



2017–2018 Minerals Yearbook

INDIA

THE MINERAL INDUSTRY OF INDIA

By Karine M. Renaud

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

In 2017, India ranked 1st in the world in the production of iron oxide pigments; 2d in the production of barite, cement, talc and pyrophyllite, and wollastonite; 3d, of aluminum, garnet, kaolin, kyanite and sillimanite, pig iron, salt, and raw steel; 4th, of alumina, chromium, coal, feldspar, graphite, iron ore (Fe content), nitrogen (ammonia), and zinc; 5th, of bauxite, bentonite, and rutile; 6th, of bromine, ilmenite, and fuller's earth; 7th, of lead, lime, and mica (natural); 8th, of manganese, sulfur, and vermiculite; 11th, of magnesium compounds; 12th, of silicon; 15th, of phosphate rock; and 16th, of gypsum. The country's estimated share of world production for wollastonite in 2017 was 20%; barite, 18%; garnet, 15%; talc and pyrophyllite, 12%; kaolin, 11%; chromium and salt, 10% each; coal, iron ore (Fe content), and nitrogen (ammonia), 8% each; bauxite and cement, 7% each; aluminum, feldspar, mica (scrap and flake), pig iron, raw steel, and zinc, 6% each; and alumina and ilmenite, 5% each (Apodaca, 2019; Bedinger, 2019; Bolen, 2019a, b; BP p.l.c., 2019, p. 44; Bray, 2019a–c; Corathers, 2019a, b; Crangle, 2019; Curry, 2019a–c; Jasinski, 2019; Klochko, 2019; McRae, 2019; Olson, 2019a, b; Schnebele, 2019a, b; Schulte, 2019; Tanner, 2019a–d; Thomas, 2019; Tuck, 2019a, b; van Oss, 2019; West, 2019).

Minerals in the National Economy

In 2017, India's real gross domestic product (GDP) increased by 7.0% compared with an increase of 8.3% in 2016. The nominal GDP in 2017 was \$2.63 trillion. In fiscal year 2017 (which ran from April 1, 2016, through March 31, 2017), the mining and quarrying sector accounted for 2.4% of the GDP compared with 2.6% in fiscal year 2016 (which ran from April 1, 2015, through March 31, 2016). In fiscal year 2016, the manufacturing sector accounted for 16.1% of the GDP compared with 16.3% in fiscal year 2015 (Ministry of Statistics and Programme Implementation, 2016, cover; 2017, cover; World Bank, The, 2019; International Monetary Fund, 2020, p. 3).

Government Policies and Programs

In 2017, the Government approved the new National Steel Policy 2017. The new policy sets a goal for India's steel sector to achieve 300 million metric tons per year (Mt/yr) of steel capacity by 2030. The Government would provide incentives to increase steel consumption to 160 kilograms per capita from 60 kilograms per capita by investing in infrastructure, automobiles, and housing, and making sure that the supplies of raw materials and energy required for steelmaking, such as iron ore, coal, and natural gas, are available domestically (Press Information Bureau, 2017).

The amended Mines and Minerals (Development and Regulations) Act, 1957 (MMDR) was passed by the Parliament

in 2016. The objectives of the MMDR are to identify illegally obtained mining licenses, make the process of allocating licenses more transparent, ensure that licenses are allocated only through auctions, improve the living conditions of communities around mines, and give States the rights to award licenses with approval from the central Government. Under the MMDR, the minerals in India are divided into categories of major minerals and minor minerals. Major minerals include bauxite, bentonite, chromite, coal, copper, diamond, fluorite, garnet, gold, graphite, ilmenite, iron ore, kyanite, lead, limestone, magnesite, manganese, marble, natural gas, petroleum, phosphate rock, rutile, salt, selenite, sillimanite, silver, sulfur, tin, uranium, vermiculite, wollastonite, and zinc. Minor minerals include barite, calcite, clay, corundum, diasporite, dolomite, dunite, feldspar, granite, gypsum, kaolin, mica, ochre, quartz, and talc (Bhushan, 2015; Times of India, The, 2016; Indian Bureau of Mines, 2017; prsindia.org, 2018).

Production

The production of minor minerals has not been reported by the Indian Bureau of Mines since 2015. The production estimates of minor minerals in table 1 are based on past levels of production and occasional data reports published in the mass media. In 2017, the production of refined cadmium (primary) increased by 190%; refined and smelter copper (secondary), by 186% each; kaolin (crude, marketable), by 183%; kyanite, by 142%; kaolin (processed, marketable), by 139%; phosphate rock (P_2O_5 content, including apatite), by 133%; phosphate rock (gross weight), by 92%; abrasives (garnet), by 75%; zirconium (zircon), by 65%; ferroalloys (ferrotitanium), by 68%; sulfur (byproduct of petroleum and fertilizer, S content), by 43%; refined zinc (primary), by 31%; barite, by 30%; mined zinc (Zn content), by 26%; diamond (industrial) and sillimanite, by 25% each; refined lead (primary), by 23%; diamond (natural, gem quality), by 22%; ferromanganese, by 21%; aluminum metal (primary), rare earths (mineral concentrate, oxide-equivalent), and monazite concentrate (gross weight), by 20% each; mined lead (Pb content), by 19%; silver (smelter, Ag content), by 18%; graphite (amorphous), graphite (crystalline flake), and silver (refined), by 17% each; gold (bullion), by 16%; silicomanganese and mined tin (concentrate, gross weight), by 15% each; bentonite and smelter tin (primary), by 11% each; iron ore (Fe content), by 10%; direct-reduced iron, iron ore (gross weight), finished steel products, and mined uranium (U content), by 9% each; mica scrap and waste, by 8%; distillate fuel oil and fuel oil products, by 7%; smelter copper (primary), refined copper (primary), raw steel, refined petroleum (other products), and industrial sand, by 6% each (table 1).

In 2017, the production of mined fluorite decreased by 42%; calcite and magnesite, by 41% each; vermiculite, by 34%;

ferrosilicomagnesium and refined tin (secondary), by 21% each; ferromolybdenum, by 19%; titanium (ilmenite and leucoxene), by 16%; dolomite and mined gold (ore, gross weight), by 15% each; titanium (rutile), by 13%; bromine (elemental), by 11%; and crude petroleum and wollastonite, by 6% each. Data on mineral production are in table 1.

Structure of the Mineral Industry

In India's fiscal year 2017, the number of mines (excluding those for nuclear and minor minerals) that reported production was 2,020 compared with 2,131 (revised) in fiscal year 2016. Of the 2,020 operating mines, 512 were fuel mineral mines, 644 were metallic mineral mines, and 864 were industrial mineral mines. In 2017, the Government continued with the privatization of coal mines owned by Coal India Ltd. and planned to invite companies to bid for coal blocks before the end of 2019 (Indian Bureau of Mines, 2018c, p. 5; Varadhan, 2019). Table 2 is a list of major mineral industry facilities.

Mineral Trade

India's total value of exports increased to \$309 billion in 2017 from \$280 billion in 2016. The total value of imports increased to \$469 billion in 2017 from \$393 billion in 2016 (International Monetary Fund, 2019a, p. 4).

In fiscal year 2017, gold metal exports decreased to 133,032 kilograms (kg) from 135,275 kg in 2016. The main gold export partner was the United Arab Emirates (UAE), which received 99% of India's gold exports. Imports decreased to 778,449 kg from 968,075 kg in fiscal year 2016. The main gold import partners were Switzerland (which supplied 48% of India's gold imports), the UAE (10%), the Dominican Republic (8%), the United States and Ghana (6% each), South Africa (5%), and Peru (3%) (Indian Bureau of Mines, 2018b, p. 11, 12, 13).

In 2017, India's exports of copper alloys and ingots increased by 215%; graphite (natural), by 167%; direct-reduced iron, by 91%; copper and alloys (semifabricated), by 42%; copper ore and concentrates, by 40%; barite, by 34%; copper (refined), iron ore (gross weight), and iron ore (Fe content), by 29% each; copper and alloys (scrap), by 25%; lead (metal), by 20%; tabular steel products, by 19%; pig iron, by 18%; coal, by 12%; and cement (in fiscal year 2017), by 10%. Exports of copper blister and anode decreased by 100%; bauxite, by 42%; potassic nitrate, by 22%; gypsum, by 21%; zinc (metal), by 13%; and potash, by 11%. In 2017, the imports of direct-reduced iron increased by 309%; alumina, by 57%; cement (in fiscal year 2017), by 50%; potassic nitrate, by 39%; barite, by 37%; graphite (natural) and potassic fertilizer, by 19% each; potash, by 16%; crude petroleum, by 13%; and gypsum, by 11%. The imports of zinc (metal) decreased by 40%; copper ore and concentrates, by 34%; pig iron, by 29%; gold metal, by 20%; and iron ore and steel (scrap), by 16% (tables 3, 4).

In 2017, India's exports of iron ore increased to 28.1 million metric tons (Mt) from 21.7 Mt in 2016. The increase was due to an increase in mine production of iron ore in the State of Goa after bans were gradually lifted. In 2017, imports of iron ore increased to 5.4 Mt from 3.6 Mt in 2016. The main export partner of iron ore was China (which received 96% of India's

iron ore exports). The main import partners of iron ore were South Africa (which supplied 52% of India's iron ore imports) and Brazil (38%) (tables 3, 4; Topf, 2017; Indian Bureau of Mines, 2018d, p. 27; World Steel Association, 2018, p. 102, 104).

In 2017, India imposed an 18.95% duty on some hot-rolled and cold-rolled stainless-steel products. In 2015, India had imposed a 20% antidumping import tax on stainless-steel imports from China. India had also imposed a 2.5% duty on imports of basic steel products in June 2015. The duty on flat-rolled products increased to 10% from 7.5%, and on long products, to 7.5% from 5.0%. In 2017, the imports of long steel products decreased by 25% to 1.1 Mt from 1.4 Mt in 2016; semifinished and finished steel products, by 10% to 8.9 Mt from 9.9 Mt; tabular products, by 13% to 658,000 metric tons (t) from 752,000 t; flat products, by 8% to 6.6 Mt from 7.1 Mt; and ingots and semis products, by 4% to 555,000 t from 577,000 t. The exports of long steel products increased by 76% to 1.8 Mt in 2017 from 1.1 Mt in 2016; flat products, by 68% to 9.7 Mt from 5.8 Mt. The exports of semifinished and finished steel products and ingots and semis increased by 58% each to 16.3 Mt from 10.3 Mt and to 2.8 Mt from 1.8 Mt, respectively; and tabular products, by 19% to 1.6 Mt from 1.3 Mt (tables 3, 4; Times of India, The, 2015; Thomson Reuters, 2018; World Steel Association, 2018, p. 53, 56, 58, 61, 63, 66, 68, 71, 73, 76).

In 2017, Israel Chemicals Limited (ICL) signed a contract with Indian buyers and planned to deliver 750,000 t of potash to India for the next 12 months. India's imports of potash increased to 4.2 Mt in 2017 from 3.6 Mt in 2016 (Wong, 2017a).

In 2017, the Government extended antidumping duties on soda ash imports for the following countries and regions: China, the European Union (EU), Iran, Kenya, Pakistan, Ukraine, and the United States. The import duty for the United States was \$38.79 per metric ton; China, \$36.26 per metric ton; and the EU, \$9.17 per metric ton. The duties were first applied in 2012 to support local production; however, domestic demand exceeded the domestic supply in 2017 and, because of the antidumping duties, it was difficult for buyers to import soda ash (Wong, 2017b).

Commodity Review

Metals

Bauxite and Alumina.—In 2017, India produced 22.8 Mt of bauxite compared with 23.9 Mt in 2016. The leading producing State was Odisha, which accounted for 49% of the country's total production; it was followed by Gujarat, 24%; Jharkhand, 9%; Chhattisgarh and Maharashtra, 8% each; Goa, Karnataka, Madhya Pradesh, and Tamil Nadu, which together contributed the remaining 2% (table 1; Indian Bureau of Mines, 2018a, p. 3, 6).

In September, the State-owned Odisha Mining Corp. (OMC) received stage II environmental clearance to develop the Kodingamali Mine in Odisha State. The mine was expected to produce 3 Mt/yr of bauxite. Bauxite output from the Kodingamali Mine would be fed to Vedanta's Lanjigarh alumina refinery (Mohanty, 2017).

OMC was not able to begin development of the Niyamgiri deposit because of the protest by Dongaria tribesmen concerning the potential environmental impacts of the project. The mine,

which is located atop the Niyamgiri hills and had an estimated resource of 75 Mt, was expected to supply bauxite to Vedanta's Lanjigarh alumina refinery. The Supreme Court had said in 2013 that it would issue the forest clearance license—which had been withdrawn in 2010 by the Environmental Ministry—to OMC after hearing the decision of the gram sabhas, or village council. In 2016, the OMC's attempt to convince the Supreme Court to hold the gram sabhas was unsuccessful. The government of Odisha State was considering reauctioning the Niyamgiri deposit, and OMC was expected to bid on it (Dash, 2017b; Metal Bulletin Magazine, 2017, p. 30; Seetharaman, 2018).

Iron Ore and Iron and Steel.—India produced 125 Mt of iron ore (Fe content) in 2017 compared with 114 Mt in 2016. In 2017, the leading producing State was Odisha, which accounted for 52% of India's total production; it was followed by Chhattisgarh, 16%; Karnataka, 14%; and Jharkhand, 11%. Andhra Pradesh, Goa, Madhya Pradesh, and Rajasthan contributed the remaining 7% (table 1; Indian Bureau of Mines, 2018e, p. 3).

In 2017, the Steel Authority of India Ltd. (SAIL), a Government-owned company, operated the following five steel plants: the Bhilai steel plant in the State of Chhattisgarh, the Rourkela steel plant in the State of Odisha, the Durgapur steel plant in the State of West Bengal, the Bokaro steel plant in the State of Jharkhand, and the Indian Iron and Steel Company Ltd. (IISCO) steel plant at Burnpur in the State of West Bengal. The combined production capacity of the five steel plants was 14.1 Mt/yr. In 2017, SAIL continued working on expanding the production capacity of the four steel plants at Bhilai, Bokaro, Burnpur, and Rourkela to 21.4 Mt/yr from 12.1 Mt/yr (table 2; Indian Bureau of Mines, 2018d, p. 14).

In 2017, following the company's announcement in 2016 that it would not be pursuing its plan to construct a 12-Mt/yr steel plant in the State of Odisha, POSCO of the Republic of Korea asked Odisha State to take back the land that the company had acquired for the project. When it was announced in 2005, the project had been one of the biggest foreign direct investments in India. POSCO had acquired 11 square kilometers (km²) for an 8-Mt/yr steel plant (out of a total of 16 km² needed for the 12 Mt-yr steel plant) in 2013, and as of yearend 2014, had received environmental clearance approval; however, the company announced that it would not start the construction of the plant owing to land acquisition issues. Also, the implementation of the Mineral (Auction) Rule indicated that the company would have to obtain a mining license through an auction (Nam and Mukherji, 2015; Sethi, 2016; Dash, 2017a).

Titanium and Zirconium (Mineral Sands).—The beach sands on the coast of Tamil Nadu contain garnet, ilmenite, rutile, and zircon. In March 2017, some of the sand-mining activities on the coast of Tamil Nadu, which is located on the southeast coast of the Indian Peninsula, were temporarily halted owing to investigations of illegal mining. While awaiting the high court verdict scheduled for March 27, the companies had to submit documents to prove the legality of their operations (Wong, 2017d).

As of 2017, the Trimex Group of the UAE had not commenced mining operations at the Bhavanapadu and Kalingaratnam heavy-mineral-sand projects in Srikakulam District.

The Trimex Group had received approval from the State of Andhra Pradesh to develop these heavy-mineral-sand projects in 2016. The Bhavanapadu project was expected to be developed by Trimex Heavy Minerals Pvt. Ltd. (THMPL), and the production capacity was expected to be 10 Mt/yr of heavy-mineral sands. The Kalingaratnam project would be developed by Trimex Ores Pvt. Ltd., and the production capacity was expected to be 4 Mt/yr of heavy-mineral sands, including garnet, ilmenite, rutile, sillimanite, and zircon. The timeframe for the development was not specified (Salwan, 2016a–c; CRISIL, 2018).

Industrial Minerals

Diamond.—In 2017, the National Mineral Development Corp. Ltd. (NMDC), which was the leading iron ore producer and exporter in India, bid \$9 billion for the Bunder diamond project. NMDC operated the Majhgawan diamond mine located in Madhya Pradesh, which produced 84,000 carats per year of diamond. In 2016, Rio Tinto Ltd. of Australia (the owner of the Bunder diamond project) had announced that it would not proceed further with the project owing to regulatory issues and local opposition (Jamasmie, 2015, 2016, 2017; Rio Tinto Ltd., 2016, p. 222; DFI Switzerland AG, 2017).

Rare Earths (Monazite).—In April, the Government announced plans to auction off a rare-earth mining block in Bramer District in the State of Rajasthan. In 2015, state-owned IREL (India) Ltd. (formerly known as India Rare Earths Ltd.) commenced operations at its only monazite-processing plant, which had a production capacity of 11,000 metric tons per year (t/yr) of mixed rare-earth chlorides. The plant processed monazite from beaches in the States of Kerala, Odisha, and Tamil Nadu. The State of Andhra Pradesh hosts monazite deposits with an estimated resource of 3.7 Mt; Tamil Nadu, 2.5 Mt; Odisha, 2.4 Mt; Kerala, 2.0 Mt; West Bengal, 1.0 Mt; and Jharkhand, 220,000 t (Industrial Minerals, 2015, p. 14; Li, 2016; Indian Bureau of Mines, 2017, p. 2).

Salt.—Salt production in 2017 was estimated to be 28 Mt, which was an increase of 1.8% from the 27.5 Mt produced in 2016. According to Dev Salt Pvt. Ltd., the production of salt would exceed 50 Mt by 2025. The increase in salt production was expected to be driven by increased consumption of salt by domestic soda ash and chlor-alkali industries. India exported salt to Bangladesh, China, Japan, Nepal, Qatar, and Vietnam (Wong, 2017c).

Mineral Fuels and Related Materials

Coal.—In 2017, the total proved mineral reserves of coal in India were estimated to be 97.7 billion metric tons (Gt); in terms of its coal reserves, India was the fifth-ranked country in the world after China, the United States, Russia, and Australia. India produced 667 Mt of bituminous coal and 47 Mt of lignite coal in 2017 compared with 647 Mt and 45 Mt, respectively, in 2016. In 2017, India remained the world's second-ranked consumer of coal (424.0 Mt) after China (1.9 Gt). In 2015, the Government set up a goal for state-owned Coal India Ltd., which was responsible for more than 80% of coal production in the country, through the Billion Ton policy. According to the policy, the company was to increase its production

to 1 billion metric tons per year of coal by 2020. However, the Government planned to increase the use of renewable sources for its power needs to 17% from 10%, and natural gas, to 10% from 8% by 2047, which might reduce the share of coal in total energy consumption in 2047 to between 42% and 48% from 58% (table 1; PricewaterhouseCoopers Private Ltd., 2016, p. 2; Russell, 2017; Ahand, 2017; Varadhan, 2017; BP p.l.c., 2019, p. 36, 39).

Uranium.—In 2017, India's production of uranium (U content) increased to 421 t from 385 t. Uranium mineralization has been identified over a large area in Meghalaya State in the Domiasiat, Wahkyn, and Lostoin deposits. In 2017, companies were invited to submit bids to conduct exploration on the lands that the State puts up for lease. Uranium Corporation of India Ltd. (UCIL), which was under Department of Atomic Energy (DAE), planned to develop the resources at Domiasiat; the name of the project was the Kylleng Phendengsohiong Mawthabah (KMP) uranium mining project (table 1; Business Standard Private Ltd., 2017).

MINERAL INDUSTRY HIGHLIGHTS IN 2018

In 2018, India ranked 1st in the world in the production of iron oxide pigments; 2d in the production of aluminum, barite, cement, feldspar, kyanite and sillimanite, raw steel, talc and pyrophyllite, and wollastonite; 3d, of kaolin, lime, pig iron, and salt; 4th, of alumina, chromium, garnet, iron ore (Fe content), nitrogen (ammonia), and zinc; 5th, of bauxite and bentonite; 6th, of bromine and graphite; 7th, of fuller's earth, ilmenite, lead, lime, manganese, rutile, and sulfur vermiculite; 8th, of mica (natural); 11th, of magnesium compounds and silicon; 13th, of gypsum; 15th, of phosphate rock; and 16th, of gypsum. The country's estimated share of world production for barite in 2018 was 26%; feldspar, 16%; pyrophyllite, talc, and wollastonite, 14% each; garnet, 13%; chromium and salt, 10% each; kaolin and iron ore (Fe content), 9% each; nitrogen (ammonia), 8%; bauxite, 7%; aluminum, pig iron, raw steel, and zinc, 6% each; alumina, 5% (table 1; Apodaca, 2020a, b; Bolen, 2020a, b; Bray, 2020a–c; Brioche, 2020; Corathers, 2020a, b; Crangle, 2020; Curry, 2020a–c; Gambogi, 2020; Ghalayini, 2020a–c; Jasinski, 2020a, b; Klochko, 2020; McRae, 2020; Olson, 2020a, b; Schnebele, 2020a, b; Schulte, 2020; Tolcin, 2020; Tuck, 2020a, b; Willett, 2020a, b).

Minerals in the National Economy

In 2018, India's real gross domestic product (GDP) increased by 7.3% compared with a 6.7% increase (revised) in 2017. The nominal GDP in 2018 was \$2.72 trillion. The mining and quarrying sector in fiscal year 2018 (April 1, 2018, through March 31, 2019), which was the latest year for which detailed data were available, accounted for 2.3% of the GDP, and the manufacturing sector, 16.4% (Ministry of Statistics and Programme Implementation, 2017, cover; 2018, cover; International Monetary Fund, 2018; 2019b, p. 156; World Bank, The, 2020).

Production

In 2018, the production of semimanufactured steel products increased by 135%; monazite concentrate, by 67%; rare-earth mineral concentrate (oxide equivalent), by 61%; barite, by 53%; fluorspar (metallurgical grade), by 43%; graphite (crystalline flake) and refined tin (primary), by 40% each; mined manganese (ore and concentrates, gross weight), by 37%; mined manganese (Mn content), by 31%; sulfur (byproduct of petroleum and fertilizer, (S content) and smelter silver (Ag content), by 23% each; refined silver, by 22%; mined tin (concentrate, gross weight), by 20%; refined lead (primary), by 18%; mined chromium (chromite), by 17%; mined copper (concentrates, Cu content), by 16%; garnet and mica (scrap and waste), by 14% each; limestone, by 13%; aluminum (metal, primary), by 12%; bentonite and finished steel products, by 11% each; ferromagnesium and mined lead (Pb content), by 10% each; coal and pig iron, by 7% each; and alumina (Al₂O₃ equivalent), ferromanganese, and refined lead (secondary), by 6% each (table 1).

In 2018, the production of ferrotitanium decreased by 68%; chalk, by 60%; zirconium (zircon), by 54%; smelter copper (primary), by 41%; refined copper, by 34%; feldspar, by 32%; phosphate rock (P₂O₅ content), by 27%; ferroaluminum, by 26%; kyanite, by 18%; ferromolybdenum, by 17%; ferrovanadium, by 13%; phosphate rock (gross weight) and mined zinc (Zn content), by 10% each; iron oxide pigments (natural, ocher) and refined zinc (primary), by 9% each; and magnesite, by 8%. Data on mineral production are in table 1.

Structure of the Mineral Industry

In fiscal year 2018 (April 1, 2018, through March 31, 2019), the number of mines (excluding those for nuclear and minor minerals) that reported production was 1,430. Of these operating mines, 638 were metallic minerals mines, and 792 were industrial minerals mines (Indian Bureau of Mines, 2018c, p. 5). Table 2 is a list of major mineral industry facilities.

Mineral Trade

The total value of India's exports was \$337 billion in 2018. The total value of the country's imports was \$518 billion (International Monetary Fund, 2019a, p. 4).

In 2018, the imports of potassic fertilizer increased by 167%; tabular steel products, by 39%; semifabricated copper alloys, by 38%; alumina, by 31%; cement, by 29%; barite and gold, by 23% each; gypsum, by 20%; iron and steel scrap, by 18%; liquefied natural gas (LNG), by 17%; bauxite, by 16%; long steel products, by 13%; copper and alloys scrap, by 11%; zinc metal, by 9%; and steel ingots and semis and lead metal, by 8% each. Imports of potassium nitrate decreased by 62%; direct-reduced iron products, by 41%; copper ore and concentrates, by 28%; pig iron, by 26%; and copper blister and anode, by 8% (table 4).

In 2018, exports of iron ore (gross weight) decreased by 36% to 17.9 Mt. Imports of iron ore (gross weight) increased by 196% to 15.9 Mt. The increase in imports and decrease in exports of iron ore were due to the government policies, environmental considerations, the influence of India's steelmakers, the low import duty (2.5%), and the cancellation of

all mining licenses in the State of Goa. The main export partners for iron ore were China (which received 76% of India's iron ore exports), Japan (12%), and the Republic of Korea (5%). The main import partners of iron ore were Australia (which supplied 33% of India's iron ore imports), South Africa (31%), Brazil (25%), and Bahrain (6%) (tables 3, 4; Metal Market Magazine, 2018a, p. 62–63; Indian Bureau of Mines, 2019b, p. 29).

In 2018, India's imports of refined copper increased by 133% to 84,000 t. Exports of refined copper decreased by 68% to 127,000 t. The increase in imports and decrease in exports of refined copper were due to the permanent closure of the Tuticorin smelter, which had a capacity of 400,000 t/yr and was operated by Vedanta Ltd. The main export partners for refined copper were China (which received 63% of India's refined copper exports), Malaysia (11%), the Republic of Korea (7%), and Singapore and the UAE (6% each). The main import partners for refined copper were Japan (which supplied 57% of India's refined copper imports), the Republic of the Congo [Congo (Brazzaville)] (18%), Malaysia (11%), and Zambia (5%) (tables 3, 4; Varadhan, 2018a; Indian Bureau of Mines, 2019a, p. 16).

In 2018, the exports of copper ore and concentrates increased by 129%; gypsum, by 98%; barite, by 58%; direct-reduced iron, by 32%; and zinc metal, by 6%. Exports of potassic fertilizer decreased by 93%; gold metal, by 72%; graphite (natural), by 58%; copper alloys ingots, by 52%; pig iron, by 51%; flat steel products, by 43%; bauxite, by 33%; semifinished and finished steel products, by 32%; tabular steel products, by 22%; long steel products, by 19%; coal, by 15%; steel ingots and semis, by 12%; semifabricated copper and alloys, by 9%; and potassium nitrate, by 7% (table 3).

Commodity Review

Metals

Bauxite and Alumina.—In 2018, production of bauxite increased to 23.2 Mt from 22.8 Mt in 2017, and alumina, to 6.4 Mt from 6.1 Mt. National Aluminium Co. Ltd. (Nalco) planned to expand its alumina refining capacity by constructing a fifth stream with a capacity of 1 Mt/yr at the Damanjodi smelter in the State of Odisha. To meet the raw material supply requirement for the expanded capacity at the refinery, Nalco was planning to begin mining at the Pottangi bauxite mines, which had an estimated 75 Mt of resources. The mining plan was approved in 2018 by the Indian Bureau of Mines (Metal Market Magazine, 2018b, p. 36; National Aluminium Co., 2019, p. 15–16).

Copper.—In 2018, India produced 492,000 t of copper blister and anode and 551,000 t of copper cathode compared with 823,000 t and 829,000 t, respectively, in 2017. In 2018, Vedanta had to shut down its 400,000-t/yr-capacity Tuticorin smelter in Tamil Nadu. The permanent closure of the smelter was ordered by the Government after protests by residents and environmental activists (Varadhan, 2018a, b).

In 2018, Hindustan Copper Ltd. reopened the Kendadih Mine, which was located in Jharkhand and had a production capacity of 2.2 Mt/yr of copper ore. The mine had been closed since 2000 for economic reasons. The company also planned to reopen the

Rakha Mine, which was closed in 2002 and had a production capacity of 47.19 Mt/yr of copper ore at a grade of 0.97% copper. The date for the reopening of the Rakha Mine was not provided (Metal Market Magazine, 2018c, p. 9).

Iron Ore and Iron and Steel.—India produced 127 Mt of iron ore (Fe content) in 2018 compared with 125 Mt in 2017. In 2018, India produced 106 Mt of raw steel compared with 101 Mt in 2017. In 2018, the leading iron-ore-producing State was Odisha, which accounted for 51% of India's total production; it was followed by Chhattisgarh, 17%; Karnataka, 14%; and Jharkhand, 11%. Andhra Pradesh, Goa, Madhya Pradesh, and Rajasthan contributed the remaining 7% (table 1; Indian Bureau of Mines, 2019b, p. 3).

In 2018, India's Supreme Court canceled all iron ore operating leases in the State of Goa, which caused the mining of iron ore in the State to come to a complete stop. The State Government was informed that according to the MMDR, the new mining leases would be awarded through auction and after new environmental clearance was obtained (table 1; Metal Market Magazine, 2018a, p. 62–63).

In 2018, the Supreme Court raised the cap on annual production of iron ore mines to 35 Mt of iron ore in the State of Karnataka; however, the State of Karnataka did not have access to overseas market and could sell its iron ore production only through e-auction. This caused the auction prices of iron ore from the State of Karnataka to fall. As a result, the iron ore producers reduced their production levels and steel companies began to import iron ore (Metal Market Magazine, 2018a, p. 62–63).

In 2018, Tata Steel Ltd. announced a plan to increase its total steel production capacity to approximately 18 Mt/yr. The company planned to increase the capacity of its Kalinganagar plant to 8 Mt/yr within 48 months from the start of the expansion. The exact dates of the planned expansion were not specified (Metal Market Magazine, 2018d, p. 13).

Reserves and Resources

Table 5 is a list of mineral reserves in India (Indian Bureau of Mines, 2018f).

Outlook

The International Monetary Fund projects that India's GDP will increase by 4.2% in 2019. As in recent years, the Government is continuing its efforts to increase the country's mineral production and to attract foreign investment into its mineral industry. The development of India's mineral industry will be highly dependent on how the country overcomes challenges faced by the industry, the pace of the implementation of some reforms and policies, and the pace of growth in domestic demand. The production capacity for iron ore is expected to continue to increase. The production of steel most likely will continue to increase, as steel companies are expected to increase their domestic raw steel capacity to meet the National Steel Policy target of 300 Mt/yr of steel by 2030. The country continues to increase alumina production in response to increased demand from China. As a result of the projected increase in alumina production, bauxite production is expected

to increase as well. Salt production is also expected to increase; Dev Salt Pvt. Ltd. anticipates that the production of salt will exceed 50 Mt by 2025. As a result of the shutdown of the Tutocaring smelter, copper concentrates imports are projected to decrease as is the production of smelted and refined copper (Varadhan, 2017; Financial Express, 2019; Tata Steel Ltd., 2019, p. 26; International Monetary Fund, 2020, p. 3).

References Cited

- Ahand, Geeta, 2017, India, once a coal goliath, is fast turning green: The New York Times, June 2. (Accessed March 5, 2019, at <https://www.nytimes.com/2017/06/02/world/asia/india-coal-green-energy-climate.html>.)
- Apodaca, L.E., 2019, Nitrogen (fixed)—Ammonia: U.S. Geological Survey Mineral Commodity Summaries 2019, p. 116–117.
- Apodaca, L.E., 2020a, Lime: U.S. Geological Survey Mineral Commodity Summaries 2020, p. 96–97.
- Apodaca, L.E., 2020b, Nitrogen (fixed)—Ammonia: U.S. Geological Survey Mineral Commodity Summaries 2020, p. 116–117.
- Bedinger, G.M., 2019, Titanium mineral concentrates: U.S. Geological Survey Mineral Commodity Summaries 2019, p. 176–177.
- Bhushan, Chandra, 2015, Will the new law improve the social and environment performance of the mining sector: New Delhi, India, Centre for Science and Environment, presentation, 16 p.
- Bolen, W.P., 2019a, Salt: U.S. Geological Survey Mineral Commodity Summaries 2019, p. 138–139.
- Bolen, W.P., 2019b, Talc and pyrophyllite: U.S. Geological Survey Mineral Commodity Summaries 2019, p. 162–163.
- Bolen, W.P., 2020a, Salt: U.S. Geological Survey Mineral Commodity Summaries 2020, p. 138–139.
- Bolen, W.P., 2020b, Talc and pyrophyllite: U.S. Geological Survey Mineral Commodity Summaries 2020, p. 162–163.
- BP p.l.c., 2019, BP statistical review of world energy: London, United Kingdom, BP p.l.c., June, 61 p. (Accessed May 29, 2019, at <https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/energy-economics/statistical-review/bp-stats-review-2019-full-report.pdf>.)
- Bray, E.L., 2019a, Aluminum: U.S. Geological Survey Mineral Commodity Summaries 2019, p. 20–21.
- Bray, E.L., 2019b, Bauxite and alumina: U.S. Geological Survey Mineral Commodity Summaries 2019, p. 30–31.
- Bray, E.L., 2019c, Magnesium compounds: U.S. Geological Survey Mineral Commodity Summaries 2019, p. 100–101.
- Bray, E.L., 2020a, Aluminum: U.S. Geological Survey Mineral Commodity Summaries 2020, p. 20–21.
- Bray, E.L., 2020b, Bauxite and alumina: U.S. Geological Survey Mineral Commodity Summaries 2020, p. 30–31.
- Bray, E.L., 2020c, Magnesium compounds: U.S. Geological Survey Mineral Commodity Summaries 2020, p. 100–101.
- Brioche, A.S., 2020, Iron oxide pigments: U.S. Geological Survey Mineral Commodity Summaries 2020, p. 90–91.
- Business Standard Private Ltd., 2017, Uranium reserves in Meghalaya: Business Standard [New Delhi, India], February 9. (Accessed May 27, 2020, at https://www.business-standard.com/article/government-press-release/uranium-reserves-in-meghalaya-117020800906_1.html.)
- Corathers, L.A., 2019a, Lime: U.S. Geological Survey Mineral Commodity Summaries 2019, p. 96–97.
- Corathers, L.A., 2019b, Manganese: U.S. Geological Survey Mineral Commodity Summaries 2019, p. 104–105.
- Corathers, L.A., 2020a, Lime: U.S. Geological Survey Mineral Commodity Summaries 2020, p. 96–97.
- Corathers, L.A., 2020b, Manganese: U.S. Geological Survey Mineral Commodity Summaries 2020, p. 104–105.
- Crangle, R.D., Jr., 2019, Gypsum: U.S. Geological Survey Mineral Commodity Summaries 2019, p. 74–75.
- Crangle, R.D., Jr., 2020, Gypsum: U.S. Geological Survey Mineral Commodity Summaries 2020, p. 74–75.
- CRISIL, 2018, Trimex Sands Private Ltd.: Mumbai, India, CRISIL, September 11. (Accessed March 1, 2019, at https://www.crisil.com/mnt/winshare/Ratings/RatingList/RatingDocs/Trimex_Sands_Private_Limited-ad_RR.pdf.)
- Curry, K.C., 2019a, Garnet (industrial): U.S. Geological Survey Mineral Commodity Summaries 2019, p. 64–65.
- Curry, K.C., 2019b, Mica (natural): U.S. Geological Survey Mineral Commodity Summaries 2019, p. 108–109.
- Curry, K.C., 2019c, Wollastonite: U.S. Geological Survey Mineral Commodity Summaries 2019, p. 184–185.
- Curry, K.C., 2020a, Cement: U.S. Geological Survey Mineral Commodity Summaries 2020, p. 42–43.
- Curry, K.C., 2020b, Garnet (industrial): U.S. Geological Survey Mineral Commodity Summaries 2020 p. 64–65.
- Curry, K.C., 2020c, Wollastonite: U.S. Geological Survey Mineral Commodity Summaries 2020, p. 184–185.
- Dash, Jatindra, 2017a, South Korea's POSCO offers to surrender land for planned India steel project: Thomson Reuters, March 18. (Accessed March 1, 2019, at <https://www.reuters.com/article/india-posco/south-korea-posco-offers-to-surrender-land-for-planned-india-steel-project-idUSL3N1GV04U>.)
- Dash, Jayajit, 2017b, Odisha weighs legal option to auction Niyamgiri mine: Business Standard [New Delhi, India], June 27. (Accessed May 27, 2020, at https://www.business-standard.com/article/economy-policy/odisha-weighs-legal-option-to-auction-niyamgiri-mine-117062600603_1.html.)
- DFI Switzerland AG, 2017, Another India conglomerate joins the race for \$9 billion diamond mining project: DFI Switzerland AG, October 11. (Accessed May 27, 2020, at <http://dfiswiss.com/en/media/dfi-news-update/another-indian-conglomerate-joins-the-race-for-9-billion-diamond-mining-project>.)
- Financial Express, 2019, India steel production, demand may grow at 7 per cent: Financial Express [Noida, India], May 11. (Accessed July 16, 2020, at <https://www.financialexpress.com/industry/india-steel-production-demand-may-grow-at-7-per-cent/1574988/>.)
- Gambogi, Joseph, 2020, Titanium mineral concentrates: U.S. Geological Survey Mineral Commodity Summaries 2020, p. 116–117.
- Ghalayini, Z.T., 2020a, Feldspar and nepheline syenite: U.S. Geological Survey Mineral Commodity Summaries 2020, p. 58–59.
- Ghalayini, Z.T., 2020b, Kyanite and related minerals: U.S. Geological Survey Mineral Commodity Summaries 2020, p. 92–93.
- Ghalayini, Z.T., 2020c, Vermiculite: U.S. Geological Survey Mineral Commodity Summaries 2020, p. 182–183.
- Indian Bureau of Mines, 2017, Mineral reviews (final release): Nagpur, India, Indian Minerals Yearbook 2016, v. III. (Accessed July 2, 2018, at <https://ibm.gov.in/index.php?c=pages&m=index&id=882>.)
- Indian Bureau of Mines, 2018a, Bauxite, chap. 3 of Mineral reviews: Nagpur, India, Indian Minerals Yearbook 2017, v. III, March, p. 1–15. (Accessed March 1, 2019, at <http://ibm.nic.in/writereaddata/files/01092019131839Bauxite%202017.pdf>.)
- Indian Bureau of Mines, 2018b, Gold, chap. 8 of Metals and alloys (final release): Nagpur, India, Indian Minerals Yearbook 2018, v. II, November, p. 1–15. (Accessed February 7, 2019, at https://ibm.gov.in/writereaddata/files/11272019153511Gold_2018_FR.pdf.)
- Indian Bureau of Mines, 2018c, Indian mineral industry and national economy, chap. 1 of General reviews: Nagpur, India, Indian Minerals Yearbook 2017, v. I, September, p. 1–30. (Accessed February 1, 2019, at http://ibm.nic.in/writereaddata/files/10122018174036IMINE%20IMYB_2017_Adv.pdf.)
- Indian Bureau of Mines, 2018d, Iron and steel and scrap, chap. 9 of Metals and alloys: Nagpur, India, Indian Minerals Yearbook 2017, v. II, p. 1–29. (Accessed March 5, 2019, at <http://ibm.nic.in/writereaddata/files/01092019101533Iron%20Steel%20and%20Scrap%202017.pdf>.)
- Indian Bureau of Mines, 2018e, Iron ore, chap. 16 of Mineral reviews: Nagpur, India, Indian Minerals Yearbook 2017, v. III, March, p. 1–31. (Accessed February 6, 2019, at <http://ibm.nic.in/writereaddata/files/01092019132421Iron%20ore%202017.pdf>.)
- Indian Bureau of Mines, 2018f, Minerals yearbook 2018: Nagpur, India, Indian Minerals Yearbook. (Accessed June 17, 2021, at <https://ibm.gov.in/?c=pages&m=index&id=1363>.)
- Indian Bureau of Mines, 2019a, Copper, chap. 5 of Metals and alloys: Nagpur, India, Indian Minerals Yearbook 2018, v. II, p. 1–23. (Accessed January 22, 2020, at http://ibm.nic.in/writereaddata/files/11272019153443Copper_2018_FR.pdf.)
- Indian Bureau of Mines, 2019b, Iron ore, chap. 17 of Mineral reviews: Nagpur, India, Indian Minerals Yearbook 2018, v. III, p. 1–33. (Accessed January 22, 2020, at http://ibm.nic.in/writereaddata/files/0927201911122Iron%20ore%20_2018.pdf.)
- Industrial Minerals, 2015, India launches first monazite processing plant: Industrial Minerals, no. 557, November, 70 p.

- International Monetary Fund, 2018, Report for selected countries and subjects: Washington, DC, International Monetary Fund. (Accessed March 15, 2018, at [http://www.imf.org/external/pubs/ft/weo/2017/02/weodata/weorept.aspx?sy=2015&ey=2016&scsm=1&ssd=1&sort=country&ds=.&br=1&pr1.x=39&pr1.y=13&c=534&s=NGDP_RPCH&grp=0&a=.](http://www.imf.org/external/pubs/ft/weo/2017/02/weodata/weorept.aspx?sy=2015&ey=2016&scsm=1&ssd=1&sort=country&ds=.&br=1&pr1.x=39&pr1.y=13&c=534&s=NGDP_RPCH&grp=0&a=))
- International Monetary Fund, 2019a, India—2019 article IV consultation—Press release—Staff report—Staff statement and statement by the executive director from India: Washington, DC, International Monetary Fund, December 23, 104 p. (Accessed January 20, 2020, at <https://www.imf.org/~media/Files/Publications/CR/2019/1INDEA2019001.ashx>.)
- International Monetary Fund, 2019b, Report for selected countries and subjects: Washington, DC, International Monetary Fund. (Accessed March 15, 2018, at [http://www.imf.org/external/pubs/ft/weo/2017/02/weodata/weorept.aspx?sy=2015&ey=2016&scsm=1&ssd=1&sort=country&ds=.&br=1&pr1.x=39&pr1.y=13&c=534&s=NGDP_RPCH&grp=0&a=.](http://www.imf.org/external/pubs/ft/weo/2017/02/weodata/weorept.aspx?sy=2015&ey=2016&scsm=1&ssd=1&sort=country&ds=.&br=1&pr1.x=39&pr1.y=13&c=534&s=NGDP_RPCH&grp=0&a=))
- International Monetary Fund, 2020, World economic outlook—The great lockdown: Washington, DC, International Monetary Fund, April, 57 p. (Accessed January 14, 2020, at <https://www.imf.org/en/Publications/WEO/Issues/2020/04/14/weo-april-2020>.)
- Jamasmie, Cecilia, 2015, Rio Tinto to spend at least \$500 million to advance diamond project in India: Mining.com, January 12. (Accessed April 24, 2017, at <http://www.mining.com/rio-tinto-to-spend-at-least-500-million-to-advance-diamond-project-in-india-44089/>.)
- Jamasmie, Cecilia, 2016, Rio Tinto walks away from India Bunder diamond project: Mining.com, August 22. (Accessed March 17, 2018, at <http://www.mining.com/rio-tinto-walks-away-from-india-bunder-diamond-mine-due-to-costs-hurdles/>.)
- Jamasmie, Cecilia, 2017, India's NMDC joins the race for \$9bn diamond project: Mining.com, November 7. (Accessed February 26, 2019, at <http://www.mining.com/indias-nmdc-joins-race-9bn-diamond-project/>.)
- Jasinski, S.M., 2019, Phosphate rock: U.S. Geological Survey Mineral Commodity Summaries 2019, p. 122–123.
- Jasinski, S.M., 2020a, Mica (natural): U.S. Geological Survey Mineral Commodity Summaries 2020, p. 108–109.
- Jasinski, S.M., 2020b, Phosphate rock: U.S. Geological Survey Mineral Commodity Summaries 2020, p. 122–123.
- Klochko, Kateryna, 2019, Lead: U.S. Geological Survey Mineral Commodity Summaries 2019, p. 94–95.
- Klochko, Kateryna, 2020, Lead: U.S. Geological Survey Mineral Commodity Summaries 2020, p. 94–95.
- Li, Albert, 2016, Rare earths—Year in review 2016: Industrial Minerals, December 28. (Accessed March 17, 2018, at <http://www.indmin.com/Article/3646973/Rare-earth-Year-in-Review-2016.html>.)
- McRae, M.E., 2019, Barite: U.S. Geological Survey Mineral Commodity Summaries 2019, p. 28–29.
- McRae, M.E., 2020, Barite: U.S. Geological Survey Mineral Commodity Summaries 2020, p. 28–29.
- Metal Bulletin Magazine, 2017, India's growing demand for bauxite and alumina: Metal Bulletin Magazine, September, 66 p.
- Metal Market Magazine, 2018a, Assessing impacts on Indian iron ore: Metal Market Magazine, November-December, p. 62-63.
- Metal Market Magazine, 2018b, Metal spotlight—Bauxite and alumina: Metal Market Magazine, March, p. 36–38.
- Metal Market Magazine, 2018c, New review—Non-ferrous: Metal Market Magazine, February, p. 8–9.
- Metal Market Magazine, 2018d, New review—Steel: Metal Market Magazine, February, p. 13.
- Ministry of Statistics and Programme Implementation, 2016, Annual report 2015–16: New Delhi, India, Ministry of Statistics and Programme Implementation, 146 p. (Accessed March 15, 2018, at http://mospi.nic.in/sites/default/files/publication_reports/mospi_annual_report_2015-16.pdf.)
- Ministry of Statistics and Programme Implementation, 2017, Annual report 2016–17: New Delhi, India, Ministry of Statistics and Programme Implementation, 144 p. (Accessed March 15, 2018, at http://www.mospi.nic.in/sites/default/files/publication_reports/mospi_Annual_Report_2016-17.pdf.)
- Ministry of Statistics and Programme Implementation, 2018, Annual report 2018–19: New Delhi, India, Ministry of Statistics and Programme Implementation, 152 p. (Accessed May 26, 2020, at http://mospi.nic.in/sites/default/files/publication_reports/Annual%20Report%202018-19%20Eng%20Web.pdf.)
- Mohanty, Meera, 2017, MoEF grants forest clearance for Kodingamali bauxite mine: The Economic Times [Mumbai, India], October 17. (Accessed February 28, 2019, at <https://economictimes.indiatimes.com/industry/indl-goods/svs/metals-mining/moef-grants-forest-clearance-for-kodingamali-bauxite-mine/articleshow/61109551.cms>.)
- Nam, In-Soo, and Mukherji, Biman, 2015, Posco suspends steel plant project in India: The Wall Street Journal, July 17. (Accessed April 24, 2017, at <https://www.wsj.com/articles/posco-scrap-steel-plant-project-in-india-for-now-1437103789>.)
- National Aluminium Co., 2019, 38th annual report 2018-19: Nayapalli, Bhubaneswar, India, National Aluminium Co., 264 p. (Accessed January 27, 2020, at https://nalcoindia.com/wp-content/uploads/2019/08/Annual-Report_38th-AGM.pdf.)
- Olson, D.W., 2019a, Graphite: U.S. Geological Survey Mineral Commodity Summaries 2019, p. 72–73.
- Olson, D.W., 2019b, Gypsum: U.S. Geological Survey Mineral Commodity Summaries 2019, p. 74–75.
- Olson, D.W., 2020a, Graphite: U.S. Geological Survey Mineral Commodity Summaries 2020, p. 72–73.
- Olson, D.W., 2020b, Gypsum: U.S. Geological Survey Mineral Commodity Summaries 2020, p. 74–75.
- Press Information Bureau, 2017, Cabinet approves National Steel Policy, 2017: New Delhi, India, Press Information Bureau Government of India Cabinet, May 3. (Accessed March 5, 2019, at <https://pib.gov.in/PressReleaseDetail.aspx?PRID=1514333>.)
- PricewaterhouseCoopers Private Ltd., 2016, Bringing the gap—Increasing coal production and sector augmentation: Kolkata, India, Indian Chamber of Commerce, June, 34 p. (Accessed July 2, 2018, at <https://www.pwc.in/assets/pdfs/publications/2016/icc-pwc-coal-report-june.pdf>.)
- prindia.org, 2018, The mines and minerals (development and regulation) amendment bill, 2016: prindia.org. (Accessed June 29, 2018, at <http://www.prindia.org/billtrack/the-mines-and-minerals-development-and-regulation-amendment-bill-2016-4228/>.)
- Rio Tinto Ltd., 2016, 2015 annual report: Melbourne, Victoria, Australia, Rio Tinto Ltd., March 2, 244 p. (Accessed April 25, 2017, at <https://www.riotinto.com/invest/reports>.)
- Russell, Clyde, 2017, Coal India missing output target doesn't matter, mining millions of tonnes more does—Russell: Thomson Reuters, March 16. (Accessed March 17, 2018, at <https://www.reuters.com/article/us-column-russell-coal-india/coal-india-missing-output-target-doesnt-matter-mining-millions-of-tonnes-more-does-russell-idUSKBN16N0Z2>.)
- Salwan, Shruti, 2016a, India's beach sand miners skeptical about new rules: Industrial Minerals, June 6. (Accessed March 17, 2018, at <http://www.indmin.com/Article/3560119/Indias-beach-sand-miners-sceptical-about-new-rules.html>.)
- Salwan, Shruti, 2016b, Private miners oppose India's atomic mineral mining draft: Industrial Minerals, June 3. (Accessed March 17, 2018, at <http://www.indmin.com/Article/3559790/Private-miners-oppose-Indias-atomic-mineral-mining-draft.html>.)
- Salwan, Shruti, 2016c, Time to expand heavy mineral operations: Industrial Minerals, January 25. (Accessed March 17, 2018, at <http://www.indmin.com/Article/3523342/Trimex-to-expand-heavy-mineral-operations.html>.)
- Schnebele, E.K., 2019a, Bromine: U.S. Geological Survey Mineral Commodity Summaries 2019, p. 38–39.
- Schnebele, E.K., 2019b, Silicon: U.S. Geological Survey Mineral Commodity Summaries 2019, p. 148–149.
- Schnebele, E.K., 2020a, Bromine: U.S. Geological Survey Mineral Commodity Summaries 2020, p. 38–39.
- Schnebele, E.K., 2020b, Silicon: U.S. Geological Survey Mineral Commodity Summaries 2020, p. 148–149.
- Schulte, R.F., 2019, Chromium: U.S. Geological Survey Mineral Commodity Summaries 2019, p. 46–47.
- Schulte, R.F., 2020, Chromium: U.S. Geological Survey Mineral Commodity Summaries 2020, p. 46–47.
- Seetharaman, G., 2018, The story of one of the biggest land conflicts—No mine now, but is it all fine in Niyamgiri?: The Economic Times [Mumbai, India], April 18. (Accessed May 27, 2020, at <https://economictimes.indiatimes.com/industry/indl-goods/svs/metals-mining/theres-no-mine-but-is-it-all-fine-on-niyam-hills/articleshow/63763978.cms>.)
- Sethi, Nitin, 2016, Project in Odisha is over, says Posco: Business Standard [New Delhi, India], April 9. (Accessed March 17, 2018, at http://www.business-standard.com/article/companies/project-in-odisha-is-over-says-posco-116040801130_1.html.)

- Tanner, A.O., 2019a, Feldspar: U.S. Geological Survey Mineral Commodity Summaries 2019, p. 58–59.
- Tanner, A.O., 2019b, Iron oxide pigments: U.S. Geological Survey Mineral Commodity Summaries 2019, p. 90–91.
- Tanner, A.O., 2019c, Kyanite and related minerals: U.S. Geological Survey Mineral Commodity Summaries 2019, p. 92–93.
- Tanner, A.O., 2019d, Vermiculite: U.S. Geological Survey Mineral Commodity Summaries 2019, p. 182–183.
- Tata Steel Ltd. 2019, Integrated Report & Annual Accounts 2018–19—112th Year: Jharkhand, India, Tata Steel Ltd., 437 p. (Accessed June 17, 2021, at <https://www.tatasteel.com/media/9238/tata-steel-ir-2018-19-220619.pdf>.)
- Thomas, C.L., 2019, Zinc: U.S. Geological Survey Mineral Commodity Summaries 2019, p. 190–191.
- Thomson Reuters, 2018, India slaps additional tax on some Chinese stainless-steel imports: Thomson Reuters, September 8. (Accessed February 7, 2019, at <https://in.reuters.com/article/india-stainlesssteel-imports/india-slaps-additional-tax-on-some-chinese-stainless-steel-imports-idINKCN1BJ192>.)
- Times of India, The, 2015, India imposes anti-dumping duty on steel products: The Times of [Mumbai] India, December 12. (Accessed December 26, 2016, at <http://timesofindia.indiatimes.com/business/india-business/India-imposes-anti-dumping-duty-on-steel-products/articleshow/50145593.cms>.)
- Times of India, The, 2016, Mines and Minerals Bill passed by Parliament: The Times of [Mumbai] India, May 2. (Accessed July 3, 2018, at <https://timesofindia.indiatimes.com/city/delhi/Mines-and-Minerals-Bill-passed-by-Parliament/articleshow/52079758.cms>.)
- Tolcin, A.C., 2020, Zinc: U.S. Geological Survey Mineral Commodity Summaries 2020, p. 190–191.
- Tolcin, A.C., 2020, Zinc: U.S. Geological Survey Mineral Commodity Summaries 2020, p. 190–191.
- Topf, Andrew, 2017, India iron ore shipments up 169%: Mining.com, March 5. (Accessed March 17, 2018, at <http://www.mining.com/indian-iron-ore-shipments-169/>.)
- Tuck, C.A., 2019a, Iron and steel: U.S. Geological Survey Mineral Commodity Summaries 2019, p. 82–83.
- Tuck, C.A., 2019b, Iron ore: U.S. Geological Survey Mineral Commodity Summaries 2019, p. 88–89.
- Tuck, C.A., 2020a, Iron and steel: U.S. Geological Survey Mineral Commodity Summaries 2020, p. 82–83.
- Tuck, C.A., 2020b, Iron ore: U.S. Geological Survey Mineral Commodity Summaries 2020, p. 88–89.
- van Oss, H.G., 2019, Cement: U.S. Geological Survey Mineral Commodity Summaries 2019, p. 42–43.
- Varadhan, Sudarshan, 2017, Coal to be India's energy mainstay for next 30 years—Policy paper: The Thomson Reuters, May 15. (Accessed March 5, 2019, at <https://www.reuters.com/article/us-india-energy/coal-to-be-indias-energy-mainstay-for-next-30-years-policy-paper-idUSKCN18B1YE>.)
- Varadhan, Sudarshan, 2018a, India closes Vedanta copper smelter permanently after bloody protest: Thomson Reuters, May 28. (Accessed January 22, 2020, at <https://www.reuters.com/article/us-vedanta-smelter/india-closes-vedanta-copper-smelter-permanently-after-bloody-protest-idUSKCN1IT0AH>.)
- Varadhan, Sudarshan, 2018b, India court orders Vedanta to not reopen copper smelter for at least a month—Petitioner: Thomson Reuters, December 21. (Accessed January 23, 2020, at <https://www.reuters.com/article/us-vedanta-smelter/indian-court-orders-vedanta-to-not-reopen-copper-smelter-for-at-least-a-month-petitioner-idUSKCN1OK1S0>.)
- Varadhan, Sudarshan, 2019, Exclusive—India to invite bids from global coal miners before end of 2019: Thomson Reuters, September 18. (Accessed May 26, 2020, at <https://www.reuters.com/article/us-india-coal-exclusive/exclusive-india-to-invite-bids-from-global-coal-miners-before-end-of-2019-sources-idUSKB1W30R3>.)
- West, D.N., 2019, Clays: U.S. Geological Survey Mineral Commodity Summaries 2019, p. 48–49.
- Willett, J.C., 2020a, Clays: U.S. Geological Survey Mineral Commodity Summaries 2020, p. 48–49.
- Willett, J.C., 2020b, Kyanite and related minerals: U.S. Geological Survey Mineral Commodity Summaries 2020, p. 92–93.
- Wong, Yoke, 2017a, ICL conclude 2017 potash contract with India: Industrial Minerals, August 14. (Accessed February 28, 2019, at <https://www.indmin.com/Article/3741281/ICL-conclude-2017-potash-contract-with-India.html>.)
- Wong, Yoke, 2017b, India extends soda ash anti-dumping duty to 2018: Industrial Minerals, September 8. (Accessed February 26, 2019, at <https://www.indmin.com/Article/3748930/India-extends-soda-ash-anti-dumping-duty-to-2018.html>.)
- Wong, Yoke, 2017c, India salt production to nearly double by 2025—Dev Salt: Industrial Minerals, March 29. (Accessed February 26, 2019, at <https://www.indmin.com/Article/3673585/India-salt-production-to-nearly-double-by-2025-Dev-Salt.html>.)
- Wong, Yoke, 2017d, Mineral sand mining in Tamil Nadu could restart in short-term: Industrial Minerals, March 7. (Accessed May 27, 2020, at <https://www.indmin.com/Article/3667602/Mineral-sand-mining-in-Tamil-Nadu-could-restart-in-short-term.html>.)
- World Bank, The, 2019, GDP (constant 2010 \$US): The World Bank. (Accessed January 29, 2019, at <https://data.worldbank.org/indicator/NY.GDP.MKTP.KD>.)
- World Bank, The, 2020, India: The World Bank. (Accessed January 14, 2020, at <https://data.worldbank.org/country/india?view=chart>.)
- World Steel Association, 2018, Steel statistical yearbook 2017: Brussels, Belgium, World Steel Association, 123 p. (Accessed March 17, 2018, at <https://www.worldsteel.org/en/dam/jcr:7eb5b4b0-2d1d-49d8-b580-a8ed74e67436/World%2520Steel%2520in%2520Figures%25202018.pdf>.)

TABLE 1
INDIA: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons, gross weight, unless otherwise specified)

Commodity ²	2014	2015	2016	2017	2018	
METALS						
Aluminum:						
Bauxite	thousand metric tons	22,636	27,757	23,886	22,803	23,229
Alumina, Al ₂ O ₃ equivalent	do.	5,060	5,512	6,028	6,055	6,430
Metal, primary	do.	1,939	2,355	2,723	3,269	3,675
Cadmium, refinery, primary		116	130	21	61	60 ^c
Chromium, mine, chromite	thousand metric tons	2,374	2,666 ^r	3,329	3,478	4,076
Cobalt, refinery, metal and salts, Co content		100	150 ^r	100 ^r	100	100
Copper:						
Mine, concentrates, Cu content		26,700	29,900	29,600 ^{r,c}	30,300 ^c	35,000 ^c
Smelter:						
Primary		766,000	792,600	769,800 ^r	813,100	481,500
Secondary		--	--	3,500 ^r	10,000	10,000
Total		766,000	793,000	773,000 ^r	823,000	492,000
Refinery:						
Primary		766,000	791,900	769,300 ^r	819,000	541,054
Secondary		--	--	3,500	10,000 ^c	10,000 ^c
Total		766,000	792,000	773,000	829,000 ^c	551,000
Ferroalloys:						
Ferroaluminum		4,596	3,010 ^r	4,140 ^r	4,337	3,221
Ferroboron		45	42 ^r	--	--	--
Ferromanganese		676,000 ^r	646,000 ^r	621,000 ^r	752,000	795,000
Ferromolybdenum		1,281	1,281	1,614	1,315	1,086
Ferrosilicomagnesium		25,788	21,887	21,140	16,724	18,436
Ferrosilicon		92,014	92,000	90,000	90,000	90,000
Ferrotitanium		760	204	231	389	125
Ferrovandium		1,031	879	1,266	1,318	1,150
Silicomanganese		1,920,000 ^r	1,832,000 ^r	1,768,000 ^r	2,038,000	2,098,000
Total		2,720,000 ^r	2,600,000 ^r	2,510,000 ^r	2,900,000	3,010,000
Gold:						
Mine, ore, gross weight	kilograms	435,245	469,336	631,815	536,240	562,681
Smelter, primary	do.	1,587	1,375	1,555	1,502	1,554
Refinery, bullion	do.	10,304	10,255	10,299	11,907	12,274
Iron ore, mine:						
Gross weight	thousand metric tons	138,000 ³	142,399	184,501	201,815	204,091
Fe content	do.	85,560 ^r	88,287 ^r	114,000	125,000	127,000
Iron and steel:						
Direct-reduced iron	do.	24,542 ^r	22,644 ^r	26,982 ^r	29,505	28,110
Pig iron	do.	55,166	58,393	63,714	66,808	71,497
Raw steel	do.	87,292	89,026	95,477	101,455	106,463
Products:						
Finished	do.	105,861	99,650	104,931	114,812	127,094
Semimanufactured	do.	61,751	45,266	38,391	37,733	88,857
Lead:						
Mine, Pb content		106,000 ^c	136,000	147,000	175,000	192,496
Refinery:						
Primary		129,000	143,000	134,000	165,122	195,055
Secondary		348,000	358,000	385,000	404,900	428,000 ^c
Total		477,000	501,000	519,000	570,000	623,000
Manganese, mine, ore and concentrate:						
Gross weight	thousand metric tons	2,200 ^r	2,300 ^r	2,100	2,100	2,880
Mn content	do.	792 ^r	810 ^r	745	734	961
Rare earths, monazite concentrate:						
Gross weight		3,000	3,000	2,500 ^r	3,000	5,000
Rare-earth oxide equivalent		1,700 ^c	1,700 ^c	1,500 ^r	1,800 ^c	2,900 ^c
Selenium, Se content	kilograms	17,000	17,000	17,000 ^c	17,000 ^c	17,000 ^c

See footnotes at end of table.

TABLE 1—Continued
INDIA: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons, gross weight, unless otherwise specified)

Commodity ²	2014	2015	2016	2017	2018
METALS—Continued					
Silver:					
Smelter kilograms	338,084	383,479	445,367	526,604	648,600
Refinery	410 ^r	453 ^r	509 ^r	596	730
Tin:					
Mine, concentrate, gross weight	30	17	13	15	18
Refinery:					
Primary	30 ^r	17 ^r	9 ^r	10 ^e	14
Secondary	3,800	3,800 ^e	3,800 ^e	3,000 ^e	--
Titanium, mineral concentrate: ^c					
Ilmenite and leucoxene	728,000 ^r	849,000 ^r	618,000 ^r	517,000	517,000
Rutile	18,600 ^r	22,200 ^r	16,200 ^r	14,100	14,100
Zinc:					
Mine, Zn content	706,000	821,617	658,000 ^{r,e}	830,000 ^e	750,000 ^e
Refinery:					
Primary	705,707	821,617	611,814	799,877	727,693
Secondary, remelt	18,293	16,383	16,816	17,600 ^e	18,300
Total	724,000	838,000	629,000	817,000	746,000
Zirconium, zircon	20,626	18,891	18,437	30,351	13,951
INDUSTRIAL MINERALS					
Abrasives:					
Diaspore, natural	17,753	15,000	NA	NA	NA
Garnet thousand metric tons	88	76	81	142	162
Asbestos	227	--	--	--	--
Barite	1,182,829 ^r	670,000 ^{r,e}	1,200,000 ^{r,e}	1,560,000 ^e	2,390,000 ^e
Bromine, elemental ^c	2,200	2,400	2,700	2,400	2,300
Cement, hydraulic thousand metric tons	240,000	260,000	280,000 ^e	283,000 ^e	298,000
Clay:					
Ball clay do.	1,927	1,970 ^e	500 ^e	500 ^e	500 ^e
Bentonite ^c do.	800	802	1,370	1,520	1,690
Fire clay do.	712	765 ^e	450 ^e	450 ^e	450 ^e
Fuller's earth	--	--	--	5,600 ^e	5,600 ^e
Kaolin, marketable: ^c					
Crude thousand metric tons	4,580	4,040	1,450	4,110	4,000
Processed do.	86	74	31	74	74
Diamond:					
Gem thousand carats	10 ^e	9 ^e	9 ^r	11	11 ^e
Industrial ^c do.	27	25 ^r	24 ^r	30	29
Feldspar	1,634,240 ^r	4,116,527 ^r	5,893,652 ^r	5,900,000 ^e	4,000,000 ^e
Fluorspar, metallurgical grade	2,439	2,270	1,920	1,120	1,600 ^e
Gemstones, unspecified	NA	90,330	--	--	--
Graphite:					
Amorphous ^c	2,300	2,700	3,000	3,500	3,500
Crystalline flake	21,000 ^e	24,200 ^e	27,000 ^e	31,500 ^e	44,207
Gypsum, mine thousand metric tons	2,902 ^r	2,640 ^{r,e}	2,700 ^{r,e}	2,700 ^e	2,700 ^e
Iron oxide pigments, mineral, natural, ocher	2,467,767	2,203,708	2,200,000 ^e	2,200,000 ^e	2,000,000 ^e
Kyanite and related materials:					
Kyanite	6,680	2,300	2,932 ^r	7,094	5,827
Sillimanite	73,661	65,243	64,923	81,044	84,215
Lime ^c	16,000,000	16,000,000	16,000,000	16,000,000	16,000,000
Magnesite, mine	195,105 ^r	251,737 ^r	317,084	187,974	172,947
Mica: ^c					
Crude thousand metric tons	1 ^r	1	1	1	1
Scrap and waste do.	16 ^r	14	13 ^r	14	16
Total do.	17 ^r	15	14 ^r	15	17
Nitrogen, ammonia, N content do.	10,780	11,309 ^r	11,574 ^r	11,405	11,400 ^e

See footnotes at end of table.

TABLE 1—Continued
INDIA: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons, gross weight, unless otherwise specified)

Commodity ²	2014	2015	2016	2017	2018	
INDUSTRIAL MINERALS—Continued						
Phosphate rock, including apatite:						
Gross weight	thousand metric tons	1,296 ^r	1,959 ^r	825 ^r	1,588	1,423
P ₂ O ₅ content, 25% P ₂ O ₅	do.	370	490	210 ^r	490	360
Salt	do.	23,017 ^r	24,241	27,500 ^e	28,000 ^e	29,000 ^e
Sand and gravel, industrial:						
Sand	do.	2,728	3,000	3,200 ^{r,e}	3,400 ^e	3,400 ^e
Quartz and quartzite	do.	3,778	4,000	4,530 ^e	4,500 ^e	4,500 ^e
Unspecified	do.	6,302	4,000	4,000 ^e	4,000 ^e	4,000 ^e
Soda ash, synthetic ^c	do.	2,370	2,500	2,400	2,500	2,500
Stone:						
Crushed:						
Calcite		109,446	92,000	184,000 ^e	109,000 ^e	109,000 ^e
Chalk		125,244	107,000	308,000 ^r	296,000	118,000 ^e
Dolomite	thousand metric tons	7,411	6,485	4,740 ^{r,e}	4,022	4,022 ^e
Limestone	do.	291,042	294,621	312,644	327,846	371,377
Size and shape unspecified, dunite		86,733	72,500 ^e	76,000 ^e	80,000 ^e	80,000 ^e
Sulfur, byproduct, S content:						
Metallurgy ^c	thousand metric tons	1,200	1,200	1,200	1,200	1,200
Petroleum and fertilizer		401,000 ^{r,e}	428,000 ^{r,e}	508,998 ^{r,e}	726,639	892,821
Talc and related materials:						
Pyrophyllite		401,347	167,000 ^e	170,000 ^e	170,000 ^e	170,000 ^e
Soapstone and steatite		936,261	803,000 ^e	730,000	750,000 ^e	750,000 ^e
Vermiculite		16,384	13,250	8,058	5,315	5,159
Wollastonite		177,465	181,720	166,554	156,096	148,379
MINERAL FUELS AND RELATED MATERIALS						
Coal:						
Bituminous	thousand metric tons	600,970	631,085	647,344	667,362	716,051
Lignite	do.	46,167	44,453	45,049	47,026	46,032
Total	do.	647,000	676,000	692,000	714,000	762,000
Natural gas:						
Gross	million cubic meters	33,046	26,517	30,391	31,855	31,776
Marketable	do.	29,400 ^r	28,100 ^{r,e}	26,600 ^r	27,700	27,500
Petroleum:						
Crude	thousand 42-gallon barrels	291,700	289,400	280,100	263,100	254,200
Refinery: ^c						
Distillate fuel oil	do.	130,000 ^r	100,000 ^r	150,000 ^r	160,000	160,000
Gasoline	do.	280,000 ^r	226,000 ^r	315,000 ^r	330,000	330,000
Kerosene, including jet fuel	do.	58,000 ^r	55,000 ^r	44,000 ^r	46,000	46,000
Liquefied petroleum gas	do.	114,000 ^r	125,000 ^r	134,000 ^r	140,000	140,000
Residual fuel oil	do.	74,900 ^r	47,300 ^r	63,400 ^r	66,000	66,000
Other	do.	907,000 ^r	860,000 ^r	303,000 ^r	320,000	320,000
Total	do.	1,560,000 ^r	1,410,000 ^r	1,010,000 ^r	1,060,000	1,060,000
Uranium, mine, U content		323	323	385	421	423

^eEstimated. ^rRevised. do. Ditto. NA Not available. -- Zero.

¹Table includes data available through December 23, 2019. All data are reported unless otherwise noted. Totals and estimated data are rounded to no more than three significant digits.

²In addition to the commodities listed, boron and corundum may have been produced, but available information was inadequate to make reliable estimates of output.

TABLE 2
INDIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2018

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity ^e
Alumina	National Aluminium Co. Ltd. (NALCO) (Government, 80.93%)	Damanjodi refinery, Odisha	2,300
Do.	Utkal Alumina International Ltd. [Hindalco Industries Ltd. (Aditya Birla Group, 33%; foreign investors, 26%; private Indian investors, 23%; financial institutions, 18%), 100%]	Koraput refinery, Odisha	1,500
Do.	Vedanta Aluminium Ltd. (Vedanta Resources plc, 100%)	Lanjigarh refinery, Odisha	1,000
Do.	Hindalco Industries Ltd. (Aditya Birla Group, 33%; foreign investors, 26%; private Indian investors, 23%; financial institutions, 18%)	Renukoot refinery, Uttar Pradesh	700
Do.	do.	Muri refinery, Jharkhand	450
Do.	do.	Belagavi refinery, Karnataka	350
Do.	Bharat Aluminium Co. Ltd. (Vedanta Aluminium Ltd., 51%, and Government, 49%)	Korba refinery, Chhattisgarh	200 ¹
Do.	Madras Aluminium Co. Ltd. (MALCO) [Vedanta Group, 80%, and others, 20%]	Mettur refinery, Tamil Nadu	85 ¹
Aluminum	do.	Jharsuguda I and II smelters, Odisha	1,750
Do.	Bharat Aluminium Co. Ltd. (Vedanta Aluminium Ltd., 51%, and Government, 49%)	Korba I and II smelters ¹	570
Do.	National Aluminium Co. Ltd. (NALCO) (Government, 100%)	Angul smelter, Odisha	460
Do.	Hindalco Industries Ltd. (Aditya Birla Group, 33%; foreign investors, 26%; private Indian investors, 23%; financial institutions, 18%)	Hirakud smelter, Odisha	220
Do.	do.	Aditya smelter, Sambalpu, Odisha	360
Do.	do.	Mahan smelter, Bargawan, Madhya Pradesh	360
Do.	do.	Renukoot smelter, Uttar Pradesh	350
Do.	Madras Aluminium Co. Ltd. (MALCO) [Vedanta Group, 80%, and others, 20%]	Mettur smelter, Tamil Nadu ²	40
Barite	Andhra Pradesh Mineral Development Corp. Ltd. (Andhra Pradesh State government, 100%)	Kadapa District mines, Andhra Pradesh	3,000
Do.	ICL Ltd.	do.	300
Do.	Associated Mineral Corp.	do.	75
Do.	Pragathi Minerals	do.	50
Do.	Vijayalaxmi Minerals Trading Co.	do.	50
Bauxite	Utkal Alumina International Ltd.	Baphilimali Mine, Rayagada District	8,500
Do.	National Aluminium Co. Ltd. (NALCO) (Government, 100%)	Mines in Panchpatmali Hills, Damanjodi Koraput District, Odisha	6,800
Do.	Bharat Aluminium Co. Ltd. [Sterlite Industries (India) Ltd., 51%, and Government 49%]	Bodai Daldali (Kawardha) Mine, Chhattisgarh	1,250
Do.	do.	Mainpat Mine, Chhattisgarh	750
Do.	Hindalco Industries Ltd. (Aditya Birla Group, 33%; foreign investors, 26%; private Indian investors, 23%; financial institutions, 18%)	Mines in Lohardaga District, Jharkhand	750
Do.	Indian Aluminium Co. Ltd. (Indian interests, 60.4%, and Alcan Aluminium Ltd., 39.6%)	Kolhapur District Mines, Maharashtra	600
Do.	Gujarat Mineral Development Corp. (Gujarat State government, 75%, and public and institutional investors, 25%)	Gadhsisa Mine and Ratadia project, Kutch District, Bhatia project, Jamnagar District	500
Do.	Minerals & Minerals Ltd. (Government, 100%)	Mines in Richuguta, Palamau District, Jharkhand	200
Do.	do.	Mewasa Mines Devbhoomi Dwarka, Gujarat	125
Do.	Bombay Minerals Ltd.	Asota Mewasa Mine, Gujarat	NA
Do.	Carborundum Universal Ltd.	Gujarat Mine, Devbhoomi Dwarka	NA
Do.	Panditrao Mines and Minerals Pvt. Ltd.	Minche Budrak Mine, Maharashtra, Kolhapur	NA
Do.	Prabhudas Vithaldas	Gujarat	NA

See footnotes at end of table.

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

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners		Location of main facilities	Annual capacity ^e
Boron	Borax Morarji Ltd.		Ambernath Mine, Maharashtra	17
Cadmium	metric tons	Hindustan Zinc Ltd.	Chanderiya zinc smelter, Rajasthan	468
Do.	do.	do.	Debari zinc smelter, Rajasthan	250
Do.	do.	do.	Vizag zinc smelter, Andhra Pradesh	115
Do.	do.	Binani Zinc Ltd.	Binanipuram District, Kerala	80
Cement	Kesoram Industries Ltd.		Kesoram Cement, Vasvadatta Cement, Karnataka	7,250
Do.	Penna Cement Ltd.		Penna Tadippatri I & II, Penna Ganeshpahad, Penna-Boyareddypalli Ltd., Penna-Tandur	6,500
Do.	Binani Cement Ltd.		Binani Cement Sirohi, Binani Cement Sikar	6,250
Do.	JSW Cement		Nandyal Works, Vijayanagar Works Dolvi Works	6,000
Do.	Birla Corp. Ltd. (M.P. Birla Group)		Birla Vikas & Satna, Birla Cement & Chanderia, Durgapur, Rae Bareli	5,780
Do.	OCL India Ltd.		Kapilas and Rajgangpur, Odisha	5,500
Do.	Orient Papers & Industries		Orient Cement, Orient-Cement-Jalgaon	5,000
Do.	JK Lakshmi Cement Ltd. (a division of Straw Products Ltd., JK Singhania, principal shareholder)		Sirohi plant, Rajasthan and Ahmadabad, Gujarat	4,700
Do.	My Home Industries Ltd. (joint venture of My Home Group and CRH plc)		Mellacheruvu and Visakhapatnam in Andhra Pradesh	4,600
Do.	Rain Cement Ltd.		Rain Comdt. Unit I, Rain Comdt. Unit LN-1, Rain Comdt. Unit LN-2	4,000
Do.	CCI Ltd. (Government, 100%)		Adilabad, Akaltara, Bokajan, Charkhi-Dadri, Kurkunta, Mandhar, Neemuch, Rajban, Tandur, Delhi	3,850
Do.	Sagar Cement Ltd.		Andhra Pradesh	3,750
Do.	Zuari Cement Ltd.		Zuari Cement, Sri Vishnu Cement	3,400
Do.	Prism Cement Ltd.		Satna plant, Madhya Pradesh	3,000
Do.	The Mehta Group		Suarashtra Cement, Gujarat Sidhee	2,700
Do.	Dalmia Cement (Bharat) Ltd.		Belgalum, Karnataka	2,500
Do.	Jaiprakash Associates Ltd.		Sewagram, Gujarat	2,400
Do.	KCP Ltd.		KCP Ltd-Macherla, Maktyala	2,350
Do.	Mangalam Cement Ltd.		Mangalam Cement, Neer Shree Cement Kolkata	2,000
Do.	Ramco Cement Ltd.		Ramasamyraja Nagar, Jayantipuram, Alathiyur Works I and II, Ariyalur Uthiramerur, Salem, Kolaghat	2,000
Do.	Shree Cement Ltd.		Haridwar plant, Uttarakhand	1,800
Do.	Shree Digvijay Cement Co. Ltd.		Durg, Chhattisgarh	1,700
Do.	Andhra Cements Ltd. (Jaypee Group, 100%)		Vizag, Nadikude-Durga Cement	1,420
Do.	Lafarge S.A.		Arasmeta and Sonadih, Chhattisgarh; Jojobera, Jharkhand; and Mejia, West Benga	1,400
Do.	Cement Manufacturing Co. Ltd.		Kolkata	1,270
Do.	Raymond Cement Works (a division of Raymond Woolen Mills Ltd., JK Singhania, principal shareholder)		Gopalnagar plant, West Bengal	1,250
Do.	Century Cement [Century Textiles and Industries Ltd. (Birla Group, 100%)]		Baikunth Plant, Madhya Pradesh	1,120
Do.	HeidelbergCement India Ltd., 100%		Narasingarh plant, Haryana	1,090
Do.	Shree Digvijay Cement Co. Ltd.		Shreeniwas plant, Maharashtra	1,070
Do.	Rajashree Cement (a division of Indian Rayon and Industries Ltd., 100%)		Khor plant, Karnataka	1,020

See footnotes at end of table.

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

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity ^c
Cement—Continued	Coromandel Fertilizers Ltd. [Chevron Chemical Co., 23.55%; International Minerals and Chemical Co., 20.89%; Parry and Co., 10.64%; E.I.D. Parry (India) Ltd., 6.65%; others, 38.27%]	Chilamkur plant, Andhra Pradesh	1,000
Do.	Manikgarth Cement [Century Textiles and Industries Ltd. (Birla Group, 100%)]	Tehsil Rajura plant, Maharashtra	1,000
Do.	Raasi Cement Ltd. (Andhra Pradesh State government, 50%, and Development Co. Ltd., 50%)	Vishnupuram plant, Andhra Pradesh	1,000
Do.	Vikram Cement [Grasim Industries Ltd. (Birla Group, 100%)]	Vikram plant, Madhya Pradesh	1,000
Do.	Tamil Nadu Cements Corp. Ltd.	Alangulam, Ariyalur, Virundhunagar District	900
Do.	Malabar Cements Ltd.	Malabar Cements, Malabar Cements	620
Do.	Ultratech Cement Ltd.	12 integrated plants and 12 grinding units	83
Do.	ACC Ltd., (LafargeHolcim Group, 67%)	Gagal I & II, Wadi I & II, Jamul, Lakheri Thondebhavi, Kudithini, Kymore, Chanda, Chaibasa and Sindri, Damodhar, Bargarh, Madhukkarai, Tikaria, Vizag	29
Do.	Ambuja Cements Ltd. (LafargeHolcim Group, 14.8%)	Plants in 7 States	25
Do.	Dalmia Cement (Bharat) Ltd.	Dalmiapuram and Ariyalur, Tamil Nadu; and Kadapa, Andhra Pradesh	21
Do.	India Cements Co. Ltd. (Government, 26%; Life Insurance Corp. of India, 24%; others, 50%)	Sankarnagar plant and 2 plants, Tamil Nadu; 4 plants, Andhra Pradesh; Mahi plant, Rajasthan	16
Do.	Jaypee Cement Ltd.	Jaypee Rewa, Jaypee Bela, Jaypee Sadva Khurd, Jaypee Ayodhya Dalla Chunar, Jaypee Panipat, Jaypee Kutch, Jaypee Wanakbori, Jaypee Roorkee, Jaypee Wanakbori, Jaypee Bagheri, Bhilai Jaypee	14
Do.	J.K. Cement Works (a division of JK Synthetics Ltd., 100%),	Nimbahera plant, Mangrol, Muddapur Jhari, Gotan, Lakshmi Cement, Lakshmi Cement-Kalol	11
Do.	Chettinad Cement Corp. Ltd.	Chettinad-Karur, Chettinad Karikkali, Chettinad-Ariyalur	11
Chromite	Orissa Mining Corp. Ltd. (Orissa Industries Ltd., 100%)	Dhenkanal and Kendujhar District, Odisha Randia plant, Bhadrak, Cuttack District, Odisha; Hassan District Karnataka	700
Do.	Tata Steel Ltd.	Randia plant, Bhadrak, Cuttack District, Odisha	351
Do.	Ferro Alloys Corp. Ltd.	Randia plant, Bhadrak, Cuttack District, Odisha; Khamman District, Andhra Pradesh; Dhenkanal and Kendujhar Districts, Odisha	310
Do.	Balasore Alloys Ltd.	Sukinda Valley, Jajpur, Odisha	95
Do.	Indian Metal & Ferro Alloys Corp. Ltd.	Therubali, Rayagada and Choudwar, Cuttack, Mahagiri and Nuasahi mines	62
Do.	Mysore Minerals Ltd. (Government, 100%)	Mines at Aladahalli	37
Do.	do.	Mines at Bhakthara Halli	24
Do.	do.	Mines at Byrapura	15
Do.	do.	Mines at Tagadur	12
Do.	do.	Hassan District, Karnataka	12
Do.	do.	Mines at Jambur	5

See footnotes at end of table.

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

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity ^c	
Chromite—Continued	Misrilal Mines Pvt Ltd.	Saruabil village, Jajpur, Odisha	NA	
Do.	Jindal Stainless Ltd.	Jindal Chromite Mines, Jajpur, Odisha	NA	
Clay:				
Bentonite	Ashapura Minechem Ltd.	Kutch Mine, Gujarat	350	
Do.	do.	Bhuji and Dharur	72	
Do.	Ashpura International Ltd.	NA	NA	
Do.	Gimpex Ltd.	Chennai	NA	
Do.	Vijaylaxmi Group of Industries	West Rajasthan	NA	
Ball clay	Bikaner Ceramics	Rajasthan, Bikaner	75	
Do.	Sampat Lal Daga	do.	NA	
Fire clay	Shanta Sales Corp.	do.	NA	
Kaolin	20 Microns Ltd.	Bhuji, Gujarat	65	
Do.	English India Clays Ltd.	Veli Mine, Kerala	240	
Coal	million metric tons	North Eastern Coalfields Ltd. [Coal India Ltd. (Government, 100%)]	Assam	64
Do.	do.	South Eastern Coalfields Ltd. [Coal India Ltd. (Government, 100%)]	Chhattisgarh	36
Do.	do.	Central Coalfields Ltd. [Coal India Ltd. (Government, 100%)]	Bihar	27
Do.	do.	Bharat Coking Coal Ltd. [Coal India Ltd. (Government, 100%)]	Bihar and West Bengal	26
Do.	do.	Northern Coalfields Ltd. [Coal India Ltd. (Government, 100%)]	Madhya Pradesh and Uttar Pradesh	24
Do.	do.	Eastern Coalfields Ltd. [Coal India Ltd. (Government, 100%)]	Bihar and West Bengal	21
Do.	do.	Mahanadi Coalfields Ltd. [Coal India Ltd. (Government, 100%)]	Odisha	21
Do.	do.	Singareni Collieries Co. Ltd. (Andhra Pradesh State government, 50%, and Government, 50%)	Andhra Pradesh and Maharashtra	18
Do.	do.	Western Coalfields Ltd. [Coal India Ltd. (Government, 100%)]	Madhya Pradesh and Maharashtra	18
Do.	do.	Neyveli Lignite Corp. Ltd. (NLC) (Government, 100%)	Tamil Nadu	17
Copper:				
Ore, gross weight	Hindustan Copper Ltd. (HCL) (Government, 100%)	Malanjkhand Copper Complex Mines, Balaghat District, Madhya Pradesh	2,000	
Do.	do.	Khetri Copper Complex Mines, Khetrinagar Rajasthan	1,000	
Do.	do.	Indian Copper Complex Mines, Ghatsila District, Jharkhand	630	
Do.	do.	Kendadih Mine, Jharkhand Balaghat District, Madhya Pradesh	225	
Metal	Hindalco Industries Ltd. (Aditya Birla Group, 33%; foreign investors, 26%; private Indian investors, 23%; financial institutions, 18%)	Birla Copper Complex smelter, Dahej, Gujarat	500	
Do.	Vedanta Ltd.	Tuticorin smelter, Tamil Nadu	400	
Do.	do.	Silvassa refinery, Gujarat	300	
Do.	Jhagadia Copper Ltd.	Jhagadia, Gujarat	50	
Do.	Hindustan Copper Ltd. (HCL) (Government, 100%)	Khetri Copper Complex smelter-refinery, Khetrinagar District, Rajasthan	31	
Do.	do.	Indian Copper Complex smelter-refinery, Ghatsila District, Jharkhand	19	
Do.	do.	Taloja copper project, Maharashtra	NA	

See footnotes at end of table.

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

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity ^c
Diamond thousand carats	National Mineral Development Corp. Ltd. (NMDC) (Government, 100%)	Majhgawan Mine	25
Fluorite	Maharashtra State Mining Corp. Ltd.	Dongargaon, Maharashtra, Chandrapur	12
Gold, ore, gross weight metric tons	Hutti Gold Mines Co.	Hutti Mine, Karnataka	490
Do.	do.	Hira-Buddini	157
Do.	do.	Uti Mine, Karnataka	55
Do.	Mahmohan Minera Industries (Pvt) Ltd.	Kunderkocha Mine, Jharkhand	NA
Graphite	Agrawal Graphite Industries Ltd.	Belpara District, Odisha	10
Do.	Tamil Nadu Minerals Ltd.	Sivaganga District, Tamil Nadu	NA
Gypsum	FCI Aravali Gypsum and Minerals India Ltd.	Kavas-Utarali group of mines, Mohangarh group of mines, Bikaner group of mines Suratgarh group of mines, Ramsinghpur group of mines, Kishanpura A and B, Rajasthan	526
Iron and raw steel	JSW Steel Co. Ltd.	Vijayanagar, Karnataka	12,000
Do.	Tata Steel Ltd.	Jamshedpur steel plant, Jharkhand	6,800
Do.	Rashtriya Ispat Nigam Ltd.	Visakhapatnam steel plant, Andhra Pradesh	6,300
Do.	Steel Authority of India Ltd. (Government, 100%)	Bhilai steel plant, Chhattisgarh	5,100
Do.	JSW Steel Co. Ltd.	Dolvi, Maharashtra	5,000
Do.	Ministeel plants (privately owned)	18 plants located throughout India	4,700
Do.	Steel Authority of India Ltd. (Government, 100%)	Bokaro steel plant, Jharkhand	3,400
Do.	Essar Steel Co. Ltd.	Hazira, Gujarat	3,000
Do.	Indian Iron and Steel Co. Ltd. (IISCO) (Steel Authority of India Ltd. [Government, 100%])	Duburi, Odisha	3,000
Do.	do.	Kalinganagar, Odisha	3,000
Do.	Steel Authority of India Ltd. (Government, 100%)	Rourkela steel plant, Odisha	2,700
Do.	do.	Durgapur steel plant, West Bengal	2,000
Do.	Indian Iron and Steel Co. Ltd. (IISCO) (Steel Authority of India Ltd. [Government, 100%])	Jagdapur, Chhattisgarh	2,000
Do.	JSW Steel Co. Ltd.	Salem Special Steel plant, Karnataka	1,200
Do.	Indian Iron and Steel Co. Ltd. (IISCO) (Steel Authority of India Ltd. [Government, 100%])	Burnpur steel plant, West Bengal	870
Do.	MSP Steel and Power Ltd.	Raipur, Chhattisgarh	750
Do.	Lloyds Steel Industries Ltd.	Wardha, Maharashtra	500
Do.	Visvesvaraya Iron and Steel Ltd. (Karnataka State Government, 60%, and Steel Authority of India Ltd. [Government, 40%])	Bhadravati steel plant, Karnataka	180
Iron ore	Kudremukh Iron Ore Co. Ltd. (Government, 100%)	Kudremukh, Chikmagalur District, Karnataka	10,000
Do.	National Mineral Development Corp. Ltd. (NMDC) (Government, 100%)	Bailadila, Chhattisgarh	9,000
Do.	do.	Donimalai, Karnataka	9,000
Do.	Steel Authority of India Ltd. (Government, 100%)	Bastar and Durg District, Chhattisgarh; Bolani, Odisha; and Chiria, Jharkhand	7,000
Do.	do.	Kendujhar District, Odisha	3,500
Do.	Tata Steel Ltd.	do.	3,500
Do.	Steel Authority of India Ltd. (Government, 100%)	do.	3,000
Do.	V.M. Salgaocar & Bros. Pvt. Ltd.	Goa	2,500
Do.	Indian Iron and Steel Co. Ltd. (IISCO) (Steel Authority of India Ltd. [Government, 100%])	Singhbhum District, Bihar	2,500
Do.	Chowgule and Co. Ltd.	Goa	2,500
Do.	Dempo Mining Corp. Ltd.	do.	2,500

See footnotes at end of table.

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

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity ^c
Iron ore—Continued	Tata Steel Ltd.	Kendujhar District, Odisha	2,000
Do.	NSL Consolidated Ltd. (China Metallurgical Group Corp., 100%)	Mangal, Andhra Pradesh	200
Do.	Sesa Goa Ltd. (Vedanta Resources plc, 51%)	Codli and Sonshi, Goa	NA
Kyanite	Hindustan Copper Ltd. (HCL) (Government, 100%)	Singhbhum District, Bihar	22
Do.	Associated Mining Co.	Bhandara District, Maharashtra	10
Do.	Maharashtra Mineral Corp. Ltd.	do.	10
Do.	Bihar State Mineral Development Corp. Ltd. (Bihar State government, 100%)	Singhbhum District, Bihar	10
Lead-zinc ore, gross weight	Hindustan Zinc Ltd. (Sterlite Opportunities and Ventures Ltd., 64.9%, and Government, 29.5%)	Rampura-Agucha Mine, Rajasthan	5,000
Do.	do.	Sindesar Khurf Mine, Rajasthan	4,500
Do.	do.	Zawar Mine group, Rajasthan	4,000
Do.	do.	Kayad Mine, Rajasthan	1,200
Do.	do.	Rajpura Dariba Mine, Rajasthan	900
Lead concentrate, Pb content	do.	Sargipalli Mine, Odisha	150
Do.	do.	Chanderiya smelters, Rajasthan	85
Do.	do.	Agnigundala Mine, Andhra Pradesh	72
Do.	do.	Zawar Mine group, Rajasthan	8
Lead, refined:			
Primary	do.	Chanderiya smelters, Rajasthan	105
Do.	do.	Dariba smelter	100
Do.	do.	Tundoo smelter, Bihar	8
Secondary	Indian Lead Co.	Thane refinery, Mumbai, Maharashtra	12
Do.	do.	Refinery at Kolkata	12
Magnesite	Steel Authority of India Ltd. (Government, 100%)	Salem, Tamil Nadu	150
Do.	Tamil Nadu Magnesite Ltd. (Tamil Nadu State government, 100%)	do.	150
Do.	Dalmia Magnesite Corp.	do.	72
Manganese ore, gross weight	MOIL Ltd. (Government, 100%)	Balaghat, Madhya Pradesh	310
Do.	do.	Chikla Mine, Maharashtra	150
Do.	do.	Ukwa Mine, Madhya Pradesh	55
Do.	do.	Munsar Mine, Maharashtra	55
Do.	do.	Gumgaon, Maharashtra	60
Do.	Aryan Mining & Trading Corp.	Sundargarh, Odisha	NA
Do.	Eastern Mining Co.	North Kanara, Karnataka	NA
Do.	Falechand Marsingdas	Andhra Pradesh	NA
Do.	J.A. Trivedi Bros.	do.	NA
Do.	Mysore Minerals Ltd.	do.	NA
Do.	do.	Shimoga, Karnataka	NA
Do.	Mangilall, Rungta (Pvt.) Ltd.	Keonjhar, Odisha	NA
Do.	Orissa Mining Corp. Ltd.	do.	NA
Do.	do.	do.	NA
Do.	Orissa Mineral Development Co. Ltd.	Koraput, Odisha	NA
Do.	Orissa Manganese & Minerals (Pvt.) Ltd.	do.	NA
Do.	Radhika Metals & Minerals Pvt. Ltd.	NA	NA
Do.	R.B.S. Shreeram Durga Prasad and Falechand Marsingdas	Vizianagaram, Andhra Pradesh	NA
Do.	Rungta Mines (Pvt.) Ltd.	do.	NA
Do.	Sandur Manganese and Iron Ores Ltd.	Bellary, Karnataka	NA
Do.	S. Lall & Co.	do.	NA
Do.	Tata Steel Ltd.	Ferromanganese plant, Odisha	NA
Do.	do.	Keonjhar, Odisha	NA
Do.	do.	do.	NA

See footnotes at end of table.

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

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity ^c
Mica		Premier Mica Co.	Rjupalem, Andhra Pradesh	200
Do.		Micafab India Pvt. Ltd.	Sydapuram Mandal, Andhra Pradesh	1
Do.		Dwarakananad Reddy, and 4 others	Nellore, Andhra Pradesh	NA
Petroleum, refined	thousand 42-gallon barrels per day	Reliance Industries Ltd.	Jamnagar refinery, Gujarat	668
Do.	do.	Essar Oil Ltd.	Vadinar refinery, Gujarat	245
Do.	do.	Indian Oil Corp. (Oil and Natural Gas Corp., 91%, and private interests, 9%)	Mathura refinery, Uttar Pradesh	240
Do.	do.	Reliance Industries Ltd.	Koyali refinery, Gujarat	185
Do.	do.	Indian Oil Corp. (Oil and Natural Gas Corp., 91%, and private interests, 9%)	Mathura refinery, Uttar Pradesh	156
Do.	do.	Bharat Petroleum Corp. Ltd. (Oil and Natural Gas Corp., 67%, and private interests, 33%)	Mahul refinery, Mumbai, Maharashtra	135
Do.	do.	Madras Refineries Ltd. (Oil and Natural Gas Corp., 52%, and private interests, 48%)	Madras refinery, Tamil Nadu	131
Do.	do.	Hindustan Petroleum Corp. Ltd. (Oil and Natural Gas Corp., 51%, and private interests, 49%)	do.	110
Do.	do.	Essar Oil Ltd.	Visakhapatnam refinery, Andhra Pradesh	90
Do.	do.	Kochi Refineries Ltd. (Oil and Natural Gas Corp., 55%, and private interests, 45%)	Ambalamugal refinery, Kerala	67
Do.	do.	do.	Haldia refinery, West Bengal	61
Phosphate rock, gross weight		Rajasthan State Mineral Development Corp. Ltd. (Rajasthan State government, 100%)	Jamarkotra, Badgaon, Dakankotra, Kanpur, Kharbaria-ka-Guda, and Sallopat Mines, Rajasthan	1,500
Do.		Pyrites Phosphates and Chemicals Ltd.	Durmala and Maldeota underground mines, Uttar Pradesh	NA
Do.		Madhya Pradesh State Mining Corp. Ltd. (Madhya Pradesh State government, 100%)	Hirapur (Maddeora) and Khatamba Mines, Madhya Pradesh	NA
Do.		do.	Hirapur Mine (Tigoda), Madhya Pradesh	NA
Do.		do.	Jhabua Mine, Madhya Pradesh	NA
Do.		Hindustan Zinc Ltd. (HZL) (Sterlite Opportunities and Ventures Ltd., 64.9%, and Government, 29.5%)	Maton Mine, Rajasthan	NA
Rare earths, monazite	metric tons	IREL (Indian) Ltd. [Government (Department of Atomic Energy, 100%)]	Manavalakurichi, Tamil Nadu	6,000
Do.	do.	Kerala Minerals and Metals Ltd.	Kollam, Kerala	240
Salt		Dev Salt Pvt. Ltd.	Morbi, Gujarat	28,000
Do.		Hindustan Salt Ltd.	Mine at Mandi District, Himachal Pradesh	4,800
Silver, metal	thousand kilograms	Hindustan Zinc Ltd. (HZL) (Sterlite Opportunities and Ventures Ltd., 64.9%, and Government, 29.5%)	Chavara, Kerala	600
Titanium, ilmenite-rutile ore		V.V. Mineral Pvt. Ltd.	Thoothukudi, Tamil Nadu	500
Do.		Trimex Sands Pvt. Ltd. (Trimex Group)	Andhra Pradesh	300
Do.		Beach Minerals Co. Pvt. Ltd.	Kuttam, Chennai, Tamil Nadu	150
Do.		Kerala Minerals and Metals Ltd. (Kerala State government, 100%)	Orissa Sands Complex, Ganjam	103
Do.		do.	Manavalakurichi, Tamil Nadu	100
Do.		Trimex Sands Pvt. Ltd. (Trimex Group)	Sirkurman deposit, Srikakulam	NA
Uranium, ore, U content		Uranium Corp. of India [Government (Department of Atomic Energy), 100%]	Jaduguda, Jharkhand, Tummalalle, Andhra Pradesh	500

See footnotes at end of table.

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

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity ^c
Zinc, metal	Hindustan Zinc Ltd. (HZL) (Sterlite Opportunities and Ventures Ltd., 64.9%, and Government, 29.5%)	Rampura, Agacha Mine	3,300
Do.	do.	Dariba Smelting Complex, Rajasthan	210
Do.	do.	Zinc Smelter Debari, Rajasthan	88
Do.	do.	Zinc Smelter Vizag, at Vizag, Andhra Pradesh	56
Do.	Binani Zinc Ltd. (Binani Industries Ltd., 89.9%)	Binanipuram smelter, Kerala	38

^cEstimated. Do., do. Ditto. NA Not available.

¹The plants were closed in 2018.

²The plant has been closed since December 2008 through 2018.

TABLE 3
INDIA: EXPORTS OF SELECTED MINERAL COMMODITIES

(Thousand metric tons unless otherwise specified)

Commodity	2014	2015	2016	2017	2018
METALS					
Aluminum:					
Alumina	1,526	1,367	1,437	1,358	1,418
Bauxite	5,289	7,491	2,929	1,694	1,132
Copper:					
Ore and concentrates	4	--	10	14	32
Blister and anode	--	--	2	--	--
Refined copper	362	341	305	395	127
Copper alloy, ingots	2	2	2	6	3
Copper and alloys, semifabricated	21	33	33	47	43
Copper and alloys, scrap	6	5	4	5	5
Gold, metal ¹	kilograms 70,721	70,796	135,275	133,032	36,929
Iron ore:					
Iron ore, gross weight	9,844	4,211	21,697	28,057	17,900
Iron ore, Fe content ^c	6,100	2,600	13,500	17,400	11,100
Iron and steel:					
Direct-reduced iron	167	132	262	500	658
Pig iron	835	542	556	655	322
Steel:					
Semifinished and finished steel products	10,379	7,563	10,325	16,335	11,101
Ingots and semis	1,601	769	1,766	2,786	2,452
Long products	908	766	1,051 ^r	1,848	1,501
Flat products	5,899	4,373	5,791	9,749	5,513
Tabular products	1,463	1,215	1,345	1,602	1,251
Lead, metal	7	54	64	77	NA
Zinc, metal	174	225	232	203	216
INDUSTRIAL MINERALS					
Barite	829 ^r	524 ^r	1,057 ^r	1,417	2,244
Cement ¹	5,141	6,288	6,222	6,851	6,650
Graphite, natural	metric tons 2,774	302	400	1,068	450
Gypsum	do. 38,213	56,023	95,391	75,738	150,050
Potassic fertilizers	do. 17	39	31	32	43
Potassium nitrate	1,246	1,063	1,130	886	821
MINERAL FUELS AND RELATED MATERIALS					
Coal ¹	2,189	1,237	1,576	1,772	1,500
Liquefied natural gas	5	5	5	NA	NA
Petroleum, crude	350	1,050	NA	NA	NA

^cEstimated. ^rRevised. NA Not available. -- Zero.

¹Production is for the fiscal year that began on April 1 of the year shown in the column heading.

Source: Indian Minerals Yearbook 2014–2018; World Steel Association, 2019; International Copper Study Group, 2019; United Nations Comtrade Database, 2014–2018.

TABLE 4
INDIA: IMPORTS OF SELECTED MINERAL COMMODITIES

(Thousand metric tons unless otherwise specified)

Commodity		2014	2015	2016	2017	2018
METALS						
Aluminum:						
Alumina		818	874	1,310	2,056	2,694
Bauxite		1,601 ^r	1,337 ^r	1,510 ^r	1,628	1,887
Copper:						
Ore and concentrates		594	687 ^r	672	440	315
Blister and anode		38	83	149	142	130
Refined copper		31	40	36	36	84
Copper alloy, ingots		4	3	3	3	3
Copper and alloys, semifabricated		227	260 ^r	296	311	429
Copper and alloys, scrap		169	174	180	175	195
Gold metal ¹	kilograms	661,715	915,473	968,075	778,449	955,182
Iron ore:						
Iron ore, gross weight		7,413	9,515	3,597	5,362	15,890
Iron ore, Fe content ^c		4,600	5,900	2,200	3,300	9,900
Iron and steel:						
Direct-reduced iron		178	38	22	90	53
Pig iron		27	35	38	27	20
Scrap		5,699	6,710	6,380	5,365	6,330
Steel:						
Semifinished and finished		9,477	13,284	9,904	8,882	9,026
Ingots and semis		413	765	577	555	598
Long products		1,626	2,015	1,423	1,062	1,198
Flat products		6,744	9,829	7,119	6,573	6,259
Tabular products		657	643	752	658	916
Lead, metal		113	109	121	121	131
Zinc, metal		112 ^r	105 ^r	236 ^r	141	153
INDUSTRIAL MINERALS						
Barite	metric tons	5,984 ^r	10,145 ^r	7,414	10,131	12,508
Cement ¹		13,676	7,165	1,359	2,038	2,620
Graphite, natural	metric tons	25,235	29,292	33,523	39,986	42,863
Gypsum	do.	4,066	3,850	4,451	4,960	5,974
Potassic fertilizers	do.	4,250	3,722	3,828	4,570	4,622
Potassium nitrate	do.	158	286	191	266	100
MINERAL FUELS AND RELATED MATERIALS						
Coal ¹		166,861	212,103	204,000	191,014	208,000
Liquefied natural gas		19,100	20,000	24,300	26,100	30,600
Petroleum, crude		1,300	1,400	1,500	1,700	1,800

^cEstimated. ^rRevised.

¹Production is for the fiscal year that began on April 1 of the year shown in the column heading.

Source: Indian Minerals Yearbook, 2014–2018; World Steel Association, 2019; International Copper Study Group, 2019; United Nations Comtrade Database, 2014–2018.

TABLE 5
INDIA: ESTIMATED RESERVES OF MAJOR MINERAL COMMODITIES IN 2018^{1,2}

(Thousand metric tons unless otherwise specified)

Commodity	Reserves
Apatite	30
Asbestos (all grades)	30
Barite (all grades)	51,000
Bauxite	660,000
Calcite	3,400
Chalk	5,100
Chromite ore (all grades)	100,000
Clay:	
Ball clay	50,000
Bentonite	15,000
Fireclay	27,000
Fuller's earth	3,900
Kaolin	230,000
Coal, lignite	150,000,000
Copper:	
Crude ore	210,000
Cu content	2,700
Corundum	metric tons 200
Diamond	thousand carats 960
Diaspore	7,900
Dolomite	680,000
Dunite	13,000
Feldspar (all grades)	320,000
Fluorite	290
Garnet	13,000
Gold:	
Crude ore	17,000
Au content	kilograms 70,000
Graphite	8,000
Gypsum	37,000
Iron ore:	
Crude ore	5,400,000
Fe content	3,400,000
Iron oxide-pigments, ochre	37,000
Kyanite and related minerals:	
Kyanite	690
Sillimanite	6,500
Lead and zinc ore	110,000
Lead, Pb content	2,500
Limestone	16,000,000
Magnesite	82,000
Manganese ore	93,000
Mica	140
Monazite	13,000
Phosphate rock	46,000
Quartzite	83,000
Silica	650,000
Salt (rock)	16,000,000
Silver:	
Crude ore	150,000
Ag content	7,200
Talc	110,000
Tin:	
Ore	4
Sn content	metric tons 150

See footnotes at end of table.

TABLE 5—Continued
INDIA: ESTIMATED RESERVES OF MAJOR MINERAL COMMODITIES IN 2018^{1,2}

(Thousand metric tons unless otherwise specified)

Commodity	Reserves
Titanium minerals:	
Ilmenite	690,000
Rutile	34,000
Vermiculite	1,600
Wollastonite	2,200
Zinc, Zn content	10,000
Zircon	3,400

¹The total reserves of major mineral commodities includes proven and probable reserves.

²Data have been rounded to no more than two significant digits.

Source: Indian Bureau of Mines, 2018