

INDIA

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India's economy in 2001 was characterized by a gross domestic product (GDP) growth of 5.4%. Fiscal deficit was projected to be 4.7% of GDP (Far Eastern Economic Review, 2001a). Interest rates were low with the Reserve Bank of India lending rate at 7%. Agriculture encompassed 25% of GDP and was forecast at 3.5% growth rate. Industrial production growth rate declined compared to that for 2000. The Government scrapped various surcharges on corporate income tax, simplified excise duties, and cut interest rates. It also sold its stakes in state-owned enterprises through privatization. The rate of growth of exports led by jewelry, leather goods, machinery, software, and textiles declined in 2001 and total exports represented 10% of GDP.

India is endowed with vast mineral resources, and their production contributed 2% to GDP. The country exploited 52 minerals—3 mineral fuels, 11 metallic minerals, and 38 non-metallic minerals in 2001. Minerals accounted for more than 20% of Indian exports. Increases in production of bauxite, cathode copper, crude oil, iron ore, steel, and other minerals were noted.

The metal industries in the States of Gujarat and Rajasthan escaped largely intact from the earthquake in western India on January 26. Most industrial minerals operations were also unscathed. Indian Farmers Fertilizer Cooperative at Kandia and Gujarat Narmada Valley Fertilizers Ltd. at Bharuch suffered damages. The quake also affected the ship breaking (salvaging) facilities in the seismic zone of Bhavnagar. Infrastructure repairs in the region were underway (Industrial Minerals, 2001d).

The Government approved applications involving total foreign direct investment of more than \$700 million in the mining sector. Low foreign investment was due to the country's poor infrastructure, delays in decisionmaking, labor laws, and high royalty rates. India allowed automatic approval of 100% foreign equity investment in prospecting, mining, processing, and metallurgy, except in diamond and precious stones. Above 74%, foreign investment in diamond and precious stones had to be approved by the Government (Asian Journal of Mining, 2001b). In the steel industry, the Government's steel policy also provided for direct foreign investment in the sector for mergers and acquisitions.

The Geological Survey of India outlined new gold resources in three States. In Andhra Pradesh, a resource of 4.8 million metric tons (Mt) averaging 1.9 grams per metric ton (g/t) gold was defined in the Dona block. A further resource defined in the Bhukia East block of the Banswara district in Rajasthan increased its total resources to 7.1 Mt averaging 2.96 g/t gold. In Madhya Pradesh, a resource of 3.3 Mt averaging 1.04 g/t gold was outlined in the Ghrhar Pahar block in the Sidhi district (Mining Journal, 2001b).

Government Policies and Programs

India's import duty on gold had been reduced from \$8.57 per 10 grams (g) of metal to \$5.35 per 10 g in an attempt to reduce smuggling. The tariff on imports of second-choice and defective quality steel was raised from 25% to 35%. The reduced duty rate of 5% on scrap for melting, currently available only to electric arc furnace operators, had been extended to all steel producers irrespective of process route. Meanwhile, dumping action had restricted Indian flat producers' exports to Canada, the European Union, and the United States. The Government asked the U.S. Government to suspend dumping duties on its steel exports in exchange for tonnage quotas and price limits (Metal Bulletin, 2001j).

The trade association, Indofer, was seeking from the Government an increase in customs duties on imported steel—cold-rolled products from 35% to 40%, hot-rolled coils from 25% to 30%, and ship plates from 5% to 20%. The Government also issued a directive requiring compliance to standards for imports of some stainless steel products such as cold-rolled carbon steel sheets, hot-rolled steel strips, and sheets and strips for utensils (Metal Bulletin, 2001h). The Ministry of Commerce imposed antidumping duties on ferrosilicon imports from China and Russia. It also imposed definitive antidumping duties on imports of certain grades of alloy and nonalloy steel billets, bars, and rounds from China and Russia for 5 years.

The Government planned to restructure loss-making public sector coal companies including Bharat Coking Coal Ltd., Eastern Coalfields Ltd., and Central Coalfields Ltd. The agenda would be technical upgrading of machinery and equipment, downsizing of workforce, and plugging of losses due to pilferage. The privatization of Coal India Ltd. was part of reforms in the coal mining sector rehabilitation project undertaken by the Government and the World Bank (Asian Journal of Mining, 2001c).

The State government of West Bengal was to give up its monopoly on mining rights and to announce a new mining policy that was to invite private investment in the sector. The State is known to contain apatite, coal, and dimension-stone resources. The State government of Haryana decided to grant mining leases for minor minerals by public auction. It also decided to keep the duration of the lease to a period of 7 years (Asian Journal of Mining, 2001a).

Commodity Review

Metals

Aluminum.—India's reserves of metallurgical bauxite were in excess of the country's requirements, but nonmetallurgical

grades were confined to Gujarat and Madhya Pradesh with scattered deposits in Andhra Pradesh, Bihar, Maharashtra, and Orissa. The country imported 40% to 60% of its calcined bauxite requirements from China and Guyana (Industrial Minerals, 2001b).

Gujarat Mineral Development Corp., in a joint venture with Jeffries & Co. and Ambassador Group International, both of the United States, planned to develop a \$700 million alumina refinery at Tragadi near Mandvi in the Kutch district of Gujarat. The company would hold a 6% interest and its share of capital costs of \$42 million in the project. Jeffries and Ambassador Group were taking a 45% stake each. The 750,000-metric-ton-per-year (t/yr) refinery would use bauxite ore mined from the Kutch, Jamnagar, and Juagadh districts where 90 Mt of low-grade bauxite were available and the output would be exported (Mining Journal, 2001d). Attached to the alumina project was the building of a 1.15-million-metric-ton-per-year (Mt/yr) coke plant and a 100-megawatt (MW) powerplant.

Construction of the 1-Mt/yr Utkal alumina refinery project at Doragurha in the Rayagada district of Orissa was expected to start by the end of 2001 with the plant being commissioned in 2005. Utkal Alumina International Ltd., in which Hindalco Industries Ltd. (20%), Alcan Aluminium Ltd. of Canada (35%), and Norsk Hydro A/S of Norway (45%) were shareholders, made large investments in infrastructure, roads, and an airstrip. The \$1 billion project included a 50-MW cogeneration plant and a port-loading facility at Vishakhapatnam. It also had received its bauxite mining lease from Orissa Mining Corp. to mine reserves at Baphlimali. The project was running behind schedule because of protests of opponents (Metal Bulletin, 2001ee). The company planned to proceed with completing an environmental impact assessment study on the project. The three partners envisioned a new plan of a bigger 3-Mt/yr project.

In December, Norsk Hydro withdrew from the Utkal alumina project citing the lack of progress at the project, an assessment of the future market for alumina, and positive developments of its Alunorte alumina project in Brazil. The company's equity alumina production from Alpart in Jamaica and Alunorte should be substantial enough to meet 70% of its requirements (Mining Journal, 2001f). Hindalco's parent, Aditya Birla Group, acquired a large stake in engineering company, Larsen & Toubro, which was interested in the alumina project as a contractor. There was a speculation in India that Hindalco and Larsen & Toubro would join together in the project.

Hindalco and Alcoa of the United States teamed up to bid for Bharat Aluminium Co. Ltd. (Balco) in which the Government was divesting a 51% stake and Sterlite Industries was the sole other bidder. Sterlite Industries won the tender for the stake in Balco with a \$118 million offer. Balco employees continued their opposition to the privatization and ended a 68-day strike in May. Balco had a 200,000-t/yr alumina refinery and a 100,000-t/yr aluminum smelter at its integrated complex in Korba in the newly formed Chattisgarh State. Plans were being drawn up to increase smelter capacity by 50% to 150,000 t/yr. Sterlite Industries estimated a cost of \$43 million to reactivate the 408 damaged pots at the smelter because of the strike in protest. The downstream facilities had the capacities to produce 40,000 t/yr of rolled products, 35,000 t/yr of rods, 18,000 t/yr of billets and slabs, and 7,000 t/yr of extrusions. Balco also had a new

cold-rolling mill near its smelter to produce 36,240 t/yr of sheet and coils. A captive powerplant at Korba had an installed capacity of 270 MW. Balco owned bauxite mines in Madhya Pradesh. The company had another plant at Bidanbag in West Bengal for downstream processing that included conductors, extrusions, foils, and rolled products (Metal Bulletin, 2001t).

Hindalco commissioned its ninth potline, adding 33,000 t/yr of capacity as part of the \$385 million brownfield expansion project. The company would add another two potlines to complete the 100,000-t/yr expansion before March 2003 when its total smelting capacity would be raised to 342,000 t/yr. Alumina refining capacity also was being increased from 450,000 t/yr to 660,000 t/yr and power generation capacity would be increased from 619 MW to 769 MW (Metal Bulletin, 2001g).

Indian Aluminium Co. Ltd.'s (Indal) planned expansion involved transferring the idled pots at its Belgaum smelter in Karnataka to its Hirakud smelter in Orissa to raise the latter's capacity to 57,000 t/yr from 30,000 t/yr. The project would cost \$21.4 million. Indal also operated a 280,000-t/yr alumina refinery at Belgaum. The company planned to spend \$4.3 million on expanding its Muri alumina refinery in Jharkhand to 100,000 t/yr from 88,000 t/yr and \$15 million on modernization of its various facilities. Indal also planned to add a second captive powerplant of 77 MW at its Hirakud smelter at an estimated cost of \$59.3 million (Metal Bulletin, 2001i).

Orissa Extrusions Ltd. (OEL) was set up by Indal in a joint venture with Hydro Aluminium of Norway and the State government of Orissa. OEL had a capacity of 8,000 t/yr of extruded aluminum and employed 153 workers. After Hindalco took over Indal with 74% of its equity, India's Board for Industrial and Financial Reconstruction asked Hindalco to submit a technical and economic proposal for the revival of OEL. The cost of the rehabilitation scheme was estimated to be \$3.1 million (Metal Bulletin, 2001f).

The Government gave clearance to National Aluminium Co. Ltd. (Nalco) to build its eighth captive powerplant of 120 MW, which was estimated to cost \$103 million and likely to be completed in 36 months. The project would ensure continuous supply of power to Nalco's aluminum smelter at Angul in Orissa when it was expanded from 230,000 t/yr to 350,000 t/yr in May 2002. Meanwhile, Nalco began ramping up output from 1.05 Mt/yr to 1.58 Mt/yr from the expansion of its Damanjodi alumina refinery in June 2001 (Metal Bulletin, 2001r). Nalco had doubled its bauxite mining capacity to 4.8 Mt/yr. The Government was to privatize Nalco in late 2001 by selling up to 30% interest to retail and institutional investors and issuing 15% of the equity as global depository receipts.

Chromite.—India was the largest exporter of chromite to China, making sales of more than 400,000 t/yr for conversion there into ferrochrome, which was either consumed domestically or reexported. Minerals and Metals Trading Corp. decided to keep its chromite ore export prices unchanged until September despite the fall in world free market levels. However, Orissa Mining Corp. and Tata Iron and Steel Co. Ltd. (Tisco) offered lower domestic prices. As a result, owing to low high-carbon ferrochrome prices in the domestic market, many producers suspended or cut back production of ferrochrome (Metal Bulletin, 2001q).

Copper.—The Government planned to complete the sale of its 51% stake in Hindustan Copper Co. Ltd. (HCL) by June, but failed. It would first sell the Khetri smelter in Rajasthan and the Taloja copper complex rod plant in Maharashtra. The prospective bidders were Birla Copper, Phelps Dodge-Metdist, and Sterlite Industries. Birla Copper completed the expansion of its Gujarat smelter's capacity from 100,000 t/yr to 150,000 t/yr to reduce fixed costs and to augment its presence in the export markets mainly in Southeast Asia (Metal Bulletin, 2001b). The company also planned to add 70,000 t/yr of capacity through a brownfield expansion.

Sterlite Industries identified a third mine at Mt. Lyell in Tasmania, Australia, that it planned to acquire. Two mines in Australia, which Sterlite acquired at a cost of \$43 million, supplied 50% of its concentrate feeds. The remaining material was imported from Chile. Sterlite Industries' copper smelter at Tuticorin faced demonstration by villagers who claimed that the plant polluted water resources in the area and who demanded its closure. The expansion at its smelter-refinery reached full capacity of 150,000 t/yr (Metal Bulletin, 2001x).

Swil's new copper smelter and refinery at Bharuch, Gujarat, was due to start production in January 2002. Output was estimated at 20,000 t/yr of anodes and 50,000 t/yr of cathodes. Boliden Contech, which was the contractor, assured that full production would be reached 6 months after startup. About 20% of the feed would be low-sulfur concentrates, 30% ashes and residues, 40% medium-grade scrap, and the remaining 10% high-grade scrap (Metal Bulletin, 2001y).

Iron and Steel.—Sesa Goa, an iron ore miner owned by Mitsui of Japan, shipped 26,000 metric tons (t) of fines from Haldia and 20,000 t from Paradip to China in January. The iron ore was transported from the Thakurani Mine in Orissa leased by K. P. Enterprises by rail—300 kilometers (km) to Haldia and 500 km to Paradip. It contained about 63.5% iron. Exports up to 1 Mt/yr were planned, and the mine had a capacity of 3 Mt/yr. The company operated two mines with 1.5 Mt/yr in Karnataka and mines in Goa with 4.5 Mt/yr and shipped ore out of Marmugao and Chennai (Metal Bulletin, 2001w).

Rio Tinto Orissa Mining Ltd., a joint venture owned by Rio Tinto Plc. (51%) and Orissa Mining Corp. (49%), studied a large new mining project that could start production in 2006, produce 25 Mt/yr of iron ore in its fifth year, and have an eventual capacity of 50 Mt/yr. The joint venture would exploit the Gandhamardan/Malanjtoli areas of Orissa, which had ore reserves of 800 Mt. The project's plan was to export 50% of output. To accommodate the larger exports, a new port was planned at Dhamra to be ready in 4 years and handle at least 5 Mt/yr of iron ore (Metal Bulletin, 2001w).

Kudremukh Iron Ore Co. Ltd. planned to open a new iron ore mine and beneficiation plant at Ongole in the Prakasam district of Andhra Pradesh. The greenfield project aimed to produce 1.5 Mt/yr to 2 Mt/yr of concentrates for export and was expected to be completed in 2004. Initial investment would be \$53.5 million during 3 years and a subsequent expansion to 8 Mt/yr would cost a further \$85.6 million. The company had existing operations at Kudremukh in Karnataka where low-grade ores were beneficiated into 66% iron concentrates for export to China, Japan, and the Republic of Korea. The operations had capacities of 6.8 Mt/yr of iron ore concentrate

and 3.5 Mt/yr of pellets. The Government granted a further 1-year extension of the mining lease as did the State government of Karnataka. The company was earmarked for selloff (Metal Bulletin, 2001o).

Jindal Vijayanagar Steel's new iron ore pelletizing plant reached a production rate of 180,000 metric tons per month (t/mo) in March. Half of the output was used in its own Corex ironmaking plant, and the other half was being exported to China. The company planned to export 1.5 Mt/yr of pellets. Jindal Vijayanagar Steel also started up its second Corex hot-metal production plant at Toranagallu. This module increased the hot-strip capacity of the plant from 800,000 t/yr to 1.6 Mt/yr. Meanwhile, Essar Steel planned to sell its remaining 49% stake in Hy-Grade Pellets at Visakhapatnam on India's east coast because only 30% of its needs came from Hy-Grade. The company sold 51% of the iron ore pellet plant to Stemcor of the United Kingdom in 2000. Hy-Grade had a capacity of 3 Mt/yr of pellets (Metal Bulletin, 2001d).

National Mineral Development Corp. (NMDC) was to build a 300,000-t/yr pig iron plant at Geedam in Chattisgarh State. The investment was expected to cost \$64 million. Also in Chattisgarh, a Romelt steel plant was being built with an estimated capacity of 300,000 t/yr and a provision for a further expansion to 600,000 t/yr. It would use fines/slimes generated at NMDC's Bailadila mines (Mining Journal, 2001e). Kudremukh Iron & Steel Co. ran a blast furnace of 230,000 t/yr that had been producing pig iron since February 2001 at a cost of \$64 million.

A move to increase natural gas prices affected Indian producers of direct-reduced iron (DRI). Essar Steel and Ispat Industries ran two largest gas-based DRI plants producing iron for use in their own steel plants. A third producer, Vikram Ispat, operated on a merchant basis. These three companies had 4 Mt/yr of installed DRI capacity. The country also had 2 Mt/yr of coal-based DRI production capacity with 26 plants. Bhushan Steel & Strips Ltd. planned to set up a coal-based DRI plant on a greenfield site in Chattisgarh or Orissa. Another source of concern was the Government's move to allow more scrap imports at a 5% rate of import duty (Metal Bulletin, 2001k). In September, Ispat Industries' DRI module and its 1.5-Mt/yr steel plant at Dolvi in Maharashtra were shut down because of inability to pay the electricity charges.

Essar Steel planned to raise output of DRI to a rate of 2.4 Mt/yr as part of a program to increase its production of hot-rolled coils to 2.3 Mt/yr in 2002. The three Midrex DRI modules at its Hazira works in Gujarat produced 2.2 Mt/yr and, by reducing the bottleneck, they should produce 2.4 Mt/yr. Of its target hot-rolled coil output, Essar Steel planned to export 900,000 t and deliver 1.4 Mt to the domestic market (Metal Bulletin, 2001c).

Tata Group pulled out of its \$1.5 billion 10-Mt/yr greenfield steel project at Gopalpur in Orissa, citing excess capacity in the steel industry and poor infrastructure at the proposed site. The company spent \$32 million acquiring infrastructure and 1,500 hectares (ha) of land. Tata Group switched strategy and was targeting acquisitions to enhance capacity rather than tying up funds in a huge greenfield project (Metal Bulletin, 2001dd). Meanwhile, Tata Steel planned to rebuild one of its three blast furnaces at Jamshedpur at a capital expense of \$43 million.

Union Trust of India, an institutional investor, called for eight

newest iron and steel companies to merge into a single entity in order to improve their chances of viability. The companies were Essar Steel, Hy-Grade Pellets, Ispat Industries, Ispat Metallics, Jindal Iron & Steel, Jindal Vijayanagar Steel, Lloyds Metal, and Lloyds Steel. The combined total production capacity would amount to 6 Mt/yr of iron ore pellets, 3.15 Mt/yr of DRI, 2 Mt/yr of pig iron, and 7.38 Mt/yr of hot-rolled steel products. The merged company would become India's second largest steel producer. The merger could save \$43 million by joint raw materials purchasing (Metal Bulletin, 2001p).

Atlas Cycle Industries Ltd. decided to set up a cold strip rolling mill adjacent to its steel tube plant at Gurgaon in Haryana. The project raised fears of growing overcapacity in cold strip production. India had 58 cold-rolling mills, of which 54 were stand-alone units without their own steelmaking and represented 43% of the installed capacity. One of them, Shree Vishnupriya Steel with a capacity of 225,000 t/yr at Nandyal in Andhra Pradesh, was taken over by Jindal Iron & Steel and Jindal Vijayanagar Steel. The mill would be transferred to Tornagallu in the Bellary-Hospet region of Karnataka where Jindal Vijayanagar Steel's 1.6-Mt/yr hot-rolled coil plant was located. Bhushan Steel & Strips Ltd. prepared to go ahead with its 250,000-t/yr cold-rolling mill at Khopoli near Mumbai. The project would cost \$103 million and was likely to be operative by 2003. Meanwhile, Tata Steel's new cold-rolling mill was operating at full capacity in June 2001 producing at a rate of 1.2 Mt/yr. It exported 300,000 t/yr of coils to Southeast Asian markets (Metal Bulletin, 2001s).

Jindal Steel & Power planned to establish a 1-Mt/yr sponge iron plant in Orissa at a capital cost of \$270 million. The plant would use locally produced iron ore from its own mines. The company also was considering coal mining if it planned to fuel the sponge iron plant with piped-in gasified coal (Mining Journal, 2001c). Jindal Steel & Power had a 600,000-t/yr coal-based sponge iron plant in Chattisgarh with its own captive coal and iron ore mines. Meanwhile, a buyer was sought for Sponge Iron India Ltd., which had a combined capacity of 60,000 t/yr of sponge iron with two modules.

Jindal Strips secured financing for a project to double production capacity from 30,000 t/yr to 60,000 t/yr for cold-rolled stainless steel strip at its Hissar plant in Haryana State. The mill would be capable of rolling thinner gauge material down to 0.2 millimeters (mm) and 1,500 mm wide. The expanded mill was in operation by March 2001, and the project cost \$53.5 million. Jindal Strips was the biggest producer of stainless steel in India with a capacity of 250,000 t/yr (Metal Bulletin, 2001m).

Steel Authority of India Ltd. (SAIL) hastened the selloff of Salem Stainless steel plant in Tamil Nadu, its two alloy steel plants at Durgapur in West Bengal and at Bharavati in Karnataka under Visvesvaraya Iron & Steel, its powerplant, and its fertilizer plant. Tisco and Jindal Strips were the two short listed for the sale. Salem Stainless had a 250,000-t/yr hot-rolling mill and a 60,000-t/yr cold-rolling mill. It was trying to produce hot-rolled coils of plain carbon steel that were among the plant's premium products and for export (Metal Bulletin, 2001u). Visvesvaraya Iron & Steel had a mini blast furnace of 200,000-t/yr hot-metal capacity and a 77,000-t/yr alloy and special steel plant.

Tisco offered to buy up shares in Tata Special Steels Ltd.

(TSSL) and had already owned 44.76% of the company. TSSL was the leading wire producer in India and wanted to expand its capacity from 165,000 t/yr to 300,000 t/yr. It had two wire-drawing plants and operated a cold-rolling plant of 40,000 t/yr and a specialized steel fabrication unit. Tisco also was taking over management of Indian Steel & Wire Products, which had an installed capacity of 354,000 t/yr and made steel wire and rolls for industrial applications (Metal Bulletin, 2001cc).

Tisco began hot trials on its second galvanizing line in June and completed commissioning in 6 months. The 300,000-t/yr line produced galvanized sheet for the automobile and domestic appliance industries. The \$58 million line produced 150,000 t/yr of material for automobile bodies, 100,000 t/yr of construction and engineering grades, and 50,000 t/yr for home appliances. Tisco's other galvanizing line had a capacity of 100,000 t/yr of construction-grade sheet (Metal Bulletin, 2001aa).

Tisco also was seeking to acquire a producer of color-coated sheets after its 300,000-t/yr galvanizing line was commissioned late in 2001. The two best established targets were Ispat Industries and Shree Pre-Coated Steels with each having a capacity of 50,000 t/yr. Hardcastle & Waud started a coating line at Kalyan near Mumbai and had a capacity of 50,000 t/yr. It produced both precoated and powder-coated sheets (Metal Bulletin, 2001bb).

Tinplate Co. of India, part of Tata Group, planned to invest \$5.4 million to de-bottleneck operations to increase the capacity of its electrolytic tinning line from 90,000 t/yr to 125,000 t/yr. The cold-rolling mill and tinning line had been working at 110% of nominal capacity and 12% to 15% of production was being exported. India's other tinplate producer was SAIL's Rourkela steel plant having a capacity of 150,000 t/yr. The producers complained of heavy imports of tinplate (Metal Bulletin, 2001z).

PSL Holdings, an Indian pipe producer, had a capacity of 250,000 t/yr from four mills. The fourth pipe mill was due to begin production at Kandla in April. The company planned to set up two new pipe mills with a total capacity of 150,000 t/yr at a cost of \$3.2 million for each mill. The two additional units would raise the capacity to 400,000 t/yr. The mills would produce water, gas, and oil pipes and would start up in the next 2 years (Metal Bulletin, 2001l).

Sandvik of Sweden acquired the 49% that had been held by Choksi Tubes Co. in the joint venture, Sandvik Choksi Ltd., to gain 100% control and renamed it Sandvik Steel Asia. The value of the deal was reported to be \$5.4 million. The new company produced seamless stainless steel tubes from an extrusion press and cold-finishing plant at Mehsana in Gujarat. The plant's capacity was 10,000 t/yr of tubes (Metal Bulletin, 2001v).

India's exports of ferrochrome remained at between 175,000 t/yr and 200,000 t/yr, mostly being shipped to Japan, the Republic of Korea, Taiwan, and the United States. Jindal Ferroalloys closed its 40,000-t/yr Vizag ferrochrome plant in Andhra Pradesh temporarily owing to labor problems. The Vizag plant produced high-carbon ferrochrome to supply its stainless steel plant at Hissar at 3,000 t/mo. There was also a ferrochrome plant of 5,000 t/yr near Hissar. GMR Vasavi Industries, Indian Charge Chrome Ltd., and Tisco stopped production of high-carbon ferrochrome for a few months owing

to faltering export market. Meanwhile, Jindal Ferroalloys signed a memorandum of understanding with the State government of Chattisgarh to build a \$10.7 million 60,000-t/yr ferrochrome plant. The capacity of a captive coal-based powerplant at Jindal Ferroalloys' existing facilities was to be increased by 110 MW at a cost of \$96 million (Metal Bulletin, 2001n).

Lead and Zinc.—Hindustan Zinc Ltd.'s (HZL) Tundoo smelter in Bihar, which produced lead and silver, was earmarked for closure because its technology was old and the plant was not worth upgrading. The company also planned to close down the Vizag lead smelter in Andhra Pradesh. The Agnigundala lead mine in Andhra Pradesh, which produced concentrate for Vizag, would be sold. HZL's Sargipalli lead mine in Orissa also would be closed (Mining Journal, 2000).

The Government stipulated that bidders for the 26% stake of state-owned HZL, which was for sale, also would have to make an open offer for a further 20% share. BHP Ltd., Binani Zinc, Birla Group, Rio Tinto, and Sterlite Industries expressed interest in HZL. Allied Deals, Glencore, and Metdist also joined the bidding. Allied Deals of the United Kingdom subsequently withdrew from the bidding. Sterlite Industries' bid was below the reserve price and was rejected. The Government decided to reconsider HZL's privatization in February 2002. Total installed zinc production capacity was 149,000 t/yr. HZL's Rampura Agucha mines in Rajasthan were highly prized in the tender (Metal Bulletin, 2001e). The company's new greenfield 100,000-t/yr zinc smelter was planned for Kapasan in Rajasthan at a cost of \$268 million.

Binani Zinc considered moving ahead with plans to expand its zinc smelter in one stage from 30,000 t/yr to 100,000 t/yr at a cost of \$96 million. The company wanted to start work on the smelter expansion by fiscal year 2002-03, and the project was being reviewed by its technology partners, KZ Engineering (a subsidiary of Korea Zinc) and Union Miniere of Belgium. Binani Zinc was considering selling a 49% stake in the company to Korea Zinc. Binani Zinc and Korea Zinc teamed up to bid for a 46% stake in HZL (Metal Bulletin, 2001a).

Titanium.—Tata Steel planned to enter titanium mining with three locations in Tamil Nadu and to consider alliances with global majors for manufacturing titanium dioxide. A joint venture, AusRutile (Ticor, 37%; Austpac, 37%; and Indian Rare Earths, 26%), was formed to develop a synthetic rutile complex near Chatrapur in Orissa. AusRutile would construct a 10,000-t/yr pilot plant adjacent to Indian Rare Earths' Oscom project. The plant could eventually produce 200,000 t/yr of synthetic rutile with a duration of 30 years (Asian Journal of Mining, 2001d).

NMDC planned to acquire up to a 33% equity share in a joint venture with Indian Rare Earths and Andhra Pradesh Mineral Development Corp. for a project near Vishakhapatnam. NMDC also would seek prospecting licenses for exploration in Tamil Nadu and Orissa and anticipated that each could contribute 30,000 t/yr of ilmenite. The corporation considered a central processing plant of 100,000-t/yr capacity as well (Mining Journal, 2001e).

Industrial Minerals

Fertilizer.—The Government was offering a 74% stake for sale in Paradeep Phosphates Ltd., which owned a diammonium phosphate plant with a capacity of 720,000 t/yr. Interest had been expressed in this sale by Hindustan Lever Chemicals Ltd., Oswal Chemicals and Fertilizers Ltd., and Tata Chemicals Ltd. The Government also was offering a 32.74% stake in Madras Fertilizers Ltd., a producer of compound fertilizers (NPK) and urea in Chennai with a capacity of 840,000 t/yr. The planned sale of a 51% stake in National Fertilizers Ltd., a producer of urea and calcium ammonium nitrate, was slated for early 2001 (Industrial Minerals, 2001c).

Garnet.—Transworld Garnet India Pvt. Ltd., 74%-owned subsidiary of Western Garnet International Ltd. of the United States, was chosen by the State government of Andhra Pradesh to gain access to a mineral sands beach deposit in the State. The company acquired lease rights to a 96-ha area with a resource base of 1.1 Mt of garnet and 0.8 Mt of ilmenite grading 24% and 20%, respectively. Western Garnet had been producing garnet in Tamil Nadu from reserves that would last for 20 to 25 years at current output levels. The company also was involved in a joint venture with India's Chettinad Group to produce garnet powder and coarser garnet at a micronizing plant 25 km from Chennai (Industrial Minerals, 2001a).

Graphite.—Graphite India Ltd.'s expansion plans were estimated to cost \$10.2 million, of which \$1.7 million would be spent on setting up a 1.5-MW hydroelectric plant near Mandya in Karnataka, and \$8.5 million would be used to expand graphite electrode plants in West Bengal and Bangalore. The plants had output capacity of 10,000 t/yr each. The West Bengal plant was to be expanded to 15,000 t/yr and the Bangalore plant to 12,000 t/yr (Mining Journal, 2001a).

Soda Ash.—Tata Chemicals Ltd. resumed production at its Mithapur plant southwest of Bhuj in Gujarat after a fire in March. It was one of the world's leading producers of synthetic soda ash with a capacity of 875,000 t/yr. In addition, the plant produced iodized salt and urea. The plant suffered only minor damage during the January earthquake. The Government proposed a 15% reduction in import duty for foreign soda ash from 35% to 20% and planned to reduce a countervailing duty on imported soda ash from 22.16% to 19.2%. The move resulted from an ongoing trade dispute between India and the United States. India's soda ash industry had been growing at 4% to 6.5% a year. Total demand was around 1.65 Mt/yr, and supply was in excess of 2 Mt/yr (Industrial Minerals, 2001e).

Mineral Fuels

Coal.—In the coal sector, as many as 17 key coal projects faced cost overruns and were behind schedules. Delays were partially blamed on constraints in procuring equipment. The expansion project of a Neyveli Lignite Corp. mine was expected to be commissioned in March 2003 at a cost of \$355 million. The completion date of a project of Northern Coalfields Ltd. at

Dundhichua was extended to March 2004, and the project would cost \$273 million (Coal Age, 2001).

Natural Gas.—Oil and Natural Gas Corp. (ONGC) planned to invest \$700 million in developing a discovered deepwater gasfield in the Krishna Godavari basin off India's east coast. The company drilled a second well in the basin to determine the quantity of recoverable gas and planned to drill a third well in the next 2 to 3 months. ONGC was seeking joint-venture partners for deep-sea prospecting and production (Petrodata Daily, 2001b§¹).

The Gas Authority of India Ltd. (GAIL) planned to undertake a project of setting up a national gas grid at a cost of \$53.5 million for supplying gas to various customers. GAIL's 4,200-km HBJ pipeline project had countrywide network, of which 1,000 km were in Gujarat. Gujarat accounted for about 30% of GAIL's natural gas sales. A plant to be set up in Gujarat at a total cost of \$85.7 million would produce 207,000 t/yr of liquefied petroleum gas (Iran Daily, 2001).

Petronet LNG awarded a consortium led by Ishikawajima-Harima Heavy Industries of Japan a contract to build a \$312 million 5-Mt/yr regasification terminal at Dahej in Gujarat. Other members of the consortium were Ballast Nedam International BV, Itochu, Mitsui Co. Ltd., the Netherlands, and Toyo Engineering, India. Petronet was to import 7.5 Mt/yr of liquefied natural gas (LNG) from Qatar's RasGas for a period of 25 years. The other terminal at Kochi in Kerala would have a capacity of 2.5 Mt/yr. The first shipment would arrive by late 2003 (Oil & Gas Journal, 2001a).

Petroleum.—The State government of Assam approved a petroleum exploration license on the 1,934-square-kilometer (km²) block AA-ON/7 in the Assam-Arakan basin for Canoro Resources Ltd. of Canada. Canoro's Canadian consortium had a 65% working interest in and operated the block. The company would get access to the five existing wells and planned to reinterpret 500 km of existing and 50 km of new seismic lines and to drill an exploration well and to reenter existing wells (Oil & Gas Journal, 2001c).

Cairn Energy Plc. of the United Kingdom and ONGC planned to invest \$200 million in oil and gas exploration in the Gulf of Khambhat offshore Gujarat during 2001 and to drill 11 to 12 wells in the 1,500-km² exploration block. A three-dimensional seismic survey had been completed in the block. The first well drilled by Cairn Energy revealed both oil and gas. ONGC had a 10% equity stake in the field and the option to increase the stake by a further 30% in case of commercial discovery. This would reduce Cairn Energy's stake to 50% (Petrodata Daily, 2001a§). Tata Petrodyne had a 10% stake.

British Gas Ltd. (BG) of the United Kingdom agreed to buy Enron Oil & Gas India's oil and gas assets off India's west coast for \$388 million. Enron had a 30% interest in the Tapti Gasfield and the Panna Mukta oilfield and gasfield northwest of Mumbai, ONGC held a 40% stake, and Reliance Group held the remaining 30%. Enron also had a 62.4% interest in the exploration license further north off Gujarat. The deal would add 5% to total BG output in India, of which 60% was gas

(Business Day, 2001§).

Indian Oil Co. planned to expand and modernize its Digboi oil refinery with an investment of \$360 million. Once work was complete, capacity was expected to increase to 1 Mt/yr from 600,000 t/yr. The refinery was to get a new hydrotreater that would allow it to make diesel with less than 0.05% sulfur (Oil & Gas Journal, 2001b).

Infrastructure

The new Ennore port, 24 km north of Chennai in Tamil Nadu, was opened in February. The port was built in two phases with loans from the Asian Development Bank. The Tamil Nadu Electricity Board invested \$63.5 million on installing the conveyor systems and had two berths at the port for its exclusive use. Two ship unloaders that were manufactured by Samsung of the Republic of Korea and that were capable of handling 2,000 metric tons per hour of coal were under installation and were scheduled to be operational in May (Bulk Materials International, 2001).

Enron Corp. of the United States dropped out of a 2,184-MW powerplant project south of Mumbai known as Dabhol Power in May. The first phase of the project (totaling 740 MW, using naphtha, and changing to LNG) was operational, while the second phase (totaling 1,444 MW and using LNG) would be ready in August. Dabhol Power terminated its contract with the Maharashtra State Electricity Board, which was its sole customer, because there was an increasing tension between Enron and the State government. The plant cost \$3 billion to build, and Enron held a 65% stake in the project, and Bechtel and General Electric held 10% each (Far Eastern Economic Review, 2001b).

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

(Metric tons unless otherwise specified)

Commodity 3/ METALS	1997	1998	1999 e/	2000 e/	2001 e/
Aluminum:					
Bauxite, gross weight thousand tons	6,019	6,102	6,712 4/	7,562 r/ 4/	8,387 4/
Alumina, Al ₂ O ₃ equivalent e/ do.	1,860	1,890	2,080	2,280	2,400
Metal, primary	484,200	541,800	614,400 4/	643,700 4/	624,000 4/
Cadmium metal	298	304	269 4/	314 4/	436 4/
Chromium, chromite, gross weight	1,363,049	1,311,310	1,472,766 4/	1,946,910 4/	1,677,924 4/
Cobalt metal e/	110	120	120	206 4/	250
Copper:					
Mine output, Cu content	37,200	39,900	34,100 4/	31,900 r/ 4/	30,900 4/
Metal, primary:					
Smelter	51,000	107,600	224,400 4/	225,600 4/	181,900 4/
Refinery e/					
Electrolytic (cathode)	30,200	100,000	200,000	234,000 4/	310,000 4/
Fire refined	6,000	7,000	8,000	9,000	18,000
Total	36,200	107,000	208,000	243,000	328,000
Gold metal, smelter kilograms	2,750	2,383	2,500 4/	6,200 r/ 4/	3,800 4/
Iron and steel:					
Iron ore and concentrate:					
Gross weight thousand tons	69,453	72,532	70,220 4/	75,950 r/ 4/	79,200 4/
Fe content do.	44,400	48,000 e/	44,940 4/	48,600 r/ 4/	50,700 4/
Metal:					
Pig iron do.	19,898	20,194	20,139 4/	21,321 4/	21,900 4/
Direct-reduced iron do.	5,250	5,260	5,220 4/	5,440 4/	5,590 4/
Ferrous alloys:					
Ferromanganese (including charge chrome)	286,973	345,125	312,140 r/ 4/	376,693 r/ 4/	266,395 4/
Ferrosilicon e/	10,000	10,000	10,000	10,000	10,000
Ferromanganese e/	166,000	165,000	160,000	160,000	165,000
Ferrosilicon e/	74,000	55,000	55,000	60,000	50,000
Silicomanganese e/	198,000	193,000	190,000	185,000	150,000
Other e/	9,000	9,000	9,000	9,000	9,000
Steel, crude thousand tons	23,748	23,480	24,269 4/	26,924 4/	27,300 4/
Semimanufactures e/ 5/ do.	11,000	12,000	12,000	12,000	13,000
Lead:					
Mine output, Pb content	32,000	39,300	32,100 4/	28,900 4/	27,000 4/
Metal, refined: e/					
Primary	69,000	70,000	72,000	70,000	74,000
Secondary	24,000	25,000	20,000	26,000	20,000
Total	93,000	95,000	92,000	96,000	94,000
Manganese:					
Ore and concentrate, gross weight thousand tons	1,596	1,557	1,500	1,550	1,600
Mn content e/ do.	606	592	570	590	600
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.	49,736	52,310	54,000	40,000	53,200 4/
Titanium concentrates, gross weight: e/					
Ilmenite	332,000	378,000	378,000	380,000	430,000
Rutile	14,000	16,000	16,000	17,000	19,000
Tungsten, mine output, W content	1	--	--	--	--
Zinc:					
Mine output, concentrate:					
Gross weight	263,270	261,467	265,000	264,000	270,000
Zn content e/	142,000 4/	143,000	145,000	144,000	146,000
Metal: e/					
Primary	159,000 4/	171,900 4/	175,000	176,000	205,000
Secondary	24,000	25,000	25,000	25,000	25,000
Total	183,000	196,900	200,000	201,000	230,000
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	867	1,230	1,300	1,250	1,200
Garnet	55,374	138,678	135,000	130,000	125,000
Jasper	5,312	6,581	7,000	7,500	8,000

See footnotes at end of table.

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

(Metric tons unless otherwise specified)

Commodity 3/	1997	1998	1999 e/	2000 e/	2001 e/	
INDUSTRIAL MINERALS--Continued						
Asbestos	25,051	18,751	20,000	21,000	21,000	
Barite	409,498	749,412	360,000 r/	840,000 r/	850,000	
Bromine, elemental e/	1,500	1,500	1,500	1,500	1,500	
Cement, hydraulic e/	thousand tons	80,000	85,000	90,000	95,000	100,000
Chalk	117,869	114,109	115,000	110,000	110,000	
Clays:						
Ball clay	373,104	381,479	380,000	375,000	370,000	
Diaspore	14,874	10,148	12,000	13,000	13,000	
Fireclay	355,331	331,729	340,000	345,000	350,000	
Kaolin:						
Salable crude	thousand tons	402	540	520	530	540
Processed	do.	175	148	150	160	170
Total	do.	577	688	670	690	710
Other	do.	53	60	65	70	70
Diamond: e/						
Gem	thousand carats	11 r/	12 r/	12 r/	16 r/	17
Industrial	do.	20 r/	22 r/	29 r/	41 r/	43
Total	do.	31 r/	34 r/	41 r/	57 r/	60
Feldspar	95,455	104,509	105,000	110,000	110,000	
Fluorspar:						
Concentrates:						
Acid-grade	6,937	--	--	--	--	
Metallurgical-grade	9,877	785	800	850	900	
Total	16,814	785	800	850	900	
Other fluorspar materials, graded	5,008	5,507	5,600	5,700	5,800	
Gemstones excluding diamond:						
Agate including chalcedony pebble	244	190	200	250	250	
Garnet	kilograms	653	829	900	850	900
Graphite 6/	102,143	143,333	145,000	140,000	140,000	
Gypsum	2,031,049	2,191,784	2,200,000	2,210,000	2,250,000	
Kyanite and related materials:						
Kyanite	6,035	5,169	5,000	5,000	5,500	
Sillimanite	12,299	11,936	12,000	12,000	13,000	
Lime	378,087	298,131	300,000	310,000	320,000	
Magnesite	362,929	355,033	360,000	365,000	370,000	
Mica:						
Crude	1,794	1,489	1,500	1,500	1,300	
Scrap and waste	1,128	966	1,000	950	1,100	
Total	2,922	2,455	2,500	2,450	2,400	
Nitrogen, N content of ammonia	thousand tons	9,328	10,240	10,376 4/	10,148 4/	10,081 4/
Phosphate rock including apatite	1,043,386	1,730,334	1,262,000 r/	1,136,000 r/	1,200,000	
Pigments, mineral, natural, ocher	347,429	351,704	380,000 r/	336,000 r/	355,000	
Pyrites, gross weight	128,571	97,163	100,000	105,000	110,000	
Salt:						
Rock salt	thousand tons	3	2	3	3	
Other	do.	14,249	11,962	14,450 4/	14,450 4/	14,500
Total	do.	14,252	11,964	14,453 4/	14,453 4/	14,503
Soda ash e/	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	
Stone, sand and gravel:						
Calcite	49,429	50,668	50,000	50,500	51,000	
Dolomite	thousand tons	2,930	2,800	2,700	2,750	2,800
Limestone	do.	104,755	108,920	110,000	105,000	110,000
Quartz and quartzite	do.	258	266	265	260	270
Sand:						
Calcareous e/	do.	225	230	235	240	245
Silica	do.	1,400	1,265	1,300	1,350	1,400
Other	do.	2,688	2,879	2,900	2,800	2,900
Slate	7,590	10,029	10,000	10,500	11,000	
Sulfur, byproduct from fertilizer plants e/	9,600	10,000	10,500	11,000	11,000	
Talc and related materials:						
Pyrophyllite	121,566	79,951	85,000	85,000	86,000	
Steatite (soapstone)	417,613	447,550	450,000	460,000	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/	1997	1998	1999 e/	2000 e/	2001 e/	
INDUSTRIAL MINERALS--Continued						
Vermiculite	4,405	4,080	4,000	4,200	4,300	
Wollastonite	97,223	95,746	96,000	100,000	100,000	
MINERAL FUELS AND RELATED MATERIALS						
Coal:						
Bituminous	thousand tons	295,195	298,116	277,493 4/	280,000	305,000
Lignite	do.	23,027	23,164	24,000	24,000	23,000
Total	do.	318,222	321,280	301,493 4/	304,000	328,000
Gas, natural: e/						
Gross	million cubic meters	20,000	25,000	31,400 4/	30,000	25,519 4/
Marketable	do.	19,047 4/	23,500	29,500	28,500	24,000
Petroleum:						
Crude	thousand 42-gallon barrels	246,989	244,854	241,119 4/	238,068 r/ 4/	239,292 4/
Refinery products: e/						
Liquefied petroleum gas	do.	40,000	40,500	41,000	41,500	42,000
Gasoline	do.	39,000	39,500	40,000	40,500	41,000
Kerosene and jet fuel	do.	59,000	58,000	58,500	59,000	58,000
Distillate fuel oil	do.	166,000	167,000	168,000	169,000	170,000
Residual fuel oil	do.	71,000	70,000	69,000	68,000	67,000
Other	do.	89,000	90,000	91,000	91,500	92,000
Total	do.	464,000	465,000	468,000	470,000	470,000

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

1/ Table includes data available through July 9, 2002.

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 2001

(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	280
Do.	National Aluminium Co. Ltd. (Indian Government, 100%)	Dhamanjodi Refinery, Orissa	1,050
Do.	Bharat Aluminium Co. Ltd. (Indian Government, 100%)	Korba Refinery, Chattisgarh	200
Do.	Utkal Alumina International Ltd. [Norsk Hydro A/S (Norway), 45%; Alcan Aluminium Ltd. (Canada), 35%; and Hindalco Industries Ltd., 20%]	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, Jharkhand	88
Do.	Hindalco Industries Ltd. (Birla Group, 33%; foreign investors, 26%; private Indian investors, 23%; and financial institutions, 18%)	Renukoot Refinery, Uttar Pradesh	450
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, Chattisgarh	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	275
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%)	Lohardarga District mines, Jharkland	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, Palamau District mines, Jharkland	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 Singhania, 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%)	Narsingarh Plant, Madhya Pradesh	1,089

See footnotes at end of table.

TABLE 2--Continued
INDIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2001

(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 Singhania, 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 and 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	150
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	150
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 2001

(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	10,300
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.	Mangilal, 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 2001

(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, 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 phosphate rock capacity is 800,000 metric tons per year.