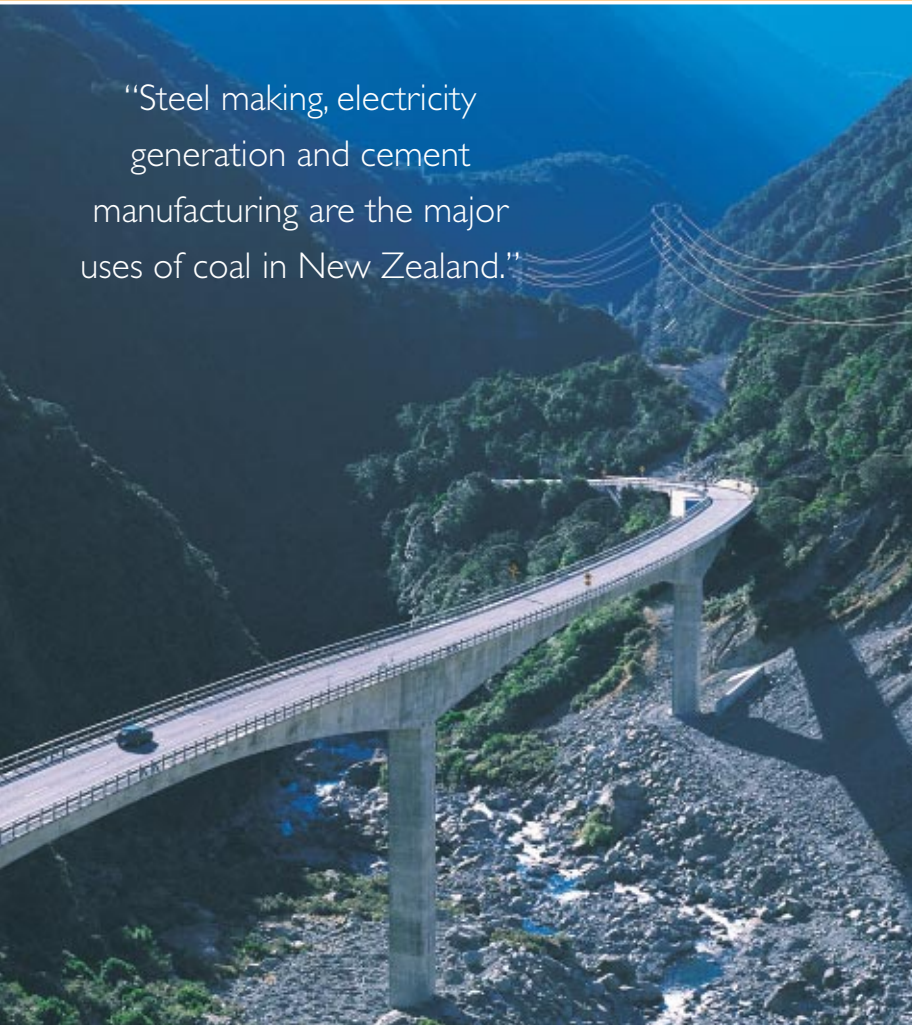


# Coal - The World's Leading Energy Source

"Steel making, electricity generation and cement manufacturing are the major uses of coal in New Zealand."



Left: Otira Viaduct, West Coast; Top right: Huntly Power Station; Bottom right: Steel building.

- Coal provides 37% of the world's electricity – 86% in Australia but only 5% in New Zealand.
- Coal feeds the blast furnaces and provides the necessary reductants to manufacture the world's steel.
- Coal is a vital ingredient in activated carbon, carbon fibre and silicon metal.
- Coal provides the energy to drive industry.
- Coal heats our schools and hospitals.
- And coal is catching up with world demands to be cleaner by using clean-coal technologies to cut emissions.

New Zealand has an international reputation as the world's leading supplier of premium coal. Solid Energy produces most of that coal and the world's markets are prepared to pay a premium price for it.

Solid Energy's heritage of mining for more than a century - on the West Coast of the South Island, in Southland, and around Huntly in the North Island - has created an industry and a mining company with a reputation for meeting customer demands for the particular blends of coals, including the special quality low-ash, low-sulphur, sub-bituminous coal and low ash and low phosphorus coal, unique to New Zealand.

## Coal is a vital ingredient in:

- **Electricity**  
Coal provides 37% of the world's electricity - as much as 86% in Australia, but only 5%

in New Zealand. With hydro-generation reaching its maximum capacity and gas availability declining in the next decade, coal may be the only economically viable alternative for New Zealand's energy and electricity needs until other renewable resources can be produced cost-effectively. It's estimated that it would take 8000 wind turbines - that's one every 100 metres the length of New Zealand - to generate enough power to meet New Zealand's projected energy needs over the next 20 years.

- **Industry "Distributed Energy"**  
Because coal can be converted on site to energy, without the fugitive emissions of pipeline systems or the energy losses of power lines, it is often cheaper than gas or electricity. New Zealand's primary industries rely on coal as an economically competitive and flexible source of energy. Dairying, cement,



Left to right: Power lines; coal ship at Port of Lyttelton; Canterbury Brewery; dairying in the South Island.

timber and industrial processing are all expanding industries with growing energy demands. Many schools and hospitals rely on coal for a low cost, efficient overall source of heating and energy. Modern industrial boilers have advanced control systems that reduce emissions to very low levels.



● **Domestic Use**

Coal has been used for hundreds of years for home heating and for cooking, but it is inefficient and expensive in open fires – most heat is wasted. Less than 6% of Solid Energy sales are for domestic use. Solid fuels (wood and coal) burnt in domestic open fires and older enclosed burners also contribute to air pollution, particularly in cities with unique meteorological conditions such as Christchurch.

● **Steel**

Most steel production worldwide comes from iron made in blast furnaces using coal and coke as both an energy source and a reducing agent in the production process. Steel is fundamental to machines that make almost everything we use and is found in buildings, bridges, cars, trains, ships, spaceships, computers and hospital equipment - from surgical instruments to life support systems. Over 80% of Solid Energy's coal exports are sold to steel producers worldwide. More than half of sales in New Zealand are to BHP New Zealand Steel's Glenbrook plant.



● **Activated Carbon, Carbon Fibre & Silicon Metal**

Coal is an essential ingredient in the production of specialist products:  
- Activated carbon - used in filters for water and air purification and in kidney dialysis machines.

- Carbon fibre - an extremely strong, but lightweight reinforcement material used in construction, fishing rods, golf clubs, mountain bikes, tennis rackets and the Britten 2000 motorbike.



- Silicon metal - used to produce silicones and silanes which in turn are used to make lubricants, water repellents, resins, cosmetics, hair shampoos and toothpaste.

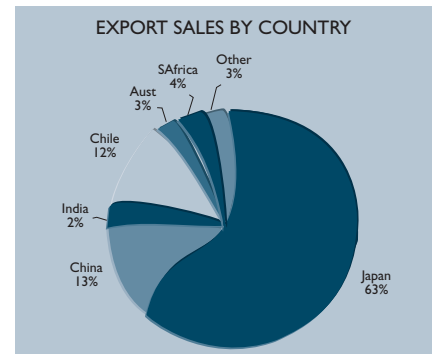
● **Coal is Coming Clean**

Clean-coal technologies are being adopted worldwide by coal-fired power stations and industries. These technologies increase energy efficiency, reduce coal use, reduce waste and cut down emissions to almost zero.

New Zealand industries using coal are working on increasing the efficiency of coal and most plants emit minimal particulates. Genesis Power and Solid Energy have formed a task force to enhance the performance of coal at Huntly Power Station and introduce the next generation of coal technology to the station. Solid Energy is seeking similar arrangements with other major industrial customers, including BHP New Zealand Steel and the dairy industry.

● **Markets for Solid Energy Coal**

Solid Energy mines over 3 million tonnes of coal each year. Over half of this annual production is exported to major international customers. This brings in more than \$150 million a year for New Zealand in export earnings. Solid Energy exports to Japan, South Africa, China, India, Chile, Australia, the United States and Northern Europe.



In New Zealand, Solid Energy's major customers are BHP New Zealand Steel at Glenbrook, Huntly Power Station, which uses both coal and gas to generate electricity, and a range of industrial customers including cement manufacturers, dairy companies, breweries, and meat, food and timber processors.

