

# Megawatts or Negawatts

**E**LECTRICORP'S PROPOSALS to increase electricity prices in anticipation of the need for a new thermal power station in 10 years' time recently hit the headlines.

A simultaneous shortage in capacity, because of a cold winter and low storage in South Island hydro lakes, has kept energy issues in the news.

All of this highlights the urgent need for this country to address the major opportunities for economic and environmental benefits through energy efficiency.

There is an alternative to Electricorp's proposal for a new thermal power generation station. It is called improved energy efficiency. It happens when consumers get the same amount of heat, light or other service for a lesser cost through requiring less energy.

This source of energy has been called "negawatts". A unit of saved energy or "negawatt" is just as good as an extra unit of electricity or megawatt, and costs less. That is, it makes common sense as well as good economic and environmental sense for people to use energy efficiency measures (or buying "negawatts") up to the point where the costs equal the current price of electricity.

The more efficiently a nation uses energy, the more cost competitive are its goods and services. At present, New Zealand ranks badly in terms of the amount of energy used to produce a unit of Gross Domestic Product (GDP).

This international measure of energy intensity shows that while other OECD countries have reduced their energy intensity in recent years, New Zealand's has risen sharply.

Between 1970 and 1988, the average energy intensity of OECD countries fell 25 percent while New Zealand's has risen 31 percent, as shown in Figure 1. The effects of the Think Big projects accounts for only part of this.

## Domestic

A 1986 study for the Ministry of Energy by Jan Wright and James Baines, of the Centre for Resource Management, Lincoln College, showed that simple cost effective measures to achieve energy efficiency in just four areas – domestic water heating, home heating, lighting and appliances – if fully utilised, could save the need for planned future power stations: Waikato thermal, lower Clutha hydro, Queensbury hydro and Mokai geothermal.

## Industry

Case studies by the Ministry of Commerce in recent years have identified energy savings of 40 percent within the meat industry. The technology investigated includes cogeneration and boiler heat recovery, computer controls to optimise speed in blast freezers, and technical advances such as hot boning plants leading to substantial energy savings. Potential energy savings of a similar amount have been identified in the cement, glass, and steel manufacturing industries. The pulp and paper, aluminium, dairy and food industries also show great scope for more efficient use of energy.

## Transport

The transport sector contributes 40 percent of New Zealand's CO<sub>2</sub> emissions, a significant proportion of our greenhouse gas emissions. If all petrol vehicles were adequately tuned, total fuel savings of around four percent could be achieved.

be corresponding costs savings to the drivers.

The use of CNG and LPG instead of petrol offers vehicle drivers potential costs savings of 30 to 40 percent for the same distance travelled, assuming engines are properly tuned in each case. The corresponding reduction in carbon dioxide emissions is around 33 percent.

## Competitive advantage

Improved energy efficiency would reduce the unit costs of production, increase firms' international competitiveness, encourage economic growth and increased employment. So why don't people take these chances to save energy and save themselves money? There are "institutional barriers" to the market delivering the full potential for energy efficiency. These include average instead of marginal cost pricing of energy, lack of competition in energy markets, lack of information to consumers, those who benefit are often



*Lake Manapouri, saved from having its water level raised for increased power generation in the early 1970s, is now at the centre of the energy debate again. Government proposals to privatise the underground Manapouri power station are strongly opposed on environmental grounds by Forest and Bird. Photo: Alan Mark*

If more fuel efficient vehicles were used than at present, there could be an overall reduction in petrol use and, consequently, a reduction in greenhouse gas emissions. For example, a target of an increase by 50 percent in fleet average economy (from the present 30 mpg to 45 mpg) by 1995 would allow sufficient time, with the present rate of turnover of the fleet, to meet a target of a 30 percent reduction in carbon dioxide levels from vehicles by 2005. There would

not those who pay, and company investment criteria which favour production ahead of energy saving measures.

## Electricity industry reform

Let me suggest some fundamental requirements in the electricity industry.

- Consumers need to have the information and be able to purchase the required equipment and appliances. A good