





New Zealand

New Zealand's electricity market has grown by leaps and bounds over the last decade. It is now an established market in electricity generation and retail, full line and energy separation, with its own set of market operation rules and regulations. This was not easily attained, and as such deficiencies with competition in both the wholesale and retail markets are evident. Thermal plants now join hydroelectric power sources, resulting in a power generation surplus where supply and demand are finely balanced.

Can NZ's electricity market meet the projected growth in energy demand with the problems it is facing? Gas supplies are on the decline and there are concerns over the management of the supply security increase. The dominant provider for the electric grid is dominated by hydropower, and as such New Zealand's power grid is at risk with its over-reliance on a particular source.

The New Zealand Outlook to 2025 report highlights the challenges that the country faces as it tries to meet the growth in demand for energy at a time when natural gas supplies are running low, and greenhouse gas emissions are high on people's priority list.

New Zealand's infrastructure may have some problem areas, but it is basically in good shape, according to findings made by New Zealand's first nationwide infrastructure stocktake that was released in May 2004 by the Ministry of Economic Development.

New Zealand's infrastructure is not perfect, but is in good shape. A 2004 stocktake by the



Ministry of Economic Development highlighted the following issues:

- Electricity security of supply, both short-term, arising because of the failure of the market to provide for security margins, and long-term, created by uncertainty around fuel availability and regulatory issues;
- Lack of investment in electricity transmission due to uncertainties about who should pay for investment and under what pricing methodology, coupled with land access issues

According to January 2004 Energy Data File released by the Ministry of Economic Development, projection of consumer energy demand is at an average of 0.6% per annum between 2000 and 2025. Some 3,357MW of new electricity generation capacity is projected to be economic by 2025, with geothermal energy and wind power both expected to become increasingly more significant generation sources.

PROFILE

Capital	Wellington	Installed Capacity	8,362MW
Area	268,680 km	Population Electrified	100%
Population	3.99 million	Main Voltages (kV)	220, 110, 66
GDP	US\$85.26 billion	Natural Resources	natural gas, coal and hydropower
Currency	New Zealand Dollar		

NZ has close to 100% access to electricity

POWER GENERATION

Generating capacity (MW)	2001	2002	2003	2004	2005
Hydro	5,260	5,245	5,524	5,344	5,345
Thermal	3,314	2,862	3,160	3,304	3,347
Nuclear	0	0	0	0	0
Others	36	36	36	72	165
All categories	8,610	8,143	8,720	8,720	8,857

Generation (Gwh)	2001	2002	2003	2004	2005
Hydro	24,693	21,594	24,560	24,564	26,442
Thermal	13,810	16,507	15,314	15,588	14,426
Nuclear	0	0	0	0	0
Others	142	136	154	155	466
All categories	38,645	38,237	40,028	40,307	41,334

NATURAL FUEL RESERVES

Gas:

Remaining gas reserves from producing fields (as at 1st January 2005) totaled 869.2 Bcf. Reserves from gas fields discovered and under development total 1,114Bcf. Gas production during 2005 equated to approximately 145Bcf (Gross). Assuming this rate of production, which is considerably lower than that in the recent past, reserves from existing producing fields would be depleted in approximately 6 years. Reserves from newly discovered fields and those under development would be depleted in 7 years and 8 months. Using these arbitrary figures, total 'Proven and Probable' gas reserves in New Zealand, not withstanding subsequent discoveries or large scale changes in gas demand, will be depleted within 13-14 years.

New Zealand imports no hydrocarbon gas.

Oil:

Remaining oil reserves from producing fields (as at 1st January 2005) totaled 39.58 mmbbls. Reserves from oil fields discovered and under

development total 139.7mmbbls. Oil production during 2005 equated to approximately 6.72 mmbbls. Assuming this rate of production, which is considerably lower than that in the recent past, reserves from existing producing fields would be depleted in approximately 5 years and 10 months. Reserves from newly discovered fields and those under development would be depleted in 20 years and 8 months. Using these arbitrary figures, which do not take into account the peak in production from fields scheduled to commence production in the next three years, total 'Proven and Probable' oil reserves in New Zealand, not withstanding subsequent discoveries or large scale changes in field recovery, will be depleted within 27-29 years.

During the 2004 calendar year, New Zealand consumption of liquid hydrocarbons equated to approximately 127,500 bbls/d. During 2004 New Zealand production averaged 23,850 bbls/d. Local production has typically been in the 30-40% range of self sufficiency, but in recent years has fallen to below 20%.



Growth pattern of Power Generation in MW	2001	2002	2003	2004	2005
Hydro		-15	+279	-188	+1
Thermal		-452	+298	+144	+43
Nuclear-					
Others		0	0	+36	+93
All categories		--467	+577	-8	+137

Future Projection (MW)	2006	2008	2010	2012
Hydro	5,333	5,632	5,647	5,947
Thermal	3,454	3,454	3,154	3,154
Nuclear				
Others	46.7	46.7	46.7	46.7
All categories	8,833.7	9,132.7	8,847.7	9,147.7

New Zealand does not import or export electricity.

Coal:

New Zealand's coal resources are substantial. Total 'measured recoverable' coal resources totaled 570.69 Mt in 1994 and total 'indicated recoverable' resources totaled 7,179Mt. Of the total 'measured recoverable' coal resources, 74.19Mt were Sub Bituminous rank coals suitable for steaming (electricity generation) purposes. Of the total 'indicated recoverable' coal resources, 933.2Mt were Sub Bituminous rank coals.

Production of Sub Bituminous coal over the period 1994-2004 totaled 20.491Mt. Production of sub bituminous coal during 2003 was a record at 2.576 Mt (2.389 Mt in 2004). A derived 'measured recoverable' resource (the 1994 'measured recoverable' resource minus 1994-2004 production) totals 53.69Mt.

Assuming future production of Sub Bituminous coal of 2.7Mt/annum, the 1994

'measured recoverable' resource figure will be depleted in approximately 19 years and 10 months. This estimate does not take into consideration 'indicated recoverable' resources of Sub Bituminous coal, subsequent alterations to resource estimates over the period 1994-2005 over resources not being mined and alterations to resource estimates over resources that are being mined.

Over the period 1990-2002 coal imports totaled approximately 0.125Mt. A Large scale importation of foreign coal commenced in 2003. During 2004 coal imports totaled 0.876Mt. It is anticipated that coal imports will continue to be in the 0.8-1.1Mt range for the immediate future.

ELECTRICITY TARIFFS

Please provide latest tariff rates for different categories (domestic, industrial, commercial

POWER PLANT LIST

Owners/ Operators1	Plant Name	Commissioned	Fuel type	Capacity (MW)
Alinta	Glenbrook	1998	Waste Heat(Cogen)	74
Bay of Plenty	Aniwhenua	1981	Hydro	25
Bay of Plenty	Edgecumbe	1996	Gas	10
Contact Energy	Clyde	1992	Hydro	432
Contact Energy	New Plymouth	1976	Gas/Oil	300
Contact Energy	Ohaaki2	1989	Geothermal	1042
Contact Energy	Otahuhu B	2000	Gas	380
Contact Energy	Poihipi	1997	Geothermal	55
Contact Energy	Roxburgh	1956	Hydro	320
Contact Energy	Taranaki CC	1998	Gas	360
Contact Energy	Te Rapa	2000	CoGen	44
Contact Energy	Wairakei	1958	Geothermal	165
Contact Energy	Wairakei Binary	2005	Geothermal	14
Contact Energy	Whirinaki3	2004	Diesel	155
Genesis Power	Huntly	1987	Coal/Gas	960
Genesis Power	Huntly-P40	2004	Gas	40
Genesis Power	Kaitawa	1947	Hydro	37
Genesis Power	Piripaua	1942	Hydro	44
Genesis Power	Tuai	1929	Hydro	60
Genesis Power	Rangipo	1983	Hydro	120
Genesis Power	Tokaanu	1973	Hydro	240
Genesis/Carter Holt Harvey	Kinleith	1998	Gas/Wood/Coal	40
Genesis/Anchor Dairy	Te Awamutu	1995	Gas (Cogen)	54
Mangahao Joint Venture	Mangahao	1925	Hydro	38
Meridian Energy	Aviemore	1968	Hydro	220
Meridian Energy	Benmore	1966	Hydro	540
Meridian Energy	Manapouri	1971/2002	Hydro	755



Owners/ Operators1	Plant Name	Commissioned	Fuel type	Capacity (MW)
Meridian Energy	Ohau A	1979	Hydro	264
Meridian Energy	Ohau B	1980	Hydro	212
Meridian Energy	Ohau C	1985	Hydro	212
Meridian Energy	Te Apiti	2004	Wind	91
Meridian Energy	Tekapo A	1951	Hydro	25
Meridian Energy	Tekapo B	1977	Hydro	160
Meridian Energy	Waitaki	1936	Hydro	105
Mighty River Power	Arapuni	1946	Hydro	188
Mighty River Power	Aratiatia	1964	Hydro	90
Mighty River Power	Atiamuri	1962	Hydro	86
Mighty River Power	Karapiro	1948	Hydro	96
Mighty River Power	Maraetai	1954/1971	Hydro	360
Mighty River Power	Ohakuri	1962	Hydro	112
Mighty River Power	Rotokawa	1997	Geothermal	32
Mighty River Power	Southdown	1997	Gas (Cogen)	125
Mighty River Power	Waipapa	1961	Hydro	58
Mighty River Power	Whakamaru	1956	Hydro	100
NGC	Kapuni	1998	Gas (Cogen)	23
Pan Pac	Pan Pac Cogeneration	2005	Biomass/Steam	13
Tai Tokerau Trust	Ngawha	1998	Geothermal	11
TrustPower	Argyle x 2	1983	Hydro	11
TrustPower	Cobb	1956	Hydro	32
TrustPower	Coleridge	1914	Hydro	45
TrustPower	Highbank x 2	1945	Hydro	25

Owners/ Operators1	Plant Name	Commissioned	Fuel type	Capacity (MW)
TrustPower	Kaimai x 4	1972-1981	Hydro	42
TrustPower	Matahina	1967	Hydro	76
TrustPower	Paerau x 2	1984	Hydro	12
TrustPower	Patea	1984	Hydro	31
TrustPower	Tararua Wind Farm	1999/2004	Wind	68
TrustPower	Waipori x 4	1903/1955	Hydro	84
TrustPower	Wheao x 2	1984	Hydro	26
Tuaropaki Power Company	Mokai	2000/2005	Geothermal	95
Whareroa Kiwi Dairy Plant	Kiwi Dairy	1997	Gas (Cogen)	50

etc.) including variations with respect to the year 2005.

When were the last increase/decrease introduced and the reasons to do so?

Electricity tariff increases occur often, on a market basis, they vary depending on electricity supplier. There are no subsidies for particular groups. Tariffs are set privately by power companies, with regulatory oversight.

TRANSMISSION AND DISTRIBUTION

The range of transmission voltage used throughout the country is 11kV – 220kV (AC) and 500kV (DC). Expansion of the transmission lines and facilities are in progress.

ENVIRONMENT

There is a body set up to promote the use of sustainable energy technologies in NZ, the Energy Efficiency and Conservation Authority (EECA). EECA was set up to encourage, promote and support the uptake of energy efficient initiatives and renewable energy in the following three key ways:

- Helping businesses to get more from their energy dollar
- Improving our lifestyles by promoting warmer, drier homes and better personal transport choices

- Protecting the environment through energy efficiency and renewable energy supply.

