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The Mineral Industry of New Caledonia

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Note: In this chapter, information for 2017 is followed by information for 2018.

New Caledonia, an overseas territory of France, is located in the Pacific Ocean east of Australia. New Caledonia's mineral industry was characterized by nickel and cobalt mining and the production of ferronickel. In 2017, New Caledonia ranked third in global mined nickel production, accounting for 10% of global production. Approximately one-third of the surface area of the country's main island, Grande Terre, is covered by peridotites. Supergene alteration of these peridotites, caused by extensive tropical weathering, produced widespread nickel-cobalt laterite deposits. Mining of these deposits remained significant to New Caledonia's economy in 2017 (Direction de l'Industrie, des Mines et de l'Energie de la Nouvelle-Calédonie, 2009; Marsh and others, 2013, p. 3, 10; McRae, 2019).

Minerals in the National Economy

In 2016 (the latest year for which data were available), the real gross domestic product (GDP) of New Caledonia increased by 1.8%. The nickel mining industry accounted for 5% of New Caledonia's nominal GDP in 2016, which was an estimated 983 billion CFP francs (XPF)[1] ($9.8 billion). In 2017, the total value of New Caledonia's exports increased by 12% to XPF 163.6 billion ($1.62 billion), of which 91% was related to New Caledonia's mineral industry. This increase was owing to the increase in both the value and amount of mineral products. The value of ferronickel exports accounted for 48% of total exports, followed by nickel oxide, 17%; nickel ore, 15%; cobalt carbonate, 7%; and nickel hydroxide cake, 4%. China accounted for the largest share of New Caledonia's total exports at 39%, followed by the Republic of Korea, 19%; Taiwan, 9%; and Japan, 8%. The United States accounted for 4% of New Caledonia's exports. At the end of 2017, the nickel industry employed about 6,040 people, of which 89% were employed directly in mining and metallurgy and 11% were employed in associated activities (Institut de la Statistique et des Études Nouvelle-Caledonie, 2017b, 2018, 2019; Institut d'Emission d'Outre-mer, 2018, p. 10–11, 51–53).

Production

In 2017, New Caledonia produced 269,961 metric tons (t) of ferronickel with a nickel content of 73,219 t. This was a 3.3% increase in the gross weight and an 8.4% increase in the nickel content compared with those of 2016. Production of nickel ore increased by 7.3% to an alltime high of 16.6 million metric tons (Mt), and it contained 215,382 t of nickel, which was a 5.5% increase compared with that of 2016. Although the estimated cobalt content of laterite ore increased by 5.4%, the amount of recoverable cobalt in nickel ore decreased by 18.0%. Nickel cobalt hydroxide cake (Ni content) production decreased by 10.2%. Production of nickel matte decreased to zero after Société Le Nickel (SLN) ceased nickel matte production in August 2016 (table 1; Eramet S.A., 2016).

Structure of the Mineral Industry

The New Caledonian Department of Industry, Mines and Energy (Directeur de l'Industrie, des Mines et de l'Énergie de la Nouvelle-Calédonie) (DIMENC) is the Government agency responsible for the development of the energy and mining industries. Within the DIMENC, the Mines and Quarry Service (Le Service des Mines et Carrières) regulates mining activities, including exploration, extraction, and environmental protection. The Mining Code of New Caledonia, established in 2009, provides companies with incentives to convert ore to metals within New Caledonia. Mining concessions are organized into the following three categories: large concessions granted to companies that simultaneously operate domestic refineries, concessions granted to small miners, and concessions granted to subcontractors operating on the behalf of mine owners (either refinery operators or small miners) (Australia Trade and Investment Commission, 2018; Direction de l'Industrie, des Mines et de l'Energie de Nouvelle-Calédonie, 2018; Institut d'Emission d'Outre-mer, 2018, p. 124).

SLN was owned jointly by Eramet S.A. of France, 56%; Société Territoriale Calédonienne de Participation Industrielle (STCPI), 34%; and Nisshin Steel Co. of Japan, 10%. SLN operated four nickel-cobalt laterite mines as well as the pyrometallurgical Doniambo plant, which produced ferronickel. Vale New Caledonia SAS (VNC), which was owned by Vale S.A. of Brazil, 95%, and La Société de Participation Minière du Sud Calédonien SAS (SPMSC), 5%, operated the hydrometallurgical Goro plant, which produced nickel oxide and recovered cobalt as a byproduct. Ore was supplied to the Goro plant by VNC's Goro nickel-cobalt mine. Koniambo Nickel SAS (KNS), which was jointly owned by Société Minière du Sud Pacifique (SMSP), 51%, and Glencore plc of Switzerland, 49%, operated the pyrometallurgical Koniambo plant and produced ferronickel from ore supplied by the company's Koniambo nickel mine. Nickel Mining Company SAS (NMC) (a joint venture between SMSP, 51%, and POSCO of the Republic of Korea, 49%) operated five nickel mines in the country. Ore produced by NMC was exported to the Republic of Korea for processing by the Gwangyang pyrometallurgical plant operated by Société du Nickel de Nouvelle-Calédonie et Corée (SNNC), which was jointly owned by SMSP, 51%, and POSCO, 49% (table 2; Institut d'Emission d'Outre-mer, 2018, p. 124–126).

[1]Where necessary, values have been converted from CFP francs (XPF) to U.S. dollars (US$) at an annual average exchange rate of XFP 99.876=US$1.00 for 2016 and XPF 100.694=US$1.00 in 2017.

Commodity Review

Metals

Nickel and Cobalt.—New Caledonia's nickel-cobalt laterite deposits were categorized into two main subtypes: a lower saprolite layer composed of weathering silicate minerals, and an overlaying limonite (also known as yellow laterite) layer composed of goethite. Limonite deposits in New Caledonia were reported to have an average grade of nearly 1.5% nickel, whereas the average grades of saprolite deposits ranged from 1.8% to 2.4% nickel. In 2017, saprolites accounted for 67.8% of nickel ore mined in the country, by gross weight, and limonite accounted for the remaining 32.2%. Limonite production was at an alltime high in 2017 after increasing by 22.9%, whereas saprolite production remained relatively stable, with a 1.2% increase (Marsh and others, 2013, p. 1, 17; Institut d'Emission d'Outre-mer, 2018, p. 122, 125).

Exports of nickel ore increased by 11.4% to 6.5 Mt in 2017, of which saprolite ore and limonite ore accounted for 91.3% and 8.7%, respectively. Exports of limonite increased by 32.5%, and exports of saprolite increased by 9.7%. Of the 5.9 Mt of saprolite exported in 2017, 3.5 Mt was exported to SNNC's Gwangyang plant in the Republic of Korea, which was an increase of 9.3%. The Gwangyang plant required 3.6 Mt of ore to operate at its full capacity of 54,000 metric tons per year (t/yr) of ferronickel. Exports of limonite increased in 2017 despite the shutdown in March 2016 of the Yabulu nickel and cobalt refinery in Queensland that was operated by Queensland Nickel Pty Ltd. of Australia. The Yabulu refinery had previously been the main destination for New Caledonia's limonite exports. The decrease in exports of limonite to Australia was offset by a 72% increase in exports of nickel ore (both limonite and saprolite) to China, for a total of 1.36 Mt exported to China in 2017. This shift toward Chinese markets was driven by a 23.4% increase in the average price of nickel ore exports to China. The Government responded to the price increase and the shutdown of the Yabulu refinery by granting authorization to certain small nickel ore miners to export laterite to China. New Caledonia's exports of metallurgical products also increased in 2017. The value of cobalt carbonate exports increased by 66.5%; nickel hydroxide cake, by 19.2%; ferronickel, 14.7%; and nickel oxide, 4.2% (Australian Broadcasting Corp., 2016; Institut d'Emission d'Outre-mer, 2018, p. 52, 124–125).

SLN operated the Doniambo plant in 2017, which had produced only ferronickel since the halting of nickel matte production in 2016. The Doniambo plant was supplied with ore solely from mines owned by SLN (including those operated through contractors), which produced 3.21 Mt of ore in 2017 compared with 3.19 Mt in 2016. The Doniambo plant produced 56,771 t of metallurgical products (Ni content of ferronickel) compared with 55,227 t (Ni content of ferronickel and nickel matte) in 2016. All ferronickel produced at Doniambo was sold directly to Eramet (Eramet S.A., 2018, p. 38, 40; Société Le Nickel, 2018, p. 5).

KNS continued the rampup of its Koniambo metallurgical plant in the North Province, which first began production in 2013. Production at the Koniambo plant increased by 29% to 17,500 t of ferronickel (Ni content) in 2017, which followed a 49% increase in 2016. In 2017, KNS completed the rebuilding of its second kiln following the discovery of a design flaw in 2014. The Koniambo plant was supplied by the company's Koniambo Mine. In 2017, proved and probable ore reserves at the Koniambo Mine were reported to be 37.1 Mt at a grade of 2.25% nickel. The facility was expected to achieve its nameplate capacity of 60,000 t/yr in 2020 (Glencore plc, 2017, p. 63; 2018, p. 71; Institut d'Emission d'Outre-mer, 2018, p. 124).

VNC operated the Goro hydrometallurgical plant, producing nickel oxide sinter and nickel hydroxide cake in the South Province. The finished nickel oxide product contained 78% nickel, and the nickel hydroxide cake contained 17% nickel and 2.5% cobalt. In 2017, VNC produced 40,300 t of nickel contained in finished products, which was a 17% increase compared with that produced in 2016. VNC also recovered cobalt as a byproduct and produced 2,780 t of cobalt in intermediate products, which was a decrease of 13%. The plant was supplied by the Goro Mine, which produced 3.0 Mt of ore at a grade of 1.47% nickel in 2017 compared with 2.9 Mt at a grade of 1.53% nickel in 2016. The company reported that the facility was expected to operate at a capacity of 57,000 t/yr of nickel in nickel oxide and 4,500 t/yr of cobalt in intermediate products in 2022 (Institut d'Emission d'Outre-mer, 2018, p. 124, 126; Vale S.A., 2018, p. 46, 49–50, 55).

MINERAL INDUSTRY HIGHLIGHTS IN 2018

In 2018, New Caledonia's nickel ore production increased slightly compared with the record production set in 2017. Production of ferronickel (Ni content) increased by 12%. The amount of cobalt recovered from nickel mining decreased by an estimated 24%. Production of cement decreased by 17%, and that of nickel oxide sinter (Ni content) decreased by 16%. The gross weight of nickel-cobalt laterite exported in 2018 totaled 6.8 Mt, which was an increase of 4% from that of 2016 (table 1; Direction de l'Industrie, des Mines et de l'Energie de Nouvelle-Calédonie, 2019).

In August 2018, protestors objecting to the expansion of the mine blockaded the entrance to the Kouaoua nickel mining center, thus forcing SLN to halt operations. The blockade was removed in November and operations at the site resumed. In addition, the mine site had 20 cases of arson during the course of the year, which caused damage to the mine's conveyor belt (Eramet S.A., 2019; RNZ Pacific, 2018a, b, c).

Production of ferronickel at the Koniambo plant continued to increase. In 2018, the plant produced 28,300 t of nickel contained in ferronickel, which was a 62% increase. Glencore attributed the increase to both of the plant's production lines operating continuously throughout the year. The company reported that proven and probable reserves of nickel ore at the Koniambo Mine increased to 41.8 Mt at a grade of 2.22% nickel (Glencore plc, 2019, p. 79, 232).

VNC produced 32,500 t of nickel contained in finished products, which was a 19% decrease compared with that of 2017, and it produced 2,104 t cobalt contained in intermediate products, which was a decrease of 24%. Production of nickel ore at VNC's Goro Mine decreased to 2.6 Mt at a grade of 1.46% nickel (Vale S.A., 2019, p. 53–54, 60).

Outlook

On November 4th, 2018, the Government of New Caledonia held a referendum on independence from France in accordance with the 1998 Nouméa Accord. The referendum failed, and New Caledonia remained an overseas territory of France. Another independence referendum was scheduled to be held in 2020 (Dziedzic and Srinivasan, 2018).

In 2018, New Caledonia reached an alltime high in the production of ferronickel (Ni content) and nickel ore (Ni content), breaking the record set in the previous year. This increase in output was owing to the continued ramping up of the Koniambo pyrometallurgical plant. The continued growth in the nickel industry depends heavily on global nickel prices, which decreased between 2011 and 2016. Nickel prices are expected to increase in the near future as a result of increased demand in China as well as an emerging electric vehicle battery market. Nickel mining is expected to remain central to New Caledonia's economy; mineral products are expected to continue to account for the majority of exports and the nickel industry is expected to remain a substantial source of employment (Institut de la Statistique et des Études Économiques Nouvelle-Caledonie, 2017a, p. 12; Institut d'Emission d'Outre-mer, 2018, p. 13, 51, 125, 127).

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TABLE 1

NEW CALEDONIA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons, gross weight, unless otherwise specified)

Commodity[2]		2014	2015	2016	2017	2018
METALS						
Cobalt, mine, nickel ore, Co content[e]		17,500 [r]	19,300 [r]	20,400 [r]	21,500	21,600
Of which, recoverable[3]		4,040	3,640 [r]	3,390	2,780	2,100
Ferroalloys, ferronickel:						
Gross weight		224,884 [r]	228,484 [r]	261,420 [r]	269,961	260,206
Ni content		54,683	56,486	67,518 [r]	73,219	82,114
Nickel:						
Mine, laterite ore:						
Gross weight	thousand metric tons	12,926 [r]	14,786 [r]	15,429 [r]	16,552	16,634
Ni content		175,174 [r]	193,199 [r]	204,207 [r]	215,382	216,225
Intermediate:						
Matte:						
Gross weight		12,102 [r]	9,978 [r]	6,333 [r]	--	--
Ni content		8,241 [r]	6,761 [r]	4,287	--	--
Nickel cobalt hydroxide, Ni content[4]		12,464	9,686	7,269	6,525	6,723
Oxide sinter, Ni content		7,366	21,044	28,465	30,875	25,800
INDUSTRIAL MINERALS						
Cement, hydraulic		106,469	112,041	111,654 [r]	104,253	86,343

[e]Estimated. [r]Revised. -- Zero.

[1]Table includes data available through May 22, 2019. All data are reported unless otherwise noted. Estimated data are rounded to no more than three significant digits.

[2]In addition to the commodities listed, chromite, copper, crushed stone, gold, iron, manganese, silica sand, and silica may have been produced, but available information was inadequate to make reliable estimates of output.

[3]Mine production of recoved cobalt is estimated from cobalt contained in the following materials: cobalt chloride produced in France from New Caledonia matte, cobalt carbonate, and nickel hydroxide produced in New Caledonia, and lateritic nickel ore exported to Australia. (Lateritic nickel exports to Australia in 2017 and 2018 were zero, and production of matte ended in 2016.)

[4]Often called mixed hydroxide product or MHP by industry.

TABLE 2
NEW CALEDONIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2018

(Metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Cement	Tokuyama Nouvelle Calédonie S.A. (Tokuyama Corp., 74.6%)	Grinding plant, Noumea	180,000 e
Cobalt, in ore and concentrate, Co content	Société Le Nickel (SLN) [Eramet S.A., 56%; Société Territoriale Calédonienne de Participation Industrielle (STCPI), 34%; Nisshin Steel Co., 10%]	Kouaoua, Nepoui-Kopeto, Thio and Tiebaghi mining centers	3,000 e
Do.	do.	Etoile du Nord, Boualoudjelima, CFTMC-Poro, Stamboul, Dothio, Opoue mining centers operated through contractors	NA
Do.	Vale New Caledonia SAS (VNC) [Vale S.A., 95%, and La Société de Participation Minière du Sud Calédonien SAS (SPMSC), 5%]	Goro, 58 kilometers east of Noumea in the South Province	4,500 e
Nickel:			
In ferronickel, Ni content	Koniambo Nickel SAS (KNS) (Société Minière du Sud Pacifique, 51%, and Glencore plc, 49%)	Koniambo plant in the North Province	60,000
Do.	Société Le Nickel (SLN) [Eramet S.A., 56%; Société Territoriale Calédonienne de Participation Industrielle (STCPI), 34%; Nisshin Steel Co., 10%]	Doniambo industrial site, Noumea	60,000 e
In nickel hydroxide cake, Ni content	Vale New Caledonia SAS (VNC) [Vale S.A., 95%, and La Société de Participation Minière du Sud Calédonien SAS (SPMSC), 5%]	Goro plant in the South Province	NA
In nickel matte, Ni content	Société Le Nickel (SLN) [Eramet S.A., 56%; Société Territoriale Calédonienne de Participation Industrielle (STCPI), 34%; Nisshin Steel Co., 10%]	Doniambo industrial site, Noumea[1]	15,000 e
In nickel oxide, Ni content	Vale New Caledonia SAS (VNC) [Vale S.A., 95%, and La Société de Participation Minière du Sud Calédonien SAS (SPMSC), 5%]	Goro plant in the South Province	57,000
Do.	Nickel Mining Company SAS (NMC) [Société Minière du Sud Pacifique (SMSP), 51%, and POSCO, 49%]	Ouaco, Poya, Nakety, Kouaoua, and Boakaine mining centers	31,000 e
Do.	Société des Mines de la Tontouta, 100%	Moneo and Nakety mining centers	50,000 e
In ore and concentrate, Ni content	Koniambo Nickel SAS (KNS) [Société Minière du Sud Pacifique (SMSP), 51%, and Glencore plc, 49%]	Koniambo mining center in the North Province	NA
Do.	Société Le Nickel (SLN) [Eramet S.A., 56%; Société Territoriale Calédonienne de Participation Industrielle (STCPI), 34%; Nisshin Steel Co., 10%]	Kouaoua, Nepoui-Kopeto, Thio, and Tiebaghi mining centers	55,000 e
Do.	do.	Etoile du Nord, Boualoudjelima, CFTMC-Poro, Stamboul, Dothio, Opoue mining centers operated through contractors	NA
Do.	Société Minière Georges Montagnat S.A. (SMGM)	Tontouta mining center	1,000 e
Do.	Vale New Caledonia SAS (VNC) [Vale S.A., 95%, and La Société de Participation Minière du Sud Calédonien SAS (SPMSC), 5%]	Goro, 58 kilometers east of Noumea in the South Province	60,000 e

eEstimated. Do., do. Ditto. NA Not available.
[1]Production of nickel matte was suspended at the Doniambo industrial site in 2016.