What's the story?
Encyclopedia of New Zealand

(Cook, 2010a)

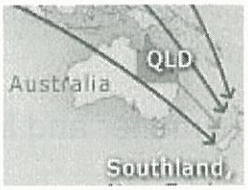
Pulp and paper, aluminium and steel industries

Aluminium

Aluminium, the most common metal in the earth's crust, is lighter than copper, steel or brass, resists corrosion and readily conducts electricity and heat. It is non-sparking and non-magnetic, and can be recycled indefinitely. When combined with zinc and magnesium, aluminium is stronger than some forms of steel.

Tīwai Point aluminium smelter

Aluminium is only found in ores such as bauxite, combined with other material. Commercially viable methods of extracting alumina (aluminium oxide) from bauxite and then smelting aluminium were discovered in the 1880s.



New Zealand in the international aluminium industry

Aluminium was used in the growing car and electricity industries. Because of its lightness and strength, it was particularly useful in the aircraft industry.

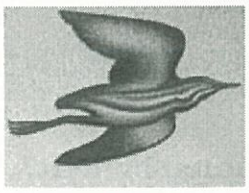
The aluminium industry

By the mid-1890s the world aluminium industry was in full swing. It was dominated by very large companies, operating across national boundaries. The processing needed a plentiful source of bauxite and massive amounts of electricity, and the bauxite refineries and aluminium smelters were expensive to build. The smelters were generally built close to the power source, and alumina was shipped to them.

Aluminium entrepreneurs, 1928

The industry has always tended to be 'vertically integrated': the same company owns or controls the bauxite, the source of power and the refineries and smelters. Rio Tinto Alcan, owner in 2008 of New Zealand's Tīwai Point aluminium smelter, owns or has interests in:

+ seven bauxite mines and deposits
+ six alumina refineries
+ six specialty alumina plants
+ 26 aluminium smelters
+ 13 power-generating plants, nine of them hydroelectric.



Independent Aramoana stamps

Aluminium in New Zealand

New Zealand's Bluff aluminium smelter produces the world's purest aluminium. It is used in mobile phone and computer chips, and, because of its strength and lightness, in very large passenger planes.

The smelter exists because of the country's hydroelectric capacity. New Zealand has no significant bauxite deposits, and imports the raw materials needed to make aluminium (alumina from Australia, petroleum coke from California, cryolite from Mexico and pitch from Korea).

Failed attempt

In the late 1920s, Arctic and Antarctic explorer Sir Douglas Mawson was an enthusiastic participant in early attempts to use Fiordland's hydroelectric potential. Mawson, an engineer and chemist, tried to interest British, European and American companies in developing the area for aluminium or fertiliser manufacture. He invented a manufacturing process that would allow both substances to be produced at once. Although the companies eventually responded positively, the New Zealand government refused its support.

From the early 20th century, New Zealand entrepreneurs saw Fiordland's potential for hydroelectric generation as an obvious base for industry and profit. Government support was lacking until after the Second World War. The government's focus was on electrification for domestic and agricultural purposes, and developing the national grid. It did not have the resources to build the large Manapōuri hydroelectric project, and objected to overseas or private control of such an important resource.

Bluff smelter and Manapōuri power scheme

After the Second World War the government's strong interest in diversifying New Zealand's economy made an aluminium industry attractive. However, without a reliable source of cheap and abundant electricity, a smelter would not be built. In 1960 the government agreed that Australian firm Consolidated Zinc (ConZinc) could build an aluminium smelter, and develop and use the hydroelectric capacity of Lakes Manapōuri and Te Anau, in Fiordland.

In 1963, ConZinc announced that it could not afford to build the power station, and the New Zealand government took on the project. In 1965 the cost was estimated at £17 million ($34 million) – but the final cost was more than triple that, at around $130 million. The first power was generated in 1969.

ConZinc built the smelter, at Tīwai Point near Bluff, which opened in 1971. It was run by New Zealand Aluminium Smelters (NZAS), a joint venture between ConZinc Rio Tinto and Japanese firms Sumitomo Aluminium and Showa Denko.

In 2006, the smelter produced 350,000 tonnes of aluminium. New Zealand used 13% of this, and the rest was exported, mainly to Japan.

National benefit?

The national benefit from hosting the smelter has been the subject of sometimes heated debate. New Zealand's contribution, through building the Manapōuri power station and providing low-priced electricity, has been considerable. In the 1970s and 1980s NZAS paid little tax.

Aluminium exports earn tens of millions of dollars (in 2005, $150 million). An NZAS-funded study in 2004 suggested that over half of the company's earnings would remain in New Zealand through local spending, salaries and taxes. The rest would be spent on imported raw materials or returned to company owners as profit.

Workforce

In 2006, the Tīwai Point smelter employed nearly 1,000 people, many of them from the nearby town of Invercargill. The smelter makes a significant contribution to Southland's economy. In addition to direct employment, the local port, health services and schools all benefit from the smelter's existence.

Aramoana smelter proposal

In the late 1970s, a partnership of local and overseas firms proposed building a second aluminium smelter at Aramoana, near Dunedin, and in December 1980 the government announced that the project would go ahead. However, due to vigorous public opposition, shifting international aluminium markets, and the withdrawal of one of the partners, the scheme was eventually dropped.

A separate state

Aramoana residents who opposed the smelter formed the Aramoana League, and declared that they had seceded from New Zealand. They set up a border post and began selling 'passports' and 'citizenships', issued their own stamps, and appointed 'ambassadors'. They travelled the country campaigning against the smelter, arguing that it would destroy the Aramoana area and be of little benefit to New Zealand.

Opposition to smelters

A range of groups opposed the Tīwai Point and Aramoana smelters for environmental, economic and engineering reasons. Lake Manapōuri was to have its level raised as part of the hydroelectricity scheme for Tīwai Point, and saving the lake became the largest conservation issue in New Zealand's history. Campaigners for open government and against foreign control of New Zealand resources also opposed the smelters.

Biographies


Peter Seton Hay, 1852/1853?–1907


Walter Nash, 1882–1968


Charles William Oakey Turner, 1901–1994


James Fletcher, 1886–1974


Woolf Fisher, 1912–1975

How to cite this page: Megan Cook. 'Pulp and paper, aluminium and steel industries - Aluminium', Te Ara - the Encyclopedia of New Zealand, updated 26-Nov-10
URL: http://www.TeAra.govt.nz/en/pulp-and-paper-aluminium-and-steel-industries/3