



# 2017–2018 Minerals Yearbook

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**PHILIPPINES [ADVANCE RELEASE]**

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# THE MINERAL INDUSTRY OF THE PHILIPPINES

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

In 2017, the Philippines was the leading producer of nickel and accounted for 17% of world production and 6.5% of global reserves. The Philippines was also the fifth-ranked producer of cobalt and accounted for 3.8% of world production and 4.1% of global reserves. The country also produced other mineral commodities, such as cement, chromium, clay, coal, copper, feldspar, gold, natural gas, petroleum, salt, silver, and stone (table 1; McRae, 2018, 2019; Shedd, 2018, 2019).

## Minerals in the National Economy

In 2017, the growth rate of the Philippines' real gross domestic product (GDP) was 6.7% compared with 6.9% in 2016. The nominal GDP in 2017 was \$314 billion (PHP15.8 trillion).<sup>1</sup> The industrial sector, which accounted for 34% of the GDP in 2017, had a growth rate of 7.2% compared with 8.0% in 2016. The mining and quarrying subsector, which accounted for 1.0% of the GDP, had a growth rate of 3.7% compared with 3.2% in 2016. In 2017, the mining and quarrying subsector faced challenges, such as regulatory changes, a Government suspension and closure order to certain mining operations, and a review of the existing mining sector law by the Department of Environment and Natural Resources (DENR). The construction subsector of the industrial sector, which accounted for 6.2% of the GDP in 2017, had a growth rate of 5.3% compared with 12% in 2016. The mining and quarrying subsector employed 203,000 people in 2017 compared with 219,000 people in 2016 (Mines and Geosciences Bureau, 2017a; Bangko Sentral ng Pilipinas, 2019, statistical annex, table 1; Philippine Statistics Authority, 2020a, p. 3–6, 11–17).

Despite the ban on open pit mining and the suspension and closure of other mining activities, the total value of metallic mineral production was maintained at \$2.1 billion in both 2016 and 2017. This maintenance of metallic mineral production value was owing to increased world metal prices; supply disruptions from the world's key copper, nickel, and gold mines; and significant metal demand from China's infrastructure and manufacturing sectors. In 2017, the global prices of copper increased by 23.3%; nickel, by 7.6%; and gold, by 0.8%. Gold accounted for 42% of the Philippines' metallic production value of 2017; nickel ore and nickel sulfides, for 39%; and copper, for 18% (Mines and Geosciences Bureau, 2018b).

## Government Policies and Programs

The principal laws that regulate the mineral industry are the Philippine Mining Act of 1995 (Mining Act), the DENR Administrative Order No. 2010–21 (Mining Act IRR), and

implementing rules and regulations. In 2012, Executive Order No. 79 (EO 79) reformed mining operations, management of mining rights, and issuance of mineral agreements, and implemented a moratorium on new open pit mining projects. The Clean Air Act of 1999 and the Clean Water Act of 2004 also apply to mining operations. Presidential Decree No. 87 (Oil Exploration and Development Act), which was issued in 1972, mandates the Government to undertake petroleum exploration and production through service contracts. Presidential Decree No. 972 (Coal Development Act), which was issued in July 1976, mandates that the Government undertake active exploration, development, and production of coal resources or execute coal operating contracts (Bunye, 2019; Philippine Extractive Industries Transparency Initiative, 2019, p. 15, 17, 18).

The DENR Administrative Order No. 2017–07, which was approved in March 2017, mandates all mineral development contractors to participate in the Philippine Extractive Industries Transparency Initiative (PH–EITI) to promote transparency and accountability of all stakeholders in the mineral, oil and gas, and coal industries. The order also mandates stricter enforcement of the laws governing the sector, including environmental and social standards. The PH–EITI functions in accordance with the requirements set by the Philippine Multi-Stakeholder Group in which the Government, industry, and civil society are represented (Mines and Geosciences Bureau, 2017b; Philippine Extractive Industries Transparency Initiative, 2019).

In 2017, DENR audited 41 operating mines under Memorandum Order 2016–01 and ordered 5 suspensions and 23 closures to mines that failed to pass audits for environmental or other legal violations. DENR canceled 75 of the 311 mining contracts that had not started operations, including the \$5.9 billion Tampakan copper and gold project. Despite the suspension and closure orders, 14 mining companies continued to operate while their motion for reconsideration was on appeal (Crismundo, 2017; Mondragon, 2017; Sagittarius Mines, Inc., 2018).

On April 27, the DENR approved Administrative Order No. 2017–10, which bans new open pit mining operations for all commodities, including copper, gold, silver, and complex ores. The President stated that this new mining law would implement higher taxes on the mineral industry and compensation for environmental damage to local communities. The President confirmed his position on banning open pit mining on July 21, but the Government panel and the new Environmental Secretary sought to reverse the policy (Cruz, 2017; Mines and Geosciences Bureau, 2017c; Serapio, 2017).

<sup>1</sup>Where necessary, values have been converted from Philippine pesos (PHP) to U.S. dollars (US\$) at an annual average exchange rate of PHP52.6614=US\$1.00 for 2018, PHP50.4037=US\$1.00 for 2017, and PHP47.4925=US\$1.00 for 2016.

## Production

In 2017, the production of marble (dimension) increased by 146% compared with that of 2016; raw steel, by 28%; stone (crushed, other), by 18%; cobalt (mine, Co content), by 15%; nickel (mine, Ni content), by 13%; copper (smelter, primary), by 12%; and copper (refinery, primary), by 11%. The production of perlite decreased by 47%; zeolites, by 33%; lead (refinery, secondary), by 29%; lime, by 22%; crude petroleum, by 21%; bentonite, chromite, and copper (mine, Cu content), by 19% each; and dolomite, by 14%. Iron ore was not produced in 2017 (table 1).

## Structure of the Mineral Industry

The Mines and Geosciences Bureau (MGB), which is under the DENR, reported that as of 2017, the Philippines had 50 operating metallic mineral mines and 61 nonmetallic mineral mines. The metallic mineral industry was wholly owned by private enterprises, including some foreign ownership of 29 nickel mines, 11 gold mines, 4 chromite mines, 3 copper mines, and 3 iron mines. The nonmetallic mineral mines for clay, dolomite, limestone, marble, sand, shale, and silica were mostly privately owned. In 2017, the Philippines had a total of 428 approved mining tenements compared with 461 in 2016, which consisted of 313 mineral production-sharing agreements, 60 industrial sand and gravel permits, 31 processing permits, and 24 exploration permits. Table 2 is a list of major mineral industry facilities (Mines and Geosciences Bureau, 2019b).

## Mineral Trade

In 2017, the Philippines' total export value increased by 19.7% to \$68.7 billion from \$57.4 billion in 2016. Exports of total mineral products, which accounted for 6.2% of total exports, increased by 82% to \$4.23 billion, including nickel concentrates and mixtures (\$1.46 billion), copper metal (\$1.27 billion), gold (\$1.11 billion), and copper concentrates (\$370 million) (Philippine Statistics Authority, 2018b, 2019).

In 2017, the total value of imports by the Philippines increased by 14.3% to \$96.1 billion from \$84.1 billion in 2016. The import value of mineral fuels, which accounted for 11.2% of total imports, increased by 35.5% to \$10.8 billion and included lubricant and related materials (\$5.93 billion), crude petroleum (\$3.42 billion), and coal and coke (\$1.44 billion). Iron and steel imports increased by 27% to \$4.22 billion; metalliferous ore, by 335% to \$1.93 billion; metal products, by 24% to \$1.79 billion; nonmetallic mineral manufactures, by 13% to \$1.38 billion; and nonferrous metals, by 17% to \$1.20 billion (Philippine Statistics Authority, 2018b, 2019).

The net foreign direct investment (FDI) inflow increased by 24% to \$10.3 billion in 2017 from \$8.3 billion in 2016. The total approved FDI for 2017 decreased by 54% to \$2.1 billion from \$4.6 billion in 2016. None of the approved FDI was distributed to the mining and quarrying subsector in 2017 compared with \$12.9 million distributed in 2016 (Bangko Sentral ng Pilipinas, 2018; Philippine Statistics Authority, 2018a).

## Commodity Review

### Metals

**Copper.**—Copper production in 2017 decreased by 18.5% to 68,156 metric tons (t) from 83,649 t in 2016. The major companies operating in the Philippines showed similar decreasing trends in production. Carmen Copper Corp. had a decrease of mined copper ore grade to 0.289% from 0.321% and a decrease of milling volume by 15% to 14.2 million metric tons (Mt) from 16.7 Mt in 2016 owing to high rainfall in the first quarter. OceanaGold Philippines Inc. had a decrease of mined copper ore grade to 0.44% from 0.48% in 2016 and mill feed grade to 0.56% from 0.61%. Philex Mining Corp. had a decrease of milled volume to 8.7 Mt from 9.4 Mt in 2016. Lepanto Consolidated Mining Co. received a notice from the DENR on February 14, 2017, to suspend operations; however, the order was lifted on October 12 by the Office of the President. Reduced production in the country was offset by an increase in the average copper prices at the London Metal Exchange to \$6,166 per metric ton from \$4,863 per metric ton in 2016 (table 1; Lim, 2017; Atlas Consolidated Mining and Development Corp., 2018, p. 12; International Copper Study Group, 2018, p. 9; OceanaGold Corp., 2018, p. 9; Philex Mining Corp., 2018, p. 9).

Philex Mining Corp. suspended the development of the Silangan copper-gold project in Surigao del Norte Province following the ban on all open pit mining. The Silangan project included the development of the Boyongan and Bayugo gold, copper, and silver deposits, which had total measured and indicated resources of 398 Mt grading 0.56% copper and 0.7 gram per metric ton (g/t) gold (Philex Mining Corp., 2018, p. 31, 32, 34).

**Gold.**—In 2017, the Philippines' production of mined gold totaled 22,749 kilograms (kg), which was a 1.3% decrease from the 23,053 kg produced in 2016. At the Masbate gold project, where Filminera Resources Corp. (60% owned by Zoom Mineral Holdings Inc. and 40% owned by B2Gold Corp. of Canada) operated the mine and Philippines Gold Processing and Refining Corp. (100% owned by B2Gold) operated the processing plant, 6,295 kg of gold was produced. This was closely followed by OceanaGold Philippines Inc., which produced 5,684 kg at the Didipio Mine; Mindanao Mineral Processing and Refining Corp. (Medusa Mining Ltd., 100%), which produced 2,868 kg at the Co-O Mine; and Philex Gold Philippines Inc. (Philex Mining Corp., 100%), which produced 2,633 kg at the Padcal Mine. The combined gold output of these companies accounted for more than 77% of the country's gold production. The milled volume at the Padcal Mine decreased to 8.67 Mt from 9.36 Mt owing to lower tonnage and grade. In 2017, the company spent \$13.7 million for expenses related to the Silangan project and for Padcal exploration projects compared with \$13.2 million in 2016 (table 1; Mines and Geosciences Bureau, 2018d; Philex Mining Corp., 2018, p.10).

**Nickel.**—The production of nickel ore and intermediate nickel products increased by 13% and 4.5%, respectively in 2017. The average world nickel price increased from \$9,598 per metric ton in 2016 to \$10,407 per metric ton in 2017. The production of direct-shipping nickel ore and mixed nickel-cobalt sulfide accounted for 49% of the total value of

metallic production from 2012 to 2015. In 2016 and 2017, gold accounted for a greater portion of the total value of metallic mineral production than nickel owing to the suspension of nickel mines in Dinagat Island, Surigao del Norte, and Zambales Provinces (table 1; International Nickel Study Group, 2018; Mines and Geosciences Bureau, 2018c).

In October 2017, Platinum Group Metals Corp. (a subsidiary of Global Ferronickel Holdings Inc.) announced that the mineral resources at the Cagdianao Mine were increased by 3.8 Mt to 54.2 Mt with an average grade of 1.1% nickel and 31.4% iron after the completion of drilling activities at the Cagdianao deposit areas 1 through 5 (Global Ferronickel Holdings Inc., 2018, p. 7, 8).

The Claver nickel project, which was owned by Taganito Mining Corp., accounted for 18.2% of the total nickel mine output of 339,337 t in the Philippines in 2017. Other major producers included Rio Tuba Nickel Mining Corp. and Platinum Group Metals Corp., which accounted for 15.9% and 9.9% of the total nickel mine output, respectively. Thirteen nickel mines reported zero production owing to the mines being on care-and-maintenance status or suspended from operations owing to environment-related issues (table 1; McRae, 2019; Mines and Geosciences Bureau, 2019d).

### ***Industrial Minerals***

**Cement.**—In 2017, the Philippines produced approximately 26 Mt of cement, although the country's total production capacity was 35 million metric tons per year (Mt/yr). Since 2011, the Philippines had not exported cement nor clinker. Imported cement had increased by 272% to 3.42 Mt in 2016 from 0.92 Mt in 2012. The Government started a \$160 billion to \$180 billion infrastructure program lasting from 2017 to 2020. This program facilitated the expansion of current cement production capacities and construction of new production lines. In 2017, Republic Cement & Building Materials Inc. was in the process of increasing its integrated cement production capacity by 1 Mt/yr to a total capacity of 8 Mt/yr. Cemex Philippines Group and CBMI Construction signed a contract for the construction of a 1.5-Mt/yr production line at the Solid Cement plant in Rizal Province. Northern Cement Corp. announced its plan to invest \$683 million on the construction of two new cement plants in Sison, Pangasinan Province. Eagle Cement Co. started construction of a \$246 million cement plant in Malabuyoc, Cebu Province and the expansion of the third line in the Bulacan plant, which would give the company a 9.1-Mt/yr capacity (Global Cement, 2017a–d; 2018b).

## **MINERAL INDUSTRY HIGHLIGHTS IN 2018**

### **Minerals in the National Economy**

In 2018, the growth rate of the Philippines' real GDP was 6.2% and the nominal GDP was \$331 billion. The growth rate of the mining and quarrying subsector decreased to 1.0%, and the mining and quarrying subsector contributed 0.94% to the GDP in 2018. Approximately 207,000 people were employed in the mining and quarrying industry in 2018 (Bangko Sentral ng

Pilipinas, 2019, statistical annex, table 1; Philippine Statistics Authority, 2020a, p. 3–6, 11–17.)

In April 2018, the Government developed a draft order that allowed mines producing up to 1 Mt/yr of nickel ore to work on up to 50 hectares of land at any one time. Mines with an output of 1 Mt/yr to 9 Mt/yr of nickel ore would be permitted to operate on up to 100 hectares of land. The draft order requires simultaneous ore extraction and mine restoration in order to prevent mine closure costs (Serapio and Cruz, 2018).

On July 3, 2018, DENR Administrative Order 2018–13 lifted the moratorium on the acceptance, processing, and approval of exploration permit applications for metallic and nonmetallic minerals following the completion of an audit on all mining operations pursuant to DENR Memorandum Order No. 2016–01. A moratorium on Government approvals for small-scale mining projects was also lifted in June. According to Republic Act 7076, small-scale mining refers to mining activities that rely heavily on manual labor using simple implements and methods without explosives or heavy mining equipment. This definition is applicable to gold, silver, and chromite mines (Mines and Geosciences Bureau, 2018a; Serapio, 2018; Teves, 2019).

In 2018, the the Philippines' total export value was \$69.3 billion, and mineral products accounted for 5.8% of total exports, including nickel concentrates and mixture (\$1.68 billion), copper metal (\$1.14 billion), copper concentrates (\$616 million), and gold (\$536 million). The total import value of the Philippines was \$113 billion. The import value of mineral fuels accounted for 12% of total imports, and it increased by 30.1% to \$14.0 billion; iron and steel, by 42% to \$5.98 billion; metal products, by 17% to \$2.08 billion; nonmetallic mineral manufactures, by 33% to \$1.84 billion; and nonferrous metals, by 16% to \$1.39 billion. The import of metalliferous ore decreased by 18% to \$1.59 billion (Philippine Statistics Authority, 2020b).

The mining and quarrying industry in 2018 included a total of 48 operating metallic mines. On November 12, 2018, the DENR issued resolutions to 9 of the 13 companies that submitted Motions of Reconsideration since the suspension and closure order in February 2017. These companies included AAMPHIL Natural Resources Exploration and Development Corp., Carrascal Nickel Corp., Emir Mineral Resources Corp., Krominco, Inc., Libjo Mining Corp., Mt. Sinai Exploration and Development Corp., Strong Built Mining Development Corp., Wellex Mining Corp., and Zambales Diversified Metals Corp. These mining companies were required to immediately and completely pay all fines and violations penalties. The transport of ore was not allowed until full environmental rehabilitation was undertaken by the companies. Berong Nickel Corp.'s suspension was lifted and the company worked on implementation of corrective measures. About 30% of the listed nickel companies reported no production in 2018 owing to care-and-maintenance programs and the previously described suspensions (Mines and Geosciences Bureau, 2019a–c).

### **Production**

In 2018, sand and gravel (industrial, silica) production increased by 141%; chromite (mine), by 116%; and natural gas, by 11%. Copper (primary smelter) production decreased by 29%;

crude petroleum, by 20%; copper (primary refinery), by 17%; and perlite, by 16% (table 1).

In 2018, the value of the Philippines' metallic mineral production increased by 5.7% to \$2 billion compared with that of 2017. Nickel direct-shipping ore and mixed nickel-cobalt sulfide production accounted for 45.3% of the total metallic mineral production, followed by gold and copper, at 36.7% and 17.0%, respectively. The remaining output (1%) was composed of silver and chromite combined (Mines and Geosciences Bureau, 2019b).

## Commodity Review

### Metals

**Bauxite and Alumina.**—Marcventures Holding Inc. (Marcventures) merged with Asia Pilot Mining Philippines Corp. (APMPC) on December 28, 2017, which included acquisition of APMPC's subsidiaries—Alumina Mining Philippines Inc. and Bauxite Resources Inc. Marcventures reported 73.2 Mt of measured and indicated resources at its properties at Gandara, Motiong, Paranas, San Juan De Buan, and San Jorge in Samar that together could produce 4 Mt/yr of bauxite and would have a combined mine life of about 20 years (Manila Times, The 2018; Marcventures Holdings Inc., 2020).

**Gold.**—In August 2018, Greenstone Resources Corp. (a subsidiary of Red 5 Ltd. of Australia) was awarded a Clearance and Notice to Proceed from the MGB to construct and operate the tailings storage facility 6 at the Siana gold project. Open pit and underground mine mineral resources were estimated to be 0.97 Mt grading 2.9 g/t gold and 7.3 g/t silver and 3.9 Mt grading 5.7 g/t gold and 7.7 g/t silver, respectively. Previously, open pit mining activities and underground mine development were suspended in April 2017 owing to delays in obtaining regulatory approvals for construction of the new tailings storage facility (Red 5 Ltd., 2018).

**Iron and Steel.**—Steel Asia Manufacturing Corp. planned to invest \$1.5 billion in an integrated steel expansion program spanning three phases over 6 years. The first phase started with the construction of a 0.8-Mt/yr capacity wire and rod plant in Compostela, Cebu Province; a 1.2-Mt/yr capacity wire and rod mill in Concepcion, Tarlac Province; and a 0.5-Mt/yr capacity section bar mill in Lemery, Batangas Province (Campos, 2018b).

Panhua Group Co. Ltd. of China signed an initial agreement with the Government to construct a \$3.5 billion integrated steel plant on Mindanao Island. The 10-Mt/yr capacity plant was to be located in a port at the Phividec Industrial Estate of the Miamis Oriental-Special Economic Zone in Tagoloan, Misamis Oriental Province (Manila Standard, 2018).

Hebei Iron and Steel Group Co. Ltd. of China, along with Huili Investment Fund Management Co. Ltd. of China, Steel Asia Manufacturing Corp., and Phividec Industrial Authority signed an agreement to build a \$4.4 billion integrated iron and steel project in Misamis Oriental Province. The first phase included the construction of a plant that would have the capacity to produce 4.5 Mt/yr of hot-rolled coil and 0.6 Mt/yr of slabs. The project included a plan to increase the plant's steel manufacturing capacity to 8 Mt/yr under the second phase (Campos, 2018a).

## Industrial Minerals

**Cement.**—In 2018, the Philippines had a total installed capacity of about 37.5 Mt/yr of cement and an operating capacity of 34.5 Mt/yr. Eagle Cement Corp. opened a third cement facility in San Ildefonso, Bulacan Province, which increased the company's capacity by 2 Mt/yr to a total capacity of 7.1 Mt/yr. Holcim Philippines Inc. planned to increase its production capacity by 30% to 13 Mt/yr by 2020. Increased fuel costs, the depreciation of the Philippine peso against the U.S. dollar, and competition from foreign producers resulted in increased cement imports from 3,558 t in 2013 to about 6.4 Mt in 2018.

The country was expected to continue to increase domestic investment with the implementation of major public infrastructure projects under the "Build, Build, Build" program. The Department of Trade and Industry planned to impose a tariff on imported cement in 2019, which accounted for 0.02% in 2013 and 15% in 2017 of the Philippines' cement market (Business World, 2018; Global Cement, 2018a; Asian Development Bank, 2019, p. 290; Canivel, 2019; Perilli, 2019).

## Outlook

The Government's suspension and closure order in February 2017, which was focused on mining firms that violated laws and caused environmental damage, led companies to implement corrective measures. The order for the mining companies that completed implementation is expected to be lifted in 2019, leading to positive effects. In addition, the mining sector will be supported by steady price increases of copper, gold, and nickel in the world market if the price trend continues. A short-term challenge to the mineral industry is the second Government audit, expected to be conducted in 2019. In the long term, decreasing ore grades of copper and gold mines and a continued ban on open pit mining in the country will affect the output of metallic minerals. The production of industrial minerals, including cement and building-related materials, is expected to increase owing to continued expansion of production capacity and the Government's infrastructure program.

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

(Metric tons, gross weight, unless otherwise specified)

Commodity <sup>2</sup>	2014	2015	2016	2017	2018
<b>METALS</b>					
Chromium, mine, chromite	47,056	15,502	25,745	20,849	45,011
Cobalt, mine, Co content <sup>c,3</sup>	4,600	4,300	4,000 <sup>r</sup>	4,600	4,600
Copper:					
Mine, concentrates, Cu content	91,824	83,835	83,649	68,156	69,933
Smelter, primary	153,200	189,200	215,000	240,000	170,900
Refinery, primary	130,000	153,000	185,100	205,000	170,800
Gold, mine, Au content kilograms	18,423	21,314	23,053	22,749	20,765
Iron ore, mine:					
Gross weight	153,775	107,119	17,088 <sup>r</sup>	--	--
Fe content	98,000 <sup>r</sup>	68,000 <sup>r</sup>	11,000 <sup>r</sup>	--	--
Iron and steel:					
Raw steel	1,196,000	968,000	1,075,000	1,378,000	1,500,000
Products, hot rolled	3,273,000	4,013,000	4,346,000	4,300,000	4,300,000
Lead, refinery, secondary	30,000	28,000	14,000 <sup>r</sup>	10,000	10,000
Manganese, mine, concentrate:					
Gross weight	6,900	--	--	--	--
Mn content	3,000	--	--	--	--
Nickel, Ni content:					
Mine, laterite ore	393,262 <sup>r</sup>	415,021 <sup>r</sup>	300,506 <sup>r</sup>	339,377	344,915
Intermediate, nickel-cobalt sulfide	50,647 <sup>r</sup>	51,733 <sup>r</sup>	48,371 <sup>r</sup>	50,553	48,633
Silver, mine, Ag content kilograms	23,005	29,952	35,186	31,737	29,782
<b>INDUSTRIAL MINERALS</b>					
Cement, hydraulic thousand metric tons	21,305	24,050	25,000 <sup>e</sup>	26,000 <sup>e</sup>	26,000 <sup>e</sup>
Clay:					
Bentonite	3,369	3,477	3,231	2,618	2,412
Kaolin	7,050	8,179	10,059	10,000 <sup>e</sup>	10,000 <sup>e</sup>
Unspecified	8,605	8,948	11,542	11,500 <sup>e</sup>	11,500 <sup>e</sup>
Feldspar	34,232	38,067	46,630	47,000	47,000 <sup>e</sup>
Lime	7,877	22,538 <sup>r</sup>	173,968 <sup>r</sup>	135,618	136,000 <sup>e</sup>
Perlite	17,194	18,575	21,645	11,545	9,696
Phosphate rock:					
Gross weight	3,897	5,437	8,019	8,600	8,600 <sup>e</sup>
P <sub>2</sub> O <sub>5</sub> content	1,325	1,850	2,700	2,900	2,900 <sup>e</sup>
Pumice and related materials:					
Pumice	6,018	6,261	8,306	8,179	8,200 <sup>e</sup>
Volcanic tuff	28,884	40,775	47,966	48,000 <sup>e</sup>	48,000 <sup>e</sup>
Salt, sea salt <sup>e</sup>	134,000 <sup>r</sup>	131,000 <sup>r</sup>	128,000 <sup>r</sup>	125,000	122,000
Sand and gravel, industrial, silica thousand metric tons	467	438 <sup>r</sup>	502 <sup>r</sup>	507	1,220
Stone, sand and gravel, construction:					
Sand and gravel do.	161,453	170,280	194,646	195,000 <sup>e</sup>	195,000 <sup>e</sup>
Stone:					
Crushed:					
Dolomite	2,948,034	3,073,695	1,839,178	1,584,507	1,560,737
Limestone <sup>4</sup> thousand metric tons	77,665	75,657 <sup>r</sup>	75,255 <sup>r</sup>	77,909	78,000 <sup>e</sup>
Volcanic cinder	6,856	7,736	8,658	9,200 <sup>e</sup>	9,200 <sup>e</sup>
Other thousand metric tons	12,417	11,330 <sup>r</sup>	12,088 <sup>r</sup>	14,303	12,911
Dimension, marble	60,572	67,494	93,304	229,130	224,786
Zeolites	--	8,468	6,177	4,127	3,600
<b>MINERAL FUELS AND RELATED MATERIALS</b>					
Coal:					
Bituminous <sup>e</sup> thousand metric tons	818 <sup>r</sup>	793 <sup>r</sup>	876 <sup>r</sup>	929	914
Subbituminous do.	7,601 <sup>r</sup>	7,378 <sup>r</sup>	11,211 <sup>r</sup>	11,932	12,100 <sup>e</sup>
Natural gas, gross million cubic meters	3,689 <sup>r</sup>	3,468 <sup>r</sup>	3,977 <sup>r</sup>	3,940	4,376

See footnotes at end of table.



TABLE 1—Continued  
 PHILIPPINES: PRODUCTION OF MINERAL COMMODITIES<sup>1</sup>

(Metric tons, gross weight, unless otherwise specified)

Commodity <sup>2</sup>	2014	2015	2016	2017	2018	
MINERAL FUELS AND RELATED MATERIALS—Continued						
Petroleum:						
Condensate	thousand 42-gallon barrels	4,173	3,746	4,136	3,914	4,061
Crude	do.	3,079 <sup>r</sup>	2,410 <sup>r</sup>	2,014 <sup>r</sup>	1,587	1,264

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

<sup>1</sup>Table includes data available through November 12, 2019. 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, platinum-group metals as byproducts of other metal production, quartz, and sulfur may have been produced, but available information was inadequate to make reliable estimates of output.

<sup>3</sup>Cobalt contained in the following materials: nickel-cobalt sulfide produced in the Philippines and lateritic nickel ore exported to Australia.

<sup>4</sup>Includes limestone for agriculture, cement manufacturing, industrial use, and other.

TABLE 2  
PHILIPPINES: 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 <sup>e</sup>	
Cement	thousand metric tons	CEMEX Philippines Group	APO cement plant at Naga, Cebu Province; Solid cement plant at Antipolo City, Rizal Province	5,700
Do.	do.	Eagle Cement Co.	Bulacan cement plant (three production lines) in Barangay Akle, San Ildefonso, Bulacan	7,100
Do.	do.	Holcim Philippines Inc. (Union Cement Holdings Corp., 60.6%; B.V. Holdrerfin, 18.1%; Cemco Holdings, Inc., 7.1%)	Bulacan plant at Norzagaray, Bulacan Province; Davao Union plant, Davao del Sur Province; La Union plant at Bacnotan, La Union Province; Lugait plant at Lugait, Misamis Oriental Province; Mabini cement grinding plant, Batangas	10,000
Do.	do.	Northern Cement Corp.	Plant at Labayug, Sison, Pangasinan Province	1,460
Do.	do.	Republic Cement & Building Materials Inc. [AEV CRH Holdings Inc., 99.1% (Aboitiz Equity Ventures, 60%, and CRH Holdings, 40%)]	Batangas plant at Taysan, Batangas Province; Bulacan plant at Norzagaray, Bulacan Province; Danao plant at Danao City, Cebu Province; Iligan plant at Iligan City, Isabela Province; Norzagaray plant at Norzagaray, Bulacan Province; Teresa plant at Teresa, Rizal Province	10,800
Do.	do.	Taiheiyō Cement Philippines Inc.	Taiheiyō cement plant at San Fernando, Cebu Province	2,400
Chromite		Chromiteking Inc. (owner) and Techiron Resources Inc. (operator)	Chromiteking-Techiron Homonhon mining project, Homonhon Island, Eastern Samar Province	17,000
Do.		Consolidated Mines Inc. (owner) and Benguet Corp. (operator)	Masinloc chromite mine (Coto chromite deposit), Coto, 27 kilometers east of the Port of Masinloc in Zambales Province	5,000
Do.		Krominco Inc.	Dinagat chromite project (Redondo Mine), Loreto Municipality, Dinagat Island	26,000 <sup>1,2</sup>
Do.		Million Link Chrome Ltd. [Classic Center Internation Ltd. (CCIL); Mining and Mineral Resources Corp.; Million Link Investment Ltd.]	Pinagrealan, Candelaria Municipality, Zambales Province	NA
Clay		Orophil Stonecraft Inc.	Mine at Baao, Camarines Sur Province	NA
Do.		UBS Marketing Corp.	Mine at Legazpi, Albay Province	NA
Coal	thousand metric tons	Semirara Mining and Power Corp. (DMCI Holdings Inc., 56.65%)	Mine at Semirara Island, Antique Province	12,900
Cobalt, mine, Co content		Rio Tuba Nickel Mining Corp. (Nickel Asia Corp., 60%, and Pacific Metals Co. Ltd., 36%)	Rio Tuba nickel project, Barrio Rio Tuba, Bataraza Municipality in Palawan Province	1,500
Do.		Taganito Mining Corp. (Nickel Asia Corp., 65%; Pacific Metals Co. Ltd., 33.5%; Sojitz Corp., 1.5%).	Barangays of Hayanggabon, Urbiztondo, Taganito and Cagdianao, Municipality of Claver, Surigao del Norte Province	3,100
<b>Copper:</b>				
Mine, Cu content		Carmen Copper Corp. (Atlas Consolidated Mining and Development Corp., 100%)	Toledo copper mine (Biga, Carmen, and Lutopan deposits), Central Cebu Island	48,000
Do.		Lepanto Consolidated Mining Corp.	Victoria and Teresa Mines, Mankayan, Benguet Province	700
Do.		OceanaGold Philippines Inc.	Didipio gold copper mine, Nueva Vizcaya Province, Luzon Island	25,000 <sup>3</sup>
Do.		Philex Gold Philippines Inc. (PGPI) (Philex Mining Corp., 100%)	Padcal copper mine located in Tuba, Benguet Province, Luzon Island	21,000
Refinery		Philippine Associated Smelting and Refining Corp. (PASAR) (Glencore International plc., 78.2%)	Refinery and smelter at Leyte Industrial Development Estate, Isabel, Leyte Province	215,000
Feldspar		Paladino Management & Development Corp., 60%, and AIM Exploration Inc., 40%	NA	NA

See footnotes at end of table.

TABLE 2—Continued  
PHILIPPINES: 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 <sup>c</sup>
<b>Gold:</b>				
Mine, Au content	kilograms	APEX Mining Co. Inc.	Maco gold operation, Municipalities of Maco and Mabini, Mindanao Island	2,000
Do.	do.	Benguet Corp.	Acupan gold project (gold and nickel), Benguet Province	300 <sup>1</sup>
Do.	do.	Carmen Copper Corp. (Atlas Consolidated Mining and Development Corp., 100%)	Toledo copper mine (Biga, Carmen, and Lutopan deposits), Central Cebu Island	1,200
Do.	do.	Filminera Resources Corp. (mine owner and operator) (Zoom Mineral Holdings Inc., 60%, and B2Gold Corp., 40%), and Philippines Gold Processing and Refining Corp. (processing plant owner and operator) (B2Gold Corp., 100%)	Masbate gold project, Masbate Island, Bicol Region	6,800
Do.	do.	FCF Minerals (Metals Exploration, Plc., 100%)	Runruno gold-molybdenum project, Nueva Viscaya Province in Luzon Island	3,000
Do.	do.	Greenstone Resources Corp. (Red 5 Ltd., 100%)	Siana gold project, Surigao del Norte Province, Mindanao Island	1,000
Do.	do.	Itoyon-Suyoc Resources Inc. (Apex Mining Co. Ltd., 100%)	Sangilo Mine in Itoyon and Suyoc Mine, Mankayan, Benguet Province	100
Do.	do.	Lepanto Consolidated Mining Corp.	Victoria and Teresa Mines, Mankayan, Benguet Province	1,000
Do.	do.	Mindanao Mineral Processing and Refining Corp. (Medusa Mining Ltd., 100%)	Co-O gold mine in Agusan del Sur Province, Mindanao Island	3,500
Do.	do.	OceanaGold Philippines Inc. (OceanaGold Corp., 100%)	Didipio gold and copper mine, Nueva Viscaya Province, Luzon Island	5,700 <sup>3</sup>
Do.	do.	Philex Gold Philippines Inc. (Philex Mining Corp., 100%)	Padcal Mine (Sto. Tomas II deposit) at Tuba, Benguet Province, Luzon Island	5,000
Do.	do.	Philippine Mining Development Corp. (PMDC)	Diwalwal Direct State Development Project, Compostela Valley and Davao del Norte Province	100
Refined	do.	Bangko Sentral ng Pilipinas	Mint and Refinery Operations Department, Quezon City	NA.
Iron ore		Ore Asia Mining and Development Corp.	Camachin iron ore mining project, Dona Remedios Trinidad, Bulacan Province	40,000 <sup>1</sup>
Do.		Strong Built Mining Development Corp.	San Pedro, MacArthur, Leyte Province	NA <sup>2,3</sup>
Lime		H.T. Mining Products Resources Corp.	Barangay Tinandog, Atimon Quezon Province	40,000
Do.		Unichamp Mineral Philippines Inc.	Rio Tuba Economic Processing Zone, Palawan Province	135,000
Do.		Upward Agro Industrial Corp.	Bacolod, Negros Occidental Province	NA
Natural gas	million cubic meters	Consortium of Shell Philippines Exploration B.V. (SPEX) (Royal Dutch Shell plc), Chevron Malampaya LLC, and Philippine National Oil Company Exploration Corp.	Malampaya gasfield, 50 kilometers offshore of Palawan Island	4,300
<b>Nickel:</b>				
Mine, Ni content		AAMPFIL Natural Resources Exploration	Dinagat chromite-nickel project	2,000 <sup>1,2</sup>
Do.		Agata Mining Ventures Inc. (TVI Resources Development Philippines Inc., 60%; Minimax Mineral Exploration Corporation, 25%; MRL Nickel Philippines Inc. 15%)	Agata nickel laterite project, Jabonga, Santiago, and Tubay Municipalities, Agusan del Norte Province	21,000
Do.		Berong Nickel Corp (DMCI Holdings Inc., 75%, and Atlas Mining Co. Ltd., 25%)	Berong nickel project, Palawan Island	37,000 <sup>2,3</sup>
Do.		Cagdianao Mining Corp., (Nickel Asia Corp., 100%)	Cagdianao nickel project, near Barangay Valencia, Dinagat Island Province	45,000

See footnotes at end of table.

TABLE 2—Continued  
PHILIPPINES: 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 <sup>c</sup>	
<b>Nickel:—Continued</b>				
Mine, Ni content—Continued	Carrascal Nickel Corp.	Carrascal nickel project, Bon-ot, Carrascal, Surigao del Sur Province	20,000 <sup>1,2</sup>	
Do.	Cit nickel Mines and Development Corp.	Toronto Narra Mine and Pulot Sofronio Nickel Mine, Palawan Province	5,000 <sup>3</sup>	
Do.	CTP Construction & Mining Corp.	Adlay-Cagdianao-Tandawa (ACT) nickel project, Barangay Adlay, Carrascal municipality, Surigao del Sur Province	32,000 <sup>1</sup>	
Do.	Hinatuan Mining Corp. (Nickel Asia Corp., 100%)	Tagana-an nickel project, Talavera, Surigao del Norte Province, Hinatuan Island	25,000 <sup>1</sup>	
Do.	Libjo Mining Corp.	Libjo nickel laterite mining project, Municipalities of Tubajon and Libjo, Dinagat Islands Province	6,500 <sup>1,2</sup>	
Do.	Marcventures Mining and Development Corp.	Cantilan nickel project, Cantilan, Surigao del Sur Province	10,000 <sup>1</sup>	
Do.	Pacific Nickel Philippines Inc.	South Dinagat nickel project, Nonoc Island	2,300	
Do.	Platinum Group Metals Corp. (Global Ferronickel Holdings Inc., 100%)	Cagdianao nickel mine, Surigao del Norte Province	55,000 <sup>1</sup>	
Do.	Rio Tuba Nickel Mining Corp. (Nickel Asia Corp., 60%, and Pacific Metals Co. Ltd., 36%)	Rio Tuba nickel project, Barrio Rio Tuba, Bataraza Municipality, Palawan Province	30,000	
Do.	San Roque (SR) Metals Inc.	SR nickel project, Tubay Mine, Tubay, Agusan del Norte Province	25,000	
Do.	Taganito Mining Corp. (Nickel Asia Corp., 65%)	Taganito Mine, Barangays Hayanggaban, Urbiztondo, Taganito and Cagdianao, Municipality of Claver, Surigao del Norte Province	70,000	
Do.	Zambales Diversified Metals Corp. (DMCI Holdings Inc.)	Santa Cruz-Candelaria nickel project, Zambales Province	3,500 <sup>1,2</sup>	
Intermediate product, Ni content	Coral Bay Nickel Corp. (Sumitomo Metal Mining Co. Ltd., 54%; Sojitz Philippines Corp., 18%; Nickel Asia Corp., 10%; Rio Tuba Nickel Mining Corp., 10%)	Coral Bay nickel high-pressure acid-leach (HPLA) plant, Rio Tuba, Bataraza Municipality, Palawan Province	24,000	
Do.	Taganito HPAL Nickel Corp. (Sumitomo Metal Mining Co. Ltd., 75%; Mitsui Co. Ltd., 15%; Nickel Asia Corp., 10%)	Nickel high-pressure acid-leach (HPAL) plant, Surigao del Norte Province, Mindanao Island	36,000	
Perlite	Orophil Stonecraft Inc.	Baao, Camarines Sur Province	NA	
Do.	UBS Marketing Corp.	Legazpi, Albay Province	NA	
<b>Petroleum:</b>				
Condensate	thousand 42-gallon barrels	Consortium of Shell Philippines Exploration B.V. (SPEX) (Royal Dutch Shell plc), Chevron Malampaya LLC, and Philippine National Oil Company Exploration Corp.	Malampaya gasfield, 50 kilometers offshore of Palawan Island	4,100
Crude	42-gallon barrels	China International Mining Petroleum Co. Ltd. (CIMP)	Alegria oilfield, onshore of Cebu	2,500
Do.	do.	Consortium of Philodrill Corp., Alcorn Petroleum, Oriental Petroleum, Nido Production, AC Energy Philippines Inc., and Forum Energy Plc.	Nido (14A) and Matinloc (14B) oilfields, northwestern Palawan Province	NA
Do.	do.	Galoc Production Co. WLL	Galoc oilfield, 60 kilometers northwest of Cuion Island, Palawan Province	750,000
Refinery	thousand 42-gallon barrels	Petron Corp. (SEA Refinery Corp, 50.1%; San Miguel Corp. 18.2%; others, 31.7%)	Petron Bataan refinery, Limay, Bataan Province	65,700
Do.	do.	Pilipinas Shell Petroleum Corp.	Tabangao refinery, Batangas City, Batangas Province	40,200
Phosphate rock		Philippine Phosphate Fertilizer Corp.	Isabel, Leyte Province	NA

See footnotes at end of table.

TABLE 2—Continued  
PHILIPPINES: 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 <sup>e</sup>
Silver, mine, Ag content	kilograms	APEX Mining Company Inc.	Maco gold operation, Municipalities of Maco and Mabini, Mindanao Island	9,630
Do.	do.	Benguet Corp.	Acupan Mine, Itogon Municipality, Benguet Province	300 <sup>1</sup>
Do.	do.	Filminera Resources Corp. (mine owner and operator), and Philippines Gold Processing & Refining Corp. (processing plant owner and developer)	Masbate gold project, located 350 kilometers south of Manila, Masbate Province	5,000
Do.	do.	Carmen Copper Corp. (Atlas Consolidated Mining and Development Corp., 100%)	Toledo copper mine (Biga, Carmen, and Lutopan deposits), Central Cebu Island	3,000
Do.	do.	Greenstone Resources Corp. (Red 5 Ltd., 100%)	Siana gold project, Surigao del Norte Province, Mindanao Island	1,000
Do.	do.	Lepanto Consolidated Mining Co.	Victoria and Teresa Mines, Mankayan, Benguet Province	4,000
Do.	do.	Mindanao Mineral Processing and Refining Corp. and Philsaga Mining Corp.	Gold processing plant in Agusan del Sur Province, Mindanao Island	1,000
Do.	do.	OceanaGold Philippines Inc.	Didipio copper-gold project at the north of Luzon Island, northern Philippines	9,000 <sup>3</sup>
Do.	do.	Philex Gold Philippines Inc. (Philex Mining Corp., 100%)	Padcal Mine (Santo Tomas II deposit) Tuba Benguet Province, Luzon Island	5,000
Steel		Cathay Metal Corp. (CAMECO)	Quezon City, Metro Manila	NA
Do.		Cathay Pacific Steel Corp. (CAPASCO)	do.	NA
Do.		Henro Steel Corp.	Meycauayan City, Bulacan Province	NA
Do.		Maxima Steel Mills Corp.	Valenzuela City, Metro Manila	NA
Do.		Sagarthama Steel Trading Corp.	Binan City, Laguna Province	NA
Do.		Somico Steel Mill Corp.	Aguado, Trece Martires, Cavite City	NA
Do.	thousand metric tons	Steel Asia Manufacturing Corp.	11 plants in Luzon, Visayas, and Mindanao	2,600

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

<sup>1</sup>Properties under closure order February 2017.

<sup>2</sup>Properties under resolved order December 2018.

<sup>3</sup>Properties under suspension order February 2017.