



2017–2018 Minerals Yearbook

INDONESIA [ADVANCE RELEASE]

THE MINERAL INDUSTRY OF INDONESIA

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

In 2017, Indonesia was the world's second-ranked producer of mined tin, accounting for 27% of total mine production and 17% of the world's reserves. Indonesia was also the world's second-ranked producer of mined nickel, accounting for 16% of total mine production and 6% of the world's reserves. The country was the world's fourth-ranked producer of mined zirconium (zircon), accounting for 7% of total production (its reserves were not available). Indonesia held 3% and 5% of the world's copper and gold reserves, respectively, in 2017, and produced 3% and 2% of the world's mined copper and gold, respectively (Anderson, 2018, 2019; Flanagan, 2018, 2019; George, 2018, 2019; McRae, 2018, 2019; Bedinger, 2019).

Minerals in the National Economy

In 2017, Indonesia's real gross domestic product (GDP) growth rate was 5.1% compared with 5.0% in 2016. The nominal GDP was \$1.02 trillion; the mineral industry accounted for 7.6% of the GDP, including crude petroleum, natural gas, and geothermal energy (together accounting for 2.9% of the GDP), coal (2.4%), iron ore (0.7%), and other mining and quarrying (1.6%). The mining and quarrying sector, in terms of its portion of the GDP, increased by 0.7%. Employment in the mining and quarrying sector decreased by 5.7% to 1,391,690 (Badan Pusat Statistik, 2017, p. 99; 2018, p. 101, 624; Bank of Indonesia, 2019, p. 23; World Bank, The, 2020).

Government Policies and Programs

The Directorate General of Mineral and Coal, which is under the Ministry of Energy and Mineral Resources (MEMR), manages the country's mineral resources by formulating and implementing policy on mining activities. BPS-Statistics Indonesia collects and publishes data on mineral production and trade monthly and annually. The Oil & Gas Law of 2001 grants the Government the exclusive rights to oil and gas extraction and requires all private companies wishing to explore for and extract oil and gas resources to enter into production-sharing contracts with the Government (Global Business Guide Indonesia, 2015).

On January 12, 2014, Indonesia's ban on exports of unprocessed minerals came into effect. The ban—Government Regulation (GR) No. 4 of 2009—included provisions that required mineral products to be processed and refined domestically and prohibited the export of unprocessed minerals. The ban states that, until January 11, 2017, mining companies were to be exempted from the ban on exporting concentrate, provided that they met the minimum domestic refining requirements for each commodity, paid export duties, and committed to building smelters. As a result of the export ban, \$20 billion was invested in 32 smelters between 2012 and 2016.

In 2017, there were 24 processing and refining facilities in operation: 15 for nickel, 4 for iron, 2 for bauxite, 2 for manganese, and 1 for copper. Another 26 smelters were under construction: 15 for nickel, 4 for bauxite, 3 for lead-zinc, 2 for iron, and 2 for copper (Global Business Guide Indonesia, 2017; Library of Congress, 2017; Republika, 2018).

On January 11, 2017, the Government of Indonesia issued GR 1/2017, which extended the exemption from the ban on exporting concentrate for the next 5 years. This new regulation is intended to prevent mining companies from reducing or suspending their mining activities. As part of the implementation of GR 1/2017, however, the MEMR stipulates in Regulation No. 9/2017 that the foreign owners of mining companies are required to start divesting their ownership share in stages after the first 5 years of production and can hold a maximum of 49% ownership in the company as of the 10th year. The previous regulation allowed foreign owners of underground mines to have a 70% share, and foreign owners of processing and refining facilities, a 60% share (PricewaterhouseCoopers Inc., 2018, p. 9, 10, 50, 74; Bill Sullivan, Senior Foreign Counsel, Christian Teo and Partners Law Office, written commun., May 18, 2018).

Production

In 2017, significant production increases included that of bauxite (wet basis), which increased by 107%; feldspar, by 100% (estimated); copper (electrowon), by 97%; silver, by 78%; nickel (mine, laterite, Ni content), by 74%; lead (mine, Pb content), by 60%; alumina, by 53%; gold, by 25%; smelter tin, coal (lignite), and steel (rolled), by 20% each; tin (mine, Sn content), by 19%; gravel, by 14%; silica and cement (hydraulic), by 12% each. Significant production decreases included that of pumice, which decreased by 69%; kaolin, by 67%; limestone (crushed), by 61%; manganese and zeolites, by 38% each; iron ore, by 24%; copper (concentrates), by 16%; zirconium mineral concentrates, by 15% (estimated); and aluminum, by 11%. Large variations in the production of Indonesia's mined metals were mostly due to changes in the mining law, GR 1/2017. Data on mineral production are in table 1.

Structure of the Mineral Industry

State-owned PT Aneka Tambang Tbk (Antam) produced bauxite, ferronickel, gold, nickel, and silver. Other major state-owned companies engaged in the production of mineral commodities included PT Bumi Resources (coal), PT Indonesia Asahan Aluminium (Inalum) (aluminum), PT Krakatau Steel (steel), PT Pertamina (natural gas and refined petroleum), and PT Timah Tbk (tin). International companies were also active in Indonesia's metals mining and processing industries. Partially foreign-owned company PT Freeport Indonesia Co. (PT-FI)

mined copper and gold. Foreign-owned PT Vale Indonesia Tbk produced nickel ore, and PT Koba Tin mined tin metal. Table 2 is a list of major mineral industry facilities.

In November 2017, the Government appointed PT Inalum to take over the Government's shares in PT Antam (65%), in PT Bukit Asam (65.02%), in PT Timah Tbk (65%), and in PT-FI (9.36%), as part of the Government's plan to establish a state-owned mining holding enterprise. PT Inalum was also granted acquisition of the 41.64% divestment of PT-FI's shares, which would increase PT Inalum's shares in PT-FI to 51% (Asmarini, 2017b).

Mineral Trade

In 2017, Indonesia's exports of goods totaled \$169 billion compared with \$145 billion in 2016. Exports of mineral products were valued at \$37.6 billion compared with \$29.8 billion in 2016, including coal [\$20.5 billion, or 389 million metric tons (Mt)], crude petroleum [\$5.3 billion, or 102 million barrels (Mbb)], copper concentrate (\$3.4 billion, or 1.5 Mt), nickel ore (\$155 million, or 4.9 Mt), and bauxite (\$66 million, or 1.7 Mt). Japan was the leading destination for Indonesia's exports of copper concentrate (receiving 29%, in terms of value). China received 100% of Indonesia's bauxite exports and 97% of its nickel ore exports (Bank of Indonesia, 2019, p. 38; 2020a, b; United Nations Statistics Division, 2020).

Indonesia's imports of goods totaled \$150 billion compared with \$129 billion in 2016. Imports of mineral commodities (excluding crude petroleum) were valued at \$1.9 billion compared with \$1.3 billion in 2016, including coal (\$641 million, or 4.4 Mt) and granite [(5.5 million, or 57,000 metric tons (t)]. Imports of crude petroleum were valued at \$7.1 billion (Bank of Indonesia, 2019, p. 38; 2020c, d; United Nations Statistics Division, 2020).

Commodity Review

Metals

Bauxite and Alumina.—In 2016, PT Antam, which was partially owned by PT Inalum, started to develop its smelter-grade alumina refinery project in Mempawah. In the first phase, the project would have a capacity of 1 million metric tons per year (Mt/yr) of alumina. The second phase would add an additional 1 Mt/yr of capacity. Through the project, PT Antam expected to process its bauxite, supply alumina to PT Inalum's aluminum smelter (in Kuala Tanjung), and lower its dependence on alumina imports (PT Aneka Tambang Tbk, 2018, p. 27, 322).

In 2017, Showa Denko of Japan opted to put its 20% share in the joint venture that had operated PT Indonesia Chemical Alumina (ICA) since 2014. PT Antam owned the remaining 80% share of PT ICA, and Showa Denko was seeking to sell its shares to PT Antam (PT Aneka Tambang Tbk, 2018, p. 124).

Copper and Gold.—PT Amman Mineral Nusa Tenggara (AMNT) purchased a 48.5% ownership share in the Batu Hijau copper mine from Newmont Mining Corp. of the United States in November 2016. The mine produced about 187,000 t of copper and 21,804 kilograms (kg) of gold in 2016 (the latest year for which data were available).

In 2017, PT AMNT planned to reduce the workforce by 20%, or by about 700 employees, owing to decreased production that was driven by a delay in the development in the Batu Hijau Mine. The company was planning to construct a smelter near the mine. The smelter would have the capacity to process 2 Mt/yr of copper concentrate. Construction of the smelter was planned to begin in early 2018 and to be completed within the next 5 years (Asmarini, 2017a; Jakarta Post, The, 2017a; Newmont Mining Corp., 2017, p. 37).

Since August 2017, PT-FI had been in discussion with the Government of Indonesia regarding conversion from a contract of work to a special mining business license (Izin Usaha Pertambangan Khusus, or IUPK). The license would include the right to export copper concentrate until January 2022, long-term mining rights through 2041, construction of a PT-FI smelter in 5 years, and the divestment of 51% of the Grasberg project area shares to PT Inalum. The company received its temporary IUPK in 2017 and agreed to complete negotiations and the required documentation of the IUPK during the first half of 2018. PT-FI managed one of the world's largest copper and gold deposits at the Grasberg minerals district in Papua Province. This district had copper and gold reserves of more than 11 Mt and about 720 t, respectively. PT-FI's copper and gold production in 2017 was 446,000 t and 48,340 kg, respectively, compared with 482,200 t and 33,000 kg, respectively, in 2016. The Grasberg open pit mine was expected to cease operations owing to its low efficiency, and the Grasberg Block Cave underground mine was expected to commence operations in early 2019 (Freeport-McMoRan Inc., 2018, p. 3, 24, 26, 43, 107).

Nickel.—PT Vale Indonesia Tbk (a subsidiary of Vale S.A. of Brazil) produced 76,807 t of nickel in matte in 2017 compared with 77,581 t in 2016. The decrease in production was due to lower ore grades. In 2017, PT Vale Indonesia Tbk planned to expand the production capacity of its nickel smelter in Sorowako, South Sulawesi Province, to 90,000 metric tons per year (t/yr) of nickel in matte by 2019, from 80,000 t/yr. The company also planned to build a \$2 billion ferronickel smelter in Pomalaa, Southeast Sulawesi Province. Construction of the smelter would start in 2018, and production was expected to commence in 2023 (Singgih, 2017c; Vale S.A., 2018, p. 18).

In 2017, PT Antam's nickel ore production increased by 241% to 5.57 million wet metric tons from 1.64 million wet metric tons in 2016. PT Antam's nickel ore was used as ore feed for the Pomalaa ferronickel plant as well as for domestic sale and export. PT Antam produced 21,762 t of nickel contained in ferronickel in 2017 compared with 20,293 t in 2016 (PT Aneka Tambang Tbk, 2018, p. 11, 12).

In March 2017, the Government granted PT Antam a permit to export 2.7 million wet metric tons of low-grade nickel ore (that is, less than 1.7% nickel); the permit was determined in accordance with the total capacity (27,000 t/yr of nickel in ferronickel) of its three ferronickel plants in Pomalaa. In July 2017, PT Ceria Nugraha Indotama obtained a permit to export 2.3 Mt of nickel ore on the terms of the company's planned smelter in Kolaka, Southeast Sulawesi Province. The permit led to the short-term price drop of benchmark nickel for 3-month delivery on the London Metals Exchange by nearly 3% to \$9,130 per metric ton; as a result, 17 smelters in Indonesia

halted operations in early July 2017 compared with 13 inactive smelters in June (Jakarta Post, The, 2017b; Singgih, 2017b; PT Aneka Tambang Tbk, 2018, p. 104, 281).

Tin.—As of 2017, PT Timah Tbk—the leading tin producer in Indonesia—reported total tin reserves of 378,000 t in the Bangka Belitung Islands compared with 336,000 t in 2016. In 2017, the company produced 31,178 t of tin (Sn content) compared with 24,121 t in 2016 and 30,249 t of refined tin compared with 23,759 t in 2016. The increases were attributed to improvement in the company’s operational performance and to a more favorable financial situation. The company exported 95% of its refined tin to countries in Asia, Europe, and the Americas through the port in Singapore (PT Timah Tbk, 2018, p. 40, 61, 127).

Mineral Fuels

Coal.—Major Indonesian coal mining companies sought to acquire local coal producers in order to increase their production capacity and replace their exhausted coal fields with productive fields. These major coal miners included Adaro Energy, AMB Investama, Dian Swastika Sentosa, Indika Energy, Indo Tambangraya Megah, and PT Tambang Batubara Bukit Asam. Another reason behind the acquisitions was the rising coal price since mid-2016 after the decline that began in mid-2012. This price recovery was owing to China’s coal-mining policies designed to control coal prices by reducing domestic coal production (Indonesia Investments, 2017).

The Government of Indonesia decided to defer placing a cap on coal production owing to difficulties in overseeing coal-mining activities in the country and an expected increase in nontax revenues. To save the resources for future generations, the Government previously had planned to reduce coal production to 419 Mt in 2016 and to limit production to 400 Mt/yr beginning in 2019; however, coal production exceeded 450 Mt in both 2016 and 2017 (table 1; Singgih, 2017a; PricewaterhouseCoopers Inc., 2019, p. 18).

In November 2017, the MEMR revoked the coal mining work agreement of Asmin Koalindo Tuhup (AKT), claiming breach of contract and negligence. AKT, which operated its mine located in Central Kalimantan Province, was the country’s only hard coking coal producer. From January to early November 2017, AKT mined 1.2 Mt of hard coking coal and exported a large amount of the output (S&P Global Platts, 2017).

MINERAL INDUSTRY HIGHLIGHTS IN 2018

Minerals in the National Economy

In 2018, Indonesia was the world’s leading producer of nickel (accounting for 25% of total mine production) and the world’s second-ranked producer of mined tin (accounting for 27% of total mine production) (Anderson, 2020; McRae, 2020).

In 2018, Indonesia’s nominal GDP was \$1.04 trillion. The real GDP growth rate was 5.2%. The mining and quarrying sector, in terms of its portion of the GDP, increased by 2.2% owing to rising commodity prices in the first half of 2018 and increases in ore production and concentrate exports. The mineral industry contributed 8.1% of the GDP, including the production of crude petroleum, natural gas, and geothermal energy (which

together accounted for 3.1% of the GDP), coal (2.7%), iron ore (0.8%), and other mining and quarrying (1.5%). Employment in the mining and quarrying sector increased by 4.5% to 1,454,256 (Badan Pusat Statistik, 2019, p. 97, 640; Bank of Indonesia, 2019, p. 23, 25; World Bank, The, 2020).

In 2018, Indonesia’s exports of goods totaled \$180.7 billion. Exports of mineral products were valued at \$44.1 billion, including coal (\$24 billion, or 429 Mt), crude petroleum (\$5.1 billion, or 75 Mbbbl), copper concentrate (\$4.2 billion, or 1.6 Mt), nickel ore (\$628 million, or 19.8 Mt), and bauxite (\$265 million, or 8.7 Mt). Indonesia’s imports of goods totaled \$181.2 billion. Imports of mineral products (excluding crude petroleum) were valued at \$2.5 billion, including coal (\$900 million, or 5.4 Mt) and granite (\$4.5 million, or 16,000 t). Imports of crude petroleum were valued at \$9.2 billion (Bank of Indonesia, 2019, p. 38; 2020a–d; United Nations Statistics Division, 2020).

In 2018, in implementation of GR 8/2018, the Government issued MEMR Decree No. 1395 K/30/MEM/2018 (as amended by Decree No. 1410 K/30/MEM/2018). Through these regulations, the MEMR set the maximum price at \$70 per metric ton for coal sold to electricity utilities for the public (PricewaterhouseCoopers Inc., 2019, p. 8).

Other major mining laws amended in 2018 included MEMR Regulation 11/2018 (as amended by MEMR Regulation 22/2018) on Procedures of Granting of Area, Licensing and Reporting in Mineral and Coal Mining Business Activity; MEMR Regulation 25/2018 on Mineral and Coal Mining Business; MEMR Regulation 26/2018 on the Implementation of Good Mining Rules and Supervision of Mineral and Coal Mining; MEMR Decree No. 1826 K/30/MEM/2018 on Guidelines for Application, Evaluation, and Approval of Grants of Recommendation for Export; and GR 37/2018 on Treatment of Taxation and/or Non-Tax State Revenue in the Field of Mineral Mining Business (Karyadi, 2019; PricewaterhouseCoopers Inc., 2019, p. 8, 72).

Production

In 2018, production of iron (direct-reduced) increased by 977%; bauxite (wet basis), by 279%; zircon mineral concentrates, by 82% (estimated); nickel (mine, laterite, Ni content), by 71%; lead (mine, Pb content), by 38% (estimated); gold, by 34%; steel (rolled), by 28%; raw steel, bituminous coal, and lignite, by 19% each (estimated); subbituminous coal, by 18% (estimated); lead (refinery, secondary), by 17%; ferronickel, by 14%; iodine, by 12%; and aluminum, by 11%. Production of manganese decreased by about 88%; iron ore, by 61%; copper (electrowon), by 26%; and feldspar, by 23% (estimated). Data on mineral production are in table 1.

Commodity Review

Metals

Copper and Gold.—In 2018, PT–FI’s mined copper (Cu content) and mined gold (Au content) production increased by 18% to 526,200 t and by 55% to 75,150 kg, respectively; however, production of copper and gold was expected to

decrease in 2019 and 2020 owing to the transition from open pit mining to underground mining. For this reason, consolidated sales in copper and gold were expected to decrease by 46% and 67%, respectively, in 2019. Rio Tinto plc and Freeport-McMoRan had signed an agreement to transfer their stakes in PT-FI's Grasberg Mine to PT Inalum. Rio Tinto had previously held a 40% participating interest in PT-FI and Freeport-McMoRan had wholly owned PT Indocopper Investama, which had held a 9.36% interest in PT-FI. After the \$3.85 billion transaction, PT Inalum held a 51.24% share (previously a 9.36% share) of PT-FI; and Freeport-McMoRan, a 48.76% share. With the closing of the transaction in 2018, PT-FI was granted a new IUPK. Under the IUPK, the company received an extension of mining rights through 2031, along with the ability to extend mining rights to 2041 (Freeport-McMoRan Inc., 2019, p. 12, 24, 41, 42, 79).

Nickel.—In June 2018, PT Megah Surya Pertiwi (PT MSP) commenced operation of the fourth ferronickel smelter line at its plant in South Halmahera, North Maluku; the new line had a production capacity of 60,000 t/yr. The company's total capacity, including that of the three preexisting 60,000-t/yr-capacity lines, brought the plant's total production capacity to 240,000 t/yr of ferronickel. PT MSP received raw materials from PT Gane Permai Sentosa and PT Trimegah Bangun Persada, which were subsidiaries of the Harita Group. The Harita Group held a 60% share in PT MSP, and Xinxing Ductile Iron Pipes Co. Ltd. of China held the remaining 40% share (Guitarra, 2018).

Lead and Zinc.—In September, PT Bumi Resources Minerals Tbk (BRMS)—a member of Bakrie Group—completed the sale of a 51% share in PT Dairi Prima Mineral (DPM) to China Nonferrous Metal Industry's Foreign Engineering and Construction Co. Ltd. for \$198 million. Previously, BRMS had acquired a 20% share in PT DPM from PT Antam for \$57.3 million and became a full owner in March. PT DPM, which was a lead-zinc and silver mining company, had obtained a 30-year production permit for the Dairi deposit in North Sumatra in 2017. PT DPM reported that the deposit had reserves of 1.2 Mt of zinc, 700,000 t of lead, and more than 93 t of silver. The company expected to begin mining by the end of 2019 (Insider Stories, The, 2018; Suzuki, 2018).

Mineral Fuels

Coal.—Under the domestic market obligation (DMO) scheme, coal-mining companies were required to allocate a specific portion of their output to the domestic market. The MEMR set the figure at 25% for 2018–19. These companies were also obligated to sell their coal for use in Indonesian powerplants at the cap of \$70 per metric ton in 2018–19, which was lower than the market price of more than \$100 per metric ton in 2018. Through the DMO, the Government expected to keep the electricity price stable (Sulaiman, 2018; Bridle and others, 2019).

Outlook

In accordance with MEMR Regulation No. 9/2017, the Government is likely to relax or adjust the regulation banning the export of unprocessed minerals in the coming years to help the mining sector recover Indonesia's metallic ore output and to increase export revenue. This adjustment in policy may result in

temporary positive effects on mineral production. On the other hand, foreign mining companies are expected gradually to divest their shares to local parties or to exit Indonesia entirely in the next few years. Indonesia plans to become a major producer of electric vehicles (EV) by directly supplying nickel to EV lithium-ion battery manufacturers planned in Indonesia and attracting global automakers to build EV factories near these battery manufacturers. These plans likely will lead to further export control for nickel ore and associated raw materials.

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TABLE 1
INDONESIA: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons, gross weight, unless otherwise specified)

Commodity ²	2014	2015	2016	2017	2018	
METALS						
Aluminum:						
Bauxite, wet basis	thousand metric tons	2,555	472	1,400	2,900 ^e	11,000 ^e
Alumina		--	70,000	600,000 ^e	917,099	842,536
Aluminum, metal, primary		264,474 ^r	257,149 ^r	245,483 ^r	218,816	242,043
Cobalt, mine, Co content ^e		1,300	1,300	1,200 ^r	1,200	1,200
Copper:						
Mine, Cu content:						
Concentrates		377,400 ^r	577,300	716,200 ^r	598,800	634,000
Solvent extraction ³		1,416 ^r	1,226 ^r	11,760 ^r	23,160	17,071
Total		378,816	578,526	727,960	621,960	651,071
Smelter, primary		236,900 ^r	199,700 ^r	255,700 ^r	247,176	230,924
Refinery, primary:						
Electrowon		1,416 ^r	1,226 ^r	11,760 ^r	23,160	17,071
Other		232,000 ^r	197,100 ^r	249,000 ^r	245,000	243,400
Total		233,416	198,326	260,760	268,160	260,471
Ferroalloys:						
Ferronickel, including nickel pig iron		119,510	358,494	860,114	856,761	857,166
Silicomanganese		25,000 ^r	30,000 ^r	40,000 ^r	40,000	--
Gold, mine, Au content	kilograms	69,023 ^r	92,171 ^r	80,868 ^r	101,000	135,000
Iron ore, iron sand, dry basis:						
Gross weight	thousand metric tons	3,162 ^r	3,056 ^r	2,574 ^r	1,967	760
Fe content	do.	1,770 ^r	1,710 ^r	1,440 ^r	1,100	426
Iron and steel:						
Direct-reduced iron	do.	155	53	--	22	237
Pig iron	do.	1,730 ^r	2,460 ^r	2,640 ^r	2,650	2,730
Steel:						
Raw steel	do.	4,428	4,854	4,746 ^r	5,195	6,183
Products, semimanufactured, rolled	do.	6,475	6,168	6,552	7,866	10,045
Lead:^e						
Mine, Pb content		5,000	5,000	5,000	8,000	11,000
Refinery, secondary		46,000 ^r	46,000 ^r	48,000 ^r	46,000	54,000
Manganese, mine, concentrate:						
Gross weight		50,000 ^r	45,000 ^r	90,000 ^r	56,012	8,000
Mn content		21,833 ^r	19,650 ^r	39,300 ^r	24,459	3,000
Nickel, Ni content:						
Mine, laterite ore		177,100 ^r	129,600 ^r	204,000 ^r	355,000	606,000
Smelter, matte		78,726 ^r	81,177	77,581	76,807	74,806
Ferronickel		16,851	17,211	20,293	21,762	24,868
Nickel pig iron		--	27,200 ^e	75,900 ^e	74,800 ^e	73,300 ^e
Silver, mine, Ag content	kilograms	119,189	151,934	185,234 ^r	329,000	309,000
Tin:						
Mine, Sn content		88,319 ^r	70,361 ^r	69,621 ^r	83,000	85,000
Smelter, primary		69,800 ^r	67,400 ^r	66,900 ^r	80,000	81,427
Zirconium, concentrates ^e		21,000	30,900	34,800 ^r	29,500	53,700
INDUSTRIAL MINERALS						
Cement, hydraulic	thousand metric tons	56,760	59,850	62,000 ^e	69,279	75,213
Clay, kaolin ^e		1,900,000	700,000	2,300,000	750,000	750,000
Diamond, industrial	thousand carats	7	--	--	--	--
Feldspar ^e		1,500,000	1,200,000	1,300,000	2,600,000	2,000,000
Iodine		56	45	35 ^r	34	38
Pumice		440,000 ^e	49,000	650,000 ^e	200,000	200,000
Salt		2,192,168	600,000 ^e	1,000,000 ^{r,e}	1,000,000 ^e	1,000,000 ^e
Sand and gravel, industrial, silica^e						
Stone, sand, and gravel, construction:		3,700,000	4,400,000	4,900,000	5,500,000	5,500,000
Gravel						
Gravel		63,014,000	31,464,000	84,679,000	96,573,000	90,000,000 ^e
Stone:						
Crushed, limestone		36,000,000	12,000,000	31,000,000	12,000,000	12,000,000 ^e
Size and shape unspecified, marble		1,909,000	1,429,000	1,652,000	1,545,000	1,550,000 ^e

See footnotes at end of table.

TABLE 1—Continued
INDONESIA: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons, gross weight, unless otherwise specified)

Commodity ²	2014	2015	2016	2017	2018
METALS—Continued					
Zeolites ⁶	220,000	200,000	210,000	130,000	130,000
MINERAL FUELS AND RELATED MATERIALS					
Coal:					
Bituminous	167,042,000 ^r	157,884,000 ^r	163,634,000 ^r	165,804,000	197,000,000 ^e
Lignite	58,005,000 ^r	49,022,000 ^r	67,667,000 ^r	81,451,000	97,000,000 ^e
Subbituminous	229,749,000 ^r	252,429,000 ^r	221,556,000 ^r	212,082,000	250,000,000 ^e
Total	454,796,000 ^r	459,335,000 ^r	452,857,000 ^r	459,337,000	544,000,000
Natural gas	million cubic meters	76,400 ^r	76,200 ^r	75,100 ^r	72,900
Petroleum, crude, including condensate	thousand 42-gallon barrels	309,155 ^r	305,870 ^r	319,740 ^r	305,870

⁶Estimated. ^rRevised. do. Ditto. -- Zero.

¹Table includes data available through January 17, 2020. All data are reported unless otherwise noted. Estimated data are rounded to no more than three significant digits.

²In addition to the commodities listed, bentonite, coal (metallurgical), dolomite, gypsum, ilmenite, coalbed methane, nitrogen (from ammonia), petroleum refinery products, phosphate rock, and sulfur may have been produced, but available information was inadequate to make reliable estimates of output.

³The copper content of solvent extraction output at the mine level is the same as electrowon refinery output because copper produced in the solvent extraction and electrowinning process is typically reported only at the refinery level.

TABLE 2
INDONESIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2018

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Locations of main facilities	Annual capacity ^e
Aluminum:				
Bauxite		PT Antam Tbk (PT Inalum, 65%, and the public, 35%)	Kijang, Bintan Island, Riau	1,300
Do.		do.	Kalimantan, Borneo	600
Alumina, chemical grade		PT Indonesia Chemical Alumina (PT Antam Tbk, 100%)	Tayan CGA plant, West Kalimantan	300
Metal		PT Indonesia Asahan Aluminium (PT Inalum) (Government, 100%)	Kual Tanjung, North Sumatra	250
Cement		PT Holcim Indonesia Tbk (LafargeHolcim, 80.64%)	Plants at Narogong, Cilacap, and Tuban	12,500
Do.		PT Indocement Tunggul Prakarsa Tbk (HeidelbergCement Group, 61.5%)	Cirebon and Citeureup, West Java; Tarjun, South Kalimantan	25,000
Do.		PT Lafarge Cement Indonesia (LafargeHolcim)	Plants at Besar and Lhok, Aceh	3,000
Do.		PT Semen Baturaja (Government, 76.24%, and others, 23.76%)	Baturaja-Ogan Komering Ulu, South Sumatra	3,850
Do.		PT Semen Bosowa Maros	Kabupaten Maros, South Sulawesi	4,200
Do.		PT Semen Indonesia Tbk (Government, 51%, and others, 49%)	Plants at Gresik, Padang, and Tonasa	34,800
Coal		PT Adaro Indonesia (New Hope Corp., 50%; PT Asminco Bara Utama, 40%; Mission Energy, 10%)	Paringin and Tutupan, South Kalimantan	35,000
Do.		PT Arutmin Indonesia (PT Bumi Resources Tbk, 80%, and Bakrie Group, 20%)	Mulia, Senakin, and Satui, South Kalimantan and Asam-Asam, East Kalimantan	20,000
Do.		PT Berau Coal (PT United Tractors, 60%; PT Armadian, 30%; Nissho Iwai, 10%)	Berau, East Kalimantan	13,000
Do.		PT Kaltim Prima Coal Co. (PT Sitrade Coal, 32.4%; Bhira Investments Ltd., 30%; PT Bumi Resources, 13.6%; Sangatta Holding Ltd., 9.5%; Kalimantan Coal Ltd., 9.5%; Kutai Timur Sejahtera, 5%)	East Kutai Regency, East Kalimantan	55,000
Do.		PT Kideco Jaya Agung (Samtan Co. Ltd., 100%)	Paser, East Kalimantan	12,000
Do.		PT Tambang Batubara Bukit Asam (PT Inalum, 65.02%, and public, 34.98%)	Tanjung Enim and Ombilin, South Sumatra	19,000
Do.		PT United Tractors	Central Kalimantan and East Kalimantan	6,500
Copper:				
Concentrate, Cu content		PT Amman Mineral Internasional, 82.2%, and PT Pukuafu Indah, 17.8%	Batu Hijau Mine, Sumbawa Island, West Nusa Tenggara	300
Do.		PT Freeport Indonesia Co. (PT Inalum, 51.24%, and Freeport-McMoRan Inc., 48.76%)	Grasberg Mine, Papua	600
Metal		PT Smelting Co. (Mitsubishi Materials Corp., 60.5%; PT Freeport Indonesia Co., 25%; others, 14.5%)	Gresik, East Java	270
Feldspar		Multiple quarrying establishments (24)	Multiple quarry locations	2,500
Gas:				
Coalbed methane	million cubic meters per day	Ephindo Energy Pvt. Ltd. (PT Pertamina, 52%, and Dart Energy Ltd., 24%)	Sangatta, East Kalimantan	14
Natural	do.	ConocoPhillips Co., 54%; Talisman Energy Inc., 36%; PT Pertamina, 10%	Corridor block, South Sumatra	23
Do.	do.	ExxonMobil Oil Indonesia	Arun and Aceh, North Sumatra	48
Do.	do.	PT Pertamina (state-owned)	Sanga Sanga block, East Kalimantan	20
Do.	do.	Total E&P Indonesia	Offshore East Kalimantan	59
Liquefied		PT Arun LNG Co. Ltd. (Government, 55%; Mobil Oil Co., 30%; Japan Indonesia LNG Co., 15%)	Blang Lancang, Aceh, North Sumatra	12,500
Do.		PT Badak LNG Co. Ltd. (Government, 55%; HUFFCO Group, 30%; Japan Indonesia LNG Co., 15%)	Bontang, East Kalimantan	22,500
Gold:				
Mine, Au content	metric tons	Bluenose Gold Corp., 80%, and Zinton Investments Ltd., 20%	Buduk Mine, West Kalimantan	1
Do.	do.	Indo Resources Pacific Inc., 75%	Woyla Mine, Aceh	1
Do.	do.	Kingrose Mining Ltd., 85%, and private Indonesian investors, 15%	Way Linggo Mine, Lampung	1

See footnotes at end of table.

TABLE 2—Continued
INDONESIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2018

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Locations of main facilities	Annual capacity ^e
Gold:—Continued				
Mine, Au content	metric tons	PT Agincourt Resources	Martabe Mine, North Sumatra	8
—Continued				
Do.	do.	PT Amman Mineral Internasional, 82.2%, and PT Pukuafu Indah, 17.8%	Batu Hijau Mine, Sumbawa Island West Nusa Tenggara	20
Do.	do.	PT Antam Tbk, 100%	Cibalung Mine, Banten	1
Do.	do.	do.	Pongor Mine, West Java	3
Do.	do.	PT Freeport Indonesia Co. (PT Inalum, 51.24%, and Freeport-McMoRan Inc., 48.76%)	Mine at Grasberg, Papua	110
Do.	do.	Newcrest Mining Ltd., 75%, and PT Antam Tbk, 25%	Gosowong (Toguraci) Mine, North Maluku	14
Do.	do.	PT J Resource Asia Pasifik Tbk, 100%	Seruyung Mine, East Kalimantan	2
Do.	do.	PT J Resource Asia Pasifik Tbk, 80%	Bakan Mine, North Sulawesi	46
Do.	do.	PT J Resource Asia Pasifik Tbk, 80%, and PT Leborg Gold, 20%	North Lanut Mine, North Sulawesi	4
Do.	do.	Private Indonesian investors, 55%	Mirah Mine, Kalimantan	1
Do.	do.	Private owner, 100%	Manado Mine, North Sulawesi	NA
Do.	do.	PT Rajawali Corp., 100%	Toka Tindung Mine, North Sulawesi	5
Do.	do.	Straits Resources Ltd., 100%	Mt Muro Mine, Central Kalimantan	6
Refinery	do.	PT Antam Tbk, 100%	Logam Mulia Refinery, Jakarta Raya, Jakarta	60
Gravel		Multiple quarrying establishments (4,279)	Multiple quarry locations	100,000
Kaolin		Multiple quarrying establishments (12)	do.	2,700
Nickel:				
Ni content in ferronickel		PT Antam Tbk (PT Inalum, 65%, and the public, 35%)	Pomalaa, South Sulawesi	27
Do.		PT Megah Surya Pertiwi (Harita Group, 60%, and Xinxing Ductile Iron Pipes Co. Ltd., 40%)	South Halmahera, North Maluku	NA
Ni content in ore		PT Antam Tbk (PT Inalum, 65%, and the public, 35%)	Pomalaa, South Sulawesi and on Gebe Island	80
Do.		PT Vale Indonesia Tbk (Vale Canada Ltd., 58.73%; Sumitomo Metal Mining Co. Ltd, 20%; others 21.27%)	Sorowako, South Sulawesi	70
Ni content in matte		do.	do.	80
Nickel-iron, ore, gross weight		PT Yiwan Mining (China Nickel Resources Holdings Co. Ltd., 80%)	Mekarsari, South Kalimantan	3,000
Nitrogen, N content		PT Asean-Aceh Fertilizer (Government, 60%, and other members of the Association of Southeast Asian Nations, 40%)	Lhokseumawe, North Sumatra	500
Do.		PT Pupuk Iskandar Muda (Government, 100%)	do.	500
Do.		PT Pupuk Kalimantan Timur (Government, 100%)	Bontang, East Kalimantan	1,850
Do.		PT Pupuk Kujang	Cikampek, West Java	330
Do.		PT Pupuk Sriwijawa (Government, 100%)	Palembang, South Sumatra	1,440
Petroleum:				
Crude	thousand 42-gallon barrels per day	BP Indonesia (BP p.l.c.)	Arjuna and Arimbi, offshore West Java	170
Do.	do.	Cepu Cooperation Contract (operated by ExxonMobil Cepu Ltd., 45%)	Cepu Block, Central Java and East Java	165
Do.	do.	China National Offshore Oil Co.	Offshore southeastern Sumatra	100
Do.	do.	Maxus Southeast Asia Ltd. (Maxus Energy Corp.)	Cinta and Rama, offshore southeast Sumatra	95
Do.	do.	PT Caltex Pacific Indonesia (Texaco Inc., 50%, and Chevron Corp., 50%)	Minas, Duri, and Bangko, central Sumatra	700
Do.	do.	PT Pertamina (Government, 100%)	Jatibarang, West Java, and Bunyu, offshore East Kalimantan	80
Do.	do.	Total E&P Indonesia (Total S.A.)	Handi and Bakapai onshore and offshore East Kalimantan	180
Refined	do.	PT Pertamina (Government, 100%)	Refineries at 6 locations	1,000
Pumice		Multiple quarrying establishments (340)	Multiple quarry locations	800
Salt		PT Puncak Keemasan Garam Dunia	Kupang, East Nusa Tenggara Province	400
Silica, quartz sand		Multiple quarrying establishments (185)	Multiple quarry locations	6,000

See footnotes at end of table.

TABLE 2—Continued
 INDONESIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2018

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Locations of main facilities	Annual capacity ^c
Silver, mine, Ag content	metric tons	PT Antam Tbk (PT Inalum, 65%, and the public, 35%)	Bogor, West Java	25
Do.	do.	PT Freeport Indonesia Co. (PT Inalum, 51.24%, and Freeport-McMoRan Inc., 48.76%)	Ertzberg and Grasberg, Papua	220
Do.	do.	PT Kelian Equatorial Mining (Rio Tinto Group, 90%, and PT Harita Jaya Raya, 10%)	180 kilometers west of Samarinda	10
Steel, raw		PT Ispat Indo	Sidoarjo, Surabaya	700
Do.		PT Krakatau Steel (Government, 100%)	Cilegon, West Java	2,400
Do.		PT Wahana Garuda Lestari	Pulogadung, Jakarta	410
Stone:				
Limestone		Multiple quarrying establishments (2,754)	do.	40,000
Marble		Multiple quarrying establishments (29)	do.	2,000
Tin:				
Ore, Sn content		PT Timah Tbk (PT Inalum, 65%, and the public, 35%)	Onshore and offshore islands of Bangka, Belitung, and Singkep	60
Metal		PT Refined Banka Tin	Banka Belitung Islands	36
Do.		PT Timah Tbk (PT Inalum, 65%, and the public, 35%)	Mentok smelter, Bangka Island, South Sumatra	68
Do.	do.		Smelters at Banka and Kundur	70
Zeolites		Multiple quarrying establishments (5)	Multiple quarry locations	300

^cEstimated: estimated data are rounded to no more than three significant digits. Do., do. Ditto. NA Not available.