



2014 Minerals Yearbook

NEW ZEALAND

THE MINERAL INDUSTRY OF NEW ZEALAND

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New Zealand is a country located in the southwestern Pacific Ocean. It consists of two main islands that were formed by volcanoes and shaped by glaciation. Industries on the North Island included cement manufacture, coal mining, and petroleum and natural gas production. Industries on the South Island included aluminum smelting, gold mining, and coal production. In 2014, New Zealand's gross domestic product (GDP) was valued at about \$200 billion at current market prices. The annual rate of growth of the GDP in 2014 was 3.0% compared with 2.5% in 2013. Economic growth was the result of higher prices of some export commodities and increased investment in the construction sector (Reserve Bank of New Zealand, 2014, 2015; New Zealand Now, 2016; World Bank, The, 2016).

Minerals in the National Economy

New Zealand's mineral industry played an important role in the country's economy. In 2014, the sector contributed about \$1 billion to the nation's GDP and about \$20 million in royalties to the Government. Activities included the mining of coal, gold, industrial minerals, iron sand, and silver. About 1,000 mineral exploration and mining permits were issued by yearend 2014. Small- and medium-sized mining operators held approximately 980 mineral exploration and mining permits to conduct extracting, quarrying, and processing activities across the country. About 20 large mining operations extracted aggregates, coal, and gold. Significant metallic minerals included gold, iron sand, and silver. Significant nonmetallic minerals included clays, diatomite, perlite, pumice, serpentine, silica sand, and zeolites (New Zealand Petroleum and Minerals, 2016a).

Government Policies and Programs

In New Zealand, multiple Government agencies, together with regional and district councils, share the responsibility for regulating mineral industry activities. On November 10, New Zealand Petroleum and Minerals, an agency under the Ministry of Business, Innovation and Employment, approved the proposal to reduce fees for getting offshore petroleum prospecting permits and offshore minerals permits. It sought to ensure that Government fees reflect the administrative costs for these types of permits and to remove barriers to industry investment. The changes included an annual flat rate of \$50,000 for all nonexclusive (multiclient) Petroleum Prospecting Permits (PPPs), annual rates of \$1 per square kilometer for exclusive PPPs and \$10.73 per square kilometer for offshore mineral exploration permits, and annual rates of \$102.22 per square kilometer for offshore mineral mining permits. These new regulations were expected to be effective in early 2015. The Government allocated petroleum exploration permits in an annual tender called a "block offer," which enabled the efficient allocation of exploration areas to all investors.

The Government selected the release areas for block offers in 2012, opened the selections for bidding, and then awarded permits to operators. On November 14, the Ministry of Energy and Resources, which is a component of the Department of the Prime Minister and Cabinet, announced open consultation on the proposed petroleum block offers for 2015. The proposal includes three onshore and four offshore crude oil and natural gas areas, which cover about 476,000 square kilometers (km²), compared with about 434,000 km² in block offers for 2014, which the Government opened in 2013. From 2012 to 2014, the Government launched three minerals tenders—Northland 2012, Epithermal Gold 2013, and Platinum 2013, to encourage global investment and to promote the country's mineral exploration activities (New Zealand Petroleum and Minerals, 2014a, b; 2016b, c, e).

Production

In 2014, the production of dolomite more than tripled compared with that in 2013; total clays (including kaolin and clay designated for use in brick and tile) increased by about 150%; limestone for agricultural use increased by 56%; sand and gravel for building aggregate increased by about 45%; silver production increased by about 40%; and gross production of crude petroleum and natural gas each increased by 12%. Production of pumice and dimension stone each decreased by 27%; coal, by about 13%; and gold, by about 4% (table 1).

Structure of the Mineral Industry

Table 2 lists major mineral industry facilities in New Zealand, which has mineral occurrences of bentonite, clays, coal, diatomite, gold, iron sand, perlite, pumice, serpentine, silica sand, silver, and zeolites. A wide range of minerals and materials were produced and contributed to other economic sectors, such as agriculture, construction, energy, manufacturing, and transportation (New Zealand Petroleum and Minerals, 2016e).

Mineral Trade

In 2014, the total value of exports (goods and services) increased by 12% to \$54 billion (NZD68.0 billion) from \$49 billion (NZD61.9 billion) in 2013.¹ China, which was the leading destination for exports, received 23% of New Zealand's total exports in 2014, followed by Australia, which accounted for 17%. The total value of the country's imports increased by 8% in 2014 to \$50 billion (NZD63.0 billion) from \$48 billion (NZD59 billion) in 2013. The countries of the European Union (EU) were the leading source of imports in

¹Where necessary, values have been converted from New Zealand dollars (NZD) to U.S. dollars (US\$) at an average rate of NZD1.255=US\$1.00 for 2014, and NZD1.270=US\$1.00 for 2013. All values are nominal, at current prices, unless otherwise stated.

2014, providing 18% of New Zealand's imports, followed by China, which accounted for 17% (Statistics New Zealand, 2016).

In 2014, New Zealand exported about \$4 billion worth of goods to the United States, of which iron and steel products were valued at about \$69 million; bauxite and aluminum, about \$24 million; copper, about \$3 million; and coal and related fuels, about \$0.5 million. The United States exported about \$4 billion of goods to New Zealand, of which petroleum products were valued at about \$56 million; iron and steel products, about \$9 million; alumina and aluminum, about \$6 million; precious metals, about \$4 million; and nonferrous metals, about \$0.8 million (U.S. Census Bureau, 2015a, b; U.S. Central Intelligence Agency, 2015; Statistics New Zealand, 2016).

Commodity Review

Metals

Aluminum.—Bauxite deposits were discovered in the Northland region of the North Island of New Zealand; however, bauxite had not been mined. Aluminum was smelted at Tiwai Point in the Southland region of the country's South Island, and alumina was imported from Queensland, Australia. New Zealand Aluminum Smelters Ltd. (NZAS) was a primary aluminum producer and New Zealand's only aluminum smelter. NZAS was a joint venture of Pacific Aluminum Ltd. of New Zealand (79.36%) and Sumitomo Chemical Co. Ltd. of Japan (20.64%). Pacific Aluminum Ltd. of New Zealand (a wholly owned subsidiary of Rio Tinto Ltd.'s Meridian Energy) supplied electricity to the Tiwai smelter at reduced prices in 2014. The demand for and the price of aluminum had decreased during the past several years. In 2014, NZAS reported production of 328,269 metric tons (t) of aluminum, which was a 1.1% increase compared with production in 2013. NZAS' aluminum production in 2014 included 118,763 t of high-purity aluminum ingot, 85,405 t of billet, 46,931 t of rolling block, 36,022 t of standard purity ingot, 13,339 t of foundry ingot, and 27,811 t of other value-added aluminum ingot. NZAS employed 800 people in 2014, and 58% of its aluminum production was exported to Japan (New Zealand Aluminum Smelters Ltd., 2015, p. 20).

Gold.—In 2014, New Zealand's gold production was about 12 t. The country's gold production was mainly from the Waihi area on the North Island and from the Otago region on the South Island. Newmont Mining Corp. of the United States and OceanaGold Corp. (OGC) of Australia were the two major operators of New Zealand's hard-rock mines. The country also had several medium-sized alluvial operations and a large number of small alluvial mines. Newmont Waihi Gold, which was a subsidiary of Newmont Mining, mined the Martha and the Trio Mines in and around Waihi on the North Island. The company reported that it produced 4.1 t (reported as 132,000 troy ounces) of gold in 2014. Oceana Gold Ltd. (a subsidiary of OGC) was the operator for the Macraes operation and the Reefion operations on the South Island. The Macraes operation consisted of the Macraes open pit mine, the Frasers underground mine, and the Macraes processing plant. In 2014, OGC reported that it produced 6.26 t (reported as 201,207 troy ounces) of gold and sold 6.48 t (reported as 208,462 troy ounces) of gold valued at \$862 per troy ounce

(Newmont Mining Corp., 2015, p. 32; OceanaGold Corp. 2015a, p. 11; 2015b, p. 7; Waihi Gold Co. Ltd., 2015, p. 1–7).

Silver City NZ Pty Ltd. of Australia acquired a 5-year permit in 2013 from the New Zealand Government to explore for gold in an area of 33 km² on the North Island's central volcanic plateau, south of Kawerau. The Government opened a tender for mineral exploration in the central volcanic zone, which is located across from the Bay of Plenty and Waikato regions of the North Island, where gold and silver had been identified (Ministry of Business, Innovation and Employment, 2015).

Iron Ore and Iron and Steel.—The main type of iron ore deposit found in New Zealand was titanomagnetite iron sand, but other types of iron materials were found at minor deposits in the country. Various attempts had been made to smelt iron sand in New Zealand, but the high titanium content and fine grain size made the ore unsuitable for processing using traditional blast furnace technology. New Zealand Steel Ltd.'s fully integrated steel mill produced about 650,000 metric tons per year of steel in a range of flat steel products for both domestic and export markets. The company used iron sand and coal to make iron and steel. The iron sand came from the Waikato North Head Mine and concentration plant, which is located 18 kilometers south of the company's Glenbrook mill. New Zealand Steel, which was a subsidiary of BlueScope Steel Ltd. of Australia, exported about 60% of its steel production. In 2014, New Zealand mined about 2.1 million metric tons (Mt) of iron ore and produced about 700,000 t of pig iron and about 900,000 t of crude steel. The country exported about 2.2 Mt of iron ore and about 367,000 t of iron scrap, and imported about 15,000 t of iron scrap (World Steel Association, 2015, p. 102–103, 107, 109; New Zealand Steel, 2016).

Industrial Minerals

Cement.—In 2014, New Zealand produced about 1.2 Mt of cement, which was about the same level of production as in 2013. The country's domestic cement consumption was about 1.15 Mt in 2014, which was about a 5% increase compared with the 1.10 Mt consumed in 2013. In 2014, New Zealand exported about 0.11 Mt of cement (a decrease of about 15% compared with that of 2013) and imported about 0.17 Mt of cement (an increase of about 31% compared with that of 2013). The residential markets of Auckland and Canterbury were the main components of new construction and demand for cement, and demand in Waikato and Wellington was helped by nonresidential projects. Golden Bay Cement (a subsidiary of New Zealand's Fletcher Building Group) and Holcim New Zealand Ltd. (a subsidiary of Switzerland's Holcim Ltd.) were the country's two major cement companies; they had a combined annual capacity of 1.4 Mt from their integrated plants and grinding station. In 2014, Holcim installed a 0.5-million-metric-ton-per-year-capacity wet-cement process line at its Westport plant and constructed a 30,000-t cement terminal at Timaru. In 2014, Golden Bay Cement replaced one-third of the Whangarei cement plant's fuel source (coal) with wood to reduce its annual carbon dioxide emissions by 58%. The country's current carbon tax had caused cement producers to shift away from clinker production to cement grinding. Golden Bay Cement, Holcim,

and HR Cement produced ordinary portland cement in 2014, which was the most used cement worldwide. Golden Bay Cement and Holcim, also produced premium portland cement by using fly ash and other cementitious materials to increase the strength of the concrete (Golden Bay Cement, 2015a–c; Holcim New Zealand Ltd., 2015a–c; International Cement Review, 2015, p. 248–249).

Mineral Fuels

Coal.—In 2014, New Zealand produced about 4 Mt of coal, which was a decrease of about 13% compared with 4.6 Mt in 2013. Bituminous coal accounted for about 1.9 Mt; subbituminous coal, about 1.7 Mt; and lignite coal, about 0.3 Mt. Coal prices decreased by at least 30% during the past 2 years in the international market. In July, Bathurst Resources Ltd. began its initial work at the Escarpment coal mine on the Denniston plateau near Westport; the company expected the price of coking coal to rebound. The company's activities included clearing the site for coal storage, constructing infrastructure, and installing water management systems (Bathurst Resources Ltd., 2014). Coal accounted for about 4% of New Zealand's total energy consumption annually. Bituminous coal resources were located mainly in the West Coast region of the South Island, and subbituminous coal resources were found mainly in the Waikato region of the North Island. Lignite resources were mainly found in the Otago and the Southland regions of the South Island. New Zealand exported coal to China, India, and Japan. State-owned Solid Energy New Zealand Ltd. was the leading coal producer in the country and operated mines at Waikato in the central region of the North Island, along the west coast of the North Island, and in the Southland regions of the South Island. Solid Energy had recently signed a new 5-year supply arrangement with New Zealand Steel that would be effective from 2014 to 2019, and a 4-year arrangement with Genesis Energy that would be effective from 2014 to 2018 (Ministry of Economic Development, 2010; Ministry of Business, Innovation and Employment, 2015; New Zealand Petroleum and Minerals, 2016d; Solid Energy New Zealand Ltd., 2016).

Natural Gas and Petroleum.—In 2014, New Zealand's production of natural gas increased by about 12%, whereas the consumption of natural gas increased by about 9% compared with that of 2013. The country's natural gas was produced in the Taranaki region of the North Island. Methanex Corp. of Canada, which was a methanol producer in New Zealand, was a major consumer of domestic natural gas. The Mai and the Mangahewa fields were the leading contributors to New Zealand's natural gas production increase in 2014. Mangahewa increased its natural gas production by 39% in 2014 compared with that of 2013, and was a major supplier to Methanex. New Zealand's crude oil production increased by 12% in 2014 compared with that of 2013. Some of the country's domestic crude oil production was sent to the Marsden Point refinery for processing. Exports of crude oil increased by 16% in 2014 compared with that of 2013. The country's crude oil was generally exported to Australia. Crude oil refinery production and imports decreased by 2% and 3.9%, respectively, in 2014

compared with that of 2013. About 52% of the country's crude oil imports were from the Middle East, compared with 59% in 2013 (Ministry of Business, Innovation and Employment, 2015).

Outlook

New Zealand's mineral sector is expected to continue to play an important role in the country's economic development. The Government is expected to encourage investment in mining and mineral exploration activities. The production of coal, gold, iron sand, and silver were expected to remain steady or gradually increase owing to market demand, stable mineral commodity prices, and increased production capacities. The exploration and production of other minerals, including base metals, platinum-group metals, phosphate, silica sand, and sulfur, may increase. Under the Crown Minerals Amendment Act 2013, the exploration restrictions for some minerals have been redefined on public areas. The Government is likely to further promote the export of domestic mineral products and commodities. New Zealand's natural gas production will continue to be dominated by the Pohokura and the Maui fields, which together account for more than 50% of domestic production. The country's crude oil production will likely continue to be dominated by the Pohokura and the Maari fields, which produce 29% and 21%, respectively, of domestic production. The country is expected to continue to explore new sources of renewable energy, including biogas, woody biomass, geothermal, hydropower, solar, and wind (Ministry of Business, Innovation and Employment, 2015; New Zealand Petroleum and Minerals, 2016f).

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TABLE 1
NEW ZEALAND: PRODUCTION OF MINERAL COMMODITIES^{1,2}

(Metric tons unless otherwise specified)

Commodity	2010	2011	2012	2013	2014
METALS					
Aluminum metal, smelter, primary	343,335	354,029	326,963	324,835	328,269
Gold, mine output, Au content kilograms	13,494	11,761	10,164	12,468	11,989
Iron and steel:					
Iron sand, titaniferous magnetite, gross weight thousand metric tons	2,439	2,357	2,395	3,157	3,245
Iron sand, iron content ^c do.	1,390	1,340	1,360	1,800	1,850
Pig iron ^c do.	667	659	669	680	670
Steel, crude ^c do.	853	844	912	900	900
Silver, mine output, Ag content kilograms	17,136	14,324	5,629	11,223	15,811
INDUSTRIAL MINERALS					
Cement, hydraulic ^c thousand metric tons	1,100	1,200	1,200	1,200	1,200
Clays:					
Bentonite	1,216	--	2,263	762	--
For brick and tile	30,192	10,911	71,487	62,288	125,508
Kaolin, pottery	10,700	21,545	11,578	13,066	61,382
Diatomaceous earth	95	--	--	4	43,624
Lime ^c	170,000	175,000	175,000	175,000	175,000
Nitrogen, N content of ammonia ^c	120,000	120,000	125,000	125,000	125,000
Perlite	5,088	--	3,598	--	--
Pumice	118,249	229,268	72,414	93,865	68,835
Salt ^c	95,000	95,000	95,000	100,000	100,000
Sand and gravel:					
Silica sand, glass sand	113,231	109,346	73,064	101,702	113,602
Other industrial sand	1,726,236	1,203,103	1,517,308	1,283,125	1,411,819
For roads and ballast thousand metric tons	13,257	15,258	15,439	19,947	21,497
For building aggregate do.	7,528	6,183	6,561	8,044	11,654
Stone:					
Dimension	18,911	140	8,614	17,769	13,061
Dolomite	86,399	59,782	86,040	5,542	22,925
Limestone and marl:					
For agriculture thousand metric tons	1,686	1,387	1,020	1,419	2,219
For cement do.	1,800	1,705	1,797	1,884	1,949
For other industrial uses do.	1,054	185	364	388	466
Serpentine	43	41,201	36,731	52,353	--
Zeolites	--	3,523	--	155	--
MINERAL FUELS AND RELATED MATERIALS					
Coal, all grades thousand metric tons	5,330	4,944	4,926	4,625	3,992
Natural gas:					
Gross production million cubic meters	5,052	4,678	5,188	5,583	6,253
Marketed production	4,432	4,003	4,559	4,866	5,440
Petroleum:					
Crude thousand 42-gallon barrels	19,302	16,591	14,149	12,325	13,804
Refinery products ^c do.	34,000	33,000	39,000	37,000	38,000

^cEstimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. do. Ditto. -- Zero.

¹Table includes data available through December 31, 2015.

²In addition to the commodities listed, New Zealand produced a number of other mineral commodities, which included lead (refinery output, secondary), marble, and liquefied petroleum gas, but available information was inadequate to make reliable estimates of output.

TABLE 2
NEW ZEALAND: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Thousand metric tons unless otherwise specified)

Commodity		Facilities, major operating companies, and major equity owners	Location of main facilities	Annual capacity ^e
Aluminum		New Zealand Aluminium Smelters Ltd. (NZAS) (Pacific Aluminium, 79.36%, and Sumitomo Chemical Co., 20.64%)	Tiwai Point smelter Southland, Invercargill	350
Cement		Golden Bay Cement (Fletcher Building Group.)	Whangarei plant	900
Do.		Holcim New Zealand Ltd. (Holcim Ltd.)	Cape Foulwind, Westport	500
Coal		Solid Energy New Zealand Ltd.	Stockton Mine, Buller, Westport	2,500 ¹
Do.		do.	Pike River Mine, Greymouth	1,000 ¹
Do.		do.	Spring Creek Mine, Greymouth	1,000 ¹
Do.		do.	Rotowaro Mine, Huntly	1,500
Do.		do.	Huntly East Mine, Huntly	500
Do.		do.	New Vale Mine, Invercargill	300
Do.		do.	Ohai Mine, Ohai	200
Do.		do.	Terrace Mine, Reefton	100
Gold	metric tons	Newmont Waihi Gold (Newmont Mining Corp.)	Martha, Trio, in Waihi	5
Do.	do.	Macraes gold project (OceanaGold Corp.)	Macraes, Reefton, in Otago	7
Iron and steel:				
Iron ore		New Zealand Steel Ltd. (BlueScope Steel Ltd.)	Taharoa, 150 kilometers south of Auckland	1,400
Do.		do.	Waikato North Head, 30 kilometers south of Auckland	1,400
Steel		do.	Glenbrook	650
Do.		Pacific Steel Group (Fletcher Building Ltd.)	Otahuhu Mill, Auckland	300
Kaolin		Imerys Tableware New Zealand Ltd.	80 kilometers northwest of Whangarei	25
Petroleum, refinery	barrels per day	New Zealand Refinery Co.	Marsden Point oil refinery Marsden Point	95,000
Salt		Dominion Salt Ltd.	South of Blenheim	70
Silver	metric tons	Newmont Waihi Gold (Newmont Mining Corp.)	Waihi	30
Do.	do.	OceanaGold Corp.	Otago	1

^eEstimated. Do., do. Ditto.

¹Partially under care and maintenance.