



2015 Minerals Yearbook

CHINA [ADVANCE RELEASE]

THE MINERAL INDUSTRY OF CHINA

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After decades of rapid growth in the mineral industry, production in China started to stabilize and even decline in recent years as economic growth slowed to about 7% to 8% annually from the previous double-digit growth rates. Economic growth in China since the late 20th century has been the primary cause of the unprecedented demand for minerals and metals by the global mineral industry. To secure supplies of minerals and metals, China expanded its domestic mineral production and increased imports of raw materials from the global market significantly. Owing to the economic slowdown of the past several years, the mineral industry in China has encountered some challenges, such as underutilization of production capacity.

In 2015, production of more than one-half of the mineral commodities listed in table 1 decreased, which can be attributed to reduced demand growth associated with the slowdown of the overall economy and decreased commodity prices on the global market. The latter was particularly challenging to China's mineral industry, as the actual cost of domestic mineral production was, in many cases, higher than the cost of imported minerals owing to the relatively low quality of some domestic resources. Deposits of some minerals have an inherently low grade, and high-quality resources of some minerals had been heavily exploited in past decades and were close to depletion. In addition, operating costs, including labor costs, had increased significantly in China in recent years.

In 2015, China invested \$14.3 billion in mineral exploration and about \$200 billion in mining (of fuel and nonfuel minerals), representing year-on-year decreases of 18% and 8.8%, respectively. According to the Ministry of Land and Resources, China was the world's leading producer of coal in 2015, the fifth-ranked producer of crude petroleum, and the sixth-ranked producer of natural gas. China was the world's leading producer and consumer of most nonferrous metals, including gold, as well as of crude steel (table 1; Ministry of Land and Resources, 2016, p. 11–12, 15–17).

Minerals in the National Economy

The rate of growth of China's gross domestic product (GDP) in real terms was 6.9% in 2015 compared with 7.3% in 2014. The nominal GDP was about \$10.5 trillion¹ in 2015. In 2014, mining and manufacturing contributed 3.6% and 30.4%, respectively, to the GDP compared with 4.3% and 30.6%, respectively, in 2013. The mineral industry's portion of the GDP decreased by 8.1% in 2014 compared with that of 2013, and the manufacturing sector's portion of the GDP increased by 7.6%. In 2015, the number of people employed in the mining sector was about 5.46 million and the number of people employed in the manufacturing sector was about 50.39 million, accounting for 3.0% and 28.1%, respectively, of the country's

¹Where necessary, values have been converted from Chinese yuan renminbi (CNY) to U.S. dollars (US\$) at an annual average exchange rate of CNY6.49=US\$1.00 for 2015.

total nonagricultural employment. In 2015, the total investment in fixed assets (excluding that by rural households; see the reference at the end of the paragraph for a detailed definition) was \$8.66 trillion, of which \$2.78 trillion was invested in the manufacturing sector and \$200 billion was invested in the mining sector (National Bureau of Statistics of China, 2016, sec. 1-3, 4-5, 10-1).

In 2015, the amount of foreign direct investment (FDI) deployed in China was \$126 billion compared with \$120 billion in 2014. In 2015, about 0.2% of the FDI was directed to the mining sector compared with 0.5% in 2014, and 31% was directed to the manufacturing sector compared with 33% in 2014. In 2015, the amount of overseas direct investment (ODI) was \$146 billion compared with \$123 billion in 2014, representing the first year in decades that China's ODI exceeded FDI. As of yearend 2015, the stock of China's ODI amounted to \$1.1 trillion. In 2015, about 7.7% of the ODI was in the mining sector compared with 13.4% in 2014, and 13.7% was in the manufacturing sector compared with 7.8% in 2014. As of yearend 2015, mining and manufacturing accounted for 13% and 7.2% of the stock of China's ODI, respectively (National Bureau of Statistics of China, 2016, sec. 11-16, 11-20).

Government Policies and Programs

On May 8, the State Council released the Notice of the State Council on Printing and Distributing "Made in China 2025" [Guo Fa (2015) No. 28] regarding the release of the Government's first 10-year action plan to strengthen the economy through development of the manufacturing sector. The plan outlined the goals for and directions to be taken to upgrade the sector, improve efficiency and competitiveness, and achieve sustainable development. Some key areas of manufacturing identified in the plan were advanced rail transportation equipment, aerospace equipment, energy-saving and "new energy" (electric) vehicles, marine engineering equipment, high-tech ships, a new generation of information technology, and new and advanced materials. Implementation of this plan in the next 10 years was expected to generate significant demand for related mineral materials, such as cobalt and lithium for batteries, high-performance steel for advanced equipment, and rare-earth elements for electronics (State Council, 2016).

In 2011, the Ministry of Finance, Ministry of Industry and Information Technology, Ministry of Land and Environmental Protection, Ministry of Supervision, National Development and Reform Commission, and other Government agencies had jointly issued the Notice on the Assessment and Implementation of the Program Aimed at Eliminating Outdated Production Capacity [Ministry of Industry and Information Technology (2011) No. 46]. According to the Ministry of Industry and Information Technology, the program achieved its target and eliminated the following annual capacities in 2015: 5.27 gigawatts (GW) of electricity, 101 million metric tons (Mt)

of coal, 49.74 Mt of cement, 17.06 Mt of steel, 13.78 Mt of iron, 9.48 Mt of coke, 1.27 Mt of ferroalloys, 493,000 metric tons (t) of lead smelting, 362,000 t of electrolytic aluminum, and 79,000 t of copper smelting. It is worth noting that, however, the eliminations were not net capacity reductions and closure of some of the inefficient production was offset by the addition of new (and more efficient) capacity in the year (Ministry of Industry and Information Technology, 2011, 2016b).

Production

In 2015, China's production of iron ore (gross weight of crude ore) was 1.38 billion metric tons (Gt), which was a decrease of 8.6% compared with that of 2014; that of crude steel was 804 Mt, which was a decrease of 2.3%; and that of rolled steel was 1.13 Gt, which was a decrease of 0.1% (rolled steel statistics may include double counting for different processing steps). The country's production of refined copper was 7.96 Mt in 2015, which was an increase of 4.1% compared with that of 2014, and production of primary aluminum was 31.4 Mt, which was an increase of 11%. In 2015, China produced 450 t of gold, which was unchanged from that of 2014. Refined cobalt production increased by 24% in 2015 owing to high demand by the battery industry (table 1).

China was the leading energy-producing and -consuming country in the world in 2015. Primary energy output totaled 3.62 Gt of standard coal equivalent and energy consumption was 4.3 Gt of standard coal equivalent. The energy self-sufficiency rate in 2015 was 84.2%. Coal accounted for 64.0% of the energy consumption mix; petroleum, 18.1%; hydropower, wind power, and nuclear power, 12.0% (combined); and natural gas, 5.9%. Coal production in 2015 was 3.75 Gt, which was a decrease of 3.4% compared with that of 2014. Crude petroleum production was 215 Mt (1,550 million barrels) in 2015, which was an increase of 1.3% compared with that of 2014. The output of natural gas was 135 billion cubic meters in 2015, which was an increase of 3.8% (table 1; Ministry of Land and Resources, 2016, p. 15–17).

In 2015, China produced 2.36 Gt of cement, which was a decrease of 5.3% compared with that of 2014; 5.71 Mt of potash fertilizer (K_2O equivalent), which was a decrease of 6.6%; and 42.6 Mt of phosphate rock (P_2O_5 equivalent), which was an increase of 18.3%. Data on mineral production are in table 1.

Structure of the Mineral Industry

In China, the majority of the mining and mineral-processing activities were conducted by state-owned or state-holding enterprises. The share of state ownership was high in the energy sectors and relatively low in the downstream metal-manufacturing sectors, and the state-owned companies were mostly large in size, whereas private enterprises were small. Foreign ownership in China's mineral industry was insignificant. On March 19, the Ministry of Industry and Information Technology issued the "Catalog of Foreign Investment Industries Guidance (Revised 2015)" that became effective on April 10, 2015. The new guidance sought to encourage foreign investment in exploration, development, and mining of unconventional resources of petroleum and gas (limited to joint

ventures with Chinese partners), such as oil sands, oil shale, and shale gas; and minerals that were in short supply in China, such as chromite and potash; as well as investment in advanced technologies for use by the mineral industry. The guidance restricted foreign investment in the mining of graphite, lithium, and precious metals; in the smelting of antimony, molybdenum, tin, and tungsten; and in the separation of rare earths (limited to joint ventures and cooperative ventures) (table 2; Ministry of Commerce, 2016; National Bureau of Statistics of China, 2016, sec. 13-4, 13-6).

Mineral Trade

In 2015, the total value of exported goods was \$2.27 trillion compared with \$2.34 trillion in 2014. The value of mineral product exports accounted for 1.4% of total exports compared with 1.7% in 2014. Exports of base metals and the articles made of them accounted for 7.8% of the total, which was the same as in 2014. In 2015, the total value of imported goods was \$1.68 trillion compared with \$1.96 trillion in 2014. The value of mineral product imports accounted for 17.7% of the total compared with 23.4% in 2014. Imports of base metals and the articles made of them accounted for about 5.2% of the total compared with 5.18% in 2014 (tables 3, 4; National Bureau of Statistics of China, 2016, sec. 11-7, 11-8).

Commodity Review

Metals

Aluminum and Bauxite and Alumina.—As of yearend 2015, China's alumina production capacity was 69.7 million metric tons per year (Mt/yr), of which 3.8 Mt/yr was new capacity added during the year (1.6 Mt/yr in Guizhou, 1 Mt/yr in Shandong, 700,000 metric tons per year (t/yr) in Shanxi, and 500,000 t/yr in Henan). About 59 Mt of alumina was produced in 2015, which was a 15% increase compared with that of 2014. The leading alumina-producing Provinces in 2015 were Shandong, which produced 17.9 Mt of alumina; Shanxi, 16.1 Mt; Henan, 11.7 Mt; Guangxi, 7.8 Mt; Guizhou, 3.2 Mt; and Yunnan, 1.0 Mt. In 2015, China imported about 51 Mt of bauxite compared with 36 Mt in 2014. Alumina production from imported bauxite sources was 18.6 Mt in 2015 compared with 15.3 Mt in 2014. Malaysia surpassed Australia and became the leading bauxite supplier to China; bauxite imports from Malaysia accounted for about 42% of China's total bauxite imports. Net imports of alumina were 4.3 Mt compared with 5.0 Mt in 2014. Consumption of alumina was 61.8 Mt compared with 56.2 Mt in 2014 (table 1; Huo, 2016, p. 5–9, 13).

Chromium.—China has limited chromite resources, and the annual output had declined by a factor of 10 during the past 5 years. No significant discovery of new deposits was expected in the near future. On the other hand, demand for chromite had increased significantly owing to the increased production of ferrochromium. In 2015, ferrochromium production was estimated to be 4.4 Mt compared with 2.7 Mt in 2011. Imports of chromite amounted to 10.4 Mt in 2015 compared with 9.4 Mt in 2014 and 9.5 Mt in 2011. In 2015, imports from South Africa accounted for 73% of total imports; Turkey, 10%; Albania, 5%;

Iran, 4%; Oman, 3%; and others, 5% (Editorial Board of China Steel Yearbook, 2016, p. 334; He and others, 2016; Xie, 2016).

Cobalt.—China had 150 cobalt deposits with total reserves of 470,000 t. Most of the cobalt deposits are associated with copper, iron, nickel, and other minerals. The reserves in Gansu Province accounted for about 30% of the total reserves in the country. In 2015, the domestic production of cobalt (all as a byproduct of nickel ore production) was estimated to be 1,600 t (cobalt content in concentrate), mainly from Gansu Province. A small amount of cobalt concentrate was produced in Hainan, Sichuan, Xinjiang, and other Provinces. In 2015, China's refined cobalt production was estimated to be 48,700 t, which was an increase of 24% from that of 2014. Cobalt chemical compounds accounted for 77% of the country's refined cobalt production; cobalt metal, 14%; and cobalt powder, 9% (China Battery Network, 2016; Tian, 2016).

Cobalt consumption in China amounted to 44,500 t in 2015, which was an increase of 15.6% from that of 2014. Batteries accounted for 73% of total cobalt consumption; carbide, 8.4%; high-temperature alloys, 3.5%; and others, 15.4%. China's cobalt consumption was expected to reach 50,000 t in 2016, and consumption by the battery industry was projected to be 40,000 t and to account for up to 80% of total cobalt consumption. China's cobalt consumption increased by an average of 14% between 2011 and 2015, and the average annual growth rate was expected to be 12.5% between 2016 and 2020, with consumption by the battery industry increasing at an annual rate of 15% (Tian, 2016).

China imported a large amount of cobalt in recent years to meet increasing domestic demand. In 2015, China imported 17,000 t of cobalt in ore and concentrate and 35,000 t of cobalt in intermediate products; imports in 2011 were 21,000 t and 8,000 t, respectively. One reason for the shift from ore and concentrate imports to intermediate product imports in recent years was the high level of stockpiled ore and concentrate resulting from the large amount of imports before 2011. Refining enterprises started to consume stockpiled ore and concentrate instead of imports because of the large supply of ore and concentrate on the domestic market. Another reason why enterprises in China were importing more intermediate products was the Democratic Republic of the Congo's [Congo (Kinshasa)'s] ban on the export of cobalt ore, which affected the global supply. The shift to intermediate product imports could be reversed in 2016, however, because the Government of Congo (Kinshasa) lifted the export ban in late 2015 and China's large stockpile of ore and concentrate was expected to be reduced in 2016. China's imports of cobalt metal were relatively low and had shown a downward trend in recent years. China imported 963 t of cobalt metal in 2015. Of China's total imports of cobalt ore and concentrate in 2015, an estimated 15,000 t (cobalt content) was the country's production share from overseas facilities in which China was an equity owner (China Battery Network, 2016; Shanghai Nonferrous Metals Net, 2016; Tian, 2016).

Copper.—Production of copper concentrate decreased by 4% in 2015 compared with that in 2014. Production of copper concentrate in five Provinces (Anhui, Gansu, Inner Mongolia, Jiangxi, and Yunnan) exceeded 100,000 t (copper content) each in 2015, and the total production in these five Provinces amounted

to 1.21 Mt (copper content). Imports of copper concentrate amounted to 3.4 Mt (copper content) in 2015 compared with 3.1 Mt in 2014. Consumption of copper concentrate was estimated to be 4.92 Mt (copper content) in 2015 compared with 4.47 Mt in 2014 (table 1; He, 2016, p. 8, 9).

Production of refined copper increased by 4% in 2015 compared with that in 2014. Imports of refined copper amounted to 3.55 Mt in 2015 compared with 3.59 Mt in 2014. Consumption of refined copper was estimated to be 9.15 Mt in 2015 compared with 8.72 Mt in 2014. New capacities added in 2015 were 600,000 t/yr for smelting and 550,000 t/yr for refining. As of yearend 2015, the total capacities for smelting and refining were 6.1 Mt/yr and 10.5 Mt/yr, respectively (table 1; He, 2016, p. 8, 15).

In 2015, the major consumption sectors of refined copper in China included electricity (which accounted for 4.55 Mt of refined copper consumption), air conditioning (1.40 Mt), transportation (880,000 t), construction (755,000 t), electronics (645,000 t), and others (920,000 t). The consumption by electricity and air conditioning increased by 7.1% and 2.9%, respectively, in 2015 compared with that in 2014. Total consumption increased by 4.9% in 2015, which was lower than the increase of 6.3% in 2014 (He, 2016, p. 12).

On December 1, 10 major copper producers in China, including Jiangxi Copper Co. Ltd., Tongling Nonferrous Metals (Group) Holdings Ltd., and Yunnan Copper Co., Ltd., jointly proposed an initiative to reduce the production of refined copper by 350,000 t in 2016 and to implement other measures to deal with the oversupply market conditions. Under the consensus reached by the parties, these companies would shut down unprofitable production capacity in the short term, accelerate further elimination of outdated production capacity in the long term, and would not expand capacity in the next few years. The combined production capacity of these 10 copper enterprises accounted for more than 70% of China's smelting capacity (Xinhuanet.com, 2015).

Iron and Steel.—In 2015, production of iron ore amounted to 1.38 Gt (crude ore gross weight) compared with 1.51 Gt in 2014. The crude iron ore produced in China generally has iron content of 20% to 30% and needs to be processed to produce iron ore concentrate that has iron content comparable to iron ore on the global market. The iron content of the iron ore concentrate produced in China in 2015 was estimated to be 232 Mt compared with 254 Mt in 2014. Imports increased to 953 Mt (gross weight with iron content of about 62.5%) in 2015 from 933 Mt in 2014. Australia supplied 607 Mt of iron ore to China, followed by Brazil (192 Mt) and South Africa (45 Mt). In October, the price of imported iron ore at China's ports was about \$40 per metric ton, which was much lower than the domestic production costs. As a result, most mining enterprises had been operating at a loss in 2015 and some were shut down. Operating their own iron ore mines, which was once advantageous for steelmakers in terms of business integration and cost savings, became a business burden for major steelmakers in China in 2015 because the imported iron ore price was below the domestic production cost (China Iron and Steel Industry Association, 2016; Ministry of Industry and Information Technology, 2016a).

In 2015, crude steel production amounted to 804 Mt compared with 822 Mt in 2014, representing the first decrease in 30 years. China's crude steel production accounted for about 50% of world production. Rolled steel production amounted to 1.1 Gt, which was unchanged from that of 2014. China's steel production capacity utilization rate was estimated to be 71% in 2015. Exports of manufactured steel increased by 20% in 2015 compared with that of 2014 to 112 Mt; imports of manufactured steel decreased by 11% to 12.8 Mt. Net exports of crude steel equivalent increased by 26% to 103 Mt. The continued increase in steel exports from China triggered increased international trade disputes, and 37 antidumping and countervailing duties cases against China's steel products were filed in 2015. Investment in fixed assets in China's steel industry continued to decline in 2015; \$65.6 billion was invested in ferrous metal smelting and rolling (a decrease of 11% from that of 2014) and \$21.1 billion was invested in ferrous metal mining (a decrease of 17.8%) (China Iron and Steel Industry Association, 2016; Ministry of Industry and Information Technology, 2016a).

Lead.—Production of lead concentrate was 2.34 Mt (lead content) in 2015 compared with 2.61 Mt (revised) in 2014. From January to November, the leading lead-concentrate-producing Province was Inner Mongolia [which produced 953,000 t (lead content)], followed by Hunan (331,000 t), Yunnan (151,000 t), Henan (104,000 t), Sichuan (90,000 t), and Guangxi (72,000 t). Imports of lead concentrate amounted to 960,000 t (lead content) in 2015 compared with 900,000 t in 2014. Consumption of lead concentrate was estimated to be 3.21 Mt in 2015 compared with 3.31 Mt in 2014 (Zhang, 2016, p. 11, 12, 15).

China produced 4.70 Mt of refined lead in 2015 compared with 4.74 Mt in 2014. From January to November, the leading refined-lead-producing Province was Henan (which produced 1.24 Mt of refined lead), followed by Hunan (922,000 t), Hubei (309,000 t), and Yunnan (304,000 t). Net exports of refined lead were 60,000 t in 2015 compared with 35,000 t in 2014. Major export partners included Vietnam (which received 45% of China's refined lead exports), Taiwan (18.4%), and Indonesia (14.4%). China's consumption of refined lead was estimated to be 4.70 Mt in 2015 compared with 4.96 Mt in 2014 (Zhang, 2016, p. 17, 22, 26).

Tin.—Production of tin concentrate was 11,000 t (tin content) in 2015 compared with 10,200 t (revised) in 2014. Imports of tin concentrate were estimated to be 25,000 t (tin content) in 2015 compared with 17,000 t in 2014. The considerable increase in tin concentrate imports was an indicator of the shortage of domestic raw material supply. The average grade of imported tin ore decreased in 2015 owing to the increased imports from Myanmar, which had lower metal content compared with other sources (table 1; Sun, 2016, p. 10).

Production of refined tin was 167,000 t in 2015 compared with 187,000 t in 2014. From January to November, the leading refined-tin-producing Province was Yunnan, which produced 85,300 t of refined tin, followed by Hunan (39,100 t), Jiangxi (22,300 t), and Guangxi (11,600 t). Imports of refined tin totaled 9,200 t in 2015, of which about 36% was supplied by Indonesia; 30%, by Bolivia; and 22%, by Malaysia. The relatively low amount of imports was mainly owing to the lower domestic price compared with the international

market price. Consumption of refined tin was estimated to be 158,000 t in 2015 compared with 163,000 t (revised) in 2014 (Sun, 2016, p. 8–12, 15).

Industrial Minerals

Cement.—In 2015, cement production decreased by 133 Mt to 2.36 Gt compared with 2.49 Gt in 2014, and consumption decreased by 5% compared with a 3% increase in 2014. The decrease in demand—the first of the past 24 years—was largely owing to the weak performance of the downstream real estate and infrastructure sectors. The rate of growth of real estate investment declined to 1% in 2015 from 10.3% in 2014 and the rate of growth of infrastructure investment was 17%, which was unchanged from that of 2014. The total revenue of the cement industry was estimated to be \$136 billion, and the total profit was \$4.6 billion. The profit margin for the whole industry was 3% in 2015, which was the lowest since 2001. More than 40% of cement enterprises recorded operational losses in 2015. Cement and clinker exports amounted to about 14 Mt in 2015, which was unchanged from 2014. The proportion of clinker exports increased in 2015 owing to the decline in domestic coal prices, which resulted in lower clinker production costs (Chen, 2016).

On the supply side, in contrast to the decrease in demand, the production capacity continued to increase in 2015 and the capacity utilization rate in the cement industry dropped to about 67%, which was a historical low. According to the preliminary statistics of the China Cement Association, 31 new clinker production lines were added in 2015, resulting in an increase of 47.12 Mt/yr in clinker production capacity. The capacity increase was 23.19 Mt/yr lower than the increase in 2014, representing the third consecutive year of decline in new capacity. As of yearend 2015, the number of preheating and precalcining process cement production lines that had suspended operations was 1,764 (excluding the production lines discontinued in 2015), with total clinker production capacity of 1.8 billion metric tons per year. Clinker production capacity increased by 2% from that of the previous year, and the overcapacity was about 600 Mt/yr (Chen, 2016).

Graphite.—As of yearend 2015, China's crystalline graphite (flake) reserves were estimated to be 265 Mt, and they were located mainly in the Provinces and Autonomous Regions of Heilongjiang (47% of the total), Inner Mongolia (19%), Sichuan (8%), Shanxi (7%), Shandong (6%), Henan (3%), and other Provinces (9%). The reserves of aphanitic graphite were estimated to be 35 Mt and were located mainly in Hunan, Inner Mongolia, Jilin, and Shaanxi Provinces. In 2015, China's graphite production totaled 860,000 t, of which flake graphite production was about 660,000 t. Owing to the large amount of mining and consumption, crystalline graphite reserves had decreased by 67.3% in 2015 from those of 2001. Most mining enterprises were small scale and scattered and the resource utilization rate (the ratio of actually recovered minerals to the total mined resource) was estimated to be 39.5% (table 1; Powder Circle Network, 2016).

In 2015, China exported 251,000 t of graphite, accounting for 79% of the world's total graphite exports. Exports to Japan amounted to 103,000 t; the Republic of Korea,

29,000 t; India, 19,000 t; and Germany and the United States, 13,000 t each. Graphite consumption in China in 2015 was about 614,000 t (or 53.4% of the world's consumption), of which crystalline graphite consumption was about 503,000 t. Production of batteries, new materials, and other emerging industries accounted for about 30% of graphite consumption, and refractory materials, steel, and other traditional industries accounted for about 70%. Development of new industries was expected to lead to substantial growth in graphite consumption, and the average annual increase was expected to be more than 9%. China's graphite consumption in 2020 was projected to reach 950,000 t, of which consumption by electric cars and other energy storage devices would be 230,000 t; nuclear power, 135,000 t; and high-end manufacturing and electronic information technology, 100,000 t. Emerging industries were projected to account for about 45% of annual consumption of graphite by 2020 (table 1; Powder Circle Network, 2016).

Lithium.—In 2015, China produced 61,400 t of lithium salt (lithium carbonate equivalent, or LCE), which was a 0.8% decrease compared with that of 2014 and accounted for 38% of world production. Lithium carbonate production was 42,000 t and lithium hydroxide production was 22,000 t. Total lithium production, including 2,700 t of lithium metal production, amounted to about 75,800 t of LCE, which was an increase of 4.3% from that of 2014. As of yearend 2015, 14 enterprises in China each had a production capacity of more than 2,000 t/yr of LCE. Most of the capacity was in the ramping up stage and had not been fully released either because of a lack of raw materials or because the production line was still in the preproduction testing phase. Development of salt lake brines and lithium mica resources continued in 2015. China had rich lithium resources, but most of the mines were not in operation owing to incomplete expansion projects and social and environmental protection issues. China's salt lakes (such as Cha'erhan Salt Lake and Zabuye Lake) are rich in lithium, but brine lithium production was limited because of technical problems. In 2015, production of lithium carbonate and lithium hydroxide from brine was 10,000 t of LCE (Shi and others, 2016).

The lithium supply in China was heavily dependent on imports. In 2015, China imported 410,000 t of spodumene concentrate, which was an increase of 19% compared with that of 2014. Almost all imports were from Australia's Talison lithium mine, which was partially owned by China's Tianqi Lithium Industries Inc. (51%). About 70% of raw materials for lithium salt processing in China were sourced from imported spodumene in 2015; 16% was sourced from imported high-concentration brine; and 14% was sourced from domestic brine and ore (Shi and others, 2016).

In 2015, China's total consumption of lithium reached 78,700 t of LCE, which was an increase of 19.6% compared with that of 2014. The consumption accounted for 46% of the world's total LCE consumption in 2015. Use in battery applications accounted for 51% of total lithium consumption in 2015 compared with 13% in 2003, becoming the main driving force of lithium demand. In 2015, the demand growth for lithium was owing mainly to the rapid growth of the electric vehicle industry. China produced 379,100 units of electric

vehicles in 2015, which was an increase of 400% compared with that of 2014 (Shi and others, 2016).

Rare Earths.—China was the world's leading rare-earth producer, consumer, and exporter in 2015. China's production quotas for rare-earth-oxide (REO) mining had been relatively stable since 2006 and reached 105,000 t (REO) in 2015 (unchanged from 2014), of which light rare earths accounted for 87,000 t and heavy rare earths accounted for 18,000 t. The total revenue of the rare-earth industry in China was estimated to be \$13.2 billion in 2015, which was an increase of 1% compared with that of 2014, and the total profit was \$840 million. In 2015, the Government continued to implement the rare-earth-industry integration plan that was approved by the State Council in January 2014. At yearend 2015, six large rare-earth companies were formed, and 22 out of 23 rare-earth mines and 54 out of 59 rare-earth smelters in the country were integrated into these six companies (Office of Rare Earth, Ministry of Industry and Information Technology, 2016; China Industrial Information Network, 2016b).

From 2006 to 2015, the annual growth rate of China's rare-earth consumption was 5%. Consumption was expected to continue to increase owing to demand by new materials in high-tech areas. Total rare-earth consumption in 2015 was estimated to be 94,000 t, which was an increase of 3.4% compared with that of 2014. Applications for new materials amounted to 63,000 t, accounting for 68% of total consumption. As of yearend 2015, China's production capacity for permanent magnets was 300,000 t/yr; hydrogen-storage materials, 25,000 t/yr; lighting materials, 25,000 t/yr; and polishing materials, 70,000 t/yr. In 2015, production of magnet ingot was 140,000 t (accounting for 88% of world production); hydrogen-storage materials, 8,100 t (70%); lighting materials, 2,540 t (90%); and polishing materials, 20,000 t (80%). The production of catalytic materials for automobile emission equipment and the petroleum industry accounted for about 20% of world production (Chen and others, 2016; China Industrial Information Network, 2016b).

The production of permanent magnets was the major driving force for the development of the rare-earth industry in China. Production of Dy_2O_3 , Nd_2O_3 , Pr_6O_{11} , and Tb_4O_7 accounted for 0.69%, 15.4%, 4.69%, and 0.13%, respectively, of total REO production in terms of volume; these same materials, however, accounted for 10.4%, 50%, 17.9%, and 3.8%, respectively, of total REO production in terms of value. Production of permanent magnet material totaled 5,250 t in 2000 and had increased at an average annual rate of 24% since then. In 2015, the amount of rare-earths consumed by wind energy, electric cars, and inverter air conditioning was estimated to be 16,000 t, and this amount was expected to increase in the coming years. The increased demand for the elements used in permanent magnet production, however, may create oversupply of nonmagnet application elements, such as cerium and lanthanum, because the total amount of ore to be processed would increase to meet the demand for specific elements (Chen and others, 2016).

Mineral Fuels

Coal.—China's coal production capacity in 2015 reached 5.7 billion metric tons per year and the capacity utilization rate

was about 65%. In the three major coal-producing Provinces, namely Shaanxi, Inner Mongolia, and Shanxi, the capacity utilization rates were 75%, 68%, and 62%, respectively. In 2015, coal output decreased by 3.4% compared with that of 2014. China's coal production reached a peak of about 4 Gt in 2013 and had declined since then owing to the economic downward pressure, weak domestic demand, and low prices. Fixed asset investments in the coal industry decreased by 14% in 2015 compared with a 26% increase in 2011 and a decrease of 10% in 2014 (China Industrial Information Network, 2016a).

Natural Gas.—In 2015, output of natural gas increased by 4.0% to 135 billion cubic meters compared with that of 2014 and apparent consumption of natural gas was 193.2 billion cubic meters, which was an increase of 5.7%. In 2015, imports of natural gas increased by 6.3% to 61.4 billion cubic meters, of which imports through natural gas pipelines amounted to about 34.6 billion cubic meters, which was an increase of 7.2% compared with that of 2014 and accounted for 55.7% of total natural gas imports. Imports of liquefied natural gas (LNG) amounted to 27.54 billion cubic meters, which was a decrease of 1.1% and accounted for 44.3% of total imports. As of yearend 2015, 148 LNG plants with a total capacity of 80.1 million cubic meters per day (20.9 Mt/yr) were active in China, which was an increase of 23.4% compared with that of 2014. Total LNG output was 7.11 Mt in 2015, which was an increase of 19.7% compared with that of 2014. The average capacity utilization rate of LNG plants was 42% in 2015, which was lower than the 49% rate in 2014. LNG consumption amounted to 10.8 Mt in 2015, which was an increase of 37.6% compared with that of 2014. Supply from domestic LNG plants accounted for 65.8% of total LNG consumption, and imported resources accounted for 34.2%. No new LNG receiving and transit stations came online in 2015. The total capacity of LNG receiving and transit stations was 40.9 Mt/yr, and about 19.7 Mt of LNG was received at these stations in 2015 (China Resources Gas Group Co. Ltd., 2016).

Reserves and Resources

As of 2015, China's proven and probable bauxite (ore) reserves were estimated to be 998 Mt compared with 983 Mt in 2014; chromite, 4.2 Mt (which was the same as in 2014); copper (copper content), 27.2 Mt compared with 28.4 Mt in 2014; iron ore, 20.8 Gt (the same as in 2013); lead, 17.4 Mt compared with 17.2 Mt in 2014; manganese, 276 Mt compared with 214 Mt in 2014; molybdenum, 8.33 Mt compared with 8.37 Mt in 2014; nickel, 2.87 Mt compared with 2.53 Mt in 2014; tin, 1.09 Mt compared with 1.11 Mt in 2014; titanium ore, 214 Mt compared with 216 Mt in 2014; tungsten (WO_3 content), 2.33 Mt (the same as in 2014); vanadium (V_2O_5 content), 8.8 Mt compared with 9.0 Mt in 2014; and zinc, 41.0 Mt compared with 40.3 Mt in 2014 (table 5; National Bureau of Statistics of China, 2016).

As of 2015, China's proven and probable kaolin reserves were estimated to be 574 Mt compared with 575 Mt in 2014; magnesite ore, 1,040 Mt compared with 1,083 Mt in 2014; phosphorus ore, 3,310 Mt compared with 3,070 Mt in 2014; potash, 576 Mt compared with 595 Mt in 2014; and pyrite, 1,310 Mt compared with 1,340 Mt in 2014. As of 2015, China's coal reserves were estimated to be 244 Gt compared with 240 Gt in 2014; crude petroleum, 3.50 Gt (of which offshore reserves were 605 Mt)

compared with 3.43 Gt in 2014; natural gas, 5.2 trillion cubic meters (of which offshore reserves were 510 billion cubic meters) compared with 5.0 trillion cubic meters in 2014 (table 5; National Bureau of Statistics of China, 2016).

One of the major mineral deposit discoveries in 2015 was the Chahanmuhulu graphite deposit in Alxa, Inner Mongolia, which reportedly contained 130 Mt of large-flake graphite reserves. The project, once developed, was expected to produce 160,000 t/yr of graphite concentrate for 28 years. Another major discovery was the Daxin manganese mine in Daxin County, Guangxi Province, which reportedly contained 33.7 Mt of manganese ore reserves at an average grade of 19.33% Mn (Ministry of Land and Resources, 2015; China Geological Society, 2016).

Outlook

China's mineral industry is expected to continue to face challenging conditions as the country's economic downward pressure increases. No significant demand growth from domestic and international markets is expected in the near future, although the Government planned to generate demand growth by implementing strategic initiatives, such as the "Beijing-Tianjin-Hebei coordinated development" initiative, the "Made in China 2025" initiative, the "One Belt One Road" initiative (a development strategy and framework that focuses on connectivity and cooperation among countries, primarily between China and the rest of Eurasia, and consists of two main components—the land-based "Silk Road Economic Belt" and the oceangoing "Maritime Silk Road"), and the "Yangtze River economic zone development" initiative.

The overall output of the mineral industry is expected to stabilize at current levels or to decrease gradually in the coming years as the Government focuses on supply-side reforms to improve efficiency and address overcapacity issues. Mineral sectors with large excess capacity, such as the coal, cement, and steel sectors, will face greater difficulties, and the production by these sectors likely will decrease further. Elimination of outdated capacity is expected to continue. The overcapacity situation, however, may not be resolved in the short term, given that significant new capacity is being added each year and some inactive facilities could be reactivated. For some minor minerals and metals, new demand could come from some new technologies and products that might be sufficient to generate growth, such as cobalt and lithium for use in batteries for electric vehicles.

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TABLE 1
CHINA: ESTIMATED PRODUCTION OF MINERAL COMMODITIES^{1,2}

(Metric tons unless otherwise specified)

Commodity ³	2011	2012	2013	2014	2015
METALS					
Aluminum:					
Bauxite, gross weight	45,000	47,000	50,400	59,200 ^r	65,000
Alumina	34,100	37,700	47,000 ^r	51,300 ^r	59,000
Metal:					
Primary	20,100 ^r	23,500 ^r	26,500 ^r	28,300 ^r	31,400
Secondary	4,400 ^r	4,830 ^r	5,270 ^r	5,650 ^r	6,000
Total	24,500 ^r	28,330 ^r	31,770 ^r	33,950 ^r	37,400
Antimony:					
Mine, Sb content	150,000	136,000	121,000	123,000 ^r	111,000
Metal	200,000	240,000	263,000 ^r	235,000 ^r	201,000
Bismuth:					
Mine output, Bi content	1,540 ^r	2,500 ^r	1,400 ^r	1,500 ^r	1,400
Metal	15,000	15,000	15,500	15,900 ^r	15,000
Cadmium, smelter	6,670	7,270	7,500 ^r	8,200 ^r	7,600
Chromite, gross weight	211 ^r	123 ^r	105 ^r	24 ^r	20
Cobalt:					
Mine output, Co content	1,500 ^r	1,500 ^r	1,500 ^r	1,600 ^r	1,600
Refined	35,000	29,800	36,100	39,300	48,700
Of which, Co metal	5,430	6,400	5,620 ^r	4,780 ^r	6,800
Copper:					
Mine output, Cu content	1,270	1,550 ^r	1,680 ^r	1,740 ^r	1,670
Metal:					
Smelter, primary	3,030	3,600	4,230 ^r	5,170 ^r	5,500
Refined:					
Primary	3,390	3,930	4,690 ^r	4,820	4,960
Secondary	1,850	1,950	1,980 ^r	2,830 ^r	3,000
Total	5,240	5,880	6,670 ^r	7,650 ^r	7,960
Germanium	110	105	110	120 ^r	127
Gold, mine output, Au content	362	403	428	451 ^r	450
Indium, primary and secondary	380	405	430	460	350
Iron and steel:					
Iron ore:					
Crude ore, gross weight	1,330,000	1,330,000	1,450,000	1,510,000	1,380,000
Usable ore, gross weight	442,000	420,000	417,000	410,000	375,000
Usable ore, Fe content	274,000	261,000	259,000	254,000	232,000
Pig iron ⁴	640,510	663,500	708,970	713,740	691,410
Ferroalloys	28,400	31,300	37,700	37,900 ^r	36,000
Steel:⁴					
Crude	685,280	723,880	779,040	822,300	803,820
Rolled	886,190	955,780	1,067,620	1,125,130	1,123,500
Lead:					
Mine output, Pb content	2,400	2,610	2,700 ^r	2,610 ^r	2,340
Metal:					
Smelter, primary	3,110	3,120	3,200	3,050	3,050
Refined:					
Primary	3,200	3,220	3,440 ^r	3,210 ^r	3,080
Secondary	1,400	1,370	1,500	1,530 ^r	1,620
Total	4,600	4,590	4,940 ^r	4,740	4,700
Magnesium, metal	675,000	698,000	770,000	874,000	852,000
Manganese:					
Ore:					
Gross weight	20,000	20,000	17,500	15,500	13,000
Mn content	3,800 ^r	3,800 ^r	3,150 ^r	2,600 ^r	2,100
Metal	1,480	1,110 ^r	1,050 ^r	1,060 ^r	930

See footnotes at end of table.

TABLE 1—Continued
CHINA: ESTIMATED PRODUCTION OF MINERAL COMMODITIES^{1,2}

(Metric tons unless otherwise specified)

Commodity ³	2011	2012	2013	2014	2015
METALS—Continued					
Mercury, mine output, Hg content	1,500	1,350	1,820 ^r	2,260 ^r	2,800
Molybdenum, mine output, Mo content	103,000	120,000	122,000 ^r	129,000 ^r	135,000
Nickel:					
Mine output, Ni content	90,000	93,300	93,300	98,400	92,900
Matte	166,000	153,000	157,000 ^r	160,000 ^r	160,000
Smelter	175,000	197,000	227,000 ^r	247,000 ^r	232,000
Niobium and tantalum, mine output:					
Nb ₂ O ₅ content	20 ^r	21 ^r	22 ^r	28 ^r	43
Ta ₂ O ₅ content	53 ^r	55 ^r	58 ^r	75 ^r	116
Palladium, mine output, Pd content	850	750	850	850	1,200
Platinum, mine output, Pt content	1,600	1,400	1,600	1,600	2,300
Rhenium, Re content in NH ₄ ReO ₄ ⁵	2,100	2,200	2,300	2,350	2,500
Silicon, metal	1,350	1,130	1,450 ^r	1,710 ^r	1,950
Silver, mine output, Ag content	3,230 ^r	3,640 ^r	3,900 ^r	3,670 ^r	3,390
Tin:					
Mine output, Sn content	94,100 ^r	91,000 ^r	10,100 ^r	10,200	11,000
Metal	156,000	148,000	159,000	187,000	167,000
Titanium:					
Ilmenite, TiO ₂ equivalent	1,330,000 ^r	1,800,000 ^r	1,910,000 ^r	1,900,000 ^r	2,100,000
Sponge	68,000	82,000	82,600 ^r	68,200 ^r	54,800
Tungsten, mine output, W content	61,800	64,400	71,100	71,000	73,000
Vanadium, V ₂ O ₅ in vanadiferous slag product	65,000	71,000	80,000	85,000 ^r	80,000
Zinc:					
Mine output, Zn content	4,050	4,860 ^r	5,190 ^r	5,120 ^r	4,750
Refined:					
Primary	5,040	4,770	5,160	5,610	5,680
Secondary	173	120	150	170	180
Total	5,210	4,890	5,310	5,780	5,860
INDUSTRIAL MINERALS					
Asbestos	370,000 ^r	320,000 ^r	280,000 ^r	250,000 ^r	210,000
Barite	5,540 ^r	5,400 ^r	5,260 ^r	5,130 ^r	5,000
Bentonite	3,500	4,000 ^r	4,500 ^r	5,000 ^r	5,600
Boron, mine output, B ₂ O ₃ equivalent	150,000	132,000 ^r	114,000 ^r	97,000 ^r	90,000
Bromine	235,000 ^r	160,000 ^r	110,000	75,500 ^r	60,000
Celestite	116,000	96,000	76,000	50,600	50,000
Cement, hydraulic ⁴	2,099	2,210	2,411	2,492	2,359
Clays, kaolin	3,200	3,300	3,300	3,200	3,200
Diatomite	187,000 ^r	250,000 ^r	310,000 ^r	379,000 ^r	350,000
Dolomite	6,320 ^r	7,300 ^r	8,330 ^r	9,520 ^r	10,600
Feldspar	3,180 ^r	3,350 ^r	3,500 ^r	3,670 ^r	3,500
Fluorspar	5,660 ^r	5,200 ^r	4,800 ^r	4,310 ^r	3,820
Graphite:					
Aphanitic	500,000	150,000	140,000	250,000	200,000
Flake	700,000	650,000	700,000	650,000	660,000
Total	1,200,000	800,000	840,000	900,000	860,000
Gypsum:					
Natural	35,600 ^r	35,000 ^r	28,000 ^r	20,000 ^r	20,000
Byproduct	169,000	172,000	184,000	192,000	200,000
Lime	186,000 ^r	200,000 ^r	220,000 ^r	230,000 ^r	220,000
Lithium:					
Mine output, Li content	2,120 ^r	1,900 ^r	2,100 ^r	1,900 ^r	2,000
Lithium carbonate	30,000	35,000	38,000	41,600	42,000
Lithium hydroxide	14,000	18,000	22,000	21,000	22,000
Lithium metal	1,700	2,000	2,300	2,650	2,680

See footnotes at end of table.

TABLE 1—Continued
CHINA: ESTIMATED PRODUCTION OF MINERAL COMMODITIES^{1,2}

(Metric tons unless otherwise specified)

Commodity ³	2011	2012	2013	2014	2015
INDUSTRIAL MINERALS—Continued					
Magnesite thousand metric tons	19,000	16,000	17,000	16,000	17,000
Mica, natural	71,800 ^r	56,000 ^r	41,000 ^r	25,600 ^r	25,000
Nitrogen, N content of ammonia ⁴ thousand metric tons	43,250	45,520	48,326	45,642	49,706
Phosphate rock, P ₂ O ₅ equivalent do.	24,000	28,500	33,500	36,000	42,600
Potash, marketable, K ₂ O equivalent do.	3,800	3,770	5,300	6,110	5,710
Rare earths, rare-earth oxide equivalent	105,000	100,000	95,000	105,000	105,000
Salt ⁴ thousand metric tons	67,420	69,120	73,676	70,497	66,655
Sodium compounds:					
Caustic soda ⁴ do.	24,740	26,970	29,270	30,640	30,210
Mirabilite do.	8,540 ^r	7,400 ^r	6,500 ^r	5,750 ^r	5,700
Soda ash, natural and synthetic ⁴ do.	22,940	24,010	24,320	25,260	25,920
Sulfur, S content: ^e					
Byproduct, domestic:					
Nonferrous, metallurgy do.	3,270	3,370	3,560	4,140	3,800
Petroleum and coal chemical industry do.	4,770	4,910	5,190	6,020	5,530
Pyrite do.	5,660 ^r	5,820 ^r	6,150 ^r	7,140 ^r	6,570
Total do.	13,700	14,100	14,900	17,300	15,900
Talc and related materials do.	2,140 ^r	2,060 ^r	1,970 ^r	1,870 ^r	1,800
MINERAL FUELS AND RELATED MATERIALS					
Coal:					
Anthracite thousand metric tons	450,000	470,000 ^r	451,000 ^r	422,000 ^r	401,000
Bituminous do.	2,800,000	2,820,000 ^r	3,220,000 ^r	3,190,000 ^r	3,100,000
Lignite do.	270,000	371,000 ^r	300,000 ^r	272,000 ^r	252,000
Total do.	3,520,000	3,660,000	3,970,000	3,880,000	3,750,000
Coke, all types ⁴ do.	432,710	447,790	481,794	479,809	448,225
Gas, natural, gross billion cubic meters	102	107	121	130	135
Petroleum:					
Crude, including crude from oil shale million 42-gallon barrels	1,480	1,510	1,520	1,530	1,550
Refinery products do.	3,170 ^r	3,360 ^r	3,500 ^r	3,710 ^r	3,900
Uranium, mine output, U content	885 ^r	1,500 ^r	1,450 ^r	1,500 ^r	1,620

^rRevised. do. Ditto.

¹Estimated data are rounded to no more than three significant digits; may not add to totals shown.

²Table includes data available through March 7, 2017.

³In addition to the commodities listed, China also produced beryllium, diamond, gallium, iodine, selenium, stone, strontium, tellurium, and zirconium, but available information was inadequate to make reliable estimates of output.

⁴Reported.

⁵Includes rhenium from imported copper and molybdenum concentrates.

TABLE 2
CHINA: STRUCTURE OF THE MINERAL INDUSTRY IN 2015

(Thousand metric tons unless otherwise specified)

Commodity	Facilities, major operating companies, and major equity owners ¹	Location of main facilities ²	Annual capacity ^e
Aluminum:			
Alumina	Guangxi Huayin Aluminium Industry Co., Ltd.	Guangxi, Debao	3,000
Do.	Luoyang Xiangjiang Wanji Aluminium Industry Co., Ltd.	Henan, Luoyang	1,800
Do.	Hangzhou Jinjian Group	Jiangsu, Hangzhou	6,000
Do.	Aluminum Corporation of China (Chinalco)	Plants in multiple provinces	17,500
Do.	China Power Investment Corp.	do.	3,800
Do.	East Hope Group	do.	3,500
Do.	Xinfa Aluminium Group Co., Ltd.	do.	12,500
Do.	Nanshan Group	Shandong, Yantai	2,000
Do.	Weiqiao Aluminum and Electricity Co., Ltd.	Shandong, Zouping	12,000
Do.	Yangquan Coal Industry Group Co., Ltd.	Shanxi, Yangquan	1,000
Metal	Dongxing Aluminum Co., Ltd.	Gansu province	1,700
Do.	Shenhua Group Co., Ltd.	Henan, Yongcheng	1,500
Do.	Yidian Holding Group Co., Ltd.	Plants in Henan Province	840
Do.	Aluminum Corporation of China (Chinalco)	Plants in multiple Provinces	3,800
Do.	China Power Investment Corp.	do.	3,230
Do.	East Hope Group	do.	1,660
Do.	Xinfa Aluminium Group Co., Ltd.	do.	3,480
Do.	Weiqiao Aluminum and Electricity Co., Ltd.	Shandong, Zouping	4,020
Do.	Tianshan Aluminum Co., Ltd.	Xinjiang, Shihezi	1,400
Do.	Yunnan Aluminium Co., Ltd.	Yunnan, Kunming	1,200
Antimony	Huaxi (China Tin) Group Industrial Co.	Guangxi, Hechi	25
Do.	Jiyuan Wangyang Smelter (Jiyuan Wangyang Smeltery Group Co. Ltd.)	Henan, Jiaozuo	10
Do.	Hunan Chenzhou Mining Group Co. Ltd.	Hunan, Yuanling	20
Do.	Hsikuangshan Twinkling Star Antimony Co. Ltd. (China Minmetals Group)	Hunan, Lengshuijiang	40
Asbestos	China National Nonmetallic Industry Corp.	Nei Mongol, Baotou; Shanxi, Lai Yuan, and Lu Liang	130
Barite	do.	Guizhou, Xiangshou	NA
Bismuth	metric tons Guangzhou Smelter	Guangdong, Guangzhou	300
Do.	do. Jiyuan Wangyang Smelter (Jiyuan Wangyang Smeltery Group Co. Ltd.)	Henan, Jiaozuo	200
Do.	do. Hunan Bismuth Industry Co. Ltd.	Hunan, Chouzhou	3,500
Do.	do. Shizhuyuan Nonferrous Metals Co. Ltd.	Hunan, Shizhuyuan	1,200
Do.	do. Zhuzhou Smelter (Zhuye Torch Metals Co. Ltd.)	Hunan, Zhuzhou	350
Do.	do. Yunnan Copper Group Co. Ltd.	Nei Mongol, Chifeng	300
Do.	do. Yunnan Chihong Zinc and Germanium Co. Ltd.	Yunnan, Qujing	300
Cadmium	do. Zhuzhou Smelter (Zhuye Torch Metals Co. Ltd.)	Hunan, Zhuzhou	1,000
Do.	do. Yunnan Chihong Zinc and Germanium Co. Ltd.	Yunnan, Qujing	800
Coal	Jizhong Energy Group Co. Ltd.	Hebei, Handan	157,000
Do.	Kailuan Group Co. Ltd.	Hebei, Tangshan	141,000
Do.	Henan Energy and Chenial Industry Group Co. Ltd.	Henan, Zhengzhou	156,000
Do.	China National Coal Group Corp.	Mines in Nei Mongol, Shanxi Jiangsu, and other Provinces	256,000
Do.	Shenhua Group Corp. Ltd.	Mines in Nei Mongol, Xinjiang and other Provinces	666,000
Do.	Shaanxi Coal and Chemical Industry Group Co. Ltd.	Shaanxi, Chengcheng	196,000
Do.	Shandong Energy Group Co. Ltd.	Shandong, Jinan	206,000
Do.	Yanzhou Coal Mining Co. Ltd.	Shandong, Jining	168,000
Do.	Datong Coal Mine Group Co. Ltd.	Shanxi, Datong	267,000
Do.	Shanxi Coking Coal Group Co. Ltd.	Shanxi, Taiyuan	162,000

See footnotes at end of table.

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

(Thousand metric tons unless otherwise specified)

Commodity		Facilities, major operating companies, and major equity owners ¹	Location of main facilities ²	Annual capacity ^e
Cobalt	metric tons	Jinchuan Nonferrous Metals Corp.	Gansu, Jinchang	10,000
Do.	do.	Huayou Cobalt Co. Ltd.	Zhejiang, Tongxiang	3,000
Copper, refined		Jinchang Smelter (Tongling Nonferrous Metals Group Holding Co. Ltd.)	Anhui, Tongling	170
Do.		Jinlong Smelter (Tongling Nonferrous Metals Group Holding Co. Ltd.)	do.	400
Do.		Wuhu Smelter (Hengxin Copper Industry Group Co.)	Anhui, Wuhu	60
Do.		Zijin Copper Co. Ltd.	Fujian, Shanghang	200
Do.		Baiyin Nonferrous Metals Group Co. Ltd.	Gansu, Baiyin	100
Do.		Jinchuan Nonferrous Metals Corp.	Gansu, Jinchuan	650
Do.		do.	Guangxi, Fangchenggang	400
Do.		Luoyang Copper Processing Factory	Henan, Luoyang	50
Do.		Daye Nonferrous Metals Co.	Hubei, Daye	600
Do.		Zhangjiagang United Copper Co. (Tongling Nonferrous Metals Group Holding Co. Ltd.)	Jiangsu, Zhangjiagang	200
Do.		Guixi Smelter (Jiangxi Copper Co. Ltd.)	Jiangxi, Guixi	900
Do.		Dongfang Copper Co. (Huludao Nonferrous Metals Group)	Liaoning, Huludao	100
Do.		Chifeng Fubang Copper Co. Ltd.	Nei Mongol, Chifeng	100
Do.		Chifeng Jingeng Copper Co. Ltd.	Nei Mongol, Chifeng, Harqin Banner	100
Do.		Shandong Dongying Fangyuan Nonferrous Metals Co. Ltd.	Shandong, Dongying	400
Do.		Shandong Jinsheng Nonferrous Metals Corp.	Shandong, Linyi	100
Do.		Yanggu Xiangguang Copper Co. Ltd. (Shandong Fengxiang Group)	Shandong, Liaocheng, Yanggu	600
Do.		Yantai Penghui Copper Industry Co. Ltd.	Shandong, Yantai	200
Do.		Taiyuan Copper Industry Co.	Shanxi, Taiyuan	100
Do.		Yuanqu Smelter (Zhongtiaoshan Nonferrous Metals Group Co. Ltd.)	Shanxi, Yuangu	100
Do.		Huili Kunpeng Co. Ltd.	Sichuan, Huili	100
Do.		Tianjin Datong Copper Co. Ltd. (formerly Tianjin Copper Electrolysis Factory)	Tianjin	200
Do.		Yunnan Smelter (Chinalco Yunnan Copper Group Co. Ltd.)	Yunnan, Kunming	500
Do.		Hangzhou Fuchunjiang Smelting Co. Ltd.	Zhejiang, Fuchunjiang	100
Gallium	metric tons	Chalco Zunyi Aluminum Co. Ltd. [Aluminum Corporation of China (Chinalco)]	Guizhou, Zunyi	40
Do.	do.	Pingguo Aluminum Co. [Aluminum Corporation of China (Chinalco)]	Guangxi, Pingguo	40
Do.	do.	Shandong Aluminum Plant	Shandong, Zibo	20
Gas, natural	billion cubic meters	China National Petroleum Corp.	Sichuan	10
Germanium	metric tons	Shaoguan Smelter (Shenzhen Nonfemet Co.)	Guangdong, Shaoguan	30
Do.	do.	Nanjing Germanium Co. Ltd.	Jiangsu, Nanjing	30
Do.	do.	Nei Mongol Xilingol Tongtai Germanium Refine Co. Ltd.	Nei Mongol, Xilinhot	20
Do.	do.	Shanghai Lontai Copper Co. Ltd.	Shanghai	10
Do.	do.	Yunnan Lincang Xinyuan Germanium Industrial Co. Ltd.	Yunnan, Lincang	50
Do.	do.	Yunnan Chihong Zinc and Germanium Industrial Co. Ltd.	Yunnan, Qujing	50
Gold, refined	do.	Zijin Copper Co. Ltd.	Fujian, Shanghang	5
Do.	do.	China National Gold Corp.	Henan, Lingbao	10
Do.	do.	Zhongyan Gold Smelter (Zhongjin Gold Co. Ltd.)	Henan, Sanmenxia	30
Do.	do.	Jiangxi Copper Co. Ltd.	Jiangxi, Guixi	20
Do.	do.	Laizhou Gold Co.	Shandong, Laizhou	15
Do.	do.	Yanggu Xiangguang Copper Co. Ltd. (Shandong Fengxiang Group)	Shandong, Liaocheng, Yanggu	20
Do.	do.	Shandong Yanggu Xiangguang Co. Ltd.	Shandong, Yanggu	20
Do.	do.	Yantai Penghui Copper Industry Co. Ltd.	Shandong, Yantai	5
Do.	do.	Zhaoyuan Gold Co.	Shandong, Zhaoyuan	15
Do.	do.	Great Wall Gold Silver Refinery	Sichuan, Chengdu	100
Do.	do.	Yunnan Chihong Zinc and Germanium Co. Ltd.	Yunnan, Qujing	130

See footnotes at end of table.

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

(Thousand metric tons unless otherwise specified)

Commodity	Facilities, major operating companies, and major equity owners ¹	Location of main facilities ²	Annual capacity ^e
Graphite	Jixi Aoyu Graphite Co. Ltd.	Heilongjiang, Jixi and Luo	60
Do.	Nei Mongol Xinghe Jingxin Graphite Co. Ltd.	Nei Mongol, Xinghe	10
Indium	metric tons Shaoguan Smelter (Shenzhen Nonfemet Co.)	Guangdong, Shaoguan	25
Do.	do. Guangxi Tanghan Zinc & Indium Co. Ltd.	Guangxi, Hechi	30
Do.	do. Laibin Smelter [Liuzhou Huaxi (China Tin) Group Co.]	Guangxi, Laibin	50
Do.	do. Guangxi Debang Technology Co. Ltd.	Guangxi, Liuzhou	85
Do.	do. Liuzhou Zinc Products Co.	do.	20
Do.	do. Yintai Technology Co. Ltd.	do.	40
Do.	do. Yuguang Gold-Lead Co. Ltd.	Henan, Jiyuan	10
Do.	do. Hsikuangshan Twinkling Star Antimony Co. Ltd. (China Minmetals Group)	Hunan, Lengshuijiang	7
Do.	do. Xiangtan Zhengtan Nonferrous Metal Co. Ltd.	Hunan, Xiangtan	75
Do.	do. Zhuzhou Smelter	Hunan, Zhuzhou	60
Do.	do. Nanjing Germanium Co. Ltd.	Jiangsu, Nanjing	150
Do.	do. Nanjing Sanyou Electronic Material Co. Ltd.	do.	50
Do.	do. Huludao Nonferrous Metals Group Co.	Liaoning, Huludao	50
Do.	do. Yunnan Chengfeng Nonferrous Metals Co. Ltd.	Yunnan, Gejiu	10
Do.	do. Yunnan Mengzi Mining and Smelting Co. Ltd.	Yunnan, Honghe	30
Iron and steel:			
Iron ore	Ma'anshan Iron and Steel Co.	Anhui, Maanshan	4,500
Do.	Shoudu (Capital) Mining Co.	Beijing	5,000
Do.	Jiuquan Iron and Steel Co. Ltd.	Gansu, Jiayuguan	4,000
Do.	Dabaoshan Mining Co.	Guangdong, Qujiang	1,670
Do.	Hainan Iron Mine	Hainan, Changjiang	4,600
Do.	Hebei Iron and Steel Group Co.	Hebei, Tangshan	7,000
Do.	Wuhan Iron and Steel (Group) Co.	Hubei, Wuhan	5,100
Do.	Meishan Metallurgical Co.	Jiangsu, Nanjing	2,000
Do.	Banshigou Iron Mine Mining Co.	Jilin, Hunjiang	1,400
Do.	Anshan Mining Co.	Liaoning, Anshan	30,000
Do.	Benxi Iron and Steel Co.	Liaoning, Benxi	7,000
Do.	Baotou Iron and Steel and Rare Earth Co.	Nei Mongol, Baotou	10,000
Do.	Shandong Iron and Steel Co.	Shandong, Jinan	3,000
Do.	Taiyuan Iron and Steel Co.	Shanxi, Taiyuan	10,000
Do.	Panzhuhua Mining Co.	Sichuan, Panzhihua	13,000
Do.	Kunming Iron and Steel Co.	Yunnan, Kunming	1,400
Ferroalloys	Shoudu (Capital) Iron and Steel (Group) Co.	Beijing	35
Do.	Qingshan Holding Group Co. Ltd.	Fujian, Fu'an	300
Do.	Desheng Nickel Industry Co. Ltd.	Fujian, Luoyuanwan	920
Do.	Northwest Ferroalloy Co.	Gansu, Yongdeng	60
Do.	Zunyi Ferroalloy Co.	Guizhou, Zunhi	100
Do.	Zhejiang Huaguang Smelting Group	Jiangxi, Hengfeng	50
Do.	Jilin Ferroalloy Co.	Jilin, Jilin	250
Do.	Jinzhou Ferroalloy Co.	Liaoning, Jinzhou	90
Do.	Liaoyang Ferroalloy Co.	Liaoning, Liaoyang	70
Do.	Shanghai Iron and Steel Co. Ltd.	Shanghai	180
Do.	Emei Ferroalloy Co.	Sichuan, Emei	70
Do.	Hengshan Ferroalloy Co.	Zhejiang, Jiande	70

See footnotes at end of table.

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

(Thousand metric tons unless otherwise specified)

Commodity	Facilities, major operating companies, and major equity owners ¹	Location of main facilities ²	Annual capacity ^c
Iron and steel—Continued:			
Crude steel	Ma'anshan Iron and Steel Co.	Anhui, Maanshan	27,000
Do.	Shougang Iron and Steel Co. Ltd.	Beijing	40,000
Do.	Beijing Jianlong Heavy Industry Group Co., Ltd	do.	21,000
Do.	Shougang-Tangshan Iron and Steel Group Co. Ltd.	Hebei, Caofeidian	10,000
Do.	Hebei Iron and Steel Group Co.	Hebei, Handan	67,000
Do.	Wuhan Iron and Steel (Group) Co.	Hubei, Wuhan	36,000
Do.	Shagang Group Co. Ltd.	Jiangsu, Zhangjiagang	48,000
Do.	Anshan Iron and Steel (Group) Co.	Liaoning, Anshan	46,000
Do.	Benxi Iron and Steel Co.	Liaoning, Benxi	21,000
Do.	Shandong Iron and Steel Group	Shandong, Jinan	31,000
Do.	Baoshan Iron and Steel (Group) Corp.	Shanghai	49,000
Do.	Tianjin Bohai Iron and Steel Group Co., Ltd	Tianjin	23,000
Lead	Jiuhua Smelter (Tongling Nonferrous Metals Group Holding Co. Ltd.)	Anhui, Chizhou	80
Do.	Baiyin Nonferrous Metals Co. Ltd.	Gansu, Baiyin	80
Do.	Shaoguan Smelter (Shenzhen Nonfemet Co.)	Guangdong, Shaoquan	100
Do.	Laibin Smelter [Huaxi (China Tin) Group Co.]	Guangxi, Laibin	100
Do.	Hechi Nanfang Nonferrous Metals Smelting Co. Ltd.	Guangxi, Hechi	80
Do.	Anyang Smelter (Yubei Metal Co.)	Henan, Anyang	160
Do.	Jiyuan Wangyang Smelter (Jiquan Wangyang Smeltery Group Co. Ltd.)	Henan, Jiaozuo	200
Do.	Jinli Smelter (Jiyuan Jinli Smelting Co.)	Henan, Jiyuan	300
Do.	Jiyuan Smelter (Yuguang Gold-Lead Co. Ltd.)	do.	300
Do.	Henan Lingye Co. Ltd.	Henan, Lingbao	100
Do.	Hanjiang Smelter	Hubei, Luhekou	50
Do.	Shuikoushan Nonferrous Metals Co. Ltd.	Hunan, Hengyang	100
Do.	Zhuzhou Smelter (Zhuye Torch Metals Co. Ltd.)	Hunan, Zhuzhou	100
Do.	Xuzhou Chunxing Alloy Co. Ltd.	Jiangsu, Xuzhou	150
Do.	Jiangxi Jinde Lead Co. Ltd.	Jiangxi, Shangrao	80
Do.	Huludao Nonferrous Metals Group Co. Ltd.	Liaoning, Huludao	30
Do.	Shaanxi Dongling Group	Shaanxi, Baoji	100
Do.	Yunnan Tin Co. Ltd. (Yunnan Tin Corp.)	Yunnan, Gejiu	100
Do.	Kunming Smelter	Yunnan, Kunming	100
Do.	Yunnan Chihong Zinc and Germanium Co. Ltd.	Yunnan, Qujing	100
Lithium, LiCO ₃	Tibet Mineral Development Co. Ltd.	Gansu, Baiyin	5
Do.	Jiangxi Ganfeng Lithium Co. Ltd.	Jiangxi, Xinyu	3
Do.	Sichuan Ni/Co Guorun New Material Co. Ltd.	Sichuan, Pengshan	2
Do.	Sichuan Shehong Lithium Co. Ltd.	Sichuan, Shehong	2
Do.	Sichuan Tianqi Lithium Industry Co. Ltd. (Chengdu Tianqi Group Co. Ltd.)	Sichuan, Suining	10
Do.	Sichuan Aba Guangsheng Lithium Industrial Co. Ltd.	Sichuan, Wenchuan	2
Do.	Qinghai Yanhu Industry Group Co. Ltd.	Qinghai, Golmud	10
Do.	Qinghai CITIC Guoan Technology Development Co. Ltd.	do.	20
Do.	Qinghai Lithium Industry Co. Ltd.	Qinghai, Xining	20
Do.	Xinjiang Haoxin Lithium Salt Development Co. Ltd. (formerly Xinjiang Lithium Co.)	Xinjiang, Urumqi	5

See footnotes at end of table.

TABLE 2—Continued
CHINA: STRUCTURE OF THE MINERAL INDUSTRY IN 2016

(Thousand metric tons unless otherwise specified)

Commodity	Facilities, major operating companies, and major equity owners ¹	Location of main facilities ²	Annual capacity ^e
Magnesium	Zunyi Titanium Co. Ltd.	Guizhou, Zunyi	24
Do.	Ningxia Huayuan Magnesium Group	Ningxia, Yinchuan	15
Do.	Huayu Enterprises (Group) Ltd.	Shanxi, Jishan	35
Do.	Taiyuan Tongxiang Magnesium Metal Co. Ltd.	Shanxi, Taiyuan	45
Do.	Taiyuan Yiwei Magnesium Co. Ltd.	do.	21
Do.	Wenxi Biyun Magnesium Co. Ltd.	Shanxi, Wenxi	30
Do.	Wenxi Yinguang Magnesium Group	do.	40
Manganese, metal	Chongqing Tycoon Manganese Co. Ltd.	Chongqing	23
Do.	Guangxi Dameng Manganese Industry Co. Ltd.	Guangxi, Nanning	70
Molybdenum, concentrate	Luoyang Luanchuan Molybdenum Industry Group Co., Ltd.	Henan, Luanchuan	30
Do.	Jinduicheng Molybdenum Industry Group Co. Ltd.	Shaanxi, Huaxian	30
Nickel, refined	Jinchuan Nonferrous Metals Corp.	Gansu, Jinchuan	130
Do.	Guangxi Yinyi Science and Technic Mine	Guangxi, Yulin, Bohai	10
Do.	Guangxi Yulin Weinie Co. Ltd.	Guangxi, Bobai	18
Do.	Jiangxi Jiangli Science and Technology Co. Ltd.	Jiangxi, Fenyi	50
Do.	Jilin Jien Nickel Industry Co. Ltd.	Jilin, Panshi	10
Do.	Inco New Nickel Materials (Dalian) Co. Ltd.	Liaoning, Dalian	32
Do.	Schaanxi Huaze Nickel and Cobalt Metal Co. Ltd.	Shaanxi, Xian	5
Do.	Chengdu Electro-Metallurgy Factory	Sichuan, Chengdu	5
Do.	Huili Kunpeng Co. Ltd.	Sichuan, Huili	10
Do.	Sichuan Ni/Co Guorun New Material Co. Ltd.	Sichuan, Pengshan	10
Do.	Xinjiang Fukang Smelter	Xinjiang, Fukang	15
Do.	Xinjiang Xinxin Mining Co. Ltd.	Xinjiang, Fuyun	7
Do.	Yuanjiang Nickel Industry Co. Ltd.	Yunnan, Yuxi	5
Niobium and tantalum, concentrate, gross weight	Jiangxi Tungsten Industry Group Co. Ltd. (China Minmetals Co.)	Mine in Jiangxi, Yichun	350
Do.	Jiangxi Jiangte Mining Development Co., Ltd.	Mine in Jiangxi, Yichun	35
Do.	Jiangxi Jinhui Renewable Resources Co., Ltd.	Plant in Jiangxi, Yichun	20
Palladium and platinum	Jinchuan Nonferrous Metals Corp.	Gansu, Jinchang	3,500
Petroleum, crude	Shengli Administration	Hebei, Shengli	245
Do.	Daqing Administration	Heilongjiang, Daqing	402
Do.	Liaohe Administration	Liaoning, Liaohe	110
Do.	Bohai Offshore Oil Corp.	Bohai	29
Do.	Nanghai East Corp.	Nanghai	37
Potash	Qinghai Yanhu Industry Group Co. Ltd.	Qinghai, Charhan	2,000
Do.	Xinjiang Lop Nur Potassic Salt Scientific and Technology Development Co.	Xinjiang, Ruoqiang	1,200
Rare earths, rare-earth oxide:			
Mine output	China Minmetals Co.	Mines in Hunan, Fujian, Guangdong, Jiangxi, and Yunnan	3,500
Do.	Aluminum Corporation of China (Chinalco)	Mines in Guangxi, Jiangsu, Shandong, and Sichuan	20,000
Do.	China North Rare Earth (Group) High Technology Co., Ltd.	Mines in Gansu and Inner Mongolia	100,000
Do.	Guangdong Province Rare Earth Industry Group Co., Ltd.	Mines in Guangdong	3,000
Do.	Xiamen Tungsten Co., Ltd.	Mines in Fujian	3,000
Do.	China Southern Rare Earth Group Co., Ltd.	Mines in Jiangxi	40,000
Smelter	China Minmetals Co.	Plants in Hunan, Fujian, Guangdong, Jiangxi, and Yunnan	14,000
Do.	Aluminum Corporation of China (Chinalco)	Plants in Guangxi, Jiangsu, Shandong, and Sichuan	45,000
Do.	China North Rare Earth (Group) High Technology Co., Ltd.	Plants in Gansu and Inner Mongolia	140,000
Do.	Guangdong Province Rare Earth Industry Group Co., Ltd.	Plants in Guangdong	28,000
Do.	Xiamen Tungsten Co., Ltd.	Plants in Fujian	7,000
Do.	China Southern Rare Earth Group Co., Ltd.	Plants in Jiangxi	42,000

See footnotes at end of table.

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

(Thousand metric tons unless otherwise specified)

Commodity		Facilities, major operating companies, and major equity owners ¹	Location of main facilities ²	Annual capacity ^c
Rhenium, rhenate	kilograms	Guixi Smelter (Jiangxi Copper Co. Ltd.)	Jiangxi, Guixi	3,000
Do.	do.	Western Xinxing Metal Materials Co. Ltd.	Shaanxi, Luonan	200
Salt		Shandong Haihua Group Co. Ltd.	Shandong, Weifang	1,400
Do.		Zigong Zhangjiaba Salt Chemical Plant	Sichuan, Zigong	250
Selenium	metric tons	Jinchuan Nonferrous Metals Corp.	Gansu, Jinchang	50
Do.	do.	Guixi Smelter (Jiangxi Copper Co. Ltd.)	Jiangxi, Guixi	300
Silver	metric tons	Zijin Copper Co. Ltd.	Fujian, Shanghang	125
Do.	do.	Jinchuan Nonferrous Metals Corp.	Gansu, Jinchang	150
Do.	do.	Laibin Smelter [Huaxi (China Tin) Group Co.]	Guangxi, Laibin	80
Do.	do.	Daye Nonferrous Metals Co.	Hubei, Daye	300
Do.	do.	Jiyuan Wangyang Smelter (Jiquan Wangyang Smeltery Group Co. Ltd.)	Henan, Jiaozuo	1,600
Do.	do.	Jinli Smelter (Jiyuan Jinli Smelting Co.)	Henan, Jiyuan	800
Do.	do.	Jiyuan Smelter (Yuguang Gold-Lead Co. Ltd.)	do.	730
Do.	do.	Jiangxi Copper Co. Ltd.	Jiangxi, Guixi	430
Do.	do.	Huludao Nonferrous Metals Group Co. Ltd.	Liaoning, Huludao	80
Do.	do.	Yanggu Xiangguang Copper Co. Ltd. (Shandong Fengxiang Group)	Shandong, Liaocheng, Yanggu	600
Do.	do.	Yantai Penghui Copper Industry Co. Ltd.	Shandong, Yantai	80
Do.	do.	Great Wall Gold Silver Refinery	Sichuan, Chengdu	300
Do.	do.	Yunnan Chengfeng Nonferrous Metals Co. Ltd.	Yunnan, Gejiu	150
Do.	do.	Yunnan Tin Co. Ltd. (Yunnan Tin Corp.)	do.	160
Do.	do.	Yunnan Smelter (Yunnan Copper Group Co. Ltd.)	Yunnan, Kunming	450
Do.	do.	Yunnan Chihong Zinc and Germanium Co. Ltd.	Yunnan, Qujing	150
Strontium, carbonate		Chongqing Chonglong Strontium Co. Ltd.	Chongqing	20
Do.		Chongqing Tongliang Redbutterfly Strontium Co.	do.	40
Do.		Shijiazhuang Zhengding Xian Jinshi Chemical Co. Ltd	Hebei, Shijiazhuang	3
Do.		Hebei Xinji Chemical Group	Hebei, Xinji	2
Do.		Nanjing Jinyan Strontium Co. Ltd.	Jiangsu, Lishui	2
Talc		China National Nonmetallic Industry Corp.	Guangxi, Longshen	130
Do.		do.	Liaoning, Haicheng	50
Do.		do.	Shandong, Qixia	5
Tellurium, concentrate	metric tons	Jiangxi Copper Co. Ltd.	Jiangxi, Guixi	50
Tin, smelter		Guihuacheng Smelter (Guangxi Pinggui PGMA Co. Ltd.)	Guangxi, Hezhou	8
Do.		Laibin Smelter (Guangxi China Tin Group Co. Ltd.)	Guangxi, Laibin	25
Do.		Chenzhou Smelter (Yunnan Tin Co. Ltd.)	Hunan, Chenzhou	20
Do.		Nanshan Tin Co. Ltd.	Jiangxi, Nankang	10
Do.		Yunnan Chengfeng Nonferrous Metals Co. Ltd.	Yunnan, Gejiu	20
Do.		Yunnan Tin Co. Ltd. (Yunnan Tin Corp.)	do.	70
Do.		Yunnan Gejiu Zili Metallurgy Co. Ltd.	Yunnan, Huogudu	20
Titanium, sponge		Jinchuan Nonferrous Metals Corp.	Gansu, Jinchuan	15
Do.		Guizhou Southwest Titanium Co. Ltd.	Guizhou, Guiyang	3
Do.		Zunbao Titanium Co. Ltd.	Guizhou, Tongzi	10
Do.		Zunyi Titanium Co. Ltd.	Guizhou, Zunyi	20
Do.		Tangshan Tianhe Titanium Co. Ltd.	Hebei, Tangshan	10
Do.		Luoyang Sun Rui Wanji Titanium Industry Co. Ltd.	Henan, Xinan	10
Do.		Chaoyang Baisheng Zirconium Co. Ltd.	Liaoning, Chaoyang	8
Do.		Chaoyang Jintai Titanium Co. Ltd.	do.	7
Do.		Fushun Titanium Co. Ltd.	Liaoning, Fushun	5
Do.		Jinzhou Huashen Nonferrous Metals Plant	Liaoning, Jinzhou	10
Do.		Baoti Titanium Industry Co. Ltd.	Shaanxi, Baoji	10
Do.		Gangqi Xinyu Titanium Co. Ltd.	Sichuan, Panzhihua	5
Do.		Hengwei Titanium Co. Ltd.	do.	5
Do.		Panzhihua Iron and Steel (Group) Co. (Pangang)	do.	15
Do.		Yunnan Metallurgical Group	Yunnan, Lufeng	10

See footnotes at end of table.

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

(Thousand metric tons unless otherwise specified)

Commodity	Facilities, major operating companies, and major equity owners ¹	Location of main facilities ²	Annual capacity ³
Tungsten, concentrate	Ninghua Hangluoken Tungsten Mine (Amoi Tungsten Co. Ltd.)	Fujian, Ninghua	4
Do.	Shizhuyuan Nonferrous Metals Co.	Hunan, Chenzhou	5
Do.	Yaogangxian Tungsten Mine	Hunan, Yizhang	3
Do.	Jiangxi Tungsten and Rare Earth Co. Ltd.	Jiangxi, Ganzhou	15
Uranium	metric tons Tianshan Uranium Co.	Mengqiguer, Xinjiang	500
Zinc	Northwest China Lead-Zinc Smelter (Baiyin Nonferrous Metals Co. Ltd.)	Gansu, Baiyin	150
Do.	Shaoguan Smelter (Shenzhen Nonfemet Co.)	Guangdong, Shaoguan	270
Do.	Hechi Nanfang Nonferrous Metal Smelting Co. Ltd.	Guangxi, Hechi	200
Do.	Liuzhou Nonferrous Metal Smelting Co. Ltd. (formerly Liuzhou Zinc Products Factory)	Guangxi, Liuzhou	100
Do.	Yugang Gold-Lead Co. Ltd.	Henan, Jiyuan	300
Do.	Shuikoushan Nonferrous Metals Co. Ltd.	Hunan, Hengyang	60
Do.	Hsikuangshan Twinkling Star Antimony Co. Ltd. (China Minmetals Group)	Hunan, Lengshuijiang	40
Do.	Zhuzhou Smelter (Zhuye Torch Metals Co. Ltd.)	Hunan, Zhuzhou	500
Do.	Huludao Zinc Smelting Co. (Huludao Nonferrous Metals Group. Co. Ltd.)	Liaoning, Huludao	390
Do.	Zijin Bayannur Co. Ltd. (Zijin Mining Group)	Nei Mongol, Bayannur League	220
Do.	Chifeng NFC Kumba Hongye Zinc Co. Ltd. (China Nonferrous Metals Mining Group Co. Ltd.)	Nei Mongol, Chifeng	230
Do.	Xingan Copper and Zinc Smelter	Nei Mongol, Xilinuo	100
Do.	Dongling Zinc Industry Co. Ltd. (Dongling Group)	Shaanxi, Baoji	250
Do.	Laibin Smelter (Guangxi China Tin Group Co. Ltd.)	Yunnan, Laibin	60
Do.	Yunnan Jinding Zinc Co. Ltd. (Sichuan Hongda Group)	Yunnan, Lanping	120
Do.	Yunnan Chihong Zinc and Germanium Co. Ltd.	Yunnan, Qujing	280

³Estimated; estimated data are rounded to no more than three significant digits. Do., do. Ditto. NA Not available.

¹Most companies are owned by either the central Government or a Provincial government. Not all facilities are listed here either because the available information was inadequate to provide a complete list for the mineral commodity or because there were too many facilities to list.

²Listed by Province or Autonomous Region, followed by locality.

TABLE 3
CHINA: EXPORTS OF SELECTED MINERAL COMMODITIES IN 2015

Commodity	Quantity (metric tons)	Value (thousands)
METALS		
Aluminum:		
Alumina	292,591	\$139,455
Metal and alloys:		
Unwrought	565,643	1,175,522
Semimanufactures	4,200,000	12,976,532
Antimony, unwrought, waste and scrap	4,106	29,956
Copper, metal and alloys:		
Unwrought	218,363	1,279,711
Semimanufactures	466,077	3,559,097
Iron and steel:		
Pig iron and cast iron	170,000	47,164
Steel:		
Bars and rods	43,900,000	16,295,438
Shapes and sections	5,420,000	2,609,716
Sheets and plates	48,460,000	27,378,240
Tube and pipe	1,560,000	4,104,770
Wire of steel or iron	2,290,000	2,134,531
Ferroalloys	370,000	871,768
Scrap	1,145	427
Manganese, unwrought	295,131	539,219
Molybdenum, ores and concentrates	4,190	36,601
Tin, metal and alloys, unwrought	562	9,179
Tungsten, tungstates	3,351	166,756
Zinc:		
Metal and alloys, unwrought	96,683	214,432
Oxide and peroxide	13,414	25,399
INDUSTRIAL MINERALS		
Barite	2,070,000	272,543
Cement	15,750,000	775,249
Fluorspar	340,000	89,374
Granite	7,160,000	4,772,678
Graphite, natural	250,000	246,366
Magnesia, fused	2,140,000	540,411
Rare-earth products	34,832	373,030
Talc	630,000	154,947
MINERAL FUELS AND RELATED MATERIALS		
Coal	5,330,000	498,750
Coke, semicoke	9,850,000	1,538,620
Petroleum:		
Crude	2,870,000	1,545,644
Refinery products	36,150,000	19,095,477

Source: General Administration of Customs of the People's Republic of China, 2015, China monthly exports and imports, no. 12.

TABLE 4
CHINA: IMPORTS OF SELECTED MINERAL COMMODITIES IN 2015

(Metric tons unless otherwise specified)

Commodity	Quantity	Value (thousands)
METALS		
Aluminum:		
Alumina	4,650,000	\$1,630,902
Metal and alloys, unwrought	223,710	460,898
Semimanufactures	472,080	2,803,361
Scrap	2,090,000	2,876,128
Chromium, chromite	10,390,000	1,788,068
Copper:		
Ore and concentrates	13,290,000	19,203,685
Metal and alloys, unwrought	4,250,000	23,968,905
Semimanufactures	563,276	5,061,692
Scrap	3,660,000	8,402,439
Iron and steel:		
Iron ore	952,720,000	57,620,298
Steel:		
Bars and rods	1,070,000	1,437,158
Seamless pipe	380,000	1,620,421
Shapes and sections	350,000	321,353
Sheets and plates	10,770,000	9,762,342
Scrap	2,330,000	1,189,450
Lead ore and concentrates	1,900,000	2,076,456
Manganese ore	15,760,000	1,993,602
Titanium dioxide	203,873	512,962
INDUSTRIAL MINERALS		
Diamond	kilograms 2,059	7,451,004
Nitrogen, phosphorus, and potassium fertilizers:		
Compound fertilizers	1,460,000	826,323
Diammonium phosphate	80,000	42,590
Potassium chloride	9,420,000	2,970,771
Potassium sulfate	50,000	25,511
Urea	7,640	3,692
MINERAL FUELS AND RELATED MATERIALS		
Coal	204,060,000	12,101,335
Liquefied natural gas	19,630,000	8,813,913
Petroleum:		
Crude	335,500,000	134,451,221
Refinery products	29,900,000	14,303,437

Source: General Administration of Customs of the People's Republic of China, 2015, China monthly exports and imports, no. 12.

TABLE 5
CHINA: RESERVES OF MAJOR MINERAL COMMODITIES IN 2015

(Thousand metric tons unless otherwise specified)

Commodities	Reserves ^{1,2}
Antimony, Sb content	479
Barite, ore	million metric tons 37
Bauxite	do. 998
Chromite, ore	4,200
Coal	billion metric tons 244
Copper, Cu content	27,200
Fluorspar, ore	40,800
Gas, natural	billion cubic meters 5,190
Gold, Au content	metric tons 1,990
Graphite, mineral	55,200
Iron ore, ore	million metric tons 20,800
Kaolin	do. 574
Lead, Pb content	17,400
Magnesite, ore	million metric tons 1,040
Manganese, ore	do. 276
Mirabilite, Na ₂ SO ₄ content	do. 5,520
Molybdenum, Mo content	8,330
Nickel, Ni content	2,870
Petroleum	million metric tons 3,500
Phosphorus, ore	do. 3,310
Potash, KCl content	do. 576
Pyrite, ore	do. 1,310
Salt, NaCl content	billion metric tons 83
Silica, ore	million metric tons 1,990
Silver, Ag content	39
Talc, ore	million metric tons 81
Tin, Sn content	1,090
Titanium, ore	million metric tons 214
Tungsten, WO ₃ content	2,330
Vanadium, V ₂ O ₅ content	8,870
Zinc, Zn content	41,000

¹Rounded to three significant digits.

²The National Bureau of Statistics of China categorizes these as "basic reserves."

Source: China Statistical Yearbook 2016.