

# 2016 Minerals Yearbook

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## CUBA

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# THE MINERAL INDUSTRY OF CUBA

By Yadira Soto-Viruet

Cuba was estimated to rank 5th among the world's leading producers of cobalt, which was produced as a byproduct of nickel processing, and 10th among the world's leading producers of nickel. Other mineral commodities produced in the country included bentonite, cement, clay (kaolin), feldspar, gypsum, lime, limestone, marble, nitrogen, salt, silica sand, raw steel, sulfuric acid, and zeolites. Cuba also produced crude petroleum, natural gas, and petroleum refinery products. Identified mineral resources in the country included such metals as chromium, copper, gold, iron, lead, manganese, silver, tungsten, zinc, and such industrial minerals as asbestos, barite, basalt, clay, gabbro, garnet, graphite, kyanite, magnesite, mica, olivine, phosphate rock, quartz, quartzite, quartz sand, and semiprecious stones (Ministerio del Comercio Exterior y la Inversión Extranjera, 2016, p. 175; McRae, 2018; Shedd, 2018).

The Government-owned Union Cuba-Petróleo (CUPET) was responsible for exploring for, producing, refining, and marketing the country's petroleum and its derivatives. Cuba's proven crude petroleum reserves were estimated to be about 124 million barrels (Mbbbl), and its natural gas reserves were estimated to be 70.8 billion cubic meters. Cuba imported most of its crude petroleum requirements from Venezuela; however, the ability to secure its crude petroleum supply from Venezuela had been greatly reduced by Venezuela's economic and political crisis. In 2016, crude petroleum imports from Petróleos de Venezuela S.A. (PDVSA) decreased by about 50% compared with that of 2014 and 2015 (Petróleos de Venezuela S.A., 2016, p. 70; 2017, p. 75; U.S. Central Intelligence Agency, 2017).

The United States Government officially severed diplomatic relations with Cuba in 1961 and, in 1962, it imposed an embargo on all trade between the United States and Cuba, including a total freeze of Cuban-owned assets in the United States, and the prohibition of United States public and private investments in Cuba, including investments in mining. As a result of the ongoing United States trade embargo, United States companies are unable to own any Cuban petroleum assets. In December 2014, the Government of the United States announced that it would begin discussions to restore diplomatic relations with Cuba and embark on a long-term process of normalization of relations between the two countries. In January 2015, the Government of the United States published regulatory amendments to the Cuba sanctions, however, these amendments did not include changes to restrictions regarding United States investment in mining. On July 20, 2016, the United States reestablished diplomatic relations with Cuba and the Governments opened embassies in the other's country. As of yearend 2016, U.S. private and public investment in mineral production continue to be prohibited (White House, The, 2014, 2015; U.S. Department of State, 2015; U.S. Department of the Treasury, 2015; U.S. Central Intelligence Agency, 2017; Wacaster and others, 2018).

## Minerals in the National Economy

Cuba's real gross domestic product (GDP) decreased by nearly 1% in 2016 compared with a revised increase of 4.4% in 2015. The industrial manufacturing sector (excluding the sugar industry) made up 12% of the country's GDP; the construction sector, about 6%; and the mining and quarrying sector, about 0.5%. Employment in the mining and quarrying sector decreased to 22,000 workers in 2016 from 28,900 workers in 2015. During the year, about 329 enterprises operated in the industrial manufacturing sector and about 20 enterprises operated in the mining and quarrying sector (Oficina Nacional de Estadística e Información, 2017a, p. 12; 2017b, p. 7; 2017d, p. 19–20).

According to the Portfolio of Opportunities for Foreign Investment 2016–2017, in 2015 (the latest year for which data were available), the most significant sector of foreign capital was tourism and real estate, followed by the energy and mining sector and the industrial manufacturing sector. In the mining sector, the country was offering foreign investment opportunities for prospecting, exploration, mining, and commercialization of metals, such as copper, gold, lead, silver, tungsten, and zinc, and of industrial minerals, such as kaolin and mica. Concession areas included the regions of Pinar del Río (Hierro Mantua copper deposit), Central Cuba (9 prospects for copper, gold, lead, silver, and zinc), Ciego-Camaguey-Tunas (14 prospects for copper, gold, lead, silver, and zinc), Holguin and Macizo Sagua-Baracoa (12 prospects for chromite, copper, gold, lead, silver, and zinc), Sierra Maestra (10 prospects for copper, gold, lead, silver, and zinc), and the Special Municipality of the Isle of Youth (8 prospects for kaolin, mica, and tungsten). In the energy sector, Cuba was offering joint ventures in petroleum extraction from onshore and offshore fields, including 52 offshore blocks located in the Exclusive Economic Zone in the Gulf of Mexico; 25 onshore blocks available throughout the country; and 8 shallow water blocks, which are located at north of the Provinces of Artemisa, Camaguey, Ciego de Avila, Granma, Matanzas, Mayabeque, Pinar del Río, Sancti Spiritus, and Villa Clara (Ministerio del Comercio Exterior y la Inversión Extranjera, 2016, p. 12, 156–159, 177).

## Government Policies and Programs

Cuba's mining sector is regulated by the Ley de Minas (Mining Law, law No. 76 of 1994), which establishes the country's mining policy and regulations regarding mineral resources. The Ministerio de Energía y Minas (Ministry of Energy and Mines; law Decree No. 301) is the entity responsible for establishing Government policy for the energy and mining sectors. The Ley de Inversión Extranjera (Law of Foreign Investment, law No. 118) establishes the legal framework for foreign investment in the country (Gaceta Oficial de la República de Cuba, 2014, p. 177–178).

## Production

Data on mineral production are in table 1.

## Structure of the Mineral Industry

Nickel was produced by Government-owned Empresa Niquelífera Ernesto Che Guevara and from Moa Nickel S.A., which was a joint venture between Sherritt International Corp. of Canada (Sherritt) and the Government (50% each). Petroleum refinery products were produced by CUPET at the Hermanos Díaz, the Nico López, and the Sergio Soto refineries, and by the joint venture between PDVSA and CUPET (PDV-CUPET S.A.) at the Cienfuegos refinery. Table 2 is a list of major mineral industry facilities.

## Mineral Trade

In 2016, the total value of Cuba's exports decreased by 31% to about \$100 million<sup>1</sup> from \$145 million (revised) in 2015 and the total value of imports decreased by 12% to about \$444 million from \$506 million (revised) in 2015. Mining products accounted for about 20% of Cuba's total exports in 2016 compared with 16% in 2015. In 2016, Venezuela, which was the country's major trade partner, received 28% of Cuba's exports and supplied 15% of its imports. During the year, total exports to Venezuela decreased by 55% and total imports from Venezuela decreased by 43%. Other major export partners were Canada (which received 14% of Cuba's exports), China (11%), and Spain (8%). The country continued to rely on crude petroleum imports from Venezuela. According to PDVSA, Venezuela's exports of crude petroleum to Cuba decreased to 45 million barrels per day (Mbbbl/d) from 87 Mbbbl/d (Oficina Nacional de Estadística e Información, 2017c, p. 12–14, 18–19; Petróleos de Venezuela S.A., 2017, p. 75).

## Commodity Review

### Metals

**Cobalt and Nickel.**—During the year, Empresa Niquelífera Ernesto Che Guevara continued to work on the modernization of its processing plant, which was located in Punta Gorda, Holguín Province. Empresa Niquelífera Ernesto Che Guevara continued operating below its capacity in 2016; however, it was expected to increase production to about 19,000 metric tons (t) in 2017 from about 18,500 t in 2016 (Centro de Investigaciones para la Industria Minero-Metalúrgica, 2016; Marsh, 2016).

Moa Nickel mined and processed mixed sulfides containing nickel and cobalt at its Moa Nickel facilities located in Holguín Province. The mixed sulfides were transported to the company's refining facilities in Fort Saskatchewan, Alberta, Canada. Moa Nickel's operations included the Central Moa project (Camarioca Norte, Camarioca Sur, Limestone Mud, Moa Occidental, Moa Oriental, Playa La Vaca-Zona, and Septentrional II, and Yagrumaje Oeste concessions) and the Eastern Satellites project (Cantarrana, La Delta, and

Santa Teresita concessions), which together cover a total area of about 12,300 hectares. As of December 31, total proven and probable reserves at Central Moa and Eastern Satellites were reported as 58.46 million metric tons at an average grade of 43.8% iron, 1.15% nickel, and 0.12% cobalt. In 2016, total production of finished nickel and cobalt was 32,928 t and 3,694 t (100% basis), respectively. The construction of the third sulfuric acid plant at Moa was completed in the second quarter of 2016. Sherritt reported that, with the startup of the new plant, it would no longer be necessary to purchase sulfuric acid to support Moa Nickel operations (Sherritt International Corp., 2017, p. 1, 7, 9–10, 17, 18, 90).

**Gold.**—PanTerra Gold Ltd. of Australia held preliminary discussions with Empresa Mixta Isla Dorada S.A. (EMID) to reopen the Damajagua Mine (formerly known as the Delita Mine) by 2018–19. Government-owned Geominera S.A. was the major shareholder of EMID. The Damajagua Mine is located on the Isle of Youth in western Cuba. In October, PanTerra reported that EMID was considering the option of selling 50,000 to 60,000 metric tons per year (t/yr) of refractory concentrate with average grades of about 40 grams per metric ton gold, 22% arsenic, and 25% sulfur to PanTerra for up to 15 years. The refractory concentrates would be ideal feed for PanTerra's Lagunas processing facility in the Dominican Republic, owing to the high gold content and the close proximity of the operation to the shipping port. In December, however, PanTerra reported that the export of concentrate was their least preferred option and, as an alternative, the company was prepared to explore the viability of developing a 50,000-t/yr modular Albion/Carbon-in-leach processing plant adjacent to the Damajagua Mine when it opens; the plant could be either a joint venture or owned by PanTerra (PanTerra Gold Ltd., 2016a, p. 6; 2016b, p. 7; 2017, p. 6).

**Lead and Zinc.**—The Empresa Mixta Minera del Caribe (Emincar), a joint venture between Geominera (51% interest) and Trafigura Group Pte. Ltd. of Singapore (49%), began the construction of the Castellanos lead-zinc mine. Castellanos, which was located in Pinar del Río Province, had an estimated reserve life of 22 years and was expected to produce 100,000 t/yr of zinc concentrate and 50,000 t/yr of lead concentrate. Emincar planned to complete the construction of Castellanos in 2017 and to begin production in 2018 (Trafigura Group Pte. Ltd., 2017, p. 32–33; 2018, p. 30).

### Mineral Fuels

**Petroleum.**—Sherritt also held 100% working interests in production-sharing contracts (PSCs) with CUPET, including Varadero West (Block II), Puerto Escondido-Yumuri, all of which are in the production phase, and Blocks 8A and 10, which are in the exploration phase. The company's share of the petroleum produced from the Puerto Escondido, Varadero West, and Yumuri oilfields (based on the gross working interest) was 15,494 barrels per day (bbl/d) in 2016 compared with 18,257 bbl/d in 2014, which was a decrease of about 15%. The decrease in petroleum production was mainly attributed to natural reservoir declines. The company reported that the terms of the original PSCs for the Varadero West (Block II) and the Puerto Escondido-Yumuri fields would expire in

<sup>1</sup>Where necessary, values have been converted from Cuban pesos (CUP) to U.S. dollars (US\$) at an annual average exchange rate of CUP0.0432=US\$1.00 for 2016 and 2015.

November 2017 and March 2018, respectively. The original PSCs were scheduled to return to Government ownership, and the company did not expect to carry out further drilling activities or to extend the original PCSs. As of 2017 and 2018, the company's future petroleum and natural gas production would depend upon new reserves in Blocks 8A and 10 or the ability to obtain and develop additional PSCs; however, Sherritt stated that it could not provide assurance that its exploration or development efforts in Blocks 8A and 10 would result on new commercial production or yield new mineral or petroleum and gas reserves to replace or expand current reserves. In August, the company began drilling an exploration well in Block 10, the results of which were expected to be announced in the first quarter of 2017. The company also expected to conduct a seismic data acquisition program for Block 8A in 2017 (Sherritt International Corp., 2017, p. 22–23, 55).

Melbana Energy Ltd., of Australia (formerly known as MEO Australia Ltd.) held the PSC for Block 9, which is located on the northern coast of Cuba about 130 kilometers east of Havana. The block is also located near the Valero oilfield and contained the Motembo field, which was the first Cuban oilfield (discovered in 1881). In July, the company announced that the first of three identified oil plays on Block 9 had been assessed to contain about 8.2 billion barrels of oil-in-place with a prospective recoverable resource of 395 Mbbbl of potentially high-quality light petroleum. By yearend, Melbana Energy announced that it was continuing with its evaluation of existing exploration data and the reprocessing of selected two-dimensional seismic data for Block 9. The company expected to complete an updated prospective resources assessment and a proposal to drill up to two exploration wells by the first quarter of 2017 (Melbana Energy Ltd., 2016a, b; 2017, p. 1, 3).

## Outlook

The Government of Cuba estimated a GDP growth of 2.0% in 2017. The growth was estimated despite the crisis in Venezuela, which was the country's major trading partner and supplier of petroleum. Cuba expected to continue to rely on crude petroleum imports in 2017 and will continue to seek foreign direct investment to further development of its hydrocarbon and mineral resources. The country is projected to continue to rank 5th among the world's leading producers of cobalt and 10th among the world's leading producers of nickel in 2017. If the development of the Castellanos lead-zinc mine comes to fruition, Cuba is likely to attract further foreign direct investment to the mineral sector and to increase interest in mineral prospecting (Associated Press, 2017; Thomson Reuters, 2017; McRae, 2018; Shedd, 2018).

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TABLE 1  
CUBA: PRODUCTION OF MINERAL COMMODITIES<sup>1</sup>

(Metric tons, gross weight, unless otherwise specified)

Commodity <sup>2,3</sup>	2012	2013	2014	2015	2016
<b>METALS</b>					
Cobalt, mine production, Co content <sup>e</sup>	4,700 <sup>r</sup>	4,000 <sup>r</sup>	3,700	4,300	5,100
Iron and steel, raw steel	277,000 <sup>r</sup>	267,200	257,700	221,800	205,000
Nickel, mine production, Ni content, recoverable laterite, limonitic and serpentinitic <sup>e</sup>	68,000 <sup>r</sup>	55,600 <sup>r</sup>	51,600 <sup>r</sup>	56,400	51,600
<b>INDUSTRIAL MINERALS</b>					
Abrasives, volcanic ash	256,000	278,900	131,200	99,900	105,000
Cement, hydraulic	1,824,800	1,659,000	1,579,900	1,517,800	1,492,600
Clay and shale:					
Bentonite	670	335	700	500	389
Kaolin	4,000	3,600	1,700	1,500	2,500
Feldspar, mine production	3,800 <sup>e</sup>	3,200 <sup>e</sup>	3,600 <sup>e</sup>	3,300 <sup>e</sup>	3,900
Gypsum thousand metric tons	131	87	98	91	74
Lime	54,100	52,400	51,500	51,500	48,600
Nitrogen, N content, ammonia	59,200	63,700	58,600	58,500	40,000
Salt thousand metric tons	216	222	243	285	248
Stone, sand, and gravel:					
Sand and gravel, construction, sand, calcareous <sup>4</sup> do.	2,800 <sup>r</sup>	2,700 <sup>r</sup>	2,700 <sup>r</sup>	2,900 <sup>r</sup>	2,800
Silica, mine production, unspecified <sup>4</sup>	25,000	26,000	47,000	25,000	19,000
Stone, crushed:					
Limestone thousand metric tons	2,800	2,800	2,000	1,900	1,900
Unspecified <sup>4</sup> do.	6,500	6,700	7,000	7,200	6,800
Stone, size and shape unspecified, marble <sup>4</sup>	13,000	16,000	18,000	13,000	16,000
Sulfur compounds, sulfuric acid thousand metric tons	399	409	404	406	533
Zeolites	41,900	43,800	43,100	50,800	52,800
<b>MINERAL FUELS AND RELATED MATERIALS</b>					
Natural gas, marketable thousand cubic meters	1,034,500	1,066,000	1,199,900	1,244,500	1,185,400
Petroleum:					
Crude thousand 42-gallon barrels	21,982 <sup>r</sup>	21,235 <sup>r</sup>	21,296 <sup>r</sup>	20,685 <sup>r</sup>	20,700 <sup>e</sup>
Refinery production: <sup>5</sup>					
Asphalt do.	500	500	370	380 <sup>r</sup>	400 <sup>e</sup>
Fuel oil do.	19,000	18,000	17,000	17,000 <sup>r</sup>	17,000 <sup>e</sup>
Gasoline, motor do.	3,500	5,700	4,700	3,800 <sup>r</sup>	3,800 <sup>e</sup>
Kerosene do.	240	220	190	220 <sup>r</sup>	200 <sup>e</sup>
Liquefied petroleum gas do.	480	860	780	590 <sup>r</sup>	600 <sup>e</sup>
Lubricants do.	330	330	350	350 <sup>r</sup>	350 <sup>e</sup>
Naphtha do.	2,100	1,400	1,800	2,000 <sup>r</sup>	2,000 <sup>e</sup>
Petroleum coke do.	7	100	70	50 <sup>r</sup>	50 <sup>e</sup>
Total do.	26,000	27,000	25,000	24,000 <sup>r</sup>	24,000 <sup>e</sup>

<sup>e</sup>Estimated. <sup>r</sup>Revised. do. Ditto.

<sup>1</sup>Table includes data available through January 30, 2018. All data are reported unless otherwise noted. Estimated data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>In addition to the commodities listed, other crude construction materials may have been produced in Cuba, but available information was inadequate to make reliable estimates of output.

<sup>3</sup>Source: Oficina Nacional de Estadística e Información, Anuario Estadístico de Cuba 2016.

<sup>4</sup>Units of measurement were converted to metric tons from cubic meters.

<sup>5</sup>Units of measurement were converted to thousand 42-gallon barrels from metric tons. Data are rounded to no more than two significant digits.

TABLE 2  
CUBA: STRUCTURE OF THE MINERAL INDUSTRY IN 2016

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity <sup>e</sup>
Cement		Cementos Cienfuegos S.A. (Government, 50%, and Holcim Ltd., 50%)	Cienfuegos, Cienfuegos Province	1,500
Do.		Fábrica de Cemento 26 de julio	Nuevitas, Camaguey Province	600
Do.		Fábrica de Cemento Mártires de Artemisa	Artemisa, Artemisa Province	600
Do.		Cementos Curazao N.V.	Barrio Mujica, Mariel, Artemisa Province	1,110
Do.		Fábrica de Cemento Siguaneý	Siguaneý, Sancti Spiritus Province	300
Cobalt		Moa Nickel S.A. (Government, 50%, and Sherritt International Corp., 50%)	Moa Bay Mine and processing plant, Moa, Holguin Province	4
Gypsum		Empresa de Materiales de la Construcción de Ciego de Avila	Punta Alegre, Ciego de Avila Province	NA
Nickel		Empresa Niquelífera Ernesto Che Guevara (Government, 100%)	Ernesto Che Guevara Mine and processing plant, Punta Gorda, Holguin Province	34
Do.		Moa Nickel S.A. (Government, 50%, and Sherritt International Corp., 50%)	Moa Bay Mine and processing plant, Moa, Holguin Province	37
Nitrogen, ammonia (N content)		NA	Revolución de Octubre plant, Nuevitas, Camaguey Province	200
Petroleum:				
Crude	thousand 42-gallon barrels	Empresa de Perforación y Extracción de Petróleo del Centro	Northern coast between Havana and Cardenas, primarily Mayabeque Province	12
Do.	do.	Sherritt International Corp. (gross working interests of 40% to 100% in various production-sharing contracts with the Government)	Puerto Escondido, Varadero West, and Yumuri	7,100
Refinery products	do.	PDV-CUPET S.A. (Government, 51%, and Petróleos de Venezuela S.A., 49%)	Cienfuegos, Cienfuegos Province	23,700
Do.	do.	Hermanos Díaz refinery (Government, 100%)	Santiago de Cuba, Santiago de Cuba Province	8,000
Do.	do.	Ñico López refinery (Government, 100%)	City of Havana	44,500
Do.	do.	Sergio Soto refinery (Government, 100%)	Cabaiguan, Sancti Spiritus Province	NA
Sand		Algaba quarry	Near Trinidad, Sancti Spiritus Province	50
Do.		Malabe quarry	NA	30
Do.		Cajobabo	Imias, Guantanamo Province	NA
Steel		Grupo Metalúrgico Acinox (Government, 100%), including:		
		Antillana de Acero	Cotorro, La Habana Province	600
Do.		Camagüey	Las Tunas, Las Tunas Province	370
Do.		Four other steel plants	NA	NA
Zeolites		Empresa Geominera Holguin	San Andres plant, Holguin Province	75
Do.		do.	El Chorillo plant, Camaguey Province; Tasajeras plant, Villa Clara Province	NA

<sup>e</sup>Estimated. Do., do. Ditto. NA Not available.