



M. 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.

BHP 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.

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, Caltex 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 return 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 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.

Primary energy supply of **geothermal** energy is taken as the amount used directly (as sourced from Statistics New Zealand through its INFOS database) and the amount used for electricity generation based on a 15% conversion efficiency from 2000. Prior to 2000, efficiency of geothermal energy transformation for electricity was taken as 10%.

Other sources of renewables include **waste heat** (to produce steam) from industrial processes, **woody biomass** (from arisings derived from conventional forest operations, wood process residues and purpose-grown fuel wood plantations) and **biogas** from landfill and sewage treatment plants.

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 – waste heat (steam) at 15%, biogas at 30% and woody biomass at 25%.

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 is used to supplement the annual electricity statistics to provide more information on cogenerators.

Electricity Prices

Price data are derived from the Ministry of Economic Development's annual (year ending 31 March) electricity statistics. These data are national average prices for residential, commercial and industrial consumers, and hence for all consumers, measured as total income received by electricity wholesalers and retailers, divided by

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 fourth quarter 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 to 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.

Natural gas prices are 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.

Energy Price Indices

The energy price indices for selected OECD countries are calculated by the IEA from data supplied by individual countries. Their approach is to use a current weight scheme (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*, June 2002, 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.

International Energy Agency (IEA), *Energy Prices and Taxes Fourth Quarter 2004*, Paris.

Energy and the Environment Group Publications: see Section N overleaf.