

THE MINERAL INDUSTRY OF

INDIA

By Chin S. Kuo

India's gross domestic product (GDP) growth was forecasted to be 5.8% for 2000. In 2000, agricultural output grew only 1.3%. The slowdown of industrial production reduced its growth to 5.4%. The fiscal deficit was predicted to be 5.4% of GDP. State budget reduced a costly fertilizer subsidy. Inflation hit a high of 8%. The rupee (Rs) dropped by 3.5% against the U.S. dollar (Far Eastern Economic Review, 2000). Foreign investment of \$32.75 million in the mining industry had been approved by the Government for fiscal year 1999-2000. Thirteen commodities, which included diamonds, were approved for private foreign investment. Privatization and infrastructure development were key factors to attract foreign investment.

Exports were up, powered by strong global demand for gems, leather, steel, and textiles. The Ministry of Disinvestment was created and charged with reducing the Government's presence in India's state-owned companies. The privatization process had been slow, particularly with state-owned aluminum and steel producers.

Government Policies and Programs

The Government imposed a 4% special ad valorem duty on imports by traders and introduced a uniform excise duty on most commodities at 16%. Beginning April 1, a tax on export earnings was introduced for iron ore producers—20% of their income would be subject to taxes in the first year, 40% in the second year, and 60% in the third year. In 5 years, all export income would be taxed. Iron ore producers from the State of Goa, National Mineral Development Corp. Ltd. (NMDC), and Kudremukh Iron Ore Co. Ltd. would be affected by this new taxation.

The Government decided to appeal the antidumping and countervailing duties imposed on Indian steel exports by the United States to the World Trade Organization. The main markets of leading Indian producers, which included Essar Steel Ltd., Steel Authority of India Ltd. (Sail), and Tata Iron and Steel Co. Ltd. (Tisco), were Canada, the European Union, and the United States, particularly for plates and hot-rolled coils. The U.S. steel mills' antidumping action halted shipments of plate from India, and the Indian mills feared their sales of hot-rolled coil would be next for an antidumping case.

The Government planned to privatize aluminum producers Bharat Aluminium Co. Ltd. (Balco) and National Aluminium Co. Ltd. (Nalco) and possibly Hindustan Zinc Ltd. (HZL) by March 2001. The sale of a 51% stake of Balco was up for sale to a strategic buyer, and the sale was expected to be completed before April 2001. The Government aimed to retain majority stakes and management control in Nalco (70%) and HZL (49%).

Other targets for privatization were Sponge Iron India Ltd. (SIIL), Metals & Minerals Trading Corp. (MMTC), and Metal Scrap Trading Corp. SIIL (100% state-owned) operated a coal-based direct-reduction plant in the State of Andhra Pradesh. The Government proposed to sell a 51% stake of MMTC to a strategic investor, and the balance would be sold later through a public flotation.

Opposition was mounting to the Government's privatization plans for various steelworks and related operations. Andhra Pradesh attacked the decision to sell off the Vizag steel plant, which is located in the State. Vizag was the newest public sector steel plant with a production capacity of 3 million metric tons per year (Mt/yr) making long products. The Government was expected to sell a 51% stake to a strategic buyer. The State of West Bengal criticized plans to sell Sail's alloy steel plant at Durgapur. There were similar developments in the State of Tamil Nadu over the Salem stainless steel plant. The possibility of foreign involvement sparked the condemnation. At MMTC and State Trading Corp., the issue was job cuts (Metal Bulletin, 2000h).

The Government amended its Customs Act so that material classified as hazardous under the Basle listings, such as zinc ashes and lead-acid scrap batteries, could be sold to recognized processors in India rather than being returned to their point of origin. It also introduced a licensing procedure for lead and zinc processors. All battery manufacturers, importers, reconditioners, assemblers, and dealers must collect used batteries before selling new ones. Four secondary lead smelters had environmental approvals and would register with the Ministry of Environment and Forests to process spent batteries under the new legislation. A bill was introduced to amend the Coal Mines (Nationalization) Act of 1973. The bill was to allow the private sector to participate in the investment in the Indian coal mining industry.

Commodity Review

Metals

Aluminum.—Andhra Pradesh had the second largest bauxite reserves in the country after the State of Orissa. The deposits in Andhra Pradesh are near the coastal side of Vizag. Of the 3,040 million metric tons (Mt) of bauxite reserves in India, 1,085 Mt was found in Andhra Pradesh, of which 570 Mt had been explored and 515 Mt lies in the Chintapalli area of the Vizag District (Metal Bulletin, 2000d). The State Government's plan was to build a 1-Mt/yr alumina refinery and related bauxite mine near Vizag followed by a project to construct a 250,000-metric-

ton-per-year (t/yr) aluminum smelter with a captive powerplant of 450 megawatts (MW) that could cost \$1.5 billion.

Utkal Alumina International Ltd. signed a joint-venture agreement with Norsk Hydro Aluminum A/S (45%) of Norway, Alcan Aluminium Ltd. (35%) of Canada, and Indian Aluminium Co. Ltd. (Indal) (20%) to build an alumina refinery at Rayagada in the State of Orissa. The \$1 billion plant would have an initial production capacity of 1 Mt/yr and a planned expansion of 2 to 2.5 Mt/yr. The Ministry of Surface Transport approved an allotment of port land and berths to the company at the port of Vizag. The plant would have facilities for mining bauxite at Baphilmali and a powerplant nearby. The project was likely to be delayed until some time after 2001 because of a protest by local tribal groups. Aditya Birla Group, which owned Hindalco Industries Ltd., would like to become the single largest stakeholder in the project either through increasing Indal's share or by buying into it through Hindalco (Mining Journal, 2000d). Alcan sold its 54.62% interest in Indal to Hindalco for \$169 million. Indal's alumina capacity was 340,000 t/yr and would rise to 710,000 t/yr after expansion programs (Mining Journal, 2000d).

Abhey Oswal Group of Punjab planned to construct a 2-Mt/yr greenfield alumina refinery with production aimed at the export market. It would be a coastal plant and close to bauxite reserves. Others were interested in alumina refineries—Larsen and Taubro Ltd. of the United States was interested in investing in a 1-Mt/yr alumina refinery in Orissa, the Government of Andhra Pradesh was looking into the potential to develop an alumina refinery in the State, and Gujarat Mineral Development Corp. was talking of building a large alumina refinery in the State of Gujarat.

The refurbishment of Nalco's smelter was expected to enable it to operate at near design capacity and produce good quality aluminum. The company was one of the lowest cost producers of alumina and aluminum in India. The cost of doubling bauxite mining capacity to 4.8 Mt/yr at the mines at Panchpatmali in Orissa and the expansion of alumina refinery capacity at Damanjodi to 1.58 Mt/yr from 800,000 t/yr totaled \$356 million. The first two phases of the refinery expansion were expected to be working by May 2000, and capacity was expected to reach 1.05 Mt/yr; the third phase was to be commissioned in April 2001. Expansion of the smelter by 115,000 t/yr to 345,000 t/yr would be completed by May 2002. In addition, the company planned to build an eighth 120-MW coal-fired powerplant at a cost of \$100 million. The port facilities at Vizag also were being expanded to handle the increase in shipments (Financial Times, 2000e).

Hindalco planned to invest from \$43 million to \$53 million in the aluminum can plant and from \$11 million to \$21 million in a diecasting plant. The company's \$13 million, 300,000-t/yr aluminum alloy plant at Silvassa near Mumbai was commissioned in 2000. The company also finalized its \$492 million brownfield expansion plan at Renukoot that included an aluminum smelter with a capacity increase to 450,000 t/yr from 350,000 t/yr, an alumina refinery with a capacity increase to 350,000 t/yr from 210,000 t/yr, and a 175-MW powerplant. The expansion project would be completed in 3 years. Hindalco's bauxite mines had sufficient reserves for the next 25 years. The company also completed the purchase of a 74.6% stake in Indal

in June and planned to bid on the 51% share of Balco and on a 30% share of Nalco when they were put on the market (Metal Bulletin, 2000o).

Indal was planning to add a new potline at its Hirakud aluminum smelter by transferring 200 pots each in two stages from its Belgaum plant. Belgaum's 70,000-t/yr smelter had been shut in 1999 following Indal's failure to secure a competitive power supply agreement. Hirakud's smelter would be expanded to 60,000 t/yr from 30,000 t/yr. The second stage of the transfer of 200 pots could raise capacity to 90,000 t/yr. Tata Electric Co. planned to double the power capacity, which was coal-based, but Indal decided to construct a second captive powerplant of 67 MW on its own (Metal Bulletin, 2000p).

Sterlite Industries Ltd. would abandon its \$770 million greenfield aluminum smelter project in Orissa (Metal Bulletin, 2000l). The project had a planned capacity of 125,000 t/yr. The company planned to strengthen India Foils, which was 55% owned by Sterlite, and to merge Madras Aluminium Co. Ltd. (Malco) into Sterlite; Malco had been bought by Sterlite in 1995. A modernization program for its aluminum production would reach a capacity of 47,000 t/yr.

Chromium.—Tisco sought Government permission to export chrome ore directly to its global customers and to convert to ferrochrome overseas for its own use. Chrome ore exports were restricted. Because the demand for lumpy chrome ore was limited, fine chrome ore exports were allowed. Chrome ore with a silica content of more than 4% also could be exported. Exports of chrome concentrates had no restrictions. Most Indian chrome ore was exported to China, and some was exported to Japan. Tisco wanted to export its chrome ore to countries other than these where power was cheaper and the producer could convert it into ferrochrome.

Tisco made a bid to acquire the ferrochrome plant of Industrial Development Corp. of Orissa by offering \$10 million for a 100% stake in the operation; the plant produced high-carbon ferrochrome. The other companies that submitted bids were Visa Industries and Sterlite Steel. The Government removed the antidumping duty on imports of low-carbon ferrochrome from Kazakhstan and Russia.

Tata Steel Ltd. and Orissa Mining Corp. Ltd. proposed a joint venture on chromite mining in the Sukinda Valley in Orissa. Orissa Mining held more than 80% of the mining lease in the valley, which totaled 4,700 hectares (ha); Tata Steel held 406 ha. Tata Steel would be responsible for chromite mining, preparing chromite ore and concentrates for export, and production of value-added materials, such as ferrochrome. Tata Steel took over the operation of Orissa Mining's Sukinda ferrochrome plant and other ferroalloys plants in Orissa (Mining Journal, 2000b).

Copper.—Supplies of copper concentrate to Sterlite's Tuticorin smelter in Tamil Nadu were interrupted by a strike by Indian port workers in January. Copper production was not affected because the smelter used stockpiled concentrate. The port of Tuticorin was one of 11 ports hit by the strike. About 100,000 workers across India were demanding a pay raise. Sterlite Industries's copper production was expected to increase

to 150,000 t/yr by April 2001 after debottlenecking and capacity expansion of 50,000 t/yr. Meanwhile, SWIL Ltd.'s 50,000-t/yr greenfield copper smelter in Gujarat was likely to start hot trials by April 2001 (Mining Journal, 2000f).

In 2000, Hindustan Copper Co. Ltd. (HCL) reduced its workforce by 2,000 per year and closed down two uneconomic mines, Kendadi and Pathagora in the State of Bihar. The company was buying copper concentrate from other producers to feed its smelters. Its 31,000-t/yr Khetri smelter was closed for a scheduled 30- to 40-day maintenance period in 2000 and would be expanded to 45,000 t/yr (Mining Journal, 2000g). The estimated cost of expansion was \$11 million. HCL's planned divestment involved its Khetri smelter and 60,000-t/yr-capacity copper rod plant, which would merge into a separate company and form the 49% stake to be retained by the Government. For the remaining 51%, a strategic partner would be sought. Also up for sale was its Indian Copper Complex, which consisted of a 20,000-t/yr smelter at Ghatsila, two working mines at Rakha and Surda, and the open pit mine at Malanjhand in Madhya Pradesh. HCL had plans to increase the capacity of its Ghatsila smelter to 25,000 t/yr.

Gold.—Owing to accumulated losses and dropping gold content, Bharat Gold Mines' operation at Kolar in the State of Karnataka was shut down in March. The mine has produced more than 809,000 kilograms of gold in total. The closure had been the subject of mass protests in the State capital of Bangalore. About 4,500 miners were directly affected. The Government offered a voluntary retirement package to all workers. Bharat Gold Mines continued its small activities at Nundydroog Mine in the area and at Chigargunta and Bisanatham Mines in Chittoor District (Asian Journal of Mining, 2000b).

Iron and Steel.—Beginning in July 1999, the U.S. Department of Commerce imposed a preliminary antidumping duty of 58.4% and a countervailing duty of 14.5% on steel plate exports from Sail's Bhilai Steel Plant. In January 2000, the U.S. International Trade Commission recommended an antidumping duty of 72.49% and a countervailing duty of 11% on steel plates (Metal Bulletin, 2000x). Sail also was facing an antidumping action on exports of hot-rolled carbon steel plates to Canada. Also, the Indian Supreme Court reinstated antidumping duties on hot-rolled coils and sheets from Russia and Ukraine. The Calcutta High Court decided that minimum prices imposed on certain steel imports should remain in place. The Government recommended provisional antidumping duties on certain grades of seamless alloy and nonalloy round sheet billets imported from China and Russia. The Government also began to restrict imports of secondary or defective steel, which included alloy steel bars and rods, cold-rolled coils, electrical sheets, hot-rolled coils, plates, sheets, and tinplate.

The Government gave more licenses to private parties for exports of high-grade iron ore. Goa's exports of 15 Mt/yr of iron ore accounted for one-half of India's total exports. The Marmugao Port Trust proposed to raise cargo-related charges by 25%, and Goa planned to impose a levy on mining to raise

funds for environmental restoration of mine sites. Arrangements were made to ship 1 Mt of iron ore from the port of Haldia near Calcutta in fiscal year 2000-01. Other mining companies in Orissa had opted for shipping from Haldia. Tisco has one iron ore mine at Naumandi in Bihar and another at Joda in Orissa. The company could use Haldia and Paradip as its export ports.

Kudremukh Iron Ore Co. Ltd. completed an increase in the capacity of its existing pellet plant to 3.5 Mt/yr and added a new vertical shaft pellet plant, which had a capacity of 500,000 t/yr. These additional capacities were likely to be handled at the company's existing iron ore berth at the port of New Mangalore. Another addition to the company was a new pig iron plant at Mangalore, which planned to import 150,000 t/yr of coke. Kudremukh also planned to build a 62-MW powerplant. Karnataka granted Kudremukh a 1-year extension for the company's permit to mine in a 1,400-ha area. Kudremukh was India's major exporter of iron ore concentrate and iron oxide pellets to Australia, China, Iran, Japan, and Taiwan (International Bulk Journal, 2000a). The Government postponed its move to divest a 74% stake in Kudremukh. The company resumed full operations after a 60-day stoppage caused by landslide damage of a slurry pipeline in July.

Jindal Vijayanagar Steel opened its new iron ore mine and expected to produce 1.8 Mt/yr of lump and fine ore initially; production could rise to 3 Mt/yr when the mine is in full operation. The total investment in the mining venture was \$2.5 million. The ore would feed its new \$92 million 3-Mt/yr pelletizing plant that was due to be commissioned by December. The pellet plant would be fueled with off-gas from its Corex ironmaking plant.

Hy-Grade Pellets Ltd.'s \$381 million expansion plan of an iron ore pelletization plant at Visakhapatnam was to increase capacity to 7.1 Mt/yr from 3.5 Mt/yr of direct-reduction-grade pellets. The project included a 267-kilometer (km) pipeline to bring iron ore slurry from the Bailadilla iron ore mines in Madhya Pradesh to the plant. The company had a guaranteed market for 50% of its output to supply Indian direct-reduced iron (DRI) plants and planned to export the increased production to Asia, the Far East, and the Middle East. The company was 51% owned by Stemcor of the United Kingdom (Mining Journal, 2000d).

The Government invited international tenders for the modernization of Indian Iron and Steel Co. Ltd.'s 1.5-Mt/yr-capacity plant at Burnpur in West Bengal. The offer would include its captive iron ore and coking coal mines. Owing to improved market prices for pig iron, the company restarted its No. 1 blast furnace, which had been shut down since April 1998. The company's Chiria iron ore mine was reported to contain 2,000 Mt of high-grade ore (Metal Bulletin, 2000c). It also had several million metric tons of high-grade iron ore fines. Potential foreign bidders included Chinese, Japanese, Russian, and Ukrainian interests. Three shortlisted potential buyers were BHP Ltd. of Australia, Mitsui & Co. Ltd. of Japan, and Tyazhpromexport of Russia.

Sail, Rashtriya Ispat Nigam Ltd., and Tisco, which were India's main pig iron producers, accounted for around 45% of the country's total output. Producers for which pig iron was a primary product accounted for the rest. Rashtriya Ispat Nigam's

Vizag plant was India's biggest exporter of pig iron. The startup in October of the blast furnace at Neelachal Ispat Nigam Ltd. in Orissa was expected to produce 490,000 t/yr of pig iron. The project was a joint venture between MMTC, the Government of Orissa, and Mecon, which was an engineering company. Meanwhile, NMDC was setting up a 300,000-t/yr pig iron plant in the Dhanuwa district of Madhya Pradesh that would start operations in July 2002. Tata Metaliks, which was another pig iron producer, completed the expansion of capacity to 130,000 t/yr from 90,000 t/yr at its works in Gokulpur, West Bengal, with an investment of \$1.7 million (Metal Bulletin, 2000k).

Essar Steel took steps to increase the capacity of its three Midrex DRI plants to 800,000 t/yr each from 650,000 t/yr each. The company might build a fourth plant with 800,000 t/yr depending on its ability to secure an adequate supply of natural gas. The plans would take its total production capacity to more than 3 Mt/yr. The company also planned to install a 200,000-t/yr cold-reduction mill at a cost of \$53.5 million, which would be the first at its works in India (Metal Bulletin, 2000a).

The Government planned to encourage expansion of DRI production with the aim of overtaking Venezuela as the world's largest producer. India had 26 DRI plants with a combined capacity of 6.5 Mt/yr; 23 were coal-based units with a total capacity of 2.7 Mt/yr, and 3 were gas-based plants with a total capacity of 3.8 Mt/yr. SIIL operated a 60,000-t/yr coal-based DRI plant in Andhra Pradesh. Essar Steel, Ispat Alloys, and Vikram Ispat Nigam operated gas-based plants (Metal Bulletin, 2000g).

Through a rescue package offered by the Government, Sail was to get access to new financing to pay for job cuts; to divest certain noncore activities, such as power generation and fertilizer manufacturing; and to seek partners for its alloy and special steel operations to raise funds for modernizing its four main plants. Sail would cut its workforce to 100,000 from 177,000 in the next 3 years and sell its three special steel plants, Durgapur alloy, Salem stainless, and Visvesvaraya alloy, by forming joint ventures with others by March 2001. The package also involved waiver of a loan of \$1.09 billion from the steel development fund and a loan of \$82 million from the Government. Sail was 85.8% state-owned and India's largest steel producer (Metal Bulletin, 2000t).

Sail planned to relight an idle blast furnace at its Rourkela steel plant in Orissa. The furnace would be relined at a cost of \$5.3 million and put into production by September 2000. The company placed emphasis on special and higher value steels to be produced by the modernized Bokaro and Rourkela steel plants and heavy plates made at the Bhilai works (Metal Bulletin, 2000v). The pipe manufacturing plant would be updated at a cost of \$12.8 million. Partial modernization of all of its four blast furnaces at Rourkela in a phased manner might cost \$34 million and would increase the crude steel capacity to 2.2 Mt/yr from 1.8 Mt/yr. The company also planned to relight the blast furnace at the Durgapur works in May.

Sail invited applications for a joint venture through equity participation in its Salem stainless steel plant. This was to set up a stainless steel melting, refining, and casting unit with a minimum capacity of 100,000 t/yr (Metal Bulletin, 2000w). The

company would be a minority shareholder in the proposed joint venture. Morgan Stanley of the United States was arranging for the Salem tender. The short-listed parties were Avesta Sheffield of Sweden, Jindal Strips Ltd., and Tata Steel together with Usinor-Sacilor of France. The workers at the Salem steel plant went on strike on March 30 because the works had not been given sufficient attention in the Government's relief program for state-owned steel plants.

Delays on the part of Mukand Ltd. to build a second large steel complex in the Bellary Hospet region in Karnataka encouraged Bhushan Steel & Strips Ltd. to compete for the right to be allowed to build the plant. Mukand won the license from the Karnataka Government to build a \$942 million, 2.8-Mt/yr steel plant on 2,000 ha of land adjacent to the Jindal Vijayanagar Steel plant. After the delay in construction, the State Government decided to entrust the building of the plant to Bhushan, which would invest a total of \$1.7 billion including that for the second phase. In addition, Bhushan was setting up a 600,000-t/yr cold-rolled and galvanized sheet plant at Patalganga near Mumbai with an investment of \$160 million. The company planned to set up a captive powerplant. Bhushan commissioned a 150,000-t/yr greenfield cold-rolling mill at a cost of \$64 million. In a 58-42 partnership with Kalyani Steel Ltd., Mukand also planned to build a \$118 million pig iron plant. The project was financed through internal funds and borrowings (Metal Bulletin, 2000s).

Tisco might drop plans to build a big new 10-Mt/yr steel plant of its own at Gopalpur in Orissa and buy Rashtriya Ispat Nigam's 3-Mt/yr Vizag steelworks instead. The Vizag plant was the most modern State sector plant that made long products. The program toward privatizing the plant included writing off its accumulated losses.

Tisco started up its new \$342 million, 1.2-Mt/yr cold-rolled strip mill at Jamshedpur in mid-May; about 50% of its hot-rolled coil would be used for captive consumption. Commercial production would begin in September 2000. The mill was constructed during a period of 26 months with technical collaboration from Nippon Steel Corp. of Japan; the main equipment supplier was Hitachi Metals, Ltd., also of Japan. The company commissioned its first 100,000-t/yr galvanizing line as the first stage of its new cold-rolling and coating plant (Metal Bulletin, 2000f).

Jindal Strip's work to increase cold-rolling capacity to 90,000 t/yr from 30,000 t/yr was completed by December at a cost of \$53.5 million. Jindal Group unveiled plans to begin production of rails and heavy sections after it bought a rail and structural mill from Iscor Ltd. of South Africa and installed the mill at its works in Raigarh in Madhya Pradesh (Metal Bulletin, 2000s). The acquisition cost more than \$10 million. The mill would produce 78-meter-long rails and have a capacity of 500,000 t/yr. The plant was due to be commissioned by the end of 2001. India's rail market was around 450,000 t/yr and was supplied by Sail's Bhilai steel works.

Raymond Steel was seeking a buyer for its cold-rolling strip mill near Nashik in the State of Maharashtra. The plant had a capacity of 215,000 t/yr and made electrical steel sheet and other cold-rolled strip products. Thyssen Krupp Steel AG of Germany, Essar Steel, Jindal Strips, and Tisco were interested in

the mill. Through its subsidiary, EBG India, Thyssen Krupp Steel acquired a 76% controlling stake in the plant for \$88 million. The remaining 24% would be held by Raymond Steel for a period of 5 years. Thyssen Krupp Steel intended to invest \$25 million in the plant to increase production capacity to 300,000 t/yr (Metal Bulletin, 2000m).

Kalyani Carpenter Special Steels Ltd. set up a plant at Ranjangaon near Pune for cold drawing and finishing of high-alloy steel grades with an investment of \$3.2 million. The company was a subsidiary of Kalyani Steel, which held a 74% stake, and Carpenter Technology Corp. of the United States, which held the balance. The subsidiary entered into a technical collaboration with Carpenter Technology for the manufacture of tool steel, die steel, high-speed steel, and stainless steel. Kalyani Steel operated an integrated steel plant at Ginigera in Hospet, Karnataka; the plant was a strategic alliance between Kalyani Steel and Mukand.

Isibars, which was the Indian producer of stainless steel bright bars, sought a joint-venture partner for its recently acquired rolling mill at Khopoli near Mumbai. The company, which had a liquid metal capacity of 50,000 t/yr of rolled valve steel, was likely to align with Kalyani Carpenter. Isibars acquired a 75,000-t/yr rolling mill from the Ashok Birla Group for \$28 million (Metal Bulletin, 2000q).

Southern Iron & Steel Co. started commercial production of steel long products. The new plant would initially produce 12,000 metric tons per month (t/mo) of bar and rod and gradually increase output to 25,000 t/mo. The product range included 5- to 12-millimeter (mm)-diameter wire and up to 55-mm-diameter bar. The plant also could make cold-twisted 8- to 32-mm-diameter debar. The company would be competitor to such rivals as Sail, Tisco, and Vizag Steel (Metal Bulletin, 2000j).

The merger of Indian Seamless and Kalyani Seamless Tubes formed Indian Seamless Metal Tubes, which was India's largest seamless tube producer. The new company would have a capacity of 155,000 t/yr and plants in two locations in Maharashtra (Metal Bulletin, 2000i). The new company planned to sell 25% of its production in the export markets. The other producer was Maharashtra Seamless Ltd. India's total output capacity of seamless steel tubes was 250,000 t/yr. The Government placed 5-year antidumping duties on imports of seamless tubes from Austria, the Czech Republic, Romania, and Russia.

India had the capacity to produce 1.4 Mt/yr of various ferroalloys, but owing to several factors, such as depressed demand, capacity utilization in 2000 was somewhat greater than 52%. About 28% of India's silicomanganese production was exported, of which Ispat Alloys accounted for two-thirds. The other producers were Maharashtra Elektros melt, Nava Bharat Ferroalloys, and Universal Ferroalloys. India's contribution to the world total export market of silicomanganese was only 4.5%.

Sail decided to relocate its two ferrosilicon furnaces from Visvesaraya Iron and Steel in Karnataka to the Bokaro steel plant where it could use the plant's captive power, low-cost electricity from the area, and low-phosphate coke to produce ferrosilicon. The two furnaces had the capacity to produce 20,000 t/yr of ferrosilicon. In another development, ferrosilicon

producers signed an antidumping petition against imports from China, Iran, and Russia (Metal Bulletin, 2000u). The Government considered antidumping duties on ferrosilicon imports from China and Russia, but dropped those against Iranian imports.

RSP Group started ferrovandium and ferromolybdenum production in August. The plant, which is 70 km from Jaipur in the State of Rajasthan, initially produced 20 t/mo of ferrovandium and 35 t/mo of ferromolybdenum for Indian steel mills. Ultimately, the plant's output would be solely for the export markets and could expand to 2,500 t/yr of ferrovandium and 3,500 t/yr of ferromolybdenum. The company was sourcing vanadium pentoxide feed from China. RSP Group was involved in the production of quartz and other minerals and chemicals (Metal Bulletin, 2000e).

Magnesium.—Tamil Nadu Industrial Development Corp. sold the assets of Tamil Nadu Magnesium & Marine Chemicals Ltd., which was one of two plants that produced 600 t/yr of magnesium metal; Southern Magnesium & Chemicals also had a capacity of 600 t/yr. India's demand for magnesium metal was around 1,000 t/yr. Most of the imported metal was from China (Metal Bulletin, 2000g).

Zinc.—The capacity of HZL's Rampura Agucha Mines was being expanded by 1,500 metric tons per day of ore at a cost of \$64 million. The company was in the process of completing an expansion of its Chanderiya zinc smelter to 172,000 t/yr and finalizing the details of a project to build a 100,000-t/yr greenfield zinc smelter. Domestic zinc metal production from HZL and Binani Zinc Ltd. satisfied 68% of India's demand, and the rest was imported from Australia, China, and the Republic of Korea. The Government planned to reduce its stake in HZL to 49% by March 2001, and Binani Zinc was interested in bidding for a 26% stake. In another development, BHP pulled out of a joint venture with HZL in Rajasthan, which had been formed in 1996 to explore and develop base and precious-metal mine projects in India and abroad (Metal Bulletin, 2000n).

Binani Zinc planned a \$107 million expansion of its zinc output to 100,000 t/yr in two stages within a 7-year period. The Kerala plant would be expanded from the current (2000) 30,000 t/yr to 75,000 t/yr by the end of March 2004. The second stage would raise production capacity to 100,000 t/yr by the end of 2007 (Mining Journal, 2000a).

Industrial Minerals

Cement.—India's cement industry, which was producing at more than capacity, was faced with drought and consolidation. Housing accounted for 55% of cement demand. In the hardest hit areas, such as Gujarat, the drought forced people to build makeshift homes, which required less cement. The removal of generous fiscal benefits and the entry of foreign companies spurred the pace of consolidation. The exemption from the sales tax had amounted to a generous subsidy, and its cessation deterred new domestic entrants and forced companies to focus on profitability and reducing costs. Existing assets were likely to become more valuable for acquisitions. Foreign companies

viewed India as a growth market. Low cement prices were a third factor driving consolidation (Financial Times, 2000a).

Lafarge Corp. of France secured 2 Mt/yr of cement capacity in a deal with Tisco and entered into an agreement with Raymond Cement Works to acquire its cement division in eastern India for \$180 million. The addition of the Raymond division would provide Lafarge with 4.24 Mt/yr of capacity from three cement plants (International Bulk Journal, 2000b).

The Government began antidumping proceedings and an investigation petitioned by Grasim Industries Ltd. and J K Synthetics Ltd. against the imports of white cement from Iran and the United Arab Emirates.

Diamond.—In January, Oropa Ltd. began diamond prospecting in Madhya Pradesh through B. Vijaykumar Chhattisgarh Exploration Pte. Ltd., which won the tender for the 4,600-square-kilometer Block D-7. Oropa was the manager of all exploration and mining activities and held a 22% stake in Chhattisgarh Exploration (owned by B. Vijaykumar & Co.).

Fertilizer.—The Government planned to divest 74% equity of Paradeep Phosphates Ltd. to a strategic partner, which could be either Indian or foreign. The company owned a 72,000-t/yr diammonium phosphate (DAP) plant and two acid plants at Paradeep, Orissa. The two acid plants had poor capacity utilization, and as a result, the company had to import more than 300,000 t/yr of phosphoric acid. The company planned to invest \$5 million to revamp the two acid plants, which would increase production of phosphoric acid to 200,000 t/yr from 100,000 t/yr. India had to import 1.8 Mt/yr of DAP because domestic production was 4.2 Mt/yr (Financial Times, 2000c).

The Indian urea industry had capacity to produce 20.8 Mt/yr of urea. The removal of nontariff barriers would make 60% of the domestic urea uncompetitive. The industry was protected from foreign competition and benefited from a significant Government subsidy (Financial Times, 2000d).

Graphite.—Hindustan Electro Graphites Ltd. planned to expand its graphite electrodes plant at Mandideep near Bhopal in Madhya Pradesh from the present (2000) 20,000 t/yr to 30,000 t/yr. The expansion would be completed by July 2001 with a total investment of \$12 million. Exports of graphite electrodes would rise to 18,000 metric tons (t) in fiscal year 2000-01 compared with 15,147 t in fiscal year 1999-2000 (Metal Bulletin, 2000d).

Gypsum.—Hyderabad Industries (a Birla Group company) sold its 6% stake in India Gypsum to BPB plc of the United Kingdom. After the buyout, BPB had an 80% stake in India Gypsum (Building Bulletin, 2000).

Soda Ash.—Nirma Ltd.'s 420,000-t/yr soda ash project at Bavnagar, Gujarat, was expected to start in the first quarter of 2000. The required investment for the project was \$198 million, which was \$40 million less than originally estimated. The saving was due to a reduction in customs and excise duties on plant and machinery and improved project management (Industrial

Minerals, 1999).

Mineral Fuels

Carbon Black.—Through corporate restructuring, Oriental Carbon and Chemical Ltd. (OCCL) planned to spin off its carbon black business into a separate company to be called Carbon Black Co. (CBCO). OCCL was a second-tier carbon black producer in India with an 11% market share. CBCO would proceed with a two-phase expansion program from 30,000 to 40,000 t/yr by debottlenecking and from 40,000 to 50,000 t/yr by using Continental technology, which had been developed by Continental Carbon Co. of the United States; Continental was a leader in the manufacture of furnace-grade carbon black. The expansion was scheduled to begin in fall 2000. Total investment was estimated to be \$29 million.

Coal.—The Ministry of Mines strongly supported a 5% increase from 25% to 30% in the import duty on noncoking coal and the demand for no increase in royalty rates on indigenous coal. It also wanted the induction of coal into the bulk user category for entitling freight incentives from railways. The Ministry of Mines proposed that profitable or potentially profitable mines owned by loss-making coal companies should be spun off into a separate company and up to 49% offered to a joint-venture partner. A provision would be made to increase the equity stake from the present (2000) planned 49% to 51% at a later stage.

Coal India Ltd. (CIL) was to import low-ash noncoking coal for blending with high-ash thermal coal produced by its subsidiary Mahanadi Coalfields Ltd. The company set up a coal-blending project at the port of New Ennore in Tamil Nadu to cater to the state electricity board. CIL hoped to raise its internal resources so that it could begin new greenfield projects in 2001. The International Bank for Reconstruction and Development terminated the final \$507 million of a total loan in excess of \$1 billion to CIL for undertaking a major rehabilitation project under which 24 open cast mines were to be modernized and expanded to produce 112 Mt/yr of coal (Asian Journal of Mining, 2000a).

CIL offered a 49% stake in a new project to supply coal to the National Thermal Power Co. (NTP) to a private company and a 10% interest to NTP. NTP was developing four greenfield powerplant projects in central India. The new project would supply 24 Mt/yr of coal to NTP and require an investment of \$107.1 million (Mining Journal, 2000c).

South Eastern Coalfields Ltd. (a subsidiary of CIL) signed contracts with Joy Mining Machinery and Long-Aircox for the supply of fully mechanized room-and-pillar mining equipment worth \$21 million and \$15.5 million, respectively. Both contracts were of a risk/gain share nature (Mining Magazine, 2000). The company also planned to expand the Gevra open cast mine from 18 to 25 Mt/yr and to double Dipka's output to 20 Mt/yr by fiscal year 2005-06. Both mines produced power-grade coal.

CIL and Oil and Natural Gas Corp. formed a joint venture to investigate coal-bed methane. The companies would identify prospective areas and conduct exploration drilling for high-rank coal in Jharia East, North Karanpura, Ramargh, Raniganj West,

and West Bokaro.

Liquefied Natural Gas.—Al Manhal International Group of the United Arab Emirates was evaluating building a \$7.4 billion liquefied natural gas (LNG)-based industrial complex at Gopalpur, Orissa. Plans included a 2,000- to 2,500-MW powerplant, a 1.2-Mt/yr fertilizer plant, a 2.5-Mt/yr olefins and derivatives complex, and a gas pipeline network to the States of Andhra Pradesh, Tamil Nadu, and Uttar Pradesh. Australia LNG inked a deal to supply 5 Mt/yr of LNG to the Gopalpur terminal for 20 years (Oil & Gas Journal, 2000b).

A consortium led by Indian Oil Corp. (IOC) put in a bid to develop LNG import facilities and related businesses at Kakinada in Andhra Pradesh to market the regasified LNG product. IOC would retain a 26% equity stake in the project. Other partners were Petronas of Malaysia, CMS Energy Corp., and India's port of Cocanada. Petronas would supply LNG from Malaysia, IOC would ship it, and Cocanada would develop the LNG terminal and ensure deepwater berthing facilities (Oil & Gas Journal, 2000c). An option to build an LNG-fed powerplant at Kakinada with \$856 million was also envisioned.

Petroleum.—A combine led by Reliance Group was awarded 12 of the 25 exploration blocks offered in India's first licensing round under its new exploration licensing policy. Other block winners were Oil and Natural Gas, IOC, Oil India Ltd., Gazprom Mosbacher Energy Co. of Russia, and Cairn Energy plc of the United Kingdom. Reliance decided to invest \$750 million in its partnership with Niko Resources Ltd. of Canada for exploration of the 12 blocks. The largest chunk of investment would address exploration of the 7,645-square-kilometer Krishna-Godavari deepwater offshore block. The biggest investment on the nine shallow-water blocks awarded would go to explore two blocks off Mumbai. Niko has an one-third interest in Hazira Gasfield, which is 25 km southwest of Surat (Oil & Gas Journal, 2000a).

Kuwait Petroleum Corp. (26%) pulled out of a joint venture with IOC (26%) to build a 180,000-barrel-per-day (bbl/d) refinery at Paradip. The \$1.74 billion project was slated to be commissioned in the next 3 years. Oil and Natural Gas would have been offered a stake of up to 24%. Kuwait Petroleum shifted its focus to investing in an existing refinery and remained keen on providing long-term crude supplies. IOC decided to carry out the project on its own (Oil & Gas Journal, 2000d).

The Government would sell its stake in four refineries, two to IOC and two to Bharat Petroleum Corp. Ltd., for an estimated \$393 million. IOC would acquire the Government's 51% stake in the 130,000-bbl/d Chennai Refinery and in the 27,000-bbl/d Bongaigoan Refinery. Bharat Petroleum would acquire the Government's 55% stake in the 150,000-bbl/d Kochi Refinery and hold more than 50% in the 60,000-bbl/d Numaligarh Refinery. The restructuring would be completed by 2002. The sales were designed to boost both companies' refining capacity in the south with the aim of creating an integrated petroleum organization. The restructuring was part of a 4-year timetable that would lead to full deregulation of the petroleum sector with price liberalization and the privatization of leading downstream

companies (Financial Times, 2000b).

Infrastructure

Marubeni Corp. of Japan and its two partners planned to build a 520-MW coal-fired powerplant in Andhra Pradesh by investing \$700 million (Coal Age, 2000). The partners were Electric Power Development of Japan and BPL, which was an Indian electric machinery company. The group would set up a joint-venture company to be called BPL Power Projects to manage the plant and to market the power produced. The plant was expected to be operational in 2003.

References Cited

- Asian Journal of Mining, 2000a, Coal India to import low-ash coal: Asian Journal of Mining, April-June, p. 32.
- 2000b, India's historic Bharat Mine closes: Asian Journal of Mining, April-June, p. 6.
- Building Bulletin, 2000, BPB new stake in India Gypsum: Building Bulletin, Issue 32, December, p. 4.
- Coal Age, 2000, World news: Coal Age, v. 105, no. 2, February, p. 13.
- Far Eastern Economic Review, 2000, Economic monitor: Far Eastern Economic Review, v. 163, no. 44, November 2, p. 70.
- Financial Times, 2000a, Cement makers dealt heavy blow by Indian drought: Financial Times [London], June 9, p. 24.
- 2000b, Delhi to sell stakes in refineries: Financial Times [London], September 7, p. 4.
- 2000c, India to sell stake in fertilizer group: Financial Times [London], May 31, p. 24.
- 2000d, Indian urea producers face competitive times: Financial Times [London], July 11, p. 30.
- 2000e, Nalco fired up after rebuilding its smelters: Financial Times [London], February 9, p. 24.
- Industrial Minerals, 1999, Nirma soda ash to start soon: Industrial Minerals, no. 387, December, p. 65.
- International Bulk Journal, 2000a, Kudremukh announces increase in iron ore exports: International Bulk Journal, April, p. 5.
- 2000b, Southeast Asia—Rich pickings for multinationals: International Bulk Journal, September, p. 13.
- Metal Bulletin, 2000a, Essar Steel moves to raise DRI capacity: Metal Bulletin, no. 8478, May 25, p. 20.
- 2000b, India aims for top spot in DRI: Metal Bulletin, no. 8495, July 24, p. 23.
- 2000c, India seeks partners for Iisco: Metal Bulletin, no. 8466, April 10, p. 29.
- 2000d, Indian alumina-bauxite project comes to a halt on land concern: Metal Bulletin, no. 8495, July 24, p. 5.
- 2000e, Indian group enters ferroalloys production: Metal Bulletin, no. 8496, July 27, p. 10.
- 2000f, Indian mills plan to raise HR coil prices: Metal Bulletin, no. 8455, March 2, p. 18.
- 2000g, Indian Mg plant to be sold: Metal Bulletin, no. 8454, February 28, p. 8.
- 2000h, Indian privatizations face growing opposition: Metal Bulletin, no. 8461, March 23, p. 20.
- 2000i, Merged Indian seamless producer sets sights on export market: Metal Bulletin, no. 8473, May 8, p. 25.
- 2000j, New long products unit opens in India: Metal Bulletin, no. 8523, November 6, p. 35.
- 2000k, New pig iron project in India: Metal Bulletin, no. 8529, November 27, p. 23.
- 2000l, Sterlite plans restructuring, end greenfield smelter project:

Metal Bulletin, no. 8465, April 6, p. 4.

—2000m, Thyssen takes over Raymond Steel: Metal Bulletin, no. 8508, September 14, p. 19.

—2000n, BHP pulls out of joint venture with HZL: Metal Bulletin, no. 8528, November 23, p. 7.

—2000o, Hindalco plans caststock and alloy plants: Metal Bulletin, no. 8445, January 27, p. 5.

—2000p, Indal considers increasing aluminum output at Hirakud: Metal Bulletin, no. 8528, November 23, p. 4.

—2000q, Isibars seeks partner for recent acquisition: Metal Bulletin, no. 8508, September 14, p. 23.

—2000r, Jindal installs rail mill bought from South Africa: Metal Bulletin, no. 8470, April 27, p. 23.

—2000s, Mukand returns to profit: Metal Bulletin, no. 8491, July 10, p. 24.

—2000t, Sail gets state bailout: Metal Bulletin, no. 8451, February 17, p. 27.

—2000u, Sail plans relocation of ferrosilicon furnaces: Metal Bulletin, no. 8487, June 26, p. 11.

—2000v, Sail relights idle blast furnace at Rourkela: Metal Bulletin, no. 8459, March 16, p. 22.

—2000w, Sail seeks partners for stainless joint venture: Metal Bulletin, no. 8449, February 10, p. 21.

—2000x, US plate duty hits Indian exporters: Metal Bulletin, no. 8445, January 27, p. 22.

Mining Journal, 2000a, Binani zinc output boost planned: Mining Journal, v. 335, no. 8613, December 15, p. 474.

—2000b, Chrome joint venture in India?: Mining Journal, v. 334, no. 8585, June 2, p. 434.

—2000c, Indian coal project participation offered: Mining Journal, v. 335, no. 8602, September 29, p. 255.

—2000d, Indian pelletization plant expansion begun: Mining Journal, v. 334, no. 8586, June 9, p. 450.

—2000e, Indian refinery joint venture: Mining Journal, v. 334, no. 8566, January 21, p. 41.

—2000f, Sterlite supplies strike-bound: Mining Journal, v. 334, no. 8566, January 21, p. 42.

—2000g, HCL cuts back: Mining Journal, v. 334, no. 8584, May 26, p. 415.

Mining Magazine, 2000, Manufacturers highlight Indian potential: Mining Magazine, v. 182, no. 1, January, p. 56.

Oil & Gas Journal, 2000a, Exploration: Oil & Gas Journal, v. 98, no. 3, January 17, p. 27.

—2000b, Quick takes: Oil & Gas Journal, v. 98, no. 21, May 22, p.

8.

—2000c, Quick takes: Oil & Gas Journal, v. 98, no. 29, July 17, p. 8.

—2000d, Refining: Oil & Gas Journal, v. 98, no. 5, January 31, p. 43.

Major Sources of Information

Geological Survey of India
27 Jawaharal Nehru Rd.

Calcutta 700 016, India
Telephone: 33 2496976

Fax: 33 2496956

Indian Bureau of Mines
New Secretariat Building
Nagpur 440 001, India

Telephone: 712 534642, 523934

Fax: 712 533041

National Mineral Development Corp. Ltd.

Khanij Bhawan, 10-3-311/A, Castle Hills
Masab Tank, Hyderabad 500 028, India
Telephone: 40 222071, 222072

Fax: 40 222236

Oil and Natural Gas Corp.

12th Floor, Express Towers, Nariman Point
Bombay 400 021, India

Telephone: 22 2026446, 2022559

Fax: 22 2027938

Major Publications

Ministry of Mines, Indian Bureau of Mines, Nagpur:
Monthly Statistics of Mineral Production,
Indian Minerals Yearbook.

Mining Engineers' Association of India, Bombay:
Indian Mining and Engineering Journal, monthly.

Balkrishna Binani, Bombay:
Minerals and Metals Review, monthly.

TABLE 1
INDIA: PRODUCTION OF MINERAL COMMODITIES 1/ 2/

(Metric tons unless otherwise specified)

Commodity 3/ METALS	1996	1997	1998	1999 e/	2000 e/
Aluminum:					
Bauxite, gross weight thousand tons	5,757	6,019	6,102	6,712 r/ 4/	7,366 4/
Alumina, Al ₂ O ₃ equivalent e/ do.	1,780	1,860	1,890	2,080 r/	2,280
Metal, primary	530,600	484,200	541,800	614,400 r/ 4/	643,700 4/
Cadmium metal	271	298	304 r/	269 r/ 4/	314 4/
Chromium, chromite, gross weight	1,363,205	1,363,049	1,311,310	1,472,766 r/ 4/	1,946,910 4/
Cobalt metal	--	110 e/	120 e/	120	206 4/
Copper:					
Mine output, Cu content	47,800	37,200	39,900	34,100 4/	35,500 4/
Metal, primary:					
Smelter	45,300	51,000 r/	107,600	224,400 4/	225,600 4/
Refinery					
Electrolytic (cathode)	29,100	30,200 e/	100,000 e/	200,000	234,000 4/
Fire refined e/	10,200	6,000	7,000	8,000	9,000
Total	39,300	36,200	107,000 e/	208,000	243,000
Gold metal, smelter kilograms	2,449	2,750	2,383	2,500 r/ 4/	4,800 4/
Iron and steel:					
Iron ore and concentrate:					
Gross weight thousand tons	66,657	69,453	72,532	70,220 r/ 4/	75,000
Fe content do.	42,660	44,400	48,000 e/	44,940 r/ 4/	48,000
Metal:					
Pig iron do.	19,864	19,898 r/	20,194 r/	20,139 r/ 4/	21,321 4/
Direct-reduced iron do.	4,830	5,250	5,260 r/	5,220 r/ 4/	5,440 4/
Ferrous alloys:					
Ferromanganese (including charge chrome)	261,666	286,973	345,125	350,000	352,000
Ferrosilicon e/	9,000	10,000	10,000	10,000	10,000
Ferromanganese e/	190,000	166,000	165,000	160,000	160,000
Ferrosilicon e/	78,000	74,000	55,000 r/	55,000	60,000
Silicomanganese e/	170,000	198,000	193,000	190,000	185,000
Other e/	8,500	9,000	9,000	9,000	9,000
Steel, crude thousand tons	23,753	23,748	23,480	24,269 4/	26,924 4/
Semimanufactures e/ 5/ do.	11,000	11,000	12,000	12,000	12,000
Lead:					
Mine output, Pb content	35,000	32,000	39,300	32,100 r/ 4/	28,900 4/
Metal, refined: e/					
Primary	67,000	69,000	70,000	72,000	70,000
Secondary	27,000	24,000	25,000	20,000	26,000
Total	94,000	93,000	95,000	92,000 r/	96,000
Manganese:					
Ore and concentrate, gross weight thousand tons	1,797	1,596	1,557	1,500	1,550
Mn content e/ do.	680	606 r/	592 r/	570 r/	590
Rare-earth metals, monazite concentrate, gross weight e/	5,000	5,000	5,000	5,000	5,000
Selenium e/ kilograms	11,500	11,500	11,500	11,500	11,500
Silver, mine and smelter output do.	35,601	49,736	52,310	54,000	40,000
Titanium concentrates, gross weight: e/					
Ilmenite	330,000	332,000 r/	378,000	378,000	380,000
Rutile	15,000	14,000	16,000	16,000	17,000
Tungsten, mine output, W content	2	1	--	--	--
Zinc:					
Mine output, concentrate:					
Gross weight	286,226	263,270	261,467	265,000	264,000
Zn content	148,200	142,000	143,000 e/	145,000	144,000
Metal:					
Primary	143,600	159,000	171,900	175,000	176,000
Secondary e/	24,000	24,000	25,000	25,000	25,000
Total e/	167,600	183,000	196,900	200,000	201,000
Zirconium concentrate, zircon, gross weight e/	19,000	19,000	19,000	19,000	19,000
INDUSTRIAL MINERALS					
Abrasives, natural, n.e.s.:					
Corundum, natural kilograms	1,408	867	1,230	1,300	1,250
Garnet	47,382	55,374	138,678	135,000	130,000
Jasper	4,740	5,312	6,581	7,000	7,500

See footnotes at end of table.

TABLE 1--Continued
INDIA: PRODUCTION OF MINERAL COMMODITIES 1/ 2/

(Metric tons unless otherwise specified)

Commodity 3/	1996	1997	1998	1999 e/	2000 e/	
INDUSTRIAL MINERALS--Continued						
Asbestos	23,215	25,051	18,751	20,000	21,000	
Barite	369,500	409,498	749,412	600,000	550,000	
Bromine, elemental e/	1,500	1,500	1,500	1,500	1,500	
Cement, hydraulic e/	thousand tons	75,000	80,000	85,000	90,000	95,000
Chalk	122,318	117,869	114,109	115,000	110,000	
Clays:						
Ball clay	396,472	373,104	381,479	380,000	375,000	
Diaspore	14,192	14,874	10,148	12,000	13,000	
Fireclay	346,599	355,331	331,729	340,000	345,000	
Kaolin:						
Salable crude	thousand tons	578	402	540	520	530
Processed	do.	183	175	148	150	160
Total	do.	761	577	688	670	690
Other	do.	55	53	60	65	70
Diamond: e/						
Gem	thousand carats	19	20	20	22	21
Industrial	do.	10	10	11	12	12
Total	do.	29	30	31	34	33
Feldspar	85,213	95,455	104,509	105,000	110,000	
Fluorspar:						
Concentrates:						
Acid-grade	5,115	6,937	--	--	--	
Metallurgical-grade	14,263	9,877	785	800	850	
Total	19,378	16,814	785	800	850	
Other fluorspar materials, graded	3,292	5,008	5,507	5,600	5,700	
Gemstones excluding diamond:						
Agate including chalcedony pebble	467	244	190	200	250	
Garnet	kilograms	627	653	829	900	850
Graphite 6/	115,233	102,143	143,333	145,000	140,000	
Gypsum	2,442,156	2,031,049	2,191,784	2,200,000	2,210,000	
Kyanite and related materials:						
Kyanite	6,715	6,035	5,169	5,000	5,000	
Sillimanite	7,521	12,299	11,936	12,000	12,000	
Lime	202,437	378,087	298,131	300,000	310,000	
Magnesite	373,306	362,929	355,033	360,000	365,000	
Mica:						
Crude	1,894	1,794	1,489	1,500	1,500	
Scrap and waste	1,413	1,128	966	1,000	950	
Total	3,307	2,922	2,455	2,500	2,450	
Nitrogen, N content of ammonia	thousand tons	8,549	9,328	10,240 r/	10,376 4/	10,148 4/
Phosphate rock including apatite	1,432,321	1,043,386	1,730,334	1,750,000	1,720,000	
Pigments, mineral, natural, ocher	284,546	347,429	351,704	360,000	365,000	
Pyrites, gross weight	145,922	128,571	97,163	100,000	105,000	
Salt:						
Rock salt	thousand tons	2	3	2	3	3
Other	do.	14,464 r/	14,249 r/	11,962 r/	14,450 r/ 4/	14,450 4/
Total	do.	14,466 r/	14,252 r/	11,964 r/	14,453 r/ 4/	14,453 4/
Soda ash e/	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	
Stone, sand and gravel:						
Calcite	64,866	49,429	50,668	50,000	50,500	
Dolomite	thousand tons	3,132	2,930	2,800	2,700	2,750
Limestone	do.	100,328	104,755	108,920	110,000	105,000
Quartz and quartzite	do.	257	258	266	265	260
Sand:						
Calcareous e/	do.	225	225	230	235	240
Silica	do.	1,534	1,400	1,265	1,300	1,350
Other	do.	1,379	2,688	2,879	2,900	2,800
Slate	9,451	7,590	10,029	10,000	10,500	
Sulfur, byproduct from fertilizer plants	9,316	9,600 e/	10,000 e/	10,500	11,000	
Talc and related materials:						
Pyrophyllite	143,172	121,566	79,951	85,000	85,000	
Steatite (soapstone)	472,001	417,613	447,550	450,000	460,000	

See footnotes at end of table.

TABLE 1--Continued
INDIA: PRODUCTION OF MINERAL COMMODITIES 1/ 2/

(Metric tons unless otherwise specified)

Commodity 3/	1996	1997	1998	1999 e/	2000 e/	
INDUSTRIAL MINERALS--Continued						
Vermiculite	2,405	4,405	4,080	4,000	4,200	
Wollastonite	76,204	97,223	95,746	96,000	100,000	
MINERAL FUELS AND RELATED MATERIALS						
Coal:						
Bituminous	thousand tons	287,935	295,195	298,116	277,493 4/	280,000
Lignite	do.	22,282	23,027	23,164	24,000	24,000
Total	do.	310,217	318,222	321,280	301,493 4/	304,000
Gas, natural:						
Gross	million cubic meters	19,700	20,000 e/	25,000 e/	31,400 4/	30,000
Marketable	do.	18,489	19,047	23,500 e/	29,500	28,500
Petroleum:						
Crude	thousand 42-gallon barrels	240,114	246,989	244,854	241,119 4/	240,000
Refinery products: e/						
Liquefied petroleum gas	do.	39,785 4/	40,000	40,500	41,000	41,500
Gasoline	do.	40,150 4/	39,000	39,500	40,000	40,500
Kerosene and jet fuel	do.	64,970 4/	59,000	58,000	58,500	59,000
Distillate fuel oil	do.	174,835 4/	166,000	167,000	168,000	169,000
Residual fuel oil	do.	74,460 4/	71,000	70,000	69,000	68,000
Other	do.	91,615 4/	89,000	90,000	91,000	91,500
Total	do.	485,815 4/	464,000	465,000	468,000	470,000

e/ Estimated. r/ Revised. -- Zero.

1/ Table includes data available through July 10, 2001.

2/ Estimated data are rounded to no more than three significant digits; may not add to totals shown.

3/ In addition to commodities listed, other gemstones (aquamarine, emerald, ruby, and spinel) and uranium are produced, but output is not reported; available information is inadequate to make reliable estimates of output levels.

4/ Reported figure.

5/ Excludes production from steel miniplants.

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

TABLE 2
INDIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2000

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity e/
Alumina	Indian Aluminium Co. Ltd. [Indian interests, 60.4%, and Alcan Aluminium Ltd. (Canada), 39.6%]	Belgaum Refinery, Karnataka	290
Do.	National Aluminium Co. Ltd. (Indian Government, 100%)	Dhamanjodi Refinery, Orissa	870
Do.	Bharat Aluminium Co. Ltd. (Indian Government, 100%)	Korba Refinery, Madhya Pradesh	200
Do.	Utkal Alumina International Ltd. [Norsk Hydro A/S (Norway), 40%; Alcan Aluminium Ltd. (Canada), Indian Aluminium Co. Ltd., and Tata Industries, 20% each]	Koraput Refinery, Orissa	1,000 1/
Do.	Madras Aluminium Co. Ltd. [Alumix SpA (Italian Government), 27%; R. Prabhu and Associates, 24%; Tamil Nadu Industrial Investment Corp., 11%, and others, 38%]	Mettur Refinery, Tamil Nadu	60
Do.	Indian Aluminium Co. Ltd. [Indian interests, 60.4%, and Alcan Aluminium Ltd. (Canada), 39.6%]	Muri Refinery, Bihar	82
Do.	Hindalco Industries Ltd. (Birla Group, 33%; foreign investors, 26%; private Indian investors, 23%; and financial institutions, 18%)	Renukoot Refinery, Uttar Pradesh	210
Aluminum	Indian Aluminium Co. Ltd. [Indian interests, 60.4%, and Alcan Aluminium Ltd. (Canada), 39.6%]	Alupuram Smelter, Kerala	20
Do.	National Aluminium Co. Ltd. (Indian Government, 100%)	Angul Smelter, Orissa	230
Do.	Indian Aluminium Co. Ltd. [Indian interests, 60.4%, and Alcan Aluminium Ltd. (Canada), 39.6%]	Belgaum Smelter, Karnataka	70
Do.	do.	Hirakud Smelter, Orissa	30
Do.	Bharat Aluminium Co. Ltd. (Indian Government, 100%)	Korba Smelter, Madhya Pradesh	100
Do.	Madras Aluminium Co. Ltd. [Alumix SpA (Italian Government), 27%; R. Prabhu and Associates, 24%; Tamil Nadu Industrial Investment Corp., 11%; and others, 38%]	Mettur Smelter, Tamil Nadu	25
Do.	Hindalco Industries Ltd. (Birla Group, 33%; foreign investors, 26%; private Indian investors, 23%; and financial institutions, 18%)	Renukoot Smelter, Uttar Pradesh	350
Bauxite	Bharat Aluminium Co. Ltd. (Indian Government, 100%)	Amarkantak Mine, Madhya Pradesh	200
Do.	Indian Aluminium Co. Ltd. [Indian interests, 60.4%, and Alcan Aluminium Ltd. (Canada), 39.6%]	Kolhapur District mines, Maharashtra	600
Do.	Gujarat Mineral Development Corp. (Gujarat State Government, 100%)	Kutch and Saurashtra Mines, Gujarat	500
Do.	Hindalco Industries Ltd. (Birla Group, 33%; foreign investors, 26%; private Indian investors, 23%; and financial institutions, 18%)	Lohardaga District mines, Bihar	750
Do.	Indian Aluminium Co. Ltd. [Indian interests, 60.4%, and Alcan Aluminium Ltd. (Canada), 39.6%]	do.	200
Do.	National Aluminium Co. Ltd. (Indian Government, 100%)	Panchpatmali Hills, Koraput District mines, Orissa	2,400
Do.	Minerals & Minerals Ltd. (Indian Government, 100%)	Richuguta, Palamu District mines, Bihar	200
Barite	Andhra Pradesh Mineral Development Corp. Ltd. (Andhra Pradesh State Government, 100%)	Cuddapah District mines, Andhra Pradesh	350
Do.	Associated Mineral Corp.	do.	75
Do.	Pragathi Minerals	do.	50
Do.	Shri C. M. Ram nath Reddy	do.	75
Do.	Vijaylaxmi Minerals Trading Co.	do.	50
Cement	Larsen and Taubro Ltd.	Awarpur Plant, Maharashtra	2,300
Do.	Century Cement [Century Textiles and Industries Ltd. (a subsidiary of the Birla Group), 100%]	Baikunth Plant, Madhya Pradesh	1,120
Do.	Coromandel Fertilizers Ltd. [Chevron Chemical Co. (United States), 23.55%; International Minerals and Chemical Co., 20.89%; Parry and Co., 10.64%; E.I.D. Parry (India) Ltd., 6.65%; and others, 38.27%]	Chilamkur Plant, Andhra Pradesh	1,000
Do.	The Associated Cement Cos. Ltd. (Indian Government, 34.86%, and private shareholders, 65.14%)	Gagal Plant, Himachal Pradesh	1,830
Do.	Raymond Cement Works (a division of Raymond Woolen Mills Ltd., J K Singhanian, principal shareholder)	Gopalnagar Plant, Madhya Pradesh	1,250
Do.	Narmada Cement Co. Ltd. (Chowgule and Co. Ltd., 34%; Gujarat State Government, 17.33%; and others, 48.67%)	Jafrabad Plant, Gujarat	1,000
Do.	Rajashree Cement (a division of Indian Rayon and Industries Ltd., 100%)	Khor Plant, Karnataka	1,020
Do.	The Associated Cement Cos. Ltd. (Indian Government, 34.86% and private shareholders, 65.14%)	Kymore Plant, Madhya Pradesh	1,500
Do.	Mangalam Cement Ltd.	Morak Plant, Rajasthan	1,000
Do.	Mysore Cements Ltd. (Government institutions and banks, 41.13%; Corporate Trust Holdings, 21.70%; and others, 37.17%)	Narasingarh Plant, Madhya Pradesh	1,089

See footnotes at end of table.

TABLE 2--Continued
INDIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2000

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity e/
Cement--Continued:		Cement Corp. of India Ltd. (Indian Government, 100%)	Nayagaon Plant, Madhya Pradesh	1,330
Do.		J K Cement Works (a division of J K Synthetics Ltd., 100%)	Nimbahera Plant, Rajasthan	1,462
Do.		The India Cement Co. Ltd. (Indian Government, 26%; Life Insurance Corp. of India, 24%; and others, 50%)	Sankarnagar Plant, Tamil Nadu	1,000
Do.		Maihar Cement [Century Textiles and Industries Ltd. (a subsidiary of the Birla Group), 100%]	Satna Plant, Madhya Pradesh	1,800
Do.		Shree Digvijay Cement Co. Ltd.	Shreeniwas Plant, Maharashtra	1,060
Do.		Lakshmi Cement (a division of Straw Products Ltd., J K Singhanian, principal shareholder)	Sirohi Plant, Rajasthan	1,400
Do.		Manikgarh Cement [Century Textiles and Industries Ltd. (a subsidiary of the Birla Group), 100%]	Tehsil Rajura Plant, Maharashtra	1,000
Do.		Vasavadatta Cement (Kesoram Industries Ltd., 100%)	Vasavadatta Plant, Karnataka	1,000
Do.		Vikram Cement [Grasim Industries Ltd. (a subsidiary of Birla Group), 100%]	Vikram Plant, Madhya Pradesh	1,000
Do.		Raasi Cement Ltd. (Andhra Pradesh Government, 50%, and Development Co. Ltd., 50%)	Vishnupuram Plant, Andhra Pradesh	1,000
Do.		The Associated Cement Cos. Ltd. (Indian Government, 34.86%, and private shareholders, 65.14%)	Wadi Plant, Karnataka	2,180
Chromite		Ferro Alloys Corp. Ltd.	Cuttack District, Orissa	120
Do.		Orissa Mining Corp. Ltd. (Orissa Industries Ltd., 100%)	do.	300
Do.		Tata Iron & Steel Co. Ltd.	do.	100
Do.		Ferro Alloys Corp. Ltd.	Dhenkanal District, Orissa	75
Do.		Orissa Mining Corp. Ltd. (Orissa Industries Ltd., 100%)	do.	200
Do.		Mysore Minerals Ltd.	Hassan District, Karnataka	125
Do.		Ferro Alloys Corp. Ltd.	Kendujhar District, Orissa	75
Do.		Orissa Mining Corp. Ltd. (Orissa Industries Ltd., 100%)	do.	100
Do.		Ferro Alloys Corp. Ltd.	Khammam District, Andhra Pradesh	100
Coal, bituminous	million tons	Bharat Coking Coal Ltd. (a subsidiary of Coal India Ltd.) (Indian Government, 100%)	Bihar and West Bengal	26
Do.	do.	Central Coalfields Ltd. (a subsidiary of Coal India Ltd.) (Indian Government, 100%)	Bihar	27
Do.	do.	Eastern Coalfields Ltd. (a subsidiary of Coal India Ltd.) (Indian Government, 100%)	Bihar and West Bengal	21
Do.	do.	Mahanadi Coalfields Ltd. (a subsidiary of Coal India Ltd.) (Indian Government, 100%)	Orissa	21
Do.	do.	North Eastern Coalfields Ltd. (a subsidiary of Coal India Ltd.) (Indian Government, 100%)	Assam	640
Do.	do.	Northern Coalfields Ltd. (a subsidiary of Coal India Ltd.) (Indian Government, 100%)	Madhya Pradesh and Uttar Pradesh	24
Do.	do.	Singareni Collieries Co. Ltd. (Andhra Pradesh State Government, 50%, and Indian Government, 50%)	Andhra Pradesh	18
Do.	do.	South Eastern Coalfields Ltd. (a subsidiary of Coal India Ltd.) (Indian Government, 100%)	Madhya Pradesh	36
Do.	do.	Western Coalfields Ltd. (a subsidiary of Coal India Ltd.) (Indian Government, 100%)	Madhya Pradesh and Maharashtra	18
Coal, lignite	do.	Neyveli Lignite Corp. Ltd. (Indian Government, 100%)	Tamil Nadu	17
Copper		Indo-Gulf Fertilizers and Chemicals Corp.	Birla Copper Complex smelter, Dahej, Gujarat	100
Do.		Hindustan Copper Co. Ltd. (Indian Government, 100%)	Indian Copper Complex mines, Ghatsila District, Bihar	31
Do.		do.	Indian Copper Complex smelter-refinery, Ghatsila District, Bihar	20
Do.		do.	Khetri Copper Complex mines, Khetrinagar Rajasthan	15
Do.		do.	Khetri Copper Complex smelter-refinery, Khetrinagar District, Rajasthan	45
Do.		do.	Malanjkhand Copper Complex mines, Balaghar District, Madhya Pradesh	22
Do.		Sterlite Industries Ltd.	Tuticorin Smelter, Tamil Nadu	100
Ilmenite-rutile ore		Kerala Minerals and Metals Ltd. (Kerala State Government, 100%)	Chavara, Kerala	100
Do.		Indian Rare Earths Ltd. (Indian Government, 100%)	do.	200
Do.		do.	Ganjam, Orissa	220
Do.		do.	Manavalakurichi, Tamil Nadu	65

See footnotes at end of table.

TABLE 2--Continued
INDIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2000

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity e/
Iron and steel:			
Crude steel	Visvesvaraya Iron and Steel Ltd. (Karnataka State, 60%, and Steel Authority of India Ltd., Indian Government, 40%)	Bhadravati steel plant, Karnataka	180
Do.	Steel Authority of India Ltd. (Indian Government, 100%)	Bhilai steel plant, Madhya Pradesh	4,000
Do.	do.	Bokaro steel plant, Bihar	4,000
Do.	Indian Iron and Steel Co. Ltd. (wholly owned subsidiary of Steel Authority of India Ltd.) (Indian Government, 100%)	Burnpur steel plant, West Bengal	1,500
Do.	Steel Authority of India Ltd. (Indian Government, 100%)	Durgapur steel plant, West Bengal	1,600
Do.	Tata Iron and Steel Co. Ltd.	Jamshedpur steel plant, Bihar	3,200
Do.	Steel Authority of India Ltd. (Indian Government, 100%)	Rourkela steel plant, Orissa	1,800
Do.	Rashtriya Ispat Nigam Ltd.	Visakhapatnam steel plant, Andhra Pradesh	3,200
Do.	Ministeel plants (privately owned)	About 180 plants located throughout India	4,700
Iron ore	National Mineral Development Corp. Ltd. (Indian Government, 100%)	Bailadila, Madhya Pradesh	9,000
Do.	Steel Authority of India Ltd. (Indian Government, 100%)	Bastar and Durg District, Madhya Pradesh	7,000
Do.	Kudremukh Iron Ore Co. Ltd. (Indian Government, 100%)	Kudremukh, Chikmagalur District, Karnataka	9,500
Do.	National Mineral Development Corp. Ltd. (Indian Government, 100%)	Donimalai, Karnataka	9,000
Do.	Chowgule and Co. Ltd.	Goa	2,500
Do.	Dempo Mining Corp. Ltd.	Goa	2,500
Do.	V.M. Salgaocar & Bros. Pvt. Ltd.	Goa	2,500
Do.	Steel Authority of India Ltd. (Indian Government, 100%)	Kendujhar District, Orissa	3,000
Do.	Tata Iron and Steel Co. Ltd.	do.	2,000
Do.	Indian Iron and Steel Co. Ltd. (wholly owned subsidiary of Steel Authority of India Ltd.) (Indian Government, 100%)	Singhbhum District, Bihar	2,500
Do.	Steel Authority of India Ltd. (Indian Government, 100%)	do.	3,500
Do.	Tata Iron and Steel Co. 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. (Indian Government, 100%)	do.	22
Lead ore	Hindustan Zinc Ltd. (Indian Government, 100%)	Agnigundala Mine, Andhra Pradesh	72
Do.	do.	Sargipalli Mine, Orissa	150
Lead, primary	do.	Chanderiya Smelter, Rajasthan	35
Do.	do.	Tundoo Smelter, Bihar	8
Do.	do.	Visakhapatnam (Vizag) Smelter, Andhra Pradesh	22
Lead, secondary	Indian Lead Co.	Thane Refinery, Mumbai, Maharashtra	25
Lead-zinc ore	do.	Rampura-Agucha Mine, Rajasthan	1,300
Do.	do.	Zawar mine group, Rajasthan	1,200
Magnesite	Burn Standard Co. Ltd. (Indian Government, 100%)	Salem, Tamil Nadu	150
Do.	Dalmia Magnesite Corp.	do.	150
Do.	Tamil Nadu Magnesite Ltd. (Tamil Nadu State Government, 100%)	do.	150
Manganese ore 2/	Manganese Ore India Ltd. (Indian Government, 100%)	Adilabad, Andhra Pradesh	NA
Do.	Falechand Marsingdas	Andhra Pradesh	NA
Do.	Manganese Ore India Ltd. (Indian Government, 100%)	Balaghat, Madhya Pradesh	NA
Do.	J.A. Trivedi Bros.	do.	NA
Do.	Sandur Manganese and Iron Ores Ltd.	Bellary, Karnataka	NA
Do.	Manganese Ore India Ltd. (Indian Government, 100%)	Bhandara, Maharashtra	NA
Do.	Eastern Mining Co.	North Kanara, Karnataka	NA
Do.	Mysore Minerals Ltd.	do.	NA
Do.	Manganese Ore India Ltd. (Indian Government, 100%)	Keonjhar, Orissa	NA
Do.	Mangilah, Rungta (Pvt.) Ltd.	do.	NA
Do.	Orissa Mining Corp. Ltd.	do.	NA
Do.	Rungta Mines (Pvt.) Ltd.	do.	NA
Do.	Serajuddin & Co.	do.	NA
Do.	S. Lall & Co.	do.	NA
Do.	Tata Iron and Steel Co. Ltd.	do.	NA
Do.	Orissa Mineral Development Co. Ltd.	Koraput, Orissa	NA
Do.	Orissa Mining Corp. Ltd.	do.	NA
Do.	Mysore Minerals Ltd.	Shimoga, Karnataka	NA
Do.	Aryan Mining & Trading Corp.	Sundargarh, Orissa	NA

See footnotes at end of table.

TABLE 2--Continued
INDIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2000

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity e/
Manganese ore 2/--Continued:	Orissa Manganese & Minerals (Pvt.) Ltd.	Sundargarh, Orissa	NA
Do.	Tata Iron and Steel Co. Ltd.	do.	NA
Do.	R.B.S. Shreeram Durga Prasad and Falechand Marsingdas	Vizianagaram, Andhra Pradesh	NA
Petroleum, refined products thousand 42-gallon barrels per day	Cochin Refineries Ltd. (a subsidiary of Oil and Natural Gas Corp., Indian Government, 55%, and private interests, 45%)	Ambalamugal Refinery, Kerala	93,000
Do.	Indian Oil Corp. (a subsidiary of Oil and Natural Gas Corp.) (Indian Government, 91%, and private interests, 9%)	Barauni Refinery, Bihar	66,000
Do.	Bongaigaon Refinery and Petrochemicals Ltd. (a subsidiary of Oil and Natural Gas Corp.) (Indian Government, 100%)	Bongaigaon Refinery, Assam	27,000
Do.	Indian Oil Corp. (a subsidiary of Oil and Natural Gas Corp.) (Indian Government, 91%, and private interests, 9%)	Digboi Refinery, Assam	12,000
Do.	do.	Guwahati Refinery, Assam	20,000
Do.	do.	Haldai Refinery, West Bengal	61,000
Do.	do.	Koyali Refinery, Gujarat	185,000
Do.	Madras Refineries Ltd. (a subsidiary of Oil and Natural Gas Corp.) (Indian Government, 52%, and private interests, 48%)	Madras Refinery, Tamil Nadu	131,000
Do.	Bharat Petroleum Corp. Ltd. (a subsidiary of Oil and Natural Gas Corp.) (Indian Government, 67%, and private interests, 33%)	Mahul Refinery, Mumbai (Bombay), Maharashtra	135,000
Do.	Industan Petroleum Corp. Ltd. (a subsidiary of Oil and Natural Gas Corp.) (Indian Government, 51%, and private interests, 49%)	do.	110,000
Do.	do.	Visakhapatnam Refinery, Andhra Pradesh	90,000
Do.	Indian Oil Corp. (a subsidiary of Oil and Natural Gas Corp.) (Indian Government, 91%, and private interests, 9%)	Mathura Refinery, Uttar Pradesh	156,000
Do.	do.	Panipat Refinery, Uttar Pradesh	120,000
Phosphate rock 3/	Rajasthan State Mineral Development Corp. Ltd. (Rajasthan State Government, 100%)	Badgaon, Dakankotra, Kanpur, Kharbaria- ka-Guda, and Sallopat Mines, Rajasthan	NA
Do.	Pyrites Phosphates and Chemicals Ltd.	Durmala and Maldeota underground mines, Uttar Pradesh	NA
Do.	Madhya Pradesh State Mining Corp. Ltd. (Pradesh State Government, 100%)	Hirapur and Khatamba Mines, Madhya Pradesh	NA
Do.	Rajasthan State Mines and Minerals Ltd. (Rajasthan State Government, 100%)	Jhamarkotra Mine, Rajasthan	NA
Do.	Hindustan Zinc Ltd. (Indian Government, 100%)	Maton Mine, Rajasthan	NA
Zinc	Binani Zinc Ltd.	Binanipuram Smelter, Kerala	30
Do.	Hindustan Zinc Ltd. (Indian Government, 100%)	Chanderiya Smelter, Rajasthan	70
Do.	do.	Debari Smelter, Rajasthan	49
Do.	do.	Visakhapatnam (Vizag) Smelter, Andhra Pradesh	30

e/ Estimated. NA Not available.

1/ Scheduled for startup in 2002.

2/ Capacity of clusters of surface mines varies extremely, depending on demand. Estimated total capacity is 1.5 million metric tons per year.

3/ Estimated total annual phosphate rock capacity is 800,000 metric tons.