1b: Total Natural Gas Production by Field for 2011



Notes to Figure E.1b: ¹ Includes Goldie and Moturoa wells.

² Includes Tariki, Ahuroa, Waihapa, Ngaere, Cheal fields, and Surrey, Sidewinder and Copper Moki wells.

E. Natural Gas

Transmission and Distribution

There are more than 3,500 km of high-pressure gas transmission pipelines in New Zealand. New Zealand has two main transmission entities: Vector's transmission network and the Maui pipeline (owned by Maui Development Limited). All gas from Maui, Pohokura, McKee, Mangahewa and Kowhai is delivered into the Maui pipeline.

More than 2,800 km of intermediate, medium and low-pressure gas distribution pipeline networks in the North Island are connected to the high-pressure transmission system (Figure E.8).

Vector operates extensive gas distribution and retail operations in the North Island. There are four gas distributors: Vector, Powerco, Nova Gas and GasNet (network operator, owned by Wanganui Gas).

Retailing and Consumption

Gas consumption information was provided by Contact Energy, Genesis Energy, Vector, Mercury Energy, Energy Online, Wanganui Gas and the Todd Energy retail brands – Auckland Gas Company, Bay of Plenty Energy and Nova Energy.

Genesis, along with its subsidiary Energy Online, held the largest share of the retail market at 44% in 2011. The Todd Energy-owned Nova brand showed the biggest increase thanks to its purchase of customers from the now defunct E-Gas in November 2010. Approximate market share based on consumer connections is shown in Figure E.1c.

Total observed gas consumption (including electricity generation, cogeneration, total losses and own use, and non-energy use) decreased from approximately 173 PJ to 157 PJ in 2011. This was mostly due to decreased use of gas for electricity generation.

Gas consumption and gas sales revenue reported by gas retailers, broken down by sector for the recent calendar years to 2011, are used to derive average unit prices (\$/GJ, Prices section, Table I.4). Gas price information presented in the Gas Prices and International Comparisons sections should be treated as approximations only.

Industrial

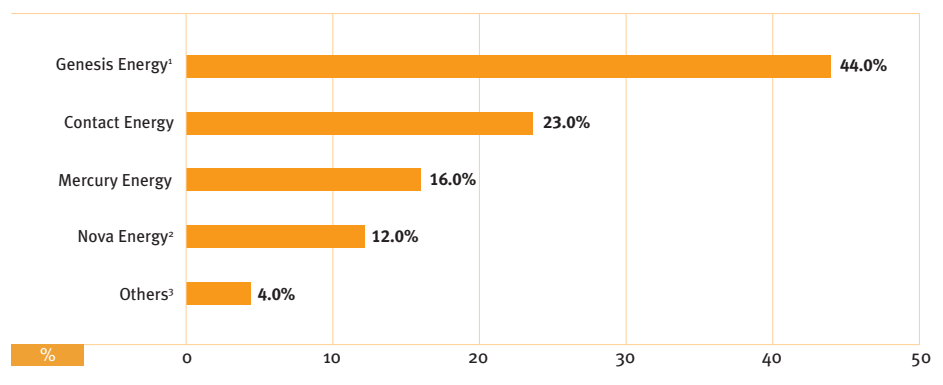
In 2011, the industrial sector accounted for 29% of total gas consumption (Figure E.1d). This was up 5% on 2010, mainly due to growth in the dairy sector (see Table E.5c). From companies surveyed, the number of industrial consumers was around 1,300.

Petrochemicals

Gas used as a feedstock in the petrochemicals sector represented around 16% of New Zealand's natural gas consumption in 2011. This natural gas was used in the Motunui methanol plant, the Ballance Agri-Nutrients ammonia/urea plant at Kapuni, and the Degussa peroxide plant near Morrinsville.

Crude methanol is produced from natural gas and distilled into high ("AA") grade methanol. Methanex New Zealand produced about 830,000 tonnes of methanol during 2011, slightly up on 2010. Methanol production has been significantly higher in the last three years due in part to the larger capacity of the Motunui plant compared with the Waitara Valley plant, which was used for most of 2008, and in part to more natural gas being available.

Figure E.1c: Retail Market Share as Determined by Consumer Connections at December 2011



Notes to Figure E.1c: ¹Includes the Genesis Energy subsidiary Energy Online.

²Todd Retail includes Nova Energy, Bay of Plenty Energy and Auckland Gas Company.

³Includes Energy Direct NZ, On Gas, and Greymouth Gas.

E. Natural Gas

Balance Agri-Nutrients (Kapuni) Limited (previously Petrochem Limited) manufactures ammonia/urea from natural gas. Gas consumption as a feedstock for ammonia/urea production was stable when compared with 2010 levels.

Electricity Generation

46% of New Zealand's natural gas consumption during 2011 was used for electricity generation (including cogeneration). Contact Energy Limited (Otahuhu B, Taranaki Combined Cycle and Stratford) and Genesis Energy Limited (Huntly – including the e3p combined cycle plant) are the main thermal electricity generators in New Zealand using natural gas. In 2011, gas consumption for electricity generation decreased by 18% to 52 PJ and cogeneration decreased by 4% to 19 PJ compared with 2010.

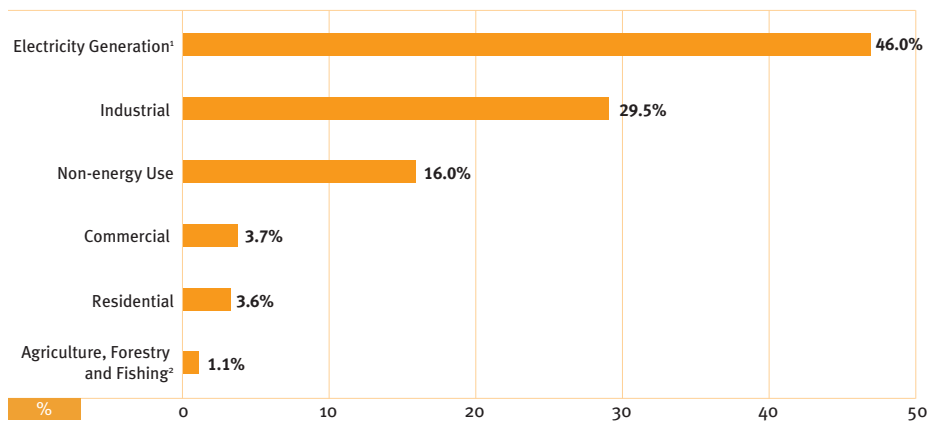
Residential

In 2011, the residential sector accounted for around 4% of total gas consumption. From companies surveyed, the number of residential consumers was around 247,000.

Commercial

Around 4% of gas consumption came from the commercial sector in 2011. From companies surveyed, the number of commercial (including transport) consumers was around 10,000.

Figure E.1d: Natural Gas Consumption by Sector for 2011



Notes to Figure E.1e: ¹ Includes cogeneration.

² Includes Transport.

E. Natural Gas

Figure E.1e: Natural Gas Energy Flow Summary for 2010



¹ Includes Ngatoro, Tui, Rimu, Sidewinder, Cheal, Copper Moki, Surrey and Waihapa wells.

² Includes transport, agriculture, forestry and fishing.

E. Natural Gas

Table E.1: Natural Gas Energy Balance 2007–2011 (Gross PJ)

Converted into Petajoules Using Gross Calorific Values		2007	2008	2009	2010	2011	Δ 2007/2011 p.a.	Δ 2010/2011
SUPPLY	Gross Production	180.90	173.78	182.52	198.17	180.33	-0.1%	-9.0%
	Gas Rejected	1.83	2.65	4.98	4.01	4.56	25.5%	13.6%
	LPG Gas Equivalent Extracted	5.53	4.21	3.62	7.34	7.33	7.3%	-0.2%
	Gas Flared	3.97	6.93	6.68	7.47	6.48	13.1%	-13.2%
	Indigenous Production	169.57	159.99	167.24	179.34	161.96	-1.1%	-9.7%
	Stock Change	0.05	0.02	4.08	5.89	3.28	n.a.	n.a.
	TOTAL PRIMARY ENERGY	169.52	159.97	163.16	173.45	158.68	-1.6%	-8.5%
	ENERGY TRANSFORMATION	-104.09	-89.02	-77.67	-89.82	-78.33	-6.9%	-12.8%
	Electricity Generation	-75.35	-60.77	-53.97	-62.58	-51.57	-9.0%	-17.6%
	Cogeneration	-22.58	-23.41	-17.26	-19.40	-18.65	-4.7%	-3.9%
Production Losses and Own Use	-5.38	-4.07	-5.63	-7.14	-7.25	7.8%	1.5%	
Transmission Losses and Own Use	-0.78	-0.78	-0.80	-0.69	-0.86	2.7%	24.6%	
NON-ENERGY USE	-15.35	-18.12	-25.46	-25.50	-24.41	12.3%	-4.3%	
CONSUMER ENERGY (calculated)	50.08	52.84	60.04	58.12	55.94	2.8%	-3.8%	
DEMAND	Agriculture	1.81	1.73	1.94	1.47	1.67	-1.9%	13.7%
	Industrial	33.39	34.54	39.49	42.99	45.03	7.8%	4.7%
	Commercial	6.57	6.53	7.30	6.87	5.54	-4.2%	-19.3%
	Transport	0.02	0.04	0.04	0.03	0.05	22.4%	60.0%
	Residential	5.65	5.47	6.38	5.99	5.70	0.2%	-4.8%
CONSUMER ENERGY (observed)	47.44	48.30	55.15	57.36	58.00	5.1%	1.1%	
Statistical Differences	2.64	4.53	4.89	0.76	-2.06	n.a.	n.a.	

E. Natural Gas

Total Gas Production by Field

Table E.2a: Total Natural Gas Production by Field (Mm³)¹

Calendar Year	Maui	Kapuni	McKee	Mangahewa	Ngatoro ²	Turangi	Kowhai	Pohokura	Tui	Maari	Kupe	Other ³	Total
1971	-	301.0	-	-	-	-	-	-	-	-	-	-	301.0
1972	-	414.0	-	-	-	-	-	-	-	-	-	-	414.0
1973	-	488.0	-	-	-	-	-	-	-	-	-	-	488.0
1974	-	515.4	-	-	-	-	-	-	-	-	-	-	515.4
1975	-	565.9	-	-	-	-	-	-	-	-	-	-	565.9
1976	-	1,501.9	-	-	-	-	-	-	-	-	-	-	1,501.9
1977	-	2,346.8	-	-	-	-	-	-	-	-	-	-	2,346.8
1978	-	2,175.2	-	-	-	-	-	-	-	-	-	-	2,175.2
1979	468.1	1,077.2	-	-	-	-	-	-	-	-	-	-	1,545.2
1980	628.0	714.4	0.0	-	-	-	-	-	-	-	-	-	1,342.4
1981	879.5	889.0	1.0	-	-	-	-	-	-	-	-	-	1,769.5
1982	1,773.5	1,156.0	0.4	-	-	-	-	-	-	-	-	-	2,930.0
1983	1,876.6	1,300.1	0.6	-	-	-	-	-	-	-	-	-	3,177.3
1984	2,499.2	1,326.0	15.6	-	1.83	-	-	-	-	-	-	-	3,842.6
1985	3,224.4	1,468.5	35.9	-	17.58	-	-	-	-	-	-	-	4,746.3
1986	3,901.0	1,413.8	45.8	-	14.73	-	-	-	-	-	-	-	5,375.3
1987	3,783.1	1,334.2	72.8	-	15.89	-	-	-	-	-	-	-	5,206.1
1988	4,113.9	1,567.6	84.9	-	16.17	-	-	-	-	-	-	-	5,782.6
1989	4,247.1	1,714.1	95.2	-	12.12	-	-	-	-	-	-	-	6,068.4
1990	4,199.8	1,666.0	95.5	-	10.15	-	-	-	-	-	-	29.25	6,000.8
1991	4,307.9	1,740.6	118.6	-	8.10	-	-	-	-	-	-	112.55	6,287.9
1992	4,610.8	1,862.3	139.1	-	9.22	-	-	-	-	-	-	88.11	6,709.5
1993	4,407.4	1,826.8	127.8	-	12.26	-	-	-	-	-	-	125.49	6,499.7
1994	3,998.8	1,958.7	181.3	-	19.49	-	-	-	-	-	-	114.92	6,273.2
1995	3,719.2	1,622.5	198.7	-	11.16	-	-	-	-	-	-	43.86	5,595.5
1996	4,218.4	1,978.2	204.2	-	32.67	-	-	-	-	-	-	142.19	6,575.7
1997	4,456.6	1,703.1	203.7	15.5	57.70	-	-	-	-	-	-	230.89	6,667.5
1998	3,778.4	1,681.8	224.6	62.7	70.55	-	-	-	-	-	-	225.00	6,043.0
1999	4,517.7	1,593.3	248.3	-	56.36	-	-	-	-	-	-	241.28	6,656.9
2000	4,775.0	1,303.8	228.8	-	56.06	-	-	-	-	-	-	282.85	6,646.5
2001	4,992.9	1,204.7	228.0	83.1	56.12	-	-	-	-	-	-	353.96	6,918.8
2002	4,555.7	1,079.9	144.0	255.5	46.72	-	-	-	-	-	-	374.52	6,456.3
2003	3,082.5	1,010.5	165.8	217.4	28.76	-	-	-	-	-	-	449.58	4,954.6
2004	2,693.7	1,034.7	198.2	205.8	29.19	-	-	-	-	-	-	368.79	4,530.3
2005	2,377.6	1,075.9	239.6	163.2	41.74	0.4	-	-	-	-	-	382.17	4,280.7
2006	2,253.0	1,054.8	224.5	141.3	41.51	37.6	-	340.7	-	-	-	288.09	4,381.5
2007	1,355.1	928.2	190.9	147.0	43.54	128.5	-	1,688.7	62.0	-	-	190.61	4,734.5
2008	1,282.0	785.8	171.2	130.7	50.32	118.5	-	1,706.5	159.2	-	-	94.07	4,498.3
2009	1,400.8	655.6	257.9	147.1	46.83	189.6	53.7	1,668.5	75.8	112.2	19.4	45.58	4,673.0
2010	1,182.5	676.6	186.2	136.3	59.73	150.2	179.3	1,706.8	43.9	161.7	542.0	28.70	5,053.9
2011	870.8	678.9	109.5	146.8	61.89	124.7	112.2	1,660.5	80.1	167.4	630.9	68.71	4,712.2

Notes to Table E.2a: ¹ Includes gas flared, gas reinjected, LPG extracted, own use and losses.

² Includes Goldie, Moturoa and Kaimiro wells.

³ Includes Tariki, Ahuroa, Waihapa, Ngaere, Piakau (not produced since September 1999), Cheal, Rimu, Copper Moki, Sidewinder, Surrey and Radnor (ceased production in 2006) wells.

E. Natural Gas

Table E.2b: Total Natural Gas Production by Field (Bcf)¹

Calendar Year	Maui	Kapuni	McKee	Mangahewa	Ngatoro ²	Turangi	Kowhai	Pohokura	Tui	Maari	Kupe	Other ³	Total
1971	-	10.63	-	-	-	-	-	-	-	-	-	-	10.63
1972	-	14.62	-	-	-	-	-	-	-	-	-	-	14.62
1973	-	17.23	-	-	-	-	-	-	-	-	-	-	17.23
1974	-	18.20	-	-	-	-	-	-	-	-	-	-	18.20
1975	-	19.99	-	-	-	-	-	-	-	-	-	-	19.99
1976	-	53.04	-	-	-	-	-	-	-	-	-	-	53.04
1977	-	82.88	-	-	-	-	-	-	-	-	-	-	82.88
1978	-	76.82	-	-	-	-	-	-	-	-	-	-	76.82
1979	16.53	38.04	-	-	-	-	-	-	-	-	-	-	54.57
1980	22.18	25.23	0.00	-	-	-	-	-	-	-	-	-	47.41
1981	31.06	31.39	0.03	-	-	-	-	-	-	-	-	-	62.49
1982	62.63	40.82	0.01	-	-	-	-	-	-	-	-	-	103.47
1983	66.27	45.91	0.02	-	-	-	-	-	-	-	-	-	112.21
1984	88.26	46.83	0.55	-	0.06	-	-	-	-	-	-	-	135.70
1985	113.87	51.86	1.27	-	0.62	-	-	-	-	-	-	-	167.62
1986	137.76	49.93	1.62	-	0.52	-	-	-	-	-	-	-	189.83
1987	133.60	47.12	2.57	-	0.56	-	-	-	-	-	-	-	183.85
1988	145.28	55.36	3.00	-	0.57	-	-	-	-	-	-	-	204.21
1989	149.98	60.53	3.36	-	0.43	-	-	-	-	-	-	-	214.31
1990	148.32	58.83	3.37	-	0.36	-	-	-	-	-	-	1.03	211.92
1991	152.13	61.47	4.19	-	0.29	-	-	-	-	-	-	3.97	222.05
1992	162.83	65.77	4.91	-	0.33	-	-	-	-	-	-	3.11	236.94
1993	155.65	64.51	4.51	-	0.43	-	-	-	-	-	-	4.43	229.53
1994	141.22	69.17	6.40	-	0.69	-	-	-	-	-	-	4.06	221.54
1995	131.34	57.30	7.02	-	0.39	-	-	-	-	-	-	1.55	197.60
1996	148.97	69.86	7.21	-	1.15	-	-	-	-	-	-	5.02	232.22
1997	157.38	60.14	7.19	0.55	2.04	-	-	-	-	-	-	8.15	235.46
1998	133.43	59.39	7.93	2.21	2.49	-	-	-	-	-	-	7.95	213.41
1999	159.54	56.27	8.77	-	1.99	-	-	-	-	-	-	8.52	235.09
2000	168.63	46.04	8.08	-	1.98	-	-	-	-	-	-	9.99	234.72
2001	176.32	42.55	8.05	2.93	1.98	-	-	-	-	-	-	12.50	244.34
2002	160.88	38.14	5.09	9.02	1.65	-	-	-	-	-	-	13.23	228.00
2003	108.86	35.69	5.86	7.68	1.02	-	-	-	-	-	-	15.88	174.97
2004	95.13	36.54	7.00	7.27	1.03	-	-	-	-	-	-	13.02	159.99
2005	83.96	37.99	8.46	5.76	1.47	0.02	-	-	-	-	-	13.50	151.17
2006	79.57	37.25	7.93	4.99	1.47	1.33	-	12.03	-	-	-	10.17	154.73
2007	47.86	32.78	6.74	5.19	1.54	4.54	-	59.64	2.19	-	-	6.73	167.20
2008	45.27	27.75	6.04	4.62	1.78	4.18	-	60.26	5.62	-	-	3.32	158.85
2009	49.47	23.15	9.11	5.20	1.65	6.69	1.90	58.92	2.68	3.96	0.68	1.61	165.03
2010	41.76	23.89	6.57	4.81	2.11	5.30	6.33	60.28	1.55	5.71	19.14	1.01	178.48
2011	30.75	23.97	3.87	5.18	2.19	4.41	3.96	58.64	2.83	5.91	22.28	2.43	166.41

Notes to Table E.2b: ¹ Includes gas flared, gas reinjected, LPG extracted, own use and losses.

² Includes Goldie, Moturoa and Kaimiro wells.

³ Includes Tariki, Ahuroa, Waihapa, Ngaere, Piakau (not produced since September 1999), Cheal, Rimu, Copper Moki, Sidewinder, Surrey and Radnor (ceased production in 2006) wells.

E. Natural Gas

Table E.2c: Total Natural Gas Production by Field (Gross PJ)¹

Calendar Year	Maui	Kapuni	McKee	Mangahewa	Ngatoro ²	Turangi	Kowhai	Pohokura	Tui	Maari	Kupe	Other ³	Total
1971	-	8.21	-	-	-	-	-	-	-	-	-	-	8.21
1972	-	11.29	-	-	-	-	-	-	-	-	-	-	8.21
1973	-	13.31	-	-	-	-	-	-	-	-	-	-	13.31
1974	-	14.06	-	-	-	-	-	-	-	-	-	-	14.06
1975	-	15.36	-	-	-	-	-	-	-	-	-	-	15.36
1976	-	40.22	-	-	-	-	-	-	-	-	-	-	40.22
1977	-	64.35	-	-	-	-	-	-	-	-	-	-	64.35
1978	-	59.49	-	-	-	-	-	-	-	-	-	-	59.49
1979	17.87	29.27	-	-	-	-	-	-	-	-	-	-	47.14
1980	23.40	19.12	0.00	-	-	-	-	-	-	-	-	-	42.52
1981	32.83	23.75	0.04	-	-	-	-	-	-	-	-	-	56.62
1982	66.49	30.28	0.02	-	-	-	-	-	-	-	-	-	96.78
1983	71.40	34.74	0.02	-	-	-	-	-	-	-	-	-	106.16
1984	96.48	35.89	0.64	-	0.07	-	-	-	-	-	-	-	133.07
1985	125.79	40.08	1.52	-	0.68	-	-	-	-	-	-	-	168.07
1986	153.26	38.60	1.89	-	0.57	-	-	-	-	-	-	-	194.33
1987	148.91	36.05	3.02	-	0.61	-	-	-	-	-	-	-	188.60
1988	162.41	42.55	3.58	-	0.62	-	-	-	-	-	-	-	209.15
1989	167.88	45.98	3.99	-	0.47	-	-	-	-	-	-	-	218.32
1990	165.98	44.59	3.97	-	0.39	-	-	-	-	-	-	1.31	216.24
1991	170.98	46.25	4.84	-	0.31	-	-	-	-	-	-	5.05	227.44
1992	183.55	49.04	5.61	-	0.39	-	-	-	-	-	-	3.95	242.54
1993	176.64	48.43	5.16	-	0.55	-	-	-	-	-	-	5.63	236.41
1994	162.31	51.50	7.32	-	0.86	-	-	-	-	-	-	5.15	227.14
1995	152.92	42.84	8.02	-	0.53	-	-	-	-	-	-	1.97	206.28
1996	173.53	52.72	8.24	-	1.41	-	-	-	-	-	-	6.55	242.45
1997	183.76	46.12	8.22	0.60	2.55	-	-	-	-	-	-	10.68	251.93
1998	156.71	45.43	9.07	2.44	3.21	-	-	-	-	-	-	10.36	227.22
1999	186.76	42.94	10.02	-	2.56	-	-	-	-	-	-	11.17	253.46
2000	195.67	34.88	9.36	-	2.63	-	-	-	-	-	-	11.64	254.17
2001	203.56	31.99	9.38	3.22	2.59	-	-	-	-	-	-	14.49	265.22
2002	186.63	28.81	5.95	9.89	2.16	-	-	-	-	-	-	15.33	248.77
2003	127.35	27.21	6.83	8.41	1.29	-	-	-	-	-	-	18.55	189.63
2004	111.29	27.79	8.18	7.98	1.13	-	-	-	-	-	-	14.91	171.28
2005	98.47	28.60	9.79	6.36	1.62	0.02	-	-	-	-	-	15.37	160.21
2006	92.87	28.13	9.14	5.49	1.63	1.45	-	14.04	-	-	-	11.55	164.32
2007	55.41	24.84	7.69	5.72	1.71	5.10	-	69.84	2.96	-	-	7.63	180.90
2008	51.87	21.13	6.92	5.13	1.95	4.78	-	70.59	7.59	-	-	3.82	173.78
2009	56.11	17.53	10.64	5.85	1.84	7.70	2.18	69.02	3.62	5.36	0.79	1.90	182.52
2010	48.07	17.70	7.64	5.40	2.32	6.12	7.26	70.61	2.10	7.73	22.01	1.21	198.17
2011	35.36	17.83	4.52	5.85	2.42	5.09	4.55	68.92	1.63	7.19	25.07	1.89	180.33
Δ2007/2011 p.a.	-10.6%	-7.9%	-12.5%	0.6%	9.2%	-0.1%	n.a.	-0.3%	-13.9%	n.a.	n.a.	-29.4%	-0.1%
Δ2010/2011	-26.4%	0.8%	-40.9%	8.3%	4.5%	-16.8%	-37.3%	-2.4%	-22.4%	-6.9%	13.9%	56.7%	-9.0%

¹ Includes gas flared, gas reinjected, LPG extracted, own use and losses.

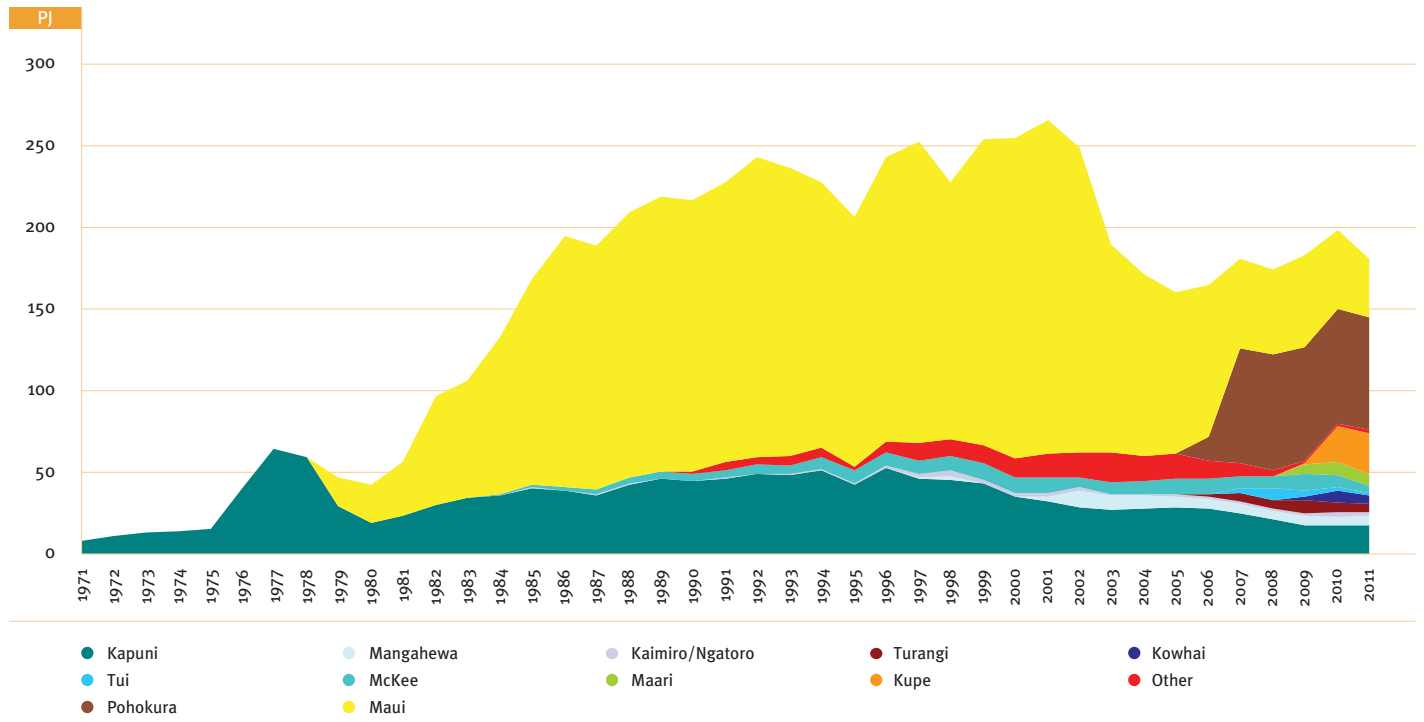
² Includes Goldie, Moturoa and Kaimiro wells.

³ Includes Tariki, Ahuroa, Waihapa, Ngaere, Piakau (not produced since September 1999), Cheal, Rimu, Copper Moki, Sidewinder, Surrey and Radnor (ceased production in 2006) wells.

n.a. = Not applicable.

E. Natural Gas

Figure E.2: Total Natural Gas Production by Field



E. Natural Gas

Net Gas Production by Field

Table E.3a: Net Natural Gas Production by Field (Mm³)

Calendar Year	Maui	Kapuni	McKee	Mangahewa	Ngatoro ¹	Turangi	Kowhai	Pohokura	Tui ²	Maari ³	Kupe	Other ⁴	Total
1971	-	286.0	-	-	-	-	-	-	-	-	-	-	286.0
1972	-	393.3	-	-	-	-	-	-	-	-	-	-	393.3
1973	-	463.6	-	-	-	-	-	-	-	-	-	-	463.6
1974	-	393.5	-	-	-	-	-	-	-	-	-	-	393.5
1975	-	415.0	-	-	-	-	-	-	-	-	-	-	415.0
1976	-	1,268.9	-	-	-	-	-	-	-	-	-	-	1,268.9
1977	-	2,122.8	-	-	-	-	-	-	-	-	-	-	2,122.8
1978	-	2,037.5	-	-	-	-	-	-	-	-	-	-	2,037.5
1979	264.0	940.2	-	-	-	-	-	-	-	-	-	-	1,204.1
1980	601.7	350.6	0.0	-	-	-	-	-	-	-	-	-	952.4
1981	854.0	315.1	1.0	-	-	-	-	-	-	-	-	-	1,170.1
1982	1,732.4	363.5	0.4	-	-	-	-	-	-	-	-	-	2,096.3
1983	1,838.0	401.2	0.6	-	-	-	-	-	-	-	-	-	2,239.8
1984	2,414.7	394.2	15.4	-	1.8	-	-	-	-	-	-	-	2,826.1
1985	3,119.0	345.8	35.0	-	17.6	-	-	-	-	-	-	-	3,517.3
1986	3,768.9	500.7	44.8	-	14.7	-	-	-	-	-	-	-	4,329.0
1987	3,649.7	464.3	71.3	-	15.8	-	-	-	-	-	-	-	4,201.2
1988	3,965.9	445.8	82.9	-	16.1	-	-	-	-	-	-	-	4,510.7
1989	4,083.6	454.6	92.9	-	11.9	-	-	-	-	-	-	-	4,643.0
1990	4,024.4	484.0	93.4	-	10.1	-	-	-	-	-	-	22.6	4,634.6
1991	4,123.8	760.9	115.3	-	8.0	-	-	-	-	-	-	97.5	5,105.6
1992	4,413.1	717.0	135.1	-	7.0	-	-	-	-	-	-	78.1	5,350.3
1993	4,213.8	707.0	123.6	-	5.8	-	-	-	-	-	-	110.7	5,160.8
1994	3,810.4	669.3	171.0	-	11.4	-	-	-	-	-	-	97.1	4,759.1
1995	3,541.6	701.4	184.9	-	3.7	-	-	-	-	-	-	39.8	4,471.4
1996	3,985.2	744.6	193.4	-	18.5	-	-	-	-	-	-	126.4	5,068.0
1997	4,179.4	777.1	194.4	8.2	30.7	-	-	-	-	-	-	204.6	5,394.4
1998	3,517.1	765.5	201.4	61.5	49.4	-	-	-	-	-	-	196.4	4,791.2
1999	4,242.5	822.2	229.3	-	45.3	-	-	-	-	-	-	210.2	5,549.4
2000	4,505.8	935.0	207.9	-	42.3	-	-	-	-	-	-	245.1	5,936.1
2001	4,696.9	948.4	208.8	80.6	35.9	-	-	-	-	-	-	292.9	6,263.6
2002	4,271.3	946.7	131.4	252.4	34.6	-	-	-	-	-	-	317.9	5,954.3
2003	2,875.3	898.2	152.9	214.9	23.5	-	-	-	-	-	-	382.1	4,547.0
2004	2,501.4	897.5	185.8	203.2	8.3	-	-	-	-	-	-	306.7	4,103.0
2005	2,204.9	933.8	232.5	160.7	6.6	-	-	-	-	-	-	320.9	3,859.4
2006	2,114.0	909.4	170.4	138.7	0.2	24.7	-	339.7	-	-	-	241.6	3,938.6
2007	1,270.1	799.9	131.5	129.2	0.8	122.8	-	1,682.5	-	-	-	151.1	4,287.9
2008	1,207.4	691.8	127.2	127.6	8.7	116.9	-	1,700.9	-	-	-	71.8	4,052.3
2009	1,318.7	588.1	156.1	143.6	6.9	187.4	53.4	1,663.8	-	-	18.1	31.8	4,167.7
2010	1,099.1	594.5	109.2	129.9	20.6	148.0	166.2	1,702.1	-	-	436.2	15.7	4,421.4
2011	811.0	593.4	86.2	110.4	15.0	122.9	110.1	1,656.5	-	-	498.7	28.3	4,032.6

Notes to Table E.3a: ¹ Includes Goldie, Moturoa and Kaimiro wells. All gas from the Moturoa field was used for own purposes. All gas from the Ngatoro field was flared from March 1992 to May 1998.

² All gas from the Tui field was flared or used for own purposes.

³ All gas from the Maari field was flared or used for own purposes.

⁴ Includes Tariki, Ahuroa, Waihapa, Ngaere, Piakau (not produced since September 1999), Rimu, Cheal, Copper Moki, Sidewinder, Surrey, and Radnor (ceased production in 2006) wells.

E. Natural Gas

Table E.3b: Net Natural Gas Production by Field (Bcf)¹

Calendar Year	Maui	Kapuni	McKee	Mangahewa	Ngatoro ¹	Turangi	Kowhai	Pohokura	Tui ²	Maari ³	Kupe	Other ⁴	Total
1971	-	10.10	-	-	-	-	-	-	-	-	-	-	10.10
1972	-	13.89	-	-	-	-	-	-	-	-	-	-	13.89
1973	-	16.37	-	-	-	-	-	-	-	-	-	-	16.37
1974	-	13.90	-	-	-	-	-	-	-	-	-	-	13.90
1975	-	14.66	-	-	-	-	-	-	-	-	-	-	14.66
1976	-	44.81	-	-	-	-	-	-	-	-	-	-	44.81
1977	-	74.97	-	-	-	-	-	-	-	-	-	-	74.97
1978	-	71.95	-	-	-	-	-	-	-	-	-	-	71.95
1979	9.32	33.20	-	-	-	-	-	-	-	-	-	-	42.52
1980	21.25	12.38	0.00	-	-	-	-	-	-	-	-	-	33.63
1981	30.16	11.13	0.03	-	-	-	-	-	-	-	-	-	41.32
1982	61.18	12.84	0.01	-	-	-	-	-	-	-	-	-	74.03
1983	64.91	14.17	0.02	-	-	-	-	-	-	-	-	-	79.10
1984	85.27	13.92	0.54	-	0.06	-	-	-	-	-	-	-	99.80
1985	110.15	12.21	1.23	-	0.62	-	-	-	-	-	-	-	124.21
1986	133.10	17.68	1.58	-	0.52	-	-	-	-	-	-	-	152.88
1987	128.89	16.40	2.52	-	0.56	-	-	-	-	-	-	-	148.36
1988	140.05	15.74	2.93	-	0.57	-	-	-	-	-	-	-	159.29
1989	144.21	16.05	3.28	-	0.42	-	-	-	-	-	-	-	163.96
1990	142.12	17.09	3.30	-	0.36	-	-	-	-	-	-	0.80	163.67
1991	145.63	26.87	4.07	-	0.28	-	-	-	-	-	-	3.44	180.30
1992	155.85	25.32	4.77	-	0.25	-	-	-	-	-	-	2.76	188.95
1993	148.81	24.97	4.37	-	0.21	-	-	-	-	-	-	3.91	182.25
1994	134.56	23.64	6.04	-	0.40	-	-	-	-	-	-	3.43	168.07
1995	125.07	24.77	6.53	-	0.13	-	-	-	-	-	-	1.40	157.91
1996	140.74	26.29	6.83	-	0.65	-	-	-	-	-	-	4.46	178.98
1997	147.60	27.44	6.87	0.29	1.08	-	-	-	-	-	-	7.22	190.50
1998	124.21	27.03	7.11	2.17	1.74	-	-	-	-	-	-	6.94	169.20
1999	149.82	29.04	8.10	-	1.60	-	-	-	-	-	-	7.42	195.98
2000	159.12	33.02	7.34	-	1.49	-	-	-	-	-	-	8.66	209.63
2001	165.87	33.49	7.37	2.85	1.27	-	-	-	-	-	-	10.34	221.20
2002	150.84	33.43	4.64	8.91	1.22	-	-	-	-	-	-	11.23	210.28
2003	101.54	31.72	5.40	7.59	0.83	-	-	-	-	-	-	13.49	160.58
2004	88.34	31.69	6.56	7.18	0.29	-	-	-	-	-	-	10.83	144.90
2005	77.86	32.98	8.21	5.68	0.23	-	-	-	-	-	-	11.33	136.29
2006	74.65	32.11	6.02	4.90	0.01	0.87	-	12.00	-	-	-	8.53	139.09
2007	44.85	28.25	4.65	4.56	0.03	4.34	-	59.42	-	-	-	5.34	151.42
2008	42.64	24.43	4.49	4.51	0.31	4.13	-	60.07	-	-	-	2.54	143.11
2009	46.57	20.77	5.51	5.07	0.25	6.62	1.89	58.76	-	-	0.64	1.12	147.18
2010	38.82	20.99	3.86	4.59	0.73	5.23	5.87	60.11	-	-	15.40	0.56	156.14
2011	28.64	20.96	3.05	3.90	0.53	4.34	3.89	58.50	-	-	17.61	1.00	142.41

Notes to Table E.3b: ¹ Includes Goldie, Moturoa and Kaimiro wells. All gas from the Moturoa field was used for own purposes. All gas from the Ngatoro field was flared from March 1992 to May 1998.

² All gas from the Tui field was flared or used for own purposes.

³ All gas from the Maari field was flared or used for own purposes.

⁴ Includes Tariki, Ahuroa, Waihapa, Ngaere, Piakau (not produced since September 1999), Rimu, Cheal, Copper Moki, Sidewinder, Surrey, and Radnor (ceased production in 2006) wells.

E. Natural Gas

Table E.3c: Net Natural Gas Production by Field (Gross PJ)

Calendar Year	Maui	Kapuni	McKee	Mangahewa	Ngatoro ¹	Turangi	Kowhai	Pohokura	Tui ²	Maari ³	Kupe	Other ⁴	Total
1971	-	7.80	-	-	-	-	-	-	-	-	-	-	7.80
1972	-	10.73	-	-	-	-	-	-	-	-	-	-	10.73
1973	-	12.65	-	-	-	-	-	-	-	-	-	-	12.65
1974	-	10.74	-	-	-	-	-	-	-	-	-	-	10.74
1975	-	11.27	-	-	-	-	-	-	-	-	-	-	11.27
1976	-	33.98	-	-	-	-	-	-	-	-	-	-	33.98
1977	-	58.20	-	-	-	-	-	-	-	-	-	-	58.20
1978	-	55.72	-	-	-	-	-	-	-	-	-	-	55.72
1979	10.03	25.56	-	-	-	-	-	-	-	-	-	-	35.60
1980	22.42	9.35	0.00	-	-	-	-	-	-	-	-	-	31.77
1981	31.88	8.41	0.04	-	-	-	-	-	-	-	-	-	40.33
1982	64.94	9.56	0.02	-	-	-	-	-	-	-	-	-	74.52
1983	69.93	10.71	0.02	-	-	-	-	-	-	-	-	-	80.67
1984	93.22	10.66	0.63	-	0.07	-	-	-	-	-	-	-	104.57
1985	121.68	9.44	1.48	-	0.68	-	-	-	-	-	-	-	133.28
1986	148.07	13.68	1.85	-	0.57	-	-	-	-	-	-	-	164.16
1987	143.66	12.54	2.96	-	0.61	-	-	-	-	-	-	-	159.77
1988	156.56	12.10	3.49	-	0.62	-	-	-	-	-	-	-	172.77
1989	161.42	12.19	3.90	-	0.46	-	-	-	-	-	-	-	177.97
1990	159.05	12.95	3.88	-	0.39	-	-	-	-	-	-	1.02	177.28
1991	163.68	20.22	4.71	-	0.31	-	-	-	-	-	-	4.37	193.29
1992	175.68	18.90	5.46	-	0.27	-	-	-	-	-	-	3.50	203.80
1993	168.88	18.75	4.99	-	0.23	-	-	-	-	-	-	4.96	197.81
1994	154.66	17.60	6.90	-	0.44	-	-	-	-	-	-	4.35	183.95
1995	145.62	18.54	7.46	-	0.14	-	-	-	-	-	-	1.78	173.55
1996	163.92	19.85	7.81	-	0.72	-	-	-	-	-	-	5.83	198.12
1997	172.32	21.04	7.85	0.32	1.18	-	-	-	-	-	-	9.46	212.18
1998	145.87	20.67	8.13	2.39	2.14	-	-	-	-	-	-	9.06	188.26
1999	175.39	22.16	9.25	-	2.03	-	-	-	-	-	-	9.73	218.57
2000	184.64	25.01	8.51	-	1.96	-	-	-	-	-	-	10.09	230.20
2001	191.49	25.18	8.59	3.13	1.65	-	-	-	-	-	-	11.96	241.99
2002	174.98	25.26	5.43	9.77	1.61	-	-	-	-	-	-	13.00	230.04
2003	118.79	24.18	6.30	8.31	1.06	-	-	-	-	-	-	15.76	174.40
2004	103.34	24.10	7.67	7.88	0.33	-	-	-	-	-	-	12.41	155.73
2005	91.31	24.83	8.75	6.26	0.25	-	-	-	-	-	-	12.92	144.32
2006	87.14	24.25	6.94	5.39	0.01	0.98	-	14.00	-	-	-	9.69	148.40
2007	51.93	21.41	5.32	5.02	0.03	4.87	-	69.58	-	-	-	6.03	164.19
2008	48.85	18.61	5.14	5.01	0.34	4.72	-	70.36	-	-	-	2.91	155.92
2009	52.81	15.73	6.44	5.71	0.27	7.61	2.16	68.82	-	-	0.74	1.31	161.61
2010	44.68	15.56	4.48	5.15	0.80	6.03	6.73	70.42	-	-	17.72	0.65	172.21
2011	32.93	15.59	2.01	4.39	0.59	5.01	4.47	68.76	-	-	19.82	1.15	154.73
Δ2007/2017 p.a.	-10.8%	-7.6%	-21.6%	-3.3%	111.0%	0.7%	n.a.	-0.3%	n.a.	n.a.	n.a.	-33.9%	-1.5%
Δ2010/2011	-26.3%	0.2%	-55.1%	-14.6%	-26.6%	-16.9%	-33.6%	-2.4%	n.a.	n.a.	11.9%	75.6%	-10.2%

Notes to Table E.3c: ¹ Includes Goldie, Moturoa and Kaimiro wells. All gas from the Moturoa field was used for own purposes. All gas from the Ngatoro field was flared from March 1992 to May 1998.

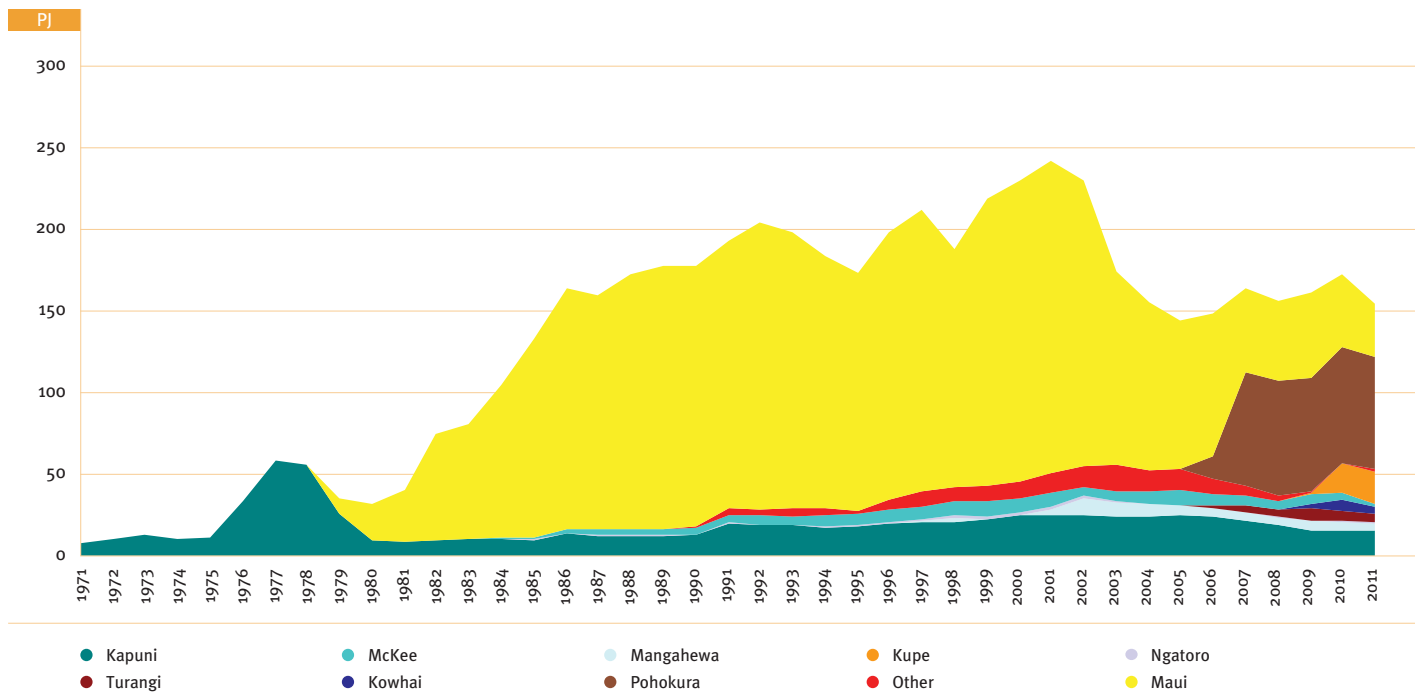
² All gas from the Tui field was flared or used for own purposes.

³ All gas from the Maari field was flared or used for own purposes.

⁴ Includes Tariki, Ahuroa, Waihapa, Ngaere, Piakau (not produced since September 1999), Rimu, Cheal, Copper Moki, Sidewinder, Surrey, and Radnor (ceased production in 2006) wells.

E. Natural Gas

Figure E.3: Net Natural Gas Production by Field (Gross PJ)



E. Natural Gas

Gas Production

Table E.4: Natural Gas Production (Gross PJ)

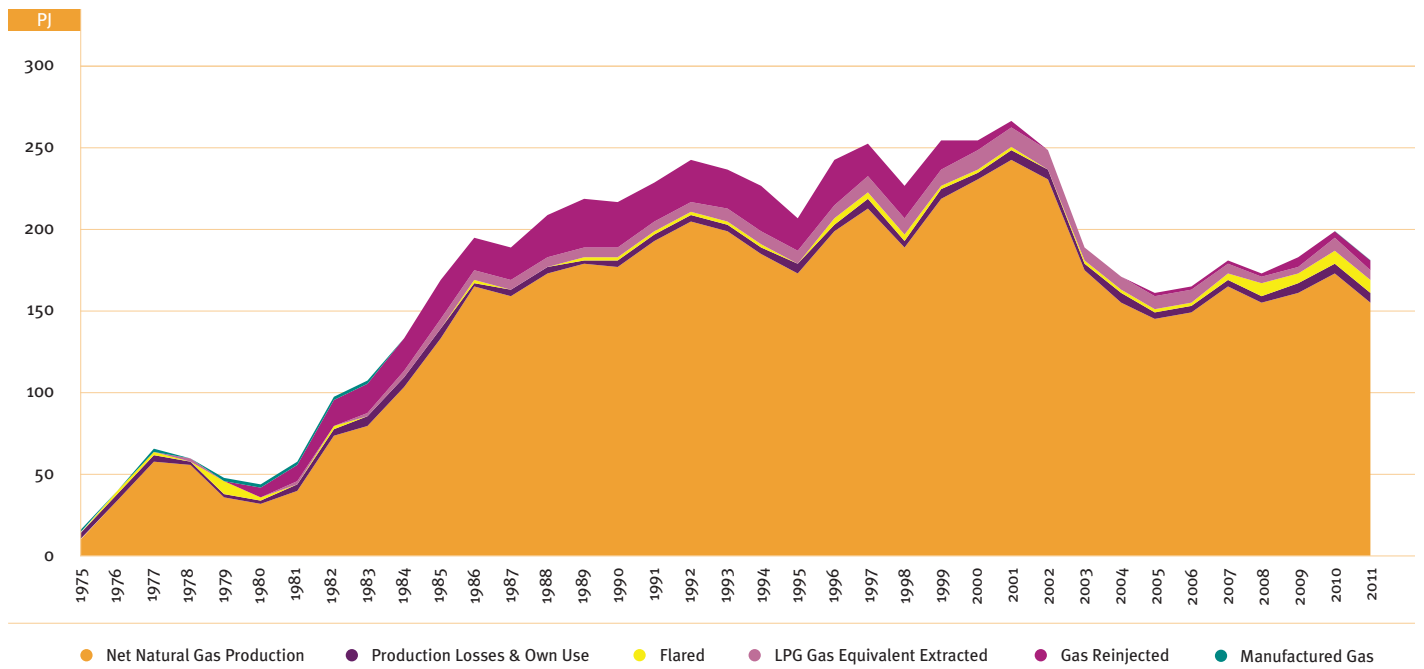
Calendar Year or Quarter	Total Natural Gas Production	- Gas Rejected	- LPG Gas Equivalent Extracted	- Gas Flared ¹	= Indigenous Production ²	- Production Losses and Own Use	= Net Natural Gas Production	+ Manufactured Gas Production	= Gas Supply	
1975	15.36	-	0.15	1.19	14.03	2.76	11.27	1.97	13.24	
1976	40.22	-	0.39	2.29	37.54	3.56	33.98	-	33.98	
1977	64.35	-	0.55	2.13	61.67	3.48	58.20	1.97	60.17	
1978	59.49	-	0.68	0.89	57.92	2.20	55.72	1.77	57.48	
1979	47.14	-	1.17	7.76	38.20	2.61	35.60	1.70	37.30	
1980	42.52	5.41	0.85	0.78	35.47	3.70	31.77	1.46	33.23	
1981	56.62	11.08	1.30	0.60	43.63	3.30	40.33	1.46	41.79	
1982	96.78	16.14	1.54	0.47	78.62	4.10	74.52	1.31	75.83	
1983	106.16	18.85	1.74	0.30	85.27	4.60	80.67	1.11	81.78	
1984	133.07	20.01	2.59	1.27	109.20	4.63	104.57	0.95	105.52	
1985	168.07	23.27	4.66	0.76	139.38	6.11	133.28	0.70	133.98	
1986	194.33	19.70	5.44	1.26	167.93	3.77	164.16	0.39	164.55	
1987	188.60	19.63	5.44	1.00	162.53	2.75	159.77	0.15	159.92	
1988	209.15	25.53	5.78	1.50	176.35	3.57	172.77	0.11	172.88	
1989	218.32	29.68	5.74	1.88	181.02	3.05	177.97	0.10	178.07	
1990	216.24	27.90	6.01	2.21	180.12	2.84	177.28	0.07	177.35	
1991	227.44	22.12	7.08	2.45	195.80	2.52	193.29	-	193.29	
1992	242.54	25.15	7.69	1.88	207.82	4.01	203.80	-	203.80	
1993	236.41	24.79	7.98	1.58	202.07	4.26	197.81	-	197.81	
1994	227.14	28.66	8.14	1.85	188.49	4.54	183.95	-	183.95	
1995	206.28	19.41	7.61	1.24	178.02	4.47	173.55	-	173.55	
1996	242.45	27.67	8.94	2.48	203.36	5.25	198.12	-	198.12	
1997	251.93	20.48	9.78	3.97	217.71	5.53	212.18	-	212.18	
1998	227.22	21.12	9.54	3.09	193.47	5.20	188.26	-	188.26	
1999	253.46	17.74	10.02	1.94	223.76	5.20	218.57	-	218.57	
2000	254.17	6.85	10.47	1.64	235.21	5.01	230.20	-	230.20	
2001	265.22	3.59	11.53	2.59	247.50	5.52	241.99	-	241.99	
2002	248.77	0.50	11.38	1.61	235.29	5.25	230.04	-	230.04	
2003	189.63	0.01	9.09	1.08	179.45	5.05	174.40	-	174.40	
2004	171.28	-	9.11	0.90	161.26	5.53	155.73	-	155.73	
2005	160.21	0.50	8.76	0.78	150.17	5.85	144.32	-	144.32	
2006	164.32	1.59	7.84	0.86	154.03	5.62	148.40	-	148.40	
2007	180.90	1.83	5.53	3.97	169.57	5.38	164.19	-	164.19	
2008	173.78	2.65	4.21	6.93	159.99	4.07	155.92	-	155.92	
2009	182.52	4.98	3.62	6.68	167.24	5.63	161.61	-	161.61	
2010	198.17	4.01	7.34	7.47	179.34	7.14	172.20	-	172.20	
2011	180.33	4.56	7.33	6.48	161.96	7.25	154.71	-	154.71	
2010	Mar	46.47	1.23	1.36	1.80	42.08	1.61	40.47	-	40.47
	Jun	49.82	1.13	1.93	1.50	45.26	1.86	43.40	-	43.40
	Sep	53.75	0.90	2.32	1.97	48.56	1.87	46.69	-	46.69
	Dec	48.13	0.76	1.73	2.20	43.44	1.80	41.63	-	41.63
2011	Mar	39.55	0.85	1.46	2.02	35.21	1.63	33.58	-	33.58
	Jun	44.49	1.12	1.68	1.53	40.16	1.88	38.28	-	38.28
	Sep	52.64	1.41	2.28	1.69	47.26	2.10	45.16	-	45.16
	Dec	43.65	1.18	1.90	1.25	39.33	1.64	37.68	-	37.68
Δ2007/2011 p.a.		-0.1%	25.5%	7.3%	13.1%	-1.1%	7.8%	-1.5%	n.a.	-1.5%
Δ2010/2011		-9.0%	13.6%	-0.2%	-13.2%	-9.7%	1.5%	-10.2%	n.a.	-10.2%

Notes to Table E.4: ¹ Does not include any gas vented. Any gas vented is assumed to be very small.

² Indigenous production is based on International Energy Agency's (IEA) definition. This excludes gas flared, gas reinjected, and any LPG extracted, but includes production losses and own use.

E. Natural Gas

Figure E.4: Natural Gas Production (Gross PJ)



E. Natural Gas

Gas Use

Table E.5a: Natural Gas Supply and Consumption (Gross PJ)

Calendar Year or Quarter	Indigenous Production	+ Manufactured Gas Production	- Stock Change	- Energy Transformation	- Non-energy Use ²	Consumer Energy ²		Statistical Difference
						= Calculated	Observed ¹	
1975	14.03	1.97						
1976	37.54	-						
1977	61.67	1.97						
1978	57.92	1.77						
1979	38.20	1.70						
1980	35.47	1.46						
1981	43.63	1.46	-0.00					
1982	78.62	1.31	0.02					
1983	85.27	1.11	0.03					
1984	109.20	0.95	0.02					
1985	139.38	0.70	-0.01					
1986	167.93	0.39	0.03					
1987	162.53	0.15	0.05					
1988	176.35	0.11	0.03					
1989	181.02	0.10	-0.02					
1990	180.12	0.07	-0.02					
1991	195.80	-	0.00	101.96	20.57	73.27	71.93	-1.34
1992	207.82	-	0.00	115.05	18.00	74.76	73.46	-1.30
1993	202.07	-	-0.02	107.14	20.03	74.92	74.00	-0.92
1994	188.49	-	-0.01	87.25	25.00	76.25	76.35	0.11
1995	178.02	-	-0.01	69.02	36.89	72.13	73.94	1.81
1996	203.36	-	0.04	80.92	48.15	74.25	75.94	1.70
1997	217.71	-	-0.02	99.19	49.26	69.28	72.08	2.80
1998	193.47	-	0.03	78.78	46.90	67.77	68.20	0.43
1999	223.76	-	0.08	95.24	54.54	73.90	71.68	-2.21
2000	235.21	-	-0.12	94.07	62.16	79.10	79.21	0.11
2001	247.50	-	-0.01	115.46	55.67	76.39	77.02	0.63
2002	235.29	-	-0.01	98.19	58.09	79.01	80.61	1.60
2003	179.45	-	0.00	90.55	26.23	62.67	61.19	-1.47
2004	161.26	-	0.02	67.15	32.22	61.88	63.06	1.19
2005	150.17	-	-0.02	86.82	12.91	50.45	50.47	0.01
2006	154.03	-	-0.01	87.75	14.98	51.31	47.41	-3.90
2007	169.57	-	0.05	104.09	15.35	50.08	47.44	-2.64
2008	159.99	-	0.02	89.02	18.12	52.84	48.30	-4.53
2009	167.24	-	4.08	77.67	25.46	60.04	55.15	-4.89
2010	179.34	-	5.89	89.82	25.50	58.12	57.35	-0.77
2011	161.96	-	3.28	77.96	24.41	56.31	58.00	1.68
2010 Mar	42.08	-	2.43	19.96	6.42	13.27	11.99	1.27
2010 Jun	45.26	-	0.32	24.12	6.57	14.25	13.64	0.62
2010 Sep	48.56	-	1.00	25.54	6.05	15.97	15.94	0.03
2010 Dec	43.44	-	2.14	20.20	6.46	14.63	15.43	-0.80
2011 Mar	35.21	-	0.35	17.74	6.13	11.00	12.79	-1.79
2011 Jun	40.16	-	1.83	18.31	6.39	13.64	14.68	-1.04
2011 Sep	47.26	-	0.42	24.16	6.01	16.66	16.18	0.49
2011 Dec	39.33	-	0.68	17.75	5.88	15.01	14.35	0.66
Δ2007/2011 p.a.	-1.1%	n.a.	184.3%	-7.0%	12.3%	3.0%	5.1%	n.a.
Δ2010/2011	-9.7%	n.a.	-44.3%	-13.2%	-4.3%	-3.1%	1.1%	n.a.

Notes to Table E.5a: ¹ Data is based on estimates up until 2004.

² = Revised figures.

n.a. = Not applicable.

E. Natural Gas

Table E.5b: Natural Gas Consumption by Sector (Gross PJ)

Calendar Year or Quarter	Energy Transformation						Non-energy Use ^{2, R}	Consumer Energy Observed ^{1, R}						Total
	Electricity Generation	Cogen-eration ^R	Petrol Production	Production Losses and Own Use	Transmission Losses	Total		Agriculture/ Forestry/ Fishing	Commercial	Residential	Industrial	Transport (CNG) ³	Total	
1990	56.98	0.71	34.90	2.84	0.12	95.56	13.98	2.00	4.39	3.49	57.33	2.65	69.86	179.40
1991	69.48	0.80	29.04	2.52	0.12	101.96	20.57	2.01	4.34	3.77	59.15	2.66	71.93	194.46
1992	74.85	0.84	35.22	4.01	0.12	115.05	18.00	1.96	4.45	4.28	60.30	2.46	73.46	206.51
1993	69.10	0.89	32.77	4.26	0.12	107.14	20.03	1.96	4.66	4.33	60.78	2.27	74.00	201.17
1994	54.70	2.25	25.59	4.54	0.17	87.25	25.00	1.96	4.97	4.53	63.05	1.83	76.35	188.60
1995	44.62	4.19	15.49	4.47	0.25	69.02	36.89	2.04	5.20	4.45	60.82	1.42	73.94	179.84
1996	58.04	8.01	9.38	5.25	0.25	80.92	48.15	2.01	5.36	4.67	62.84	1.06	75.94	205.02
1997	76.33	16.29	0.76	5.53	0.28	99.19	49.26	2.12	5.54	4.96	58.71	0.76	72.08	220.53
1998	53.73	19.43	-	5.20	0.41	78.78	46.90	2.03	5.74	5.13	54.79	0.51	68.20	193.87
1999	69.80	19.86	-	5.20	0.39	95.24	54.54	1.97	6.06	5.55	57.91	0.19	71.68	221.47
2000	70.83	17.47	-	5.01	0.76	94.07	62.16	2.10	6.32	7.26	63.53	0.01	79.21	235.44
2001	85.72	23.62	-	5.52	0.60	115.46	55.67	2.12	6.60	7.29	60.99	0.02	77.02	248.15
2002	70.04	22.20	-	5.25	0.70	98.19	58.09	2.04	6.79	6.87	64.88	0.02	80.61	236.89
2003	60.32	24.38	-	5.05	0.80	90.55	26.23	2.06	7.14	6.96	45.01	0.02	61.19	177.97
2004	39.77	21.12	-	5.53	0.73	67.15	32.22	1.96	7.86	7.29	45.93	0.02	63.06	162.43
2005	56.62	23.59	-	5.85	0.76	86.82	12.91	2.06	7.74	6.57	34.09	0.02	50.47	150.20
2006	60.10	21.30	-	5.62	0.72	87.75	14.98	1.88	7.40	6.64	31.47	0.02	47.41	150.13
2007	75.35	22.58	-	5.38	0.78	104.09	15.35	1.81	6.57	5.65	33.39	0.02	47.44	166.88
2008	60.77	23.41	-	4.07	0.78	89.02	18.12	1.73	6.53	5.47	34.54	0.04	48.30	155.44
2009	53.97	17.26	-	5.63	0.80	77.67	25.46	1.94	7.30	6.38	39.49	0.04	55.15	158.27
2010	62.58	19.40	-	7.14	0.69	89.82	25.50	1.47	6.87	5.99	42.99	0.03	57.36	172.69
2011	51.57	18.65	-	7.25	0.86	78.33	24.41	1.67	5.54	5.70	45.03	0.05	58.00	160.74
2010 Mar	13.09	5.14	-	1.61	0.12	19.96	6.42	0.27	1.40	0.88	9.53	0.01	12.09	38.47
2010 Jun	17.51	4.56	-	1.86	0.19	24.12	6.57	0.44	1.87	1.54	9.88	0.01	13.74	44.43
2010 Sep	18.48	4.95	-	1.87	0.24	25.54	6.05	0.44	2.11	2.42	11.12	0.01	16.10	47.69
2010 Dec	13.50	4.75	-	1.80	0.15	20.20	6.46	0.33	1.48	1.16	12.46	0.00	15.43	42.10
2011 Mar	11.72	4.23	-	1.63	0.15	17.74	6.13	0.27	0.97	0.74	10.81	0.01	12.79	36.66
2011 Jun	12.49	3.73	-	1.88	0.22	18.31	6.39	0.52	1.58	1.43	11.14	0.01	14.68	39.38
2011 Sep	16.15	5.85	-	2.10	0.30	24.39	6.01	0.57	1.61	2.38	11.60	0.02	16.18	46.58
2011 Dec	11.21	4.83	-	1.64	0.20	17.89	5.88	0.32	1.38	1.16	11.47	0.02	14.35	38.12
Δ2007/2011 p.a.	-9.0%	-4.7%	n.a.	7.8%	2.7%	-6.9%	12.3%	-1.9%	-4.2%	0.2%	7.8%	22.4%	5.1%	-0.9%
Δ2010/2011	-17.6%	-3.9%	n.a.	1.5%	24.6%	-12.8%	-4.3%	13.7%	-19.3%	-4.8%	4.7%	60.0%	1.1%	-6.9%

Notes to Table E.5b: ¹ Data is based on estimates up until 2004.

n.a. = Not available.

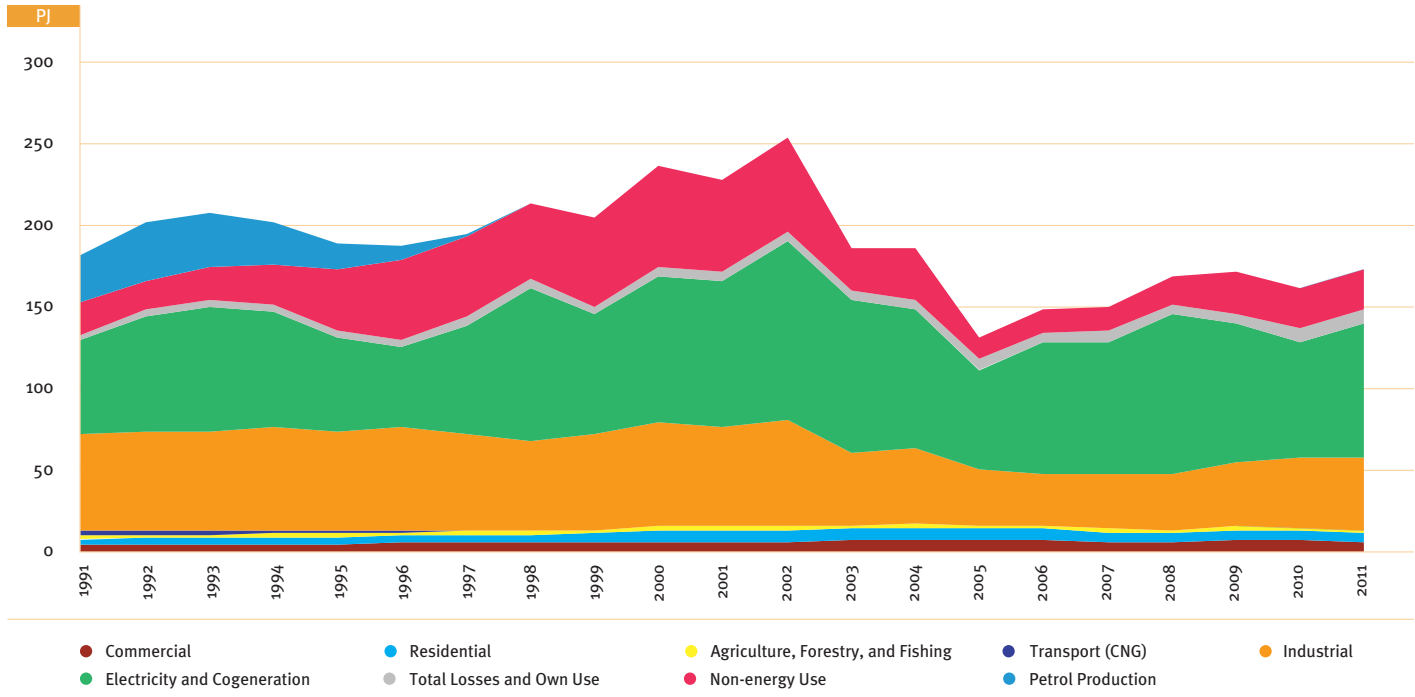
² Excludes gas for energy purposes used by non-energy users.

^R = Revised figures.

³ Estimated from 2000 to 2008.

E. Natural Gas

Figure E.5: Natural Gas Use by Sector (Gross PJ)



E. Natural Gas

Table E.5c: Natural Gas Consumer Energy¹ by Sector (Gross PJ)

Calendar Year or Quarter	Agriculture, Forestry, and Fishing	Industrial ^R						Industrial Total	Commercial	Transport (CNG)	Residential	Total
		Food Processing	Wood, Pulp, Paper and Printing	Chemicals	Basic Metals	Other Minor Sectors ²						
1990	2.00	8.22	6.06	35.26	4.21	3.58	57.33	4.39	2.65	3.49	69.86	
1991	2.01	8.45	6.01	36.48	4.78	3.43	59.15	4.34	2.66	3.77	71.93	
1992	1.96	8.51	5.79	38.04	4.48	3.49	60.30	4.45	2.46	4.28	73.46	
1993	1.96	8.87	6.14	38.06	4.00	3.71	60.78	4.66	2.27	4.33	74.00	
1994	1.96	9.24	6.42	39.34	4.16	3.89	63.05	4.97	1.83	4.53	76.35	
1995	2.04	9.68	6.59	36.70	3.80	4.05	60.82	5.20	1.42	4.45	73.94	
1996	2.01	9.93	6.54	37.80	4.41	4.16	62.84	5.36	1.06	4.67	75.94	
1997	2.12	10.54	6.55	33.39	4.12	4.11	58.71	5.54	0.76	4.96	72.08	
1998	2.03	10.30	6.30	30.63	3.60	3.95	54.79	5.74	0.51	5.13	68.20	
1999	1.97	9.98	6.42	33.71	3.73	4.07	57.91	6.06	0.19	5.55	71.68	
2000	2.10	10.62	6.69	38.75	3.35	4.11	63.53	6.32	0.01	7.26	79.21	
2001	2.12	11.13	6.62	35.27	3.93	4.04	60.99	6.60	0.02	7.29	77.02	
2002	2.04	11.33	6.57	39.22	3.56	4.20	64.88	6.79	0.02	6.87	80.61	
2003	2.06	10.83	5.85	20.80	3.35	4.19	45.01	7.14	0.02	6.96	61.19	
2004	1.96	11.18	6.92	19.85	3.68	4.30	45.93	7.86	0.02	7.29	63.06	
2005	2.06	10.85	6.41	9.75	3.28	3.80	34.09	7.74	0.02	6.57	50.47	
2006	1.88	7.99	5.67	10.79	3.14	3.88	31.47	7.40	0.02	6.64	47.41	
2007	1.81	10.08	5.30	11.06	3.00	3.95	33.39	6.57	0.02	5.65	47.44	
2008	1.73	9.02	4.92	14.01	3.01	3.57	34.54	6.53	0.04	5.47	48.30	
2009	1.94	9.65	5.00	18.54	2.94	3.35	39.49	7.30	0.04	6.38	55.15	
2010	1.47	13.15	4.85	18.80	3.00	3.19	42.99	6.87	0.03	5.99	57.36	
2011	1.67	14.72	5.13	18.86	2.95	3.37	45.03	5.54	0.05	5.70	58.00	
2010 Mar	0.27	2.83	1.03	4.22	0.70	0.75	9.53	1.40	0.01	0.88	12.09	
2010 Jun	0.44	2.58	1.33	4.39	0.78	0.80	9.88	1.87	0.01	1.54	13.74	
2010 Sep	0.44	3.04	1.44	4.97	0.79	0.88	11.12	2.11	0.01	2.42	16.10	
2010 Dec	0.33	4.70	1.05	5.22	0.73	0.76	12.46	1.48	0.00	1.16	15.43	
2011 Mar	0.27	3.06	1.13	4.75	0.70	1.18	10.81	0.97	0.01	0.74	12.79	
2011 Jun	0.52	3.20	1.43	5.01	0.76	0.74	11.14	1.58	0.01	1.43	14.68	
2011 Sep	0.57	3.81	1.40	4.79	0.78	0.81	11.60	1.61	0.02	2.38	16.18	
2011 Dec	0.32	4.65	1.17	4.31	0.71	0.64	11.47	1.38	0.02	1.16	14.35	
Δ2007/2011 p.a.	-1.9%	9.9%	-0.8%	14.3%	-0.5%	-3.9%	7.8%	-4.2%	22.4%	0.2%	5.1%	
Δ2010/2011	13.7%	11.9%	5.9%	0.3%	-2.0%	5.5%	4.7%	-19.3%	60.0%	-4.8%	1.1%	

Notes to Table E.5c: ¹ Excludes amount of gas for non-energy purposes.

² Includes non-metallic mineral products, cement and lime, machinery and equipment, gas and water supply, and construction.

^R = Revised figures.

E. Natural Gas

Table E.5d: Natural Gas Market Snapshot for 2011

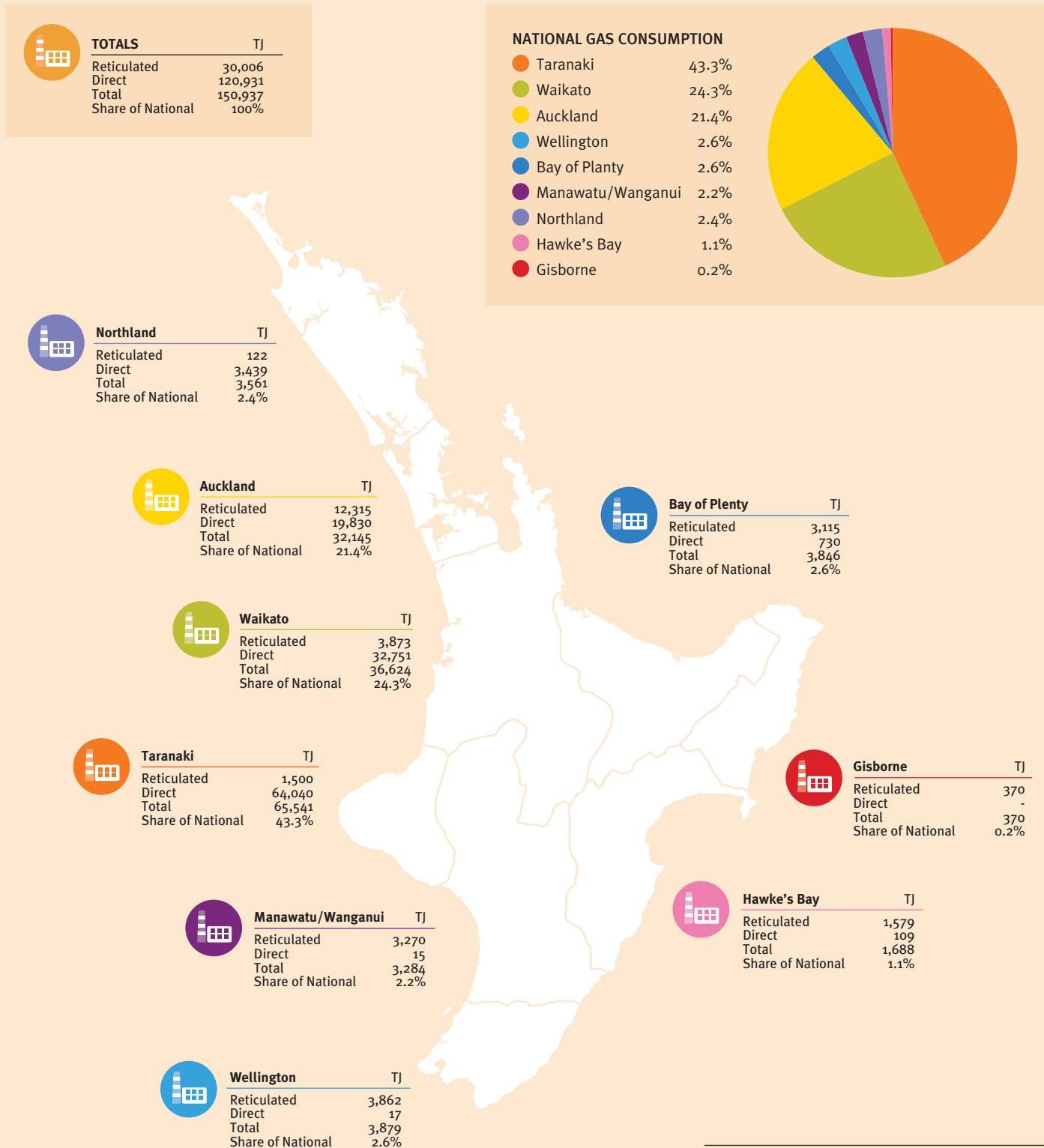
	ANZSIC 2006	Sales TJ
Agriculture, Forestry		1,672.7
Agriculture and Agricultural Services	A01, A02, A04 & A05	1,649.4
Forestry and Logging	A03	23.4
Industrial		45,026.1
Coal Mining, Other Mining and Quarrying, and Services to Mining	B06, B07, B09 & B10	4.1
Dairy Products	C113	10,157.8
Meat and Meat Products, Other Food Processing, Beverages, Malt and Tobacco Products	C111, C112, C114 - C119, C12	4,558.5
Textile, Clothing, Footwear and Leather	C13	838.4
Log Sawmilling and Timber Dressing, and Other Wood Products	C14	1,617.8
Paper and Paper Products	C15	2,493.7
Printing, Publishing and Recorded Media	C16	1,020.3
Petroleum Refining	C1701	3,089.9
Petroleum and Coal Products	C1709	66.5
Fertiliser	C1831	2,730.7
Industrial Gases and Synthetic Resin	C181 - C182 except C1812	50.3
Organic Industrial Chemicals	C1812	12,337.1
Inorganic Industrial Chemicals, Other Chemical Products, Rubber and Plastic Products	C183 - C19 except C1831	590.4
Non-metallic Mineral Products (except Cement and Lime)	C20 except C2031	583.5
Cement and Lime	C2031	161.4
Iron and Steel	C211	2,506.5
Basic Non-ferrous Metals	C213	61.5
Basic Non-ferrous Metal Products	C214	95.2
Metal Products (other)	C212, C22	282.0
Machinery and Equipment Manufacturing, as well as all other manufacturing not yet specified	C23 - C25	1,545.7
Water Supply, Sewerage and Drainage Services	D28, D29	196.5
Construction	E	38.2
Commercial		5,539.7
Wholesale and Retail Trade, Accommodation, Cafes and Restaurants	F, G, H	1,892.5
Road Freight Industry	I461	5.5
Road Passenger Industry	I462	26.2
Rail Transport Industry	I47	3.8
Water Transport Industry	I48	3.6
Air Transport Industry	I490	0.0
Other Transport Industry, and Services to Transport	I50, I52	112.1
Storage	I53	113.6
Communication Services, Finance, Insurance, Property and Business Services	I51, J, K - N	439.7
Government (including Foreign), Administration and Defence	O	217.7
Education, Cultural, Recreational, Personal and Other Services	P, R - S	1,559.0
Health and Community Services	Q	1,166.1
Transport (CNG)	n.a.	54.7
Residential	n.a.	5,703.6
Total Sales		57,996.8

Note to Table E.5d: n.a. = Not applicable.

E. Natural Gas

Gas Consumption by Region

Figure E6: Gas Consumption by Region for 2011 (Gross TJ)¹

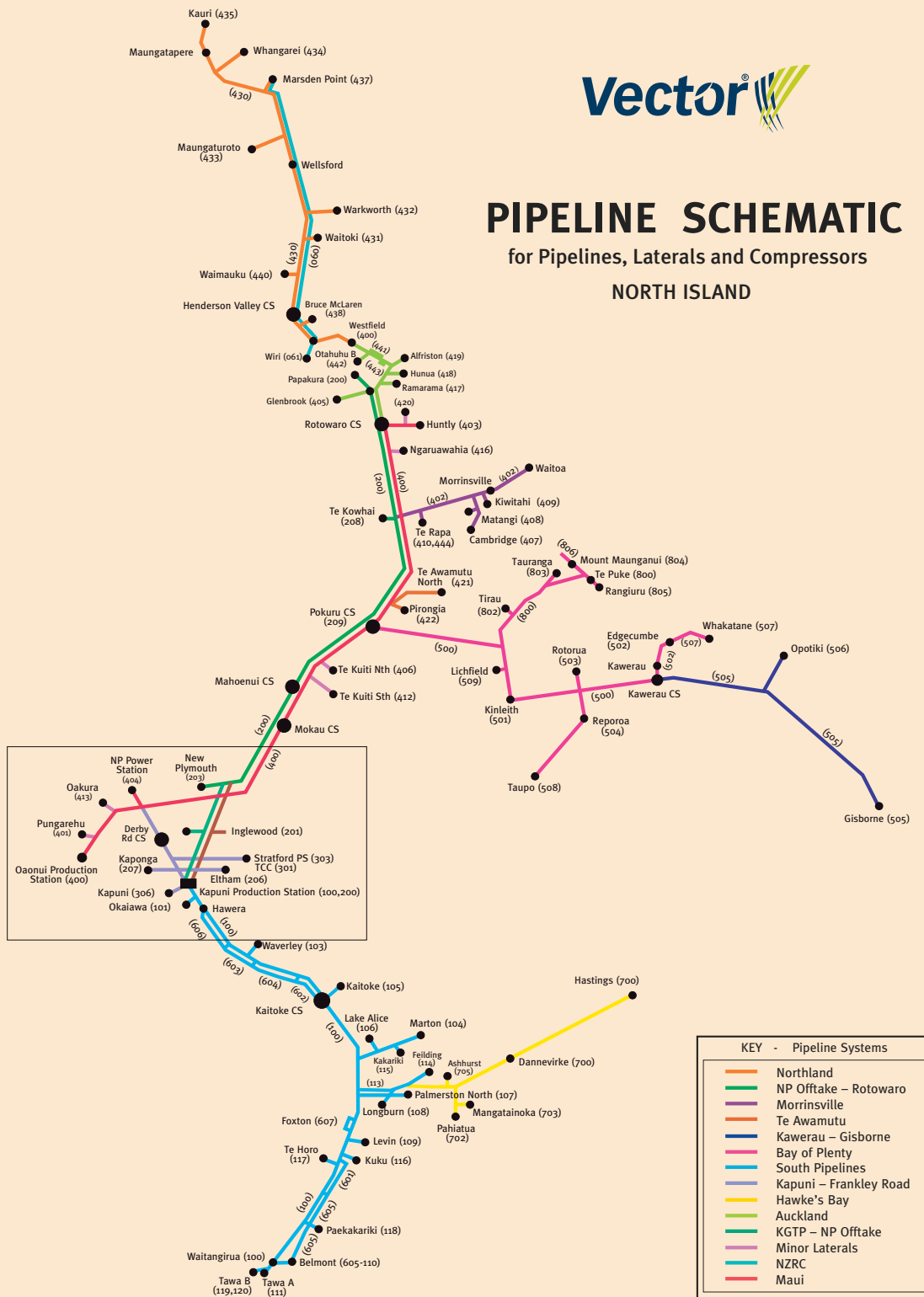


Note to Figure E.6: ¹ Numbers do not include losses and own use, flaring, LPG extracted, gas reinjected, and stock changes.

E. Natural Gas

New Zealand Gas Transmission Pipelines

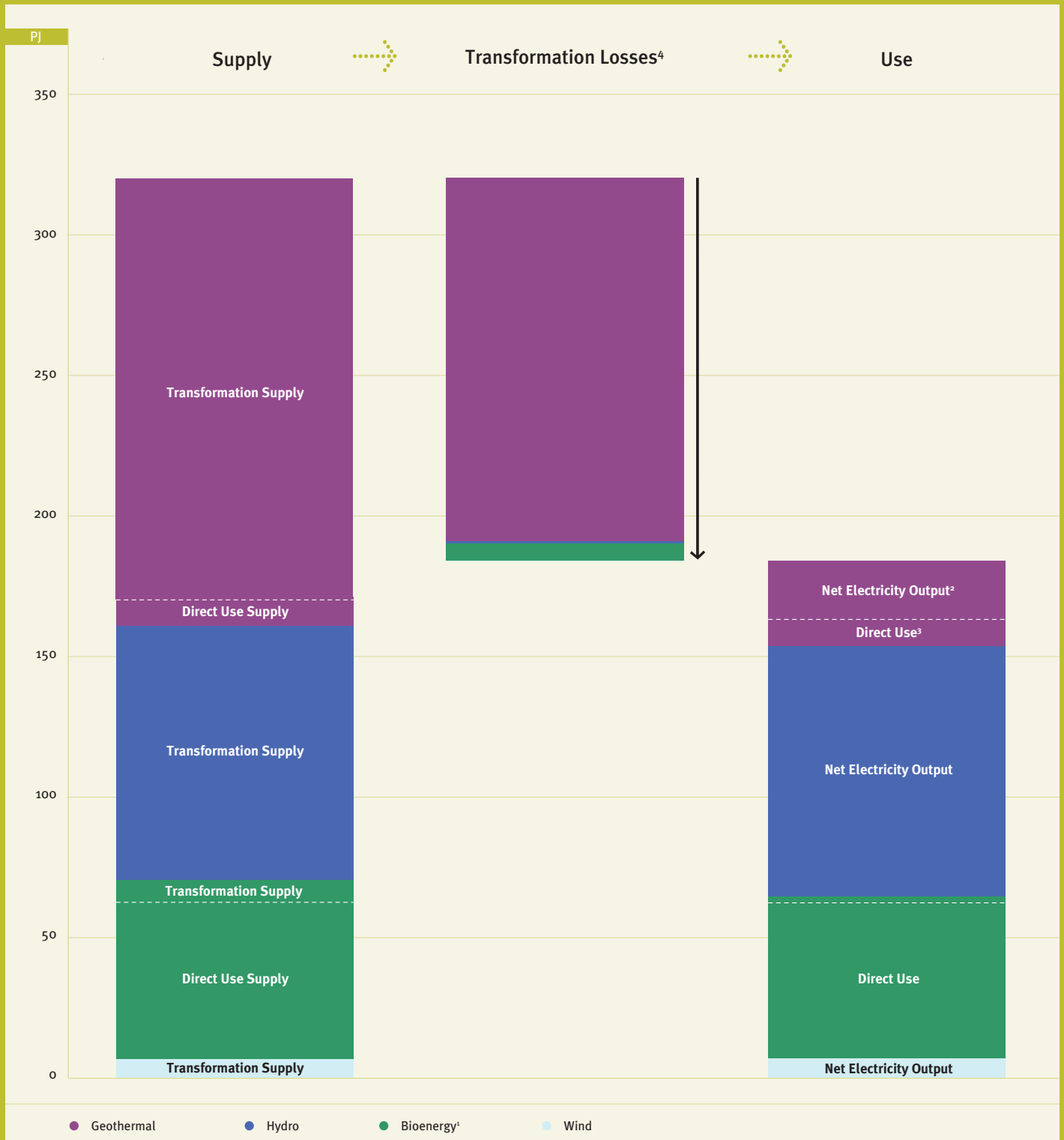
Figure E.7: New Zealand Natural Gas Transmission Pipelines



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F. Renewables

Figure F.1: Renewable Energy Flow Summary for 2011



Notes to Figure F.1: ¹ Bioenergy in this instance refers to biogas, woody biomass and liquid biofuel.

² In addition to Net Electricity Output, a very small amount of liquid biofuel is produced in New Zealand and sent to the Transformation sector under Oil Production. This is included in Bioenergy and Solar but is too small to distinguish on this figure.

³ Direct use of renewable energy covers mainly heat and biofuel for commercial and industrial applications.

⁴ For default electrical transformation factors, see Table B.1.

F. Renewables

Overview of Renewables in New Zealand

Introduction

Renewable energy sources discussed in this section include hydro, wind, geothermal, solar, woody biomass, biogas and liquid biofuels. Information on renewable energy is presented for calendar years by fuel type and total sectorial demand, and for 2011 for the sectorial breakdown by fuel.

Detailed information is available on renewable energy used to generate electricity. However, information on the direct use of renewable energy is more difficult to obtain given it is often used without being purchased; hence it is not well-recorded. Where actual information on the direct use of renewable energy is not available, estimates have been made based on research and the knowledge of experts in this field.

Supply

New Zealand has the second highest proportion of renewable energy in its Primary Energy Supply in the OECD after Iceland, according to the latest data available from the International Energy Agency. This is due to the high levels of hydro and geothermal energy used for electricity generation. The last few years have seen this proportion of renewables grow substantially due to a significant increase in the use of New Zealand's geothermal and wind resources. Figure F.2 gives a breakdown of Renewable Primary Energy Supply for 2011.

The year 2011 saw a record high contribution of renewable sources to primary energy supply, both as a share of total supply 39% and as an absolute 321 PJ. This increase on the previous year is mainly due to continued growth in the geothermal sector.

Electricity Generation

Most of New Zealand's production of renewable energy is used for electricity generation. In 2011, a total of 77% of electricity generation came from renewable resources due to record high geothermal generation and good hydro inflows. This is the highest renewables percentage since 1996 and is third in the OECD. Figure F.3 shows how the percentage of electricity generation from renewables has changed over time.

Figure F.2: Renewable Primary Energy for 2011

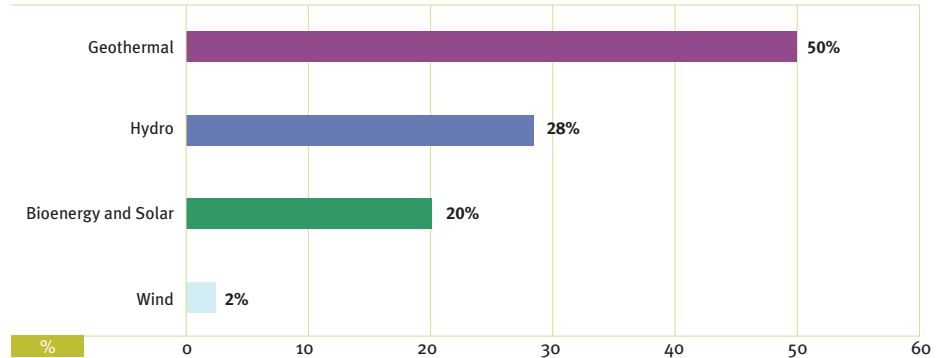
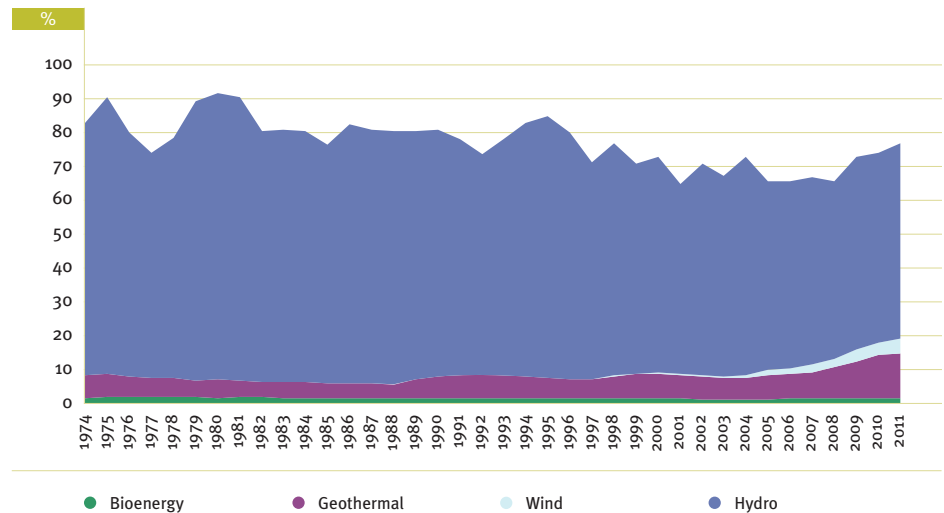


Figure F.3: Percentage of New Zealand Electricity Generation from Renewable Sources



F. Renewables

Direct Use of Renewable Energy

In 2011, an estimated 65 PJ of renewable energy was used for direct-use heat applications around New Zealand. This is mostly in the form of woody biomass and geothermal for heating in commercial and industrial applications.

Geothermal energy is used directly as a heat source in small quantities in the central North Island in the timber and tourism industries. It is also used in small quantities for domestic heating.

Woody biomass direct use is mainly in the timber industry, which burns residue wood to provide heat energy. Wood is also burned to heat many private homes in New Zealand.

Liquid Biofuels Production

An estimated 7 million litres of liquid biofuel was produced in 2011, a 22% increase from 2010. As per International Energy Agency definitions, final consumption of liquid biofuel is included under oil, rather than renewables. Table F.3 gives the production of biodiesel and bio-ethanol for the last five years. For comparison, imports of bio-ethanol totalled 1.18 ML in 2010 and 2.22 ML in 2011. Production of biodiesel has been supported by the Government's Biodiesel Grants Scheme, which provided a grant of up to 42.5 cents per litre from 2009 to 2012. In New Zealand, biodiesel is currently produced from tallow, oilseed rape and used cooking oil, resulting in life-cycle greenhouse gas

emissions of 40% to 50% lower than those from fossil diesel. As tallow and used cooking oil are by-products of other industry and oilseed rape is grown as a break crop on grain fields to increase soil quality, current New Zealand biodiesel does not compete with food production or compromise biodiversity or soil quality.

Table F.1: Renewable Energy Balance 2007–2011 (Gross PJ)

Gross PJ		1991	2001	2007	2008	2009	2010	2011	Δ1991/2011 p.a.	Δ2007/2011 p.a.	Δ2010/2011
SUPPLY	TOTAL PRIMARY ENERGY	188.31	213.06	244.71	252.55	273.50	310.96	320.60	2.7%	7.0%	3.1%
	Production & Imports	188.31	213.06	244.71	252.55	273.50	310.96	320.60	2.8%	7.0%	3.1%
	ENERGY TRANSFORMATION	(147.37)	(152.67)	(176.71)	(189.00)	(214.64)	(245.98)	(255.19)	2.9%	9.6%	3.7%
	Electricity Generation	(139.45)	(145.87)	(170.18)	(182.32)	(207.42)	(238.57)	(247.70)	3.1%	9.8%	3.8%
	Cogeneration	(7.92)	(6.80)	(6.48)	(6.59)	(7.10)	(7.22)	(7.25)	-0.5%	2.8%	0.3%
	Oil Production ¹	-	-	(0.05)	(0.09)	(0.12)	(0.18)	(0.25)			35.1%
DEMAND	CONSUMER ENERGY	40.94	60.38	68.00	63.55	58.85	64.98	65.41	2.5%	-1.0%	0.7%
	Agriculture	0.32	0.37	0.56	0.73	0.73	0.73	0.68	4.1%	5.3%	-6.2%
	Industrial	30.41	49.77	56.15	51.68	47.06	53.45	54.28	3.1%	-0.8%	1.5%
	Commercial	1.86	1.96	2.90	2.80	2.80	2.62	2.38	1.3%	-4.8%	-9.4%
	Residential	8.36	8.29	8.40	8.34	8.26	8.18	8.08	-0.2%	-1.0%	-1.3%

Note to Table F.1: ¹ Almost all liquid biofuel production in New Zealand is blended with fossil fuel oil products and so by IEA definitions it is consumed by the oil products sector and is included in oil product statistics. The *Energy Data File* (EDF) makes the assumption that all biofuel sold in New Zealand is blended. This means there will be no biofuel Total Consumer Energy demand and all biofuel will go to "Oil Production" in the Transformation sector.

F. Renewables

Table F.2: Renewable Energy Supply and Use by Fuel (Gross PJ)

Calendar Year	Hydro		Geothermal				Solar		
	Supply	Use	Supply	Use			Supply	Use	
	Production	Electricity	Production	Electricity	Cogeneration	Direct Use ¹	Production	Cogeneration	Direct Use
1991	82.41	82.41	64.87	56.45	1.37	7.04	-	-	-
1992	75.93	75.93	64.23	55.84	1.37	7.01	-	-	-
1993	84.57	84.57	67.57	58.95	1.37	7.24	-	-	-
1994	93.00	93.00	63.26	54.38	1.37	7.51	-	-	-
1995	99.12	99.12	62.36	53.50	1.37	7.48	-	-	-
1996	94.25	94.25	63.46	54.56	1.40	7.50	-	-	-
1997	83.72	83.72	65.95	57.05	1.36	7.54	-	-	-
1998	91.14	91.14	70.13	60.94	1.39	7.80	-	-	-
1999	82.50	82.50	74.45	65.16	1.33	7.96	-	-	-
2000	87.96	87.96	81.64	72.51	1.00	8.12	-	-	-
2001	78.04	78.04	75.93	66.46	1.30	8.17	-	-	-
2002	89.53	89.53	74.08	63.96	1.25	8.88	0.16	-	0.16
2003	85.03	85.03	73.64	63.50	1.13	9.01	0.19	-	0.19
2004	96.94	96.94	75.29	64.80	1.21	9.29	0.21	-	0.21
2005	83.97	83.97	82.99	72.10	1.49	9.40	0.24	-	0.24
2006	84.86	84.86	86.35	75.65	1.33	9.38	0.26	-	0.26
2007	85.10	85.10	90.64	79.84	1.25	9.56	0.30	-	0.30
2008	80.41	80.41	107.16	96.29	1.25	9.62	0.32	-	0.32
2009	87.19	87.19	124.15	113.02	1.29	9.84	0.34	-	0.34
2010	88.98	88.98	152.55	141.76	1.31	9.48	0.35	-	0.35
2011	90.28	90.28	159.05	148.45	1.31	9.30	0.36	-	0.36
Calendar Year	Wind		Biogas				Woody Biomass		
	Supply	Use	Supply	Use			Supply	Use	
	Production	Electricity	Production	Electricity	Cogeneration	Direct Use	Production	Cogeneration	Direct Use ²
1991	-	-	2.00	0.58	1.36	0.06	39.02	5.18	33.84
1992	0.00	0.00	2.06	0.64	1.36	0.06	39.00	5.18	33.81
1993	0.00	0.00	2.06	0.64	1.36	0.06	41.15	5.18	35.97
1994	0.00	0.00	2.14	0.64	1.45	0.06	43.21	5.18	38.03
1995	0.00	0.00	2.27	0.74	1.47	0.06	44.44	5.18	39.25
1996	0.03	0.03	1.94	0.86	1.01	0.06	42.84	4.78	38.06
1997	0.05	0.05	1.86	1.01	0.78	0.07	44.94	4.80	40.13
1998	0.08	0.08	1.82	0.84	0.91	0.07	47.64	6.24	41.40
1999	0.14	0.14	1.63	0.93	0.56	0.14	52.95	5.79	47.16
2000	0.43	0.43	1.47	0.92	0.40	0.15	57.86	6.59	51.27
2001	0.50	0.50	1.48	0.86	0.43	0.18	57.10	5.07	52.03
2002	0.56	0.56	1.88	0.98	0.71	0.19	61.25	3.25	58.00
2003	0.53	0.53	2.46	1.43	0.85	0.18	61.42	2.75	58.67
2004	1.30	1.30	2.67	1.71	0.85	0.11	66.04	3.43	62.61
2005	2.21	2.21	2.70	1.66	0.83	0.22	65.70	3.83	61.87
2006	2.24	2.24	3.06	1.87	0.93	0.26	65.09	4.15	60.94
2007	3.35	3.35	3.03	1.90	0.85	0.28	62.24	4.38	57.86
2008	3.81	3.81	2.91	1.82	0.81	0.28	57.85	4.53	53.32
2009	5.32	5.32	3.05	1.89	0.88	0.28	53.32	4.93	48.40
2010	5.88	5.88	3.07	1.95	0.84	0.28	59.95	5.08	54.87
2011	7.02	7.02	3.04	1.95	0.82	0.28	61.13	5.12	55.47

Notes to Table F.2: Electricity and Cogeneration: For all fuels information is predominantly estimated based on the gross electrical output of plants and standard efficiencies. Some actual information is included where it is reported to the Ministry of Economic Development on a monthly or annual basis.

¹ Based on the report (and associated data) *An Updated Assessment of Geothermal Direct Heat Use in New Zealand* 2008, prepared by Brian White, Executive Officer of the New Zealand Geothermal Association. 2011 estimate based on regional and industrial updates.

² Industrial use estimated using information from the Heat Plant Database 2008, prepared by East Harbour Management Services on behalf of the Bioenergy Association of New Zealand (BANZ), in conjunction with the Energy Efficiency and Conservation Authority (EECA) and the Ministry of Economic Development. Residential use estimated based on Census data.

F. Renewables

Table F.3: Estimated¹ Production of Liquid Biofuel 2007–2011

Calendar Year	Biodiesel		Bio-ethanol ²		Total Biofuel	
	ML	PJ	ML	PJ	ML	PJ
2007	1.20	0.04	0.30	0.01	1.50	0.05
2008	1.20	0.04	2.00	0.05	3.20	0.09
2009	1.07	0.04	3.70	0.09	4.77	0.12
2010	1.61	0.06	4.21	0.10	5.82	0.15
2011	2.35	0.08	4.81	0.11	7.16	0.19
GCV (PJ/ML)²	0.0350		0.0234			

Notes to Table F.3: ¹ 2009–2011 figures are based on information collected under the Petroleum or Engine Fuel Monitoring Levy. Information for 2007 and 2008 is estimated by the Energy Efficiency and Conservation Authority.

² GCV = Gross Calorific Value. ML = Million Litres.

Table F.4: Renewable Energy Direct Use by Sector for 2011 (Gross PJ)

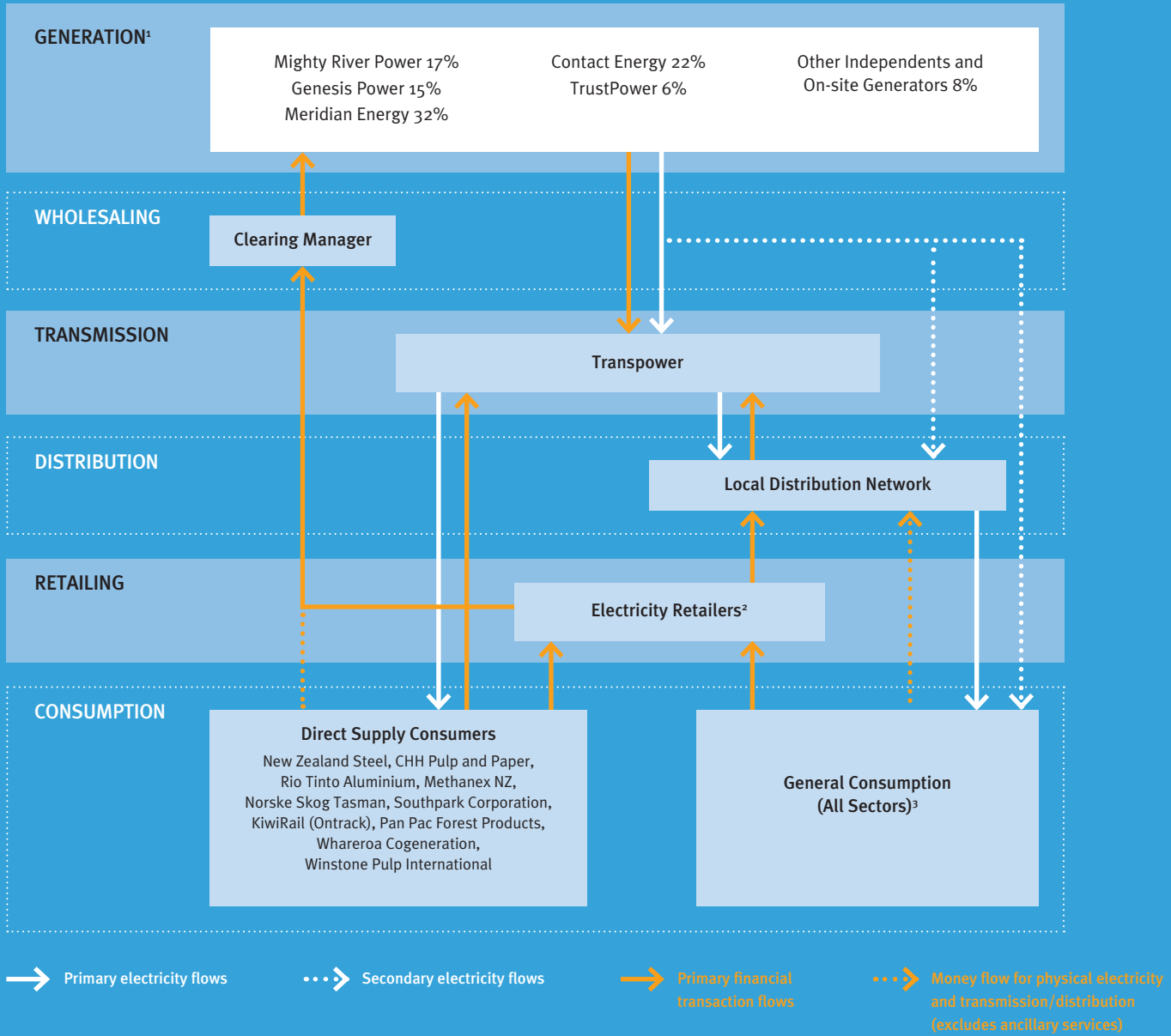
PJ	Geothermal ¹	Solar	Biogas	Woody biomass ²	Total Direct Use
Agriculture, Forestry and Fishing	0.68	-	-	-	0.68
Industrial	6.21	-	-	48.07	54.28
Commercial	2.10	-	0.28	-	2.38
Residential	0.31	0.36	-	7.40	8.08

Notes to Table F.4: ¹ Based on the report and associated data *An Updated Assessment of Geothermal Direct Heat Use in New Zealand 2008*, prepared by Brian White, Executive Officer of the New Zealand Geothermal Association.

² Industrial use estimated using information from the Heat Plant Database 2008, with production data for wood products from Statistics New Zealand. Residential use estimated based on the Household Energy End-use Project carried out by BRANZ, along with Census data.

G. Electricity

Figure G.1a: Electricity Industry Summary for 2011



"Primary" refers to the most common or typical way that electricity or money flows through the electricity industry.

"Secondary" refers to flows of money or electricity that do occur, but that are not typical of most participants in the industry.

As an example, all customers in the Lines Company distribution network area pay distribution charges directly to the local distribution network, as shown by the orange dotted line between the General Consumption box and Local Distribution Network box. This is not typical nationwide as most consumers pay their lines charges through their retailer, as shown by the dense orange line running between the General Consumption and Electricity Retailers boxes and continuing on to Local Distribution Network.

The thickness of the lines in Figure G.1a in no way indicates the amount of money or electricity that passes through or is used by a particular participant or group of participants.

Notes to Figure G.1a:

¹ Embedded (distributed) generators can choose to sell their electricity directly to retailers trading on the same grid exit point.

² Electricity retailers include Contact Energy (and subsidiary Empower), Genesis Energy (and subsidiary Energy Online), Meridian Energy (and subsidiary Powershop), Mighty River Power (through its brands and subsidiaries of Mercury Energy, Bosco Connect and Tiny Mighty Power), TrustPower, Pulse Energy, Opunake Hydro, and Bay of Plenty Energy and Auckland Gas, which are both owned by Todd Energy and trade together as Nova Energy in most markets in which they retail.

³ Sectors are defined in table G.6a

Both the Commerce Commission and Electricity Authority have key roles in the electricity market. The Commerce Commission has regulatory oversight of distribution and transmission pricing, while the Electricity Authority has regulatory oversight of the retail and wholesale markets and of transmission contracts. The Electricity Authority also has contracts with service providers for market operation services such as that of the Clearing Manager.

Overview of New Zealand's Electricity Industry

Introduction

This section contains information about electricity generation/supply, transmission and distribution, and consumption.

All annual figures are calendar year unless it is clearly stated as March year in the title for the table or figure. Sales and income information is still presented as it is collected for the latest March Year (2011).

It was an eventful year for the electricity market in 2011, with the spot price for electricity spiking to around \$20,000/MWh at some nodes during two distinct events, before being reset. For more information on wholesale electricity prices, visit: www.ea.govt.nz/industry/market/wholesale-pricing/.

On 26 March 2011, a combination of transmission constraints, unforeseen demand, and generation withdrawal led to a surge in prices that lasted several hours. The resulting Electricity Authority hearing on the proposal to classify the event as an “undesirable trading situation” (UTS) saw generators and large industrial consumers on both sides of the argument.

On 27 February 2012, the High Court upheld the Electricity Authority's original decision to reset the price to \$3,000/MWh. For more information on the UTS and proposed response, go to: www.ea.govt.nz/our-work/consultations/uts/15Jun11/.

Later in the year, a technical fault at the 400 MW combined-cycle gas turbine, Huntly unit five (e3p), on 13 December tripped circuit breakers on both the generation and transmission sides, disconnecting all 850 MW being generated by Huntly at the time. The sudden drop in supply led to load shedding in the North Island through the Automatic Under-Frequency Load Shedding (AUFLS) system and interruptible load (IL).

AUFLS is the automatic disconnection of blocks of load when the system frequency falls below a level specified in the Electricity Industry Participation Code 2010. The Huntly shutdown was the first time in 15 years that the AUFLS has been called on. IL is demand that may be disconnected without warning, under arrangement between the system operator and the consumer affected, in the interest of maintaining system integrity.

A subsequent Electricity Authority (EA) review investigated the divergence between the real-time prices available prior to dispatch and the final prices.

Several recommendations to improve the quality of information available to generators and large consumers came out of the review. For more information on the event and the EA review, go to: www.ea.govt.nz/industry/monitoring/enquiries-reviews-investigations/2011/.

Future Developments

Electricity demand is expected to grow by a little over 1% per annum on average out to 2030 under business-as-usual assumptions. New generation will need to be built in order to meet this demand.

In the past, the Electricity Commission (the predecessor to the Electricity Authority) produced the *Statement of Opportunities* (SOO), a set of possible future electricity supply and demand scenarios to facilitate efficient management and investment in new generation and new transmission and distribution infrastructure.

Starting in 2012, the SOO will be replaced by *Electricity Demand and Generation Scenarios* (EDGS), produced by MED. The EDGS will present a range of national electricity demand forecasts and a small set of new generation scenarios and associated assumptions.

Transpower, the grid operator, will be required to use the EDGS when developing major capital expenditure plans, which will then be subject to Commerce Commission approval.

Evolution of the Electricity Industry

In the mid-1980s, electricity generation and transmission were the responsibility of the Ministry of Energy. In 1987, as part of a wider government review of operational departments within government, the electricity generation and transmission functions of the Ministry of Energy were transferred into a new State-Owned Enterprise (SOE), the Electricity Corporation of New Zealand (ECNZ).

In 1988, ECNZ reorganised its operations into separate transmission and generation arms. In 1994, the transmission component was formally removed from ECNZ to become the independent SOE, Transpower.

Around the same time, the electricity line and supply (distribution and retail) sector underwent major changes.

In the early 1990s, government legislation required that all Electricity Supply Authorities (ESAs) be made into corporations, with local community trusts assuming ownership of most Power Board ESAs and all Municipal Electricity Department ESAs becoming corporate assets of the local territorial authorities. Following these transfers of ownership, the new entities were free to be sold to private interests or merge with other line and supply companies.

In 1996, competition was introduced into the electricity generation industry when Contact Energy was split from ECNZ.

In 1999, further reforms led to the splitting of ECNZ into three competing SOEs, which became Meridian Energy, Genesis Power and Mighty River Power. The electricity lines and supply businesses were also split into separate distribution and retail entities. Also around that time, Contact Energy was listed on the New Zealand Stock Exchange (NZX), with the Government fully divesting its interest by May 1999.

G. Electricity

As of April 2012, there are 29 independent distribution companies with varying ownership regimes ranging from locally owned cooperatives, trusts and territorial authority assets, to foreign-owned corporations.

Today, electricity is sold by generators and bought by retailers and large industrial users. This process is controlled by the Electricity Industry (Enforcement) Regulations 2010 and the Electricity Industry Participation Code 2010, which came into force on 1 November 2010. Transpower maintains responsibility for the high-voltage transmission lines and acts as System Operator, which means it is responsible for overall coordination of the system, as well as security of supply.

Figure G.1a summarises the current structure of the electricity industry.

Government Policy and Regulation of New Zealand's Electricity Industry

New Zealand's current electricity policy and regulatory structure has three main bodies: The Ministry of Economic Development (MED), the Electricity Authority (EA) and the Commerce Commission (ComCom).

MED develops and implements electricity-sector policy, particularly relating to the governance and market structure. MED also monitors market performance, including competition issues and electricity prices.

The EA is the sector regulator created on 1 November 2010 to replace the Electricity Commission, as a result of a broad electricity market performance review undertaken in 2009. The objective of the Authority is "to promote competition in, reliable supply by, and the efficient operation of, the electricity industry for the long-term benefit of consumers."

A number of functions previously performed by the Electricity Commission were transferred to other bodies. ComCom now undertakes approval of grid expenditure plans by Transpower as part of its overall revenue regulation, and the Energy Efficiency and Conservation Authority (EECA) is now solely responsible for electricity efficiency programmes. Transpower, as system operator, is responsible for emergency management and provision of information and forecasting on security of supply, subject to rules set out by the EA.

Other changes implemented as a result of the 2009 review include some restructuring of State-Owned Enterprise generation assets, with hydro plants Tekapo A and B being transferred from Meridian to Genesis and "virtual asset swaps" between Meridian, Genesis and Mighty River Power in order to increase competition in the retail and wholesale markets. In addition, the government-owned peaking plant at Whirinaki was sold to Contact Energy as part of disestablishing the reserve energy scheme.

More details about the Ministerial Review of Electricity Market Performance 2009 can be found on the MED website at: www.med.govt.nz/sectors-industries/energy/electricity/implementing-electricity-market-review-recommendations.

Generation

In 2011, 43,138 GWh or 155 PJ of electricity was generated in New Zealand. This was generated by the five main generating companies plus a number of small, independent generators and on-site cogenerators.

Figure G.1b shows a summary of electricity generation by fuel type for 2011, and Figure G.1c shows a time series of generation by fuel type. In 2011, the five major generating companies provided 92% of New Zealand's electricity generation. These were Meridian Energy (32%), Contact Energy (22%), Genesis Energy (15%), Mighty River Power (17%) and TrustPower (6%).

Renewable Generation

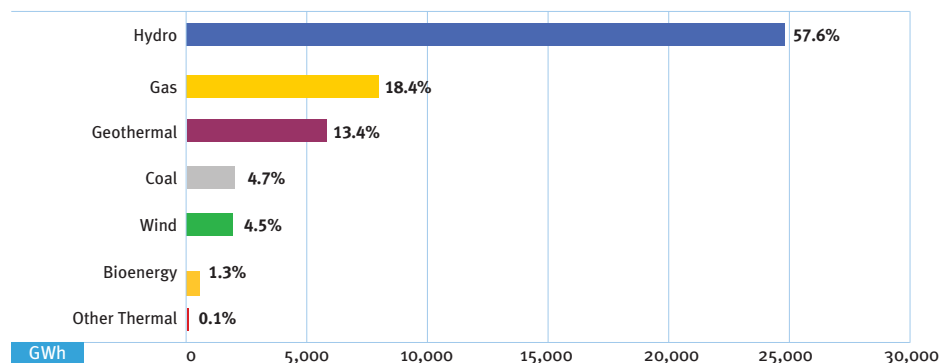
The percentage of electricity generated from renewable resources climbed to 77% in 2011. This was driven by another year of strong hydro inflows, a 20% increase in generation from wind, and a reduction in demand. Two new wind farms were commissioned in 2011 – 36 MW from the first stage of Trustpower's Mahinerangi wind farm in Otago, and 64 MW from Meridian Energy's Te Uku wind farm in the Waikato. Further information on renewable energy supply and consumption can be found in the Renewables section (F).

Hydro

Hydroelectric generation has been a part of New Zealand's energy system for over 100 years and continues to provide for most of our electricity needs. Early schemes such as the Waipori scheme commissioned in 1903 and the Coleridge plant commissioned in 1914 established New Zealand's use of renewable hydro energy.

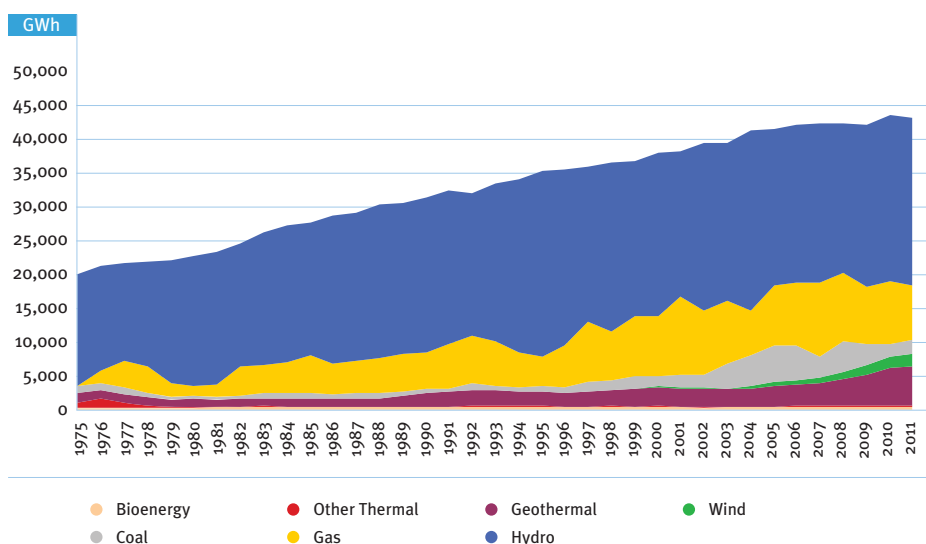
By the early 1950s, over 1,000 MW of installed capacity was from hydro energy. In 1965, the High-Voltage Direct Current transmission line between Benmore in the South Island and Haywards in the North Island was commissioned.

Figure G.1b: Electricity Generation by Fuel Type for 2011



G. Electricity

Figure G.1c: Annual Electricity Generation by Fuel Type



From this point onwards, hydro capacity in the South Island increased rapidly, with developments including the 540 MW Benmore power station in 1966, the 700 MW¹ Manapouri power station in 1971, and the 432 MW Clyde dam, which was commissioned in 1992. By the mid-1990s, hydro capacity had reached over 5,000 MW, and remains around this level today.

Geothermal

Geothermal generation has, for a long time, been an integral part of New Zealand's electricity landscape, beginning over 50 years ago with the opening of the Wairakei power station in November 1958.

Wairakei was New Zealand's first geothermal power station and is the world's oldest still in operation. It currently has an installed capacity of nearly 180 MW and remains New Zealand's largest geothermal power station. By 2016, Wairakei is expected to have been replaced by the planned Te Mihi plant, which will have a capacity in excess of 220 MW, utilising the same steam field. The 166 MW first stage of Te Mihi is due to be completed in 2013, at which time 45 MW of the original Wairakei plant will be decommissioned.

The second large-scale geothermal power station to be built in New Zealand was Ohaaki, built in 1989. While it has an installed capacity of 104 MW, due to geothermal steam limitations it has never run at full capacity, highlighting the risks involved with geothermal exploration and development.

More recent additions include Poihipi Road and Rotokawa, which opened in 1997, adding 55 MW and 35 MW respectively, and Ngawha, which was commissioned in 1998 with an initial capacity of 10 MW. In 2000, the Mokai geothermal plant was commissioned with a capacity of 55 MW, which was progressively increased to 112 MW by 2007.

In 2008, a further 115 MW of new capacity was commissioned, including the 100 MW Kawerau geothermal plant and a 15 MW upgrade of the Ngawha plant to 25 MW. In December 2009 New Zealand's geothermal capacity was around 580 MW. In 2010, an additional 162 MW of geothermal capacity came online with the commissioning of the 138 MW Nga Awa Purua, situated next to the existing Rotokawa plant, and Contact Energy's opening of the 24 MW Tauhara geothermal plant.

¹ Manapouri has never operated at full capacity due to tailrace consent and safety limits. Although Manapouri's 1971 maximum capacity was 700 MW, its dependable capacity was 585 MW. Between 2002 and 2008, its rated capacity was increased to around 850 MW; however, it can only operate at less than 730 MW.

Wind

Wind generation has grown quickly as a source of electricity generation in New Zealand, at an average of 30% annually over the last decade. In 2011, wind accounted for over 4% of total generation.

New Zealand's first large-scale wind turbine was opened in Wellington in 1993 with a capacity of 225 kW. By December 2011, New Zealand had a total capacity of over 614 MW.

The first wind farm in New Zealand, Hau Nui, was commissioned in 1997. Today, it has a total capacity of 8.65 MW and is owned by Genesis Energy.

The largest wind farm in New Zealand is TrustPower's Tararua wind farm. Stage 3 of the project was commissioned in 2007 with the addition of 31 wind turbines each rated at 3 MW, which has brought the combined capacity to 161 MW.

In June 2007, Meridian Energy opened the first South Island wind farm, with a total capacity of 58 MW, followed in 2009 by the 143 MW West Wind project, near Wellington.

Last year saw 75 MW of new wind capacity fully commissioned. Meridian Energy's 64 MW Te Uku wind farm was injecting up to 25 MW into the grid at the end of 2010, but was not fully operational until April 2011. Trustpower's 36 MW Mahinerangi wind farm, embedded in the local distribution network in the Waikato, also came online in April 2011.

Other Renewables

Other renewable sources for electricity generation include bioenergy, solar energy and marine energy. Of these, only bioenergy has significant installed capacity in New Zealand. Bioenergy is predominantly from woody biomass consumed at a number of cogeneration plants located at wood-processing factories, and also from biogas created from digesting waste at wastewater treatment plants and landfills.

Non-renewable Generation

Electricity generation from the combustion of coal, oil and gas plays a crucial role in New Zealand's electricity system by providing baseload, backup and peak load supply. Today, nearly 3,000 MW of installed capacity comes from fossil fuel thermal plants, which provided 23% of New Zealand's total electricity supply in 2011.

There are four main types of thermal electricity generation plant operating in New Zealand: steam turbine plants, gas turbine plants, combined cycle gas turbine plants, and cogeneration or combined heat and power plants, including those that utilise waste chemical process heat to generate power.

There are also a few small plants powered by reciprocating engines. Trustpower commissioned the 9 MW Bream Bay diesel peaker plant in July 2011. The plant was intended to reduce Trustpower's exposure to high local spot prices and was quickly put to the test as a record-breaking cold snap swept the country in mid-August 2011.

Steam Turbine Plants

Steam turbine plants use boilers to heat water at high pressure, creating steam that is expanded through a steam turbine, which in turn drives a generator.

The first large-scale grid-connected thermal power station in New Zealand was the 210 MW coal-fired steam turbine plant at Meremere, constructed between 1956 and 1958. Over the next 20 years, several other steam turbine plants were commissioned, including Marsden A, a 240 MW plant using residual oil from the nearby refinery designed to provide winter power to Auckland, then New Plymouth, a 600 MW primarily gas-fired baseload plant. The Marsden B plant, which was built in the late 1970s, has never run.

The steam-fired plant that dwarfs all other generation plant in New Zealand is the 1,000 MW Huntly power station. Huntly, which was constructed between 1973 and 1983, is made up of four units of 250 MW and is still operational. It can run on either coal or gas.

Gas Turbine Plants

Gas turbines are a younger technology than their steam turbine counterparts, only refined after World War II. Most gas turbines take in air and compress it, and it is then mixed with fuel and ignited. The hot, high-pressure gases are expanded through a turbine, which, in turn, drives a generator. The primary advantage of this technology is that, just like in the jet engine of an aeroplane, gas turbines start very fast and can go from standby to fully operational in a matter of minutes, whereas a steam turbine plant may take many hours to reach a fully operational output. This makes gas turbines ideal for providing peak load requirements.

The first gas turbine plant to be built in New Zealand was Otahuhu A in the Auckland region, which was finished in 1970. It was expanded in 1978 with faster starting turbines to a total capacity of 274 MW. In 1976, the original Stratford plant opened with a total capacity of 220 MW. This was followed by the original 220 MW Whirinaki plant, which opened in 1978. Today, there are two large-scale primary electricity generating open cycle turbine plants in use for peak demand operation in New Zealand. This includes the replacement plant at Whirinaki, which is 155 MW and runs entirely on diesel, and the gas-fired 50 MW Unit 6 at the Huntly site, known as Huntly-P40.

In 2010, Contact Energy finished constructing a new peaking gas turbine plant at Stratford next to the existing Taranaki Combined Cycle power station. The new plant is the first in New Zealand to use stored gas and consists of two 100 MW peaker units.

Combined Cycle Gas Turbine (CCGT) Plants

CCGT plants (which combine an open cycle gas turbine with a steam cycle turbine) achieve better efficiencies than gas/steam-turbine-only plants, although they generally take some time to reach peak output. The first CCGT plant – the 360 MW Taranaki Combined Cycle plant (now 377 MW) – was built in 1998 at the old Stratford site. In 2000, the 380 MW Otahuhu B plant (now 404 MW) was opened, and then in 2007 the Huntly site was further expanded with a new 385 MW unit known as Huntly-e3p.

Cogeneration

Not all large-scale electricity generators in New Zealand were built simply with the creation of electricity in mind. Cogeneration – or Combined Heat and Power (CHP) – plants are in widespread use throughout New Zealand. By making use of energy that would otherwise be wasted, cogeneration improves overall thermal energy efficiency. Large-scale cogeneration plants currently in use include plants that provide heat and electricity for many industrial uses, with the largest users being the wood-processing and dairy sectors. Additionally, the fertiliser industry makes use of chemical waste heat from product manufacture to generate electricity.

Cogeneration plants can be either bottoming cycle or topping cycle. Bottoming cycle plants first generate high-pressure steam through a boiler for industrial process heat requirements. They then use the residual heat in a Waste Heat Recovery Steam Generator (WHRSG) to drive a steam cycle for use in a steam turbine.

Topping cycle plants first generate electricity, usually through the use of an open cycle gas turbine. They then use a WHRSG to provide steam for industrial heat requirements. If the waste heat recovered in a gas turbine topping cycle were used to drive a steam turbine rather than for an industrial process, this would effectively become a combined cycle plant.

G. Electricity

Transmission and Distribution

Transpower operates the national transmission grid, which conveys electricity from most of the major power stations around the country to local distribution lines. It also conveys electricity directly to major users such as the New Zealand Aluminium Smelter, Tasman Pulp and Paper, and New Zealand Steel.

Electricity transmission between the North and South Islands is via a high-voltage direct current (HVDC) link from Benmore power station in the South Island to Haywards substation in the North Island. The link allows surplus power generated in the South Island to be transmitted to the North Island, where demand is greatest, but also allows transmission from north to south if required – for example, when South Island hydro storage is low. Work began on a major upgrade of the HVDC link in April 2010. Testing of the new equipment is now scheduled to start in late 2012 and to be made commercially available from February 2013. This project will first increase the HVDC link capacity from 700 MW to 1,000 MW, then to 1,200 MW in 2014.

There are 29 lines companies in New Zealand, with a variety of ownership forms from publicly listed companies to local community-owned trusts. Lines companies convey electricity to users within their network areas.

Consumption

Total electricity demand was down 1% compared with 2010. Much of this reduction can be attributed to reduced demand in the wake of the 22 February 2011 earthquake in Canterbury. Average annual demand growth from 2007 to 2011 was 0.5%.

The reduction in demand affected the commercial and residential sectors primarily, with drops of 1.4% and 2.3% respectively.

Households account for around a third of total electricity consumption, approximately 10% less than electricity consumption by industry. Consumption of electricity in industry is dominated by the wood, pulp, paper and printing sector and basic metals, with the Tiwai Point aluminium smelter being the largest single user of electricity in the country.

The North Island uses almost two thirds of the electricity generated in New Zealand, with Auckland accounting for around 25% of the total.

Wholesale Electricity Market

The buying and selling of wholesale electricity is done via a “pool”, where electricity generators offer electricity to the market and retailers bid to buy the electricity at prices set half-hourly. The market is operated under the Electricity Industry (Enforcement) Regulations 2010 and the Electricity Industry Participation Code 2010. Electricity generators and buyers can also enter into hedge contracts to manage the financial risks of trading electricity at spot prices.

Retail Electricity Market

Different retailers compete in various parts of New Zealand. These include the five major generators/retailers: Contact Energy (and subsidiary Empower), Genesis Energy (and subsidiary Energy Online), Meridian Energy (and subsidiary Powershop), Mighty River Power (through its brands and subsidiaries Mercury Energy, Bosco Connect and Tiny Mighty Power) and TrustPower. Together those major retailers hold 95% of the retail market, based on customer connection information published by the EA in December 2011. Other independent retailers include Bay of Plenty Energy and Auckland Gas (which are both owned by Todd Energy) trade together as Nova Energy in most markets in which they retail, and Simply Energy, Pulse Energy and Opunake Hydro.

Genesis Energy and its subsidiary Energy Online together hold the largest share of the retail market at 27%, largely unchanged from the end of 2010. Over the past few years the market-share of smaller retailers – particularly Pulse Energy – has grown substantially to over 2% by the end of 2011, primarily due to growth in the customer base of Pulse Energy. Approximate market share based on consumer connection numbers is shown in Figure G.1f.

In mid-2011 the Electricity Authority began the “What’s My Number” campaign to promote the benefits of comparing and switching retailers. The campaign has seen a sustained increase in customer switching activity.

Figure G.1d: Observed Electricity Consumption by Sector for 2011

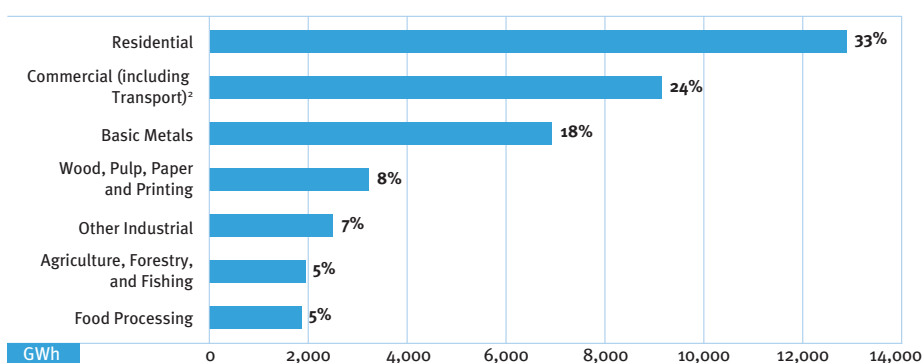
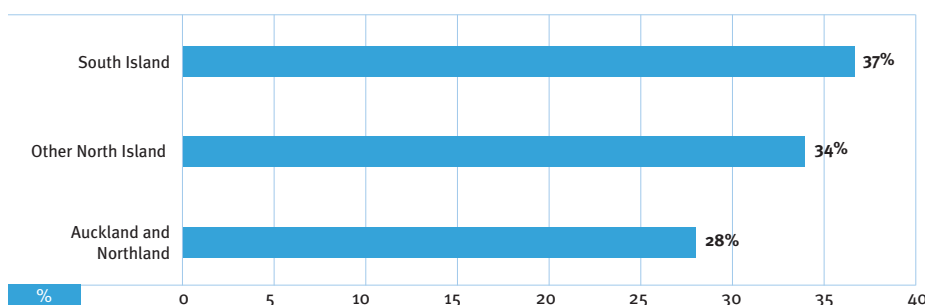


Figure G.1e: Electricity Demand by Region for 2011



G. Electricity

Table G.1: Electricity Energy Balance 2007–2011 (GWh)

	2007	2008	2009	2010	2011	Δ2007/2011 p.a.	Δ2010/2011	
SUPPLY	TOTAL GROSS PRODUCTION	43,750	43,838	43,454	44,878	44,494	0.4%	-0.9%
	Own Use ~ Parasitic Load ¹	-1,467	-1,532	-1,373	-1,421	-1,356	-1.9%	-4.6%
	TOTAL NET PRODUCTION	42,284	42,306	42,081	43,457	43,138	0.5%	-0.7%
	Electricity Only Plant	39,302	39,283	39,674	40,846	40,626	0.8%	-0.5%
	Combined Heat and Power Plant	2,982	3,023	2,407	2,611	2,513	-4.2%	-3.8%
	TOTAL LINES LOSSES²	-3,029	-3,130	-2,992	-3,101	-3,093	0.5%	-0.3%
	Losses ~ Transmission	-1,338	-1,451	-1,350	-1,356	-1,345	0.1%	-0.8%
Losses ~ Distribution	-1,691	-1,679	-1,642	-1,745	-1,748	0.8%	0.1%	
TOTAL CONSUMPTION (Calculated)	39,255	39,176	39,089	40,356	40,046	0.5%	-0.8%	
Statistical Difference ³	-0.5%	1.1%	1.4%	1.8%	2.3%		29.1%	
TOTAL CONSUMPTION (Observed)	39,442	38,745	38,543	39,640	39,128	-0.2%	-1.3%	
DEMAND	Agriculture, Forestry and Fishing	1,837	1,815	1,835	1,945	1,937	1.3%	-0.4%
	Industrial	15,240	14,431	13,665	14,607	14,528	-1.2%	-0.5%
	Commercial (including Transport) ⁴	9,167	9,277	9,162	9,276	9,146	-0.1%	-1.4%
	Residential	12,456	12,678	13,209	13,177	12,879	0.8%	-2.3%
	Calculated Onsite Consumption ⁵	742	545	673	635	638	-3.7%	0.5%
	Electricity Entering System ⁶	41,542	41,762	41,408	42,823	42,501		
National Loss Ratio ⁷	7.3%	7.5%	7.2%	7.2%	7.3%			

Notes to Table G.1: ¹ Electricity used by the generator for auxiliary services (e.g. lighting, coal grinders) and internal losses.

² Loss information is obtained through electricity disclosures by Transpower and the distribution companies.

³ Statistical differences exist between supply and demand figures, as the information comes from different sources.

⁴ Transport is included with Commercial as the Ministry of Economic Development does not have a reliable time series of electricity used for transport (electric trains, trolley buses and so on).

For the balance tables presented at the front of the *Energy Data File*, estimates have been made based on the outputs of the Ministry of Transport's Vehicle Fleet Model and data collected on consumption by trains and buses. Sales to different parts of the commercial transport sector does not provide an accurate enough reflection of demand for transport, as it includes some electricity used for airports, train stations and bus terminals etc, which should be excluded from the transport sector under IEA definitions.

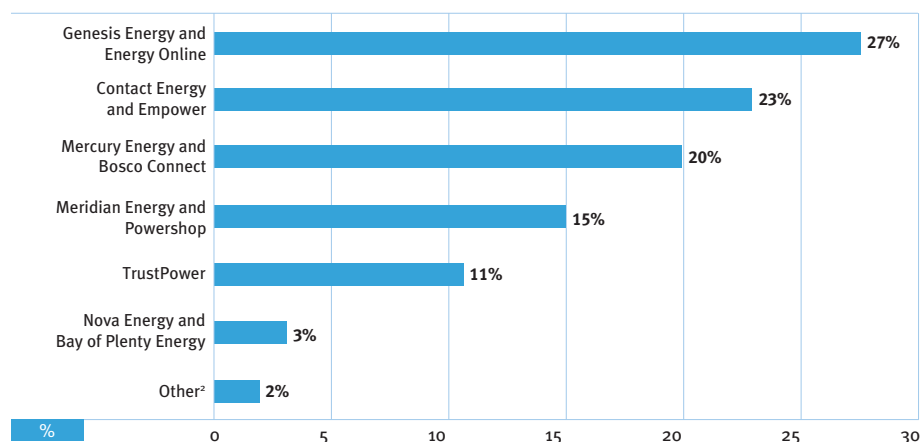
⁵ Calculated estimate based on the difference between net production and electricity entering the system. This includes

on-site generation not exported into the network. In the balance tables in Section B, this figure is added to the Industrial Unallocated sector.

⁶ Total amount of electricity entering the local and national transmission and distribution networks. Includes embedded generation.

⁷ Loss ratio calculated as the transmission and distribution losses divide by the total electricity entering the system.

Figure G.1f: Approximate Market Share¹ Groupings Based on Registry Count of Active ICPs at December 2011



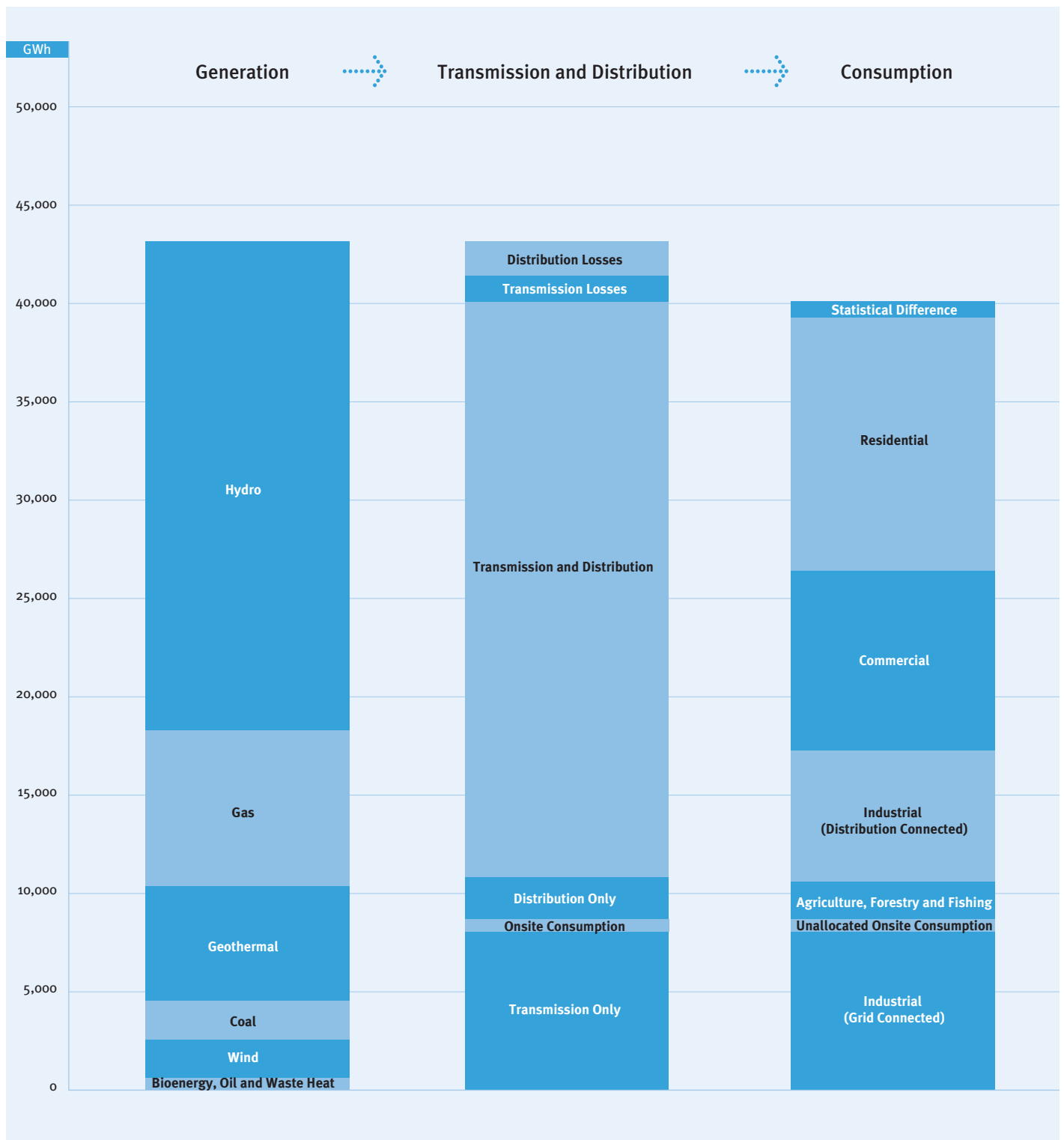
This data is sourced from Electricity Authority (EA) Registry Statistics and is not collected by MED directly. For detailed information visit the Registry Statistics section of EC's website at: www.ea.govt.nz/industry/market/statistics-reports/.

Notes to Figure G.1f: ¹ Retailers have been aggregated into these multi-retailer groupings based on ownership. Where one company fully owns more than one retail brand these have been added together from the raw data available from the EA. In addition to this, some retailers do not have ICPs registered under their own name but may use another retailer's (e.g. Energy Direct NZ). All market-share figures presented are only approximate and do not take account of demand or the size of consumers. Some retailers may have fewer customers than other retailers but have larger industrial-use customers, so actually supply a larger amount of electricity in GWh.

² "Other" is primarily King Country Energy and Pulse Energy.

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Figure G.1g: Electricity Flow Summary for 2011



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Electricity Generation

Table G.2a: Net Electricity Generation by Fuel Type (GWh)

Calendar Year or Quarter	Renewable						Non-renewable					Total	Renewable Generation %	
	Hydro	Geothermal ¹	Biogas ¹	Wood ¹	Wind	Subtotal	Oil ²	Coal ¹	Gas ¹	Waste Heat ¹	Subtotal			
1975	16,497	1,350	41	306	-	18,194	787	1,046	51	42	1,926	20,120	90.4%	
1976	15,344	1,290	53	306	-	16,993	1,280	1,097	1,801	50	4,228	21,220	80.1%	
1977	14,573	1,217	53	306	-	16,149	729	910	3,955	50	5,644	21,792	74.1%	
1978	15,503	1,239	53	306	-	17,101	199	742	3,763	50	4,754	21,854	78.2%	
1979	18,259	1,118	56	306	-	19,739	48	392	1,946	50	2,435	22,175	89.0%	
1980	19,171	1,206	57	306	-	20,741	-10	426	1,494	50	1,959	22,700	91.4%	
1981	19,483	1,141	91	306	-	21,021	-7	390	1,813	65	2,260	23,281	90.3%	
1982	18,121	1,158	102	306	-	19,688	3	422	4,382	70	4,876	24,564	80.1%	
1983	19,554	1,173	105	306	-	21,138	144	651	4,137	70	5,002	26,139	80.9%	
1984	20,173	1,294	105	329	-	21,901	1	729	4,553	66	5,348	27,250	80.4%	
1985	19,511	1,165	105	336	-	21,117	48	717	5,744	63	6,572	27,689	76.3%	
1986	21,877	1,234	105	336	-	23,552	6	556	4,475	63	5,099	28,652	82.2%	
1987	21,709	1,228	106	336	-	23,380	9	845	4,724	63	5,641	29,021	80.6%	
1988	22,733	1,237	106	336	-	24,413	6	723	5,118	63	5,910	30,323	80.5%	
1989	22,333	1,706	106	336	-	24,481	-2	446	5,557	63	6,064	30,545	80.1%	
1990	22,953	2,011	131	336	-	25,432	9	620	5,336	63	6,028	31,459	80.8%	
1991	22,666	2,158	151	336	-	25,311	23	451	6,561	63	7,098	32,409	78.1%	
1992	20,882	2,131	156	336	1	23,505	188	1,171	7,006	63	8,427	31,932	73.6%	
1993	23,258	2,247	156	336	1	25,998	59	696	6,543	63	7,360	33,358	77.9%	
1994	25,579	2,101	162	336	1	28,180	20	647	5,117	63	5,846	34,026	82.8%	
1995	27,259	2,039	172	336	1	29,808	48	842	4,489	63	5,442	35,250	84.6%	
1996	25,921	2,038	146	310	8	28,424	15	876	6,183	63	7,136	35,560	79.9%	
1997	23,026	2,130	139	312	13	25,621	-2	1,535	8,775	63	10,371	35,991	71.2%	
1998	25,066	2,386	137	409	22	28,019	1	1,365	7,131	63	8,560	36,579	76.6%	
1999	22,690	2,636	116	392	39	25,873	0	1,678	9,030	63	10,771	36,643	70.6%	
2000	24,191	2,756	103	447	119	27,615	0	1,445	8,946	63	10,454	38,069	72.5%	
2001	21,464	2,678	101	361	138	24,742	0	1,980	11,450	47	13,477	38,218	64.7%	
2002	24,624	2,655	131	231	154	27,796	0	1,925	9,572	93	11,590	39,386	70.6%	
2003	23,387	2,595	178	192	145	26,495	19	3,707	9,148	84	12,959	39,454	67.2%	
2004	26,660	2,631	199	236	358	30,084	23	4,474	6,600	83	11,180	41,264	72.9%	
2005	23,094	2,981	194	277	608	27,153	4	5,481	8,801	76	14,361	41,514	65.4%	
2006	23,337	3,177	218	299	616	27,648	22	5,176	9,206	71	14,475	42,123	65.6%	
2007	23,404	3,354	214	314	921	28,207	1	2,956	11,067	53	14,077	42,284	66.7%	
2008	22,114	3,966	205	324	1,048	27,657	123	4,515	9,955	56	14,650	42,306	65.4%	
2009	23,981	4,589	216	344	1,462	30,591	8	3,082	8,347	53	11,490	42,081	72.7%	
2010 ^R	24,472	5,550	217	346	1,618	32,202	2	1,929	9,267	57	11,255	43,457	74.1%	
2011 ^P	24,831	5,770	215	351	1,931	33,097	2	2,026	7,955	59	10,041	43,138	76.7%	
2010	Mar	5,710	1,161	56	94	414	7,435	1	636	2,070	13	2,720	10,155	73.2%
	Jun	5,974	1,491	54	86	404	8,010	0	444	2,492	15	2,952	10,962	73.1%
	Sep	6,631	1,450	54	84	387	8,606	0	354	2,683	15	3,053	11,659	73.8%
	Dec	6,156	1,448	54	81	413	8,151	0	494	2,021	15	2,530	10,682	76.3%
2011 ^P	Mar	6,157	1,401	54	83	431	8,125	0	342	1,674	15	2,031	10,156	80.0%
	Jun	6,504	1,471	54	95	483	8,607	0	397	1,850	15	2,262	10,868	79.2%
	Sep	6,238	1,475	54	85	544	8,396	0	670	2,632	15	3,317	11,713	71.7%
	Dec	5,932	1,423	54	88	472	7,969	1	616	1,799	15	2,431	10,400	76.6%
Δ2007/2011 p.a.		1.5%	14.5%	0.1%	2.8%	20.3%	4.1%	n.a.	-9.0%	-7.9%	2.8%	-8.1%	0.5%	
Δ2010/2011		1.5%	4.0%	-1.0%	1.5%	19.4%	2.8%	n.a.	5.0%	-14.2%	3.4%	-10.8%	-0.7%	

Notes to Table G.2a: ¹ These fuels also include generation from cogeneration plants.

² Negative generation by oil-fired plants implies a net import into the station to maintain station viability and system voltage stability.

^P = Provisional figures. Electricity information is collected from a number of sources including Statistics New Zealand, the Electricity Commission, and generators. Some generator-supplied information is collected only on a March year basis so figures for the most recent year in the *Energy Data File* will always be provisional estimates.

^R = Revised figures.

n.a. = Not applicable.

¹ Gigawatt Hour (GWh) = 0.0036 Petajoules (PJ).

G. Electricity

Table G.2b: Net Electricity Generation by Fuel Type (Gross PJ)

Calendar Year or Quarter	Renewable						Non-renewable					Total	
	Hydro	Geothermal ¹	Biogas ¹	Wood ¹	Wind	Subtotal	Oil ²	Coal ¹	Gas ¹	Waste Heat ¹	Subtotal		
1975	59.39	4.86	0.15	1.10	-	65.50	2.83	3.77	0.18	0.15	6.93	72.43	
1976	55.24	4.64	0.19	1.10	-	61.17	4.61	3.95	6.48	0.18	15.22	76.39	
1977	52.46	4.38	0.19	1.10	-	58.14	2.62	3.28	14.24	0.18	20.32	78.45	
1978	55.81	4.46	0.19	1.10	-	61.56	0.72	2.67	13.55	0.18	17.11	78.68	
1979	65.73	4.02	0.20	1.10	-	71.06	0.17	1.41	7.00	0.18	8.77	79.83	
1980	69.02	4.34	0.21	1.10	-	74.67	-0.04	1.53	5.38	0.18	7.05	81.72	
1981	70.14	4.11	0.33	1.10	-	75.68	-0.03	1.40	6.53	0.23	8.14	83.81	
1982	65.24	4.17	0.37	1.10	-	70.88	0.01	1.52	15.77	0.25	17.55	88.43	
1983	70.39	4.22	0.38	1.10	-	76.10	0.52	2.34	14.89	0.25	18.01	94.10	
1984	72.62	4.66	0.38	1.18	-	78.84	0.00	2.62	16.39	0.24	19.25	98.10	
1985	70.24	4.19	0.38	1.21	-	76.02	0.17	2.58	20.68	0.23	23.66	99.68	
1986	78.76	4.44	0.38	1.21	-	84.79	0.02	2.00	16.11	0.23	18.36	103.15	
1987	78.15	4.42	0.38	1.21	-	84.17	0.03	3.04	17.01	0.23	20.31	104.47	
1988	81.84	4.45	0.38	1.21	-	87.89	0.02	2.60	18.43	0.23	21.28	109.16	
1989	80.40	6.14	0.38	1.21	-	88.13	-0.01	1.61	20.01	0.23	21.83	109.96	
1990	82.63	7.24	0.47	1.21	-	91.55	0.03	2.23	19.21	0.23	21.70	113.25	
1991	81.60	7.77	0.55	1.21	-	91.12	0.08	1.62	23.62	0.23	25.55	116.67	
1992	75.17	7.67	0.56	1.21	0.00	84.62	0.68	4.21	25.22	0.23	30.34	114.96	
1993	83.73	8.09	0.56	1.21	0.00	93.59	0.21	2.51	23.55	0.23	26.50	120.09	
1994	92.08	7.56	0.58	1.21	0.00	101.45	0.07	2.33	18.42	0.23	21.05	122.49	
1995	98.13	7.34	0.62	1.21	0.00	107.31	0.17	3.03	16.16	0.23	19.59	126.90	
1996	93.32	7.34	0.52	1.12	0.03	102.32	0.05	3.15	22.26	0.23	25.69	128.02	
1997	82.89	7.67	0.50	1.12	0.05	92.23	-0.01	5.53	31.59	0.23	37.33	129.57	
1998	90.24	8.59	0.49	1.47	0.08	100.87	0.00	4.91	25.67	0.23	30.82	131.69	
1999	81.69	9.49	0.42	1.41	0.14	93.14	0.00	6.04	32.51	0.23	38.77	131.92	
2000	87.09	9.92	0.37	1.61	0.43	99.41	0.00	5.20	32.20	0.23	37.63	137.05	
2001	77.27	9.64	0.36	1.30	0.50	89.07	-	7.13	41.22	0.17	48.52	137.59	
2002	88.65	9.56	0.47	0.83	0.55	100.06	0.00	6.93	34.46	0.34	41.72	141.79	
2003	84.19	9.34	0.64	0.69	0.52	95.38	0.07	13.35	32.93	0.30	46.65	142.04	
2004	95.98	9.47	0.72	0.85	1.29	108.30	0.08	16.11	23.76	0.30	40.25	148.55	
2005	83.14	10.73	0.70	1.00	2.19	97.75	0.01	19.73	31.68	0.27	51.70	149.45	
2006	84.01	11.44	0.79	1.08	2.22	99.53	0.08	18.63	33.14	0.26	52.11	151.64	
2007	84.25	12.07	0.77	1.13	3.31	101.54	0.00	10.64	39.84	0.19	50.68	152.22	
2008	79.61	14.28	0.74	1.17	3.77	99.56	0.44	16.26	35.84	0.20	52.74	152.30	
2009	86.33	16.52	0.78	1.24	5.26	110.13	0.03	11.09	30.05	0.19	41.36	151.49	
2010 ^R	88.10	19.98	0.78	1.24	5.82	115.93	0.01	6.94	33.36	0.21	40.52	156.45	
2011 ^P	89.39	20.77	0.77	1.26	6.95	119.15	0.01	7.29	28.64	0.21	36.15	155.30	
2010	Mar	20.56	4.18	0.20	0.34	1.49	26.77	0.00	2.29	7.45	0.05	9.79	36.56
	Jun	21.51	5.37	0.19	0.31	1.45	28.83	0.00	1.60	8.97	0.05	10.63	39.46
	Sep	23.87	5.22	0.19	0.30	1.39	30.98	0.00	1.28	9.66	0.05	10.99	41.97
	Dec	22.16	5.21	0.19	0.29	1.49	29.35	0.00	1.78	7.28	0.05	9.11	38.45
2011 ^P	Mar	22.16	5.04	0.19	0.30	1.55	29.25	0.00	1.23	6.03	0.05	7.31	36.56
	Jun	23.41	5.29	0.19	0.34	1.74	30.98	0.00	1.43	6.66	0.05	8.14	39.13
	Sep	22.46	5.31	0.19	0.30	1.96	30.23	0.00	2.41	9.48	0.05	11.94	42.17
	Dec	21.36	5.12	0.19	0.32	1.70	28.69	0.00	2.22	6.48	0.05	8.75	37.44
Δ2007/2017 p.a.		1.5%	14.5%	0.1%	2.8%	20.3%	4.1%	n.a.	-9.0%	-7.9%	2.8%	-8.1%	0.5%
Δ2010/2011		1.5%	4.0%	-1.0%	1.5%	19.4%	2.8%	n.a.	5.0%	-14.2%	3.4%	-10.8%	-0.7%

Notes to Table G.2b: ¹ These fuels also include generation from cogeneration plants.

² Negative generation by oil-fired plants implies a net import into the station to maintain station viability and system voltage stability.

^P = Provisional figures. Electricity information is collected from a number of sources including Statistics New Zealand, the Electricity Commission, and generators. Some generator-supplied information is collected only on a March year basis so figures for the most recent year in the *Energy Data File* will always be provisional estimates.

^R = Revised figures.

n.a. = Not applicable.

¹ Gigawatt Hour (GWh) = 0.0036 Petajoules (PJ).

G. Electricity

Table G.2c: Net Electricity Generation by Fuel Type – Cogeneration Separated (GWh)

Calendar Year or Quarter	Electricity-only Plants								Cogeneration ²	Total
	Hydro	Geothermal	Biogas	Wind	Oil ¹	Coal	Gas	Subtotal		
1975	16,497	1,296	-	-	787	1,030	28	19,638	482	20,120
1976	15,344	1,236	-	-	1,280	1,081	1,778	20,719	501	21,220
1977	14,573	1,163	-	-	729	894	3,932	21,291	501	21,792
1978	15,503	1,185	-	-	199	705	3,740	21,332	522	21,854
1979	18,259	1,064	-	-	48	345	1,923	21,639	536	22,175
1980	19,171	1,152	-	-	-10	378	1,471	22,162	538	22,700
1981	19,483	1,087	-	-	-7	342	1,790	22,695	586	23,281
1982	18,121	1,104	-	-	3	374	4,343	23,945	619	24,564
1983	19,554	1,119	-	-	144	603	4,092	25,512	627	26,139
1984	20,173	1,240	-	-	1	681	4,508	26,603	647	27,250
1985	19,511	1,111	-	-	48	653	5,698	27,021	668	27,689
1986	21,877	1,180	-	-	6	492	4,430	27,984	668	28,652
1987	21,709	1,174	-	-	9	765	4,677	28,334	686	29,021
1988	22,733	1,183	-	-	6	582	5,071	29,575	747	30,323
1989	22,333	1,652	-	-	-2	307	5,510	29,800	745	30,545
1990	22,953	1,957	25	-	9	436	5,280	30,660	799	31,459
1991	22,666	2,104	46	-	23	227	6,499	31,565	845	32,409
1992	20,882	2,077	50	1	188	947	6,940	31,083	849	31,932
1993	23,258	2,193	50	1	59	454	6,474	32,489	870	33,358
1994	25,579	2,047	50	1	20	397	4,942	33,035	991	34,026
1995	27,259	1,985	58	1	48	592	4,172	34,115	1,135	35,250
1996	25,921	1,984	67	8	15	631	5,556	34,181	1,379	35,560
1997	23,026	2,077	79	13	-2	1,226	7,225	33,644	2,347	35,991
1998	25,066	2,331	66	22	1	781	5,328	33,595	2,985	36,579
1999	22,690	2,583	72	39	0	1,123	7,213	33,720	2,923	36,643
2000	24,191	2,717	71	119	0	889	7,432	35,419	2,649	38,069
2001	21,464	2,627	67	138	-	1,373	9,421	35,090	3,128	38,218
2002	24,624	2,606	76	154	0	1,362	7,718	36,539	2,847	39,386
2003	23,387	2,550	111	145	19	3,035	7,060	36,307	3,147	39,454
2004	26,660	2,584	133	358	23	3,816	4,920	38,494	2,771	41,264
2005	23,094	2,922	129	608	4	4,867	6,849	38,473	3,041	41,514
2006	23,337	3,125	146	616	22	4,536	7,487	39,268	2,855	42,123
2007	23,404	3,305	148	921	1	2,354	9,170	39,302	2,982	42,284
2008	22,114	3,917	141	1,048	123	3,943	7,997	39,283	3,023	42,306
2009	23,981	4,539	147	1,462	8	2,528	7,009	39,674	2,407	42,081
2010 ^R	24,472	5,499	152	1,618	2	1,300	7,805	40,846	2,611	43,457
2011 ^P	24,831	5,718	151	1,931	2	1,477	6,516	40,626	2,513	43,138
2010 Mar	5,710	1,149	38	414	1	477	1,657	9,445	710	10,155
2010 Jun	5,974	1,478	38	404	0	278	2,153	10,326	636	10,962
2010 Sep	6,631	1,437	38	387	0	198	2,328	11,020	639	11,659
2010 Dec	6,156	1,435	38	413	0	347	1,667	10,056	626	10,682
2011 ^P Mar	6,157	1,388	38	431	0	193	1,371	9,577	579	10,156
2011 Jun	6,504	1,458	38	483	0	251	1,578	10,312	557	10,868
2011 Sep	6,238	1,463	38	544	0	561	2,133	10,977	737	11,713
2011 Dec	5,932	1,410	38	472	1	473	1,434	9,760	640	10,400
Δ2007/2011 p.a.	1.5%	14.7%	0.6%	20.3%	33.2%	-11.0%	-8.2%	0.8%	-4.2%	0.5%
Δ2010/2011	1.5%	4.0%	-0.4%	19.4%	0.2%	13.6%	-16.5%	-0.5%	-3.8%	-0.7%

Notes to Table G.2c: ¹ Negative generation by oil-fired plants implies a net import into the station to maintain station viability and system voltage stability.

² Individual estimates of generation from cogeneration plant types can be obtained by subtracting the electricity-only plant information from Table G.2a.

^P = Provisional figures. Electricity information is collected from a number of sources including Statistics New Zealand, the Electricity Commission, and generators. Some generator-supplied information is collected only on a March year basis so figures for the most recent year in the *Energy Data File* will always be provisional estimates.

^R = Revised figures.

n.a. = Not applicable.

G. Electricity

Table G.2d: Estimated Generation by Fuel Type For 2011 Calendar Year (GWh)

Generating Stations ¹	Hydro	Geothermal	Oil ²	Coal ²	Gas ²	Biogas	Waste Heat	Wood ²	Wind	Total
<i>North Island</i>										
Above or equal to 100 MW	4,303	3,513	1.2	1,477	6,436	-	-	-	1,041	16,772
Less than 100 MW but greater than or equal to 10 MW	3,043	2,117	-	-	23	-	-	-	605	5,788
Less than 10 MW	165	89	-	-	57	151	-	-	25.3	487
Cogeneration	-	51.3	-	530	1,439	52.2	46	348	-	2,466
North Island Total	7,511	5,770	1.2	2,007	7,955	204	46	348	1,671	25,513
<i>South Island</i>										
Above or equal to 100 MW	15,355	-	-	-	-	-	-	-	-	15,355
Less than 100 MW but greater than or equal to 10 MW	1,643	-	-	-	-	-	-	-	255	1,898
Less than 10 MW	321	-	0.02	-	-	-	-	-	4.9	326
Cogeneration	-	-	-	18.8	-	11.6	13.3	2.6	-	46
South Island Total	17,319	-	0.02	19	-	12	13	2.6	260	17,625
<i>New Zealand</i>										
Above or equal to 100 MW	19,658	3,513	1.2	1,477	6,435	-	-	-	1,047	32,127
Less than 100 MW but greater than or equal to 10 MW	4,686	2,117	-	-	23	-	-	-	853	7,685
Less than 10 MW	486	88.6	0	-	58	151	-	-	30	813
Cogeneration	-	51.3	-	549	1,439	64	59	351	-	2,513
New Zealand Total	24,831	5,770	1.2	2,026	7,955	215	59	351	1,931	43,138

Notes to Table G.2d: ¹ Stations have been aggregated according to their rated capacity.

² Multi-fuel plants such as the original Huntly station's dual-fired generating capacity (1,000 MW) have been split between fuels according to the units of electricity generated by the respective fuels during the period.

G. Electricity

Electricity Generation Capacity

Table G.3a: Operational Electricity Generation Capacity by Plant Type (MW)¹

In December	Electricity-only Plants									Cogeneration			Total
	Hydro	Geothermal	Biogas	Wind	Diesel	Coal/Gas	Gas	Other Thermal ²	Subtotal	Gas ³	Other ⁴	Subtotal	
1975	3,665	173	-	-	-	-	180	930	4,948	-	83	83	5,031
1976	3,665	173	-	-	-	-	400	1,050	5,288	-	83	83	5,371
1977	3,825	173	-	-	-	-	447	1,050	5,495	-	83	83	5,578
1978	3,825	173	-	-	-	-	494	1,050	5,542	-	88	88	5,629
1979	4,089	173	-	-	220	-	494	1,300	6,276	-	88	88	6,364
1980	4,301	173	-	-	220	-	494	1,300	6,488	-	88	88	6,576
1981	4,326	173	-	-	220	-	494	1,300	6,513	-	107	107	6,620
1982	4,328	157	-	-	220	-	494	1,300	6,499	-	107	107	6,606
1983	4,474	157	-	-	220	250	494	1,300	6,895	-	107	107	7,002
1984	4,543	157	-	-	220	750	494	1,300	7,464	-	107	107	7,571
1985	4,760	157	-	-	220	1,000	494	1,300	7,931	-	107	107	8,038
1986	4,760	157	-	-	220	1,000	494	1,300	7,931	-	107	107	8,038
1987	4,760	157	-	-	220	1,000	494	1,300	7,931	-	143	143	8,074
1988	4,760	175	-	-	220	1,000	314	1,300	7,769	-	143	143	7,912
1989	4,760	261	-	-	220	1,000	314	1,300	7,855	-	143	143	7,998
1990	4,760	261	4	-	220	1,000	314	1,300	7,858	-	143	143	8,001
1991	4,760	261	7	-	220	1,000	314	1,090	7,652	-	143	143	7,795
1992	5,192	261	7	-	220	1,000	314	850	7,844	-	143	143	7,987
1993	5,192	261	7	0	220	1,000	314	850	7,844	-	143	143	7,987
1994	5,192	265	7	0	220	1,000	314	850	7,848	-	144	144	7,992
1995	5,192	265	8	0	220	1,000	314	850	7,849	62	150	212	8,061
1996	5,192	248	11	4	220	1,000	314	600	7,589	72	145	217	7,805
1997	5,192	318	11	4	0	1,000	220	600	7,346	267	221	488	7,833
1998	5,192	328	11	4	0	1,000	357	480	7,373	267	221	488	7,860
1999	5,199	353	11	36	0	1,000	737	440	7,776	267	216	483	8,259
2000	5,202	365	11	36	0	1,000	737	440	7,791	311	221	532	8,323
2001	5,202	365	11	36	0	1,000	737	440	7,791	314	221	536	8,327
2002	5,341	365	14	54	0	1,000	737	440	7,952	347	226	573	8,525
2003	5,348	370	22	72	0	1,000	737	440	7,988	337	226	563	8,551
2004	5,345	370	22	165	155	1,000	777	440	8,275	337	228	565	8,840
2005	5,345	425	22	168	155	1,000	821	330	8,267	340	243	583	8,851
2006	5,345	425	23	169	155	1,000	832	330	8,280	340	244	584	8,864
2007	5,348	443	26	320	155	1,000	1,217	330	8,839	331	244	575	9,414
2008	5,371	585	27	321	155	1,000	1,227	100	8,787	339	244	582	9,369
2009	5,325	625	29	496	155	1,000	1,227	-	8,858	304	237	541	9,398
2010	5,252	723	29	539	155	1,000	1,397	-	9,096	336	235	571	9,667
2011	5,252	723	29	614	164	1,000	1,397	-	9,180	336	235	571	9,751
Δ2007/2011 p.a.	-0.4%	13.0%	3.0%	17.7%	1.4%	0.0%	3.5%	n.a.	1.0%	0.3%	-0.9%	-0.2%	0.9%
Δ2010/2011	0.0%	0.0%	0.0%	13.9%	5.8%	0.0%	0.0%	n.a.	0.9%	0.0%	0.0%	0.0%	0.9%

Notes to Table G.3a: ¹ All capacities are net of any plant decommissioning.

² "Other Thermal" in this instance includes generation by all major coal-only (Meremere), fuel oil-only (Marsden A and B), and gas/fuel oil plants (New Plymouth).

³ Plants that run solely on natural gas are listed under "Gas". Multi-fuelled plants that run partly on natural gas are listed under "Other".

⁴ Includes cogeneration by some multi-fuel or single-fuel biomass, coal, liquid fuel and geothermal plants. It also includes multi-fuelled plants running partly on natural gas.

n.a. = Not applicable.

G. Electricity

Figure G.3: Operational Electricity Generation Capacity by Plant Type (MW)

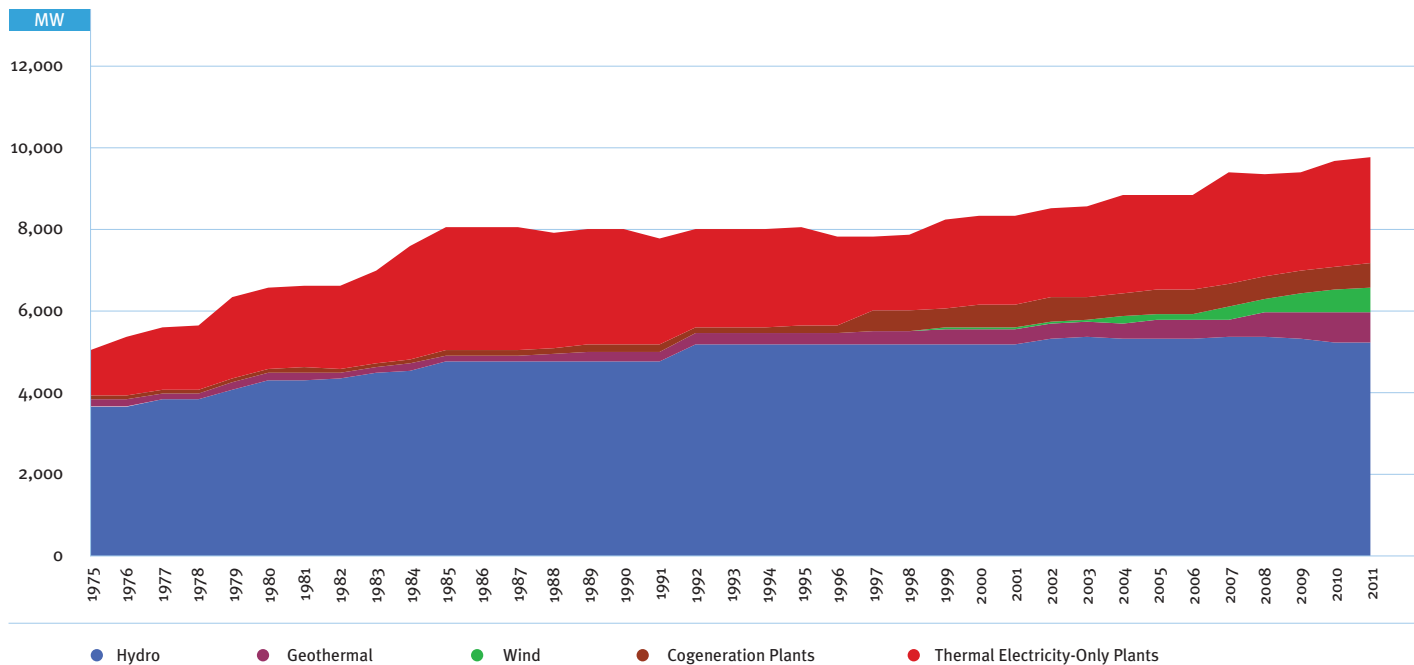


Table G.3b: Estimated Generating Capacity by Fuel Type December 2011 (MW)

Generating Stations ¹	Hydro	Geothermal	Oil ²	Coal ²	Gas ²	Biogas	Waste Heat	Wood ²	Wind	Total
<i>North Island</i>										
Above or equal to 100 MW	1,096	422	155	800	1,535	-	-	-	320	4,328
Less than 100 MW but greater or equal to 10 MW	681	287	-	-	50	-	-	-	188	1,205
Less than 10 MW	42	15	9	-	12	29	-	-	8.9	116
Cogeneration	-	8.0	-	116	345	9.6	15	66	-	559
North Island Total	1,818	731	164	916	1,942	39	15	66	517	6,208
<i>South Island</i>										
Above or equal to 100 MW	3,123	-	-	-	-	-	-	-	-	3,123
Less than 100 MW but greater or equal to 10 MW	247	-	-	-	-	-	-	-	94	341
Less than 10 MW	64	-	0.4	-	-	-	-	-	3.4	67
Cogeneration	-	-	-	3.9	0.0	1.9	3.9	1.7	-	12
South Island Total	3,434	-	0.4	3.9	0.0	1.9	3.9	1.7	97	3,543
<i>New Zealand</i>										
Above or equal to 100 MW	4,219	422	155	800	1,535	-	-	-	320	7,451
Less than 100 MW but greater or equal to 10 MW	928	287	-	-	50	-	-	-	282	1,546
Less than 10 MW	105	14.5	10	-	12	29	-	-	12	183
Cogeneration	-	8.0	-	120	345	12	19	67	-	571
New Zealand Total	5,252	731	165	920	1,942	41	19	67	614	9,751

Notes to Table G.3b: ¹ Stations have been aggregated according to their rated capacity.

² Multi-fuel plants such as the original Huntly station's dual-fired generating capacity (1,000 MW) have been split between fuels according to the units of electricity generated by the respective fuels during the period.

G. Electricity

Table G.3c: Information on Generating Plants December 2011 (10 MW or Greater)

Plant type	Plant Name	Owners/Operators	Commissioned	Capacity MW
Biomass/Coal/Gas	Kawerau A&B (Wood)	Carter Holt Harvey – Tasman	1966	19
Biomass/Coal/Gas	Kinleith Cogen	CHH & Genesis	1998	40
Biomass/Coal/Gas	PanPac Steam Cogen	Pan Pac	2005	13
Coal/Gas	Huntly Units 1-U4 ¹	Genesis Energy	1987	1,000
Coal/Gas Waste	Glenbrook Cogen	NZ Steel	1987/1997	112
Diesel	Whirinaki ²	Contact Energy	2004	155
Gas	Edgecumbe Cogen	Bay of Plenty (Todd Energy)	1996	10
Gas	Huntly Units 5~e3p CCGT	Genesis Energy	2007	385
Gas	Kapuni Cogen CCGT	Vector/Bay of Plenty (Todd Energy)	1998	22
Gas	Otauhu B	Contact Energy	2000/2005	380
Gas	Southdown Cogen CCGT	Mighty River Power	1997/2007	170
Gas	Stratford Peaker	Contact Energy	2010	200
Gas	Taranaki CCGT	Contact Energy	1998/2005	370
Gas	Te Rapa Cogen	Contact Energy	2000	48
Gas	Whareroa Cogen CCGT	Fonterra Todd JV	1997	68
Gas/Diesel	Huntly Units 6-P40 OCGT	Genesis Energy	2004	50
Geothermal	Kawerau	Mighty River Power	2008	93
Geothermal	Mokai	Tuaropaki Power	2000/2005/2007	112
Geothermal	Nga Awa Purua	Mighty River Power	2010	138
Geothermal	Ngawha	Tai Tokerau Trust/Top Energy	1998/2008	28
Geothermal	Ohaaki ³	Contact Energy	1989	57
Geothermal	Poihipi	Contact Energy	1997/2008	50
Geothermal	Rotokawa	Mighty River Power	1997	35
Geothermal	Tauhara	Contact Energy	2010	24
Geothermal	Wairakei	Contact Energy	1958/2005	172
Hydro	Aniwhenua	Bay of Plenty (Todd Energy)	1981	25
Hydro	Arapuni	Mighty River Power	1946	178
Hydro	Aratiatia	Mighty River Power	1964	78
Hydro	Argyle – Branch	TrustPower	1983	11
Hydro	Atiamuri	Mighty River Power	1962	74
Hydro	Aviemore	Meridian Energy	1968	220
Hydro	Benmore	Meridian Energy	1966	540
Hydro	Clyde	Contact Energy	1992	400
Hydro	Cobb	TrustPower	1956	32
Hydro	Coleridge	TrustPower	1914	47
Hydro	Highbank	TrustPower	1945	25
Hydro	Kaimai	TrustPower	1972–1981	42
Hydro	Kaitawa	Genesis Energy	1947	37
Hydro	Karapiro	Mighty River Power	1948	96
Hydro	Kumara	TrustPower	1928	11
Hydro	Manapouri ⁴	Meridian Energy	1971/2002/2008	730

TABLE CONTINUED ON PAGE 115

Company names are listed without the suffixes “Limited”, “New Zealand Limited” and “Co-operative Group Limited” where applicable. JV indicates a Joint Venture.

Bold indicates plants commissioning new capacity in 2011.

Notes to Table G.3c: ¹ 1,000 MW is the maximum capacity if running fully on gas. When running on coal and gas the capacity is less by up to 40 MW.

² The sale of Whirinaki to Contact took effect in December 2011.

³ Ohaaki plant capacity is 104 MW. However, it is restricted to 80 MW by steam field limitations.

⁴ Manapouri has a maximum capacity of 840 MW, but cannot generate this due to consent limits.

G. Electricity

Table G.3c: Information on Generating Plants December 2010 (10 MW or Greater) continued

Plant type	Plant Name	Owners/Operators	Commissioned	Capacity MW
Hydro	Mangahao	Mangahao JV	1925	38
Hydro	Maraetai	Mighty River Power	1954/1971	352
Hydro	Matahina	TrustPower	1967	76
Hydro	Ohakuri	Mighty River Power	1962	106
Hydro	Ohau A	Meridian Energy	1979	264
Hydro	Ohau B	Meridian Energy	1980	212
Hydro	Ohau C	Meridian Energy	1985	212
Hydro	Patea	TrustPower	1984	31
Hydro	Patearoa/Paerau	TrustPower	1984	12
Hydro	Piripaua	Genesis Energy	1942	44
Hydro	Rangipo	Genesis Energy	1983	120
Hydro	Roxburgh	Contact Energy	1956	280
Hydro	Tekapo A	Meridian Energy	1951	25
Hydro	Tekapo B	Meridian Energy	1977	160
Hydro	Teviot 1-7	Pioneer Generation	1983	11
Hydro	Tokaanu	Genesis Energy	1973	240
Hydro	Tuai	Genesis Energy	1929	60
Hydro	Waipapa	Mighty River Power	1961	54
Hydro	Waipori	TrustPower	1903/1955	84
Hydro	Waitaki	Meridian Energy	1936	105
Hydro	Whakamaru	Mighty River Power	1956	100
Hydro	Wheao	TrustPower	1984	26
Wind	Mahinerangi Wind Farm	TrustPower	2011	36
Wind	Tararua Wind Farm	TrustPower	1999–2007	161
Wind	Te Apiti Windfarm	Meridian Energy	2004	91
Wind	Te Rere Hau	NZ Windfarms	2006/2009	33
Wind	Te Uku	Meridian Energy	2011	64
Wind	West Wind Makara	Meridian Energy	2009	159
Wind	White Hill	Meridian Energy	2007	58

Company names are listed without the suffixes "Limited", "New Zealand Limited" and "Co-operative Group Limited" where applicable. JV indicates a Joint Venture.

Bold indicates plants commissioning new capacity in 2011.

G. Electricity

Transmission and Distribution

Table G.4: Transmission and Distribution Network Statistics Summary

Reporting Lines Company ¹	Circuit Length (km) ²			Transformer Capacity (MVA) ³			Loss Ratio ⁴
	Overhead	Underground	Total	Lines Company Owned	Other Company Owned	Total	
<i>North Island Distribution</i>							
Centralines	1,647	81	1,728	84	12	96	7.1%
Counties Power	2,420	613	3,033	277	28	304	5.8%
Eastland Network	3,273	381	3,654	211	31	242	6.6%
Electra	1,628	953	2,580	304	-	304	7.5%
Horizon Energy Distribution	1,919	445	2,364	226	78	304	4.4%
Northpower	4,970	856	5,826	511	3	514	3.6%
Powerco	22,322	7,598	29,920	2,911	92	3,003	7.5%
Scanpower	968	71	1,039	65	-	65	7.4%
The Lines Company	4,707	294	5,001	227	8	234	7.7%
Top Energy	3,051	798	3,849	251	41	292	8.6%
Unison Networks	5,493	2,489	7,982	1,036	31	1,066	5.3%
Vector Lines	8,461	9,259	17,720	3,902	467	4,369	5.4%
Waipa Networks	1,735	349	2,084	209	49	258	6.1%
WEL Networks	3,161	1,892	5,053	719	18	737	4.9%
Wellington Electricity	1,759	2,845	4,604	1,338	-	1,338	4.8%
Total	67,513	28,924	96,437	12,271	857	13,128	5.8%
<i>South Island Distribution</i>							
Alpine Energy	3,454	666	4,120	371	88	459	2.4%
Aurora Energy	3,891	1,730	5,621	815	62	877	6.2%
Buller Electricity	586	37	623	35	9	44	7.6%
Electricity Ashburton	2,540	420	2,961	474	11	485	5.7%
Electricity Invercargill	54	600	654	147	-	147	3.8%
Mainpower New Zealand	3,836	747	4,583	419	7	426	5.6%
Marlborough Lines	2,877	472	3,349	301	9	310	5.1%
Nelson Electricity	39	216	255	92	0	92	3.6%
Network Tasman	2,549	807	3,356	355	35	390	5.7%
Network Waitaki	1,645	85	1,730	172	12	184	7.6%
Orion New Zealand ⁵	5,823	4,885	10,708	1,760	209	1,970	2.5%
OtagoNet Joint Venture	4,350	42	4,392	161	38	199	7.6%
The Power Company	8,306	324	8,630	383	62	445	6.8%
Westpower	1,972	179	2,151	153	27	180	5.0%
Total	41,924	11,209	53,133	5,639	569	6,208	4.5%
<i>National Transmission and Distribution</i>							
Distribution Companies	109,437	40,133	149,570	17,910	1,426	19,336	5.4%
Transpower	11,658	91	11,749	14,464	-	14,464	4.4%
Total	121,095	40,224	161,319	32,374	1,426	33,800	7.3%

The summary information shown in Table G.4 is primarily sourced from information published by the Commerce Commission as part of the Electricity Distribution (Information Disclosure) Requirements 2008. More detailed information is available at www.comcom.govt.nz under Industry Regulation, Electricity. Some figures published here may differ from those on www.comcom.govt.nz website, as additional information is collected by MED.

Notes to Table G.4: ¹ Most information is displayed for 31 March 2011 or the year to 31 March 2011.

² For National Transmission (Transpower), "Underground" includes 80 km of High Voltage Direct Current (HVDC) submarine cables.

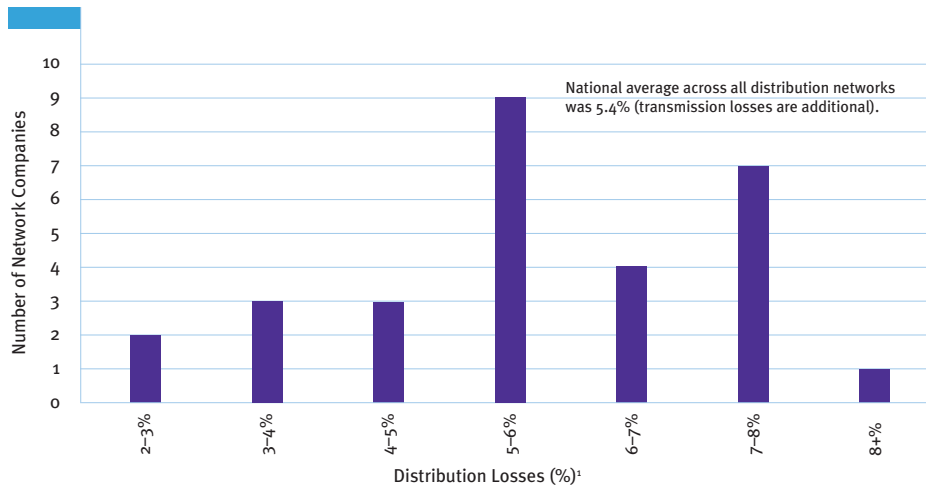
³ Units are Megavolt Amps (MVA).

⁴ Losses are approximated by subtracting 1. the electricity leaving a system for consumption or further distribution, from 2. the total amount of electricity entering a system (including distributed generation). Loss ratios are the percentage of electricity entering the system that is lost as lines losses.

⁵ Data for the 2011 March year is not available for Christchurch. Data presented in Table G.4 for Orion New Zealand is for the 2010 March year.

G. Electricity

Figure G.4: Electricity Distribution Network Losses for the 2011 March Year



Note to Figure G.4: ¹ As at 31 March 2011 there were 29 network (distribution) companies in New Zealand.

Electricity Consumption

Table G.5a: Observed Electricity Consumption by Sector (GWh)

Calendar Year Estimates	Agriculture, Forestry, and Fishing	Industrial						Commercial (including Transport) ²	Residential	Total Observed Consumption ³	
		Mining	Food Processing	Wood, Pulp, Paper and Printing	Chemicals	Basic Metals	Other Minor Sectors ¹				
1975	389						6,043	2,684	8,190	17,306	
1976	406						6,472	2,862	8,399	18,139	
1977	429						6,976	3,017	8,335	18,757	
1978	412						7,224	3,043	8,215	18,893	
1979	407						7,415	3,202	7,977	19,002	
1980	444						7,644	3,323	8,004	19,415	
1981	471						7,762	3,523	8,207	19,963	
1982	506						8,118	3,814	8,616	21,054	
1983	503						9,126	4,065	8,919	22,613	
1984	584						9,852	4,322	8,994	23,752	
1985	587						10,027	4,531	9,060	24,205	
1986	570						10,363	4,810	9,338	25,081	
1987	566						10,691	5,011	9,423	25,691	
1988	656						10,990	5,340	9,488	26,475	
1989	662						11,361	5,388	9,745	27,157	
1990	682	192	1,516	2,756	509	5,466	1,057	11,495	5,331	10,192	27,700
1991	708	235	1,482	2,860	599	5,610	1,005	11,791	5,371	10,415	28,285
1992	748	280	1,463	2,968	694	5,308	987	11,699	5,260	10,188	27,895
1993	777	308	1,591	3,079	765	5,766	1,098	12,607	5,340	10,210	28,933
1994	847	338	1,682	3,158	785	5,755	1,260	12,978	5,501	10,389	29,715
1995	891	382	1,698	3,268	822	5,752	1,267	13,189	5,728	10,530	30,338
1996	975	383	1,713	3,266	755	5,966	1,381	13,466	6,024	10,899	31,364
1997	1,129	387	1,850	3,317	733	6,136	1,413	13,836	6,444	10,859	32,269
1998	1,189	326	1,778	3,158	698	6,275	1,369	13,604	6,678	11,102	32,573
1999	1,266	281	1,834	3,567	667	6,351	1,316	14,017	6,872	11,088	33,243
2000	1,296	341	1,877	3,858	659	6,347	1,459	14,541	6,912	11,261	34,010
2001	1,420	352	1,977	3,799	711	6,291	1,442	14,570	6,963	11,601	34,554
2002	1,443	333	2,095	4,121	719	6,334	1,685	15,286	6,990	11,670	35,390
2003	1,438	313	2,037	3,774	678	6,381	1,604	14,788	7,277	12,085	35,588
2004	1,408	289	2,124	4,256	644	6,670	1,567	15,549	7,910	12,297	37,164
2005	1,480	322	2,285	4,129	753	6,711	1,561	15,761	8,241	12,144	37,626
2006	1,675	328	2,209	3,688	794	6,614	1,537	15,170	8,884	12,665	38,394
2007	1,837	371	2,165	3,445	781	6,869	1,609	15,240	9,167	12,456	38,699
2008	1,815	419	2,116	3,347	735	6,304	1,510	14,431	9,277	12,678	38,201
2009	1,835	490	2,154	3,343	678	5,621	1,379	13,665	9,162	13,209	37,870
2010 ^R	1,945	437	1,977	3,319	689	6,765	1,421	14,607	9,276	13,177	39,005
2011 ^{PE}	1,937	407	1,882	3,224	683	6,917	1,414	14,528	9,146	12,879	38,490
Δ2007/2011 p.a.	1.3%	2.4%	-3.4%	-1.6%	-3.3%	0.2%	-3.2%	-1.2%	-0.1%	0.8%	-0.1%
Δ2010/2011	-0.4%	-6.7%	-4.8%	-2.9%	-0.9%	2.2%	-0.5%	-0.5%	-1.4%	-2.3%	-1.3%

Electricity consumption by sector for calendar years has been estimated from sales and income information collected on a 31 March year basis by the Ministry of Economic Development in conjunction with grid exit point (GXP) demand data sourced from the Electricity Authority's Centralised Dataset (CDS). Estimates have been made to enable easier comparison with other sections of the *Energy Data File*.

¹ Includes: Mining, Textiles, Non-metallic Minerals, Mechanical/Electrical Equipment, Furniture and other Manufacturing and Building and Construction.

² Transport is included with Commercial, as the Ministry of Economic Development does not have a reliable time series of electricity used for transport (electric trains, trolley buses and so on). For the balance tables presented at the front of the *Energy Data File*, estimates have been made based on the outputs of the Ministry of Transport's Vehicle Fleet Model and data collected on consumption by trains and buses. Sales to different parts of the commercial transport sector does not provide an accurate enough reflection of demand for transport as it includes some electricity used for airports, train stations and bus terminals etc, which should be excluded from the Transport sector under IEA definitions.

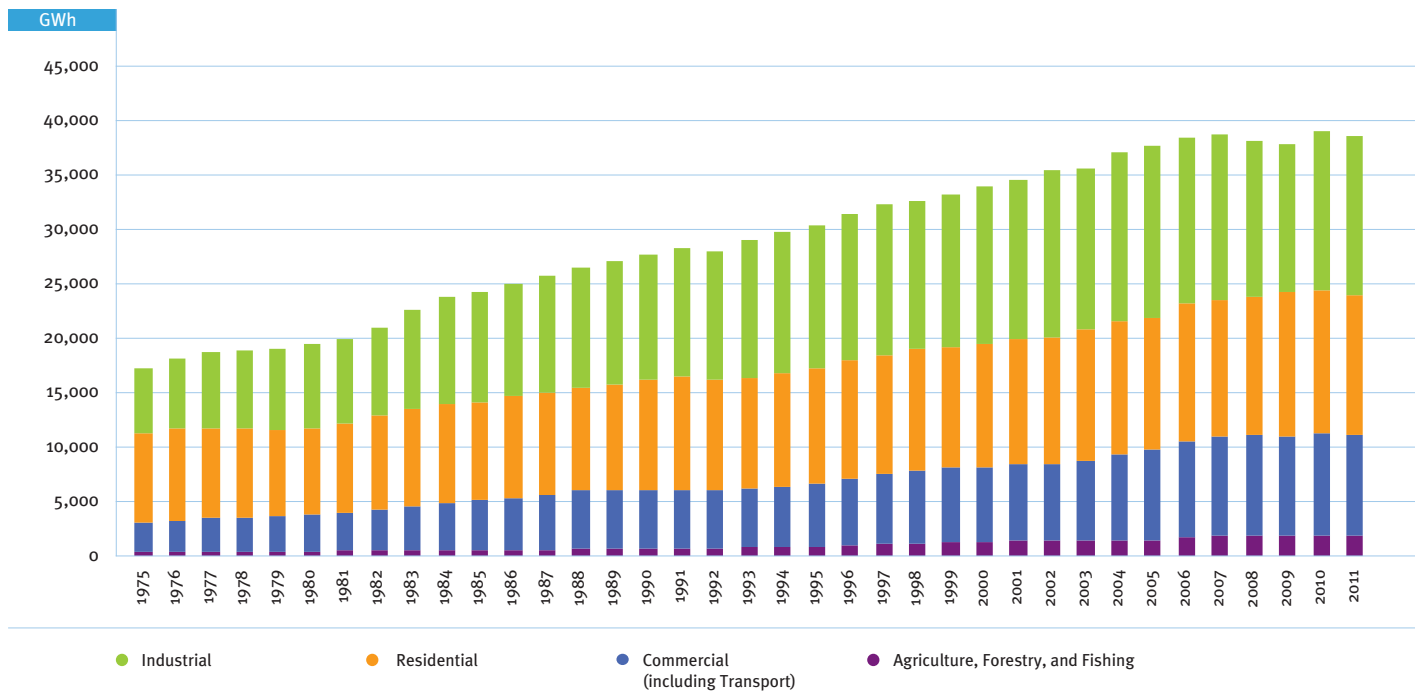
³ Observed consumption does not include the calculated additional unallocated consumption (mostly onsite), which is shown in the Balance Tables and in Table G.1.

^{PE} = Provisional Estimate. Sales and income information is only available up until 31 March 2011. Consumption for the 2011 year is estimated using the latest March year retail data and the Electricity Authority's Centralised Dataset.

^R = Revised figures.

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Figure G.5: Observed Electricity Consumption by Sector



G. Electricity

Table G.5b: Observed Percentage of Consumers (Active ICPs) by Sector

In March	Agriculture, Forestry, and Fishing	Industrial	Commercial (including Transport)	Residential	Total Surveyed Connections ¹	Total Active Connections ²
2002	4.1%	1.6%	7.2%	84.0%	1,787,842	1,803,364
2003	4.2%	1.8%	7.7%	86.3%	1,787,842	1,803,364
2004	4.1%	1.8%	7.6%	86.5%	1,810,908	1,828,234
2005	4.0%	1.8%	7.6%	86.6%	1,803,628	1,853,093
2006	4.1%	1.9%	8.3%	85.7%	1,871,308	1,882,942
2007	4.1%	2.0%	8.6%	85.3%	1,902,994	1,908,241
2008	3.9%	2.1%	8.1%	85.9%	1,894,974	1,938,010
2009	3.9%	2.0%	8.1%	86.0%	1,922,780	1,956,741
2010	3.6%	2.0%	8.6%	85.9%	1,925,911	1,975,472
2011	3.3%	1.8%	7.7%	87.2%	1,929,046	1,989,732

Consumer numbers can be estimated by Active Connections (Installation Control Points – ICPs) and are used to represent sectorial customer numbers.

Due to changes in sectorial definitions and to changes in the way this information was collected between 1995 and 2002, only figures from 2002 onwards are displayed.

Notes to Table G.5b: ¹Total Surveyed Connections is the number of connections observed in the annual electricity sales survey. The percentages displayed are based on the result of this survey, which is also used to complete Table G.6a.

²Total Active Connections, obtained from Electricity Authority Registry Statistics, are a more complete indication of how many active retail connections exist and should be used when comparing with market-share and switching information.

Table G.5c: Regional Electricity Demand Approximations for 2011

Region ¹	Approximate Share of National Demand
<i>North Island</i>	62.9%
North Auckland and Northland	10.2%
Central and South Auckland	18.3%
Waikato	8.1%
Bay of Plenty	6.9%
Eastland and Hawke's Bay	4.6%
Central North Island	4.5%
Taranaki	2.2%
Wellington	8.1%
<i>South Island</i>	37.1%
Nelson/Marlborough	3.0%
West Coast	0.9%
Canterbury	12.1%
Otago/Southland	21.1%

This data is sourced from the Electricity Authority's Centralised Dataset (CDS) and is not collected by the Ministry of Economic Development directly. For more detailed information – including time series data – visit the Electricity Commission's CDS: at www.ea.govt.nz/industry/monitoring/cds/centralised-dataset-web-interface/.

Note to Table G.5c: ¹Regions are those defined by the Electricity Authority (see the CDS webpage) and are not those defined by Regional Council boundaries. For ease of understanding "North Isthmus" as defined by the EA has been renamed "North Auckland and Northland" and "Auckland" has been renamed "Central and South Auckland". "South Canterbury" has been added to "Canterbury".

G. Electricity

Electricity Market Information

Table G.6a: Electricity Market Snapshot – 2011 March Year

	ANZSIC	ANZSIC	Sales ¹	Energy Cost ²	Line Cost ²	Total Cost ²	Average Cost	Number of Connections ³	Average Consumption
	2006	1996	MWh	\$(000)	\$(000)	\$(000)	c/kWh		MWh
Agriculture, forestry and fishing			1,964,316	228,821	127,519	356,340	18.14	63,512	30.93
Agriculture and Primary Sector Support Services	A01,A05	A01-A02	1,759,897	212,314	121,364	333,678	18.96	62,809	28.02
Forestry and Logging	A03	A03	53,331	5,104	2,528	7,632	14.31	348	153.12
Aquaculture, Fishing, Hunting and Trapping	A02,A04	A04	151,088	11,403	3,627	15,030	9.95	355	425.68
Industrial			14,567,703	945,804	259,006	1,204,810	8.27	34,832	418.23
Coal Mining	B06	B11	76,252	6,759	4,461	11,220	14.71	55	1,378.06
Oil and Gas Extraction	B07	B12	19,723	1,669	1,453	3,122	15.83	101	194.56
Other Mining and Quarrying, and Services to Mining	B08-B10	B13-B15	317,190	20,528	10,528	31,057	9.79	473	670.64
Meat and Meat Products	C111-C112	C211	741,028	62,416	21,421	83,837	11.31	496	1,493.36
Dairy Products	C113	C212	453,194	42,933	21,034	63,967	14.11	354	1,279.29
Other Food Products, Beverages and Tobaccos	C114-C12	C213-C219	714,476	60,521	25,340	85,861	12.02	1,817	393.15
Textile, Leather, Clothing and Footwear	C13	C22	119,923	11,706	5,319	17,025	14.20	1,027	116.79
Log Sawmilling and Timber Dressing, and Other Wood Products	C14	C231-C232	1,563,905	102,013	16,005	118,019	7.55	1,049	1,490.65
Pulp, Paper and Converted Paper Products	C15	C233	1,560,453	91,468	11,061	102,530	6.57	161	9,699.27
Printing	C16	C24	165,275	15,649	5,350	20,999	12.71	996	166.01
Petroleum and Coal Product Manufacturing	C17	C251-C252	291,491	18,222	7,569	25,791	8.85	229	1,271.10
Basic Chemicals and Chemical Products	C18	C253-C254	151,930	12,584	4,809	17,393	11.45	467	325.55
Polymer and Rubber Products	C19	C255-C256	249,131	22,670	9,211	31,881	12.80	430	578.88
Non-metallic Mineral Products	C20	C26	268,624	24,766	6,608	31,373	11.68	694	387.06
Basic Ferrous Metals	C211	C271	1,405,984	94,652	3,029	97,681	6.95	361	3,895.72
Basic Non-ferrous Metals	C213	C272	5,311,741	228,434	38,624	267,058	5.03	71	74,842.18
Basic Non-ferrous Metal Products	C214	C273	5,659	552	327	879	15.53	49	115.99
Basic Ferrous and Other Metal Products	C212,C22	C274-C276	106,129	11,200	5,956	17,156	16.17	1,267	83.76
Transport Equipment	C23	C281-C282	27,409	3,605	2,109	5,714	20.85	954	28.72
Machinery and Equipment Manufacturing	C24	C283-C286	154,418	16,716	7,182	23,898	15.48	2,348	65.77
Furniture and Other Manufacturing	C25	C29	307,667	29,002	12,664	41,666	13.54	2,634	116.79
Electricity Supply	D26	D361	128,110	17,617	11,355	28,973	22.62	2,698	47.48
Gas Supply (Including LPG and CNG)	D27	D362	5,352	663	357	1,020	19.06	177	30.25
Water Supply, Sewerage and Drainage Services	D28	D37	239,855	27,017	14,204	41,221	17.19	6,377	37.61
Construction	E	E	182,786	22,440	13,028	35,468	19.40	9,545	19.15
Commercial (including Transport)			9,273,607	956,006	481,304	1,437,309	15.50	147,613	62.82
Wholesale and Retail Trade	F-G	F-G	2,152,802	239,483	112,109	351,592	16.33	39,110	55.04
Accommodation and Food Services	H	H	1,077,440	122,863	55,726	178,590	16.58	14,424	74.70
Transport, Storage and Warehousing	I461	I611	663,506	65,470	31,905	97,375	14.68	10,163	65.29
Information Media and Telecommunications	J, I51	J	539,096	43,546	22,021	65,567	12.16	9,467	56.95
Financial, Property, Hiring, Professional and Administrative Services	K-N	K-L	2,008,543	191,770	100,622	292,391	14.56	29,564	67.94
Public Administration and Safety	O	M	766,279	78,035	56,244	134,279	17.52	8,769	87.39
Education and Training	P	N	707,200	74,966	35,893	110,859	15.68	8,035	88.02
Health Care and Social Assistance	Q	O	686,299	65,398	28,604	94,002	13.70	8,385	81.85
Arts, Recreational and Other Services	R-S	P-Q	672,442	74,475	38,180	112,655	16.75	19,698	34.14
Residential			13,060,289	1,946,842	1,003,437	2,950,279	22.59	1,683,089	7.76
Total Sales			38,865,916	4,077,474	1,871,265	5,948,739	15.31	1,929,046	20.15

Notes to Table G.6a: ¹ Excludes on-site cogeneration.

² Some financial information has been estimated based on the average March year cost for the relevant industry (by ANZSIC classification) or other information where appropriate. Additionally, financial information provided here contains error for reasons

outlined in the Preface. While absolute values for these factors are at least indicative, caution should be applied when comparing the information in this table to Table G.5a and previous editions of the *Energy Data File*.

³ Connections are defined by Installation Control Points (ICPs) and in all instances are used to represent sectorial customer numbers. From this, average consumption and electricity prices are calculated.

G. Electricity

Table G.7b: Market Competition Statistics

Calendar Year or Quarter (total/end)	Percentage of Consumers Switching in Year or Quarter ¹			Approximate Retail Market Share Groupings Based on Registry Count of Active ICPS ²						
	North Island	South Island	New Zealand	Contact Energy and Empower	Genesis Energy and Energy Online	Mercury Energy and Bosco Connect	Meridian Energy and Powershop	Nova Energy and Bay of Plenty Energy	TrustPower	Other ³
2005	8.6%	7.2%	8.2%	27.5%	29.0%	17.6%	11.6%	1.3%	11.9%	1.0%
2006	9.7%	7.8%	9.2%	27.1%	29.1%	18.4%	11.5%	1.3%	11.6%	1.0%
2007	9.9%	8.5%	9.6%	26.9%	29.2%	18.7%	11.5%	1.3%	11.5%	1.0%
2008	11.0%	10.3%	10.8%	26.1%	28.5%	19.6%	11.9%	1.4%	11.5%	1.0%
2009	13.8%	14.6%	14.0%	24.9%	27.1%	21.7%	11.9%	1.8%	11.5%	1.0%
2010	17.7%	20.8%	18.5%	24.1%	26.6%	20.5%	13.5%	2.2%	11.2%	1.9%
2011	20.4%	21.4%	20.7%	23.0%	26.8%	19.5%	14.8%	2.6%	10.8%	2.4%
2010 Mar	4.1%	4.5%	4.2%	24.8%	26.6%	22.0%	12.2%	1.8%	11.4%	1.2%
Jun	4.0%	5.1%	4.3%	24.7%	26.4%	22.0%	12.3%	2.0%	11.3%	1.3%
Sep	5.4%	6.4%	5.7%	24.4%	26.6%	20.8%	13.3%	2.1%	11.3%	1.6%
Dec	4.2%	5.0%	4.4%	24.1%	26.6%	20.5%	13.5%	2.2%	11.2%	1.9%
2011 Mar	4.2%	4.9%	4.4%	23.9%	26.6%	20.3%	13.7%	2.2%	11.2%	2.1%
Jun	5.2%	6.0%	5.4%	23.3%	26.8%	20.1%	14.2%	2.3%	11.1%	2.2%
Sep	6.0%	6.1%	6.0%	22.9%	27.0%	19.7%	14.6%	2.5%	11.0%	2.3%
Dec	5.1%	4.4%	5.0%	23.0%	26.8%	19.5%	14.8%	2.6%	10.8%	2.4%
Δ2007/2011 p.a.	2.6%	3.2%	2.8%	-1.0%	-0.6%	0.2%	0.8%	0.3%	-0.2%	0.4%
Δ2010/2011	2.7%	0.5%	2.2%	-1.1%	0.2%	-1.0%	1.3%	0.4%	-0.4%	0.5%

This data is sourced from Electricity Authority (EA) registry statistics and is not collected by the Ministry of Economic Development directly. For detailed information visit the Registry Statistics section of EA's website at: www.ea.govt.nz/industry/market/statistics-reports/.

Notes to Table G.7b: ¹ Calculated by taking the total number of switches in a quarter or year and dividing by the average number of connections in a quarter (3 months of data) or year (12 months of data).

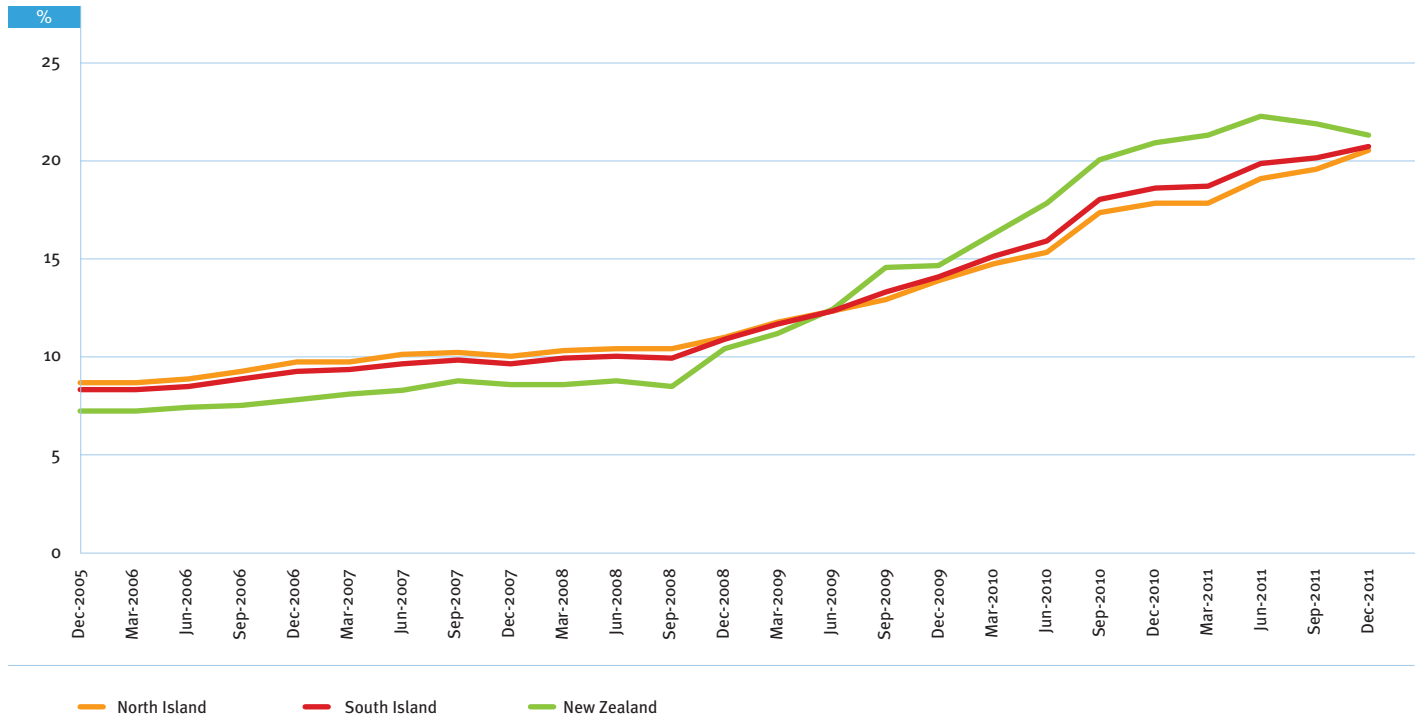
² Retailers have been aggregated into these multi-retailer groupings based on ownership. Where one company fully owns more than one retail brand these have been added together from the raw data available from the EA. In addition to this, some

retailers do not have ICPS registered under their own name but may use another retailer's (e.g. Energy Direct NZ). All market-share figures presented are only approximate and do not take account of demand or the size of consumers. Some retailers may have fewer customers than other retailers but have larger industrial-use customers so actually supply a larger amount of electricity in GWh.

³ "Other" primarily includes King Country Energy and Pulse Energy.

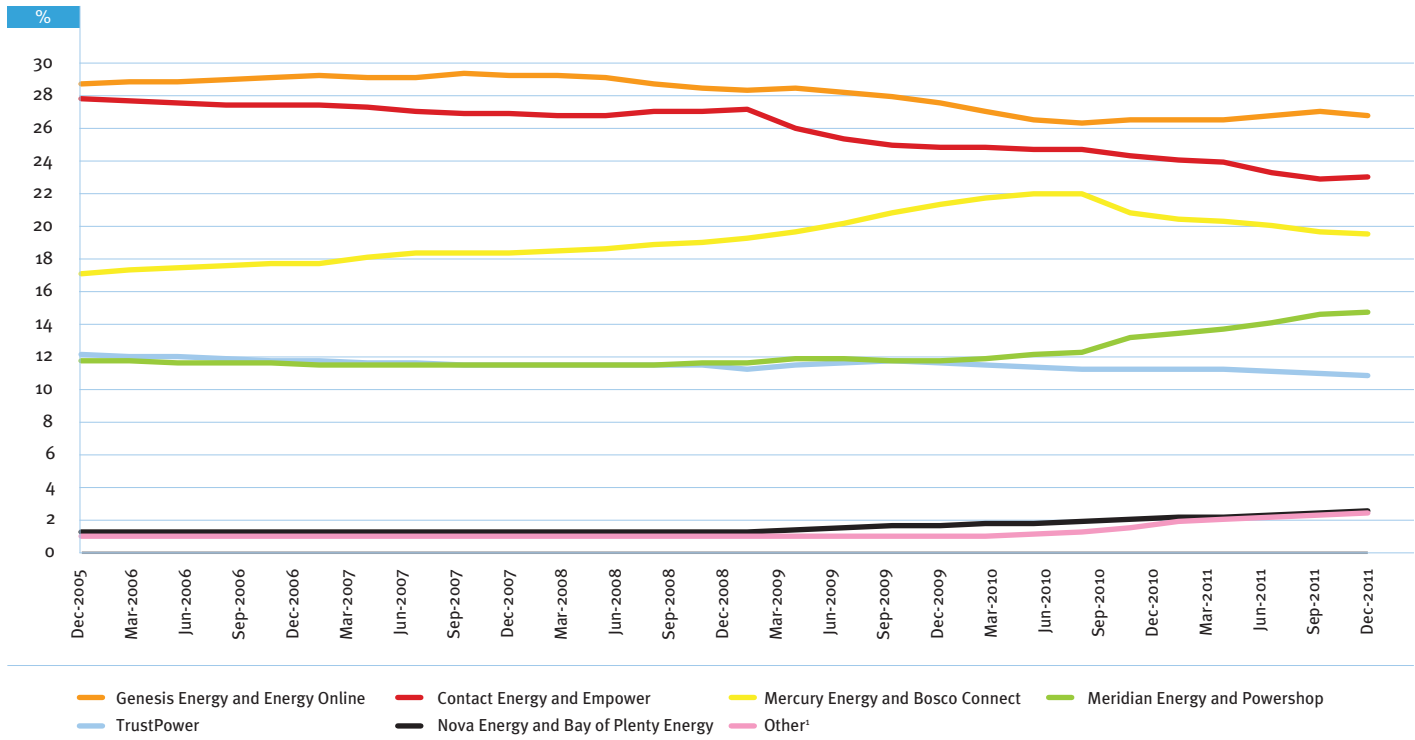
G. Electricity

Figure G.7a: Percentage of Consumers Switching in Year to Date



G. Electricity

Figure G.7b: Approximate Retail Market Share Groupings Based on Registry Count of Active ICPs



Note to Figure G.7b: 'Other' is primarily King Country Energy and Pulse Energy.

H. Oil and Gas Reserves

Overview of New Zealand's Oil and Gas Reserves

Introduction

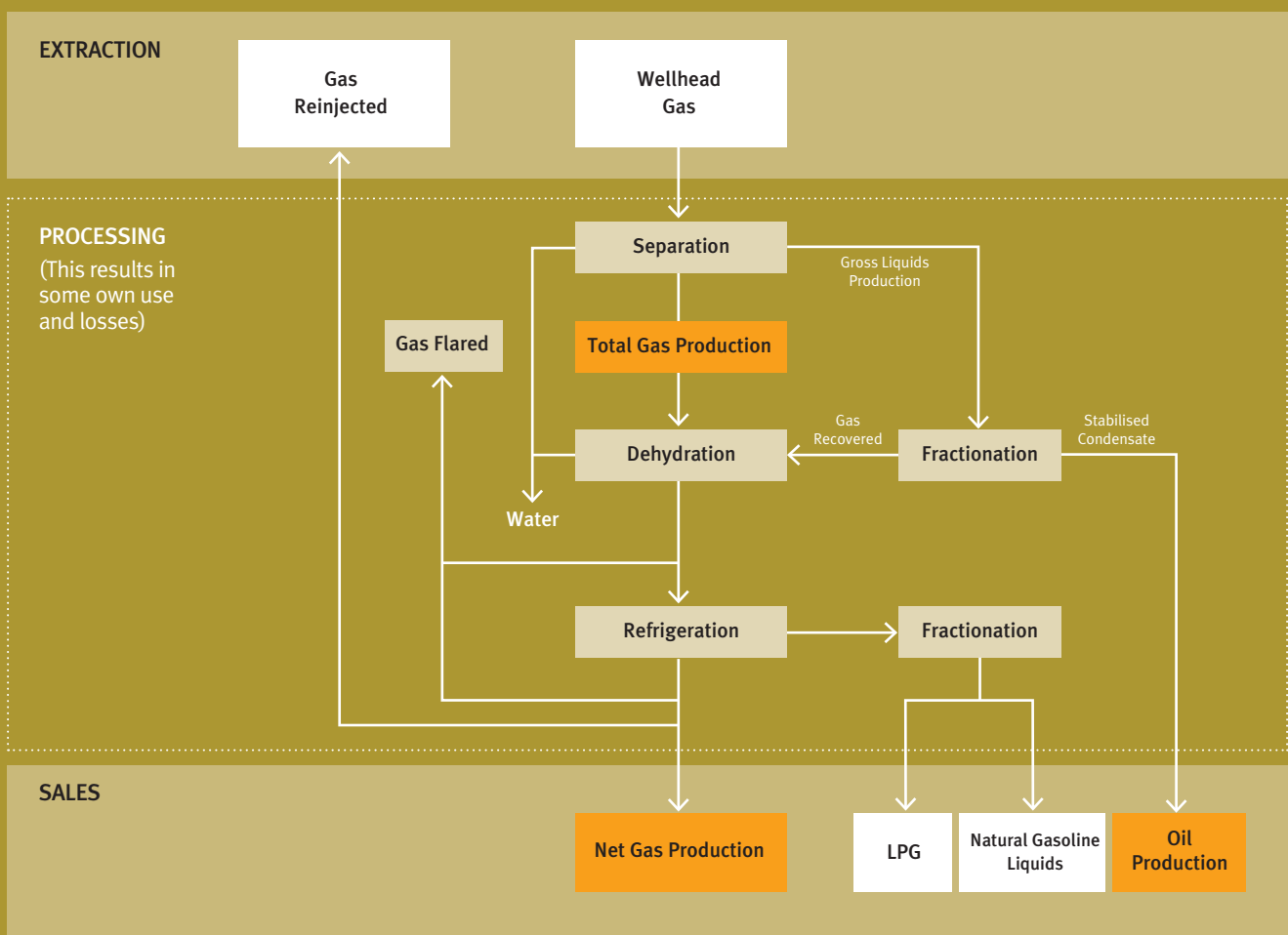
Oil and gas reserves reported in this section apply to figures as at 1 January 2012. Reserves are estimated total amounts of oil and gas that are able to be produced from a known petroleum reservoir. Ultimate Recoverable Reserves are the total reserves before any oil or gas is produced. Remaining Reserves are Ultimate Recoverable Reserves, less production to date.

The reserves figures are based on information from field operators and are expressed in terms of “proven” (P90, or 90% probability of producing the stated amount) and “proven and probable” (P50, or 50% probability of producing the stated amount).

All of New Zealand's producing fields are in the Taranaki region as outlined in Figure H.2. Reserve information for oil, condensate and naphtha is outlined in Table H.2 and Figure H.3. The equivalent gas information is presented in Tables H.3 and Figure H.4.

Oil and gas production are discussed in detail in Section D (Oil) and Section E (Gas).

Figure H.1: Gas/Condensate Separation Process (Generalised)



H. Oil and Gas Reserves

Reserves

Total oil Remaining Reserves (P50) from producing and non-producing fields decreased by 11% on the previous year. Total gas Remaining Reserves (P50) from producing and non-producing fields decreased by 2%.

On-going production was the main cause for both the decrease in total Remaining Reserves of oil and total Remaining Reserves of gas. A significant downgrade of Ultimate Recoverable Reserves from Tui also contributed to the decrease in total Remaining Reserves of oil. However, due to increases in Ultimate Recoverable Reserves at various fields the fluctuations balanced out and subsequently had little effect on total Remaining Reserves of oil.

Reserve Adjustments

In regards to Tui, a subsurface review and modelling exercise was carried out by permit holder AWE Taranaki Limited to reconfirm the developed recoverable reserves from Tui Petroleum Mining Permit (PMP) 38158. This review downgraded the P50 Ultimate Recoverable Reserves of oil by 9.5 million barrels (mmbbls), a decrease of 19% on the previous year.

The decrease in total Remaining Reserves of gas was mainly due to on-going gas production.

Additional adjustments in P50 Ultimate Recoverable Reserves for Kowhai, PMP 51378, operated by Petrochem Limited (a subsidiary of Greymouth Petroleum), also had a small impact. Gas reserves decreased by 87 billion cubic feet (Bcf) and oil decreased by 2.7 mmbbls.

There was an increase in P50 Ultimate Recoverable Reserves at Pohokura (PMP 38154), operated by Shell Exploration NZ Limited. This was a result of a modelling update, which included the addition of recent production data and a review of field uncertainties, and a Final Investment Decision (FID) that was taken for a Gas Re-injection project. P50 Ultimate Recoverable Reserves increased by 6.5 mmbbls of oil and 32.2 Bcf of gas.

At Maui, Petroleum Mining Licence (PML) 381012 operated by Shell Todd Oil Services Limited, there was an increase of P50 Ultimate Recoverable Reserves. Oil increased by 5.9 mmbbls and gas increased by 127 Bcf. This was a result of revisions based on production performance and dynamic reservoir simulation associated with the existing Maui-B Improved Recovery Factor (IRF) wells MB-03A and MB-05B, the approval of a further IRF well campaign at Maui-B, and the approval of the Maui-A Ihi fault block development in the first half of 2011.

Onshore, the drilling of Turangi-4 by Greymouth Petroleum in PMP 38161 (Turangi), increased Ultimate Recoverable Reserves of gas by 45.8 Bcf. Turangi-4 proved reserves in new zones and provided important structural and pressure information to improve the understanding of the field.

Permitting

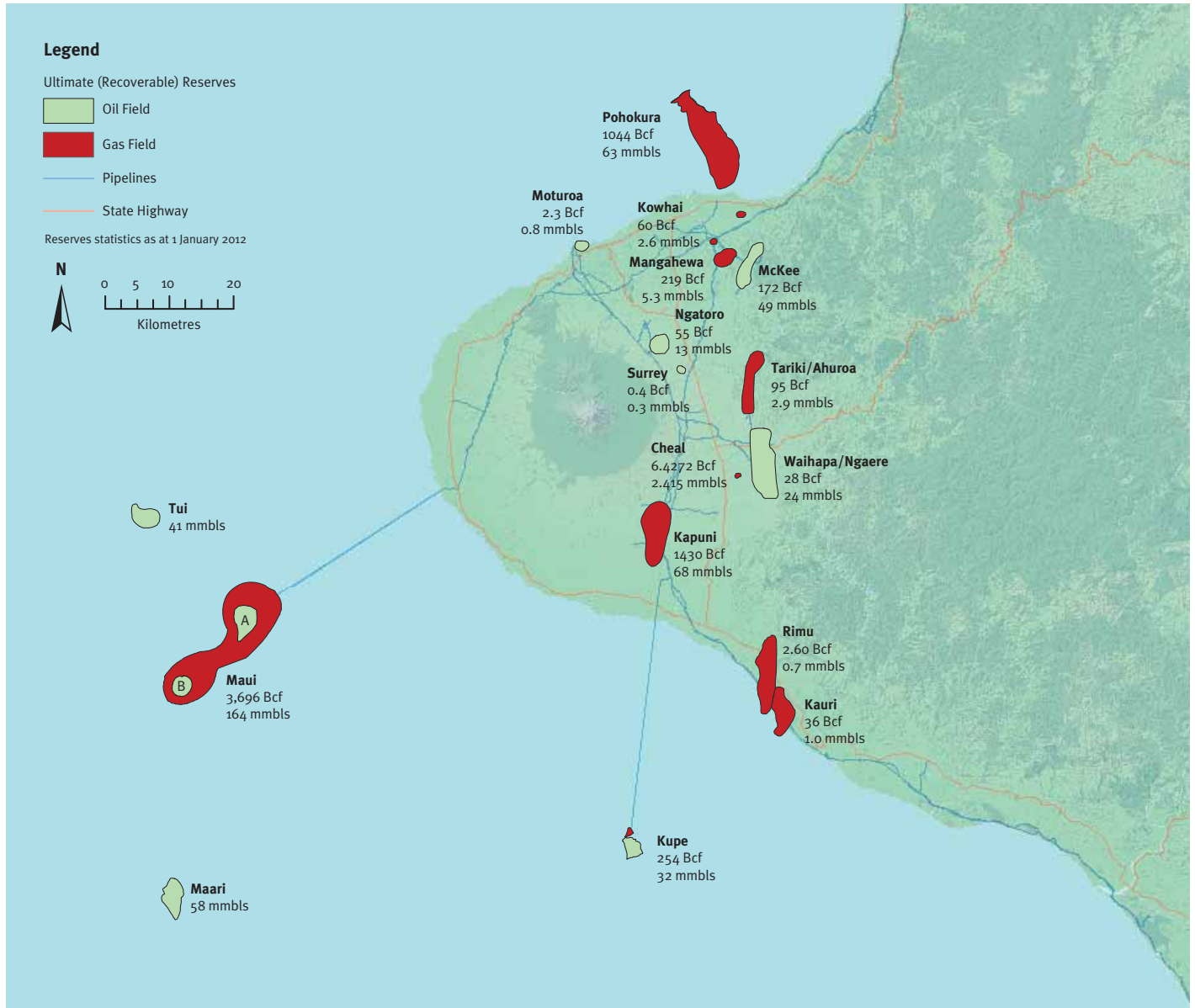
New Zealand Petroleum & Minerals granted three Petroleum Exploration Permits (PEPs) in 2011, a decrease on the 11 PEPs granted in 2010. No Petroleum Mining Permits (PMPs) or Petroleum Prospecting Permits (PPPs) were granted in 2011. In comparison, 1 PMP was granted in 2010.

Two PEPs were awarded over the Taranaki Basin in 2011. Both of these covered offshore areas and were awarded via Priority in Time (PIT) applications. PEP 52593 is a 3,509 km² permit and was awarded to Octanex NZ Limited on 1 April 2011. In addition to this, on 5 July 2011 OMV New Zealand Limited (65%) and Octanex NZ Limited (35%) were granted PEP 53537, located in the west of the Taranaki Basin and covering 1,146 km².

Coal Seam Gas (CSG) permit PEP 52605 covers 3,600 km² in the onshore Canterbury Basin and was awarded to L&M Energy Limited on 20 September 2011. This was a competitive PIT and had a competing bid from Solid Energy New Zealand Limited.

H. Oil and Gas Reserves

Figure H.2: Oil and Gas Fields in the Taranaki Basin



H. Oil and Gas Reserves

Table H.1: National Summary of Activity and Expenditure (All Petroleum Exploration and Mining Permits/Licences)

National Totals – Activity Statistics Combined for PPPs, PEPs, PMPs and PMLs	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Wells Drilled	17	21	16	33	34	30	43	34	37	45	52
Metres Made	48,541	36,958	35,201	78,237	87,533	112,369	99,854	51,037	64,596	76,026	63,669
2-D Seismic Acquired (km)	7,518	141	2,455	5,466	3,764	13,240	14,424	25,749	12,058	9,751	8,353
2-D Seismic Reprocessed (km)	1,504	9,927	10,829	23,808	14,707	30,627	20,019	11,411	6,989	21,512	7,911
3-D Seismic Acquired (km ²)	50	483	444	39	3,120	2,360	935	991	1,151	204	6,864
3-D Seismic Reprocessed (km ²)		566	961	410	247	2,147	407	432	457	1,244	1,214
PEPs & PPPs Granted	14	29	18	29	5	16	19	15	9	10	3
PMPs Granted	1	1	-	2	5	2	2	-	2	1	-
Total Permits Granted	15	30	18	31	10	18	21	15	11	11	3
PEPs & PPPs Surrendered, Revoked, Relinquished or Expired	7	14	10	6	14	25	20	13	21	11	14
Number of PEPs & PPPs at Granted Status	59	82	86	105	104	79	76	89	71	70	73
Number of PMPs and PMLs at Granted Status	11	12	12	14	19	21	23	23	24	23	23
PEP & PPP National Expenditure (Million NZD)	\$203	\$186	\$159	\$280	\$186	\$133	\$200	\$314	\$191	\$246	\$159
PMP/PML National Expenditure (Million NZD)	\$128	\$218	\$195	\$182	\$553	\$574	\$1,359	\$963	\$1,202	\$1,095	\$1,084
Expenditure, All Permits – National Total (Million NZD)	\$331	\$404	\$354	\$462	\$739	\$707	\$1,559	\$1,277	\$1,393	\$1,341	\$1,243

PEPs = Petroleum Exploration Permits.

PPPs = Petroleum Prospecting Permits.

PMPs = Petroleum Mining Permits (production permits).

PMLs = Petroleum Mining Licences (production permits).

Exploration and Developments

Exploration for oil and gas encompasses activities designed to find new oil and gas fields. These activities include geophysical surveys (e.g. 2D and 3D seismic surveys) as well as drilling wells into suspected petroleum reservoirs. Development activities are those performed on existing oil and gas fields to enhance production of oil and gas.

The historically high rate of exploration and development expenditure experienced in New Zealand since 2007 continued in 2011. In 2011, a total of \$1.2 billion dollars was spent on exploration and development in New Zealand. This was 7% less than the expenditure in 2010, but still well above spending levels from 2001 to 2006. Between 2007 and 2011 a total of \$6.8 billion was spent on exploration and development in New Zealand, compared with the \$2.7 billion in the 5 years prior (2002–2006).

In 2011, a total of 8,353 km of new 2D seismic surveys were acquired, as well as 6,864 km² of new 3D seismic surveys. A significant quantity of 2D and 3D seismic data were also reprocessed in 2011. Table H.1 shows a summary of the exploration and development activity across all petroleum prospecting, exploration and mining permits and licences in New Zealand since 2001.

Wells Drilled

Exploration and development activity was the highest it has been in the past 10 years, with 52 wells drilled, an increase from the 45 wells drilled in 2010 and the 37 wells drilled in 2009.

Wells were drilled in a number of basins in 2011, including onshore and offshore Taranaki, onshore East Coast Basin, Waikato Basin, and Great South and Southland Basins. Offshore well drilling decreased from 10 wells in 2010 to two in 2011, and onshore drilling increased from 35 wells to 50 in the same period.

A total of 63,669 m was made in oil and gas wells in 2011, down from the 76,026 m in 2010. Of the 52 wells drilled in 2011, 32 were exploration wells and 20 were appraisal or development wells.

Drilling Campaigns

Highlights of drilling campaigns in 2011 included the Copper Moki-1 well in PEP 51150 in the onshore Taranaki Basin, operated by Taranaki Ventures Limited, a subsidiary of New Zealand Energy Corp. The well was spudded in March 2011 and was successful in discovering gas and oil shows in the Mt Messenger and Urenui Formations. Copper Moki-1 has been producing from the Mt Messenger Formation since December 2011. Production from the Urenui Formation has been suspended to focus on oil production from the Mt Messenger Formation. Taranaki Ventures Limited has since drilled three additional wells within the proximity of Copper Moki-1.

H. Oil and Gas Reserves

TAG Oil continued its development in PEP 38748 following the success of the Sidewinder-1 discovery in 2010. In 2011 TAG drilled three wells, Sidewinder-2, -3 and -4. All three wells were confirmed as light oil and gas discoveries and subsequently flow-tested with encouraging results. In September 2011, the Sidewinder Production Facility was completed and since then all four wells have been brought into production. Sidewinder is currently producing 6-8 million cubic feet of gas per day and 100 to 200 barrels of light oil per day.

In addition to this, TAG further developed its Cheal field (PMP 38156). The Cheal B4 ST-1 well, drilled in February 2011, encountered light oil shows in the Urenui and Mt Messenger Formations. Flow-testing confirmed the presence of oil and gas in both zones. The Cheal B4 ST-1 was brought into production in May 2011 and was yet another well in the Cheal field to produce oil from the Urenui Sands.

Following this, TAG drilled Cheal-C1 and C2 wells from the new "Cheal-C site". Both had oil and gas shows, extending the known oil and gas saturation area within the Cheal permit. TAG drilled a total of five wells in 2011 in the Cheal field (Cheal C-1, Cheal B-4 ST1, Cheal C-2, Cheal A-8 and Cheal B-5) and brought Cheal B-4 ST1, Cheal B-5 and Cheal C-1 into production.

Cheal-B5 provided the highest flow rate for an onshore Miocene reservoir to date. Flow-testing confirmed an oil flow rate in excess of 1,700 barrels of oil per day.

A pilot project began in Origin Energy's PMP 38155 to determine the effectiveness of thermal water flooding as a secondary oil recovery method for the Manutahi reservoir. Origin Energy drilled Manutahi D2H and Manutahi D4H ST2 as water injection wells and Manutahi D-3H ST2 as a production well. Manutahi D-2H and Manutahi D4H ST2 were both produced for a period of clean-up, then shut in while awaiting injection start-up. Manutahi D3H ST2 remained in production testing awaiting completion of surface facilities.

In PEP 38746, Greymouth Petroleum re-entered Onaero-1, which was first drilled in October 1980. Greymouth Petroleum deepened the well to the Mangahewa formation and confirmed a commercial discovery.

CSG wells accounted for 16 of the 53 petroleum wells drilled in 2011. Drilling activity was high in Waikato, Southland and King Country Basins, with work also carried out in onshore Great South Basin.

Solid Energy continued appraisal within PEP 38605, located in the Waikato Region. Solid completed five appraisal wells within PEP 38605, with four of the five being successfully stimulated with strong initial gas production. These wells were commissioned as trial CSG production wells.

Seismic Acquired

Accompanying this drilling activity was a 14% decrease in the acquisition of 2D seismic in 2011, to 8,353 km. A total of 7,911 km of 2D seismic data were reprocessed across all permits in 2011, a decrease from the 21,512 km reprocessed in 2010. In addition to the 2D seismic, a total of 6,864 km² of 3D seismic data was acquired in 2011, nearly 34 times the amount that was acquired in 2010.

Seismic Campaigns

Of the 8,353 km of 2D seismic shot in 2011, notable surveys include Petrobras' 2D marine seismic survey (3,305 km) in PEP 52707, Raukumara Basin, and Anadarko's 2D seismic survey across PEP 38262 and PEP 38264, which yielded 3,900 km in the offshore Canterbury basin.

Todd Energy completed the Pungarehu 2D seismic survey in April 2011 in PEP 51149, an onshore/offshore permit in the Taranaki Basin. The survey was unique as it consisted of the integration of land, transition zone, and marine seismic surveys. Both land and marine crews were required to work simultaneously to record seismic reflection data over the coastal transition-zone ("TZ") portion of the survey area. Todd also shot 683 km of 2D seismic in its offshore permit PEP 51313.

A total of 6,864 km² of 3D seismic data was acquired in 2011. Of this, 4,812 km² was shot by OMV across PEP 50119 in offshore Great South Basin from December 2011 to March 2012. In addition to this, OMV shot 3D surveys in PEP 51906 and PEP 53537 in offshore Taranaki Basin. The remaining 1,800 km² was acquired by Anadarko across PEP 38451 in offshore Taranaki Basin. Both surveys were completed with the Polarcus Alima vessel.

Other Developments

In other developments for the 2011 year, Apache Corporation, an American-based company, entered into a farm-out agreement with TAG Oil on two of TAG's east coast exploration permits, PEP 38349 and PEP38348. In addition, Shell New Zealand stepped out beyond its Taranaki operations and joined OMV in the Great South Basin, taking a 50% share in PEP 50119 and PEP 50120. Along with this development, OMV surrendered PEP 50121, a third permit held in the Great South Basin.

In Northland Basin, Kea Oil and Gas Limited surrendered PEP 51339, an onshore permit in Kaipara Harbour. Moreover, Origin Energy Resources NZ Limited was awarded an extension of five years for PEP 38619 in the offshore.

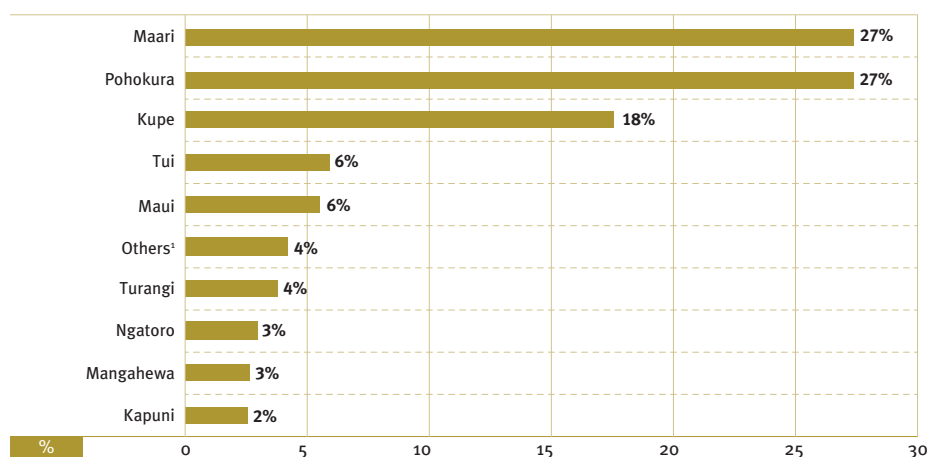
On 2 May 2011, New Zealand Petroleum & Minerals replaced Crown Minerals as the agency that manages the petroleum and minerals estate on behalf of the Crown. New Zealand Petroleum & Minerals was the result of a review which identified the need to increase the Crown's capability to meet the Government's objective of maximising the returns to New Zealand from the development of oil, gas and mineral resources. The new entity provides a larger business unit and builds on the strengths of Crown Minerals. The review was one of seven action points announced in the Petroleum Action Plan in November 2009.

H. Oil and Gas Reserves

Table H.2: Oil and Condensate Reserves

Field	Ultimate Recoverable (P90)			Ultimate Recoverable (P50)			Remaining Reserve (P90) as at 1 January 2012			Remaining Reserve (P50) as at 1 January 2012		
	Mm ³	mmbbls	PJ	Mm ³	mmbbls	PJ	Mm ³	mmbbls	PJ	Mm ³	mmbbls	PJ
Maari	6.3	39.6	237.8	9.2	57.6	345.7	3.6	22.7	146.1	6.5	40.7	261.7
Pohokura	7.8	49.0	281.8	10.1	63.4	364.9	4.2	26.3	151.2	6.5	40.7	234.3
Kupe	2.7	17.3	109.9	5.0	31.7	155.8	2.5	14.5	77.7	4.1	26.1	127.9
Tui	6.0	37.6	231.3	6.5	41.0	252.3	0.9	5.4	33.2	1.4	8.8	54.1
McKee	7.5	47.1	285.6	7.7	48.7	295.3	0.1	0.8	28.3	0.2	1.5	52.1
Maui	25.2	158.6	878.3	26.0	163.5	905.3	0.5	3.4	18.8	1.3	8.3	45.8
Turangi	0.5	3.4	16.9	1.1	6.8	34.0	0.3	2.0	9.9	0.9	5.4	27.0
Mangahewa	0.4	2.7	17.2	0.8	5.3	33.8	0.2	1.2	7.7	0.6	3.9	24.9
Ngatoro	1.6	10.3	51.7	2.1	13.3	67.0	0.2	1.4	6.8	0.7	4.4	22.1
Kapuni	10.6	66.5	378.6	10.8	68.2	388.3	0.3	2.1	12.0	0.6	3.8	21.6
Cheal	0.2	1.4	8.8	0.4	2.4	15.7	0.1	0.7	4.3	0.3	1.7	11.2
Kowhai	0.1	0.9	4.4	0.4	2.6	13.1	0.1	0.3	1.6	0.3	2.1	10.4
Moturoa	0.1	0.5	2.6	0.1	0.8	3.9	0.1	0.4	2.0	0.1	0.7	3.4
Kauri	0.1	0.5	2.7	0.2	1.0	4.9	0.0	0.1	0.3	0.1	0.5	2.6
Surrey	-	0.2	1.1	-	0.3	1.4	-	0.1	0.4	-	0.2	0.8
Rimu	0.1	0.6	3.4	0.1	0.7	3.8	-	-	-	0.0	0.1	0.4
Tariki/Ahuroa	0.5	2.9	15.8	0.5	2.9	15.9	-	-	-	-	-	-
Waihapa/Ngaere	3.8	23.8	138.9	3.8	23.8	138.9	-	-	-	-	-	-
Total	73.5	462.9	2,666.9	84.9	534.0	3,040.1	13.2	81.4	500.2	23.6	148.9	900.4

Figure H.3: Remaining P50 Oil Reserves from Producing Wells at 1 January 2012



Note to Figure H.3: * Includes Rimu, Waihapa/Ngaere, Tariki/Ahuroa, Kauri, Moturoa, Surrey, Kapuni, Cheal and McKee fields.

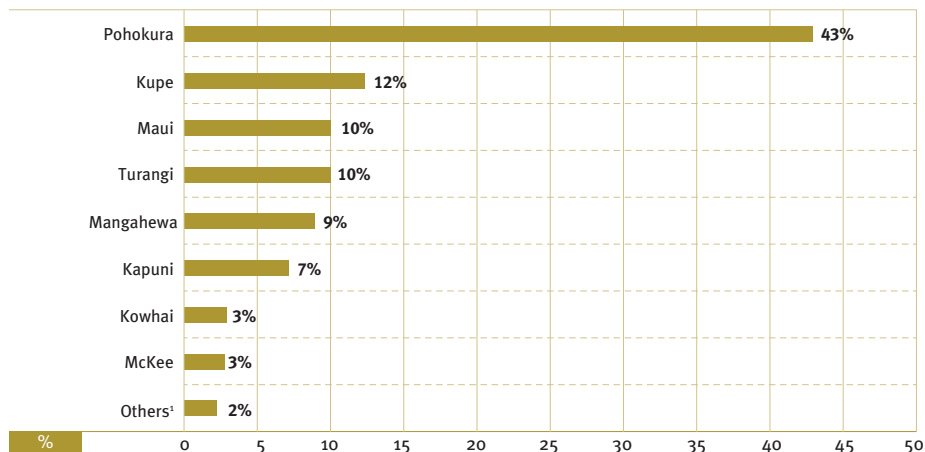
H. Oil and Gas Reserves

Table H.3: Gas Reserves¹

Field	Ultimate Recoverable (P90)			Ultimate Recoverable (P50)			Remaining Reserve (P90) as at 1 January 2012			Remaining Reserve (P50) as at 1 January 2012		
	(Gross Production)			(Gross Production)			(Gross Production)			(Gross Production)		
	Mm ³	Bcf	PJ	Mm ³	Bcf	PJ	Mm ³	Bcf	PJ	Mm ³	Bcf	PJ
Pohokura	22,630	799.6	936.8	29,530	1,043.5	1,222.5	13,880	490.4	574.6	20,780	734.2	860.3
Kupe	5,871	207.4	233.6	7,202	254.4	286.6	4,662	164.6	185.5	6,238	220.3	248.2
Maui	101,105	3,589.0	3,983.0	104,118	3,696.0	4,103.0	2,249	80.0	88.8	5,262	187.3	207.9
Turangi	2,954	104.9	119.3	6,179	219.3	247.6	2,091	74.2	84.8	5,011	177.8	200.9
Mangahewa	3,627	128.1	142.7	6,167	217.8	245.9	1,877	66.3	77.3	4,417	156.0	180.5
Kapuni	38,389	1,356.0	1,034.0	40,474	1,430.0	1,089.0	3,315	117.0	87.8	5,400	191.0	143.1
Kowhai	580	20.6	22.6	1,700	60.3	73.7	219	7.8	8.0	1,284	45.6	56.6
McKee	4,304	152.0	174.7	4,882	172.4	198.5	688	24.3	28.3	1,266	44.7	52.1
Ngatoro	572	38.2	42.6	1,923	54.5	58.8	206	10.1	11.1	1,557	22.7	23.3
Kauri	602	21.3	24.9	1,028	36.3	42.6	35	1.2	1.4	442	15.6	18.3
Cheal	71	2.5	2.6	182	6.4	6.8	53	1.9	2.0	164	5.8	6.1
Moturoa	28	1.0	0.6	64	2.3	1.3	28	1.0	0.6	61	2.2	1.2
Rimu	63	2.2	2.6	74	2.6	3.1	0	0.0	0.0	8	0.3	0.3
Tariki/Ahuroa	2,668	94.2	91.5	2,682	94.7	92.0	-	-	-	-	-	-
Surrey	11	0.4	0.5	12	0.4	0.5	-	-	-	-	-	-
Waihapa/Ngaere	789	27.9	26.5	789	27.9	26.5	-	-	-	-	-	-
Total	184,266	6,545.2	6,838.6	207,006	7,318.7	7,698.3	29,303	1,038.9	1,150.2	51,890	1,803.5	1,998.8

Note to Table H.4: ¹ Includes LPG.

Figure H.4: Remaining P50 Gas Reserves from Producing Wells at 1 January 2012



Note to Figure H.4: ¹ Includes Ngatoro, Kauri, Tariki/Ahuroa, Moturoa, Cheal, Surrey, Rimu and Waihapa/Ngaere fields.

I. Prices

Introduction

This section presents New Zealand's energy prices, taxes and levies since 1974 (where available), with all prices presented in New Zealand dollars. Prices are presented in units typical for each fuel (such as cents/litre for petrol and diesel, or cents/kWh for electricity) and are displayed on a calendar year basis in both real (adjusted for inflation) and nominal terms for all available years. Prices are presented inclusive of all applicable taxes and levies. Industrial and commercial prices exclude Goods and Services Tax (GST), as these sectors can generally reclaim the GST component. Wholesale prices are assumed to relate to the commercial sector so exclude GST. Residential customers generally cannot reclaim GST, and therefore residential prices include the GST component.

To aid price comparison between fuels, prices are also presented by energy content in dollars per gigajoule (GJ). However, direct inter-fuel comparisons on this basis do not allow for differences in end-use efficiency, which can vary between fuel and application. For this reason care should be taken when comparing prices on an energy-content basis.

Although fuel prices are now market-driven, historically many were under some form of price control. The wholesale prices of diesel and petrol were controlled until July 1987 and May 1988 respectively. Gas prices were under price control until 1993. Before the electricity sector reforms, which began in the late 1980s, electricity prices were influenced by the need for government approval of wholesale prices.

Technical Notes

Electricity Prices

Electricity prices data in the *Energy Data File* are calculated by dividing total income from each of the residential, commercial and industrial sectors, by those sectors' electricity consumption. Consumption and income figures are collected on a March year-end basis; hence December year-end prices need to be estimated.

Oil Prices

Prices for petrol, diesel and fuel oil are collected each quarter from New Zealand's large oil companies (BP, Z, Chevron and Mobil). These prices are then weight-averaged by sales to calculate the annualised prices.

Natural Gas Prices

Natural gas prices are calculated by dividing income data by consumption data for each of the commercial, industrial and residential sectors. This data is collected quarterly from gas retailers. Gas sold for electricity generation has been excluded from the industrial sector, as the actual price paid by the generators is reflected in the wholesale price. Quarterly residential gas prices are calculated as a rolling average over the last year for smoothing purposes.

I. Prices

Electricity Prices

Table I.1a: Nominal Electricity Consumer Prices

Calendar Year	Residential		Commercial		Industrial ¹		Residential	Commercial	Industrial ¹
	(incl GST)		(excl GST)		(excl GST)		(incl GST)	(excl GST)	(excl GST)
	Tariff	Lines %	Tariff	Lines %	Tariff	Lines %			
	c/kWh						\$/GJ		
1974	1.15		2.08		0.90		3.20	5.77	2.50
1975	1.19		2.13		0.94		3.31	5.91	2.61
1976	1.56		2.73		1.25		4.33	7.58	3.46
1977	2.15		3.72		1.68		5.96	10.32	4.66
1978	2.42		4.22		1.95		6.71	11.73	5.41
1979	3.19		5.38		2.63		8.86	14.94	7.30
1980	3.69		6.08		3.05		10.26	16.89	8.47
1981	4.05		6.61		3.34		11.25	18.37	9.29
1982	4.56		7.33		3.78		12.66	20.36	10.50
1983	4.69		7.53		3.80		13.04	20.93	10.56
1984	4.80		7.70		3.88		13.33	21.38	10.79
1985	5.62		8.87		4.55		15.62	24.63	12.63
1986	6.71		9.94		5.13		18.65	27.61	14.26
1987	7.89		10.98		5.47		21.91	30.50	15.20
1988	8.71		11.52		5.73		24.20	31.99	15.90
1989	9.03		11.71		5.78		25.08	32.53	16.05
1990	9.22		11.72		5.73		25.62	32.56	15.91
1991	9.81		11.59		5.78		27.24	32.18	16.06
1992	10.27		11.49		6.00		28.52	31.92	16.67
1993	10.78		11.15		6.01		29.93	30.97	16.70
1994	11.37		10.90		5.88		31.58	30.28	16.33
1995	11.93		10.72		6.21		33.14	29.78	17.26
1996	12.68		10.92		6.17		35.23	30.33	17.14
1997	13.41		10.91		6.11		37.25	30.30	16.96
1998	13.19	48.8%	10.56	50.0%	6.64	35.5%	36.64	29.34	18.44
1999	13.28	47.3%	10.20	47.9%	6.17	34.2%	36.88	28.32	17.13
2000	13.26	46.5%	10.26	46.0%	6.23	34.1%	36.83	28.50	17.31
2001	14.17	43.8%	10.49	45.6%	6.62	30.7%	39.35	29.14	18.40
2002	15.28	40.5%	10.73	42.0%	7.12	26.9%	42.44	29.81	19.79
2003	16.42	37.5%	11.69	39.4%	7.91	27.0%	45.60	32.48	21.96
2004	17.96	35.8%	12.27	36.6%	8.00	25.6%	49.90	34.08	22.21
2005	19.19	33.5%	13.25	33.5%	9.05	22.8%	53.29	36.79	25.13
2006	20.56	31.7%	13.85	32.8%	9.30	23.5%	57.11	38.46	25.83
2007	22.10	31.9%	14.14	32.5%	9.79	22.8%	61.39	39.29	27.20
2008	23.28	32.8%	14.94	33.2%	10.87	21.7%	64.67	41.51	30.21
2009	24.13	33.1%	15.09	33.0%	10.40	23.3%	67.03	41.90	28.89
2010 ^R	25.34	33.8%	15.39	33.3%	9.61	24.6%	70.40	42.74	26.70
2011 ^E	26.23	33.6%	15.85	33.1%	9.35	23.1%	72.87	44.02	25.97
Δ2007/2011 p.a.	4.4%		2.9%		-1.1%		4.4%	2.9%	-1.1%
Δ2010/2011	3.5%		3.0%		-2.7%		3.5%	3.0%	-2.7%

Notes to Table I.1a: ¹ Industrial sector includes Agriculture, Forestry and Fishing – this differs from the definition of Industrial in the Electricity section (G), where these were separated.

^E = Estimate.

^R = Revised figures.

Estimates are provided for the calendar year 2011 as actual information is collected on a March year basis, meaning actual information is only available to 31 March 2011 (See the Electricity section, G, for latest actual information).

I. Prices

Table I.1b: Real 2011 Electricity Consumer Prices¹

Calendar Year	Residential	Commercial	Industrial ²	Residential	Commercial	Industrial ²	
	(incl GST)	(excl GST)	(excl GST)	(incl GST)	(excl GST)	(excl GST)	
	c/kWh			\$/GJ			
1974	11.69			32.48			
1975	10.54			29.27			
1976	11.80	PPI deflator unavailable before December 1979 quarter			32.77	PPI deflator unavailable before December 1979 quarter	
1977	14.19			39.41			
1978	14.27			39.65			
1979	16.56	26.09	12.76	46.01	72.47	35.43	
1980	16.37	24.02	12.04	45.48	66.71	33.43	
1981	15.56	22.35	11.30	43.21	62.09	31.40	
1982	15.08	21.53	11.10	41.88	59.80	30.83	
1983	14.46	20.98	10.59	40.18	58.28	29.42	
1984	13.93	20.01	10.10	38.70	55.60	28.05	
1985	14.14	19.98	10.25	39.29	55.50	28.46	
1986	14.91	21.19	10.94	41.42	58.85	30.39	
1987	15.14	21.68	10.80	42.06	60.23	30.01	
1988	15.72	21.61	10.74	43.65	60.03	29.84	
1989	15.41	20.52	10.13	42.81	57.00	28.13	
1990	14.84	19.63	9.59	41.21	54.53	26.64	
1991	15.37	19.24	9.60	42.71	53.44	26.67	
1992	15.93	18.70	9.76	44.26	51.93	27.12	
1993	16.51	17.70	9.55	45.87	49.17	26.52	
1994	17.12	17.08	9.21	47.55	47.45	25.58	
1995	17.32	16.66	9.66	48.11	46.28	26.83	
1996	18.00	16.87	9.54	50.00	46.87	26.49	
1997	18.80	16.79	9.40	52.23	46.64	26.11	
1998	18.26	16.15	10.15	50.74	44.87	28.19	
1999	18.41	15.44	9.33	51.13	42.88	25.93	
2000	17.92	14.43	8.76	49.76	40.09	24.35	
2001	18.65	13.92	8.79	51.81	38.68	24.42	
2002	19.59	14.23	9.44	54.41	39.51	26.23	
2003	20.69	15.62	10.56	57.46	43.38	29.33	
2004	22.13	16.08	10.48	61.47	44.67	29.11	
2005	22.94	16.59	11.33	63.71	46.09	31.48	
2006	23.78	16.33	10.97	66.06	45.37	30.47	
2007	24.97	16.30	11.28	69.35	45.27	31.34	
2008	25.30	15.55	11.31	70.27	43.19	31.43	
2009	25.68	15.94	10.99	71.34	44.27	30.52	
2010 ^R	26.37	15.83	9.89	73.24	43.97	27.46	
2011 ^E	26.23	15.85	9.35	72.87	44.02	25.97	
Δ2007/2011 p.a.	1.2%	-0.7%	-4.6%	1.2%	-0.7%	-4.6%	
Δ2010/2011	-0.5%	0.1%	-5.4%	-0.5%	0.1%	-5.4%	

Notes to Table I.1b: ¹ Price information in the three sectors shown has been adjusted into real terms using different price deflators (see Section I.6). It is not possible to make definitive inferences about relative price movements between sectors.

² Industrial sector includes Agriculture, Forestry and Fishing – this differs from the definition of Industrial in the Electricity Section (G), where these were separated.

^E = Estimate.

^R = Revised figures.

Real prices are revised each year as they are reset to the present value of money.

Estimates are provided for the calendar year 2011 as actual information is collected on a March year basis, meaning actual information is only available to 31 March 2011 (see the Electricity section, G, for latest actual information).

I. Prices

Figure I.1a: Nominal Electricity Consumer Prices

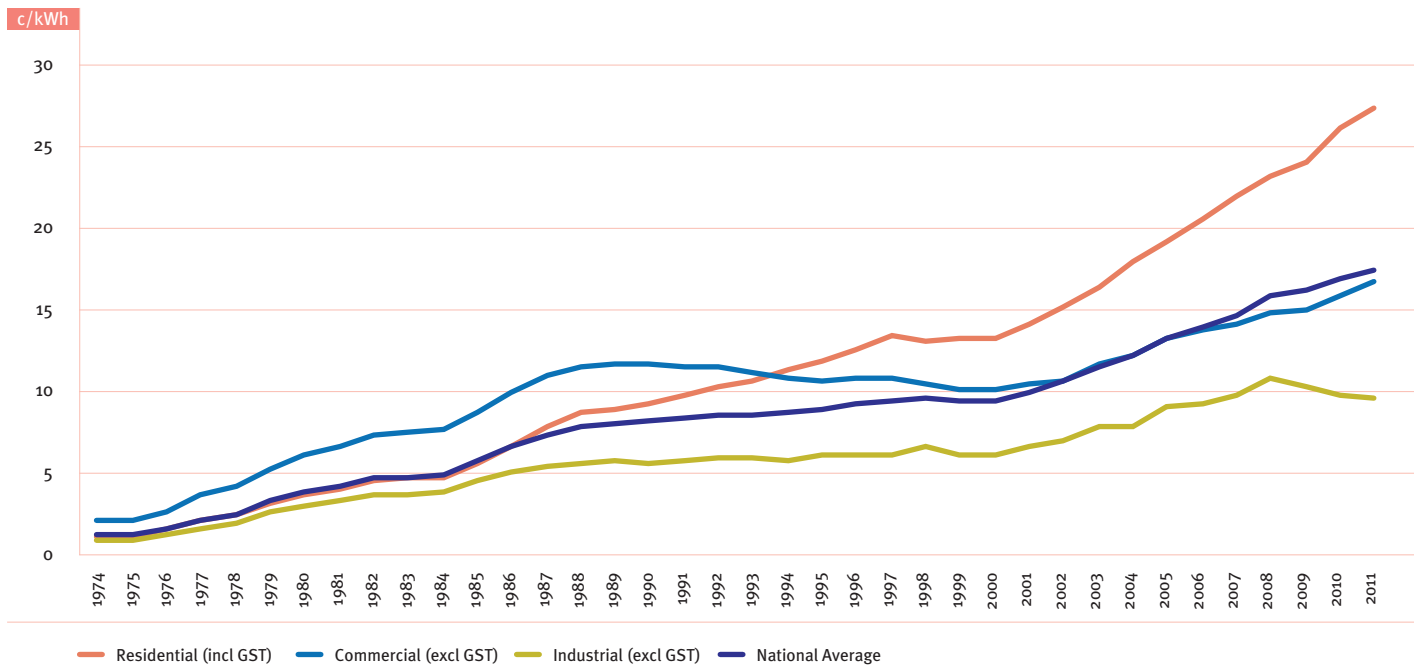
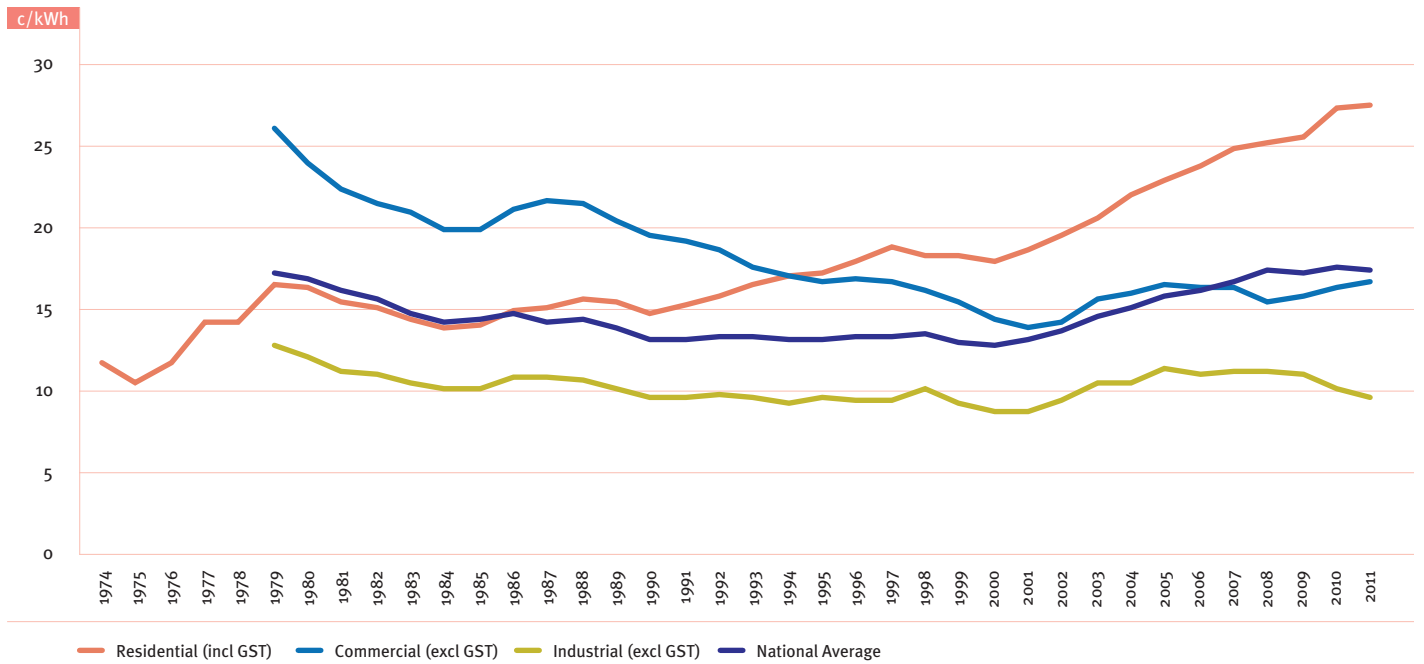


Figure I.1b: Real 2011 Electricity Consumer Prices



I. Prices

Petrol and Diesel Prices

Table I.2a: Nominal Petrol and Diesel Prices

Calendar Year Average or Quarters	Premium Petrol	Regular Petrol	Diesel		Premium Petrol	Regular Petrol	Diesel	
	Retail (incl GST)	Retail (incl GST)	Retail (incl GST)	Wholesale ¹ (excl GST) ²	Retail (incl GST)	Retail (incl GST)	Retail (incl GST)	Wholesale ¹ (excl GST) ²
	c/l				\$/GJ			
1974	14.25	13.95	9.50		4.04	4.00	2.51	
1975	19.70	21.18	10.96		5.58	6.07	2.90	
1976	27.00	26.10	14.90		7.65	7.49	3.94	
1977	28.95	28.05	17.20		8.20	8.05	4.55	
1978	30.78	30.20	17.20		8.72	8.66	4.55	
1979	36.28	36.60	23.02		10.28	10.50	6.09	
1980	51.08	49.79	38.80		14.47	14.28	10.26	
1981	58.58	56.83	44.20		16.59	16.30	11.69	
1982	67.08	64.33	58.50		19.00	18.45	15.48	
1983	71.00	68.00	58.50	55.50	20.11	19.51	15.48	14.68
1984	78.30	75.29	68.50	65.50	22.18	21.60	18.12	17.33
1985	92.93	90.67	69.90	65.90	26.32	26.01	18.49	17.43
1986	83.85	80.16	62.70	58.30	23.75	22.99	16.59	15.42
1987	91.03	88.00	69.00	64.16	25.79	25.24	18.25	16.97
1988	89.93	87.58	70.29	65.36	25.47	25.12	18.60	17.29
1989	91.20	88.40	62.71	49.06	25.84	25.36	16.59	12.98
1990	96.28	95.83	70.56	55.20	27.27	27.49	18.67	14.60
1991	99.80	94.63	55.97	43.79	28.27	27.14	14.81	11.58
1992	100.61	96.65	56.65	44.32	28.50	27.73	14.99	11.73
1993	99.88	95.24	55.28	43.25	28.29	27.32	14.63	11.44
1994	94.95	90.01	51.65	40.82	26.90	25.82	13.66	10.80
1995	95.01	89.96	50.73	41.20	26.92	25.81	13.42	10.90
1996	95.43	90.43	53.29	42.35	27.03	25.94	14.10	11.20
1997	95.61	90.58	55.13	42.89	27.08	25.99	14.58	11.35
1998	89.85	84.85	48.22	39.26	25.45	24.34	12.76	10.39
1999	90.14	85.36	50.01	41.94	25.54	24.49	13.23	11.09
2000	111.19	107.11	72.89	61.10	31.50	30.73	19.28	16.16
2001	109.46	104.52	71.95	60.98	31.01	29.98	19.04	16.13
2002	107.92	102.85	64.25	54.97	30.57	29.50	17.00	14.54
2003	110.48	105.04	62.15	55.71	31.30	30.13	16.44	14.74
2004	122.04	116.44	72.99	65.20	34.57	33.40	19.31	17.25
2005	137.12	132.02	90.21	79.58	38.84	37.87	23.87	21.05
2006	160.94	154.95	113.08	96.33	45.59	44.45	29.92	25.48
2007	160.33	154.47	104.88	90.70	45.42	44.31	27.75	24.00
2008	186.63	180.79	144.95	128.03	52.87	51.86	38.35	33.87
2009	167.90	160.30	101.96	89.33	47.56	45.98	26.97	23.63
2010	185.39	176.79	117.36	98.55	52.52	50.71	31.05	26.07
2011	215.32	205.81	148.56	117.58	61.00	59.04	39.30	31.11
2010 Mar	181.80	173.20	110.60	94.04	51.50	49.68	29.26	24.88
2010 Jun	184.20	175.50	116.70	103.40	52.18	50.34	30.87	27.36
2010 Sep	181.80	173.10	116.80	97.19	51.50	49.66	30.90	25.71
2010 Dec	193.50	185.00	124.70	99.56	54.82	53.07	32.99	26.34
2011 Mar	211.90	203.00	143.70	112.46	60.03	58.23	38.02	29.75
2011 Jun	220.20	211.10	155.30	128.35	62.38	60.56	41.08	33.95
2011 Sep	213.50	203.80	143.30	111.36	60.48	58.46	37.91	29.46
2011 Dec	216.00	205.50	151.80	118.19	61.19	58.95	40.16	31.27
Δ2007/2011 p.a.	7.7%	7.4%	9.1%	6.7%	7.7%	7.4%	9.1%	6.7%
Δ2010/2011	16.1%	16.4%	26.6%	19.3%	16.1%	16.4%	26.6%	19.3%

Notes to Table I.2a: ¹ Wholesale diesel price data collection started in 1983.

² The wholesale diesel price has been shown exclusive of GST as it relates to commercial customers who can reclaim the GST component.

Retail diesel prices between 1990 and 1994 have been recreated using an index.

Annual prices are weighted by sales; therefore a straight average of the quarters will not match the annual figure.

I. Prices

Figure I.2a: Nominal Petrol and Diesel Prices

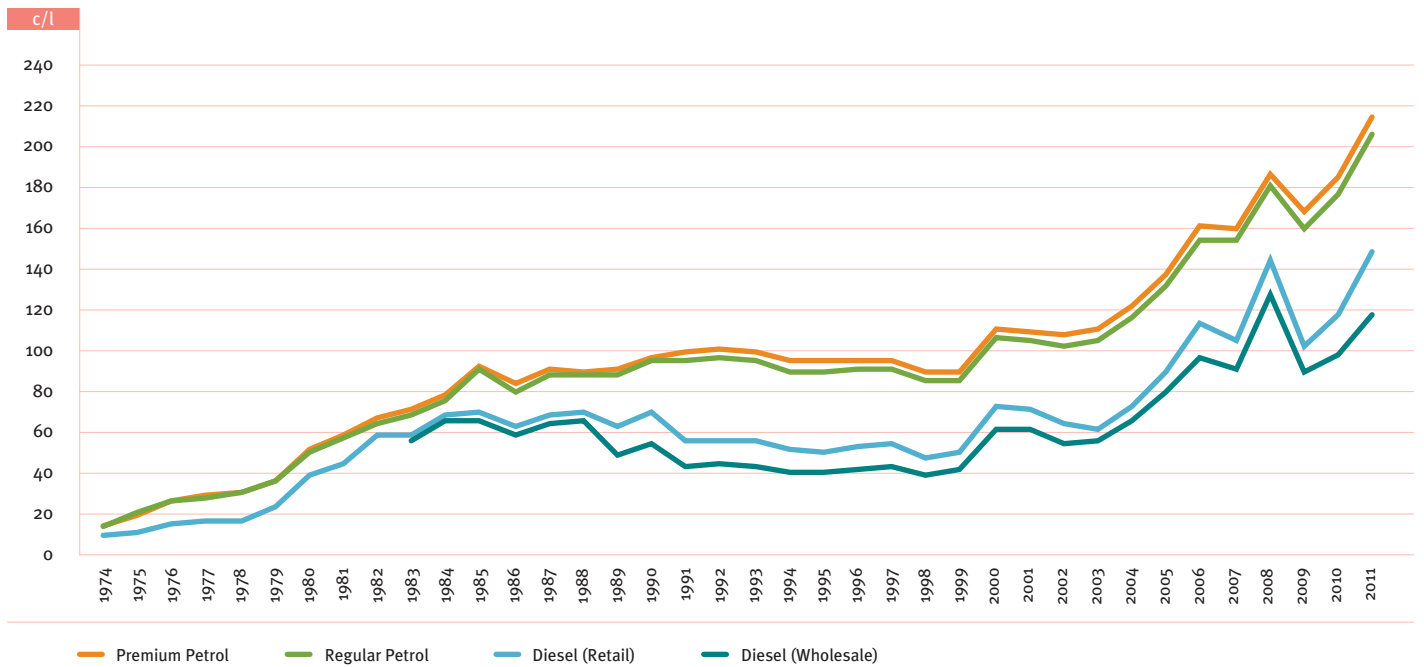
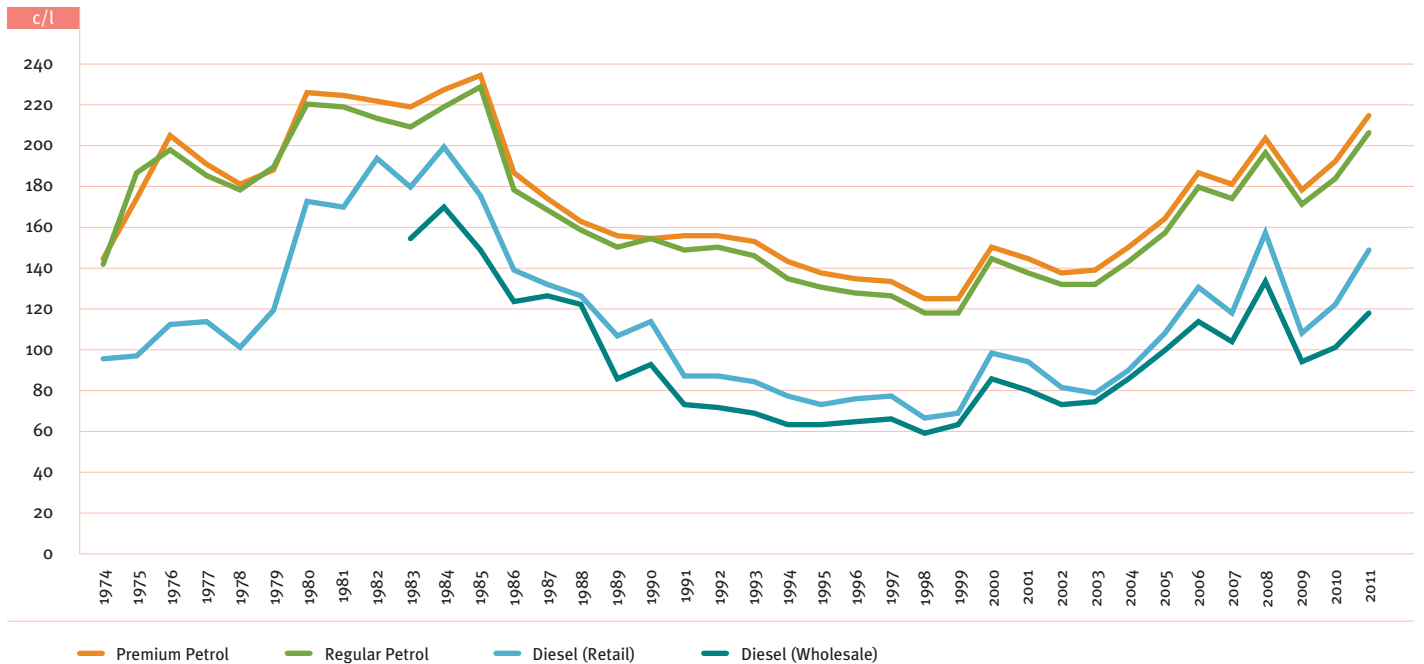


Figure I.2b: Real 2011 Petrol and Diesel Prices



I. Prices

Table I.2b: Real 2011 Petrol and Diesel Prices

Calendar Year Average or Quarters	Premium Petrol	Regular Petrol	Diesel		Premium Petrol	Regular Petrol	Diesel		
	Retail (incl GST)	Retail (incl GST)	Retail (incl GST)	Wholesale ¹ (excl GST) ²	Retail (incl GST)	Retail (incl GST)	Retail (incl GST)	Wholesale ¹ (excl GST) ²	
	c/l				\$/GJ				
1974	144.47	141.43	96.31		40.93	40.57	25.48		
1975	174.15	187.19	96.87		49.33	53.70	25.63		
1976	204.17	197.36	112.67		57.84	56.62	29.81		
1977	191.38	185.44	113.71		54.22	53.19	30.08		
1978	181.72	178.33	101.56		51.48	51.16	26.87		
1979	188.39	190.08	119.54		53.37	54.53	31.62		
1980	226.42	220.73	172.00		64.14	63.32	45.50		
1981	225.07	218.38	169.84		63.76	62.65	44.93		
1982	221.87	212.80	193.51		62.85	61.05	51.19		
1983	218.79	209.55	180.27	154.56	61.98	60.11	47.69	40.89	
1984	227.26	218.53	198.82	170.32	64.38	62.69	52.60	45.06	
1985	233.68	228.01	175.79	148.52	66.20	65.41	46.50	39.29	
1986	186.25	178.05	139.27	124.26	52.76	51.08	36.84	32.87	
1987	174.69	168.88	132.42	126.68	49.49	48.45	35.03	33.51	
1988	162.23	157.99	126.81	122.64	45.96	45.32	33.55	32.45	
1989	155.64	150.86	107.02	85.98	44.09	43.28	28.31	22.75	
1990	154.85	154.14	113.49	92.45	43.87	44.22	30.02	24.46	
1991	156.47	148.36	87.75	72.72	44.32	42.56	23.21	19.24	
1992	156.12	149.98	87.91	72.12	44.23	43.02	23.26	19.08	
1993	153.02	145.92	84.70	68.68	43.35	41.86	22.41	18.17	
1994	142.99	135.55	77.78	63.96	40.51	38.88	20.58	16.92	
1995	137.92	130.59	73.64	64.03	39.07	37.46	19.48	16.94	
1996	135.41	128.32	75.62	65.44	38.36	36.81	20.00	17.31	
1997	134.09	127.05	77.32	66.01	37.99	36.45	20.45	17.46	
1998	124.42	117.49	66.77	60.03	35.25	33.70	17.66	15.88	
1999	124.97	118.35	69.34	63.49	35.40	33.95	18.34	16.80	
2000	150.22	144.72	98.47	85.94	42.56	41.51	26.05	22.74	
2001	144.11	137.60	94.73	80.94	40.82	39.47	25.06	21.41	
2002	138.38	131.87	82.38	72.87	39.20	37.83	21.79	19.28	
2003	139.21	132.35	78.31	74.41	39.44	37.97	20.72	19.69	
2004	150.34	143.43	89.92	85.46	42.59	41.15	23.79	22.61	
2005	163.93	157.83	107.85	99.70	46.44	45.28	28.53	26.37	
2006	186.15	179.22	130.79	113.63	52.73	51.41	34.60	30.06	
2007	181.13	174.52	118.49	104.50	51.31	50.06	31.35	27.65	
2008	202.82	196.47	157.52	133.21	57.46	56.36	41.67	35.24	
2009	178.69	170.59	108.51	94.38	50.62	48.94	28.71	24.97	
2010	192.86	183.91	122.09	101.39	54.63	52.76	32.30	26.82	
2011	215.32	205.81	148.56	117.58	61.00	59.04	39.30	31.11	
2010	Mar	191.91	182.83	116.75	97.40	54.37	52.45	30.89	25.77
	Jun	194.09	184.92	122.97	105.65	54.98	53.05	32.53	27.95
	Sep	189.49	180.42	121.74	98.64	53.68	51.76	32.21	26.10
	Dec	197.07	188.42	127.00	100.10	55.83	54.05	33.60	26.48
2011	Mar	214.12	205.13	145.20	110.64	60.66	58.84	38.41	29.27
	Jun	220.39	211.28	155.43	125.17	62.43	60.61	41.12	33.11
	Sep	212.77	203.10	142.81	111.90	60.27	58.26	37.78	29.60
	Dec	216.00	205.50	151.80	118.19	61.19	58.95	40.16	31.27
Δ2007/2011 p.a.		4.4%	4.2%	5.8%	3.0%	4.4%	4.2%	5.8%	3.0%
Δ2010/2011		11.6%	11.9%	21.7%	16.0%	11.6%	11.9%	21.7%	16.0%

Notes to Table I.2b: ¹ Wholesale diesel price data collection started in 1983.

² The wholesale diesel price has been shown exclusive of GST as it relates to commercial customers who can reclaim the GST component.

Retail diesel prices between 1990 and 1994 have been recreated using an index.

Annual prices are weighted by sales; therefore a straight average of the quarters will not match the annual figure.

I. Prices

Table I.2c: Composition of the Regular Petrol Retail Price

Calendar Year Average or Quarters	Regular Petrol Retail Price	Importers' Cost	Fuel Taxes and Levies	Import Cost plus Taxes and levies	Importers' Margin	Importers' Margin
	Nominal Price (excl GST)					Real 2011 Prices
1983	68.00	30.91	18.89	49.80	18.20	56.10
1984	75.29	32.07	23.56	55.63	19.66	57.08
1985	90.67	37.51	31.76	69.27	21.39	53.80
1986	78.33	21.59	33.44	55.02	23.31	51.78
1987	80.00	26.69	35.61	62.30	17.70	33.96
1988	79.61	21.99	36.62	58.61	21.00	37.89
1989	79.46	26.56	34.89	61.44	18.02	30.76
1990	84.13	35.05	32.89	67.94	16.20	26.05
1991	84.20	34.93	31.39	66.32	17.88	28.04
1992	85.84	33.22	32.89	66.11	19.74	30.63
1993	84.80	30.48	32.89	63.36	21.44	32.84
1994	79.96	24.82	32.89	57.71	22.25	33.50
1995	80.00	23.19	32.89	56.07	23.93	34.74
1996	80.36	22.97	32.89	55.86	24.50	34.76
1997	80.51	25.10	32.89	57.99	22.52	31.59
1998	75.44	22.97	34.21	57.17	18.27	25.30
1999	75.71	26.00	34.99	60.99	14.72	20.42
2000	95.11	47.29	34.99	82.28	12.84	17.34
2001	93.09	44.81	34.99	79.80	13.29	17.50
2002	91.47	41.59	38.49	80.07	11.40	14.61
2003	93.36	41.10	40.58	81.68	11.68	14.72
2004	103.51	48.13	41.97	90.09	13.42	16.53
2005	117.33	59.59	46.07	105.65	11.68	13.96
2006	138.11	75.10	48.20	123.30	14.81	17.13
2007	137.27	73.69	49.61	123.30	13.97	15.78
2008	161.04	98.84	51.55	150.39	10.66	11.58
2009	142.51	75.77	53.60	129.37	13.14	13.98
2010	156.17	82.54	57.98	140.52	15.65	16.28
2011	179.00	100.91	61.33	162.24	16.76	16.76
2010 Mar	153.96	83.56	56.13	139.69	14.27	15.06
2010 Jun	156.00	83.51	56.13	139.64	16.36	17.24
2010 Sep	153.87	78.62	58.20	136.82	17.04	17.76
2010 Dec	160.87	84.45	61.48	145.93	14.94	15.21
2011 Mar	176.52	99.76	61.55	161.32	15.21	15.37
2011 Jun	183.57	105.05	61.55	166.60	16.96	16.97
2011 Sep	177.22	99.30	61.35	160.66	16.56	16.50
2011 Dec	178.70	99.51	60.87	160.38	18.32	18.32
Δ2007/2011 p.a.	6.9%	8.2%	5.4%	7.1%	4.7%	1.5%
Δ2010/2011	14.6%	22.3%	5.8%	15.5%	7.1%	2.9%

I. Prices

Retail Importer's Cost and Margin

The calculated importer's margin for petrol and diesel is the amount available to cover domestic transportation, distribution, retailing costs, and profit margins. This is calculated as the difference between the New Zealand retail price (excluding taxes and levies) and the calculated New Zealand import cost.

The New Zealand import cost is calculated using the Singapore spot market price plus allowances for international freight, wharfage fees and insurance costs. Singapore prices are used as they represent one of New Zealand's major markets for importing petrol and diesel (South Korea and Australia being the others) and because Singapore is one of the world's largest refining centres. The Singapore price series is based on 95 octane petrol (premium petrol). A quality-related price adjustment is used to alter this price and make it comparable to 91 octane (regular petrol).

This analysis does not allow for any effect of the growth in fleet discounting (the use of fleet cards) or bulk sales via commercial agreements. Furthermore, supermarkets, in conjunction with the oil companies, are offering discounted petrol and diesel to their customers via self-service stations and fuel discount vouchers. These discounts have not been incorporated into the Prices section.

Figure I.2c: Nominal Regular Petrol Retail Price Composition

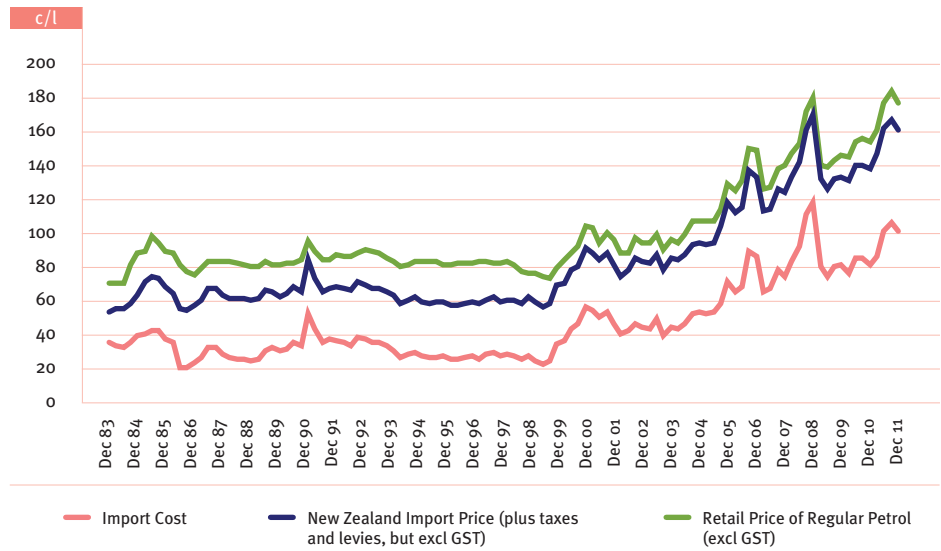
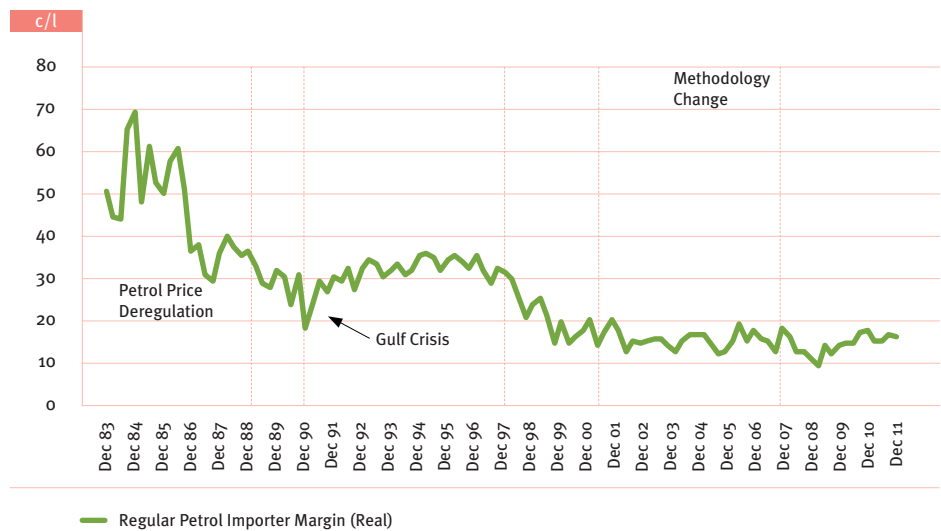


Figure I.2d: Real 2011 Regular Petrol Importer Margin



I. Prices

Fuel Oil Prices

Table I.3: Nominal and Real 2011 Fuel Oil Prices

Calendar Year Average or Quarters	Light Fuel Oil	Heavy Fuel Oil	Light Fuel Oil	Heavy Fuel Oil	Light Fuel Oil	Heavy Fuel Oil	Light Fuel Oil	Heavy Fuel Oil
	c/l	c/l	\$/GJ	\$/GJ	c/l	c/l	\$/GJ	\$/GJ
	Nominal (excl GST)				Real 2011 Prices (excl GST)			
1989	34.67	32.46	8.47	7.80	60.75	56.89	14.84	13.66
1990	37.36	36.51	9.12	8.77	62.57	61.15	15.28	14.69
1991	40.65	39.20	9.93	9.41	67.50	65.10	16.48	15.63
1992	38.35	36.73	9.37	8.82	62.41	59.76	15.24	14.35
1993	35.61	30.82	8.70	7.40	56.54	48.93	13.81	11.75
1994	33.99	30.31	8.30	7.28	53.26	47.49	13.01	11.40
1995	33.50	33.43	8.18	8.03	52.07	51.96	12.71	12.48
1996	34.30	30.32	8.38	7.28	53.01	46.86	12.94	11.25
1997	35.17	30.62	8.59	7.35	54.13	47.12	13.22	11.32
1998	34.03	28.98	8.31	6.96	52.04	44.31	12.71	10.64
1999	37.53	33.52	9.16	8.05	56.82	50.76	13.87	12.19
2000	52.58	48.13	12.84	11.56	73.95	67.70	18.06	16.26
2001	53.18	43.29	12.99	10.40	70.58	57.45	17.24	13.80
2002	51.66	38.77	12.62	9.31	68.48	51.39	16.72	12.34
2003	49.27	38.90	12.03	9.34	65.81	51.96	16.07	12.48
2004	45.53	39.92	11.12	9.59	59.68	52.33	14.57	12.57
2005	53.97	53.93	13.18	12.95	67.62	67.56	16.51	16.23
2006	67.54	55.26	16.49	13.27	79.67	65.19	19.46	15.65
2007	65.87	55.29	16.08	13.28	75.88	63.70	18.53	15.30
2008	94.16	78.26	22.99	18.79	97.98	81.43	23.93	19.55
2009	69.89	62.03	17.07	14.90	73.84	65.54	18.03	15.74
2010 ^R	79.94	78.43	19.52	18.84	82.24	80.69	20.08	19.38
2011	97.67	80.91	23.85	19.43	97.67	80.91	23.85	19.43
2010 ^R Mar	78.42	84.33	19.15	20.25	81.22	87.34	19.83	20.97
Jun	81.35	94.70	19.87	22.74	83.12	96.76	20.30	23.24
Sep	79.16	70.07	19.33	16.83	80.34	71.12	19.62	17.08
Dec	81.18	72.04	19.82	17.30	81.62	72.44	19.93	17.40
2011 Mar	92.83	82.10	22.67	19.72	91.33	80.78	22.30	19.40
Jun	100.20	79.21	24.47	19.02	97.73	77.25	23.86	18.55
Sep	96.04	82.39	23.45	19.79	96.51	82.79	23.57	19.88
Dec	102.61	80.17	25.06	19.25	102.61	80.17	25.06	19.25
Δ2007/2011 p.a.	10.4%	10.0%	10.4%	10.0%	6.5%	6.2%	6.5%	6.2%
Δ2010/2011	22.2%	3.2%	22.2%	3.2%	18.8%	0.3%	18.8%	0.3%

Note to Table I.3:

^R = Revised figures.

I. Prices

Figure I.3a: Nominal Fuel Oil Prices

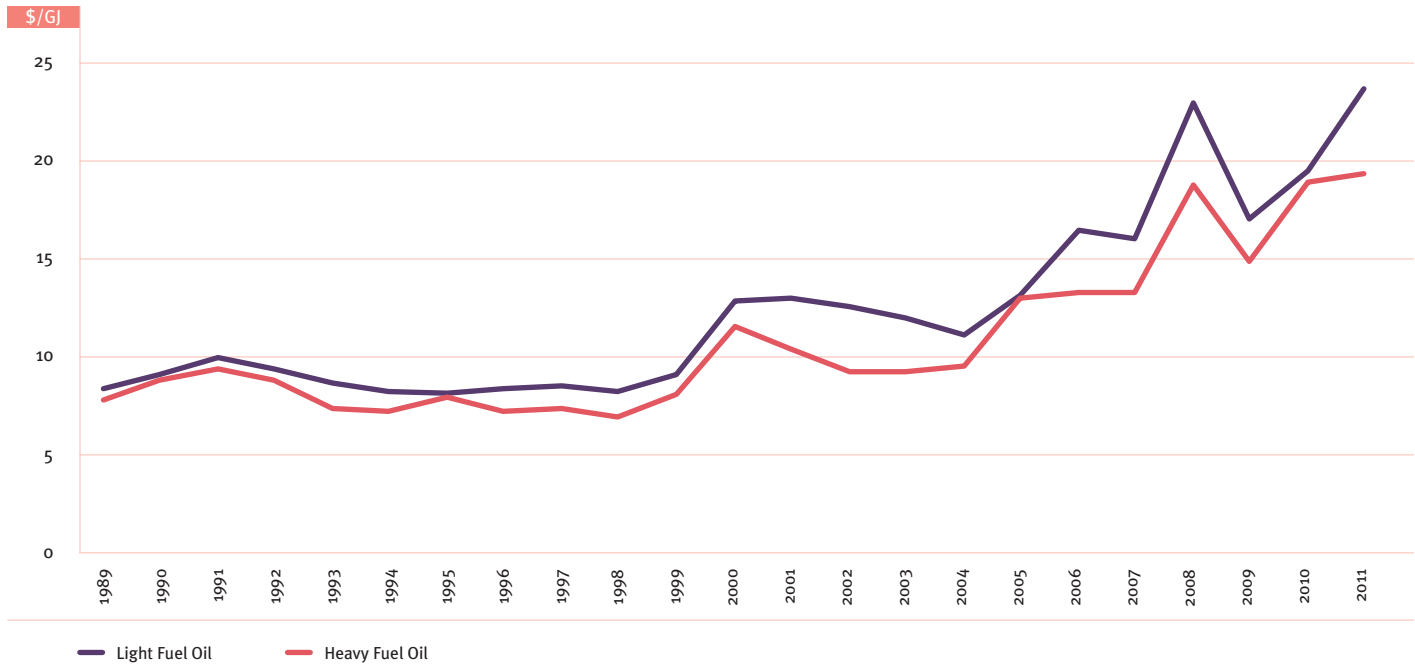
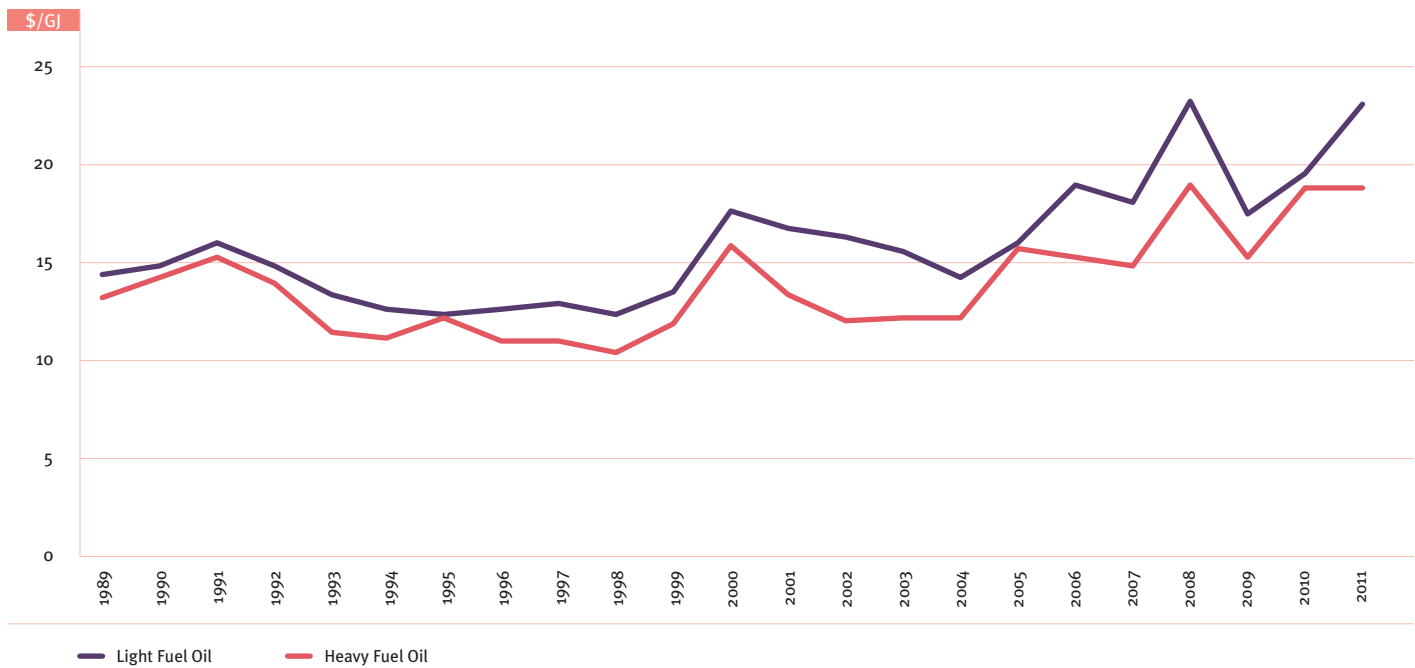


Figure I.3b: Real 2011 Fuel Oil Prices



I. Prices

Natural Gas Prices

Table I.4: Nominal and Real 2011 Natural Gas Prices

Calendar Year Average or Quarters	Retail				Retail			
	Wholesale	Industrial ^{1, R}	Commercial	Residential ²	Wholesale	Industrial ¹	Commercial	Residential ²
	(excl GST)	(excl GST)	(excl GST)	(incl GST)	(excl GST)	(excl GST)	(excl GST)	(incl GST)
Nominal Prices (\$/GJ)				Real 2011 Prices (\$/GJ)				
1979			2.39	5.42			11.58	28.16
1980			3.58	6.21			14.15	27.53
1981			3.69	6.59			12.46	25.32
1982			3.68	6.59			10.81	21.80
1983			3.68	6.59			10.25	20.31
1984			4.13	5.22			10.75	15.16
1985			4.92	5.79			11.09	14.56
1986			5.68	7.83			12.11	17.39
1987			7.33	8.48			14.47	16.27
1988			6.61	7.56			12.40	13.64
1989			6.85	9.22			12.01	15.74
1990			6.87	9.42			11.50	15.15
1991			7.29	10.51			12.11	16.48
1992			7.31	10.65			11.89	16.53
1993			7.17	11.52			11.38	17.65
1994			7.32	12.23			11.47	18.42
1995			7.43	13.60			11.55	19.75
1996			7.59	15.25			11.73	21.64
1997			9.11	16.59			14.02	23.27
1998			9.33	17.06			14.27	23.63
1999			11.82	16.34			17.90	22.65
2000	2.72	4.41	8.98	12.89	3.82	6.20	12.64	17.42
2001	2.84	4.53	8.84	13.08	3.77	6.01	11.73	17.22
2002	2.96	4.84	9.32	13.33	3.92	6.42	12.35	17.10
2003	3.23	5.77	10.29	18.33	4.31	7.70	13.75	23.10
2004	3.84	6.35	9.60	24.34	5.04	8.32	12.58	29.99
2005	3.82	7.53	11.80	28.13	4.78	9.44	14.78	33.63
2006	4.83	8.80	14.28	27.30	5.70	10.38	16.84	31.58
2007	5.44	8.95	16.17	34.92	6.27	10.32	18.63	39.45
2008	5.57	8.29	16.73	39.68	5.80	8.63	17.40	43.13
2009	6.96	8.78	15.61	32.87	7.36	9.28	16.49	34.98
2010 ^R	7.37	8.04	15.88	33.17	7.58	8.27	16.34	34.50
2011	7.13	7.85	17.09	36.09	7.13	7.85	17.09	36.09
2010 ^R Mar	7.34	8.66	16.57	31.57	7.60	8.97	17.17	33.33
Jun	7.04	7.98	15.35	32.72	7.19	8.15	15.69	34.47
Sep	7.49	8.27	16.40	32.39	7.60	8.39	16.64	33.76
Dec	7.61	7.60	15.19	33.17	7.65	7.64	15.28	33.78
2011 Mar	7.29	7.63	16.92	33.75	7.17	7.50	16.65	34.10
Jun	7.19	7.47	16.22	34.76	7.01	7.29	15.81	34.79
Sep	7.31	7.87	18.09	35.65	7.34	7.91	18.18	35.53
Dec	6.68	8.37	17.05	36.09	6.68	8.37	17.05	36.09
Δ2007/2011 p.a.	7.0%	-3.2%	1.4%	0.8%	3.3%	-6.6%	-2.1%	-2.2%
Δ2010/2011	-3.3%	-2.3%	7.6%	8.8%	-6.0%	-5.1%	4.6%	4.6%

Notes to Table I.4: ¹ Industrial natural gas prices have been revised as they now exclude gas sold for electricity generation. Gas sold for electricity generation is included in the wholesale price. ^R = Revised figures.

² Quarterly residential natural gas prices are now calculated as a rolling average over the last year.

I. Prices

Figure I.4a: Nominal Natural Gas Prices

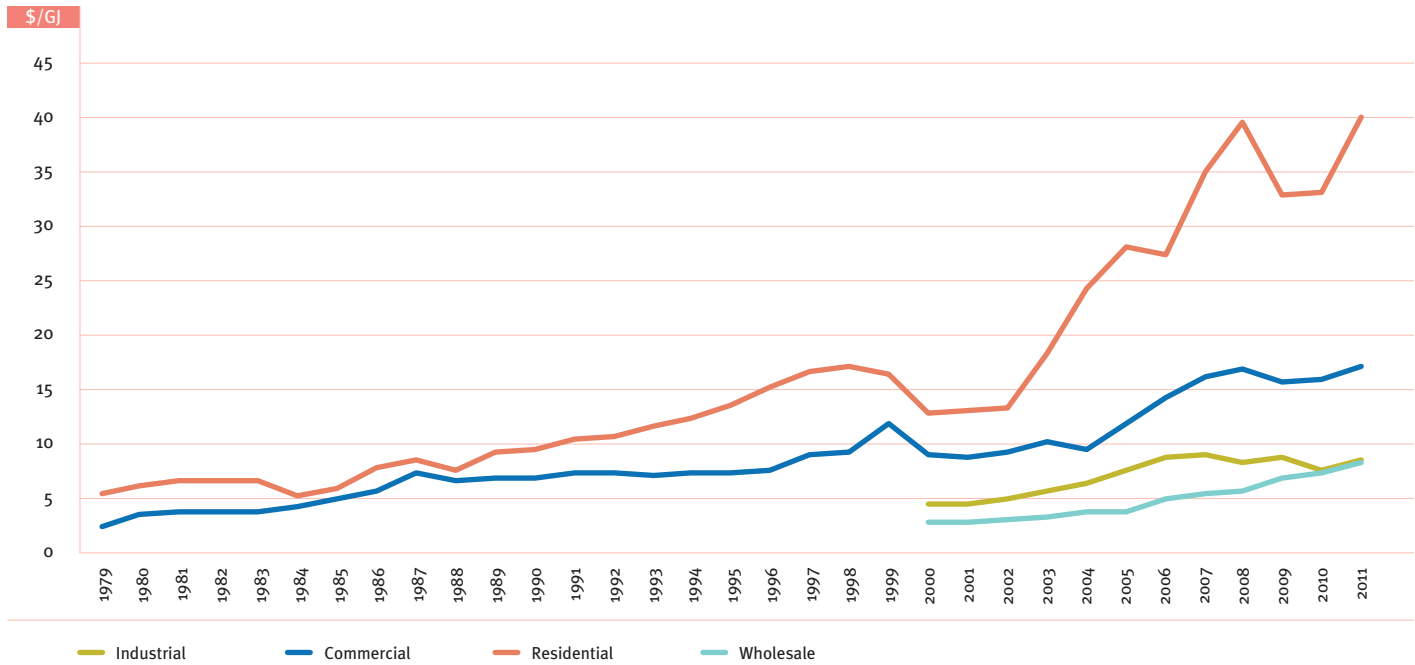
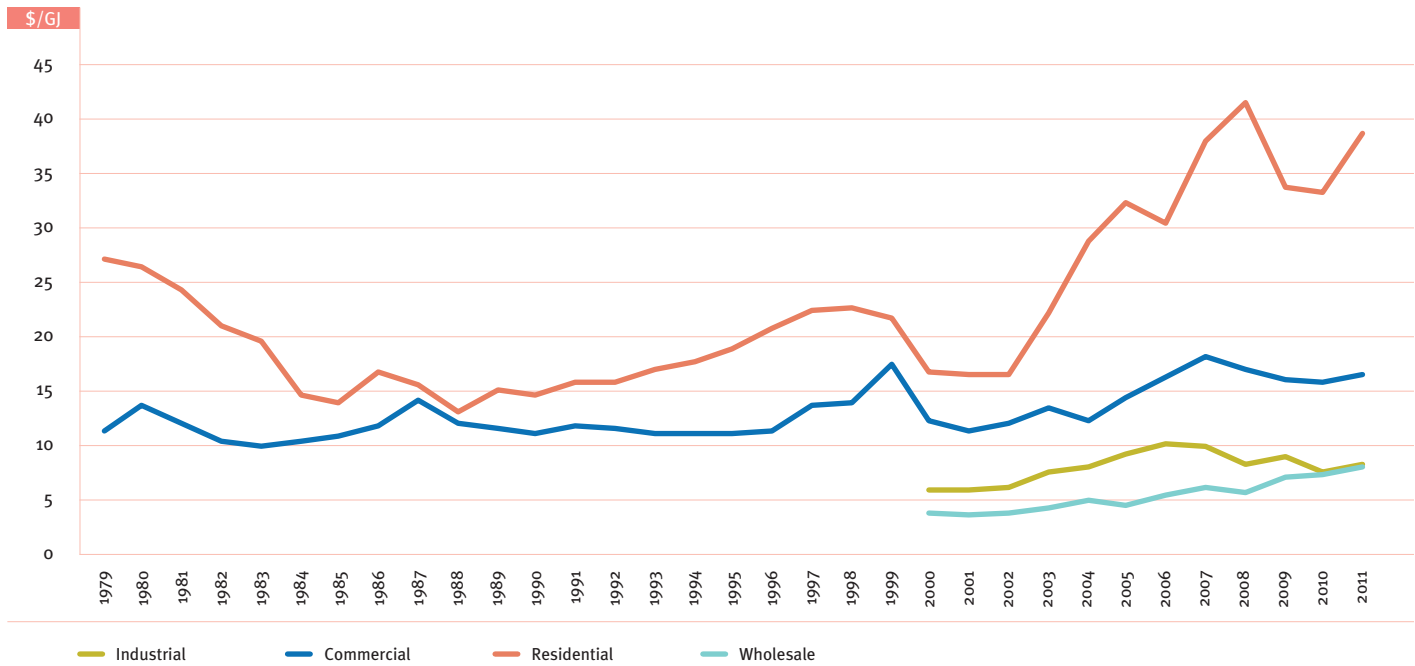


Figure I.4b: Real 2011 Natural Gas Prices



I. Prices

Taxes and Levies

Sales of all goods and services in New Zealand are subject to a **Goods and Services Tax (GST)**. GST was introduced on 1 October 1986 at a rate of 10%. GST increased to 12.5% on 1 July 1989, then to 15% on 1 October 2010. Commercial and industrial consumers generally obtain refunds on any GST paid; therefore, prices relating to commercial and industrial consumers are presented exclusive of GST to reflect the cost incurred. Residential consumers generally cannot obtain refunds so prices are presented inclusive of GST.

Excise duty on motor spirits is collected on the sale of motor spirits by the New Zealand Customs Service and revenue is distributed to the National Land Transport Fund (NLTF). Revenue was formerly split between the NLTF and the Crown, but an amendment to this scenario came into effect on 1 July 2008. This does not affect the amount of tax collected, just how the revenue is distributed. The NLTF is a dedicated transport account that funds roading and public-transport projects and developments.

Road User Charges are applicable to vehicles over 3.5 tonnes manufacturer's gross laden weight and all vehicles of 3.5 tonnes or less powered by a fuel not taxed at purchase. Diesel is not taxed at purchase and is therefore subject to Road User Charges. Information on Road User Charges can be found on Land Transport New Zealand's, website www.nzta.govt.nz.

Regional taxes on petrol were introduced on 1 July 1992 and were in place until 31 January 1996. The rates applicable during this period were: 0.95 cents per litre (c/l) for Auckland

Urban Area, 0.2 c/l for Waikato, 1.5 c/l for Wellington, Porirua and Hutt Valley, 0.5 c/l for Kapiti Coast and Waikanae, 0.62 c/l for Canterbury, and 0.5 c/l for Otago.

The **Accident Compensation Corporation (ACC) Levy** is collected under the Accident Compensation Act 2001. The ACC Levy is collected directly on petrol sales at a rate of 9.90 c/l. ACC also collects revenue through the New Zealand Transport Agency's licencing process. The annual rate for passenger cars (1,300 – 2,600 cc) is \$198.48 per year for petrol cars and \$311.38 for diesel cars. Trucks, vans and utility vehicles are charged at the higher rates of \$238.15 and \$467.08 per year for petrol and diesel respectively. The levies on diesel vehicles are higher because there is no ACC levy on the fuel.

The **Energy Resources Levy (ERL)**, which applies to LPG, CNG and Natural Gas, has not been included in the duties, taxes and levies tables as it does not apply to all sales. The ERL only applies to gas discoveries made before 1 January 1986, at a rate of 45 cents per GJ. The quantity of gas that is affected by the levy is decreasing over time as production from pre-1986 fields decreases.

The **Petroleum or Engine Fuel Monitoring Levy** is collected under the Energy (Fuels, Levies, and References) Act 1989 by the New Zealand Customs Service. The levy was amended in 2008 from the Petroleum Fuel Monitoring Levy to its current title and is now payable on petrol, diesel, biodiesel, fuel ethanol, and any blends of these fuels, for the purpose of inspecting and monitoring fuel quality in New Zealand. This levy was increased from 0.025 cents per litre to 0.045

cents per litre on 1 October 2008 to account for the future costs of monitoring the bio-fuel content of fuels.

Local Authority Fuel Tax is collected under the Local Government Act 1974. This centrally collected tax is distributed to local authorities. In 2008, it was renamed from Local Authority Petroleum Tax.

The **New Zealand Emissions Trading Scheme (ETS)** came into effect for Electricity Generation, Industrial Processes and Transport Fuels from 1 July 2010. This scheme puts an obligation on mandatory participants to pay for carbon emissions (in carbon dioxide equivalent (CO₂-e) terms). This is a market-based scheme, where companies can buy and sell New Zealand Units (NZUs), equivalent to one tonne of CO₂-e, or until December 2012 they may surrender their emissions units from the Government at a fixed price of \$25 per tonne of CO₂-e. Additionally, during the transition period, each unit will cover two tonnes of CO₂-e, thereby setting a price cap of \$12.50 per tonne. At this price cap (\$12.50 per tonne CO₂-e), the effect (from 1 July 2010 to 31 December 2012) on the petrol price and diesel price is 2.9 c/l and 3.3 c/l respectively.

The Ministry for the Environment released a consultation document in April 2012. The document proposes – among other changes to the ETS – the extension of the transition phase from 31 December 2012 to stepped removal of the price cap and obligation reduction by 2015 or beyond.

Table I.5a: Taxes, Duties and Levies on Fuels at December 2011 (c/l excluding GST)¹

Product	Excise Duty on Motor Spirits delivered to:			Accident Compensation Corporation Levy	Petroleum or Engine Fuel Monitoring Levy ⁵	Local Authority Fuel Tax	Total
	Crown	NLTF ⁴	Total				
Regular Unleaded Petrol	0.000	48.524	48.524	9.900	0.045	0.66	59.129
Premium Unleaded Petrol ²	0.000	48.524	48.524	9.900	0.045	0.66	59.129
Diesel ³	n.a.	n.a.	n.a.	n.a.	0.045	0.33	0.375
Marine Diesel	n.a.	n.a.	n.a.	n.a.	0.045	n.a.	0.045
Methanol	30.20	0.00	30.20	n.a.	n.a.	0.66	30.86
LPG	0.0	10.4	10.4	n.a.	n.a.	n.a.	10.4
CNG	0.0	10.5	10.5	n.a.	n.a.	n.a.	10.5
Aviation Fuel, Kerosene, Light Fuel Oil and Heavy Fuel Oil	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

¹ Notes to Table I.5a: ¹ Indirect charges such as Energy Resources Levy (ERL) that only apply on LPG and CNG produced from certain oil and gas fields are not included in the following tables.

² Petrol with an octane of 95 and above, e.g. Premium and Premium 98 petrol.

³ Excludes Road User Charges.

⁴ National Land Transport Fund.

⁵ The name of the Petroleum Fuels Monitoring Levy changed to the Petroleum or Engine Fuel Monitoring Levy on 1 October 2008. n.a. = Not applicable.

I. Prices

Table I.5b: Premium and Regular Petrol Taxes, Duties and Levies (c/l)

Effective Date ¹	Excise Duty on Motor Spirits delivered to:			Accident Compensation Corporation Levy	Petroleum or Engine Fuel Monitoring Levy	Local Authority Fuel Tax	Liquid Fuels Trust Levy	Refinery Expansion Levy	Total
	Crown	NLTF	Total						
1 Jan 1970	-	4.000	4.000	-	-	-	-	-	4.00
1 Feb 1971	-	4.000	4.000	-	-	0.66	-	-	4.66
23 May 1975	4.700	4.000	8.700	-	-	0.66	-	-	9.36
1 Apr 1977	4.700	5.000	9.700	-	-	0.66	-	-	10.36
2 Jun 1978	7.700	5.000	12.700	-	-	0.66	-	-	13.36
1 Nov 1978	7.700	5.000	12.700	-	-	0.66	0.1	-	13.46
1 Apr 1979	8.450	4.250	12.700	-	-	0.66	0.1	-	13.46
1 Apr 1980	6.700	6.000	12.700	-	-	0.66	0.1	-	13.46
6 Aug 1982	9.800	6.000	15.800	-	-	0.66	0.1	-	16.56
1 Oct 1982	9.800	6.400	16.200	-	-	0.66	0.1	-	16.96
1 Jan 1983	9.800	6.400	16.200	-	-	0.66	0.1	2.43	19.39
1 Jan 1984	9.800	6.400	16.200	-	-	0.66	0.1	6.74	23.70
9 Nov 1984	9.800	8.900	18.700	-	-	0.66	0.1	6.74	26.20
1 Jan 1985	9.800	8.900	18.700	-	-	0.66	0.1	12.80	32.26
1 Jan 1986	9.800	8.900	18.700	-	-	0.66	0.1	10.00	29.46
1 Apr 1986	9.800	8.900	18.700	-	-	0.66	0.1	16.00	35.46
1 Oct 1986	25.800	8.900	34.700	-	-	0.66	abolished	abolished	35.36
1 Apr 1987	25.800	9.900	35.700	-	-	0.66	-	-	36.36
1 Apr 1988	25.800	10.900	36.700	-	-	0.66	-	-	37.36
1 Aug 1988	25.800	10.900	36.700	-	0.030	0.66	-	-	37.39
1 Jan 1989	25.800	10.900	36.700	-	0.025	0.66	-	-	37.39
1 Jul 1989	21.800	10.900	32.700	-	0.025	0.66	-	-	33.39
1 Jan 1991	19.800	10.900	30.700	-	0.025	0.66	-	-	31.39
31 Jul 1991	19.300	10.900	30.200	-	0.025	0.66	-	-	30.89
8 Aug 1991	23.100	7.100	30.200	-	0.025	0.66	-	-	30.89
1 Oct 1991	23.100	7.100	30.200	2.00	0.025	0.66	-	-	32.89
3 Jul 1992	20.800	9.400	30.200	2.00	0.025	0.66	-	-	32.89
15 May 1998	18.700	13.600	32.300	2.00	0.025	0.66	-	-	34.99
1 Jul 2000	18.775	13.525	32.300	2.00	0.025	0.66	-	-	34.99
20 Mar 2001	17.775	13.530	31.305	3.00	0.025	0.66	-	-	34.99
1 Jul 2001	18.475	13.530	32.005	2.30	0.025	0.66	-	-	34.99
1 Mar 2002	18.475	17.725	36.200	2.30	0.025	0.66	-	-	39.19
1 Jul 2003	18.475	17.725	36.200	5.08	0.025	0.66	-	-	41.97
1 Oct 2004	18.708	17.492	36.200	5.08	0.025	0.66	-	-	41.97
1 Apr 2005	18.708	22.492	41.200	5.08	0.025	0.66	-	-	46.97
1 Jul 2005	18.708	22.492	41.200	5.78	0.025	0.66	-	-	47.67
1 Apr 2006	18.708	23.200	41.908	5.78	0.025	0.66	-	-	48.37
1 Apr 2007	18.708	23.816	42.524	5.78	0.025	0.66	-	-	48.99
1 Jul 2007	18.708	23.816	42.524	7.33	0.025	0.66	-	-	50.54
1 Jul 2008	18.708	23.816	42.524	9.34	0.025	0.66	-	-	52.55
1 Oct 2008	0.000	42.524	42.524	9.34	0.045	0.66	-	-	52.57
1 Jul 2009	0.000	42.524	42.524	9.90	0.045	0.66	-	-	53.13
1 Oct 2009	0.000	45.524	45.524	9.90	0.045	0.66	-	-	56.13
1 Oct 2010	0.000	48.524	48.524	9.90	0.045	0.66	-	-	59.13

Note to Table I.5b: ¹ From 6 August 1982 to 31 July 1991 tax on premium petrol was 0.5c/l more than on regular. The variance is due to a reduced rate of excise duty collected and passed on to the Crown.

Figures in grey indicate the level of tax did not change.

I. Prices

Table I.5c: Lead Tax Payable on Lead Content of Petrol (c/gram)

Effective Date	Lead Tax
1 Jan 1991	6.6
1 Jul 1993	8.0

Table I.5d: Diesel Taxes, Duties and Levies (c/l)

Effective Date	Excise Duty on Motor Spirits delivered to:			Petroleum or Engine Fuel Monitoring Levy	Local Authority Fuel Tax	Liquid Fuels Trust Levy	Total
	Crown	NLTF	Total				
<i>Automotive Diesel¹</i>							
1 Feb 1971	-	-	-	-	0.33	-	0.330
1 Nov 1978	-	-	-	-	0.33	0.1	0.430
22 Jun 1979	0.5	-	0.5	-	0.33	0.1	1.430
6 Aug 1982	7.2	-	7.2	-	0.33	0.1	14.830
1 Oct 1986	23.2	-	23.2	-	0.33	abolished	46.730
1 Aug 1988	23.2	-	23.2	0.030	0.33	-	46.760
1 Jan 1989	23.2	-	23.2	0.025	0.33	-	46.755
1 Jul 1989	16.2	-	16.2	0.025	0.33	-	32.755
1 Nov 1989	11.2	-	11.2	0.025	0.33	-	22.755
1 Jan 1991	-	-	Replaced by Road User Charges	0.025	0.33	-	0.355
1 Oct 2008	-	-	-	0.045	0.33	-	0.375
<i>Marine Diesel</i>							
1 Oct 1986	-	5.80	5.80	0.025	n/a	n/a	5.825
1 Jul 1989	-	-	abolished	0.025	n/a	n/a	0.025
1 Oct 2008	-	-	-	0.045	n/a	n/a	0.045

Notes to Table I.5d: Figures in grey indicate the level of tax did not change.

¹ Diesel vehicles are subject to Road User Charges, which are not displayed in this table. Road User Charges and Accident Compensation Corporation premiums are collected through the Land Transport New Zealand licensing process.

Table I.5e: Other Liquid Fuels Taxes, Duties and Levies (c/l)

Fuel	Effective Date	Excise Duty on Motor Spirits delivered to:			Total
		Crown	NLTF	Total	
Light Fuel Oil and Heavy Fuel Oil	1 Oct 1986	5.0	-	5.00	5.00
	1 Jul 1989	-	-	abolished	-
Aviation Gasoline	1 Oct 1986	11.20	-	11.20	11.20
Jet Fuel	1 Oct 1986	7.20	-	7.20	7.20
Both Aviation Fuels	1 Jul 1989	-	-	abolished	-
Kerosene	1 Oct 1986	8.00	-	8.00	8.00
	1 Jul 1989	-	-	abolished	-

I. Prices

Table I.5f: Gas and Methanol Taxes, Duties and Levies (c/l)

Fuel	Effective Date	Excise Duty on Motor Spirits delivered to:			Local Authority Fuel Tax	Total
		Crown	NLTF	Total		
LPG (Used as a motor spirit)	1 Oct 1986	-	6.86	6.86	n/a	6.86
	1 Apr 1987	-	7.63	7.63	n/a	7.63
	1 Apr 1988	-	8.40	8.40	n/a	8.40
	1 Nov 1989	-	8.40	8.40	n/a	8.40
	1 Jul 1992	-	8.40	8.40	n/a	8.40
	15 May 1998	-	10.40	10.40	n/a	10.40
CNG	1 Oct 1986	-	8.03	8.03	n/a	8.03
	1 Nov 1989	-	9.83	9.83	n/a	9.83
	1 Jul 1992	-	10.50	10.50	n/a	10.50
Methanol	1 Feb 1971	-	-	-	0.66	0.66
	1 Oct 1986	25.80	8.90	34.70	0.66	35.36
	1 Apr 1987	25.80	9.90	35.70	0.66	36.36
	1 Apr 1988	25.80	10.90	36.70	0.66	37.36
	1 Jul 1989	21.80	10.90	32.70	0.66	33.36
	1 Jan 1991	20.80	9.40	30.20	0.66	30.86
	1 Oct 2004	30.20	-	30.20	0.66	30.86

Note to Table I.5f: Figures in grey indicate the level of tax did not change.

Table I.5g: Natural Gas Taxes and Levies (c/GJ)

Effective Date	Gas Levy
26 Jun 1987	0.969
1 Jan 1990	1.310
1 Oct 2000	2.000

Table I.5h: Coal (Opencast Mines Only) Taxes, Duties and Levies (\$/tonne)

Fuel	Effective Date	Energy Resources Levy
Coal, excluding South Island Lignite	1 Jan 1977	2.00
South Island Lignite	1 Jan 1977	1.50

Table I.5i: Acts and Regulations

Tax/Levy	Act/Regulation	Administered by	Payable on
Crown Revenue – Petroleum Excise Tax	Customs and Excise Act 1996	New Zealand Customs Service	Production / Imports
National Land Transport Management Fund	Customs and Excise Act 1996	New Zealand Customs Service	Production / Imports
Accident Compensation Corporation Levy	Accident Compensation Act 2001	New Zealand Customs Service	Production / Imports
Petroleum or Engine Fuel Monitoring Levy	Energy (Fuels, Levies, and References) Act 1989	New Zealand Customs Service	Sales
Local Authority Petroleum Tax	Local Government Act 1974	Department of Internal Affairs	Wholesale sales
Energy Resources Levy	Energy Resources Levy Act 1976	Ministry of Economic Development	Production of coal and gas
Gas Levy	Energy (Fuels, Levies, and References) Act 1989	Ministry of Economic Development	Piped Sales

I. Prices

Price Deflators

Price deflators are used to convert nominal (face value) prices into real (inflation adjusted prices). They separate inflationary movements to provide a more accurate picture of the underlying change in price. In this publication the real prices are presented as December 2011 prices and are calculated using two national deflators: the Consumer Price Index (CPI) for residential consumers, and the Producer Price Index input sub-series (PPI Input) for all other consumers. Both indices are supplied by Statistics New Zealand. To provide a consistent CPI and PPI Input time series, historical indices have been adjusted and linked to the current Statistics New Zealand series.

Table I.6: Price Deflators

Calendar Year or Quarter	All Groups CPI	All Groups PPI (Input)
	June quarter 2006=1000	Dec quarter 2010=1000
1974	114	
1975	131	PPI Deflator unavailable before December 1979 quarter
1976	153	
1977	175	
1978	196	
1979	223	
1980	261	209
1981	301	257
1982	349	300
1983	375	345
1984	398	364
1985	460	390
1986	520	450
1987	602	476
1988	641	514
1989	677	541
1990	719	579
1991	737	606
1992	745	611
1993	754	624
1994	767	639
1995	796	648
1996	815	653
1997	824	657
1998	835	659
1999	834	664
2000	855	670
2001	878	721
2002	901	765
2003	917	766
2004	938	760
2005	967	774
2006	999	810
2007	1,023	860
2008	1,064	881
2009	1,086	975
2010	1,111	961
2011	1,156	986
2010 Mar	1,097	1,033
2010 Jun	1,099	971
2010 Sep	1,111	984
2010 Dec	1,137	991
2011 Mar	1,146	1,000
2011 Jun	1,157	1,022
2011 Sep	1,162	1,031
2011 Dec	1,158	1,037
		1,042
Used to deflate:	Residential Fuel Prices	Wholesale, Industrial and Commercial Fuel Prices
Statistics New Zealand Series	CPI009AA	PPI019AA

Note to Table I.6: Industrial and Commercial PPI Input series are no longer included in the *Energy Data File*. All Wholesale, Industrial and Commercial prices are now deflated by the PPI Input All Groups series because this allows easier comparison between price series.

J. International Energy Comparisons

Introduction

This section compares New Zealand's energy situation with that of its major Organisation for Economic Cooperation and Development (OECD) trading partners, for which information is available.

Data is based on *Energy Prices and Taxes Fourth Quarter 2011*, published by the International Energy Agency (IEA). Care is needed in interpreting the data as product specifications, statistical methodology and information available can differ considerably among countries. Where 2011 data is not available the latest available information has been used. Where information is unavailable for the last three years, no data is shown.

Taxation forms a large component of some energy prices, notably for petrol (around 50% or more for most countries, except for the North American countries, for which the share is closer to 30%).

Prices

Table J.1 and Figures J.1a-J.1d compare the prices of different energy sources in OECD countries for the December quarter 2011.

New Zealand liquid fuel prices are at the lower end of the OECD range. However, diesel price comparisons may be misleading because Road User Charges are not included in this data. Other countries may have taxes and levies paid at the pump. Residential natural gas prices are currently higher than the average OECD price. Industrial natural gas prices and industrial and residential electricity prices are all less than the average for OECD countries. However, international gas and electricity price comparisons should be treated with caution given the incomplete data and inconsistent price-calculation methodologies.

Residential (or "retail") energy prices are subject to value-added taxes such as New Zealand's Goods and Services Tax of 15%.

Figure J.1e compares the international free on board (FoB) spot price of New Zealand indigenous crude oil to three other international crude benchmarks: Dubai Fateh, UK Brent and West Texas Intermediate (WTI). The Dubai Fateh crude is chosen for this chart because it is similar in quality to many of the crudes imported for refining in New Zealand. The UK Brent and WTI benchmarks are chosen because they are similar in quality to the exported New Zealand crude, and are also widely used in the media as "the crude oil price." The figure shows the steady growth in these prices in the years leading up to the peak price during the 2008 global financial crisis and the following price drop in 2009. The prices thereafter resume positive growth. Three of these crudes reached new all-time high prices in 2011, surpassing the 2008 peaks. WTI was the exception: it grew more slowly than the others between 2009 and 2011, and is yet to surpass its 2008 all-time high.

The crude oil price series are presented in US\$/barrel because these crudes are traded in US dollars (one barrel is approximately 159 litres). A time-series of exchange rates to convert these data to New Zealand dollar equivalent are available from the Reserve Bank of New Zealand (www.rbnz.govt.nz/statistics/exandint/b1/).

Consumption

Comparative energy consumption on a per capita basis in New Zealand's OECD trading partners in 2010 (2011 international energy consumption and production comparisons were not available for this edition) is shown in Table J.2 and Figures J.2a-J.2c. This shows that New Zealand is around the middle of the group when comparing electricity, oil and natural gas consumption.

Production

Despite growing oil and gas production, New Zealand is a very minor player in global energy production. In 2011 New Zealand produced the equivalent of 41%¹ of the amount of the oil it consumed. However, most of this was exported. New Zealand is therefore a net importer of oil and oil products.

¹ Calculated as:

$$\frac{\text{Indigenous production}}{\text{Observed consumer energy} + \text{non-energy use}}$$

J. International Energy Comparisons

Price Comparisons

Table J.1: International Energy Prices for the December Quarter 2011¹

Country	Electricity		Natural Gas ²		Petrol		Diesel ³	
	NZ cents/kWh		NZ\$/GJ		NZ cents/litre		NZ cents/litre	
	Industrial	Residential	Industrial	Residential	Premium	Regular	Industrial	Residential
Australia	na	na	na	na	202.54	188.73	na	196.55
Austria	21.56	33.69	na	29.66	236.32	236.15	136.54	236.71
Belgium	na	na	na	na	277.50	na	213.48	258.32
Canada	na	na	5.14	10.27	166.64	152.88	na	na
Czech Republic	19.36	25.53	18.52	30.12	239.43	234.80	201.27	241.51
Denmark	13.81	51.72	28.32	51.08	272.54	271.84	198.83	248.64
Finland	14.11	26.75	16.44	22.51	269.82	na	195.75	240.77
France	14.20	23.75	19.00	29.65	258.44	na	197.90	236.76
Germany	19.76	43.90	na	na	269.71	280.58	211.94	252.21
Hungary	15.93	27.53	16.78	20.42	227.31	na	189.41	236.77
Ireland	21.61	34.85	15.61	29.93	261.91	na	205.71	249.07
Italy	36.54	35.84	16.81	35.00	279.45	na	220.82	267.20
Japan	25.06	36.08	21.01	54.72	na	na	167.84	205.93
Korea	9.11	10.83	21.97	23.73	na	na	na	na
Luxembourg	na	na	14.89	22.30	221.84	na	181.60	208.83
Mexico	14.59	11.26	14.48	10.41	98.99	90.06	81.05	93.04
Netherlands	na	na	13.80	35.02	281.80	na	200.85	239.01
New Zealand	9.84	28.28	8.37	36.09	215.50	205.03	131.70	151.45
Norway	8.30	18.61	na	na	309.94	na	233.21	291.51
Poland	14.20	23.14	14.30	22.81	209.89	na	172.32	211.95
Portugal	17.52	32.63	18.35	37.31	265.90	na	219.81	242.48
Slovak Republic	22.18	28.76	18.20	24.48	254.15	na	199.17	238.99
Spain	na	na	14.65	32.08	226.18	na	190.10	224.27
Sweden	na	na	na	na	265.81	na	219.77	274.72
Turkey	17.37	21.29	12.19	15.26	na	na	272.29	272.29
United Kingdom	15.09	27.72	10.75	25.32	269.23	na	236.17	283.41
United States	8.87	15.02	5.95	12.72	119.06	114.48	132.66	132.66

¹ Notes to Table J.1: ¹ Based on prices published by the International Energy Agency (Energy Prices and Taxes, 4th Quarter 2011).

² The New Zealand residential natural gas price presented in this International Energy Comparisons section should be treated as an approximation only.

³ New Zealand Road User Charges are not taken into account by IEA diesel price statistics.

Taxes that have to be paid by the user and are not refundable are included. Value added taxes (such as New Zealand's GST) are refundable to industrial users and are not included for them. They are included for residential users.

Figures in grey are based on older information.

na = Not available. No data is available for the previous three years.

J. International Energy Comparisons

Figure J.1a: International Residential Electricity Prices for the December Quarter 2011

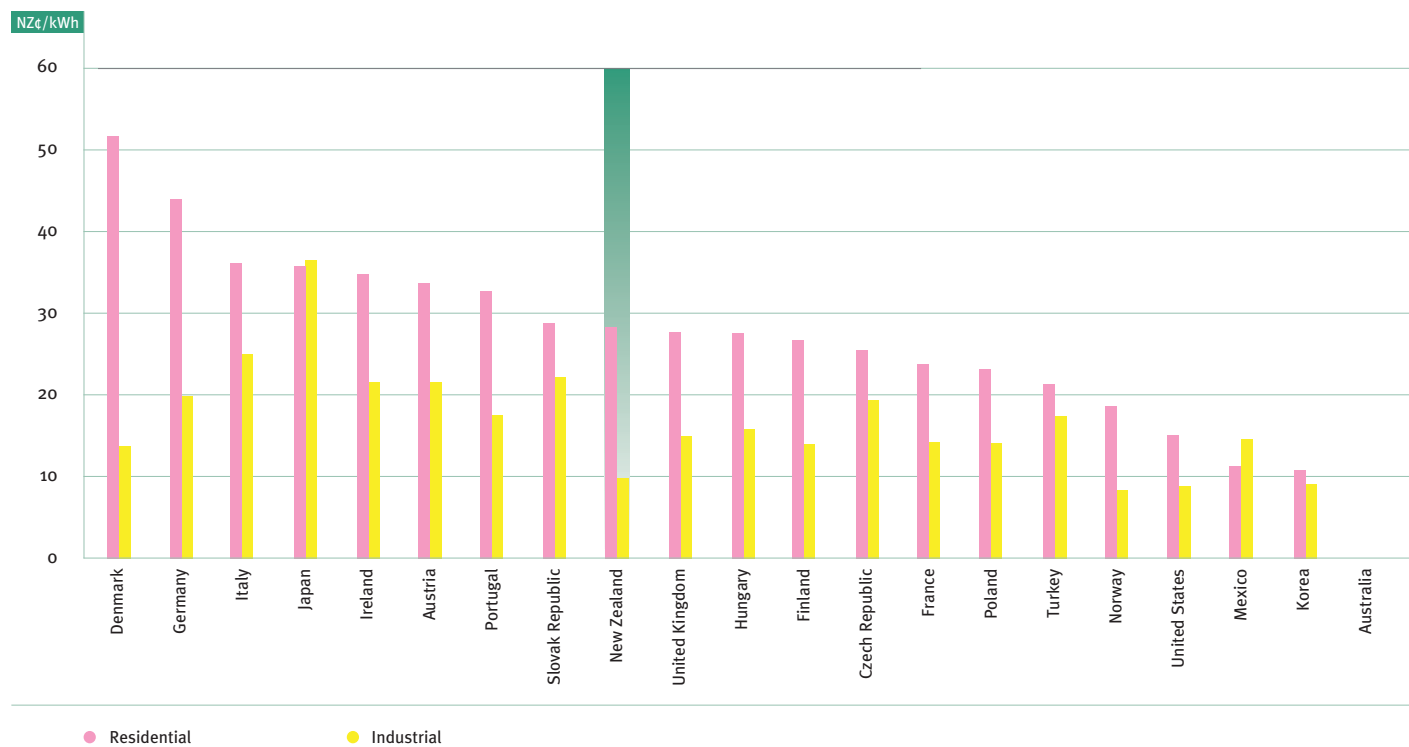
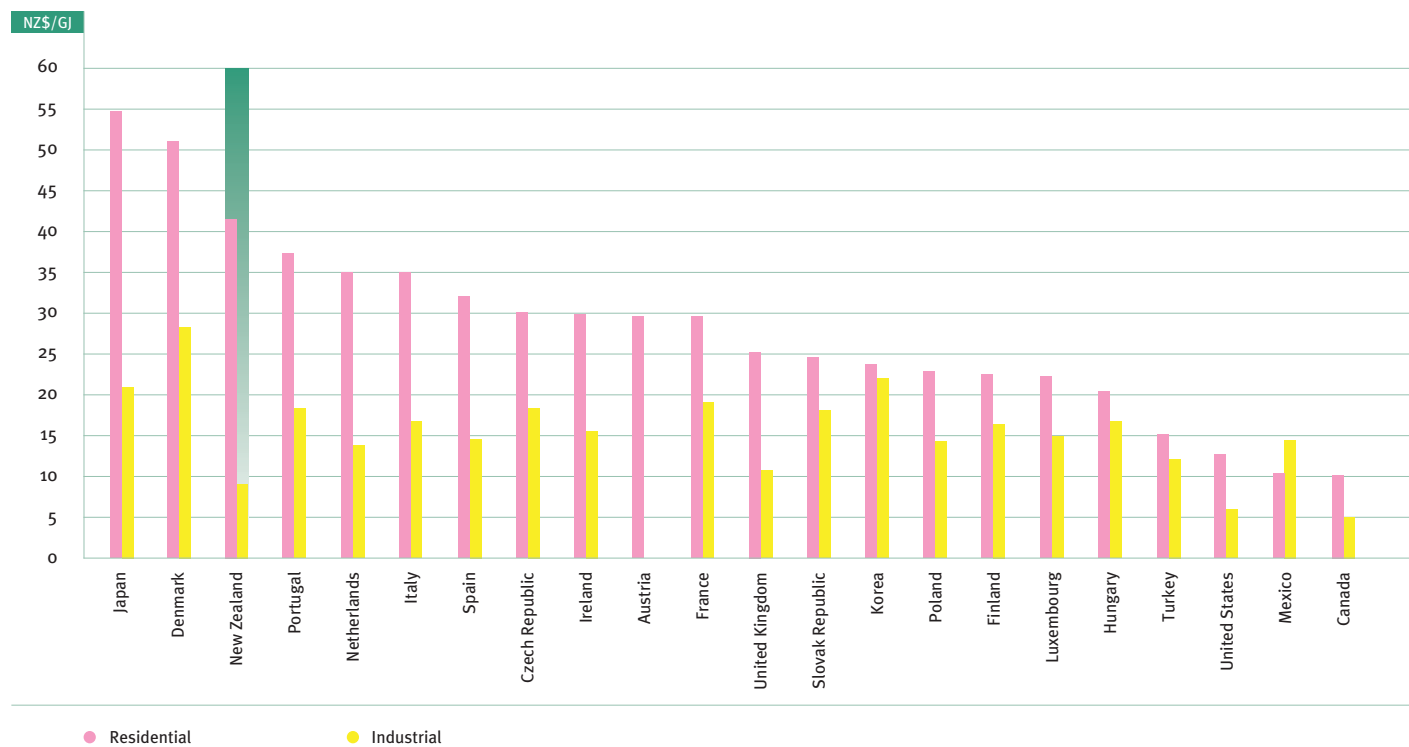


Figure J.1b: International Residential Natural Gas Prices for the December Quarter 2011



J. International Energy Comparisons

Figure J.1c: International Petrol Prices for the December Quarter 2011

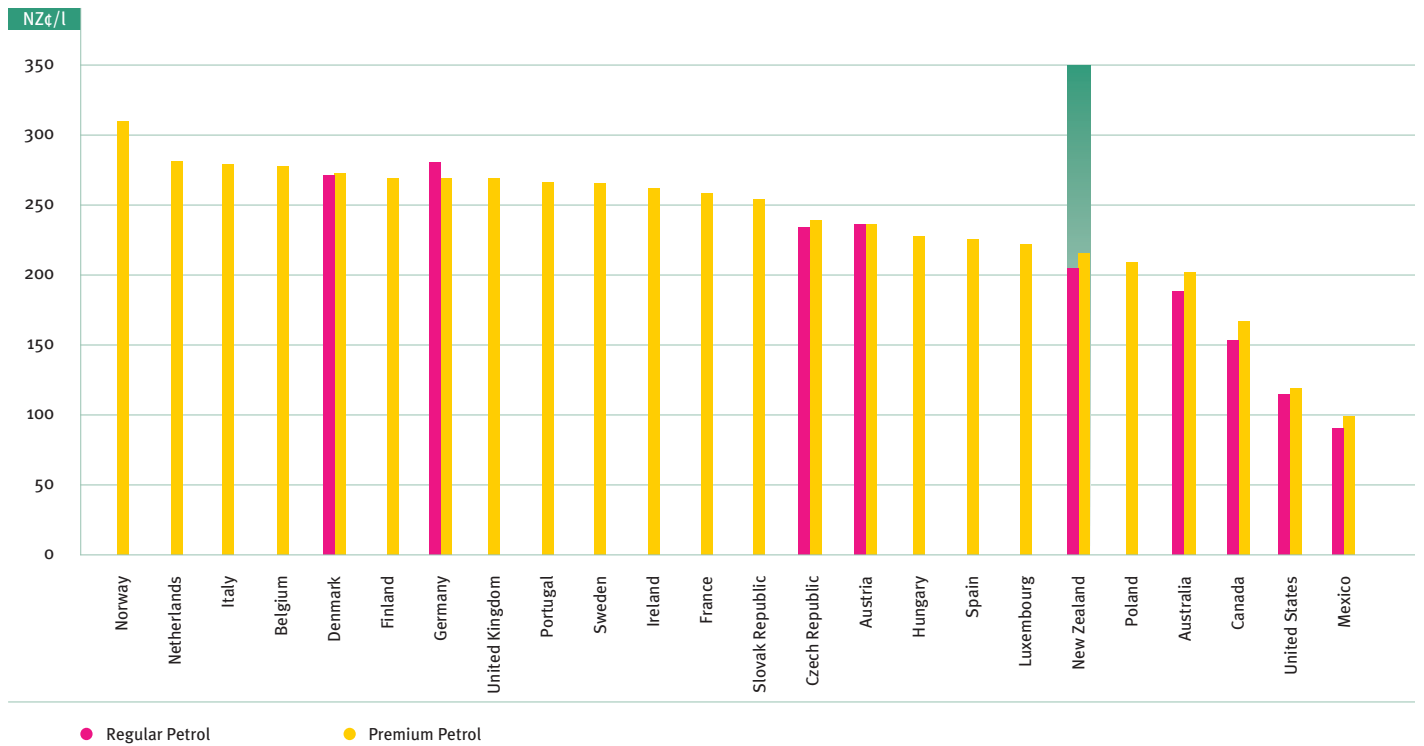
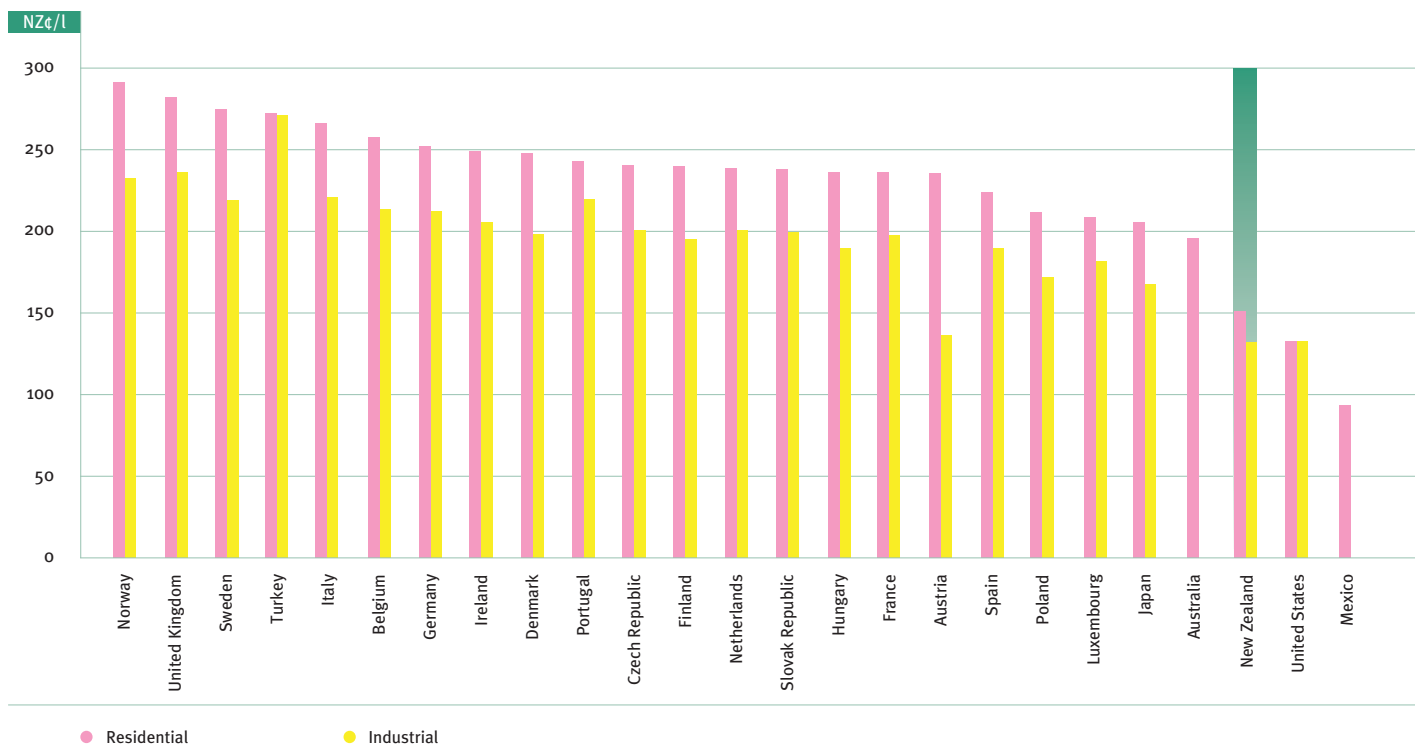
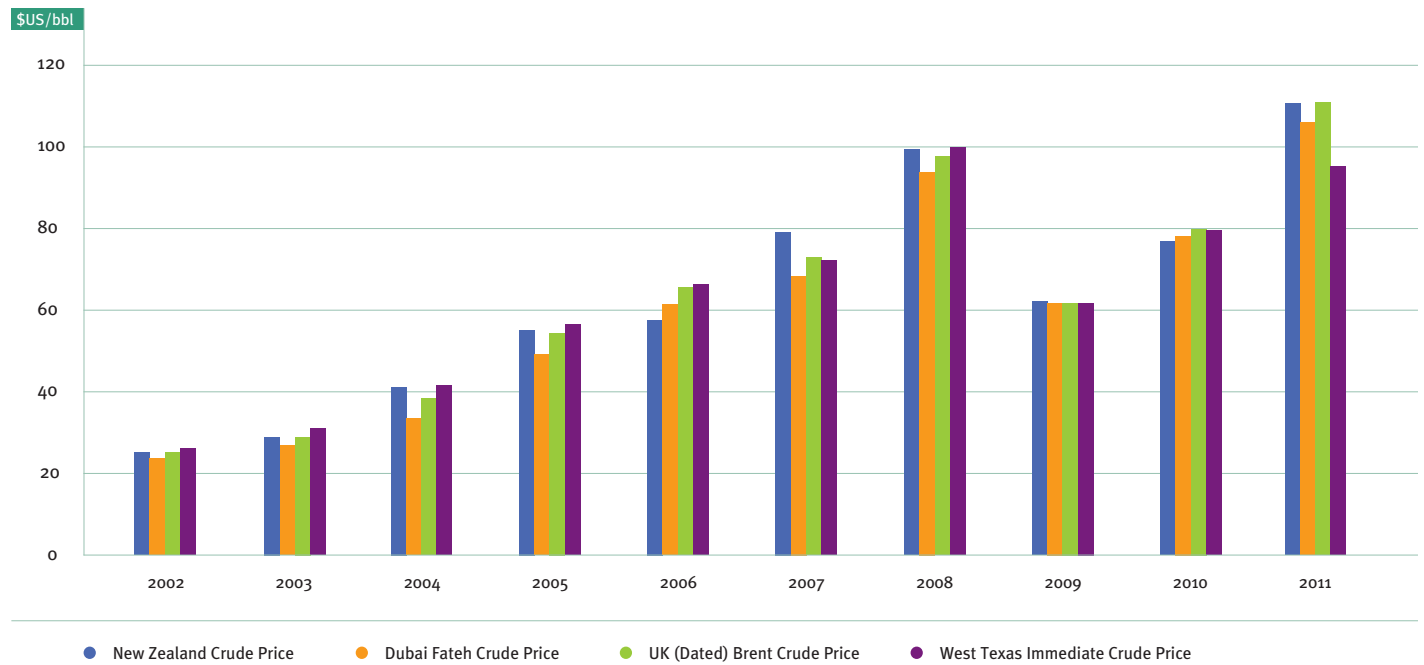


Figure J.1d: International Diesel Prices for the December Quarter 2011



J. International Energy Comparisons

Figure J.1e: Annual Average Crude Oil Spot Price (Nominal)



J. International Energy Comparisons

Energy Consumption Comparisons

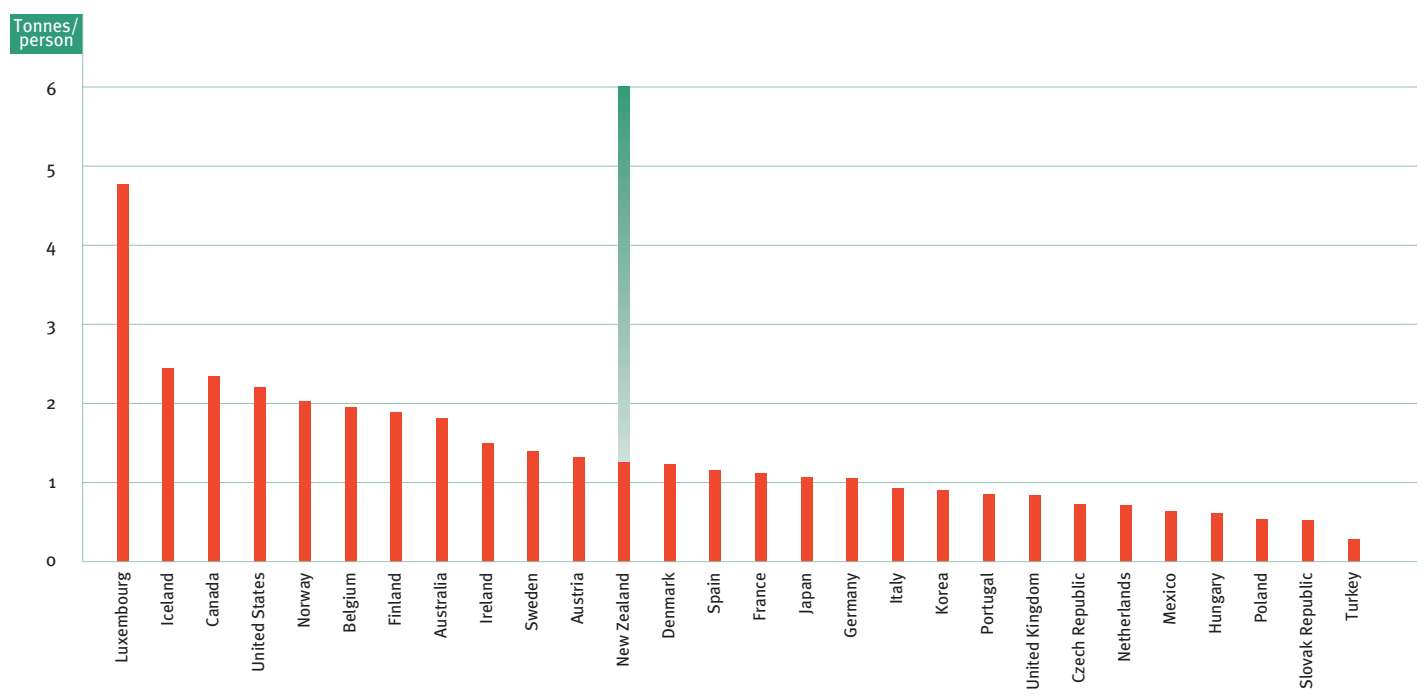
Table J.2: International Comparison of Natural Gas Prices December Quarter 2011¹

Country	Industry	Residential
	NZ \$/GJ (Including all taxes) ²	
Canada	5.14	10.27
Mexico	14.48	10.41
United States	5.95	12.72
Turkey	12.19	15.26
Hungary	16.78	20.42
Luxembourg	14.89	22.30
Finland	16.44	22.51
Poland	14.30	22.81
Korea	21.97	23.73
Slovak Republic	18.20	24.48
United Kingdom	10.75	25.32
France	19.00	29.65
Austria	na	29.66
Ireland	15.61	29.93
Czech Republic	18.52	30.12
Spain	14.65	32.08
Italy	16.81	35.00
Netherlands	13.80	35.02
Portugal	18.35	37.31
New Zealand	9.03	41.50
Denmark	28.32	51.08
Japan	21.01	54.72

Notes to Table J.2: ¹Based on prices and exchange rates published by the International Energy Agency (Energy Prices and Taxes, 4th Quarter 2011). United Kingdom, Japan, Canada, Luxembourg, Denmark and Italy prices are based on older information.

² Taxes that have to be paid by the user and are not refundable are included. Value added taxes (such as New Zealand's GST) are refundable to industrial users and are not included for them. Value added taxes are included for residential users.

Figure J.2a: Oil Products Consumption – Calendar Year 2010



J. International Energy Comparisons

Figure J.2b: Gas Consumption – Calendar Year 2010

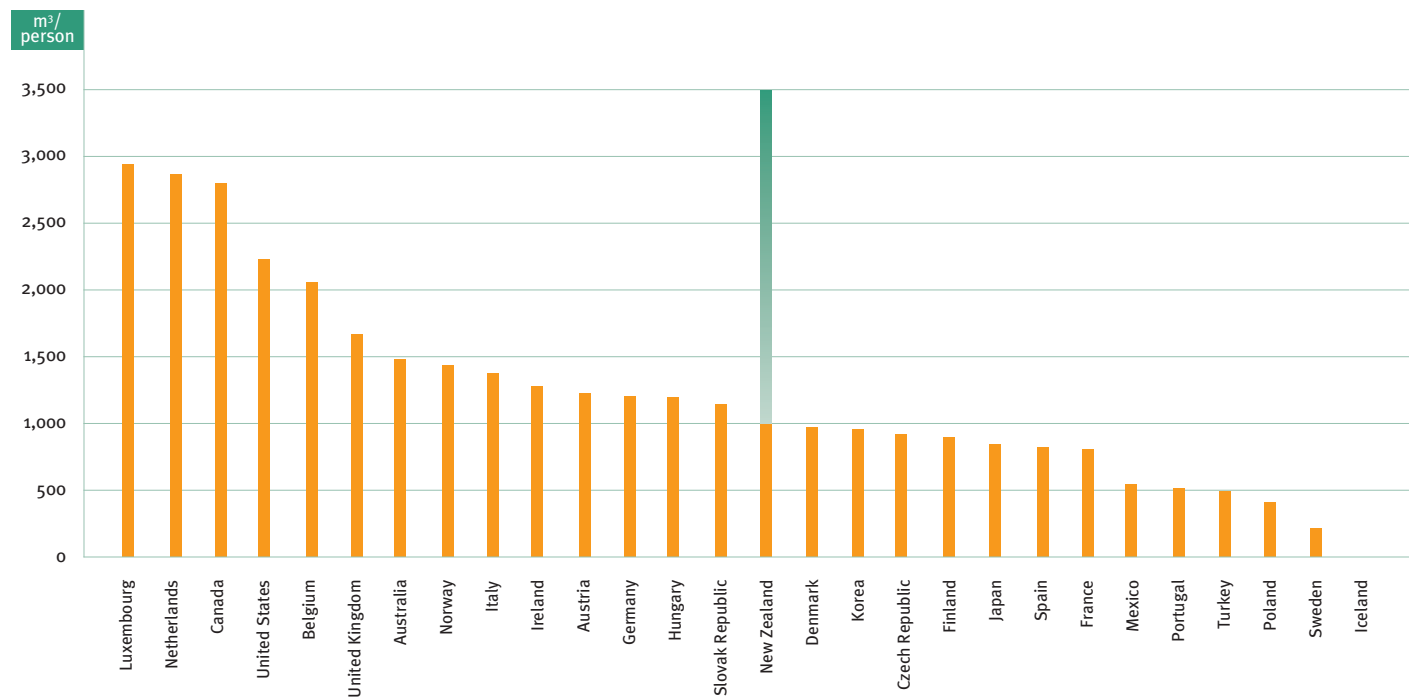
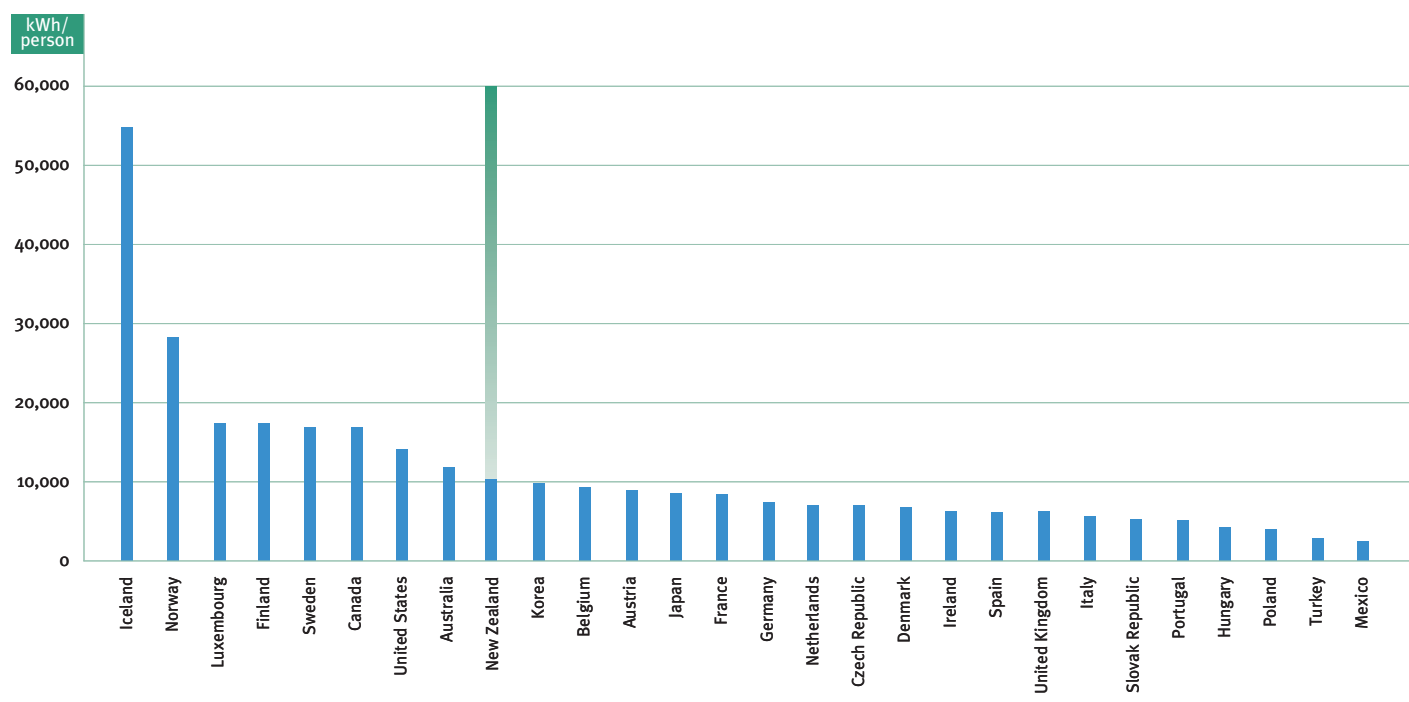


Figure J.2c: Electricity Consumption – Calendar Year 2010



K. Fuel Properties

Gross and Net Calorific Values

The energy contents of fuels, or calorific values, can be expressed as a gross (or higher heating) value and a net (or lower heating) value. The difference between the two values is due to the release of energy from the condensation of water in the products of combustion. Net calorific values give the amount of useful heat available on combustion, rather than the total heat theoretically available. This means net calorific values are generally a better basis for comparing the energy contents of different fuels.

In general, the difference between gross and net calorific values is around 6–8% for liquid fuels and 10% for gaseous fuels. In coals, the greater chemical variability (in contrast with petroleum products) gives rise to a much wider range of gross/net differences, 2–15% or more. In New Zealand the convention for energy accounting and statistical recording has been to use gross calorific values. This is why the *Energy Data File* generally uses gross calorific values.

The latest annual energy supply and demand balance is presented in both gross (Table B.6) and net (Table B.7) petajoules, and conversion factors for different fuels are provided in this section (K).

In the *Energy Data File*, petajoules refers to gross petajoules unless specified as net petajoules.

K. Fuel Properties

Solid Fuel Physical Properties

Table K.1: Solid Fuel Calorific Values¹

Region	Mine	Coal Field	Coal Rank	Mining Method	Gross		Net	
					Mbtu/tonne	MJ/kg	Mbtu/tonne	MJ/kg
Waikato	Awaroa	Rotowaro	Sub-bituminous	Opencast	21.08	22.24	19.79	20.88
	Kimihia	Huntly	Sub-bituminous	Opencast	21.73	22.93	20.43	21.55
	Kopako	Maramarua	Sub-bituminous	Opencast	19.00	20.05	18.01	19.00
	O'Reillys	Huntly	Sub-bituminous	Opencast	21.31	22.48	20.05	21.15
	East Mine	Huntly	Sub-bituminous	Underground	21.73	22.93	20.43	21.55
West Coast	Berlins Creek	Inangahua	Sub-bituminous	Opencast	22.94	24.20	21.66	22.85
	Burkes Creek	Reefton	Sub-bituminous	Opencast	23.70	25.00	22.56	23.80
	Cascade	Buller	Bituminous	Opencast	28.40	29.96	27.16	28.65
	Giles Creek	Inangahua	Sub-bituminous	Opencast	18.05	19.04	16.82	17.75
	New Creek	Buller	Sub-bituminous	Opencast	22.68	23.93	21.39	22.57
	Rockies	Buller	Bituminous	Opencast	26.54	28.00	25.49	26.89
	Stockton	Buller	Bituminous	Opencast	30.00	31.65	28.81	30.40
	Echo	Garvey Creek	Bituminous	Underground	29.26	30.87	28.07	29.61
	Roa	Greymouth	Bituminous	Underground	30.28	31.95	29.16	30.77
	Spring Creek	Greymouth	Bituminous	Underground	28.27	29.83	27.04	28.53
Canterbury	Canterbury Coal	Canterbury	Sub-bituminous	Opencast	18.48	19.50	17.37	18.33
Otago	Castle Hill	Kaitangata	Sub-bituminous	Opencast	18.64	19.67	17.24	18.19
	Harlwich	Roxburgh	Lignite	Opencast	17.55	18.52	16.22	17.11
Southland	Newvale	Waimumu	Lignite	Opencast	14.45	15.25	12.95	13.66
	Nightcaps	Ohai	Sub-Bituminous	Opencast	17.91	18.90	16.64	17.56
Average Coal Figures (weighted for 2010 production)			Sampled at the mine ready for delivery					
					Mbtu/tonne	MJ/kg	Mbtu/tonne	MJ/kg
Bituminous (export)					29.73	31.36	28.54	30.11
Bituminous (used in New Zealand)					27.72	29.25	26.58	28.04
Sub-bituminous					19.07	20.12	17.90	18.88
Lignite					14.54	15.34	13.04	13.76
Type of Wood								
				Moisture Content	Mbtu/tonne	MJ/kg	Mbtu/tonne	MJ/kg
Oven-dried Wood				0	19.47	20.55	18.20	19.20
Fresh Harvested				50-55%	8.84	9.33	7.01	7.40
Bark				60-70%	8.59	9.06	6.63	7.00
Fuel Wood				38-41%	11.45	12.08	9.76	10.30
Wooden Containers				23-29%	14.15	14.94	12.60	13.30
Furniture Residues				12-14%	16.86	17.79	15.45	16.30
Black Liquor				50%	9.95	10.5	8.15	8.60

Note to Table K.1: ¹ Coal values are at point of sale.

K. Fuel Properties

Liquid Fuel Physical Properties

Table K.2a: Petroleum Gross and Net Calorific Values

	kg/l	bbl/tonne	Gross			Net		
			MJ/bbl	MJ/kg	MJ/litre	MJ/bbl	MJ/kg	MJ/litre
<i>Indigenous Crudes</i>								
Kaimiro Crude	0.794	7.92	5,854.0	46.37	36.82	5,480.3	43.41	34.47
Kapuni Condensate	0.766	8.21	5,693.9	46.75	35.81	5,326.1	43.73	33.50
Kupe Condensate	0.750	8.39	5,601.2	46.97	35.23	5,218.4	43.76	32.82
Maari Crude	0.840	7.49	6,424.2	48.10	40.40	6,006.7	44.97	37.78
Mangahewa Crude	0.806	7.80	6,386.2	49.83	40.16	5,770.1	45.02	36.29
Maui Condensate	0.739	8.51	5,536.6	47.12	34.82	5,170.0	44.00	32.52
McKee Crude	0.832	7.56	6,062.8	45.83	38.13	5,691.0	43.02	35.79
Ngatoro Crude	0.854	7.36	5,030.2	37.05	31.64	4,728.1	34.82	29.74
Pohokura Crude	0.777	8.09	5,751.8	46.56	36.17	5,378.7	43.54	33.83
Tui Crude	0.813	7.74	6,152.9	47.60	38.70	5,585.0	43.21	35.13
Waihapa Crude	0.886	7.10	6,311.2	44.80	39.69	5,987.1	42.50	37.66
<i>Top Ten Crudes/Residues used at the New Zealand Refinery (Country of Origin)</i>								
Sokol (Russia)	0.859	7.32	6,204.9	45.43	39.02	5,825.2	42.65	36.64
Qatar Marine (Qatar)	0.822	7.65	6,042.4	46.23	38.00	5,653.7	43.26	35.56
Abu Safah (Saudi Arabia)	0.870	7.23	6,260.8	45.26	39.38	5,873.5	42.46	36.94
UMM SHAIF (Dubai)	0.841	7.48	6,098.4	45.63	38.35	5,719.5	42.79	35.97
Kuwait Crude (Kuwait)	0.870	7.23	6,260.8	45.26	39.38	5,873.5	42.46	36.94
Ratawi (Neutral Zone ¹)	0.791	7.95	5,838.2	46.42	36.72	5,465.9	43.46	34.38
Arab Light Crude (Saudi Arabia)	0.859	7.32	6,204.9	45.43	39.02	5,825.2	42.65	36.64
Champion (Brunei)	0.859	7.32	6,204.9	45.43	39.02	5,825.2	42.65	36.64
Murban Crude (UAE)	0.830	7.58	6,052.1	45.86	38.06	5,674.7	43.00	35.69
Seria Light Export Blend (Brunei)	0.848	7.42	6,145.6	45.58	38.65	5,766.1	42.77	36.26
<i>Refinery Feedstocks</i>								
Naphtha	0.750	8.39	5,601.2	46.97	35.23	5,218.4	43.76	32.82
Middle Distillate	0.820	7.67	5,997.5	46.00	37.72	5,623.3	43.13	35.37
Lgo/Kero Ex Naphtha	0.810	7.76	5,943.7	46.15	37.38	5,570.2	43.25	35.03
Intermediate Variation	0.767	8.20	5,700.1	46.74	35.85	5,328.1	43.69	33.51
Intermediate Residue	0.899	7.00	6,405.2	44.81	40.28	5,999.2	41.97	37.73
Blendstock	0.840	7.49	6,105.0	45.71	38.40	5,729.7	42.90	36.04
<i>Petroleum Products²</i>								
Premium Unleaded Gasoline	0.751	8.38	5,604.7	46.96	35.25	5,233.1	43.85	32.91
Regular Unleaded Gasoline	0.745	8.44	5,570.9	47.04	35.04	5,200.0	43.91	32.70
Automotive Gas Oil – 10 ppm Sulphur	0.842	7.47	6,113.7	45.69	38.45	5,735.7	42.86	36.07
Light Fuel Oil	0.930	6.77	6,463.2	43.72	40.65	6,093.2	41.22	38.32
Heavy Fuel Oil	0.958	6.57	6,530.6	42.89	41.07	6,167.0	40.50	38.79
Bunker Fuel Oil	0.967	6.51	6,547.6	42.61	41.18	6,186.2	40.25	38.91
Power Station Fuel Oil	0.890	7.07	6,360.9	44.95	40.01	5,717.0	40.40	35.96
Export Fuel Oil	0.940	6.69	6,598.7	44.15	41.50	6,174.2	41.31	38.83
Lighting Kerosene	0.788	7.98	5,813.5	46.40	36.56	5,462.7	43.60	34.36
Jet Fuel	0.807	7.80	5,924.3	46.19	37.26	5,547.8	43.25	34.89
Aviation Gasoline	0.716	8.78	5,384.8	47.30	33.87	5,066.1	44.50	31.86
Blended Heating Oil	0.824	7.63	6,079.1	46.40	38.23	5,686.1	43.40	35.76
Bitumen	1.030	6.11	6,756.3	41.27	42.49	6,406.0	39.13	40.29
Natural Gasoline	0.668	9.42	5,130.0	48.30	32.26	4,812.5	45.31	30.27
<i>Liquid Petroleum Gas³</i>								
LPG 60/40	0.534	11.78	4,203.8	49.51	26.44	3,876.3	45.65	24.38
General Product LPG	0.536	11.73	4,219.6	49.51	26.54	3,890.9	45.66	24.47
Commercial Propane	0.508	12.38	4,027.5	49.86	25.33	3,713.5	45.98	23.36
Commercial Butane	0.572	11.00	4,465.5	49.10	28.09	4,118.2	45.28	25.90

Notes to Table K.2a: ¹ Neutral Zone is between Kuwait and Saudi Arabia.

² The calorific values of petroleum products are based on Refining New Zealand's update for 2011.

³ Source: Vector Limited.

K. Fuel Properties

Table K.2b: Oil Conversion Factors for 2011¹

	Thousand Tonnes/PJ	m ³ /PJ
Crude Oil and Condensate	21.31	25,615
Refinery Blendstocks and Other Feedstocks	21.20	28,870
Oil Products Total	21.63	26,494
Total Petrol	21.28	28,534
Premium Unleaded Petrol	21.19	28,232
Regular Unleaded Petrol	21.34	28,648
Diesel	21.75	25,842
Fuel Oil	22.60	23,804
Aviation Fuels	21.55	26,750
Other Petroleum Products	23.44	21,276
LPG	21.31	39,910

Note to Table K.2b: ¹ Conversion factors depend on source (weight average) feedstocks and products.

Gas Physical Properties

Table K.3: Gas Physical Properties

	Gas Density	Relative Density ²	Gross	Net
	kg/m ³	(air = 1)	MJ/m ³	MJ/m ³
<i>Natural Gases¹</i>				
Kapuni	1.302	1.062	26.27	n.a.
Maui	1.170	0.955	40.61	35.40
McKee			37.77	33.64 [£]
Mangahewa			39.84	35.48 [£]
Turangi			40.78	36.67
Pohokura			41.51	35.52
Kupe			39.75	36.64
Ngatoro			39.19	34.89 [£]
Rimu			41.39	37.41
Waihapa			38.37	34.17 [£]
Cheal			47.94	42.69 [£]
Kowhai			40.60	36.15 [£]
Sidewinder			39.21	34.91 [£]
Weighted Average	n.a.	n.a.	38.53	35.68
Kapuni Processed ³	0.816	0.666	41.3	37.4
Kupe Processed ³	0.816	0.666	40.1	36.2
McKee Processed ³	0.873	0.712	41.3	37.3
<i>Alkanes</i>				
Methane	0.678	0.554	37.7	34.0
Ethane	1.272	1.038	66.0	60.4
Propane	1.865	1.523	94.0	86.5
Butane	2.480	2.007	122.8	112.5

Note to Table K.3: ¹ Measured at the wellhead.

² Dry air has a density of 1.226 kg/m³ when measured at 15°C and 101.325 kPa.

³ Source: Vector Limited.

[£] = Indicates estimated values.

n.a. = Not applicable.

L. Data Contributors

The Energy Information and Modelling Group collects and collates a wide range of energy statistics from many sources. We would like to thank all contributors for the time and effort involved in preparing this information for the *Energy Data File* and our other publications.

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Clearwater Hydro Limited	Methanex Limited	TJ & EP O'Reilly Limited
Coastal Oil Logistics Limited	Mighty River Power (Mercury Energy) Limited	TAG Oil New Zealand Limited
Commerce Commission	Minifuels & Oils Limited	Takitimu Coal Limited
Contact Energy Limited	Mitsui E & P Australia Pty Limited	The Lines Company Limited
Counties Power Limited	Mobil Oil New Zealand Limited	Todd Energy Limited (Nova, Bay of Plenty)
CRT Fuel Limited	Nelson Electricity Limited	Toll United Carriers Limited
Delta Utility Services Limited (Aurora)	Nelson Petroleum Distributors Limited	Top Energy Limited
Direct Fuels Limited	Network Tasman Limited	Transpacific Industries
Dominion Salt Limited	Network Waitaki Limited	Transpower NZ Limited
Eastland Network Limited	New Creek Mining Company Limited	TrustPower Limited
EDC Power	New Zealand Coal and Carbon Limited	Tuaropaki Power Company Limited
Electra Limited	New Zealand Energy Corporation	Unison Networks Limited
Electricity Ashburton Limited	New Zealand Energy Limited	Vector Limited
Energy Direct	New Zealand Geothermal Association	Waipa Networks Limited
Energy Efficiency and Conservation Authority (EECA)	New Zealand Oil and Gas Limited	Waitomo Petroleum Limited
Energy for Industry Limited	New Zealand Petroleum and Minerals	Waste Disposal Services Limited
Energy Online Limited	New Zealand Steel Limited	Watercare Services Limited
Electricity Authority (EA)	Norske Skog Tasman Limited	Wealleans Petroleum Limited
Findlater Sawmilling Limited	Northpower Limited	WEL Green Energy Joint Venture
Fonterra Co-operative Group Limited	NZ Windfarms Limited	WEL Networks Limited
Fonterra Todd Cogeneration Joint Venture	OMV New Zealand Limited	Wellington Electricity Lines Limited
Genesis Energy Limited	Opunake Hydro Limited	Westpower Limited
Geothermal Developments Limited	Origin Energy New Zealand Limited	Windflow Technology Limited
Glencol Energy Limited	Orion New Zealand Limited	Z Energy Limited
Greymouth Petroleum Limited	Palmerston North City Council	
	Pan Pac Forest Products Limited	

M. Glossary

Agriculture, forestry and fishing	This sector includes all types of farming, hunting, forestry, logging, fishing and aquaculture. For gas and electricity, it excludes separately metered farm houses, which are included in the residential sector, but includes houses where separate metering is not available and farming activity is the dominant use.
ANZSIC 2006	Australia-New Zealand Standard Industrial Classification. In this publication, end uses of gas, coal and electricity are identified by ANZSIC 2006 codes. For comparison with previous editions of the <i>Energy Data File</i> , ANZSIC 1996 classifications have also been displayed.
Aviation fuels	A specialised type of liquid fuel used to power aircraft. Aviation fuels include Avgas, Avtur, Jet-A1 and Jet-4 aviation fuels, light kerosene, and premium kerosene.
bbls per day	Barrels per day: a unit for the production rate of oil.
Bcf	Billion cubic feet: this unit is often used to express volumes of natural gas.
Biogas	Energy produced from the anaerobic digestion of liquid and solid waste. Includes landfill gas and sewage sludge gas.
Calorific value	The energy that would be released upon complete combustion of a given quantity of fuel.
Capacity	The maximum energy output rate of an electricity generation or heat plant, usually measured in megawatts (MW).
CNG	Compressed natural gas. Natural gas that has been compressed, or contained under pressure. Mainly used as a transport fuel.
Cogeneration	The simultaneous or sequential production of two or more forms of useful energy from a single primary energy source. In this publication, a cogenerator is an electricity-generating facility that produces electricity and a form of useful thermal energy (such as heat or steam for industrial or commercial heating or cooling purposes).
Coke	The solid product obtained from carbonisation of coal (principally coking coal) at high temperatures. Low in moisture and volatile matter, coke is used mainly in the iron and steel industry, acting as an energy source and chemical agent.
Commercial	This sector includes non-manufacturing business establishments such as hotels, motels, restaurants, wholesale businesses, retail stores, and health, social and educational institutions. It also includes electricity used in public lighting, railway and urban traction.
Condensate	A light crude oil that is present in natural gas deposits.
Consumer energy	The amount of energy consumed by final users. Consumer energy statistics can be either calculated from supply-side data or observed from usage data.
Consumer energy (calculated)	Generally calculated as production plus imports less losses and own use less exports less international transport less stock change.
Consumer energy (observed)	Represents reported demand within (or sales to) the agricultural, industrial, commercial and residential sectors.
Crude oil	A mineral oil consisting of a mixture of hydrocarbons of natural origins, yellow to black in colour, of variable density and viscosity.
Diesel	A liquid fuel that includes automotive gas oil, marine diesel and blended heating oil.

DPFI	Delivery of Petroleum Fuels by Industry Survey. This is a quarterly survey of New Zealand oil companies' deliveries of petroleum fuels to 14 economic sectors.
Energy efficiency	The ratio of total "useful output" to energy input. The "useful output" can be either energy (energy efficiency) or financial gain (economic energy efficiency).
Energy intensity	Energy use per unit of output.
Energy transformation	See Transformation.
Exchange rate	The relative value of one currency compared with another (e.g. USD/NZD). Conversions to New Zealand dollars carried out for purposes of international comparisons are based on exchange rates used by the International Energy Agency.
Flaring	The burning of natural gas that would otherwise be released to the atmosphere. Combustion converts the methane in natural gas into carbon dioxide and water, which has less global warming impact. Flaring generally occurs during oil production and in the early stages of gas production.
Fossil fuels	Fuels formed over long periods of time from the decay of dead plants and animals. Fossil fuels include coal, natural gas, LPG, crude oil and fuels derived from crude oil (including petrol and diesel).
Fractionation	A distillation process used for the separation of the various components of a liquid.
Fuel oil	A specialised type of liquid fuel that is burned in a furnace or boiler for the generation of heat or used in an engine for the generation of power. Fuel oil includes light fuel oil, heavy fuel oil and other fuel oils.
Geothermal energy	Energy derived from the heat in the interior of the earth.
Gross and net generation	Gross generation is the total electricity output from a station's generators. Net generation subtracts the parasitic and auxiliary load within the station (such as pumps, fans, crushers, excitation, lighting and heating), that allow the station to operate. Gross generation is fully estimated in the <i>Energy Data File</i> from reported net generation.
Gross calorific value (GCV)	The gross calorific value, or higher heating value (HHV), is determined by bringing all the products of combustion back to the original precombustion temperature and, in particular, condensing any vapour produced. See Fuel Properties (Section K) for further information.
GWh	Gigawatt hour: see kWh.
Hydrocarbons	An organic compound that consists entirely of hydrogen and carbon.
IEA	International Energy Agency. An intergovernmental organisation established in the framework of the Organisation for Economic Co-operation and Development (OECD), which acts as a policy adviser to its member states.
Importer margin	A term used in the petrol and diesel market representing the amount available to cover domestic transportation, distribution and retailing costs and profit margins. This is calculated as the difference between the New Zealand retail price (excluding taxes and levies) and the cost of imported fuel.
Industrial	An energy-consuming sector that consists of all facilities and equipment used for producing, processing or assembling goods. The industrial sector encompasses activities such as manufacturing, metal production, and construction. Overall energy use in this sector is largely for process heat and cooling and powering machinery, with lesser amounts used for facility heating, air conditioning and lighting.

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International transport	Includes international sea and air transport. Excludes coastal shipping, national air transport, and all land transport.
kt	Kilotonnes (thousand tonnes): see t.
kWh	Kilowatt hour. In the electricity industry, energy is measured in kilowatt hours (kWh), sometimes referred to in context as “units” or, for large quantities, gigawatt hours (GWh). 1 GWh = 1,000,000 kWh. A device with a rating of 1,000 watts or 1 kilowatt running for 1 hour would consume 1 kilowatt hour of electricity. A similar device running for half an hour or 2 hours would use 0.5 kWh or 2 kWh respectively.
Line losses	A term used in relation to electricity. Refers to the losses incurred by Transpower and local distribution companies in conveying electricity to their bulk and retail consumers. It results mainly from transformer and other losses on the network.
Losses and own use	In the energy balances, this includes losses both before and after transformation: losses and own use in production; transmission and distribution losses; oil industry losses and own use; and electricity own use free of charge. In the energy balances and the tables in Section D, oil industry losses and own use includes distribution tankage losses, stocks, accounts adjustment and own consumption.
LPG	Liquefied petroleum gas, a flammable mixture of hydrocarbon gases used as a fuel in heating appliances and vehicles. LPG typically consists of propane (60%) and butane (about 40%).
Mm³	Million cubic metres: see Volume.
mmbbls	Million barrels, a unit commonly used to express volumes of oil. A barrel is 159 litres or 0.159 m ³ .
mmbbls per day	Million barrels per day, a unit commonly used to express the production rate of an oil field. See mmbbls.
mmscf per day	Million standard cubic feet per day, a unit commonly used to express the production rate of a natural gas field.
MW	Megawatt or one million watts. The Système International (SI) unit of power is the watt (W) and is defined as a rate of one joule per second. This is the rate of doing work or the rate of energy flow, i.e. the rate at which energy is produced or used. In this publication, the standard unit of power is the megawatt (MW). Power is usually recorded (and is shown in these statistics) as the average over a period (typically a half-hour period) rather than as an instantaneous value.
Natural gas	A gas consisting mainly of methane that occurs naturally in underground deposits.
Net calorific value (NCV)	The net calorific value, or lower heating value (LHV), is determined by subtracting the heat of vaporisation of the water vapour produced in combustion of a fuel from the gross calorific (or higher heating) value. This treats any water formed as a vapour. The energy required to vaporise the water therefore is not realised as heat. See Fuel Properties (Section K) for further information.
Net gas production	Net gas production (also known as sale gas) is gas production less any gas flared, gas reinjected, LPG extracted, own use and losses.
Net generation	See Gross and net generation.

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NGL	Natural gas liquids – liquid or liquefied hydrocarbons recovered from natural gas in separation facilities or gas-processing plants.
Non-energy use	Use of fuels for non-combustion purposes (e.g. bitumen for roads and natural gas used as feedstock for the production of methanol and ammonia/urea).
Oil	Usually refers to all oil and oil products. Specifically, this includes crude oil, condensate, naphtha, feedstocks, natural gas liquids, LPG and all refined oil products, unless otherwise specified.
Other oil products	Includes other petroleum products such as bitumen, lubes, solvents, waxes, petroleum coke, white spirit, other liquid fuels and sulphur.
Own use	For electricity, this refers to the electricity used by an electricity supplier or generating plants free of charge. See Losses and own use.
PJ	Petajoule. The joule is the Système International (SI) unit of energy and heat. Its consistent use simplifies comparisons between different forms of energy and between energy supplied or consumed in New Zealand and overseas. A joule is the energy required to heat 1 cubic centimetre of water by about a quarter (0.239) of a degree Celsius, or the energy needed to lift a 1 kilogram mass about 0.102 metres. A PJ is 10 ¹⁵ (1,000,000,000,000,000) joules.
Primary energy	Energy found in the environment that has not been subject to any conversion or transformation process (i.e. raw fuels).
Refinery blendstocks and other feedstocks	Processed oil destined for further processing or blending. It includes refinery naphtha, mid-distillate and motor gasoline blending components, e.g. alkylate mix, offgrade regular, offgrade premium, reformat, and cracked spirit. Synfuels used as refinery feedstock are also included in this category.
Reinjection	The reinjection of natural gas that has been extracted from a well.
Reserves	Oil and gas reserves are expected reserves, estimated as “proven and probable” or P50 reserves (i.e. with a greater than 50% probability of being technically and economically producible) and P90 reserves (i.e. with a greater than 90% probability of being technically and economically producible) by the field operators. Ultimately, recoverable reserves are estimates of the total amounts of oil and gas that can be extracted during the lifetime of each field. These may differ from initial reserves estimates made at the commencement of production.
Residential	An energy-consuming sector that consists of living quarters for private households. Common uses of energy associated with this sector include space heating, water heating, air conditioning, lighting, refrigeration, cooking, and running a variety of other appliances.
Self-sufficiency	A term used commonly in relation to oil and which is calculated as domestic production divided by total domestic consumption (including refinery and industry own uses).
Separation	Splitting wellhead gas into a gas stream and a liquid stream.
Stock change	Change in the level of stocks between ends of months, quarters or years. By convention, an increase in stock levels is defined as a positive stock change.
t	Tonne: Unit of mass equal to 1,000 kg.

Total gas production

The quantity of natural gas extracted after the first separation point (see Separation) and before any gas reinjection, flaring, own use, losses or LPG extraction.

Total primary energy supply (TPES)

The amount of energy available for use in New Zealand for energy transformation and end use. It includes energy as it is first obtained from natural sources, which means that coal is accounted for as it is mined, indigenous oil and natural gas as they are extracted from wells, imported oil and oil products as they are imported, and hydro as it is used for electricity generation (assuming efficiency of 100%). Geothermal is accounted for on the basis of its use as an input to electricity generation, including cogeneration and geothermal used directly as a heat source. TPES accounts for imports and exports and makes allowance for any stock change. By convention, fuels used for international transport are excluded from total primary energy supply. Thus, total primary energy supply is calculated as indigenous production plus imports less exports less stock change less international transport.

Transformation

Transformation in this publication refers to the conversion of energy from one form to another.

Unallocated

In the energy balance tables, a category within the industry sector for those items for which industrial disaggregation is either unknown or confidential.

Volume

Measured at 15°C and 101.325 kPa.

Waste heat

Includes chemical waste heat produced from sulphur as a by-product in the fertiliser manufacturing industry used for electricity cogeneration.

N. Unit Conversion

SI Decimal Multiples

Prefix	Symbol	Factor	Term
kilo	k	10^3	thousand
mega	M	10^6	million
giga	G	10^9	billion
tera	T	10^{12}	trillion
peta	P	10^{15}	quadrillion

Mass

Name		t	kg	t _s	t _l	lb	Units System
tonne	t	1	1000	1.102	0.984	2205	Metric
kilograms	kg	0.001	1	0.001102	0.000984	2.205	Metric/SI
short tons	t _s	0.907	907	1	0.893	2000	American
long tons	t _l	1.016	1016	1.120	1	2240	Imperial
pounds	lb	0.000454	0.454	0.0005	0.000446	1	American/Imperial

Volume

Name		Mm ³	Bcf	mmbbls	Units System
million cubic metres	Mm ³	1	0.035	6.289	Metric/SI
billion cubic feet	Bcf	28.317	1	178.08	American/Imperial
million barrels	mmbbls	0.159	0.00562	1	Common Oil

Energy and Heat

Name		PJ	Cal _{th}	btu	GWh	boe	toe	Units System
petajoule	PJ	1	2.390×10^{14}	9.478×10^{11}	277.78	1.634×10^5	23885	Metric/SI
thermochemical calories	Cal _{th}	4.184×10^{15}	1	0.00397	1.162×10^{12}	6.837×10^{10}	9.993×10^{11}	Imperial/American
British thermal units	btu	1.055×10^{12}	252.16	1	2.931×10^{10}	1.724×10^7	2.520×10^8	Imperial/American
gigawatt hours	GWh	0.0036	8.604×10^{11}	3.412×10^9	1	588.30	85.98	Common Electricity
barrels of oil equivalent	boe	6.119×10^6	1.463×10^9	5.800×10^6	0.00170	1	0.146	Common Oil
tonnes of oil equivalent (toe)	toe	4.187×10^5	1.001×10^{10}	3.968×10^7	0.01163	6.842	1	Common Oil

Electrical Capacity – Power

Name		MW	kW	HP _e
megawatt	MW	1	1000	1340.5
kilowatt	kW	0.001	1	1.3405
horsepower (electrical)	HP _e	0.00746	0.746	1

FURTHER READING

www.med.govt.nz/sectors-industries/energy/energy-modelling

Energy Information and Modelling Group Publications



New Zealand Energy Data File provides comprehensive statistics and supporting information on New Zealand's energy supply, demand, reserves and prices, mostly as national aggregates.



New Zealand Energy Greenhouse Gas Emissions provides detailed inventory information on carbon dioxide equivalent emissions from New Zealand's energy sector and industrial processes for the calendar years 1990–2010.



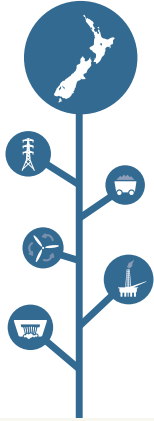
New Zealand's Energy Outlook sets out a 25-year projection of energy supply, demand and prices, and energy-sector greenhouse gas emissions.



New Zealand Energy Snapshot provides a handy pocket-sized overview and insight into New Zealand's energy sector. The New Zealand Energy Snapshot replaced New Zealand Energy in Brief.



New Zealand Energy Quarterly provides quarterly energy statistics and trend data on: the supply of major fuel types; electricity generation and its associated greenhouse gas emissions; and fuel prices.



www.med.govt.nz/sectors-industries/energy/energy-modelling/data
