

# N. Data Sources

The *Energy Data File* is compiled using the following main external sources of data. In some cases provisional figures are used, which are amended as soon as updated data become available.

## Coal

**Mine operators** provided six-monthly coal production returns until December 1997. Coal production by mine is now obtained through coal production levies data from the mines.

**Crown Minerals**, a group within the Ministry of Economic Development, provided calendar year coal production data, based on Resources Levy reporting from 1998.

**Statistics New Zealand** provides:

*Quarterly Coal Sales Survey* for coal from which quarterly production data are estimated. This survey is sponsored by the Ministry of Economic Development.

*Coal imports and exports* through its INFOS database until September 1999.

**New Zealand Steel Limited** provides quarterly data on production, natural gas and coal used.

## Oil and Gas

**Greymouth Petroleum Limited** provides monthly returns for crude oil production and the production of gas fields, gas flared and own use.

**Indo-Pacific Energy New Zealand Limited** provided monthly returns (from March 2001 to August 2002) for crude oil production and the production of gas well and gas flared.

**Liquigas Limited** (from June 2003) provides monthly returns containing LPG stocks, imports, exports, deliveries and losses.

**New Zealand Refining Company Limited** provides monthly returns of receipts for all crude oils and condensates by origin, refinery stocks, and crude and semi-refined input, and on oil products production and stocks.

**NZOG Services Limited** provided monthly returns (from March 1992 to January 2004) for crude oil production, own use, closing stock and sale, as well as gas production, and for production of gas fields and the volume of gas flared.

**Oil and gas field operators** (Greymouth Petroleum Limited, Indo-Pacific Energy New Zealand Limited, NZOG Services Limited, Shell Todd Oil Services Limited and Swift Energy New Zealand Limited) each provide information on their expected oil and gas reserves.

**Oil companies** (BP New Zealand Limited, Chevron New Zealand Limited, Challenge Petroleum Limited (from March 1998 to August 2001), Gull Petroleum Limited (from December 1998), Mobil Oil New Zealand Limited and Shell New Zealand Limited) each provide a monthly return containing product stocks, imports and exports, refinery receipts, intercompany sales, rebrands and blends, deliveries, and losses.

**Silver Fern Shipping Limited** (from January 2000) provides monthly returns containing industry product stocks: premium gasoline, regular gasoline, automotive diesel, marine diesel, light fuel oil, heavy fuel oil and jet a1.

**Shell Todd Oil Services Limited** provides monthly returns for condensate crude oil separated, stock changes of condensate and crude oil, for amounts of condensate and crude oil sent to the refining company and exported, and for production of raw gas, gas flared, own use, LPG and natural gasoline extracted, gas to NGC (now owned by Vector) and the amount of gas reinjected.

**Swift Energy New Zealand Limited** provides monthly returns for crude oil production and the production of gas fields, gas flared and own use.

**Statistics New Zealand** provides through its:

*Deliveries of Petroleum Fuels by Industry (DPFI) Survey*, quarterly data on petroleum product demand to 14 final use sectors, based on oil company returns. This survey is sponsored by the Ministry of Economic Development.

*Survey of Manufactured Gas*, until September 1990 when manufactured gas production ceased, monthly data on production of gas and by-products, feedstocks used in production, and stocks at the end of the month.

*Survey of Natural Gas*, monthly data on the production and distribution of gas in New Zealand. The figures used in the Data File are deliveries to undertakings, gas to other customers, losses in production, own use, and natural gasoline and LPG extracted from the raw gas.

*Trade Statistics*, data on nominal CIF cost of oil imports and all imports.

## Renewables

Renewables use for electricity generation is sourced as shown under **Electricity** below.

Primary energy supply of **hydro** and **wind** is defined as the amount used for energy transformation. This amount is derived from the amount of electricity generated and is based on a 100% efficiency for these energy sources.

In previous editions of the *Energy Data File* the figures for geothermal direct use is sourced from Statistics New Zealand through its INFOS database. In this edition the figures have been revised from the year 2000 and based on the report – ‘An Assessment of Geothermal Direct Heat Use in New Zealand’ – prepared by Brian White, Executive Officer of New Zealand Geothermal Association.

Primary energy supply of **geothermal** energy is taken as the amount used directly and the amount used for electricity generation based on a 15% conversion efficiency from 2000. Before 2000, efficiency of geothermal energy transformation for electricity was taken as 10%.

Other sources of renewables include **woody biomass** (from arisings derived from conventional forest operations, wood process residues and purpose-grown fuel wood plantations), **biogas** from landfill and sewage treatment plants and **solar** (for solar water heating and does not include space heating or solar electric (photovoltaics)).

Direct use of woody biomass and biogas from sludge gas has been estimated from available renewable publications produced by the Energy Efficiency and Conservation Authority (EECA) and the Centre for Advanced Engineering at Canterbury University.

Data on electricity generation from these renewable energy forms (eg, landfill gas) is supplied by the owners/operators of the respective plants. Estimates of primary energy are made based on Cogeneration Association conversion figures for plants where operational data is not available. The total primary energy supply for these renewable sources is estimated from the amount of the direct energy use and energy transformation to electricity based on corresponding efficiencies – biogas at 30% and woody biomass at 25%.

In previous editions of the *Energy Data File*, the figures for residential wood use included in the Energy Balances were based on an average use of 4.3 GJ per household, using firewood. This figure had been estimated by an industry analyst in 1996. The 'Household Energy End-use Project' (HEEP) carried out by BRANZ monitored actual firewood use and reported average annual use of 13.7 GJ (Report No SR 141 (2005)). This latest figure from BRANZ has now been adopted.

Number of households using firewood is based on findings of the census carried out by Statistics New Zealand in 1996 and 2001.

**Solar Industries Association** provides quarterly solar statistics from March 2002.

## Electricity

**Electricity Corporation of New Zealand Limited (ECNZ)** (until March 1999), **Contact Energy Limited** (from March 1996), **Genesis Power Limited** (from April 1999), **Meridian Energy Limited** (from April 1999), **Mighty River Power Limited** (from April 1999), **TrustPower Limited** and **Pioneer Generation Limited** (from January 2002) provide monthly generation data.

**Electricity companies** (generators, wholesalers, transmitters, distributors and retailers) provide annual electricity statistics (operational) for years ending March including end-use information.

**The Cogeneration Association of New Zealand's** survey of its members was used to supplement the annual electricity statistics to provide more information on cogenerators.

## Waste Heat

Primary energy supply for waste heat is estimated and efficiency of waste heat transformation for cogeneration was taken as 15%.

## Electricity Prices

Price data are derived from the Ministry of Economic Development's annual (year end March) electricity statistics. These data are national average prices for residential, commercial and industrial consumers, and hence for all consumers, measured as total sale received by electricity wholesalers and retailers, divided by total electricity sold (see Tables G.9 to G.13).

## Transport Fuels Prices

Retail prices for premium petrol are based on data from Statistics New Zealand.

Retail prices for regular petrol are based on data from the Motor Trade Association (until the fourth quarter of 1983) and Statistics New Zealand (from first quarter 1984).

Retail diesel prices are based on data from the Motor Trade Association (until 1982), the former Ministry of Energy (from 1983 to 1987) and Statistics New Zealand (from 1994). Limited price data are available from 1988 to 1993. *The Transport Fuels Retail Price Survey* (produced by the former Ministry of Energy) has been used to estimate prices for 1988 and 1989.

Retail prices for CNG and LPG are from Statistics New Zealand. The collection of both CNG and LPG prices has been discontinued by Statistics New Zealand as of the June quarter 1999 (for CNG) and as of the June quarter 2002 (for LPG).

Wholesale prices (from 1990) are a weighted average price calculated quarterly by the Ministry of Economic Development, based on information provided by the oil companies. Diesel wholesale prices for the period 1984–1987 are those set under price regulation.

## Non-transport Fuels Prices

Heavy and light fuel oil prices are a weighted average price calculated quarterly by the Ministry of Economic Development, based on information provided by the oil companies.

Before 2001, natural gas prices were calculated quarterly by the Ministry of Economic Development, using a sample of gas companies' standard tariffs for industry and residential consumers, based on annual consumption of 100,000 GJ and 60 GJ respectively. Prices reported since 2001 are based on a survey of natural gas retailers. Total dollars and volume of sales information is the basis of average unit prices derived for the residential, commercial and industrial sectors as well as for industrial sub-sectors.

## Energy Price Indices

The energy price indices for selected OECD countries were calculated by the IEA from data supplied by individual countries. Their approach is to use a current weight scheme (the Paasche formula) in tons of oil equivalent, derived from data in the OECD yearbook *Basic Energy Statistics*, to weight the energy prices supplied by each country for the industrial and residential sectors. The industrial sector includes the price for automotive diesel, while the residential sector includes the price for premium leaded petrol or premium unleaded petrol, depending on the country.

## Other Sources and References

**Baines J T (Editor)**, *New Zealand Energy Information Handbook – Energy Data, Conversion Factors, Definitions*, 1993, Taylor Baines and Associates, Christchurch.

**East Harbour Management Services Ltd**, *Availability and Costs of Renewable Sources of Energy for Generating Electricity and Heat*, updated June 2005, a report to the Ministry of Economic Development.

**Energy Efficiency and Conservation Authority (EECA) and Centre for Advanced Engineering**, *New and Emerging Renewable Energy Opportunities in New Zealand*, July 1996, Christchurch: EECA and University of Canterbury.

**Energy Information and Modelling Group Publications**: see Section O overleaf.

**International Energy Agency (IEA)**, *Energy Prices and Taxes First and Second Quarter 2006*, Paris.