



# 2015 Minerals Yearbook

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CUBA [ADVANCE RELEASE]

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# THE MINERAL INDUSTRY OF CUBA

By Yadira Soto-Viruet

In 2015, Cuba was estimated to rank 7th (tied with the Philippines) among the world's leading producers of cobalt, which was 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, crushed stone, feldspar, gypsum, kaolin, lime, limestone, marble, nitrogen, salt, silica sand, sulfuric acid, and zeolites. Cuba also produced crude petroleum, natural gas, and petroleum refinery products. According to the Centro para la Promocion del Comercio Exterior y la Inversion Extranjera de Cuba [Center for Promotion of Foreign Trade and Investment] (CEPEC), the country had significant mineral resources of cobalt and nickel and less significant mineral resources of chromium, iron ore, and manganese. Nickel was one of the leading sources of foreign exchange and export earnings in the country, generating earnings equivalent to tourism revenue. Identified mineral resources in the country also included copper, gold, lead, silver, tungsten, and zinc and such industrial minerals as asbestos, barite, basalt, bentonite, clay, feldspar, gabbro, garnet, graphite, kyanite, magnesite, mica, mineral salt, olivine, phosphorite, quartz, quartz sand, quartzite, and semiprecious stones (Jimenez, 2015, p. 5, 16; Ministry of Foreign Trade and Investments, 2016, p. 139; Schnebele, 2017; Shedd, 2017).

Cuba imported most of its crude petroleum supply from Venezuela; however, the country's crude petroleum imports had been affected by Venezuela's economic and political crisis. In 2015, crude petroleum imports from Petr leos de Venezuela S.A. (PDVSA) decreased by 11% compared with those of 2012 and by 3% compared with those of 2014. The Government-owned Union Cuba-Petroleo (CUPET) is responsible for exploring, producing, refining, and marketing the country's petroleum and its derivatives (U.S. Energy Information Administration, 2016; Petr leos de Venezuela S.A, 2014, p. 108; 2016, p. 70).

The U.S. Government imposed an embargo on all trade between the United States and Cuba in 1960 and officially severed diplomatic relations in 1961. In December 2014, the President of the United States announced that the United States 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 in accordance with the December 2014 announcement. These measures made changes in the implementation of the embargo but did not lift the embargo. Most transactions involving Cuba, including private and public investment in mineral production, continue to be prohibited. On July 1, a major step in the normalization process between the United States and Cuba was reached when the President of the United States announced the decision to reestablish diplomatic relations between the two countries. On July 20, the Embassy of the United States reopened in Havana

and Cuba's Embassy reopened in Washington, DC (White House, The, 2014; U.S. Department of State, 2015; U.S. Department of the Treasury, 2015; Wacaster and others, 2015).

## Minerals in the National Economy

In 2015, Cuba's real gross domestic product (GDP) increased by 4.3% compared with that of 2014. The industrial manufacturing sector (excluding the sugar industry) made up about 13% of the country's GDP; the construction sector, about 6%; the sector that included electricity, gas, and water, about 1.4%; and the mining and quarrying sector, about 0.6%. Employment in the mining and quarrying sector increased by 4% to 28,900 workers in 2015 compared with 27,700 workers in 2014. During the year, about 336 enterprises operated in the industrial manufacturing sector and about 20 enterprises operated in the mining and quarrying sector (Oficina Nacional de Estadística e Información 2016a, p. 12; 2016c, p. 7; 2016d, p. 18–19).

According to the Portfolio of Opportunities for Foreign Investment, in 2014, the most significant sector for foreign capital was tourism and real estate (52%), followed by the energy and mining sector (11%), and the industrial manufacturing sector (10%). In the mining sector, the country was offering foreign investment opportunities for prospecting, exploration, mining, and commercialization of copper, gold, lead, silver, zinc, and other minerals, such as kaolin, mica, and tungsten. The offering included the regions of Pinar del Rio (Hierro Mantua copper deposit), Central Cuba (10 prospects for copper, gold, lead, silver, and zinc), Ciego-Camaguey-Tunas (13 prospects for copper, gold, lead, silver, and zinc), Holguin and Macizo Sagua-Baracoa (12 prospects for chromium, 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 both onshore and offshore petroleum extraction, including 52 offshore blocks located in the Exclusive Economic Zone (EEZ) in the Gulf of Mexico; 25 onshore blocks available throughout the country; and 8 shallow-water blocks, which are located in the Provinces of Artemisa, Camaguey, Ciego de Avila, Granma, Matanzas, Mayabeque, Pinar del Rio, Sancti Spiritus, and Villa Clara (Ministry of Foreign Trade and Investments, 2016, p. 12, 121–123, 141).

## Government Policies and Programs

Cuba's mining sector is regulated by the Ley de Minas (Mining Law, law No. 76 of January 23, 1995). The law establishes the mining policy and regulations, which guarantee the protection, development, and rational use of the mineral resources. The Ministerio de Energia 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. In 2014, Cuba's National Peoples' Power Assembly approved the new Ley de Inversion Extranjera [Law of Foreign Investment], law No. 118. The law establishes the new legal framework for foreign investment in the country. The types of businesses that can be adopted through foreign investment include joint ventures, international economic association agreements, and companies with 100% foreign capital investment. The law states that a 15% tax on net profits shall be paid by joint ventures and by domestic and foreign investors and partners in international economic association agreements. Joint ventures and partners in international economic association contracts shall be exempt from paying taxes on profits for a period of 8 years from the date of their incorporation, but the Council of Ministers shall be entitled to extend the tax exemption period. The exploitation of natural resources, whether renewable or nonrenewable, could have the profit tax rate increased by up to 50% (Centro para la Promocion del Comercio Exterior y la Inversion Extranjera de Cuba, 2014, p. 5; Gaceta Oficial de la Republica de Cuba, 2014, p. 177, 179, 185; Ministry of Foreign Trade and Investments, 2016, p. 13).

## Production

In 2015, zeolites production increased by 18% to 50,800 metric tons (t) from 43,100 t in 2014; salt, by 17% to 285,000 t from 243,000 t; cobalt (estimated), by 16% to 4,300 t from 3,700 t; and nickel (estimated), by 12% to 56,400 t from 50,400 t. Bentonite production decreased by 29% to 500 t from 700 t; marble, by 28% to 7,700 cubic meters from 10,700 cubic meters; volcanic ash, by 24% to 99,900 t from 131,200 t (revised); silica sand, by 15% to 24,800 cubic meters from 29,300 cubic meters (revised); crude steel, by 14% to 221,800 t from 257,700 t; and kaolin, by 12% to 1,500 t from 1,700 t. Data on mineral production are in table 1.

## Structure of the Mineral Industry

Petroleum refinery products were produced by CUPET at the Hermanos Díaz, Níco López, and Sergio Soto refineries, and by the joint venture of PDVSA and CUPET (PDV-CUPET S.A.) at the Cienfuegos refinery. The Níco López refinery is located in the city of Havana and processed domestic and imported petroleum; the Cienfuegos refinery processed only Venezuelan crude petroleum (U.S. Energy Information Administration, 2016). Nickel was produced by Government-owned Empresa Niquelífera Ernesto Che Guevara and Moa Nickel S.A., which was a joint venture of Sherritt International Corp. of Canada (Sherritt) and the Government (50% each). Table 2 is a list of major mineral industry facilities

## Mineral Trade

In 2015, the total value of Cuba's exports decreased by 25% to about \$167 million from \$222 million in 2014 and the total value of imports increased by 3% to about \$582 million from \$566 million in 2014. In 2014, mining products accounted for about 15% of Cuba's total exports. The country's major export trade partners included Canada, China, the Netherlands, Spain, and Venezuela, and its major import trade partners included China, Spain, and Venezuela. According to PDVSA,

in 2015, Cuba imported from PDVSA about 87,000 barrels per day (bbl/d), which was about 31.8 million barrels per year (Mbbbl/yr) compared with 90,000 bbl/d in 2014, which was about 32.9 Mbbbl/yr. In 2014, the country imported about 9.2 million barrels (Mbbbl) of fuel oil, 2.7 Mbbbl of motor gasoline, and 925,000 barrels of liquefied petroleum gas (Oficina Nacional de Estadística e Información, 2015, p.12–18; 2016b, p. 15; 2016d, p. 35; Petróleos de Venezuela S.A, 2016, p. 70).

## Commodity Review

### Metals

**Cobalt and Nickel.**—Moa Nickel's mines are mined by open pit methods and processed at its facilities at Moa into mixed sulfides (containing nickel and cobalt). The mixed sulfides are transported to the company's refining facilities in Fort Saskatchewan, Alberta, Canada. Moa Nickel's operations included the Central Moa projects (Camarioca Norte, Camarioca Sur, Limestone Mud, Moa Occidental, Moa Oriental, Playa La Vaca-Zona, Septentrional II, and Yagrumaje Oeste concessions) and the Eastern Satellites projects (Cantarrana, La Delta, and Santa Teresita concessions), which cover a total area of about 12,282 hectares. As of December 31, total proven and probable reserves at Central Moa and Eastern Satellites were reported as 60.48 million metric tons (Mt) at average grades of 43.8% iron, 1.15% nickel, and 0.12% cobalt. Measured, indicated, and inferred mineral resources at Central Moa were reported as 10.92 Mt at average grades of 44.1% iron, 1.16% nickel, and 0.14% cobalt; 7.54 Mt at average grades of 43.0% iron, 1.25% nickel, and 0.13% cobalt; and 5.60 Mt at average grades of 47.4% iron, 1.46% nickel, and 0.10% cobalt, respectively. The measured and inferred mineral resources at Eastern Satellites were reported as 3.29 Mt at average grades of 45.5% iron, 1.24% nickel, and 0.15% cobalt and 4.36 Mt at average grades of 45.2% iron, 1.30% nickel, and 0.14% cobalt, respectively (Sherritt International Corp., 2016a, p. 1, 10, 16, 17, 18, 82, 85, 87).

In 2015, total production of finished nickel and cobalt was 33,705 t and 3,733 t (100% basis), respectively, compared with 32,909 t and 3,210 t (100% basis), respectively, in 2014. The construction of the 2,000-metric-ton-per-day sulfuric acid plant at Moa was underway in 2015 and was expected to be completed by the second half of 2016. Sherritt reported that the new plant would provide the necessary sulfuric acid production capacity to eliminate all the company's purchases of sulfuric acid (Sherritt International Corp., 2016b, p. 1, 6, 32).

**Lead and Zinc.**—Empresa Minera del Caribe (Emincar) continued with its plans to develop the Castellanos and Santa Lucia lead-zinc deposit, which is located in Pinar del Rio Province. Emincar expected to produce lead and zinc concentrates at a total investment cost of about \$300 million and to produce nearly 1 Mt of lead and zinc concentrate, mainly for export, within 11 years (Garcia, 2013; Diario de Cuba, 2016; Havana Reporter, The, 2016).

### Mineral Fuels

**Petroleum.**—The country's proven crude petroleum reserves were estimated to be about 124 Mbbbl, and its natural gas

reserves were estimated to be 70.8 billion cubic meters. Sherritt held working interests (ranging from 40% to 100%) in various petroleum production-sharing contracts (PSCs) with CUPET. According to Sherritt, Cuba's petroleum accounted for more than 90% of the company's total production. Sherritt operated the Puerto Escondido, the Varadero West, and the Yumuri oilfields, which are located on the northern coast between Havana and Cardenas. The company's share of the petroleum produced from these three fields combined (based on the percentage of its working interest) was 18,257 bbl/d in 2015 compared with 19,456 bbl/d in 2014, which was a decrease of about 6%. The decrease in petroleum production was mainly attributed to natural reservoir declines. As of 2015, eight wells were drilled in the Puerto Escondido and Yumuri fields, which was part of an agreement signed with the Government in 2014 for a 10-year extension of the Puerto Escondido and Yumuri PSCs. During the year, Sherritt reprocessed and identified drilling locations in Block 10, which is located in Cardenas Bay on the north coast of Cuba and covers about 261 square kilometers (km<sup>2</sup>). The company reported that it would focus on the preparation and drilling of the block in 2016, and the first well was planned for mid-2016 (Sherritt International Corp., 2015, p. 15, 28; 2016b, p. 2, 25; 2016c; U.S. Central Intelligence Agency, 2016).

On September 3, CUPET awarded to MEO Australia Ltd. (MEO) a 100% interest in the Block 9 PSC, which is located on the north coast of Cuba about 130 kilometers east of Havana and covers an area of 2,380 km<sup>2</sup>. The block is also located near the Valero oilfield and contained the Motembo field, which was the first Cuban oilfield (discovered in 1881). The exploration period of the PSC was divided into four subperiods totaling 8.5 years with a withdrawal option at the end of each subperiod. The exploration phase included an initial period of 18 months during which existing exploration data would be evaluated and reprocessed before MEO decided whether to continue with a 24-month exploration subperiod, which would include the acquisition of new two-dimensional seismic data (MEO Australia Ltd., 2014, p. 1; 2015; 2016, p. 12).

In 2015, CUPET agreed to PSCs with PDV and Group Sonangol of Angola to drill exploratory deepwater wells in the country's maritime EEZ, which extends into the Gulf of Mexico to the north, northwest, and west of the island. The PSCs included drilling exploratory wells as deep as 7,000 meters (m) in waters of up to a depth of 3,000 m. The drilling was expected to begin in 2016 or 2017. As of 2015, exploration drillings conducted along the northwest coast of the country by foreign companies, such as PDVSA, Repsol S.A. of Spain, and JSC Zarubezhneft of Russia, had resulted in no discovery of commercial quantities of petroleum and gas (Hamre, 2015; Jamaica Observer, 2015; Wacaster and others, 2015).

## Outlook

Cuba's GDP was forecasted to increase by 2% in 2016 (Havana Times.org, 2015; Frank, 2015). The process toward normalization of relations between the United States and Cuba is expected to continue in 2016. The country continues to seek foreign investment for further development of its hydrocarbons and mineral resources, such as copper, gold, silver, lead, and zinc.

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

(Metric tons unless otherwise specified)

Commodity <sup>2,3</sup>	2011	2012	2013	2014	2015	
METALS						
Cobalt, mine output, Co content <sup>e</sup>	5,100	4,900	4,200	3,700	4,300	
Nickel, mine output, recoverable laterite (limonitic and serpentinic), Ni content <sup>e</sup>	72,500	68,200	66,000	50,400	56,400	
Steel, crude	282,100	277,000	267,200	257,700	221,800	
INDUSTRIAL MINERALS						
Cement, hydraulic	1,736,300	1,824,800	1,659,000	1,579,900	1,517,800	
Clay:						
Bentonite	1,244	670	335	700	500	
Kaolin	3,000	4,000	3,600	1,700	1,500	
Feldspar	3,100	3,800	3,200	3,600	3,300	
Gypsum	thousand metric tons	131	131	87	98	91
Lime	38,000	54,100	52,400	51,500 <sup>f</sup>	51,500	
Nitrogen, N content of ammonia	45,200	59,200	63,700	58,600 <sup>f</sup>	58,500	
Pumice and related materials, volcanic ash	96,500	256,000	278,900	131,200 <sup>f</sup>	99,900	
Salt	thousand metric tons	281	216	222	243	285
Sand:						
Calcareous	thousand cubic meters	1,785	1,811	1,732	1,702	1,783
Silica	cubic meters	20,400	24,700	26,100	29,300 <sup>f</sup>	24,800
Stone:						
Crushed	thousand cubic meters	3,542	3,943	4,196	4,226	4,311
Limestone	thousand metric tons	2,700	2,800	2,800	2,000	1,900
Marble	cubic meters	6,700	7,800	9,600	10,700	7,700
Sulfuric acid	thousand metric tons	417	399	409	404	406
Zeolites		44,600	41,900	43,800	43,100	50,800
INDUSTRIAL MINERALS						
Natural gas, marketed	thousand cubic meters	1,019,800	1,034,500	1,066,000	1,199,900	1,244,500
Petroleum:						
Crude <sup>4</sup>	thousand 42-gallon barrels	19,422	19,340	18,683	18,736 <sup>f</sup>	18,700 <sup>e</sup>
Refinery products: <sup>5</sup>						
Asphalt	metric tons	79,600	81,100	83,000	61,300 <sup>f</sup>	61,300 <sup>e</sup>
Petroleum coke	thousand 42-gallon barrels	37	7	99	68 <sup>f</sup>	70 <sup>e</sup>
Gasoline, motor	do.	4,286	3,539	5,729	4,728 <sup>f</sup>	4,700 <sup>e</sup>
Fuel oil	do.	17,321	18,802	17,548	17,266 <sup>f</sup>	17,300 <sup>e</sup>
Kerosene	do.	28	236	223	190 <sup>f</sup>	200 <sup>e</sup>
Liquefied petroleum gas	do.	585	483	857	779 <sup>f</sup>	780 <sup>e</sup>
Lubricants	do.	340	330	333	346 <sup>f</sup>	350 <sup>e</sup>
Naphtha	do.	1,341	2,106	1,425	1,764 <sup>f</sup>	1,800 <sup>e</sup>
Total <sup>6</sup>	do.	23,938	25,502	26,214	25,141 <sup>f</sup>	25,200 <sup>e</sup>

<sup>e</sup>Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. <sup>f</sup>Revised. do. Ditto.

<sup>1</sup>Table includes data available through August 5, 2016.

<sup>2</sup>In addition to the commodities listed, Cuba also produced crude construction materials, 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 2015 [Statistical Yearbook of Cuba 2015].

<sup>4</sup>Production has been converted from metric tons to barrels by using the U.S. Energy Information Administration's factor of 6.449 barrels per metric ton (bbl/t) of crude petroleum.

<sup>5</sup>Production has been converted from metric tons to barrels by using the U.S. Energy Information Administration's factors of 5.51 bbl/t for petroleum coke; 8.53 bbl/t for motor gasoline; 7.46 bbl/t for distillate fuel oil; 7.73 bbl/t for kerosene; 11.63 bbl/t for liquefied petroleum gas; 7.00 bbl/t for lubricants; and 8.22 bbl/t for naphtha.

<sup>6</sup>Total does not include asphalt.

TABLE 2  
CUBA: STRUCTURE OF THE MINERAL INDUSTRY IN 2015

(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 Curacao N.V.	Barrio Mujica, Mariel, Artemisa Province	1,110	
Do.	Fábrica de Cemento Siguaney	Siguaney, 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	
Do.	Empresa Niquelífera Comandante René Ramos Latour (Government, 100%)	René Ramos Latour Mine and processing plant, Nicaro, Holguin Province	12 <sup>1</sup>	
Nitrogen (ammonia)	NA	Revolución de Octubre plant, Nuevitas, Camaguey Province	200	
<b>Petroleum:</b>				
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	11,000
Do.	do.	Ñico López refinery (Government, 100%)	City of Havana	13,300
Do.	do.	Sergio Soto refinery (Government, 100%)	Cabaiguan, Sancti Spiritus Province	1,000.
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 Havana 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.

<sup>1</sup>Operations suspended in March 2012.