



2020–2021 Minerals Yearbook

INDIA [ADVANCE RELEASE]

THE MINERAL INDUSTRY OF INDIA

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Note: In this chapter, information for 2020 is followed by information for 2021.

India's economic growth was largely driven by investment and exports, which resulted in increases in India's production of, and demand for, mineral commodities. As a result, India had become the world's leading producer of numerous commodities. In 2020, India ranked 1st in the world in the production of feldspar, iron oxide pigments (not including United States production), kaolin, and talc and pyrophyllite; 2d in the production of barite (not including United States production), bentonite, cement, fuller's earth, pig iron, raw steel, and wollastonite (not including United States production); 3d in the production of aluminum (metal, primary), coal, kyanite and related minerals, lime, and salt; 4th in the production of alumina, garnet (industrial), iron ore (Fe content), nitrogen (ammonia), and zinc; 5th in the production of abrasives (manufactured, fused aluminum oxide); 6th in the production of bauxite, bromine (not including United States production), chromium (not including United States production), manganese, and rare earths; 7th in the production of lead, mica (natural), and titanium (sponge); 8th in the production of sulfur and vermiculite; 9th in the production of abrasives (manufactured, silicon carbide); 10th in the production of graphite (natural) and silicon; 11th in the production of ilmenite and selenium; 16th in the production of phosphate rock; 18th in the production of gypsum; and 20th in the production of crude petroleum. The country's share of world production of feldspar and talc and pyrophyllite was 25% each in 2020; barite, 23%; bentonite and fuller's earth, 19% each; bentonite and kaolin, 16% each; wollastonite, 14%; garnet (industrial), 12%; cement, iron ore (Fe content), and nitrogen (ammonia), 8% each; chromium, 7%; raw steel and zinc, 6% each; alumina, aluminum, bauxite, lead, and pig iron, 5% each; and lime and sulfur, 4% each (Anderson, 2022; Apodaca, 2022a–c; Barry, 2022; Bolen, 2022a, b; BP p.l.c., 2022, p. 15, 38; Bray, 2022a, b; Brioche, 2022; Cordier, 2022; Crangle, 2022; Gambogi, 2022a, b; Hatfield, 2022a, b; Jasinski, 2022a, b; Klochko, 2022; McRae, 2022; Olson, 2022a, b; Sangine, 2022; Schnebele, 2022a–c; Schulte, 2022; Simmons, 2022a, b; Stewart, 2022; Tolcin, 2022; Tuck, 2022a, b).

Minerals in the National Economy

In 2020, India's real gross domestic product (GDP) decreased by 6.6% compared with an increase of 3.7% in 2019. The nominal GDP in 2020 was \$2.67 trillion. The mining and quarrying sector in fiscal year 2020 (which ran from April 1, 2020, through March 31, 2021) accounted for 1.6% of the gross value added. Foreign direct investment (FDI) inflows increased by 27% to \$64.1 billion in 2020 from \$50.5 billion in 2019 as a result of merger and acquisition activity in the energy, health, information and communication technology, and infrastructure sectors. The investment in greenfield projects decreased by 59% to \$27 billion in 2020 owing to the

coronavirus disease 2019 (COVID-19) pandemic. The largest greenfield project in 2020 was the construction of the \$508 million steel plant in the State of Maharashtra by NLMK India of Russia, a fully owned subsidiary by NMLK Group of Russia. The commissioning of the Turkmenistan–Afghanistan–Pakistan–India natural gas pipeline was delayed until 2023 (Steel Orbis Connecting Markets, 2021; United Nations Conference on Trade and Development, 2021, p. x, 50, 70, 91, 119, 250; International Monetary Fund, 2022b, p. 129; Ministry of Mines, 2022, p. 5; World Bank, The, 2022).

Government Policies and Programs

Before 2020, Government restrictions allowed coal mined in India to be used only domestically and not to be sold on the open market. In 2020, Parliament passed the MMDR amendment bill that removed the restrictions on the end use of mined coal and opened the sector to mining by a broader range of companies. As a result of the amendment, state-run Coal India Ltd.'s monopoly on domestic coal production was ended, and a reduction in coal imports was expected. The amendment also was expected to aid the bidding process for domestic and foreign companies. As a result, 41 coal mines across the country were auctioned to private companies and 26 companies bought tenders for \$6,700 each. Despite the amendments to the MMDR, however, some coal companies continued to face objections from unions. Some of the mines had to be withdrawn from the auction process because they are located in the western peninsular region of Maharashtra in an ecologically sensitive area, and the Chief Minister of eastern Jharkhand State filed the petition in the Supreme Court against the Government's decision to open coal mining to the private sector in 2020 (Economic Times, The, 2020; Leotaud, 2020; Verma and Varadhan, 2020).

Production

In 2020, production of kyanite increased by 84%; bituminous coal, by 38%; mined uranium (U content), by 30%; ferrotitanium, by 25%; fuller's earth, by 18% (estimated); bromine, by 17% (estimated); and ferrovanadium, by 13%. Production of garnet decreased by 97%; ferroaluminum, by 44%; mined chromium, by 42%; industrial diamond, by 41%; gem diamond and wollastonite, by 40% each; ferrosilicomagnesium, by 38%; ferromolybdenum and fluorspar (metallurgical grade), by 36% each; refined gold (bullion), mined gold, and mined tin (concentrate, gross weight), by 35% each; mined manganese (Mn content) and refined tin (primary), by 32% each; natural gas (gross), by 31%; vermiculite, by 30%; copper (smelter, primary) and mined magnesite, by 29% each; graphite, amorphous and crystalline flake, by 25% each (estimated); barite and crude petroleum (estimated), by 24% each; mined gold (ore, gross weight), by 23%; mined copper

(concentrates, Cu content) and refined copper (primary), by 21% each; sillimanite, by 20%; finished steel products, by 19%; refined lead (secondary), by 16%; cement and sulfur (S content), by 13% each; natural gas (marketable), by 12%; bauxite, iron oxide pigments (ocher), refined silver, and raw steel, by 10% each. There was no production of secondary copper. Data on mineral production are provided in table 1.

Structure of the Mineral Industry

In India, most of the mining and mineral-processing activities were conducted by Government-owned, private, and (or) State-owned companies. The shares of State and (or) Government ownership were mainly in the metal and energy industries. Some of the Government-owned companies operated in both upstream and downstream production. Coal production (prior to passage of the MMDR amendment bill in 2020) was conducted mostly by Coal India (which was Government-owned); chromite production, by Karnataka State Minerals Corp. Ltd. (State-owned); manganese production by MOIL Ltd. (Government-owned); bauxite mining and alumina and aluminum production, by National Aluminium Co. Ltd. (Government-owned); copper mining and processing and diamond mining, by Hindustan Copper Ltd. (Government-owned); iron ore mining and steel production, by Steel Authority of India Ltd. (Government-owned); and uranium mining, by Uranium Corp. Ltd. of India (Government-owned) (table 2). After passage of the amendment to the MMDR, private noncoal companies were allowed to invest in the coal industry. The privatization of the coal industry was expected to increase coal production as well as increase competitiveness in the bidding process and in the price of coal (Krishna, 2022).

Mineral Trade

The total value of India's exports decreased to \$296.3 billion in fiscal year 2020 from \$320.4 billion (revised) in fiscal year 2019. The total value of imports decreased to \$398.5 billion in fiscal year 2020 from \$477.9 billion (revised) in fiscal year 2019. The decreases were due to the decline in demand and interruptions in the supply chain caused by the coronavirus disease (COVID-19) pandemic (Afonso, 2020; International Monetary Fund, 2022a, p. 4, 8).

In 2020, in terms of quantity, exports of gold (metal) increased by 725%; copper alloys and ingots, by 433%; lead (metal), by 300%; pig iron, by 95%; graphite (natural), by 70%; iron ore (gross weight), by 67%; iron ore (Fe content), by 66%; zinc (metal), by 54%; refined copper, by 43%; semifinished and finished steel products, by 28%; potassium nitrate, by 22%; and steel flat products, by 12%. Exports of bauxite decreased by 78%; copper ore and concentrates, by 73%; cement, by 51%; diamond and copper and alloys scrap, by 36% each; direct-reduced iron, by 31%; potassic fertilizers, by 27%; barite, by 23%; and petroleum products, by 20% (table 3).

In 2020, in terms of tonnage, imports of potassium nitrate increased by 126%; bauxite, by 44%; and copper blister and anode, by 28%. Imports of iron ore (Fe content) decreased by 69%; iron ore (gross weight), by 66%; gold (metal), by 56%; copper and alloys (semifabricated), by 50%; pig iron, by 46%;

steel flat products, by 45%; steel (semifinished and finished), by 44%; copper alloys (ingots), by 33%; copper ore and concentrates, by 30%; barite, by 28%; diamond, by 26%; iron and steel (scrap), by 24%; alumina, by 19%; graphite (natural), by 14%; coal, by 13%; and potassium fertilizer, by 12% (table 4).

In 2020, imports to India from the United States were valued at about \$27.1 billion compared with \$34.2 billion in 2019. These included crude petroleum worth \$4.4 billion; gem diamond, \$3.4 billion; coal and fuels, \$795.3 million; natural gas, \$733.67 million; petroleum products, \$730.9 million; natural gas liquids, \$649.95 million; nonmonetary gold, \$522.4 million; metallurgical-grade coal, \$439.37 million; aluminum and alumina, \$382.79 million; precious metals \$212.27 million; copper, \$123.35 million; nonferrous metals, \$140.76 million; iron and steel products, \$59.21 million; iron and steel mill products, \$29.62 million; nonmetallic minerals, \$5.1 million; and fuel oil, \$1.87 million (U.S. Census Bureau, 2022a).

In 2020, exports from India to the United States were valued at about \$51.3 billion compared with \$57.9 billion in 2019. These included gem diamond worth \$6.1 billion; petroleum products, \$1.7 billion; gemstones, \$609.0 million; stone, sand, and cement, \$544.2 million; iron and steel products, \$324.4 million; fuel oil, \$296.9 million; iron and steel (advanced), \$265.9 million; bauxite and aluminum, \$219.0 million; iron and steel mill products, \$65.17 million; sulfur and related nonmetallic minerals, \$47.75 million; nonferrous metals, \$22.07 million; other precious metals, \$18.87 million; copper, \$7.31 million; nickel, \$711,000; zinc, \$585,000; tin, \$144,000; coal and related materials, \$100,000; and nonmonetary gold, \$23,000 (U.S. Census Bureau, 2022b).

Commodity Review

Metals

Bauxite and Alumina.—In 2020, India produced 19.99 million metric tons (Mt) of bauxite compared with 22.32 Mt in 2019. As a result of the countrywide lockdown during the COVID-19 pandemic, most of the bauxite mines in the States of Chhattisgarh and Jharkhand were temporarily suspended in 2020 (table 1; KMPG, 2020, p. 30).

Government-owned Odisha Mining Corp. Ltd. (OMC) was expected to increase production of bauxite at the Kodingamali Mine to 6 million metric tons per year (Mt/yr) from 3 Mt/yr. In November 2018, a complaint against OMC was filed by villages because of the contamination of agricultural fields caused by the mine. In September 2020, the villagers continued to protest against the mining project. A public hearing about the mining project was held in November 2020; however, no further details were available. Despite the lockdown, mining operations continued at the Kodingamali bauxite mine in the State of Odisha in 2020, and the mine continued to supply bauxite to Vedanta Ltd.'s alumina refinery at Lanjigarh in the State of Odisha (table 2; Mohanty, 2017; KMPG, 2020, p. 30; Pal, 2020; Krithika, 2021).

Utkal Alumina International Ltd., which was a wholly owned subsidiary of Hindalco Industries, planned to expand the production capacity of alumina at its Koraput refinery in Odisha to 2.0 Mt/yr from 1.5 Mt/yr. As of yearend 2020, the expansion

project was in progress. The bauxite supply to the refinery was sourced from the Baphlimali bauxite mine located in Odisha. The expansion project was expected to be completed by 2021 (table 2; Indian Bureau of Mines, 2019, p. 1; Mining.com, 2019; Aditya Birla Group, 2021, p. 25, 167, 174, 184).

Copper.—In 2020, production of mined copper (concentrates, Cu content) decreased to 23,000 metric tons (t) from 29,200 t in 2019; smelted copper (primary), to 243,000 t from 342,300 t; and total refined copper (primary and secondary), to 334,000 t from 426,000 t. In 2020, the Madras High Court rejected Vedanta’s petition to restart the Tuticorin copper smelter in Tamil Nadu. In March 2018, the State government ordered Vedanta to permanently shut down the smelter owing to protests concerning the environmental risk of the smelter and the company’s plan to increase the smelter’s production capacity to 800,000 metric tons per year of refined copper. Vedanta submitted a petition for renewal of its Consent to Operate (CTO) certificate in 2018, which was rejected by the Tamil Nadu Pollution Control Board. The company then approached the National Green Tribunal (NGT) in New Delhi, and the State government reached out to the Supreme Court of India, which was expected to review the case in 2021. The Supreme Court transferred the case to the High Court of Judicature at Madras (the Madras High Court), however, which is the highest court in the State of Tamil Nadu. As of 2020, the smelter remained closed, and Vedanta was awaiting the Madras High Court’s decision on the renewal of the company’s CTO certificate (tables 1, 2; Varadhan, 2018; Narasimhan, 2020; Trivedi, 2020).

Iron Ore and Iron and Steel.—India produced 126 Mt of iron ore (Fe content) in 2020, which is the same as in 2019. Raw steel production was 100.26 Mt in 2020 compared with 111.35 Mt in 2019. As a result of the lockdown during the COVID-19 pandemic, the demand for steel from the construction, automobile, and railway sectors decreased by 7.7% to 93.7 Mt in 2020. The Jamshedpur steel plant reduced its production, and some companies’ downstream facilities were suspended and put on care-and-maintenance status (table 1; Firstpost, 2020; Hindu Business Line, The, 2020).

In September 2020, in a meeting among the Minister of the State of Karnataka, the national (or “Union”) Minister of Coal and Mines, and the 100%-Government-owned National Mineral Development Corp. Ltd. (NMDC), a decision was made to extend the mining licenses of the Donimalai mines in Bellary District, Karnataka, and for NMDC to resume mining operations there. NMDC had closed the mines in 2018 owing to a disagreement with the State government concerning an extension of NMDC’s mining license that, as a condition of the extension, required a premium payment equal to 80% from the sale value of iron ore from the mines. The High Court of Karnataka ruled against the State government’s decision to impose the premium payment and, in response to this decision, the State government withdrew its approval for the extension of the mining license and started to auction off new mining licenses for the mines. NMDC filed a petition with the Karnataka High Court to end the issuance of new mining licenses for the Donimalai mines, and the High Court issued an order that prevented the State government from any further auctions in

relation to the Donimalai mines (table 2; Choo, 2019; Iyengar, 2021; Ministry of Mines, 2021, p. 7; NMDC Ltd., 2021, p. 36).

Since 2019, the country’s steel companies had continued to request that the Government ban the export of iron ore. The companies stated that the steel production goal specified in the National Steel Policy would be possible if issues with the iron ore supply could be resolved. The Government had approved the National Steel Policy in 2017. Under this policy, the country’s steel production capacity is planned to reach 300 Mt/yr by 2030 (Press Information Bureau, 2017; Business Today, 2021).

Titanium and Zirconium (Mineral Sands).—In 2020, the production of ilmenite and leucoxene decreased to 310,000 t from 340,000 t in 2019, and that of rutile decreased to 12,000 t from 13,000 t; production of zircon remained the same, at an estimated 18,000 t (table 1). In 2020, the employees of Trimex Sands Pvt. Ltd. requested that the Union Government (that is, the central Government) and the State of Andhra Pradesh take steps to resume heavy-mineral-sand mining operations as privately owned, Government-owned, or State-owned sectors. The Government order issued in 2020 stated that heavy minerals may be mined only by Government-owned companies. In 2019, Trimex Sands, which was part of the Trimex Group, halted its mineral-sand development operation because of the ban on beach sand mining by private mining companies. The company had been conducting the mining operations at the Bhavanapadu and Kalingaratnam heavy-mineral-sand projects in Srikakulam District (CRISIL Ltd., 2018, p. 1–2; Hindu, The, 2020).

Industrial Minerals

Diamond.—In 2020, the production of gem diamond decreased to 6,000 carats from 10,000 carats in 2019, and production of industrial diamond decreased to 16,000 carats from a revised 27,000 carats in 2019 (table 1). As of yearend 2020, Essel Mining and Industries Ltd., which was a subsidiary of Aditya Birla, was in the process of obtaining regulatory clearances on a mine plan and on an environmental and forest impact statement for the Bunder diamond project. The company was expected to obtain a mining license by the end of 2022 and to start mine development and construction of a processing plant. The company won the auction for the Bunder project in 2019; the project is located in Chhatarpur District, Madhya Pradesh. Previous exploration work by Rio Tinto Ltd. of Australia estimated the resources at the deposit to be 44 Mt of kimberlite ore containing about 0.7 carat per metric ton of rough diamond (Rio Tinto Ltd., 2016, p. 222; Aditya Birla Group, 2019, 2020).

Minerals Fuels and Related Materials

Uranium.—India’s production of mined uranium (U content) increased to 400 t in 2020 from 308 t in 2019. As of 2020, Uranium Corporation of India Ltd. (UCIL), which was owned by the Department of Atomic Energy, continued to work on the Kanampalle project. The Atomic Mineral Directorate completed defining the lease boundary in 2020 and sent the results to the Department of Mines and Geology (DMG) for review. According to the company, the Kanampalle deposit, which is located in the State of Andhra Pradesh, was the country’s

largest uranium deposit. The company was expected to invest about \$845 million in the project (table 1; Das, 2019; Uranium Corporation of India Ltd., 2020, p. 8, 10).

MINERAL INDUSTRY HIGHLIGHTS IN 2021

In 2021, India ranked 1st in the world in the production of feldspar, iron oxide pigments (not including United States production), kaolin, and talc and pyrophyllite; 2d in the production of aluminum (metal, primary), barite (not including United States production), bentonite, cement, fuller's earth, pig iron, raw steel, salt, and wollastonite (not including United States production); 3d in the production of coal, chromium (not including United States production), and lime; 4th in the production of alumina, iron ore (Fe content), nitrogen (ammonia), and zinc; 5th in the production of abrasives (manufactured, fused aluminum oxide), garnet (industrial), industrial sand and gravel, kyanite and related minerals, rutile, and sulfur; 6th in the production of bauxite (not including United States production), lead, and mica (natural); 7th in the production of titanium (sponge) (not including United States production) and rare earths; 8th in the production of manganese and sulfur; 9th in the production of abrasives (manufactured, silicon carbide); 10th in the production of graphite (natural), gypsum, and ilmenite; 11th in the production of vermiculite; 12th in the production of selenium and silver; 13th in the production of silicon; 16th in the production of phosphate rock; and 21st in the production of crude petroleum. The country's estimated share of world production of barite, feldspar, and talc and pyrophyllite was 24% each in 2021; fuller's earth, 18%; kaolin, 17%; bentonite, 16%; salt, 15%; chromium, iron ore (Fe content), and wollastonite, 10% each; cement and nitrogen (ammonia), 8% each; aluminum, pig iron, raw steel, and zinc, 6% each; alumina and lead, 5% each; and bauxite, lime, mica (natural), and sulfur, 4% each (BP p.l.c., 2022, p. 15, 38; Apodaca, 2023a–c; Barry, 2023; Bolen, 2023; Briocche, 2023; Cordier, 2023; Crangle, 2023; Flanagan, 2023a, b; Gambogi, 2023a, b; George, 2023; Goodin, 2023; Hatfield, 2023a, b; Jasinski, 2023a, b; McRae, 2023; Merrill, 2023a, b; Olson, 2023a, b; Sangine, 2023a, b; Schnebele, 2023a–c; Schulte, 2023; Simmons, 2023a, b; Stewart, 2023; Tolcin, 2023a, b; Tuck, 2023a, b).

Minerals in the National Economy

In 2021, India's real GDP increased by 8.7% compared with a decrease of 6.6% in 2020. The nominal GDP in 2021 was \$3.18 trillion. In fiscal year of 2021 (which ran from April 1, 2021, through March 31, 2022), mining and quarrying accounted for 2.3% of the country's gross value added (International Monetary Fund, 2022b, p. 129; Ministry of Mines, 2022, p. 5; World Bank, The, 2022).

In 2021, the Government announced the temporary withdrawal of antidumping duties on imports of alloy-steel bar, rods, and flat steel products coated or plated with aluminum or zinc from China and other countries, including Vietnam and the Republic of Korea, until September 30, 2021. In addition, the Government also reduced the custom duties on semifinished,

flat, and long products of nonalloy, alloy, and stainless steel to 7.5% from a range of 10% to 12.5% (Arora, 2021).

After consultations with the State governments, industry associations, miners, other stakeholders, and the general public, the Ministry of Mines, through a notification dated November 10, 2021, introduced the Mineral Conservation and Development (Amendment) Rules, 2021 to amend the Mineral Conservation and Development Rules, 2017 [MCDR], which falls under section 18 of the MMDR. The amendments specify that all plans and sections related to certain or all leases specified by the Indian Bureau of Mines must be prepared using a digital global positioning system (DGPS) and (or) total station (TS) and (or) drone. The amended rule requires the submission of digital images of mining areas by leasing companies or mine holders. The leasing companies and mine holders that have excavation plans of 1 Mt/yr or more or with a leased area of 50 hectares or more must submit drone survey images of the area and up to 100 meters outside the area boundary every year. Other leasing companies or mine holders are expected to meet a high-resolution satellite image requirement for submission of digital images of the mining area (PIB Delhi, 2021).

Mineral Trade

The total value of India's exports increased to \$429.2 billion in 2021 from \$296.3 billion in 2020. In 2021, in terms of quantity, exports of blister and anode increased by 400%; copper and alloys (scrap), by 129%; refined copper, by 113%; diamond, by 107%; bauxite, by 92%; pig iron, by 71%; copper and alloys (semifabricated), by 50%; gypsum, by 38%; barite and petroleum products, by 30% each; potassic fertilizer, by 27%; alumina, by 16%; and steel, direct-reduced iron, and flat steel products, by 13% each. In 2021, in terms of quantity, exports of gold (metal) decreased by 97%; copper ore and concentrates, by 43%; cement and iron ore (Fe content), by 31% each; lead metal, by 25%; and zinc metal, by 12% (table 3; International Monetary Fund, 2022a, p. 4, 8).

The total value of India's imports increased to \$618.6 billion in 2021 from \$398.5 billion in 2020. In 2021, in terms of quantity, imports of iron ore (Fe content) increased by 139%; pig iron, by 114%; copper ore and concentrates, by 59%; diamond, by 45%; iron and steel (semifinished and finished), by 35%; barite, by 33%; alumina, by 31%; graphite (natural), by 27%; copper alloys (semifabricated), by 22%; and copper blister and anode, by 17%. In 2021, in terms of quantity, imports of copper alloys (ingots) decreased by 50%; lead metal, by 18%; steel (flat products), by 16%; and direct-reduced iron, by 15% (table 4).

In 2021, imports to India from the United States were valued at about \$40.1 billion compared with \$27.1 billion in 2020; these included crude petroleum worth \$9.7 billion; gem diamond, \$5.4 billion; natural gas, \$1.4 billion; nonmonetary gold, \$1.3 billion; petroleum products, \$1.2 billion; coal and mineral fuels and natural gas liquids, \$1.0 billion each; aluminum and alumina, \$812.9 million; metallurgical-grade coal, \$547.9 million; other precious metals, \$189.1 million; nonferrous metals, \$179.0 million; copper, \$140.7 million; iron and steel products, \$70.2 million; iron and steel mill products, \$25.9 million; nonmetallic minerals, \$7.6 million; and fuel oil, \$7.1 million (U.S. Census Bureau, 2022a).

In 2021, exports from India to the United States were valued at about \$73.2 billion compared with \$51.2 billion in 2020; these included gem diamond worth \$10.8 billion; petroleum products, \$3.1 billion; gemstones, \$1.2 billion; stone, sand, and cement, \$835.4 million; iron and steel products, \$603.6 million; iron and steel (advanced), \$467.0 million; fuel oil, \$459.6 million; iron and steel mill products, \$281.2 million; bauxite and aluminum, \$193.3 million; other precious metals, \$100.6 million; sulfur and nonmetallic minerals, \$47.2 million; nonferrous metals, \$29.15 million; copper, \$12.7 million; tin, \$6.24 million; nickel, \$2.6 million; zinc, \$265,232; coal and related materials, \$197,101; and nonmonetary gold, \$19,057 (U.S. Census Bureau, 2022b).

Production

In 2021, the production of abrasives (garnet) increased by 1,100%; ferrotitanium, by 297%; vermiculite, by 123%; mined chromium, by 77%; kyanite, by 74%; ferromanganese, by 68%; fluor spar (metallurgical grade), by 64% (estimated); ferrosilicomagnesium, by 61%; uranium (U content), by 54%; copper (smelter, primary), by 49%; mined tin (concentrate, gross weight), magnesite, and refined tin (secondary), by 46% each; refined gold (bullion), by 43%; refined lead (secondary), by 39%; silicomanganese, by 29%; iron ore (Fe content), by 23%; cement (estimated) and finished steel products, by 21% each; lignite coal and marketable natural gas, by 20% each; ferrovanadium, limestone, raw steel, and semimanufactured steel products, by 18% each; graphite (amorphous) and graphite (crystalline flake), by 17% (estimated) each; copper concentrates (Cu content), ferroaluminum, and direct-reduced iron, by 16% each; pig iron, by 15%; bauxite, by 11%; ferromolybdenum, ilmenite and leucogene (estimated), refined zinc (primary), and sulfur (S content), by 10% each (table 1).

In 2021, production of sillimanite decreased by 79%; refined lead (secondary), by 69%; mined manganese (Mn content), by 31%; mined manganese (gross weight), by 25%; refined silver, by 16%; and smelted silver (estimated) and zirconium (zircon) (estimated), by 11% each. There was no diamond production in 2021 (table 1).

Commodity Review

Metals

Bauxite and Alumina and Aluminum.—In 2021, following an expansion project commissioned in August 2021, the production capacity at Utkal Alumina International Ltd.'s Koraput refinery in Odisha was increased to 2.0 Mt/yr from 1.5 Mt/yr. Vedanta Aluminium Ltd. continued to work on expansion of the production capacity at the Lanjigarh refinery to 6 Mt from 2 Mt. The company noted that the expansion project faced some challenges, such as sourcing of raw material and infrastructure-related issues (tables 1, 2; KMPG, 2020, p. 30; Vedanta Ltd., 2021, p. 51; Aditya Birla Group, 2023).

Iron Ore.—India's production of iron ore (Fe content) increased by 23% to 155.0 Mt in 2021 from 126.0 Mt in 2020. In 2021, NMDC resumed operations at the Donimalai mining complex and pellet plant. The company received a 20-year extension of its mining licenses at Donimalai to 2038 (from 2018). At full capacity, production at the Donimalai mines was

expected to increase to 7.0 Mt from 4.0 Mt in 2022 (tables 1, 2; NMDC Ltd., 2022, p. 26, 27, 49).

Titanium and Zirconium (Mineral Sands).—In 2021, the production of ilmenite and leucogene increased to 340,000 t; rutile, to 13,000; and zircon, to an estimated 16,000 t. In 2021, India's Supreme Court lifted the ban on heavy-mineral-sand mining in the State of Rajasthan, which had been imposed in 2017. As a result, the price of heavy-mineral sand was expected to decrease, and the annual revenue for the government of the State of Rajasthan was expected to increase. The ban had reportedly resulted in increased illegal mining activities in the region during the period (tables 1, 2; Parihar, 2021).

Mineral Fuels and Related Materials

Uranium.—In 2021, UCIL continued pursuing through the High Court of Andhra Pradesh the expansion of production capacity of the Tummalappalle Mine in Andhra Pradesh. The Andhra Pradesh Pollution Control Board challenged the UCIL's expansion activity owing to groundwater contamination by existing uranium mines. A planned hearing in the High Court was canceled in 2021 because of the COVID-19 pandemic. In addition, the company continued to work on preparation of a techno-economic feasibility report for the Banadungri and Garadih projects in Jharkhand, the Gogi and Kanchankayi projects in Yadgir District, Karnataka, and the Kanampalle project in Andhra Pradesh. The Atomic Mineral Directorate for Exploration and Research was conducting exploration at the Rohi uranium deposits in Sikar District, Rajasthan. UCIL also proposed in 2021 the construction of two uranium recovery plants in Mosabani, Singhbhum East District, Jharkhand (tables 1, 2; Reddy, 2020; Uranium Corporation of India Ltd., 2021, p. 8–10).

Reserves and Resources

As of 2021, India's estimated share of world reserves of chromite was 15%; ilmenite, 12%; barite and graphite, 3% each; and iron ore, 4% (table 5; McRae, 2023; Schulte, 2023; Stewart, 2023; Tuck, 2023b). Table 5 is a list of mineral reserves in India.

Outlook

The real GDP of India was projected by the International Monetary Fund to increase by 6.8% in 2022. The development of India's mineral industry would be highly dependent on a variety of factors, including the pace of the implementation of relevant reforms and policies, the pace of the growth in domestic demand, the movement in the nationalization of some mining sites, the imposition of bans on exports of iron ore, environmental-related protests at some major projects, and the effects of the COVID-19 pandemic. In the future, the country's iron ore production capacity is expected to continue to expand. Steel companies are expected to increase their raw steel capacity; however, the increase in production of steel will depend on domestic demand from the construction, automobile, and transportation sectors. Alumina production is likely to increase as a result of the expansion of production capacity at some plants. Uranium production is expected to continue to increase as the uranium deposit at Kanampalle is developed. As a result of the Tuticorin copper smelter shutdown, imports of copper concentrates will likely continue to increase, as will

imports of smelted and refined copper (International Monetary Fund, 2022, p. 129).

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TABLE 1
INDIA: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons, gross weight, unless otherwise specified)

Commodity ²	2017	2018	2019	2020	2021	
METALS						
Aluminum:						
Bauxite	thousand metric tons	22,803	23,229	22,321 ^r	19,988	22,136
Alumina, Al ₂ O ₃ equivalent	do.	6,055	6,430	6,690	6,563	6,634
Metal, primary	do.	3,269	3,675	3,640	3,558	3,627
Cadmium, refinery, primary		61	--	-- ^e	--	-- ^e
Chromium, mine, chromite	thousand metric tons	3,478	4,076	4,139	2,402	4,249
Cobalt, refinery, metal and salts, Co content		100	100	NA	NA	NA
Copper:						
Mine, concentrates, Cu content		30,300	35,300	29,200	23,000	26,600
Smelter:						
Primary		813,100	481,500	342,300	243,200	363,000
Secondary		10,000	10,000	2,000	--	--
Total		823,000	492,000	344,000	243,000	363,000
Refinery:						
Primary		819,000	541,000	424,200	333,542	353,086
Secondary		10,000	10,000	2,000	--	--
Total		829,000	551,000	426,000	334,000	353,000
Ferroalloys:						
Ferroaluminum		4,337	3,221	1,962	1,101	1,278
Ferromanganese		514,000 ^r	537,000 ^r	542,000 ^r	566,000	952,000
Ferromolybdenum		1,315	1,086	631	403	442
Ferrosilicomagnesium		16,724	18,436	15,445	9,652	15,536
Ferrosilicon ^e		90,000	90,000	93,000	90,000	90,000
Ferrotitanium		389	125	92	115	457
Ferrovanadium		1,318	1,150	587	662	779
Silicomanganese		2,038,000	2,133,000	1,889,000 ^r	1,770,000	2,276,000
Total		2,670,000 ^r	2,780,000 ^r	2,540,000 ^r	2,440,000	3,340,000
Gold:						
Mine, ore, gross weight		536,240	562,681	594,858	459,098	486,377
Smelter, primary	kilograms	1,502 ^r	1,554 ^r	1,896 ^r	1,227	1,220
Refinery, bullion	do.	11,907	12,274	10,286	6,643	9,509
Iron ore, mine:						
Gross weight	thousand metric tons	201,815	204,091	203,052	203,982	249,383
Fe content ^e	do.	125,000	127,000	126,000	126,000	155,000
Iron and steel:						
Direct-reduced iron	do.	29,505	34,213	36,818 ^r	33,593	39,068
Pig iron	do.	66,808	72,610 ^r	74,156 ^r	67,782	77,849
Steel:						
Raw steel	do.	101,455	109,272	111,351 ^r	100,256	118,234
Products:						
Finished	do.	114,812	127,094	112,236	91,302	110,884
Semimanufactured	do.	37,733	88,857	109,631	100,122	117,715
Lead:						
Mine, Pb content		175,633 ^r	192,496	202,974 ^r	197,527	211,250
Refinery:						
Primary		165,122	195,055	184,901	200,000	62,961
Secondary		647,000	688,000	737,000	620,000	860,000
Total		812,000	883,000	922,000	820,000	923,000
Manganese, mine, ore and concentrate:						
Gross weight	thousand metric tons	1,957 ^r	3,924 ^r	3,134 ^r	2,146	1,609
Mn content	do.	668 ^r	1,224 ^r	962 ^r	656	453
Rare earths, monazite concentrate:^e						
Gross weight		3,000	5,000	5,000	5,000	5,000
Rare-earth oxide equivalent		1,800	2,900	2,900	2,900	2,900
Selenium, Se content	kilograms	17,000 ^e	17,000 ^e	14,600	14,000 ^e	14,000 ^e

See footnotes at end of table.

TABLE 1—Continued
INDIA: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons, gross weight, unless otherwise specified)

Commodity ²	2017	2018	2019	2020	2021
METALS—Continued					
Silver:					
Smelter kilograms	526,604	648,600	633,176	682,000 ^e	610,000 ^e
Refinery	596	730	703	633	529
Tin:					
Mine, concentrate, gross weight	15	18	20	13	19
Refinery:					
Primary	15	18	19	13	19
Secondary	3,000 ^e	--	--	--	--
Titanium, mineral concentrate: ^e					
Ilmenite and leucoxene	360,000 ^r	290,000 ^r	340,000 ^r	310,000	340,000
Rutile	13,000 ^r	12,000 ^r	13,000 ^r	12,000	13,000
Zinc:					
Mine, Zn content	830,000 ^e	750,000 ^e	720,000 ^e	731,000 ^e	784,507
Refinery:					
Primary	799,877	727,693	691,030	688,000	759,000
Secondary, remelt	18,100	18,300	21,000	22,000	20,000
Total	818,000	746,000	712,000	710,000	779,000
Zirconium, zircon	30,351	13,951	18,000 ^e	18,000 ^e	16,000 ^e
INDUSTRIAL MINERALS					
Abrasives, garnet thousand metric tons	142	162	31	1	12
Barite	2,038,915	2,390,000 ^e	2,100,000 ^{r,e}	1,600,000 ^e	1,600,000 ^e
Bromine, elemental	2,717 ^r	2,266 ^r	2,813 ^r	3,300 ^e	3,000
Cement, hydraulic ^e thousand metric tons	308,000	310,000	334,000 ^r	290,000	350,000
Clay:					
Ball clay do.	3,780 ^e	4,140 ^r	4,530 ^r	4,500 ^e	4,500 ^e
Bentonite do.	3,460 ^e	3,502 ^r	2,822 ^r	3,000 ^e	3,000 ^e
Fire clay do.	702 ^e	972 ^r	528 ^r	530 ^e	530 ^e
Fuller's earth ^e	734,000	753,000 ^r	619,000 ^r	730,000	730,000
Kaolin, marketable:					
Crude thousand metric tons	7,640	8,900 ^{r,e}	8,300 ^{r,e}	8,300 ^e	8,300 ^e
Processed ^e do.	74	74	74	74	73
Diamond:					
Gem thousand carats	11	11	10 ^r	6	--
Industrial do.	30	29	27 ^r	16	--
Feldspar	4,270,245 ^r	8,486,262 ^r	6,173,287 ^r	6,200,000 ^e	6,600,000 ^e
Fluorspar, metallurgical grade	1,120	1,270	1,424	917	1,500 ^e
Graphite: ^e					
Amorphous	3,500	800 ^r	800 ^r	600	700
Crystalline flake	31,500	7,100 ^r	7,200 ^r	5,400	6,300
Gypsum, mine ^e thousand metric tons	1,540	2,530 ^r	4,250 ^r	4,300	4,300
Iron oxide pigments, natural, ocher	2,400,000	2,365,850	3,280,956 ^r	2,940,000	3,000,000 ^e
Kyanite and related minerals:					
Kyanite	7,094	5,827	2,681 ^r	4,941	8,586
Sillimanite	81,044	78,388 ^r	19,496 ^r	15,549	3,265
Lime ^e thousand metric tons	16,000	16,000	16,000	15,000	16,000
Magnesite, crude	187,974	172,947	106,379	75,590	110,021
Mica: ^e					
Crude thousand metric tons	1	1	1	1	1
Scrap and waste do.	14	15	15	15	16
Total do.	15	16	16	16	17
Nitrogen, ammonia, N content do.	11,405	11,900	12,200	12,200	12,100
Phosphate rock, including apatite:					
Gross weight do.	1,588	1,423	1,484	1,407	1,363
P ₂ O ₅ content, 25% P ₂ O ₅ do.	400	360	370	350 ^e	340 ^e

See footnotes at end of table.

TABLE 1—Continued
INDIA: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons, gross weight, unless otherwise specified)

Commodity ²	2017	2018	2019	2020	2021
INDUSTRIAL MINERALS—Continued					
Salt thousand metric tons	28,000 ^e	40,000 ^r	45,000 ^r	45,000 ^e	45,000 ^e
Stone:					
Crushed:					
Calcite ^e	95,000	71,000 ^r	30,000 ^r	30,000	30,000
Chalk ^e	296,000	118,000	120,000	120,000	120,000
Dolomite thousand metric tons	5,296 ^r	5,172 ^r	4,000 ^{r,e}	4,000 ^e	4,000 ^e
Limestone do.	327,846	371,377	366,596	334,252	395,008
Size and shape unspecified, dunite	80,000 ^e	80,000	NA ^r	NA	NA
Sulfur, byproduct, petroleum and fertilizer, S content	726,639	892,821	875,579	762,029	840,754
Talc and related minerals:					
Pyrophyllite	38,760 ^r	40,870 ^r	158,610 ^r	150,000 ^e	150,000 ^e
Soapstone and steatite	1,613,607 ^r	1,567,055 ^r	1,595,353 ^r	1,600,000 ^e	1,600,000 ^e
Vermiculite	5,315	5,159	2,232	1,560	3,486
Wollastonite	156,096	148,379	170,401	102,209	110,778
MINERAL FUELS AND RELATED MATERIALS					
Coal:					
Bituminous thousand metric tons	667,362	716,051	523,484	720,597	766,536
Lignite do.	47,026	46,032	40,279	37,366	44,673
Total do.	714,000	762,000	564,000	758,000	811,000
Natural gas:					
Gross million cubic meters	31,855	31,776	40,205	27,569	29,000 ^e
Marketable do.	27,700	27,500	26,900	23,800	28,500
Petroleum:					
Crude thousand 42-gallon barrels	263,000 ^r	254,000 ^r	297,000 ^r	226,000	240,000 ^e
Refinery: ^e					
Distillate fuel oil do.	149,000	150,000	150,000	150,000	160,000
Gasoline do.	323,000	320,000	320,000	320,000	340,000
Kerosene, including jet fuel do.	26,000	30,000	30,000	30,000	32,000
Liquefied petroleum gas do.	145,000	150,000	150,000	150,000	160,000
Residual fuel oil do.	61,000	61,000	61,000	61,000	64,000
Other do.	320,000	320,000	320,000	320,000	340,000
Total do.	1,020,000	1,030,000	1,030,000	1,030,000	1,100,000
Uranium, mine, U content	421	423	308	400	615

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

¹Table includes data available through January 10, 2023. All data are reported unless otherwise noted. Totals and estimated data are rounded to no more than three significant digits; may not add to totals shown.

²In addition to the commodities listed, boron, corundum, other gemstones (aquamarine, emerald, ruby, and spinel), sand and gravel (industrial), soda ash (synthetic), and sulfur (byproduct, metallurgy) may have been produced, but available information was inadequate to make reliable estimates of output.

TABLE 2
INDIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2021

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity ^c
Alumina	Bharat Aluminium Co. Ltd. [Government, 49%, and Vedanta Alumimu Ltd., 51%)	Korba refinery, Chhattisgarh	600
Do.	Hindalco Industries Ltd. (Aditya Birla Group, 33%; foreign investors, 26%; private investors, 23%; financial institutions, 18%)	Renukoot smelter, Uttar Pradesh	700
Do.	do.	Muri smelter, Jharkhand	450
Do.	do.	Belagavi smelter, Karnataka	350
Do.	Madras Aluminium Co. Ltd. (Vedanta Group, 80%, and others, 20%)	Mettur smelter, Tamil Nadu	60
Do.	National Aluminium Co. Ltd. (Government, 51.28%)	Damanjodi smelter, Odisha	2,300
Do.	Utkal Alumina International Ltd. (Hindalco Industries Ltd., 100%)	Koraput refinery, Odisha	2,100
Do.	Vedanta Aluminium Ltd. (Vedanta Resources plc, 100%)	Lanjigarh refinery, Kalahandi, Odisha	2,000
Aluminum	Hindalco Industries Ltd. (Aditya Birla Group, 33%; foreign investors, 26%; private investors, 23%; financial institutions, 18%)	Aditya smelter, Sambalpur, Odisha	360
Do.	do.	Mahan smelter, Bargawan, Madhya Pradesh	360
Do.	do.	Renukoot smelter, Uttar Pradesh	410
Do.	do.	Hirakud smelter, Odisha	140
Do.	do.	Alupuram smelter, Kerala	8
Do.	Madras Aluminium Co. Ltd. (Vedanta Group, 80%, and others, 20%)	Mettur smelter, Tamil Nadu	30
Do.	National Aluminium Co. Ltd. (Government, 100%)	Angul smelter, Odisha	460
Do.	Vedanta Aluminium Ltd. (Vedanta Resources plc, 100%)	Jharsuguda I and II smelters, Odisha	1,800
Barite	Andhra Pradesh Mineral Development Corp. Ltd. (Andhra Pradesh State government, 100%)	Kadapa District Mines, Andhra Pradesh	3,000
Do.	IBC Ltd. (Government, 100%)	do.	NA
Do.	Ramadas Minerals Pvt. Ltd. (privately owned, 100%)	2 mines in Nellore District Andhra Pradesh	NA
Do.	Sudarsan Barytes Co.	Mine in Nellore District, Andhra Pradesh	NA
Do.	Viswabharati Mining Corp. Ltd.	Mine in Khammam District, Telangana	NA
Bauxite	Ashapura Minechem Ltd., 100%	Jamangar and Rata-Talab mines, Raigarh, Gujarat	NA
Do.	do.	Mine in Maharashtra	NA
Do.	Bharat Aluminium Co. Ltd. [Sterlite Industries (India) Ltd., 51%, and Government, 49%]	Mainpat Mine, Chhattisgarh	4,500
Do.	do.	Bodai Daldali (Kawardha) Mine, Chhattisgarh	2,300
Do.	Bombay Minerals Ltd.	Asota Mewasa Mine, Gujarat	NA
Do.	Gujarat Mineral Development Corp. (Gujarat State government, 75%, and public and institutional investors, 25%)	Mines in Gadhsisa and Mevasa Mine in Devbhumi Dwarka	NA
Do.	Hindalco Industries Ltd. (Aditya Birla Group, 33%; foreign investors, 26%; private investors, 23%; and financial institutions, 18%)	Gulma and Latehar Mines in Lohardaga District, Jharkhand	750
Do.	do.	Mine in Surgudja District, Chhattisgarh	NA
Do.	Madras Aluminium Co., 100%	Mine in Shevaroy, Tamil Nadu	NA
Do.	Minerals & Minerals Ltd. (Government, 100%)	Mines in Richuguta, Palamau District, Jharkhand	200
Do.	M/S Orient Abrasive Ltd.	Avaryar-I, Varada-IV, and Rata-Talab Mines, Gujarat	NA
Do.	National Aluminium Co. Ltd. (Government, 100%)	Mines in Panchpatmali Hills, Damanjodi Koraput District, Odisha	6,800
Do.	Odisha Mining Corp. Ltd. (Government of Odisha, 100%)	Kodingamali Mine, Koraput, Odisha	3,000
Do.	Panditrao Mines and Minerals Pvt. Ltd.	Minche Budrak Mine, Maharashtra, Kolhapur	NA

See footnotes at end of table.

TABLE 2—Continued
INDIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2021

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity ^e
Bauxite—Continued	Prabhudas Vithaldas	Virpur and Kenedy Mines, Gujarat	840
Do.	Utkal Alumina International Ltd. (Hindalco Industries Ltd., 100%)	Baphilimali Mine, Rayagada District, Odisha	8,500
Boron	Borax Morarji Ltd.	Ambernath refinery, Maharashtra	24
Bromine	metric tons Hindustan Salt Ltd., 60%, and Government, 40%	Plant in Kharaghoda, Gujarat	300
Do.	do. Satyesh Brinechem Pvt. Ltd.	Plant in Greater Rann, Kutch, Gujarat	5
Cadmium	do. Hindustan Zinc Ltd. (Vedanta Ltd., 64.9%, and Government, 29.5%)	Chanderiya zinc smelter, Rajasthan	468
Do.	do. do.	Debari zinc smelter, Rajasthan	250
Cement	ACC Ltd. (Holcim Group, 36.1%)	Eleven plants in twelve States	35
Do.	ACL Ltd. (Jaypee Group 100%)	Durga Cement Works, Andhra Pradesh	400
Do.	Ambuja Cements Ltd. (Holcim Group, 63.1%)	Plants in six States	27
Do.	Andhra Cements Ltd. (Jaypee Group, 100%)	Durga Cement Works, Andhra Pradesh	370
Do.	Anjani Portland Cement Ltd.	Anjani Portland Cements, Nalgonda, Telangana	930
Do.	Bharathi Cement Corp. Pvt. Ltd.	Kadapa plant, Andhra Pradesh	5,000
Do.	Bhavya Cement Pvt. Ltd. (privately owned, 100%)	Bhavya plant, Guntur, Andhra Pradesh	970
Do.	Binani Cement Ltd.	Sikar plant, Rajasthan	1,700
Do.	Birla Corp. Ltd. (M.P. Birla Group)	Chandera plant, Rajasthan	3,600
Do.	Birla Corp. Ltd. (Erstwhile Reliance Cement Co.)	Maihar plant, Madhya Pradesh	2,700
Do.	BMM Cement Ltd.	Antapur plant, Adhra Pradesh	870
Do.	Century Textiles and Industries Ltd.	1 plant in Chhattisgarh and 1 plant in Maharashtra	4,800
Do.	Chettinad Cement Corp. Ltd. (privately owned, 100%)	3 plants in Tamil Nadu and 1 in Karnataka	6,900
Do.	Dalmia Cement (Bharat) Ltd. (Dalmia Bharat Ltd., 100%)	1 plant in Maghalaya, 2 plants in Tamil Nadu, 1 plant in Karnataka, and 1 plant in Andhra Pradesh	8,500
Do.	Deccan Cements Ltd.	Nalgonda plant, Telangana	1,500
Do.	Emami Ltd.	Risda plant, Chhattisgarh	2,600
Do.	Gujarat Sidhee Cement Ltd. (Mehta Group, 100%)	Junagad plant, Gujarat	1,200
Do.	HeidelbergCement India Ltd.	Imlai plant, Madhya Pradesh	2,800
Do.	Hemadri Cement Ltd.	Vedadri plant, Andhra Pradesh	190
Do.	India Cements Co. Ltd. (Government, 26%; Life Insurance Corp. of India, 24%; others, 50%)	3 plants in Tamil Nadu, 2 plants in Telangana, 1 plant in Rajasthan, 1 plant in Andhra Pradesh, and one plant in Andaman Nicobal Islands	9,800
Do.	J. K. Cement Ltd. (Jaykay Enterprises Ltd., 100%)	3 plants in Rajasthan and 1 in Karnataka	7,700
Do.	JK Lakshmi Cement Ltd. (JK Organization)	1 plant in Chhattisgarh and 1 plant in Rajasthan	5,500
Do.	JSW Cement	Nandyal Works, Andhra Pradesh	1,500
Do.	Kalburgi Cement Pvt. Ltd.	Gulbarga plant, Karnataka	2,700
Do.	Kakatiya Cement Sugar & Industries Ltd.	Kakatiya plant, Telangana	260
Do.	KCP Ltd.	Unit II and Guntur plants, Andhra Pradesh	2,100
Do.	Kesoram Industries Ltd.	Kesoram plant, Telngana; Vasvadatta plant, Karnataka	5,700
Do.	KJS Cement Ltd.	KJS plant, Madhya Pradesh	1,800
Do.	Lafarge S.A.	Chittorgarh plant, Rajasthan; Mejjia plant, West Bengal; Sonadih plant, Chhattisgarh	4,400
Do.	Malabar Cements Ltd.	Walayar plant, Kerala	400
Do.	Manikgarth Cement (Century Textiles and Industries Ltd., 100%)	Tehsil Rajura plant, Maharashtra	1,000
Do.	Mehta Group	Suarashtra Cement and Sidhee plants, Gujarat	2,400

See footnotes at end of table.

TABLE 2—Continued
INDIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2021

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity ^c
Cement—Continued	Mangalam Cement Ltd.	Mangalam plant, Karnataka	2,500
Do.	My Home Industries Ltd. (My Home Group and CRH plc)	Mellacheruvu plant, Telangana	2,200
Do.	NCL Industries Ltd. (privately owned, 100%)	Simhapuri plant, Telangana	1,400
Do.	Orient Cement (CK Birla Group, 100%)	Chittapur plant, Karnataka; Devapur plant, Telangana	4,700
Do.	Parasaki Cement Industries Ltd.	Parasaki plant, Andhra Pradesh	800
Do.	Penna Cement Industries Ltd.	Ganeshpahad plant, Telangana; Talaricheruvu plant, Andhra Pradesh	2,500
Do.	Rain Cements Ltd. (Rain Industries Ltd.)	Karnool plant, Andhra Pradesh; Ramapuram plant, Telangana	2,500
Do.	Ramco Cements Ltd.	Ariyalur and Ramasamyraja plants, Tamil Nadu; Jayantipuram plant, Andhra Pradesh	6,200
Do.	Sagar Cements Ltd.	Mattampally plant, Telangana	1,400
Do.	Sangi Industries Ltd.	Sanghi plant, Gujarat	2,000
Do.	Surarashtra Cement Ltd.	Porbandar plant, Gujarat	1,300
Do.	Shree Cement Ltd.	4 plants in Rajasthan; 1 plant in Chhattisgarh; 1 plant in Bihar; 1 plant in Uttar Pradesh; 2 plants in Karnataka	15
Do.	Shree Digvijay Cement Co. Ltd.	Shree Digvijay-Sikka plant, Gujarat	1,000
Do.	Sree Jayajothi Cements Pvt. Ltd.	Sree Jayajothi plant, Andhra Pradesh	2,000
Do.	The K.C.P. Ltd.	Muktyala plant, Andhra Pradesh	1,700
Do.	Ultratech Cement Ltd.	17 integrated plants	41
Do.	Vinay Cement Ltd.	Vinay plant, Assam	1,000
Do.	Wonder Cement Ltd.	Wonder plant, Rajasthan	6,300
Do.	Zuari Cement Ltd.	Sitapuram plant, Telnagana; Yeraguntla plant, Andhra Pradesh	3,200
Chromite	Balasure Alloys Ltd.	Kaliapani Mine, Sukinda Valley, Jajpur, Odisha	95
Do.	Ferro Alloys Corp. Ltd.	Khathpal Mine, Andhra Pradesh; Ostapal Mine, Odisha; Kalarangiatta Mine, Odisha	NA
Do.	Indian Metals & Ferro Alloys Corp. Ltd.	Mahagiri Mine in Sukinda valley, Odisha; Nuasahi and Bangur Mines in Keonjhar, Odisha; Chingudipal Mine Jajapur District, Odisha;	847
Do.	Jindal Stainless Ltd.	Kaliapani Mine, Jajpur, Odisha	100
Do.	Karnataka State Minerals Corp. Ltd. (state-owned)	Aladahalli Mines, Karnataka	37
Do.	do.	Bhakthara Halli Mines, Karnataka	24
Do.	do.	Byrapura Mines, Karnataka	15
Do.	do.	Tagadur Mines, Karnataka	12
Do.	do.	Mines in Hassan District, Karnataka	12
Do.	do.	Jambur mines, Karnataka	5
Do.	Misrilall Mines Pvt. Ltd., 100%	Mine, Saruabil village, Jajpur, Odisha	NA
Do.	Odisha Mining Corp. Ltd. (Government of Odisha, 100%)	Sukrangi and South Kaliapani mines, Jaipur	1,100
Do.	do.	Chrome beneficiation plant in Odisha	35
Do.	Tata Steel Ltd.	Randia plant, Bhadrak, Cuttack District, Odisha	351
Do.	do.	Kamarda, Saruabil, and Sukinda mines, Odisha	200
Clay:			
Bentonite	Ashapura Minechem Ltd. (Ashapura Minechem Ltd. and AMCOL Int. Corp.)	Kutch Mine, Gujarat	350

See footnotes at end of table.

TABLE 2—Continued
INDIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2021

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity ^c	
Clay:—Continued				
Bentonite—Continued	Ashpura International Ltd.	NA	NA	
Do.	do.	Bhuji and Dharur Mines, Rajasthan	72	
Do.	Gimpex Ltd.	Mine in Chennai	NA	
Do.	Gujarat Mineral Development Corp. Ltd.	Mine in Surkha, Gujarat	750	
Do.	Vijaylaxmi Group of Industries	Mine in West Rajasthan	NA	
Ball clay	Bikaner Ceramics	Mine in Kolayat, Rajasthan	75	
Do.	Sampat Lal Daga	Mine in Bikaner, Rajasthan	NA	
Fire clay	Mshabhi Ismaibhai Kalidia	Mine in Surendranagar, Gujarat	NA	
Do.	Parijat Mining Industries (India) Pvt. Ltd.	Mine in Latehar, Jharkhand	10	
Do.	Sampat Lal Daga	Mine in Kotri, Bikaner, Rajasthan	35	
Do.	Shri Motilal Bajaj	Mine in Tikariya, Madhya Pradesh	2	
Do.	Sunder Lal Daga	Mine in Golari, Bikaner, Rajasthan	30	
Kaolin	Gopalbhai Savanghai Dangar	Mine in Dagala, Gujarat	115	
Do.	Manoj P. Solanki	Mine in Nadapa, Gujarat	600	
Coal	million metric tons	Bharat Coking Coal Ltd. [Coal India Ltd. (Government, 100%)]	Jharia, Dhanband District, Jharkhand; Raniganj in West Bengal;	27
Do.	do.	Bharat Aluminium Co. Ltd. (Vedanta Aluminum Ltd., 51%, and Government, 49%)	Chotia Mine, Chhattisgarh	17
Do.	do.	Central Coalfields Ltd. [Coal India Ltd. (Government, 100%)]	Mines in Bihar	61
Do.	do.	Eastern Coalfields Ltd. [Coal India Ltd. (Government, 100%)]	Mines in Bihar and West Bengal	50
Do.	do.	Mahanadi Coalfields Ltd. [Coal India Ltd. (Government, 100%)]	Mines in Odisha	89
Do.	do.	Neyveli Lignite Corp. Ltd. (Government, 100%)	Mines in Tamil Nadu	242
Do.	do.	Northern Coalfields Ltd. [Coal India Ltd. (Government, 100%)]	Mines in Madhya Pradesh and Uttar Pradesh	108
Do.	do.	North Eastern Coalfields Ltd. [Coal India Ltd. (Government, 100%)]	Mines in Assam	486
Do.	do.	Singareni Collieries Co. Ltd. [Andhra Pradesh State government, 50%, and Coal India Ltd. (Government), 50%]	Mines in Andhra Pradesh and Maharashtra	64
Do.	do.	South Eastern Coalfields Ltd. [Coal India Ltd. (Government, 100%)]	Mines in Chhattisgarh	145
Do.	do.	Western Coalfields Ltd. [Coal India Ltd. (Government, 100%)]	Mines in Madhya Pradesh and Maharashtra	108
Copper:				
Ore, gross weight	Hindustan Copper Ltd. (HCL) (Government, 100%)	Indian Copper Complex Mines, Ghatsila District, Jharkhand	362	
Do.	do.	Malanjkhand Copper Complex Mines, Balaghat District, Madhya Pradesh	17	
Do.	do.	Khetri Copper Complex Mines, Khetrinagar, Rajasthan	11	
Do.	do.	Surda Mine, Jharkhand	8	
Metal	Hindalco Industries Ltd. (Birla Group, 33%; foreign investors, 26%; private Indian investors, 23%; financial institutions, 18%)	Birla Copper Complex smelter, Dahej, Gujarat	321	
Do.	Hindustan Copper Ltd. (HCL) (Government, 100%)	Taloja copper project, Maharashtra	60	
Do.	do.	Khetri Copper Complex smelter-refinery, Khetrinagar District, Rajasthan	31	
Do.	do.	Indian Copper Complex smelter-refinery, Ghatsila District, Jharkhand	19	
Do.	Vedanta Ltd.	Tuticorin smelter, Tamil Nadu ¹	400	
Do.	do.	Silvassa refinery, Gujarat	300	
Diamond	thousand carats	National Mineral Development Corp. Ltd. (Government, 100%)	Mahjgawan Mine, Panna, Madhya Pradesh	84

See footnotes at end of table.

TABLE 2—Continued
INDIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2021

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity ^e
Ferroalloys:				
Ferrochrome		Indian Metals & Ferro Alloys Corp. Ltd.	Choudwar plant, Cuttack District, Odisha	NA
do.		do.	Therubali plant, Ryagada District, Odisha	NA
Ferromanganese		Steel Authority of India Ltd. (Government, 100%)	Chandrapur Ferro Alloy Plant, Maharashtra	90
Silicomanganese		do.	do.	70
Ferrochrome and manganese		Tata Steel Ltd. (Tata Group, 100%)	Plant in Keonjhar, Joda, Odisha	1,100
Fluorite		Maharashtra State Mining Corp. Ltd.	Dongargaon Mine, Maharashtra, Chandrapur	1
Garnet		AKD Gem Garnet Mines	Kodukota Mine, Bhilwara, Rajasthan	NA
Do.		Ansari Brothers Garnet Works	Rajmahal Mine, Tonk, Rajasthan	NA
Do.		Indian Rare Earths Ltd.	Orrisa Sands Complex, Ganjam, Odisha	20
Do.		do.	Manavalakurichi Mine, Kanniyakumari, Tamil Nadu	10
Do.		Trimex Sands Pvt. Ltd. (Trimex Group)	Sirkurman deposit, Sriakulam, Andhra Pradesh	60
Do.		do.	Bhavanapadu mineral sands deposit, Andhra Pradesh	50
Do.		V. V. Mineral Ltd.	Thoothukudi Mine, Tamil Nadu	NA
Gold:				
Ore, gross weight		Hutti Gold Mines Co.	Hutti Mine, Karnataka	560
Do.		do.	Hira-Buddini Mine, Karnataka	73
Do.		Mahmohan Minera Industries (Pvt.) Ltd.	Kunderkocha Mine, Jharkhand	NA
Metal	kilograms	ABANS Jewells Pvt. Ltd. (privately owned, 100%)	Refinery in Rudrapur, Uttarakhand	NA
Do.		Agnis Bullion House LLP, 100%	Refinery in Gurgaon, southwest of New Delhi	NA
Do.	kilograms	AJ Gold & Silver Refinery Inc.	Refinery in Hamirpur, Himachal Pradesh	150
Do.	do.	Altim Metals Pvt. Ltd. (privately owned, 100%)	Refinery in Udham Singh Nagar, Uttarakhand	26
Do.		Augmont Enterprises Pvt. Ltd.	Refinery in Rudrapur, Uttarakhand	NA
Do.		AUPTAG Refinery Pvt. Ltd.	Refinery in Mumbai, Maharashtra	NA
Do.	kilograms	Bangalore Refinery Pvt. Ltd.	Refinery in Bangalore, Karnataka	30
Do.	do.	Bright Metal Refiners	Refinery in Udham Singh Nagar, Uttarakhand	30
Do.	do.	Chemmanur Gold Refinery Pvt. Ltd.	Refinery in Ernakulam, Kerala	30
Do.		CGR Metalloys Pvt. Ltd.	do.	NA
Do.		do.	Refinery in MG Road, Ernakulam District, Kerala	NA
Do.		do.	Refinery in Kalamassery, Ernakulam District, Kerala	NA
Do.	kilograms	Diamond Forever International	Refinery in Udham Singh Nagar District, Uttarakhand	35
Do.	do.	Edelweiss Metals Ltd. (Edelweiss Financial Services Inc.)	Refinery in Ahmedabad, Gujarat	70
Do.	do.	Emerald Jewel Industry India Ltd.	Refinery in Coimbatore, Tamil Nadu	40
Do.		Golden Star Trading Pvt. Ltd.	Refinery in Chennai, Tamil Nadu	NA
Do.		Goldfrab Industries Pvt. Ltd.	Refinery in Sanand, Gujarat	NA
Do.	kilograms	Gujarat Gold Centre (GGC) Pvt. Ltd.	Refinery in Ahmedabad, Gujarat	30
Do.		Harshini Maple Leafs	Refinery in Chennai, Tamil Nadu	NA
Do.		Hindustan Platinum Pvt. Ltd.	Refinery in Navi, Mumbai	NA
Do.		Indian Government Mint (unit of Security of Printing and Mining Corporation India Ltd.)	Refinery in Alipore, Kolkata	NA
Do.		do.	Refinery in Mumbai, Maharashtra	NA
Do.	kilograms	do.	Refinery in Telangana, Hyderabad	40
Do.	do.	do.	Refinery in Nodia, Uttar Pradesh	NA

See footnotes at end of table.

TABLE 2—Continued
INDIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2021

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity ^e
Gold—Continued			
Metal—Continued	Kundan Refinery Pvt. Ltd.	Refinery at Gurugram, southwest of New Delhi	NA
Do.	Infinium Precious Resources Pvt. Ltd.	Refinery in Mumbai, Maharashtra	NA
Do. kilograms	Jalan and Company	Refinery in Chandni Chowk, New Delhi	30
Do. do.	Khandwala Finstock Pvt. Ltd	do.	40
Do. do.	Kundan Care Products Ltd.	Refinery in Hareswar, Uttarakhand	30
Do.	Lalithaa Jewelry Mart Pvt. Ltd.	Refinery in Chennai, Tamil Nadu	NA
Do. kilograms	M.D. Overseas Ltd.	Refinery in Rudrapur, Uttarakhand	30
Do.	do.	Refinery in Alwar, Rajasthan	NA
Do. kilograms	MMTC-PAMP India Pvt. Ltd. (MMTV Ltd. and PAMP SA)	Refinery in Mewat, Haryana	150
Do.	Narrondass Manordass Precious Metals Refinery	Refinery in Mumbai, Maharashtra	NA
Do. kilograms	National India Bullion Refinery	do.	30
Do. do.	National Refinery Pvt. Ltd.	do.	30
Do.	OMGL Refinery LLP	Refinery in Rudrapur, Uttarakhand	NA
Do.	Onkar Jewellers Pvt. Ltd.	Refinery in Sonapat, Haryana	NA
Do. kilograms	Orelia Refineries Pvt. Ltd.	Refinery in Solan, Himachal Pradesh	40
Do.	Paraj Exim	Refinery in Rudrapur, Uttarakhand	NA
Do. kilograms	Parekh Platinum Ltd.	Refinery in Mumbai, Maharashtra	30
Do.	Quality Assay and Hallmarking Centre Pvt. Ltd.	Refinery in Kannur, Kerala	NA
Do.	Rajesh Exports Ltd.	Refinery in Rudrapur, Uttarakhand	NA
Do.	RG Refineries Pvt. Ltd.	do.	NA
Do.	R.K. Jewels	Refinery in Rohtak, Haryana	NA
Do.	Salasar Synthetics Pvt. Ltd.	Refinery in Sidcul, Uttarakhand	NA
Do.	Shreer Ambica Touch	Refinery in Ahmedabad, Gujarat	NA
Do. kilograms	Shirpur Gold Refinery Ltd. (Zee Gold DMCC)	Refinery in Shirpur, Dhule, Maharashtra	217
Do.	Siddheshwar Refinery	Refinery in Mumbai, Maharashtra	NA
Do.	Sonigara Jewellers Pvt. Ltd.	Refinery in Pune, Maharashtra	NA
Do.	Sovereign Metals Ltd. (Edelweiss Financial Services Inc.)	Refinery in Ahmedabad, Gujarat	NA
Do.	Sunanda Polymers	Refinery in Solan, Himachal Pradesh	NA
Do.	Tasha Gold Private Ltd.	Refinery in Nagar, Uttar Pradesh	NA
Do.	Titan Co. Ltd.	Refinery in Krishnagiri, Tamil Nadu	NA
Do.	Yash Oro India Pvt. Ltd.	Refinery in Telangana, Hyderabad	NA
Do. kilograms	Zaveri & Co. Pvt. Ltd.	Refinery in Ahmedabad, Gujarat	30
Do. do.	do.	Refinery in Rudrapur, Uttarakhand	30
Graphite	Agrawal Graphite Industries Ltd.	Mine in Belpara District, Odisha	15
Do.	K. K. Poddar (privately owned, 100%)	Mine in Murma, Jharkhand	60
Do.	Tamil Nadu Minerals Ltd.	Mine in Pudupatti, Kumaripatti and Senthudayanathapuram villages of Sivaganga Taluk, Sivagangai District, Tamil Nadu	NA
Do.	do.	Mine in Senthil Udayanathapuram Village, Sivaganga District, Tamil Nadu	7
Gypsum	FCI Aravali Gypsum and Minerals India Ltd.	Mohangarh group of Mines, Bikaner group of mines; Suratgarh group of Mines, Ramsinghpurgroup of mines, Rajasthan	1,100
Iron ore, Fe content	Aryan Mining & Trading Corp. Pvt. Ltd.	Narayanposhi Mine, Odisha	NA
Do.	Bonai Industrial Co. Ltd.	Nadidih Mine, Odisha	3,300
Do.	Essel Mining and Industries Ltd. (Aditya Birla Group, 100%)	Koira Mine, Odisha	2,500
Do.	Freegrade & Co. Pvt. Ltd.	Nadidih Mine, Odisha	1,800
Do.	Jindal Steel & Power Ltd. (Jindal Group, 60.41%; foreign investors, 23.18%; others, 16.41%)	Tensa Mine, Odisha	2,000
Do.	National Mineral Development Corp. Ltd. (Government, 100%)	Donimalai Mines, Karnataka	7,000
Do.	do.	Bailadila Mines, Bacheli Complex, Chhattisgarh	6,000

See footnotes at end of table.

TABLE 2—Continued
INDIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2021

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity ^e
Iron ore, Fe content—Continued	M.S.P.L. Ltd. (Baldota Group, 100%)	Alampara Mines, Kerala	NA
Do.	do.	Bailadila Mines, Kirandul Complex, Chhattisgarh	5,500
Do.	do.	Cheruppa Mines, Kerala	NA
Do.	do.	Iyli and Gurunath Mines, Kerala	NA
Do.	do.	Nadavallur Mines, Kerala	NA
Do.	do.	Patikonda Mines, Kerala	NA
Do.	do.	Vyasanakere Mine, Hospet, Karnataka	570
Do.	Odisha Mining Corp. Ltd. (Government of Odisha, 100%)	Daitari Mines, Keonjhar District, Odisha	1,900
Do.	do.	Gandhamardan Block A and B Mines, Keonjhar District, Odisha	4,000
Do.	do.	Guali Mine, Keonjhar District, Odisha	230
Do.	do.	Jiling Longalota Mine, Keonjhar District, Odisha	120
Do.	do.	Kurmitar Mine, Sundaraghar District, Odisha	1,700
Do.	do.	Tiringpahar Mine, Keonjhar District, Odisha	80
Do.	Patnaik Minerals Pvt. Ltd., 100%	Jaribahal Mine, Odisha	630
Do.	Rungta Sons Pvt. Ltd., 100%	Sanindpur Mine, Odisha	2,800
Do.	Serajuddin & Co., 100%	Balda Mines, Odisha	9,500
Do.	Shri Ramesh Prasad Sao, 100%	Guali Mine, Odisha	1,100
Do.	Sesa Iron Ore (Vedanta Group, 100%)	Mines in Goa	5,500
Do.	do.	Mines in Karnataka	4,500
Do.	Steel Authority of India Ltd. (Government, 100%)	Kiriburu, Gua, Meghahatuburu, and Manoharpur Mines, Jharkhand	17,000
Do.	do.	Barsua-Taldih-Kalta and Bolani Mines, Odisha	12,000
Do.	Tata Steel Ltd. (Tata Group, 100%)	Joda East Mine, Khandbond, and Katamati Mines, Odisha	32,000
Do.	do.	Noamundi Mine, Jharkhand	17,000
Do.	Usha Martin Ltd., 100%	Vijay-II Mine, Jharkhand	1,600
Iron and steel:			
Raw steel	Essar Steel Ltd. (Essar Global Fund Ltd., 100%)	Steel plant in Gujarat	10,000
Do.	Jindal Steel & Power Ltd.	Steel plant in Chhattisgarh	8,600
Do.	JSW Steel Co. Ltd.	Salem steel plant, Tamil Nadu	18,000
Do.	Rashtriya Ispat Nigam Ltd.	Steel plant in Andhra Pradesh	6,300
Do.	Steel Authority of India Ltd. (Government, 100%)	Rourkela steel plant, Odisha	4,200
Do.	do.	Bhilai steel plant, Chhattisgarh	7,000
Do.	do.	IISCO steel plant, West Bengal	2,500
Do.	do.	Durgapur steel plant, West Bengal	2,200
Do.	do.	Alloy steel plant, West Bengal	1,800
Do.	do.	Visvesvaraya iron and steel plant, Karnataka	1,100
Do.	Tata Steel Ltd. (Tata Group, 100%)	Jamshedpur steel plant, Jharkhand	13,000
Do.	do.	Bakaro steel plant, Jharkhand	4,600

See footnotes at end of table.

TABLE 2—Continued
INDIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2021

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity ^c
Iron and steel:—Continued			
Direct-reduced iron	Action Ispat & Power Pvt. Ltd.	Plants in Marakuta and Pandaripathar, Jharsugunda, Odisha	2,500
Do.	Adhunik Metaliks Ltd.	Plant in Chandrihariharpur, Sundargarh, Odisha	1,800
Do.	Alliance Integrated Metallics Ltd.	Plant in Bemta, Raipur, Chhattisgarh	5,000
Do.	Anjani Steel Ltd.	Plant in Ujalpur, Raigarh, Chhattisgarh	1,000
Do.	Anindita Steels Ltd.	Plant in Rabodh, Jharkhand	1,460
Do.	Aparant Iron & Steel Pvt. Ltd.	Plant in Sanguem, Goa	160
Do.	API Ispat Powertech Pvt. Ltd.	Plant in IGC Siltara, Raipur, Chhattisgarh	1,100
Do.	Beekay Steel & Power Ltd.	Plant in Uliburu, Barbil, Odisha	1,100
Do.	Bihar Sponge Iron Ltd. (Umesh Modi Group, 100%)	Plant in Umesh Nagar, Chandil, Jharkhand	150
Do.	Electrosteel Castings Ltd.	Plant in Khardah, West Bengal	360
Do.	Essar Steel Ltd.	Plant in Hazira, Gujarat	6,800
Do.	IDCOL Kalinga Iron Works Ltd.	Plant in Barbil, Odisha	345
Do.	do.	Plant in Geetapuram, Dolvi, Maharashtra	1,600
Do.	Jai Balaji Industries Ltd.	Plant in Durgapur, West Bengal	510
Do.	Jandal Steel and Power Co.	Plant in Raigarh, Chhattisgarh	2,000
Do.	Jayaswal NECO Industries Ltd.	Plant in Raipur, Chhattisgarh	650
Do.	Jindal Saw Pipes Ltd.	Plant in Mundra, Gujarat	360
Do.	JSW Steel Ltd.	Plant in Vijayanagar, Karnataka; Dolvi works, Maharashtra; plant in Salem District, Tamil Nadu; and plant in Salav, Raigad Maharashtra	18,900
Do.	Kajaria Iron Castings Ltd.	Plant in Durgapur, West Bengal	110
Do.	Kalyani Steels Ltd.	Plant in Hospet, Karnataka	290
Do.	KIC Metaliks Ltd.	Plant in Durgapur, West Bengal	165
Do.	KIOCL Ltd.	Plant in Mangaluru, Karnataka	216
Do.	Kirloskar Ferrous Industries Ltd.	Plant in Koppal, Karnataka	360
Do.	do.	Plant in Hospet, Karnataka	360
Do.	MESCO Steel Ltd.	Plant in Kalinganagar, Odisha	450
Do.	Monnet Ispat Ltd.	Plant in Raigarh, Chhattisgarh	700
Do.	New Metaliks Ltd.	Plant in Durgapur, West Bengal	175
Do.	Neelachal Ispat Nigam Ltd.	Plant in Kalinganagar, Odisha	1,100
Do.	Ramsarup Loha Udyog	Plant in Kharagpur, West Bengal	300
Do.	Rashmai Metaliks Ltd.	do.	175
Do.	Rashtriya Ispat Nigam Ltd. (Steel Authority of India Ltd.)	Visakhapatnam steel plant, Andhra Pradesh	6,500
Do.	Sathavahana Ispat Ltd.	Plant in Haresamudram, Andhra Pradesh	210
Do.	SLR Steels Ltd.	Plant in Hospet, Karnataka	210
Do.	Sona Alloys Pvt. Ltd.	Plant in Satara, Maharashtra	314
Do.	Srikalahasthi Pipes Ltd.	Plant in Chittoor, Andhra Pradesh	275
Do.	Steel Authority of India Ltd. (Government, 100%)	IISCO steel plant, West Bengal	250
Do.	do.	Bhilai plant in Chattisgarh; Bokaro plant in Jharkhand; Durgapur plant in West Bengal; Rourkela plant in Odisha	24,000
Do.	Tata Metaliks Ltd.	Plant in Redi, Maharashtra	316
Do.	Tata Steel BLS	Meramandali plant in Dhenkanal, Odisha	2,800
Do.	Usha Martin Ltd. (Tata Steel Ltd., 100%)	Plant in Jamshedpur, Jharkhand	600
Do.	do.	Plant in Kharagpur, West Bengal	345
Do.	Vedanta Ltd.	Plant in Amona, Goa	740
Do.	VISA Industries Ltd.	Plant in Kalinganagar, Odisha	175
Do.	VSL Steels Ltd.	Plant in Hiriya, Karnataka	360
Steel products	JSW Steel Co. Ltd.	Dolvi works, Maharashtra	3,000

See footnotes at end of table.

TABLE 2—Continued
INDIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2021

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity ^c
Iron and steel:—Continued			
Steel products—Continued	JSW Steel Co. Ltd.	Vijayanagar works, Karnataka	950
Do.	Rashtriya Ispat Nigam Ltd. (Steel Authority of India Ltd.)	Visakhapatnam steel plant, Andhra Pradesh	6,300
Do.	do.	Rourkela steel plant, Odisha	1,700
Do.	Steel Authority of India Ltd. (Government, 100%)	Bhilai steel plant, 40 km west of Raipur	3,100
Do.	do.	Durgapur steel plant, West Bengal	2,100
Do.	do.	IISCO steel plant, West Bengal	430
Do.	do.	Salem steel plant, Tamil Nadu	340
Do.	Usha Martin Ltd. (Tata Steel Ltd., 100%)	Steel Plant in Jamshedpur, Jharkhand	1,000
Kyanite	Bihar State Mineral Development Corp. Ltd. (Bihar State government, 100%)	Mine in Singhbhum District, Bihar	10
Do.	Maharashtra Mineral Corp. Ltd.	Navargaon-Chowa Mine, Maharashtra	10
Do.	Pavri Kyanite Mines Co.	Pavri Kyanite Mine (Jamdi), Maharashtra	NA
Lead:			
Mine, Pb content	Hindustan Zinc Ltd. (Vedanta Ltd., 64.9%, and Government, 29.5%)	Sindesar-Khurd Mine, Rajasthan	160
Do.	do.	Rampura-Agucha Mine, Rajasthan	59
Do.	do.	Zawar Mine, Rajasthan	54
Do.	do.	Rajpura-Dariba Mine, Rajasthan	23
Do.	do.	Kayad Mine, Rajasthan	11
Metal	do.	Dariba Smelting Complex, Rajasthan	120
Do.	do.	Chanderiya smelter, Rajasthan	85
Do.	Indian Lead Co.	Thane refinery, Mumbai, Maharashtra	12
Do.	do.	Refinery at Kolkata	12
Magnesite	Dalmia Magnesite Corp.	Mine in Tamil Nadu	NA
Do.	Steel Authority of India Ltd. (Government, 100%)	Mine in Salem, Tamil Nadu	150
Do.	Tamil Nadu Magnesite Ltd. (Tamil Nadu State government, 100%)	do.	150
Manganese, ore, gross weight	Aryan Mining & Trading Corp.	Mine in Sundargarh, Odisha	NA
Do.	Eastern Mining Co.	Mine in North Kanara	NA
Do.	Falechand Narsingdas	Mine in Andhra Pradesh	NA
Do.	J.A. Trivedi Bros.	do.	NA
Do.	MOIL Ltd. (Government, 100%)	Mine in 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.	Mine in Gumgaon, Maharashtra	60
Do.	Mysore Minerals Ltd.	do.	NA
Do.	do.	Mine in Shimoga, Karnataka	NA
Do.	Mangilall Rungta Pvt. Ltd.	Mine in 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
Mica	Dwarakananad Reddy, and 4 others	Mine in Nellore, Andhra Pradesh	NA
Do.	Micafab India Pvt. Ltd.	Sydapuram Mandal, Andhra Pradesh	1
Do.	Premier Mica Co.	Rjupalem, Andhra Pradesh	NA

See footnotes at end of table.

TABLE 2—Continued
INDIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2021

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity ^c
Petroleum, refined	thousand	Bharat Petroleum Corp. Ltd. (Oil and Natural Gas Corp., 67%, and private interests, 33%)	Mahul refinery, Mumbai, Maharashtra	135
	42-gallon barrels			
	per day			
Do.	do.	Essar Oil Ltd.	Vadinar refinery, Gujarat	245
Do.	do.	do.	Visakhapatnam refinery, Andhra Pradesh	90
Do.	do.	Hindustan Petroleum Corp. Ltd. (Oil and Natural Gas Corp., 51%, and private interests, 49%)	Madras refinery, Tamil Nadu	110
Do.	do.	Indian Oil Corp. (Oil and Natural Gas Corp., 91%, and private interests, 9%)	Mathura refinery, Uttar Pradesh	240
Do.	do.	do.	do.	156
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
Do.	do.	Madras Refineries Ltd. (Oil and Natural Gas Corp., 52%, and private interests, 48%)	Madras refinery, Tamil Nadu	131
Do.	do.	Reliance Industries Ltd.	Jamnagar refinery, Gujarat	668
Do.	do.	do.	Koyali refinery, Gujarat	185
Phosphate rock, gross weight		Hindustan Zinc Ltd. (Vedanta Ltd., 64.9%, and Government, 29.5%)	Maton Mine, Rajasthan	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.		Pyrites Phosphates and Chemicals Ltd.	Durmala and Maldeota underground Mines, Uttrakhand	NA
Do.		Rajasthan State Mineral Development Corp. Ltd. (Rajasthan State government, 100%)	Jamarkotra, Badgaon, Dakankotra, Kanpur, Kharbaria-ka-Guda, and Sallopat Mines, Rajasthan	1,500
Rare earths, monazite	metric tons	Indian Rare Earths Ltd. [Department of Atomic Energy, (Government), 100%]	Mine in Manavalakurichi, Tamil Nadu	6,000
Do.	do.	do.	Chavara, Kollam District, Kerala	211
Do.	do.	Kerala Minerals and Metals Ltd.	Kollam, Kerala	240
Salt		Dev Salt Pvt. Ltd.	Mine in Morbi, Gujarat	1,200
Do.		Hindustan Salt Ltd.	Mine at Mandi District, Himachal Pradesh	4,800
Sillimanite		Indian Rare Earths Ltd.	Chavara, Kollam District, Kerala	10
Do.		do.	Orrisa Sands Complex, Ganjam, Odisha	13
Do.		do.	Manavalakurichi Mine in Kanniyakumari, Tamil Nadu	9
Do.		Kerala Minerals and Metals Ltd. (Kerala State government, 100%)	Chavara, Kollam District, Kerala	66
Do.		Trimex Sands Pvt. Ltd. (Trimex Group)	Sirkurman deposit, Srikakulam, Andhra Pradesh	50
Do.		do.	Bhavanapadu mineral sands deposit, Karnataka	50
Do.		V. V. Mineral Ltd.	Thoothukudi, Tamil Nadu, Ilmenite	NA
Silver, metal	metric tons	Hindustan Zinc Ltd. (Vedanta Ltd., 64.9%, and Government, 29.5%)	Smelter in Chavara, Kerala	600
Do.	do.	do.	Chanderiya smelter, Rajasthan	168
Do.	do.	Hutti Gold Mines Co.	Hutti refinery, Karnataka	560
Do.	do.	do.	Hira-Buddini refinery, Karnataka	33
Titanium, ilmenite-rutile ore		Beach Minerals Co. Pvt. Ltd.	Mine in Kuttam, Chennai, Tamil Nadu	150
Do.		Indian Rare Earths Ltd. (Government, 100%)	Manavalakurichi, Kanniyakumari, Tamil Nadu	94

See footnotes at end of table.

TABLE 2—Continued
INDIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2021

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity ^e
Titanium, ilmenite-rutile ore— Continued	Indian Rare Earths Ltd. (Government, 100%)	Orrisa Sands Complex, Ganjam, Odisha	230
Do.	do.	Mine in Chavara, Kollam District, Kerala	211
Do.	Kerala Minerals and Metals Ltd. (Kerala State government, 100%)	Chavara, Kollam District, Kerala	66
Do.	Trimex Sands Pvt. Ltd. (Trimex Group)	Bhavanapadu Mineral Sands deposit, Andhra Pradesh	308
Do.	do.	Sirkurman deposit, Srikakulam, Andhra Pradesh	206
Do.	V. V. Mineral Ltd.	Thoothukudi, Tamil Nadu	500
Do.	V.V. Titanium Pigments Pvt. Ltd.	do.	18
Uranium, ore, U content	metric tons Uranium Corp. Ltd. of India [Department of Atomic Energy, (Government, 100%)]	Jaduguda, Jharkhand, Tummalppalle Mines, Andhra Pradesh	500
Wollastonite	Renu Atre	Ramawas Mine, Ajmer District, Rajasthan	NA
Do.	Wolkem Industries Ltd. (100% private)	Belka, Khera, and Beawar Mines, Udaipur District, Rajasthan	170
Zinc:			
Mine, Zn content	Hindustan Zinc Ltd. (HZL) (Vedanta Ltd., 64.9%, and Government, 29.5%)	Rampura-Agucha, Rajasthan	
Do.	do.	Sindesar-Khurd, Rajasthan	205
Do.	do.	Zawar, Rajasthan	102
Do.	do.	Rajpura-Dariba, Rajasthan	66
Do.	do.	Kayad, Rajasthan	65
Smelter	Edayar Zinc Ltd. (Binani Industries Ltd., 89.9%)	Binanipuram, Kerala	38
Do.	Hindustan Zinc Ltd. (HZL) (Vedanta Ltd., 64.9%, and Government, 29.5%)	Chanderiya, Rajasthan	558
Do.	do.	Dariba Smelting Complex, Rajasthan	240
Do.	do.	Debari, Rajasthan	88
Zircon	Indian Rare Earths Ltd.	Mine in Chavara, Kollam District, Kerala	18
Do.	do.	Manavalakurichi Mine, Kanniyakumari, Tamil Nadu	10
Do.	do.	Orrisa Sands Complex, Ganjam, Odisha	5
Do.	Kerala Minerals and Metals Ltd. (Kerala State government, 100%)	Mine in Chavara, Kollam District, Kerala	66
Do.	metric tons Trimex Sands Pvt. Ltd. (Trimex Group)	Sirkurman deposit, Srikakulam, Andhra Pradesh	3,000
Do.	do.	Bhavanapadu Mineral Sands deposit, Andhra Pradesh	50
Do.	V. V. Mineral Ltd.	Thoothukudi, Tamil Nadu	NA

^eEstimated. do. Ditto. NA Not available.

¹The smelter remained closed throughout 2021.

TABLE 3
INDIA: EXPORTS OF SELECTED MINERAL COMMODITIES

(Thousand metric tons unless otherwise specified)

Commodity	2017	2018	2019	2020	2021	
METALS						
Aluminum:						
Alumina	1,358	1,418	1,417 ^r	1,318	1,529	
Bauxite	1,694	1,132	942	208	400	
Copper:						
Ore and concentrates	14	32	86	23	13	
Blister and anode	--	--	--	1	5	
Refined copper	395	127	42	60	128	
Copper alloy, ingots	6	3	6	32	31	
Copper and alloys, semifabricated	47	43	21	22	33	
Copper and alloys, scrap	5	5	11	7	16	
Gold, nonmonetary, metal ¹	kilograms	133,032	36,927	507	4,184	105
Iron ore:						
Gross weight	28,057	17,900 ^r	31,211 ^r	51,973	35,683	
Fe content ^e	17,400	11,100 ^r	19,400 ^r	32,200	22,100	
Iron and steel:						
Direct-reduced iron	500	658	861 ^r	591	666	
Pig iron	668 ^r	335 ^r	421 ^r	823	1,407	
Steel:						
Semifinished and finished steel products	16,335	11,101	13,356	17,113	16,749	
Flat products	9,749	5,513	7,541 ^r	8,425	9,551	
Lead, metal	77	1	1	4	3	
Zinc, metal	203	216	186	286	252	
INDUSTRIAL MINERALS						
Barite	1,417	2,244	1,903	1,460	1,903	
Cement	6,851 ¹	6,664 ¹	5,824 ¹	2,840 ¹	1,951	
Diamond	carats	45,610 ^r	39,390 ^r	28,930 ^r	18,490	38,200
Graphite, natural	metric tons	1,068	450	459	781	765
Gypsum	do.	75,738	150,050	149,123 ^r	151,234	208,792
Potassic fertilizers	do.	32 ¹	41 ¹	41 ¹	30 ¹	38
Potassium nitrate		886 ¹	921 ¹	805 ¹	985 ¹	917
MINERAL FUELS AND RELATED MATERIALS						
Coal		1,255 ^r	1,358 ^r	1,123 ^r	1,133	1,171
Petroleum, refinery products	million 42-gallon barrels	396	426	484	389	507

^eEstimated. ^rRevised. do. Ditto. -- Zero.

¹Data are based on fiscal year ending on March 31 of the year stated.

Source: Indian Minerals Yearbook 2017–2020; Kimberley Process, 2021; BP p.l.c., 2022; International Copper Study Group, 2022; International Lead and Zinc Study Group 2022; Ministry of Steel, 2022; World Steel Association, 2022; United Nations Comtrade database, 2023.

TABLE 4
INDIA: IMPORTS OF SELECTED MINERAL COMMODITIES

(Thousand metric tons unless otherwise specified)

Commodity		2017	2018	2019	2020	2021
METALS						
Aluminum:						
Alumina		2,056	2,694	2,400	1,946	2,546
Bauxite		1,628	1,887	2,079	2,991	3,090
Copper:						
Ore and concentrates		440	315	233	163	259
Blister and anode		142	130	125	160	187
Refined copper		36	84	141	152	139
Copper alloy, ingots		3	3	3	2	1
Copper and alloys, semifabricated		311	429	348	173	211
Copper and alloys, scrap		175	195	249	228	247
Gold, nonmonetary, metal ¹	kilograms	778,449	955,366	982,697	430,110	430,000
Iron ore:						
Gross weight		5,362	15,890 ^r	2,129 ^r	717	1,558
Fe content ^c		3,300	9,900	1,300	400	956
Iron and steel:						
Direct-reduced iron		90	53	58 ^r	55	47
Pig iron		16 ^r	67 ^r	13 ^r	7	15
Scrap		5,365	6,330	7,053 ^r	5,383	5,383
Steel:						
Semifinished and finished		8,882	9,026	8,921	5,038	6,812
Flat products		6,573	6,259	6,470	3,542	2,976
Lead, metal		121	131	113	122	100
Zinc, metal		141	153	134	122	128
INDUSTRIAL MINERALS						
Barite	metric tons	10,131	12,508	15,278 ^r	10,988	14,657
Cement		2,038 ¹	2,620 ¹	2,262 ¹	2,214 ¹	2,200 ^c
Diamond	thousand carats	195,000 ^r	170,010 ^r	159,030 ^r	118,350	171,620
Graphite, natural	metric tons	39,986	42,863	45,003	38,651	49,154
Gypsum	do.	4,960	5,974	5,283 ^r	4,952	5,291
Potassic fertilizer	do.	4,570 ¹	5,114 ¹	4,577 ^{r,1}	4,040 ¹	4,000 ^c
Potassium nitrate	do.	266 ¹	108 ¹	92 ¹	208 ¹	200 ^c
MINERAL FUELS AND RELATED MATERIALS						
Coal		180,000 ^r	194,000 ^r	160,000 ^r	140,000	140,000 ^c
Petroleum:						
Crude	million 42-gallon barrels	1,722 ^r	1,819 ^r	1,889 ^r	1,714	1,864
Refinery products	do.	278	229	329	334	361

^cEstimated. ^rRevised. do. Ditto.

¹Data are based on fiscal year ending on March 31 of the year stated.

Source: Indian Minerals Yearbook 2017–2020; Kimberley Process, 2021; BP p.l.c., 2022; International Copper Study Group, 2022; International Lead and Zinc Study Group 2022; Ministry of Steel, 2022; World Steel Association, 2022; United Nations Comtrade database, 2023.

TABLE 5
INDIA: ESTIMATED RESERVES OF MAJOR MINERAL COMMODITIES IN 2021^{1,2}

(Thousand metric tons unless otherwise specified)

Commodity	Reserves
Apatite	30
Barite (all grades)	51,000
Bauxite	650,000
Calcite	3,400
Chalk	5,100
Chromite ore (all grades)	79,000
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	164,000
Cu content	2,200
Corundum	metric tons 200
Diamond	thousand carats 850
Diaspore	7,900
Dolomite	680,000
Dunite	13,000
Feldspar (all grades)	320,000
Fluorite	404
Garnet	8,600
Gold:	
Crude ore	24,000
Au content	kilograms 93,000
Graphite	8,600
Gypsum	37,000
Iron ore:	
Crude ore	6,400,000
Iron content	4,000,000
Iron oxide pegmatites, ochre	37,000
Kyanite and related minerals:	
Kyanite	850
Sillimanite	6,500
Lead and zinc ore	100,000
Lead, Pb content	2,000
Limestone	19,000,000
Magnesite	66,000
Manganese ore	75,000
Mica	114
Monazite	13,000
Phosphate rock	31,000
Quartzite	83,000
Silica	648,000
Salt (rock)	4,000,000
Silver:	
Crude ore	170,000
Metal, Ag content	metric tons 8,000
Talc	106,000
Tin, ore	2
Titanium minerals:	
Ilmenite	630,000
Rutile	34,000
Vermiculite	1,600
Wollastonite	2,700

See footnotes at end of table.

TABLE 5—Continued
INDIA: ESTIMATED RESERVES OF MAJOR MINERAL COMMODITIES IN 2021^{1,2}

(Thousand metric tons unless otherwise specified)

Commodity	Reserves
Zinc, Zn content	7,000
Zircon	3,400

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

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

Source: Indian Bureau of Mines, 2022.