



# 2015 Minerals Yearbook

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# THE MINERAL INDUSTRY OF INDIA

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India produced 16 metals, 33 industrial minerals, and 4 mineral fuels and related materials. India ranked 1st in the world in production of garnet (industrial); 2d, of cement, kaolin, pig iron, and wollastonite (not including U.S. production); 3d, of barite, crude (raw) steel, lime, nitrogen, and salt; 4th, of alumina, bentonite, and iron ore; 5th, of bauxite, bromine (not including U.S. production), and zinc; 6th, of manganese (not including U.S. production), sulfur (byproduct), and rutile (not including U.S. production); 7th, of lead and zircon; 8th, of mica (natural); and 11th, in ilmenite. The country's estimated share of world production of garnet (industrial) amounted to 47%; wollastonite (not including U.S. production), 26%; kaolin, 13%; barite, 9%; bauxite and nitrogen (ammonia), 8% each; bentonite, cement, and iron ore, 7% each; crude steel, salt, and zinc, 6% each; and lime, manganese, mica (sheet), and pig iron, 5% each (table 1; World Steel Association, 2016, p. 2, 92, 103; Apodaca, 2017a, b; Bedinger, 2017a, b; Bolen, 2017; Bray, 2017; Corathers, 2017a, b; Fenton, 2017; Flanagan, 2017a, b; Guberman, 2017; McRae, 2017; Schnebele, 2017; Thomas, 2017a, b; Tolcin, 2017; Tuck, 2017; van Oss, 2017).

## Minerals in the National Economy

In 2015, India's real gross domestic product (GDP) increased by 7.6% compared with a 7.2% increase in 2014. The nominal GDP was \$2.10 trillion. The mining and quarrying sector accounted for 2.6% of the GDP in 2015 compared with 2.5% in 2014, and the manufacturing sector accounted for 16.3% of the GDP compared with 17% in 2014. Mining and quarrying production increased by 1.4% in terms of the total value added compared with a decrease of 0.6% in 2014. Manufacturing production increased by 2.3% in terms of the total value added compared with a decrease of 0.8% in 2014. In 2015, 129,000 workers were employed in mining and quarrying compared with 141,000 in 2014. Foreign direct investment increased by 28% to \$44.1 billion from \$34.6 billion in 2014 (Indian Bureau of Mines, 2015h, p. 103; International Monetary Fund, 2015, p. 5; 2016, p. 232; Ministry of Statistics and Programme Implementation, 2015, p. x; 2016a, p. x; 2016b, p. 12; World Bank, The, 2016; United Nations Conference on Trade and Development, 2017, p. 224).

## Government Policies and Programs

The Mines and Minerals (Development and Regulation) Act, 1957 (MMDR) was amended and implemented in 2015. The objectives of the MMDR are to identify illegally awarded mining licenses, make allocation of licenses more transparent and only through auction, improve the living conditions of communities located around mines, and give States the right to award mining licenses for major minerals with the approval of the central Government. The MMDR divides minerals in India into two groups: major minerals (which are managed

by the central Government) and minor minerals (managed by the States). Some of the major minerals include bauxite, coal, chromite, copper, lignite, gold, iron ore, lead, manganese, uranium, zinc, and others. Some of the minor minerals include building stone, gravel, ordinary clay, ordinary sand, and any other minerals determined by the central Government to be a minor mineral (Indian Parliament, 2014; Yamada, 2014, p. 16; Athrapedia, 2015; Bhushan, 2015, p. 4–5).

In 2015, the Government approved the National Mineral Exploration Policy (NMEP), which allows private exploration companies to have access to Government geoscientific data. The Government also passed the Mineral (Auction) Rule, which requires the holder of a mining lease to complete detailed exploration and prepare a detailed feasibility report within 5 years of the date that the mining lease was issued; the feasibility report must conform to the requirements of the Mineral (Evidence of Mineral Contents) Rules. The auction of blocks with identified deposits are conducted by the responsible State government. The Government also initiated the Mining Surveillance System to decrease illegal mining (CRISIL Ltd., 2016, p. 30–31, 39–40; Ministry of Mines, 2016a; Press Information Bureau, Government of India, 2016).

In 2015, the Government passed the Coal Mines (Special Provisions) Act, 2015, which helped to identify and close a total of 204 mines that were either in operation or were in advanced stages of development. Later in the year, the 204 coal mines were put up for auction in a transparent way to the private sector; 31 of the coal mines were successfully auctioned to private sector companies and 42 were allotted to State-owned or central Government-owned companies (Ministry of Coal, 2015b; CRISIL Ltd., 2016, p. 28).

In 2014, the Government launched a program called "Make in India" along with several other key policy reforms to promote the country's industrial and manufacturing sector, build infrastructure, and develop value-added sectors. The key policies include the Automobile Mission Plan 2016–2024, the Defense Production Policy, the National Policy on Electronics, the National Electric Mobility Mission Plan, Power for All, and Digital India. The objectives of "Make in India" are to (1) attract foreign companies to invest in India, (2) reform the policies (land acquisition laws and labor laws) by passing amendments to the 2013 Land Acquisition Bill and Labor and Employment Law, (3) construct infrastructure, (4) make the manufacturing sector grow, and (5) create new jobs. As a result of the Make in India program, in 2015, the Ministry of Mines, in cooperation with the Federation of Indian Mineral Industries, established a Department of Skill Development and Vocational Education to help improve the skills of existing employees in the mineral sector and increase the number of skilled workers in the mining and manufacturing industries (Mehra, 2014; CRISIL Ltd., 2016, p. 27; Make in India, 2016; Ministry of Mines, 2016b).

The Dedicated Freight Corridor Corp. was established by the Government in 2016 to carry out the construction of a western freight corridor [1,499 kilometers (km) long] and an eastern freight corridor (1,839 km long). The eastern corridor would pass through the States of Punjab, Haryana, Uttar Pradesh, Bihar, Jharkhand, and West Bengal, and the western corridor would pass through the States of Haryana, Rajasthan, Gujarat, Maharashtra, and Uttar Pradesh. The freight corridor was expected to start operating by 2020 and would make it easier and cheaper to move raw materials and finished products between industrial areas in the north and ports on the eastern and western coasts (Dedicated Freight Corridor Corp. of India Ltd., 2017a, b; Railway-technology.com, 2017; Tribune, The, 2017).

## Production

In 2015, the production of kyanite increased by 116%; phosphate rock ( $P_2O_5$  content and gross weight), by 51% each; cobalt (metal), by 50%; lead (mine output), by 28%; bauxite, by 23%; cadmium (metal) and slate, by 21% each; sillimanite, by 20%; coal and zinc (metal, primary only), by 19% each; gypsum, zinc (mine output), and zinc (metal, primary and secondary), by 16% each; silicomanganese and silver (smelter output), by 13% each; chromite (gross weight), by 12%; fluor spar, by an estimated 12%; copper (mine output) and lead (metal, primary), by 11% each; sand (other than silica), by 10%; and quartz and quartzite, by 9% (table 1).

In 2015, the production of ferrotitanium decreased by 74%; selenite, by 61%; tin (metal, smelter output), by 44%; barite, by 41%; crude petroleum, by 27%; zinc (metal, secondary), by 26%; iron (direct-reduced), natural gas (gross weight), and pyrophyllite, by 20% each; vermiculite, by 19%; marl and natural gas (marketable), by 17% each; calcite, diaspore, and magnesium ferrosilicon, by 16% each; chalk and ferrovanadium, by 15% each; gold (smelter output), by 13%; dolomite, by 12%; magnesite, by 8%, and ilmenite, by 5%. Data on mineral production are in table 1.

## Structure of the Mineral Industry

The Government owned and controlled key sectors of the mining and manufacturing industries, including 80% of the coal, gas, and petroleum sectors. In 2014, however, the Government sold 10% of Coal India Ltd. (an 80% state-owned company) to private investors for \$3.6 billion, and, in 2015, the Government launched a second auction for sale of another 10% of Coal India to private companies for \$3.2 billion. In 2015, the number of mines (excluding those for nuclear materials and minor minerals) that reported production was 3,524 compared with 3,979 (revised) in 2014. Of the 3,524 operating mines, 541 were located in the State of Rajasthan; 470, in Andhra Pradesh; 410, in Gujarat; 376, in Madhya Pradesh; 292, in Tamil Nadu; 224, in Jharkhand; 215, in Chhattisgarh; 183, in Karnataka; 172, in Odisha; 162, in Maharashtra; 154, in Telangana; 119, in West Bengal; and 206, in other States. Table 2 is a list of major mineral industry facilities (table 2; Dash and Das, 2015; Indian Bureau of Mines, 2015g, p. ix; Keohane, 2015; U.S. Department of State, 2016).

## Mineral Trade

The total value of India's exports decreased by 17% to \$267 billion in 2015 from \$323 billion (revised) in 2014. The total value of imports decreased by 15% to \$392 billion in 2015 from \$463 billion (revised) in 2014. In fiscal year 2015 (which was from April 1, 2014, through March 31, 2015), the value of exports (including reexports) of ores and minerals decreased by 12% to \$26.9 billion from \$30.6 billion in fiscal year 2014 (April 1, 2013, through March 31, 2014). In fiscal year 2015, the value of imports of ore and minerals decreased by 15% to \$161.9 billion from \$191.2 billion in fiscal year 2014 (Indian Bureau of Mines, 2015e, p. 2, 16; United Nations Conference on Trade and Development, 2016, p. 4–5).

In 2015, India remained the leading consumer of gold in the world; consumption of gold for jewelry and investment increased by 6% to 890 metric tons (t) from 843 t in 2014. In fiscal year 2015, gold metal imports increased by 38% to 915,473 kilograms (kg) from 661,715 kg in fiscal year 2014. The main import partners were Switzerland (55%), the United Arab Emirates (UAE) (11%), and the United States (9%). Exports of gold metal totaled 69,894 kg in fiscal year 2015 compared with 70,721 kg in fiscal year 2014. The main export partner was the UAE (99%). The Government increased import duties on gold bullion to 10% from 1% in 2012 and required importers to reexport 20% of the gold brought into the country in 2012 to protect the interests of small artisans and the domestic gold industry. In 2015, the Government decided to maintain the import duty on gold at 10% (tables 3, 4; Hindu, The, 2013, 2016b; Sahu and Mukherji, 2014; Indian Bureau of Mines, 2015f, p. 20, 22; Roy and Agarwal, 2015b; Shumsky and Mukherji, 2015).

In 2015, India's imports of iron ore (iron content) increased by 28% to 5.9 million metric tons (Mt) from 4.6 Mt. Exports of iron ore (iron content) decreased by 57% to 2.6 Mt in 2015 from 6.1 Mt in 2014. In February 2015, the Government proposed to remove the export tax on low-grade iron ore fines and lumps. In 2011, in order to make raw material available for domestic steelmakers, the Government had imposed a 30% tax on exports of iron ore fines and lumps with iron ore content of 58% and above, a 10% tax on exports of iron ore fines and lumps with iron ore content below 58%, and a 5% tax on exports of iron ore pellets. India's main export partners for iron ore were China (60%), Japan (25%), and Iran and the Republic of Korea (7% each). The main import partners were South Africa (42%), Brazil (28%), and Australia (16%) (tables 3, 4; Reuters Staff, 2014; Indian Bureau of Mines, 2015f, p. 32; Roy and Agarwal, 2015a; Hindu, The, 2016a; World Steel Association, 2016, p. 104–105).

In 2014, following Indonesia's ban on bauxite exports, India became the second-ranked exporter of bauxite to China after Australia. In 2014, India increased the export tax on bauxite exports to 20%. In 2015, imports of bauxite increased to 1.8 Mt from 422,000 t in 2014, of which 77% was from Guinea and 7% was from Australia. Exports of bauxite increased to 6.8 Mt in 2015 from 3.5 Mt in 2014. The main export partner for bauxite was China (92%) (tables 3, 4; Economic Times, The, 2014a, b; Mukherji, 2014; Indian Bureau of Mines, 2015c, p. 13).

India met 100% of its potash demand through imports. The country was the second-ranked consumer of potash in the world in 2015. India's potash imports increased by 36% to 4.6 Mt in 2015 from 3.4 Mt in 2014. Indian Potash Ltd. was the leading potash importer in the country, and Zuari Agro Chemicals Ltd. was the second-ranked importer (table 4; Mukherji, 2013; Farchy and Terazono, 2015; Ministry of Chemical and Fertilizer, 2015, p. 7).

In 2015, the Government imposed a 20% antidumping import tax on stainless steel imports from China. The Government also imposed a 2.5% duty on imports of basic steel products in June 2015. In addition, the duty on flat-rolled steel products was increased to 10% from 7.5%, and that on long products was increased to 7.5% from 5.0%. India had been a net importer of steel products since 2006. From 2014 through 2015, the country's imports of semifinished and finished steel products increased by 40% to 13.3 Mt from 9.5 Mt; ingots and semis, by 85% to 765,000 t from 413,000 t; long products, by 24% to 2.0 Mt from 1.6 Mt; and flat products, by 46% to 9.8 Mt from 6.7 Mt (tables 3, 4; Metal Bulletin, 2015b, p. 10; Times of India, The, 2015; International Trade Administration, 2016, p. 13, World Steel Association, 2016, p. 58, 63, 68, 72).

In 2015, India remained the leading coal importer in the world. The production of coal in India remained low and was not able to keep up with domestic demand. Coal imports increased by 47% to 102.8 Mt in 2012; 42% to 145.8 Mt in 2013; 14% to 166.9 Mt in 2014; and 27% to 212.1 Mt in 2015. Exports decreased by 33% to 1.5 Mt in 2015 from 2.2 Mt in 2014 (tables 3, 4; CRU Group, 2015; Das, 2015a).

In 2015, imports of copper concentrates decreased by 9% to 543,000 t from 594,000 t in 2014, and imports of copper scrap increased by 3% to 174,000 t from 169,000 t in 2014. Imports of refined copper increased by 29% to 40,000 t in 2015 from 31,000 t in 2014. Exports of scrap decreased by 17% to 5,000 t in 2015 from 6,000 t in 2014, and exports of refined copper decreased by 6% to 341,000 t in 2015 from 362,000 t in 2014. In 2013, the Government imposed a 2.5% import duty on copper scrap metal. In 2015, India's refined copper producers faced competition from cheap imports of refined copper, and they asked the Government to increase the import duty on refined copper to 7.5% from 5% and to remove the 2.5% duty on copper scrap and concentrate (tables 3, 4; Metal Bulletin, 2013; Economic Times, The, 2015).

In 2015, India was the fourth-ranked consumer of crude petroleum and petroleum products. The country has a limited supply of crude petroleum and relied on imports for more than 75% of its domestic consumption. In 2015, India imported 1.4 billion barrels (Gbb) of petroleum, and the country consumed 1.5 Gbb of petroleum compared with 1.3 Gbb in 2014. Most of the petroleum imports came from Central America and South America, the Middle East, and West Africa (BP p.l.c., 2016, p. 9, 18; U.S. Energy Information Administration, 2016, p. 4).

India's exports to the United States were valued at \$44.8 billion in 2015 compared with \$45.4 billion (revised) in 2014. Of this amount, gem diamond accounted for \$7.4 billion; petroleum products, about \$2.2 billion; fuel oil, \$549 million; iron and steel mill products, \$501 million; iron and steel

products, \$430 million; finished metal shapes, \$371 million; gemstones, \$288 million; iron and steel, advanced, \$225 million; bauxite and alumina, \$129 million; cement, sand, and stone, \$25 million; sulfur and other nonmetallic minerals, \$24 million; nonferrous metals, \$58 million; zinc, \$5 million; other precious metals, \$3 million; and nickel, \$2 million. In 2015, India's imports from the United States were valued at \$21.45 billion compared with about \$21.50 billion in 2014; these included \$3.8 billion in gem diamond; \$2.3 billion in nonmonetary gold; \$694 million in petroleum products; \$479 million in chemical fertilizers; \$369 million in steelmaking materials; \$303 million in metallurgical-grade coal; \$225 million in coal and fuels; \$220 million in precious metals; \$159 million in finished metal shapes; \$111 million in iron and steel products; \$103 million in aluminum and alumina; \$98 million in nonferrous metals; \$86 million in copper; \$81 million in iron and steel mill products; and \$17 million each in crude petroleum and nonmetallic minerals (U.S. Census Bureau, 2016a, b).

## Commodity Review

### Metals

**Bauxite and Alumina and Aluminum.**—India produced 22.6 Mt of bauxite in 2015 compared with 20.7 Mt in 2014. In 2015, Odisha was the leading producing State, accounting for 42% of India's total production; followed by Gujarat, 25%; Maharashtra, 12%; Jharkhand, 9%; Chhattisgarh, 7%; Madhya Pradesh, 4%; and Goa, Karnataka, and Tamil Nadu, the remaining 1% (tables 1, 2; Indian Bureau of Mines, 2015c, p. 5).

In 2015, National Aluminum Co. Ltd. (NALCO) remained the leading bauxite producer. NALCO operated the Panchpatmali bauxite mine at the industrial town of Damanjodi, Koraput District, State of Odisha. Panchpatmali had a production capacity of 6.8 million metric tons per year (Mt/yr) of bauxite. The Panchpatmali Mine contributed 26% of India's total bauxite production (Indian Bureau of Mines, 2015c, p. 2; National Aluminum Company Ltd., 2015d).

Bharat Aluminum Co. Ltd. (BALCO) operated two bauxite mines in the State of Chhattisgarh—one at Mainpat with a capacity of 750,000 metric tons per year (t/yr) and one at Bodai Daldali (Kawardha) with a capacity of 1.3 Mt/yr. Vedanta Ltd. (formerly Sesa Sterlite Ltd.) held a 51% stake in BALCO, and the remaining 49% was held by the Government. In 2014, Vedanta Aluminium Ltd. (VAL), a wholly owned subsidiary of Vedanta Ltd., entered into a joint-venture agreement with Orissa Mining Corp. Ltd. (OMCL) and South West Orissa Bauxite Mining Pvt. Ltd. (SWOBM) for bauxite production at the Niyamgiri project in the State of Odisha. The Niyamgiri project was one of the sources of bauxite supply for the alumina refinery at Lanjigarh town. In 2015, the State of Odisha was trying to revive a plan to mine bauxite at the Niyamgiri project; however, the Ministry of Environment, Forest, and Climate Change rejected clearance approval owing to environmental concerns (Sesa Sterlite Ltd., 2013; Vedanta Ltd., 2014, p. 250; Dash and Das, 2015).

In 2015, India produced 5.5 Mt of alumina compared with 5.1 Mt in 2014. India also produced 2.1 Mt of aluminum in 2015 compared with 1.7 Mt in 2014. Hindalco, which was



33% owned by Aditya Birla Group, 26% by foreign investors, 23% by private Indian investors, and 18% by financial institutions, made significant progress on its Utkal alumina greenfield project. The Utkal project was operated by Utkal Alumina International Ltd. (UAIL), which was a wholly owned subsidiary of Hindalco. After a 21-year delay owing to objections by environmentalist groups, UAIL commenced operations at the Utkal refinery in 2014. In 2015, the Utkal refinery produced 1.0 Mt of alumina. The supply of bauxite for the Utkal refinery came from the Baphimali bauxite mine, which had reserves estimated to last for 25 years at the current rate of production. The alumina produced from UAIL was used at the Aditya and the Mahan smelters (tables 1, 2; Mohanty, 2013; Hindalco Industries Ltd., 2013, p. 4, 14–15; 2014a, p. 10; 2014b; 2015, p. 45; Indian Bureau of Mines, 2015a, p. 2, 5).

In 2015, NALCO was the leading producer of alumina in India and accounted for 51% of the country's alumina production. NALCO planned to construct greenfield 1-Mt/yr-capacity alumina refineries in Sundargarh District, State of Odisha, and in Kutch District, State of Gujarat. As of 2015, the projects awaited approval. The bauxite for the alumina refinery in Kutch District would be supplied from the mines of Gujarat Mineral Development Corp. Ltd. (GMDC). VAL operated a 1-Mt/yr-capacity alumina refinery at Lanjigarh, District of Kalahandi, State of Odisha, in 2015. In 2014, VAL had planned to increase the production capacity at this refinery to 2 Mt/yr of alumina; as of yearend 2015, the company was awaiting environmental clearance for this expansion (National Aluminium Company Ltd., 2014, p. 56; 2015a, p. 2; 2015b; 2015c; 2015e; Indian Bureau of Mines, 2015a, p. 5–6; Vedanta Resources plc, 2015, p. 71).

In 2015, Hindalco operated four aluminum smelters—the Aditya smelter, State of Odisha; the Hirakud smelter, State of Odisha; the Mahan smelter, State of Madhya Pradesh; and the Renukoot smelter, State of Uttar Pradesh. The Aditya smelter was located at Lapanga, Sambalpu District, and had the capacity to produce 360,000 t/yr of aluminum. The Mahan smelter was located at Bargawan and had the capacity to produce 360,000 t/yr of aluminum. In 2015, the Aditya and the Mahan smelters produced at almost 50% and 85% of their capacity, respectively. In 2015, Hindalco expanded its major manufacturing facilities through brownfield projects at the Hirakud smelter. Owing to the plant modernization, the capacity of the Hirakud smelter increased to 217,000 t/yr from 161,400 t/yr in 2014 (Mohanty, 2013; Hindalco Industries Ltd., 2013, p. 4, 14–15; 2014a, p. 10; 2014b; 2015, p. iii, p. 7; Indian Bureau of Mines, 2015a, p. 5).

**Iron Ore and Iron and Steel.**—In 2015, India ranked fourth in the world in iron ore production. As of 2013, India's total iron ore resources were estimated to be 20.6 billion metric tons (Gt), of which 32% was proven and probable reserves. Iron ore production (gross weight) increased by 2% to 142.5 Mt in 2015 from 139.7 Mt in 2014. In 2015, National Mineral Development Corp. Ltd. (NMDC) continued to operate large iron ore mines at Bailadila, State of Chhattisgarh, and at Donimalai, State of Karnataka. In 2015, NMDC started construction of the Kumaraswamy iron ore mine, which would have a production capacity of 7.0 Mt/yr of ore. The construction of the mine was

expected to be completed in 2017. In 2015, the mining licenses for Steel Authority of India Ltd.'s (SAIL's) Barsua and Bolani iron ore mines were extended until March 2020 under the MMDR (table 1; Indian Bureau of Mines, 2015i, p. 4; Steel Authority of India Ltd., 2015, p. 12; Ministry of Steel, 2016, p. 5; National Mineral Development Corp. Ltd., 2016, p. 9–10).

In 2015, India ranked third in the world in crude steel production after China and Japan, and its production increased by 2% to 89 Mt from 87 Mt. India's steel industry faced such challenges as low domestic demand, an unsteady supply of iron ore and coal from local producers, and delays in obtaining environmental clearance. In 2015, production of direct-reduced iron in India decreased to 16.2 Mt from 20.4 Mt in 2014 (tables 1, 5; Metal Bulletin, 2015a, p. 32; World Steel Association, 2016, p. 2).

SAIL operated 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 (IISCO) steel plant at Burnpur in the State of West Bengal. SAIL also operated three steel alloy plants—the plant at Durgapur in the State of West Bengal, the Salem steel plant at Salem in the State of Tamil Nadu, and the Viscoswaraya iron and steel plant at Bhadravati in the State of Karnataka—and several Visakhapatnam (viz) units. In 2015, SAIL set a goal to increase its production to 50 Mt of hot metal, 48 Mt/yr of crude steel, and 46 Mt/yr of salable steel by 2025–26, in order to reach a Government goal of 300 Mt/yr of crude steel production. In 2015, SAIL was working on modernization and expansion of five steel plants at Bhilai, Bokaro, Burnpur, Durgapur, and Rourkela. The expansion of the plants was expected to be completed by 2016. The company's steel plant capacity was expected to increase to 21.4 Mt/yr from 12.8 Mt/yr. The expansion of the Rourkela plant was completed in 2015, and the production capacity of crude steel increased to 4.2 Mt/yr from 1.9 Mt/yr (Money Control, 2015; Roy and Agarwal, 2015a).

NMDC constructed a steel plant with a production capacity of 3 Mt/yr of steel at Nagarnar, Bastar District, State of Chhattisgarh. The trial run of a 1.2-Mt/yr pellet plant at Donimalai in the State of Karnataka was scheduled for 2017. NMDC obtained the approvals for setting up a 2-Mt/yr-capacity pellet plant at Nagarnar and a 2-Mt/yr-capacity beneficiation plant at Bachel that would be connected by a slurry pipeline between Bachel and Nagarnar in the State of Chhattisgarh (National Mineral Development Corp. Ltd., 2016, p. 9–10).

In 2015, POSCO of the Republic of Korea put on hold the construction of a 12-Mt/yr-capacity steel plant in the State of Odisha. POSCO, in one of India's biggest foreign direct investments, had planned to set up a 12-Mt/yr-capacity steel plant in the State of Odisha in 2005. As of yearend 2015, POSCO had not started 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 buy a mining license in an auction (Dash and Das, 2015; Nam and Mukherji, 2015).

## Industrial Minerals

**Barite.**—State-owned Andhra Pradesh Mineral Development Corp. Ltd. operated the Mangampeta barite project located in Mangampeta village in Cuddapah District. In 2015, the State of Andhra Pradesh accounted for about 97% of India's total production of barite; the remaining 3% was produced in the States of Rajasthan and Telangana. In 2014, the government of Andhra Pradesh State decided to cancel 32 barite mining licenses in Mangampeta in Cuddapah District and established a technical committee to tender canceled licenses in a more transparent way. In 2015, the government of Andhra Pradesh sold barite mining licenses to Ashapura Group, IBC Ltd., Oren Hydrocarbons (Pvt) Ltd., and Trimex Group of the United Arab Emirates (Hindu, The, 2014; Times of India, The, 2014; Indian Bureau of Mines, 2015b, p. 2; Syrett, 2015, p. 14; Syrett and Salwan, 2015, p. 19).

**Diamond.**—In 2015, Rio Tinto Ltd. of Australia made progress on the prefeasibility study (which had been started in July 2010) on its wholly owned Bunder diamond project in the State of Madhya Pradesh. As of 2015, the total inferred resources were estimated to be 44 Mt grading 0.7 carats per metric ton. As of yearend 2015, Rio Tinto planned to invest \$500 million and was awaiting environmental and forest clearances (Jamasmie, 2015; Rio Tinto Ltd., 2015, p. 222).

**Fluorite.**—In 2015, Maharashtra State Mining Corp. Ltd., which was the only fluorite mining company in India, operated the Dongargaon fluorite mine in Chandrapur District. In 2014, GMDC, in cooperation with Gujarat Fluoro Chemicals Ltd. and Navin Fluorine Chemicals Ltd., planned to construct a fluorite beneficiation plant with a capacity of 40,000 t/yr at Kadipani in Vadodara District. As of 2015, the company was working in cooperation with a company from China on the selection of the technology for the plant (Gujarat Mineral Development Corporation Ltd., 2013, p. 14, 30, 38; 2015, p. 8; Maharashtra State Mining Corp. Ltd., 2014; Indian Bureau of Mines, 2015d, p. 4).

**Rare Earths (Monazite).**—In 2015, India Rare Earths Ltd. (IREL) commenced operations at its only monazite-processing plant; the plant had a production capacity of 11,000 t/yr of mixed rare-earth chlorides. The plant was to process the monazite from the beaches of the States of Odisha, Tamil Nadu, and Kerala. The State of Andhra Pradesh hosts monazite deposits with an estimated monazite resource of 3.72 Mt; the State of Tamil Nadu, 2.46 Mt; the State of Odisha, 2.41 Mt; the State of Kerala, 1.9 Mt; the State of West Bengal, 1.22 Mt; the State of Jharkhand, 220,000 t; the State of Gujarat, 3,000 t; and the State of Maharashtra, 2,000 t (Indian Bureau of Mines, 2015j, p. 2; Industrial Minerals, 2015, p. 14).

## Mineral Fuels

**Coal.**—In 2015, the total proved reserves of coal in India were estimated to be 60.6 Gt, which ranked India fifth in the world in terms of coal reserves. India produced 631 Mt of bituminous coal and 44 Mt of lignite coal in 2015 compared with 601 Mt of bituminous coal and 46 Mt of lignite coal in 2014. In 2015, India remained the world's third-ranked consumer of coal after China and the United States and became

the world's third-ranked importer. Coal India decided to invest in overseas coal mines to fill the demand gap. In 2015, the Government set up a goal for Coal India, which was responsible for more than 80% of coal production in India, through the "billion ton" policy. The company was expected to produce 1 gigaton per year of coal by 2020. In 2015, under the Coal Mines (Special Provision) Act, 18 coal blocks were auctioned and were awarded to steel companies, cement companies, and captive powerplants (tables 1, 5; Crabtree, 2014; Eastern Coalfields Ltd., 2014, p. 4; Hindustan Times, 2014; Kumar and Das, 2014; Mallet, 2015; Ministry of Coal, 2015a, p. 51; Office of the Economist, 2015, p. 12; PricewaterhouseCoopers India, 2015, p. 10; BP p.l.c., 2016, p. 30, 33; U.S. Energy Information Administration, 2016, p. 17).

## Reserves and Resources

Table 5 is a list of mineral reserves in India.

## Outlook

In 2016, production capacities for alumina, aluminum, bauxite, and cement are expected to increase. For the next few years, the production of steel is also likely to continue to increase. In 2015, the Government set a goal for the Indian steel industry to reach 300 Mt/yr of steel production by 2025. Privatization of the coal industry is likely to help increase coal production; the coal companies were projected to produce 1 billion metric tons per year of coal by 2020. The Government intensified its efforts to increase the country's mineral production by adopting new mineral policies and amending existing policies, implementing trade policies, and trying to attract foreign investment into its mineral industry. The Government's implementation of the "Make in India" program could help transition India into a global design and manufacturing hub. India is likely to continue to import copper, natural gas, petroleum, and other raw materials. The development of India's mineral industry will be highly dependent on how the country overcomes challenges faced by the industry, on the speed of the implementation of some reforms and policies, and on domestic demand.

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

(Metric tons unless otherwise specified)

Commodity <sup>2</sup>	2011	2012	2013	2014	2015	
<b>METALS</b>						
<b>Aluminum:</b>						
Alumina, Al <sub>2</sub> O <sub>3</sub> equivalent	thousand metric tons	3,842	4,347	4,040	5,060	5,510
Bauxite, gross weight	do.	13,008	13,463 <sup>r</sup>	20,663	22,579	27,757
Metal, primary	do.	1,645	1,704	1,700	2,100	2,166
Cadmium, metal		479 <sup>r</sup>	396 <sup>r</sup>	287 <sup>r</sup>	380 <sup>r</sup>	460
Chromium, chromite, gross weight	thousand metric tons	3,778 <sup>r</sup>	3,255 <sup>r</sup>	2,632	2,374	2,656
Cobalt, metal		1,299	800	295	100	150
<b>Copper:</b>						
Mine output, Cu content		36,000	33,000	35,000	27,000	30,000
<b>Metal, primary:</b>						
Smelter		671,000	695,000	617,000	766,000	793,000
Refinery, electrolytic, cathode		671,000	695,000	617,000	766,000	792,000
<b>Ferroalloys:</b>						
Ferrochrome		947,000 <sup>r</sup>	944,000 <sup>r</sup>	944,000	944,000	944,000
Ferromanganese		517,000 <sup>r</sup>	518,000 <sup>r</sup>	518,000	518,000	518,000
Ferromolybdenum		1,010 <sup>r</sup>	1,057 <sup>r</sup>	1,151	1,281	1,260
Ferrosilicon		86,000 <sup>r</sup>	90,000 <sup>r</sup>	90,000	90,000	90,000
Ferrotitanium	thousand metric tons	374 <sup>r</sup>	542 <sup>r</sup>	691	760	197
Ferrovandium	do.	630 <sup>r</sup>	815 <sup>r</sup>	815	1,031	875
Magnesium ferrosilicon		20,102	18,246	21,365	26,058	21,887
Silicomanganese	thousand metric tons	173 <sup>r</sup>	234 <sup>r</sup>	220	243	274
Total		1,572,289	1,572,894	1,576,242	1,581,373	1,576,493
<b>Gold:</b>						
Ore, gross weight		493,069	504,549	403,723	435,245	469,336
Smelter output	kilograms	2,260 <sup>r</sup>	1,748 <sup>r</sup>	1,423	1,587	1,375
<b>Iron and steel:</b>						
Direct-reduced	thousand metric tons	21,970	20,050	16,893	20,366	16,228
Pig iron	do.	43,624	47,987	51,359	55,166	58,393
Sponge iron	do.	23,903	19,944	17,428	17,232	17,868
<b>Iron ore and concentrate:</b>						
Gross weight	do.	191,800	152,600	136,100	139,700	142,500
Fe content (62%)	do.	118,916	94,612	84,382	86,614	88,350
Steel, crude	do.	73,471	77,264	81,299	87,292	89,026
Semimanufactures <sup>3</sup>	do.	53,000	52,000	53,000	59,400	59,400
<b>Lead:</b>						
Mine output, Pb content		84,000	100,000	105,000	106,000	136,000
<b>Metal, refined:</b>						
Primary		92,000	119,000	120,000	129,000	143,000
Secondary		327,000	341,000	343,000	348,000	358,000
Total		419,000	460,000	463,000	477,000	501,000
<b>Manganese:</b>						
Ore and concentrate, gross weight	thousand metric tons	2,542	2,470	2,320	2,570	2,549
Mn content <sup>c</sup>	do.	900	890	920	950	900
Selenium <sup>c</sup>	kilograms	16,000	16,000	16,000	17,000	17,000
Silver, smelter output	do.	173,066 <sup>r</sup>	342,684 <sup>r</sup>	367,022	338,084	383,479
Tin, metal, smelter	do.	54,768 <sup>r</sup>	48,597 <sup>r</sup>	32,676	29,892	16,804
<b>Titanium mineral concentrates, gross weight:</b>						
Ilmenite <sup>c</sup>		550,000	340,000	436,000	190,000	180,000
Rutile		18,573	24,000 <sup>c</sup>	26,000 <sup>c</sup>	17,000 <sup>c</sup>	18,000 <sup>c</sup>
<b>Zinc:</b>						
Mine output, Zn content		796,000	758,000	793,000	706,000	821,617
<b>Metal:</b>						
Primary		726,000	683,000	734,000	678,000	804,000
Secondary		54,000	46,000	49,000	46,000	34,000
Total		780,000	729,000	783,000	724,000	838,000
Zirconium concentrate, zircon, gross weight <sup>c</sup>		39,000	40,000	40,000	40,000	40,000

See footnotes at end of table.

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

(Metric tons unless otherwise specified)

Commodity <sup>2</sup>	2011	2012	2013	2014	2015
<b>INDUSTRIAL MINERALS</b>					
Abrasives, natural, n.e.s.: <sup>4</sup>					
Garnet thousand metric tons	4,320 <sup>r</sup>	1,420 <sup>r</sup>	552	800	800
Diaspore	24,878 <sup>r</sup>	18,366 <sup>r</sup>	12,920	17,753	15,000
Barite thousand metric tons	2,008 <sup>r</sup>	1,675 <sup>r</sup>	1,316	1,182	700 <sup>c</sup>
Bromine, elemental <sup>c</sup>	1,600	1,700	1,700	2,100	2,100
Cement, hydraulic <sup>c</sup> thousand metric tons	240,000	270,000	280,000	275,000	300,000
Chalk	288,862 <sup>r</sup>	173,331 <sup>r</sup>	127,859	125,244	107,000 <sup>c</sup>
Clays: <sup>5</sup>					
Ball thousand metric tons	1,159 <sup>r</sup>	1,853 <sup>r</sup>	1,770	1,927	2,000 <sup>c</sup>
Bentonite	739,000	996,000	1,081,000	1,081,000	1,100,000 <sup>c</sup>
Fireclay thousand metric tons	735 <sup>r</sup>	764 <sup>r</sup>	601	712	712
Kaolin:					
Salable crude do.	2,663 <sup>r</sup>	2,354 <sup>r</sup>	4,066	4,576	4,680
Processed do.	69 <sup>r</sup>	100 <sup>r</sup>	68	86	90 <sup>c</sup>
Total do.	2,732	2,454	4,134	4,662	4,770
Diamond:					
Gem thousand carats	12 <sup>r</sup>	28	37	38	35
Industrial do.	36	35	37	38	35
Total do.	48	63	74	76	70
Dunite	26,912 <sup>r</sup>	86,630 <sup>r</sup>	70,447	86,733	91,000 <sup>c</sup>
Feldspar	930,787 <sup>r</sup>	1,066,752 <sup>r</sup>	1,224,000	1,633,775	1,700,000 <sup>c</sup>
Felsite	720 <sup>r</sup>	688 <sup>r</sup>	791	492	500 <sup>c</sup>
Fluorspar, concentrates, metallurgical grade	8,000	5,010	3,107	2,600	2,900 <sup>c</sup>
Gemstones, excluding diamond:					
Agate	236 <sup>r</sup>	489	198	100 <sup>c</sup>	100 <sup>c</sup>
Agate, including chalcedony pebble <sup>c</sup>	150	140	140	140	140
Graphite <sup>6</sup>	128,920 <sup>r</sup>	139,742 <sup>r</sup>	157,999	295,000	290,000
Gypsum thousand metric tons	3,114 <sup>r</sup>	3,537 <sup>r</sup>	3,190	2,583	3,000 <sup>c</sup>
Kyanite and related minerals:					
Kyanite	4,164 <sup>r</sup>	2,197 <sup>r</sup>	1,708	3,100	6,684
Sillimanite	53,545 <sup>r</sup>	43,187 <sup>r</sup>	56,830	61,597	73,661
Lime <sup>c</sup>	15,000	15,000	16,000	16,000	16,000
Magnesite	232,112 <sup>r</sup>	216,072 <sup>r</sup>	213,000	266,856	246,055
Mica:					
Crude	1,622 <sup>r</sup>	1,507 <sup>r</sup>	1,403	962	1,000 <sup>c</sup>
Scrap and waste	8,317 <sup>r</sup>	11,111 <sup>r</sup>	16,783	17,545	18,000 <sup>c</sup>
Total	9,939 <sup>4</sup>	12,618	18,186	18,507	19,000
Nitrogen, N content of ammonia thousand metric tons	10,500	10,650	10,840	10,780	10,800
Phosphate rock, including apatite:					
Gross weight do.	2,421	2,125 <sup>r</sup>	1,537	1,296	1,960
P <sub>2</sub> O <sub>5</sub> content (25%) <sup>c</sup> do.	605	531	384	324	490
Pigments, mineral, natural, ocher do.	1,296 <sup>r</sup>	1,592 <sup>r</sup>	1,490	2,467	2,500
Rare earths, monazite concentrate, gross weight <sup>6, 7</sup>	5,200	5,400	2,900	NA	NA
Salt: <sup>c</sup>					
Rock thousand metric tons	2,000	2,000	2,000	--	--
Other do.	16,000	17,000	18,000	17,000	17,000
Total do.	18,000	19,000	20,000	17,000	17,000
Sand:					
Silica do.	3,442 <sup>r</sup>	3,950 <sup>r</sup>	3,288	3,778	4,000 <sup>c</sup>
Other do.	2,351 <sup>r</sup>	2,659 <sup>r</sup>	2,575 <sup>r</sup>	2,728 <sup>r</sup>	3,000 <sup>c</sup>
Selenite	10,895 <sup>r</sup>	7,622 <sup>r</sup>	2,293	532	207
Soda ash <sup>c</sup> thousand metric tons	1,400	1,500	1,500	1,500	1,500
Stone, sand and gravel:					
Calcite	53,549 <sup>r</sup>	43,710 <sup>r</sup>	95,177	109,446	92,000
Dolomite thousand metric tons	5,237 <sup>r</sup>	6,064 <sup>r</sup>	6,810	7,411	6,485
Limestone do.	250,007 <sup>r</sup>	273,996 <sup>r</sup>	277,601	291,042	294,621

See footnotes at end of table.



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

(Metric tons unless otherwise specified)

Commodity <sup>2</sup>	2011	2012	2013	2014	2015	
Stone, sand and gravel:—Continued						
Marl	thousand metric tons	4,301	4,311	5,174	2,591	2,154
Pyroxenite		234,261	75,190 <sup>r</sup>	15,803	2,985	--
Quartz and quartzite	thousand metric tons	587 <sup>r</sup>	1,115 <sup>r</sup>	1,701	2,754	3,000
Slate <sup>e</sup>		--	--	278	239	288
Sulfur, petroleum and fertilizer byproduct		332,584	425,997	382,911	401,347	428,480
Talc and related materials:						
Pyrophyllite		251,939	248,022	217,690	207,454	167,000 <sup>e</sup>
Steatite, soapstone		974,000	954,000	940,000	865,126	802,000 <sup>e</sup>
Vermiculite		12,850 <sup>r</sup>	8,358 <sup>r</sup>	6,882	16,384	13,250
Wollastonite		191,547 <sup>r</sup>	162,035 <sup>r</sup>	178,058	177,465	190,000
MINERAL FUELS AND RELATED MATERIALS						
Coal:						
Bituminous	thousand metric tons	523,484 <sup>r</sup>	560,113 <sup>r</sup>	561,272	600,970	631,085
Lignite	do.	40,279 <sup>r</sup>	46,533 <sup>r</sup>	44,760	46,167	44,453
Total	do.	563,763	606,646	606,032	647,137	675,538
Gas, natural:						
Gross	million cubic meters	36,277	41,726	35,061	33,046	26,517
Marketable	do.	26,000	30,000	25,000	24,000	20,000
Petroleum:						
Crude	thousand 42-gallon barrels	28,100	27,846	27,644	37,543	27,300
Refinery products:						
Liquefied petroleum gas	do.	86,000	85,000	89,000	92,000	100,000
Gasoline	do.	222,000	231,000	250,000	200,000	200,000
Kerosene and jet fuel	do.	136,000	140,000	141,000	146,000	151,000
Distillate fuel oil	do.	717,000	750,000	812,000	830,000	805,000
Residual fuel oil	do.	261,000	234,000	191,000	175,000	195,000
Other	do.	300,000	280,000	275,000	300,000	300,000
Total	do.	1,722,000	1,720,000	1,758,000	1,743,000	1,751,000
Uranium:						
Concentrate, U content		336	323	336	323	323
U <sub>3</sub> O <sub>8</sub> content		400	385	400	385	385

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

NA Not available. -- Zero.

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

<sup>2</sup>In addition to the commodities listed, boron, corundum, fuller's earth, other gemstones (aquamarine, emerald, ruby, and spinel) were produced, but output was not reported, and available information was inadequate to make reliable estimates of output.

<sup>3</sup>Excludes production from small steel plants.

<sup>4</sup>Not elsewhere specified.

<sup>5</sup>Updated data for clays are based on data from the India Bureau of Mines.

<sup>6</sup>India's marketable production is 10% to 20% of mine production.

<sup>7</sup>Significant quantities are contained in stockpiled monazite tailings, but quantitative data were not available.

TABLE 2  
INDIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2015

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity <sup>c</sup>
Alumina	National Aluminium Co. Ltd. (NALCO) (Government, 80.93%)	Damanjodi refinery, Odisha	2,100
Do.	Bharat Aluminium Co. Ltd. [Government, 49%, and Vedanta Aluminium Ltd., 51%]	Korba refinery, Chhattisgarh	200
Do.	Utkal Alumina International Ltd. (Hindalco Industries Ltd., 100%)	Koraput refinery, Odisha	1,500
Do.	Madras Aluminium Co. Ltd. (MALCO) [Vedanta Group, 80%, and others, 20%]	Mettur refinery, Tamil Nadu	85
Do.	Hindalco Aluminium Industries Ltd. (Aditya Birla Group, 33%; foreign investors, 26%; private Indian investors, 23%; financial institutions, 18%)	Renukoot refinery, Uttar Pradesh	700
Do.	do.	Belgaum, Karnataka	350
Do.	do.	Muri, Jharkhand	450
Do.	Vedanta Aluminium Ltd. (Vedanta Resources plc, 100%)	Lanjigarh, Odisha	1,000
Do.	do.	Korba, Chhattisgarh	750
Aluminium	do.	Jharsuguda, Odisha	500
Do.	do.	Korba I <sup>1</sup>	245
Do.	National Aluminium Co. Ltd. (NALCO) (Government, 100%)	Angul smelter, Odisha	567
Do.	Hindalco Industries Ltd. (Aditya Birla Group, 33%; foreign investors, 26%; private Indian investors, 23%; financial institutions, 18%)	Hirakud smelter, Odisha	217
Do.	do.	Renukoot, Uttar Pradesh	345
Do.	do.	Alupuram, Kerala <sup>2</sup>	NA
Do.	do.	Aditya smelter, Sambalpu, Odisha	360
Do.	do.	Mahan smelter, Bargawan, Madhya Pradesh	360
Do.	Bharat Aluminium Co. Ltd. [Government, 49%, and Vedanta Aluminium Ltd., 51%]	Korba smelter, Korba-III smelter, <sup>1</sup> Chhattisgarh	670
Do.	Hindalco Industries Ltd. (Birla Group, 33%; foreign investors, 26%; private Indian investors, 23%; financial institutions, 18%)	Renukoot smelter, Uttar Pradesh	345
Barite	Andhra Pradesh Mineral Development Corp. Ltd. (Andhra Pradesh State government, 100%)	Cuddapah District mines, Andhra Pradesh	1,600
Do.	ICL Ltd.	do.	300
Do.	Associated Mineral Corp.	do.	75
Do.	Pragathi Minerals	do.	50
Do.	Vijayalaxmi Minerals Trading Co.	do.	50
Bauxite	Bharat Aluminium Co. Ltd. [Government, 49%, and Sterlite Industries (India) Ltd., 51%]	Mainpat, Chhattisgarh	750
Do.	do.	Bodai Daldali (Kawardha), Chhattisgarh	1,250
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.	do.	Mewasa Mines Devbhoomi Dwarka Gujarat	125
Do.	Hindalco Industries Co. Ltd. (Birla Group, 33%; foreign investors, 26%; private Indian investors, 23%; financial institutions, 18%)	Mines in Lohardaga District, Jharkhand	750
Do.	National Aluminium Co. Ltd. (NALCO) (Government, 100%)	Mines in Panchpatmali Hills, Damanjodi Koraput District, Odisha <sup>1</sup>	6,800
Do.	Minerals & Minerals Ltd. (Government, 100%)	Mines in Richuguta, Palamau District, Jharkhand	200
Do.	Panditrao Mines and Minerals Pvt. Ltd.	Maharashtra, Kolhapur	NA
Do.	Prabhudas Vithaldas	Gujarat	NA
Do.	Bombay Minerals Ltd.	Asota Mewasa, Gujarat	NA
Do.	Utkal Alumina International Ltd.	Rayagada District	8,500
Do.	Carborundum Universal Ltd.	Gujarat, Devbhoomi Dwarka	NA
Boron	Borax Morarji Ltd.	Ambernath, Maharashtra	17

See footnotes at end of table.

TABLE 2—Continued  
INDIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2015

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity <sup>c</sup>
Cement	Ultratech Cement Ltd.	12 integrated plants and 12 grinding units	58,800
Do.	Century Cement [Century Textiles and Industries Ltd. (a subsidiary of the Birla Group, 100%)]	Baikunth plant, Madhya Pradesh	1,120
Do.	Ambuja Cements Ltd. (LafargeHolcim Group, 14.8%)	Plants in 7 States	25,000
Do.	JSW Cement	Nandyal Works, Vijaynagar Works Dolvi Works	6,000
Do.	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.	Dalmia Cement (Bharat) Ltd.	Dalmiapuram and Ariyalur, Tamil Nadu; and Kadapa, Andhra Pradesh	21,000
Do.	do.	Belgaum, Karnataka	2,500
Do.	Birla Corp. Ltd. (M.P. Birla Group)	Birla Vikas & Satna, Birla Cement & Chandera, Durgapur, Rae Bareli, Durga Hitech	5,780
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	28,800
Do.	Raymond Cement Works (a division of Raymond Woolen Mills Ltd., JK Singhania, principal shareholder)	Gopalnagar plant, West Bengal	1,250
Do.	Shree Cement Ltd.	Haridwar plant, Uttarakhand	1,800
Do.	OCL India Ltd.	Kapilas and Rajgangpur, Odisha	5,500
Do.	Rajashree Cement (a division of Indian Rayon and Industries Ltd., 100%)	Khor plant, Karnataka	1,020
Do.	My Home Industries Ltd. (joint venture of My Home Group and CRH plc)	Mellacheruvu and Visakhapatnam in Andhra Pradesh	4,600
Do.	HeidelbergCement India Ltd.	Narasingarh plant, Haryana	1,090
Do.	CCI Ltd. (Government, 100%)	Adilabad, Akaltara, Bokajan, Charkhi-Dadri, Kurkunta, Mandhar, Neemuch, Rajban, Tandur, Delhi	3,850
Do.	Andhra Cements Ltd. (Jaypee Group 100%)	Vizag, Nadikude-Durga Cement	1,420
Do.	J.K. Cement Works (a division of JK Synthetics Ltd.), 100%	Nimbahera plant, Mangrol, Muddapur Jhari, Gotan, Lakshmi Cement, Lakshmi Cement-Kalol	11,000
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	15,800
Do.	Prism Cement Ltd.	Satna plant, Madhya Pradesh	3,000
Do.	Jaiprakash Associates Ltd.	Sewagram, Gujarat	2,400
Do.	Shree Digvijay Cement Co. Ltd.	Shreeniwas plant, Maharashtra	1,070
Do.	JK Lakshmi Cement Ltd. (a division of Straw Products Ltd., JK Singhania, principal shareholder)	Sirohi plant, Rajasthan and Ahmedabad, Gujarat	4,700
Do.	do.	Durg, Chhattisgarh	1,700
Do.	Lafarge S.A.	Arasmeta and Sonadih, Chhattisgarh; Jojobera, Jharkhand; and Mejia, West Bengal	1,400
Do.	Manikgarh Cement [Century Textiles and Industries Ltd. (a subsidiary of the Birla Group, 100%)]	Tehsil Rajura plant, Maharashtra	1,000
Do.	Vikram Cement [Grasim Industries Ltd. (a subsidiary of the Birla Group, 100%)]	Vikram plant, Madhya Pradesh	1,000
Do.	Raasi Cement Ltd. (Andhra Pradesh State government, 50%, and Development Co. Ltd., 50%)	Vishnupuram plant, Andhra Pradesh	1,000
Do.	Tamil Nadu Cements Corp. Ltd.	Alangulam, Ariyalur, Virundhunagar District	900
Do.	Ramco Cement Ltd.	Ramasamyraja Nagar, Jayantipuram, Alathiyur Works I and II, Ariyalur Uthiramerur, Salem, Kolaghat	2,000

See footnotes at end of table.



TABLE 2—Continued  
INDIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2015

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity <sup>c</sup>
Cement—Continued	The Mehta Group	Suarashtra Cement, Gujarat Sidhee Cement	2,700
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.	13,520
Do.	Kesoram Industries Ltd.	Kesoram Cement, Vasvadata Cement	7,250
Do.	Mangalam Cement Ltd.	Mangalam Cement, Neer Shree Cement	2,000
Do.	Orient Papers & Industries	Orient Cement, Orient-Cement-Jalgaon	5,000
Do.	Penna Cement Ltd.	Penna Tadippatri I&II, Penna Ganeshpahad, Penna-Boyareddypalli Ltd., Penna-Tandur	6,500
Do.	Malabar Cements Ltd.	Malabar Cements, Malabar Cements	620
Do.	Binani Cement Ltd.	Binani Cement Sirohi, Binani Cement Sikar	6,250
Do.	Rain Cement Ltd.	Rain Comdt. Unit I, Rain Comdt. Unit LN-1, Rain Comdt. Unit LN-2	4,000
Do.	KCP Ltd.	KCP Ltd-Macherla, Maktyala	2,350
Do.	Cement Manufacturing Co. Ltd.	Cement Manufacturing Co. Ltd., Megha T&E (P) Ltd.	1,270
Do.	Chettinad Cement Corp. Ltd.	Chettinad-Karur, Chettinad Karikkali, Chettinad-Ariyalur	10,500
Do.	Sagar Cement Ltd.	BMM Cements Ltd., Andhra Pradesh	3,750
Do.	Zuari Cement Ltd.	Zuari Cement, Sri Vishnu Cement	3,400
Chromite	Mysore Minerals Ltd. (state-owned)	Aladahalli mines	37
Do.	do.	Byrapura mines	15
Do.	do.	Bhaktara Halli mines	24
Do.	do.	Jambur mines	5
Do.	do.	Tagadur mines	12
Do.	Ferro Alloys Corp. Ltd.	Randia plant, Bhadrak, Cuttack District, Odisha	65
Do.	Orissa Mining Corp. Ltd. (Orissa Industries Ltd., 100%)	do.	300
Do.	Tata Steel Ltd.	do.	351
Do.	Ferro Alloys Corp. Ltd.	Dhenkanal and Kendujhar District, Odisha	150
Do.	Orissa Mining Corp. Ltd. (Orissa Industries Ltd., 100%)	do.	200
Do.	Mysore Minerals Ltd.	Hassan District, Karnataka	125
Do.	Orissa Mining Corp. Ltd. (Orissa Industries Ltd., 100%)	do.	100
Do.	Ferro Alloys Corp. Ltd.	Khammam District, Andhra Pradesh	100
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.	Misrilall Mines Pvt Ltd.	Saruabil village, Jajpur, Odisha	NA
Do.	Jindal Stainless Ltd.	Jindal Chromite Mines, Jajpur, Odisha	NA
Clay:			
Ball	Bikaner Ceramics	Rajasthan, Bikaner	75
Do.	Sampat Lal Daga	do.	NA
Bentonite	Ashapura Minechem Ltd (Ashpura Group)	Kutch, Gujarat	350
Do.	Ashapura Volclay Ltd. (Ashpura Minechem Ltd. and AMCOL Int. Corp)	Bhuji and Dharur	72
Do.	Ashapura International Ltd.	NA	NA
Do.	Vijayalaxmi Group of Industries	West Rajasthan	NA
Do.	Gimpex Ltd.	Chennai	NA
Fire clay	Shanta Sales Corp.	Rajasthan, Bikaner	NA
Kaolin	20 Microns Ltd.	Bhuj, Gujarat	65
Do.	English India Clays Ltd.	Veli, Kerala	240

See footnotes at end of table.

TABLE 2—Continued  
INDIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2015

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity <sup>c</sup>
Coal, bituminous	million metric tons	Bharat Coking Coal Ltd. [a subsidiary of Coal India Ltd. (Government, 100%)]	Bihar and West Bengal	26
Do.	do.	Central Coalfields Ltd. [a subsidiary of Coal India Ltd. (Government, 100%)]	Bihar	27
Do.	do.	Eastern Coalfields Ltd. [a subsidiary of Coal India Ltd. (Government, 100%)]	Bihar and West Bengal	21
Do.	do.	Mahanadi Coalfields Ltd. [a subsidiary of Coal India Ltd. (Government, 100%)]	Odisha	21
Do.	do.	North Eastern Coalfields Ltd. [a subsidiary of Coal India Ltd. (Government, 100%)]	Assam	64
Do.	do.	Northern Coalfields Ltd. [a subsidiary of Coal India Ltd. (Government, 100%)]	Madhya Pradesh and Uttar Pradesh	24
Do.	do.	Singareni Collieries Co. Ltd. (Andhra Pradesh State government, 50%, and Government, 50%)	Andhra Pradesh and Maharashtra	18
Do.	do.	South Eastern Coalfields Ltd. [a subsidiary of Coal India Ltd. (Government, 100%)]	Chhattisgarh	36
Do.	do.	Western Coalfields Ltd. [a subsidiary of Coal India Ltd. (Government, 100%)]	Madhya Pradesh and Maharashtra	18
Coal, lignite	do.	Neyveli Lignite Corp. Ltd. (NLC) (Government, 100%)	Tamil Nadu	17
Copper ore, mine output, Cu content		Hindustan Copper Ltd. (HCL) (Government, 100%)	Indian Copper Complex Mines, Ghatsila District, Jharkhand	13
Do.	do.	do.	Khetri Copper Complex Mines, Khetrinagar Rajasthan	28
Do.	do.	do.	Malanjkhand Copper Complex Mines, Balaghat District, Madhya Pradesh	45
Copper, metal		Hindalco Industries Ltd. (Birla Group, 33%; foreign investors, 26%; private Indian investors, 23%; financial institutions, 18%)	Birla Copper Complex smelter, Dahej, Gujarat	500
Do.		Hindustan Copper Ltd. (HCL) (Government, 100%)	Indian Copper Complex smelter-refinery, Ghatsila District, Jharkhand	19
Do.	do.	do.	Khetri Copper Complex smelter-refinery, Khetrinagar District, Rajasthan	31
Do.	do.	do.	Taloja copper project, Maharashtra	NA
Do.		Vedanta Aluminium Ltd.	Tuticorin smelter, Tamil Nadu	400
Do.	do.	do.	Silvassa refinery, Gujarat	300
Do.		Jhagadia Copper Ltd.	Jhagadia, Gujarat	50
Diamond	carats	National Mineral Development Corp. Ltd. (NMDC) (Government, 100%)	Mahjgawan Mine	25,000
Fluorite		Maharashtra State Mining Corporation Ltd.	Dongargaon, Maharashtra, Chandrapur	12
Gold	kilograms	Hutti Gold Mines Co.	Hutti Mine, Karnataka	490
Do.	do.	do.	Uti Mine, Karnataka	55
Do.	do.	do.	Hira-Buddini	157
Do.	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, Rainsinghpur group of mines, Kishanpura A and B Rajasthan	526
Iron and steel, crude steel		Visvesvaraya Iron and Steel Ltd. (Karnataka State government, 60%, and Government-owned Steel Authority of India Ltd., 40%)	Bhadravati steel plant, Karnataka	180
Do.		Steel Authority of India Ltd. (Government, 100%)	Bhilai steel plant, Jharkhand	4,930
Do.	do.	do.	Bokaro steel plant, Jharkhand	4,600

See footnotes at end of table.

TABLE 2—Continued  
INDIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2015

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity <sup>c</sup>
Iron and steel, crude steel—Continued	Indian Iron and Steel Co. Ltd. (a wholly owned subsidiary of Government-owned Steel Authority of India Ltd.), 100%	Burnpur steel plant, West Bengal	1,500
Do.	JSW Steel Co. Ltd.	Dolvi, Maharashtra	5,000
Do.	Steel Authority of India Ltd. (Government, 100%)	Durgapur steel plant, West Bengal	1,600
Do.	Tata Steel Ltd.	Jamshedpur steel plant, Jharkhand	6,800
Do.	do.	Jagdapur, Chhattisgarh	2,000
Do.	do.	Duburi, Odisha	3,000
Do.	Steel Authority of India Ltd. (Government, 100%)	Rourkela steel plant, Odisha	1,800
Do.	Rashtriya Ispat Nigam Ltd.	Visakhapatnam steel plant, Andhra Pradesh	3,000
Do.	JSW Steel Co. Ltd.	Vijayanagar, Karnataka	12,000
Do.	Ministeel plants (privately owned)	18 plants located throughout India	4,700
Do.	Essar Steel Co. Ltd.	Hazira, Gujarat	3,000
Do.	Lloyds Steel Industries Ltd.	Wardha, Maharashtra	500
Do.	MSP Steel and Power Ltd.	Raipur, Chhattisgarh	750
Do.	JSW Steel Co. Ltd.	Salem Special Steel plant, Karnataka	1,200
Iron ore	National Mineral Development Corp. Ltd. (NMDC) (Government, 100%)	Bailadila, Chhattisgarh	9,000
Do.	Steel Authority of India Ltd. (Government, 100%)	Bastar and Durg District, Chhattisgarh; Bolani, Odisha; <sup>1</sup> and Chiria, Jharkhand	7,000
Do.	Kudremukh Iron Ore Co. Ltd. (Government, 100%)	Kudremukh, Chikmagalur District, Karnataka	10,300
Do.	National Mineral Development Corp. Ltd. (NMDC) (Government, 100%)	Donimalai, Karnataka	9,000
Do.	Chowgule and Co. Ltd.	Goa	2,500
Do.	Dempo Mining Corp. Ltd.	do.	2,500
Do.	V.M. Salgaocar & Bros. Pvt. Ltd.	do.	2,500
Do.	Sesa Goa Ltd. (Vedanta Resources plc, 51%)	Codli and Sonshi, Goa	NA
Do.	Steel Authority of India Ltd. (Government, 100%)	Kendujhar District, Odisha	3,000
Do.	Tata Steel Ltd.	do.	2,000
Do.	NSL Consolidated Ltd. (China Metallurgical Group Corp., 10%)	Mangal, Andhra Pradesh	200
Do.	Indian Iron and Steel Co. Ltd. (a wholly owned subsidiary of Government-owned Steel Authority of India Ltd.), 100%	Singhbhum District, Bihar	2,500
Do.	Steel Authority of India Ltd. (Government, 100%)	do.	3,500
Do.	Tata Steel Ltd.	do.	3,500
Kyanite	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
Do.	Hindustan Copper Ltd. (HCL) (Government, 100%)	do.	22
Lead:			
Primary	Hindustan Zinc Ltd. (Sterlite Opportunities and Ventures Ltd., 64.9%, and Government, 29.5%)	Chanderiya smelters, Rajasthan	105
Do.	do.	Tundoo smelter, Bihar	8
Do.	do.	Dariba smelter	100
Secondary	Indian Lead Co.	Thane refinery, Mumbai, Maharashtra	12
Do.	do.	Refinery at Kolkata	12
Lead concentrate, Pb content	Hindustan Zinc Ltd. (Sterlite Opportunities and Ventures Ltd., 64.9%, and Government, 29.5%)	Agnigundala Mine, Andhra Pradesh	72
Do.	do.	Sargipalli Mine, Odisha	150
Lead-zinc ore, gross weight	do.	Rampura-Agucha Mine, Rajasthan	6,500
Do.	do.	Zawar Mine group, Rajasthan	1,200
Do.	do.	Kayad Mine, Rajasthan	350
Magnesite	Steel Authority of India Ltd. (Government, 100%)	Salem, Tamil Nadu	150
Do.	Dalmia Magnesite Corp.	do.	72
Do.	Tamil Nadu Magnesite Ltd. (Tamil Nadu State government, 100%)	do.	150

See footnotes at end of table.



TABLE 2—Continued  
INDIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2015

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity <sup>c</sup>	
Manganese ore, <sup>3</sup> gross weight	MOIL Ltd. (Government, 100%)	Ukwa Mine, Madhya Pradesh	55	
Do.	do.	Balaghat, Madhya Pradesh	310	
Do.	do.	Chikla Mine, Maharashtra	150	
Do.	do.	Munsar Mine, Maharashtra	55	
Do.	do.	Gumgaon, Maharashtra	60	
Do.	Falechand Marsingdas	Andhra Pradesh	NA	
Do.	J.A. Trivedi Bros.	do.	NA	
Do.	Sandur Manganese and Iron Ores Ltd.	Bellary, Karnataka	NA	
Do.	Eastern Mining Co.	North Kanara, Karnataka	NA	
Do.	Mysore Minerals Ltd.	do.	NA	
Do.	Mangilall, Rungta (Pvt.) Ltd.	Keonjhar, Odisha	NA	
Do.	Orissa Mining Corp. Ltd.	do.	NA	
Do.	Rungta Mines (Pvt.) Ltd.	do.	NA	
Do.	Tata Steel Ltd.	Ferro Manganese Plant, Odisha	NA	
Do.	S. Lall & Co.	do.	NA	
Do.	Tata Steel Ltd.	Keonjhar, Odisha	NA	
Do.	Orissa Mineral Development Co. Ltd.	Koraput, Odisha	NA	
Do.	Orissa Mining Corp. Ltd.	do.	NA	
Do.	Mysore Minerals Ltd.	Shimoga, Karnataka	NA	
Do.	Aryan Mining & Trading Corp.	Sundargarh, Odisha	NA	
Do.	Orissa Manganese & Minerals (Pvt.) Ltd.	do.	NA	
Do.	Tata Steel	do.	NA	
Do.	R.B.S. Shreeram Durga Prasad and Falechand Marsingdas	Vizianagaram, Andhra Pradesh	NA	
Do.	Radhika Metals & Minerals Pvt. Ltd.	NA	NA	
Mica	Micafab India Pvt. Ltd.	Sydapuram Mandal, Andhra Pradesh	4,500	
Do.	Premier Mica Co.	Rjupalem, Andhra Pradesh	200	
Do.	Dwarakananad Reddy, and 4 others, 1-C, Vaibhav Enclave	Nellore, Andhra Pradesh	NA	
Petroleum, refined	thousand 42-gallon barrels per day	Cochin 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.	Reliance Industries Ltd.	Jamnagar refinery, Gujarat	430
Do.	do.	do.	Koyali refinery, Gujarat	185
Do.	do.	Madras Refineries Ltd. (Oil and Natural Gas Corp., 52%, and private interests, 48%)	Madras refinery, Tamil Nadu	131
Do.	do.	Bharat Petroleum Corp. Ltd. (Oil and Natural Gas Corp., 67%, and private interests, 33%)	Mahul refinery, Mumbai, Maharashtra	135
Do.	do.	Hindustan Petroleum Corp. Ltd. (Oil and Natural Gas Corp., 51%, and private interests, 49%)	do.	110
Do.	do.	Essar Oil Ltd.	Vadinar refinery, Gujarat	245
Do.	do.	do.	Visakhapatnam refinery, Andhra Pradesh	90
Do.	do.	Indian Oil Corp. (Oil and Natural Gas Corp., 91%, and private interests, 9%)	Mathura refinery, Uttar Pradesh	156
Do.	do.	do.	Panipat refinery, Haryana	240
Phosphate rock	Rajasthan State Mineral Development Corp. Ltd. (Rajasthan State government, 100%)	Jamarkotra, Badgaon, Dakankotra, Kanpur, Kharbaria-ka-Guda, and Sallopat Mines, Rajasthan	20	
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	Indian Rare Earths Ltd. (IREL) [Government (Department of Atomic Energy), 100%]	NA	11	

See footnotes at end of table.

TABLE 2—Continued  
INDIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2015

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity <sup>c</sup>
Silver thousand kilograms	Hindustan Zinc Ltd. (HZL) (Sterlite Opportunities and Ventures Ltd., 64.9%, and Government, 29.5%)	Chavara, Kerala, Ilmenite	518
Titanium, ilmenite-rutile ore	Kerala Minerals and Metals Ltd. (Kerala State government, 100%)	do.	103
Do.	do.	Orissa Sands Complex, Ganjam, Odisha	240
Do.	do.	Manavalakurichi, Tamil Nadu, Ilmenite	100
Do.	do.	Garnet	9
Do.	Trimex Sands Pvt. Ltd. (Trimex Group)	Sirkurman deposit, Srikakulam	NA
Do.	do.	Andhra Pradesh, Ilmenite	300
Do.	V.V. Mineral Ltd.	Thoothukudi, Tamil Nadu, Ilmenite	500
Do.	Beach Minerals Co. Pvt.Ltd., Tamil Nadu	Kuttam, Chennai, Tamil Nadu	150
Uranium, ore	Uranium Corp. of India [Government (Department of Atomic Energy), 100%]	Jaduguda, Jharkhand, Tummalpalle, Andhra Pradesh	NA
Zinc	Binani Zinc Ltd. (Binani Industries Ltd., 89.9%)	Binanipuram smelter, Kerala	38
Do.	Hindustan Zinc Ltd. (HZL) (Sterlite Opportunities and Ventures Ltd., 64.9%, and Government, 29.5%)	Rampura-Agacha Mine, Chanderiya smelter, Rajasthan	6,150
Do.	do.	Sindesar Khurf Mine, Rajasthan	2,000
Do.	do.	Rajpura Dariba Mine, Rajasthan	900
Do.	do.	Kayad Mine, Rajasthan	350
Do.	do.	Zawar Mine, Rajasthan	1,200
Do.	do.	Chanderiya zinc smelter, Rajasthan	525
Do.	do.	Dariba smelting complex, Rajasthan	210
Do.	do.	Zinc Smelter Debari, Rajasthan	88
Do.	do.	Zinc Smelter Vizag, at Vizag, Andhra Pradesh	56

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

<sup>1</sup>The Korba plan-I was not operational.

<sup>2</sup>Closed

<sup>3</sup>Capacity of clusters of surface mines varies extremely; annual production depends on demand. Estimated total capacity is 3.0 million metric tons per year (Mt/yr).

TABLE 3  
INDIA: EXPORTS OF SELECTED MINERAL COMMODITIES IN 2015

Thousand metric tons unless otherwise specified

Commodity		2011	2012	2013	2014	2015
<b>METALS</b>						
<b>Aluminum:</b>						
Alumina		2,547	991	1,190	1,526	1,419
Bauxite		116	401	4,200	3,500	6,809
Metal and alloys		242	316	440	589	600
<b>Copper, metal and alloys:</b>						
Ore and concentrates		2	--	8	4	--
Blister and anode		0.1	0.1	0.0	0.1	0.1
Refined copper		342	254	237	362	341
Copper alloy, ingots		3	3	3	2	2
Copper and alloys, semifabricated		52	20	17	21	31
Copper and alloys, scrap		7	6	6	6	5
Gold, metal <sup>1</sup>	kilograms	34,595	169,126	85,349	70,721	69,894
<b>Iron ore:</b>						
Iron ore		39,156	28,432	14,426	9,844	4,211
Iron ore, Fe content		24,277	17,628	8,944	6,103	2,611
<b>Iron and steel:</b>						
Direct-reduced		70	126	117	167	132
Pig iron		1,197	394	1,063	835	542
Sponge iron		899	3,115	22,331	2,828	937
<b>Steel:</b>						
Semifinished and finished steel products		8,940	8,232	10,078	10,379	7,563
Ingots and semis		481	601	1,253	1,601	769
Long products		949	707	776	908	766
Flat products		4,985	4,445	6,369	5,899	4,373
Tabular products		2,047	1,989	1,430	1,463	1,215
Ferroalloys		2,043	1,693	1,719	1,655	1,454
Scrap		6,175	8,156	5,632	5,699	5,699
<b>Lead:</b>						
Ores and concentrates <sup>1</sup>	metric tons	39,195	10,226	14	7	509
Metal <sup>1</sup>		149	NA	30	58	58
Lead and alloys, including scrap <sup>1</sup>		286	241	47	81	81
<b>Zinc:</b>						
Ores and concentrates, Zn content <sup>1</sup>	metric tons	67,501	5,591	75,870	45,660	41
Zinc and alloys, including scrap <sup>1</sup>		264	296	199	195	195
Metal		323	207	195	174	311
<b>INDUSTRIAL MINERALS</b>						
Barite <sup>1</sup>		2,188	3,784	1,971	1,641	1,285
Cement		3,612	3,399	2,918	5,141	5,141
Diamond, mostly cut <sup>1</sup>	carats	78,994	62,654	65,561	83,851	70,929
Graphite, natural	metric tons	1,898	2,217	922	2,790	302
Gypsum	do.	62,747	29,401	54,854	38,719	63,531
Potash		30	32	14	20	39
Talc		116	101	118	149	158
<b>MINERAL FUELS AND RELATED MATERIALS</b>						
Coal <sup>1</sup>		4,327	3,025	2,514	2,189	1,470
Coke, semicoke <sup>1</sup>		650	612	1,138	151	162
Liquefied gas		27	22	28	5	5
Petroleum, crude		7	156	NA	350	1,050

do. Ditto. NA Not available. -- Zero.

<sup>1</sup>Data are based on fiscal year ending on March 31 of the year stated.

Sources: Indian Minerals Yearbook 2010–2015; World Steel Association, 2015; International Copper Study Group, 2015; UN Comtrade database, 2010–2014; BP Statistical Review of World Energy, 2016.



TABLE 4  
INDIA: IMPORTS OF SELECTED MINERAL COMMODITIES IN 2015

Thousand metric tons unless otherwise specified

Commodity	2011	2012	2013	2014	2015	
<b>METALS</b>						
<b>Aluminum:</b>						
Alumina	571	735	1,384	818	874	
Bauxite	64	79	66	422	1,801	
Metal and alloys, unwrought	233	292	348	345	345	
<b>Copper:</b>						
Ore and concentrates	582	580	920	594	543	
Copper alloy, ingots	4	4	3	4	3	
Copper and alloys, semifabricated	139	134	180	227	247	
Copper and alloys, scrap	153	204	141	169	174	
Blister and anode	13	29	16	38	83	
Refined copper	14	21	41	31	40	
Gold metal <sup>1</sup>	kilograms	696,738	1,078,354	1,013,703	661,715	915,473
<b>Iron ore:</b>						
Iron ore	1,316	2,882	1,115	7,413	9,515	
Iron ore, Fe content	816	1,787	691	4,596	5,899	
<b>Iron and steel:</b>						
Direct-reduced	422	1,069	671	178	38	
Pig iron	11	12	46	27	35	
Sponge iron	66	214	17	18	13	
Scrap	6,175	8,156	5,632	5,699	6,710	
<b>Steel:</b>						
Semifinished and finished	9,213	9,341	7,392	9,477	13,284	
Ingots and semis	563	823	248	413	765	
Long products	904	963	881	1,626	2,015	
Ferroalloys	260	291	265	308	350	
Flat products	6,896	6,868	5,648	6,744	9,829	
Tubular products	813	642	576	657	643	
<b>Lead:</b>						
Ores and concentrates	9	30	56	33	39	
Metal	78	99	102	113	109	
<b>Zinc:</b>						
Ores and concentrates	88	63	112	33	36	
Metals	56	78	62	112	105	
<b>INDUSTRIAL MINERALS</b>						
Barite <sup>1</sup>	metric tons	2,843	3,720	6,174	5,687	7,484
Cement		6,765	9,189	11,967	13,676	7,175
Diamond, rough: <sup>1</sup>		182,227	152,811	135,730	146,612	150,487
Graphite (natural)	metric tons	18,154	18,334	23,291	25,235	29,227
Gypsum	do.	2,337	3,197	3,011	4,066	3,955
Potash		4,618	2,842	2,123	3,395	4,621
Talc		101	5	3	3	4
<b>MINERAL FUELS AND RELATED MATERIALS</b>						
Coal <sup>1</sup>		69,918	102,841	145,790	166,861	212,103
Coke, semicoke <sup>1</sup>		1,490	2,365	3,077	4,167	4,446
Liquefied gas		9,766	13,200	13,136	13,021	21,700
Petroleum, crude	million 42-gallon barrels	1,139,000	1,233,000	1,381,000	1,324,000	1,372,000

do. Ditto.

<sup>1</sup>Data are based on fiscal year ending on March 31 of the year stated.

Sources: Indian Minerals Yearbook, 2010–2015; World Steel Association, 2015; International Copper Study Group, 2015, UN Comtrade database, 2010–2014; BP Statistical Review of World Energy, 2016.

TABLE 5  
INDIA: ESTIMATED RESERVES OF MAJOR MINERAL COMMODITIES IN 2015

(Thousand metric tons unless otherwise specified)

Commodity	Reserves
Apatite	31,000
Asbestos (all grades)	2,500
Barite (all grades)	32,000
Bauxite	830,000
Calcite	3,000
Chalk	4,000
Chromite ore (all grades)	107,000
Clay:	
Ball	17,000
Kaolin	180,000
Coal, lignite	130,000,000
Copper:	
Ore	240,000
Cu content	3,000
Corundum	metric tons 600
Diamond	thousand carats 990
Diaspore	3,000
Dolomite	780,000
Dunite	17,000
Feldspar	45,000
Fireclay	30,000
Fluorite	5,000
Garnet	19,000
Gold:	
Ore	15,000
Au content	kilograms 72,000
Graphite	8,000
Gypsum	39,000
Iron ore:	
Crude ore	6,600,000
Fe content	4,100,000
Iron oxide pigments, ochre	55,000
Kyanite and related minerals:	
Kyanite	1,600
Sillimanite	4,100
Lead and zinc ore	103,000
Lead, Pb content	2,200
Limestone	15,000,000
Magnesite	21,000
Manganese ore	96,000
Marl	140,000
Mica	190
Perlite	430
Phosphate rock	70,000
Pyrophyllite	23,000
Ruby	kilograms 240
Salt (rock)	16,000
Silica sand	520,000
Silver:	
Ore	120,000
Ag content	8,000
Talc	90,000
Tin concentrate of ore	metric tons 7,000
Titanium minerals:	
Ilmenite	590,000
Rutile	31,000
Vermiculite	1,700
Wollastonite	2,500
Zinc (Zn content)	11,000
Zircon	3,400

Source: Indian Bureau of Mines, 2015.