



2012 Minerals Yearbook

CHINA

THE MINERAL INDUSTRY OF CHINA

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China ranked second behind the United States as the world's leading economic power; it was also one of the world's leading mineral producing and consuming countries. In 2012, China's economy remained strong compared with most of the developed countries in the West. During the past two decades, China's economic growth was the result of a combination of trade and investment, and this growth greatly affected the global commodity market. The country's demand for energy, metals, and minerals was particularly strong. China imported significant amounts of raw materials and transformed the materials into products for export. During the 1980s and 1990s, China's commodity exports went primarily to Europe and the United States; however, during the past several years, intraregional trade within the Asia and the Pacific region increased significantly, which benefited other emerging economies in Asia, especially those that exported raw materials to China (Asian Development Bank, 2013, p. 14–16).

During the past decade, the Chinese Government's economic policy was to prevent economic slowdown and fight inflation. In November 2012, the 18th National Congress of the Communist Party of China (CPC) was convened and new leaders were elected. The CPC aimed to increase the gross domestic product (GDP) by 2020 to double that of 2010 and to continue to transform China into a modern industrialized country. The Chinese Government set the country's targeted economic growth rate at 7% in its 12th 5-year plan (which covers the years 2011 through 2015). In 2012, the GDP growth rate was 7.8% compared with 9.3% in 2011. The growth rate was the lowest of the past 13 years but was higher than the Government's target of 7.5%, which was set at the beginning of the year. Economic activity, especially manufacturing, was slow during the first half of the year but started to rebound in September. The slowdown in fixed-asset investment was a major reason for the slower economic growth rate. During the first half of the year, the Government restricted purchases of investment property as a result of decreases in real estate investment and raw material consumption. Also, the value of the industrial sector, which was one of the leading contributors to the GDP growth rate, decreased by 2.2% compared with that of the previous year. In 2012, the consumer price index increased by 2.6% compared with an increase of 5.4% in 2011. The country's fixed-asset investment increased by 20.3% to \$6.0 trillion, which was the smallest growth rate of the past 3 years. The mining sector (including coal, gas, and oil) received \$211 billion of the total investment, which was an increase of 11.8% from that of 2011. China's long-term challenge was to continue to foster economic growth at a sustainable rate (Citigroup Global Market Inc., 2012, p. 2; National Bureau of Statistics of China, 2013, p. 1–10).

The size of China's labor force was expected to shrink during the next decade because of the Government's adoption of a one-child policy in the 1980s. In the past, the decrease in the labor force has tended to raise wage levels and increase

social welfare costs. The working-age population decreased by 3.5 million in 2012. The labor force in the mining sector was 6.11 million, or 4.2% of the country's total workforce in 2011.

In the manufacturing sector, rising production and environmental costs, overcapacity, and uncertain external demand were likely to affect the sector's profit margin. Month-on-month production growth in the ferrous metals sector decreased significantly to 19.1% in November from 23.2% in August, and the trend toward decreased production was mirrored in the cement sector as well. During the past decade, the Chinese Government has tried to restrict the expansion capacity in such energy-intensive sectors as aluminum, cement, and iron and steel. Capacity reduction in these sectors could have a significant effect on investment and employment in the future (Citigroup Global Market Inc., 2013a, p. 3; National Bureau of Statistics of China, 2013, p. 1–10).

Minerals in the National Economy

China is rich in mineral resources and was the world's leading producer of aluminum, antimony, barite, bismuth, cement, coal, fluorspar, gold, graphite, iron and steel, lead, magnesium, mercury, molybdenum, phosphate rock, rare earths, salt, talc, tin, tungsten, and zinc in 2012. China ranked among the top three countries in the world in the production of many other mineral commodities. China was the leading exporter of antimony, barite, fluorspar, graphite, indium, rare earths, and tungsten in the world. The country's consumption of chromium, cobalt, copper, iron ore, manganese, nickel, petroleum, platinum-group metals, and potash exceeded domestic production, and imports were estimated to account for more than 40% of total domestic consumption. Mineral trade accounted for about 25% of the country's total trade. China was one of the few countries whose domestic supply of and demand for a variety of mineral commodities affected the world mineral market (National Bureau of Statistics of China, 2012, p. 130).

Government Policies and Programs

The 12th National People's Congress (NPC) adopted the recommendations from the CPC to consolidate the Government's bureaucracy by combining regulators into several larger Ministries. The existing Government structure made responding quickly to shifting economic and social demands difficult. The State Council hoped that the reform would build a more transparent, service-oriented Government. The State Council would have 25 Ministries and Commissions compared with the current 27. The Ministry of Railways was eliminated, and its railway planning and development functions were placed under the Ministry of Transportation. The State Administration of Press and Publication and the State Administration of Radio, Film, and Television were merged. The Ministry of Health and National Population and Family Planning Commission

were merged to become the National Health and Family Planning Commission. The Government also reduced its 1,700 requirements by one-third, subject to Central Government approval (State Council, The, 2013a, b).

China's rapid capital-intensive, export-oriented growth had been successful during the past three decades; however, the global markets it relied on were expected to be weaker in the future. The country's economic pattern of growth was energy- and natural-resource intensive and environmentally unsustainable. The constrained supply of major mineral commodities and environmental degradation were limiting the country's ability to maintain its past level of economic growth. The Government indicated that it intended to support and build a more energy-efficient and ecologically friendly society by upgrading the value chain in manufacturing while enhancing innovation and promoting the development of new strategic industries. Its plan to reduce carbon emissions was to be focused on the energy-intensive sectors, such as cement, chemicals, iron and steel, and nonferrous metals. The Government stated that the country's economic growth should be less dependent on export markets, such as Europe and the United States, and thus was planning to transform the economy from one that is export focused to one that is consumer driven (Zhonghua Renmin Gongheguo Guowuyuan Gongbao, 2012a, b).

The Government also planned to deepen administrative reform and strengthen efforts to combat corruption. The 12th 5-year plan aimed to strengthen accountability and public financial management. The Central and local government roles and responsibilities were expected to be defined more clearly. The Government planned to develop an effective anti-corruption system, including improving transparency, reporting, and enforcement (Citigroup Global Market Inc., 2013b, p. 6–10).

During the past decade, the output capacity of China's manufacturing industry had increased rapidly, including in the ferrous and nonferrous metals, industrial, and new energy (solar photovoltaic and wind power generation) sectors. Owing to a decrease in global demand for these products since the financial crisis starting in 2008, the domestic capacity utilization ratio decreased sharply. As a result, cumulative financial losses in these sectors became a significant issue for the Government. Excess capacity had been a long chronic problem for China's manufacturing industries. During the past decade, the Government repeatedly issued guidelines to restrict the construction of new plants and expansion of facilities in these sectors. The Central Government's effort to reduce excess output capacity was undermined, however, by local governments and state-owned enterprises that were keen to expand and the performances of which were based on how much revenue they could generate (China Metal Bulletin, 2013g).

In 2011, the ferrous and nonferrous metals sectors each received \$61 billion in fixed-asset investment and the nonmetallic sector received \$166 billion. Domestic analysts estimated that fixed-asset investment in these sectors was about 20% more in 2012 than in 2011. Since the global financial crisis in 2008, most recent investments have been supported by local governments.

The Ministry of Finance (MOF) announced that the Government would disband the investment tax for domestic investors and companies beginning on January 1, 2013. In 1983,

the Government had used the construction tax as a way to manage and control the country's investment conditions and subsequently changed it to an investment adjustment tax in 1991. The investment tax applied only to domestic investors. The investment tax was adopted under a planned economy and did not fit within the country's current "social market economic state" (Ministry of Finance, 2012).

In 2012, the Ministry of Industry and Information Technology (MIIT) amended regulations that were issued in 2010 on the development of the iron and steel sector. The new regulations require iron and steel producers to produce products that are within the guidelines of the country's iron and steel products qualification standards. Iron and steel producers are forbidden to use obsolete technology to produce iron and steel products. The emission of powder dust should be less than 1.19 kilograms (kg); sulfur dioxide emission, 1.63 kg; and water consumption, 4.1 cubic meters per metric ton of steel products. For each ton produced, the energy consumption of the blast furnace for ironmaking should be less than 446 kg of standard coal [5,500-kilocalorie (kcal) coal]; sintering, 56 kg of standard coal; electric arc furnace (EAF), 92 kg of standard coal; EAF for specialty steel, 171 kg of standard coal; and coking, 155 kg of standard coal. The new regulations also specify the minimum capacities of equipment for iron and steel production including blast furnace volume, more than 400 cubic meters; EAF, 30 metric tons (t) (15,000-kiloampere capacity or higher); and EAF for ferroalloys, 10 t. The minimum required production capacity for an individual iron and steel production plant is 1 million metric tons per year (Mt/yr), and that for specialty steel plants is 300,000 metric tons per year (t/yr). The new regulations took effect on October 1, 2012. The tougher regulations are intended to curb excess capacity and to force iron and steel producers to produce more high-quality and environmentally friendly products (Ministry of Industry and Information Technology, 2012a).

As part of the Government's efforts to reduce the excess supply of nonferrous metals in the domestic market and to provide financial assistance to domestic nonferrous metal producers, the State Reserve Bureau (SRB) announced in late 2012 that the Government had started stockpiling aluminum, copper, indium, and zinc. In 2008 and 2009, the Government stockpiled 400,000 t of aluminum, 165,000 t of copper, 150,000 t of zinc, and 30 t of indium from the domestic market to stabilize metal prices in the domestic market, and local governments also stockpiled more than 1 million metric tons (Mt) of nonferrous metals during the same period. Also, the SRB took advantage of low metal prices in the international markets to purchase strategic metals, of which the country had limited resources. Domestic analysts estimated that the SRB purchased (through metal traders) more than 60,000 t of nickel from the international markets in 2012. The Government also stockpiled rare-earth products domestically (China Metals, 2012d).

The MIIT issued industrial policy guidelines for the development of the graphite sector. According to the guidelines, the Government prohibits mining within 1 kilometer of the boundary of environmentally protected areas, water resources, urban areas, and nonindustrial zones. The guidelines urge

graphite producers to adopt advanced processing technology in their operations. The guidelines set the minimum processing capacity for flake graphite plants at 20,000 t/yr and the minimum recovery rate at 80% for ore grading 5% carbon, 85% for ore grading 8% carbon, and 90% for ore grading 10% carbon. The minimum processing capacity for an amorphous graphite plant is set at 150,000 t/yr, and the minimum recovery rate is set at 85%. The Government's guidelines also require all graphite producers to meet energy and water consumption limits. The Government planned to publish a list of graphite producers that had met the policy and environmental guidelines at yearend 2014 (Ministry of Industry and Information Technology, 2012c).

The MIIT and 11 ministries and commissions jointly issued policy guidelines for industry mergers. Two basic policies for saving natural resources and protecting the environment were introduced. Important objectives noted in the guidelines are reducing production and transportation costs; upgrading technological processes; improving energy development; and adjusting the raw material supply infrastructure in China. By 2015, the top iron and steel producers would account for 60% of total output. About three to five domestic iron and steel companies are projected to have the capability to compete with international iron and steel companies in the global market. The Government industry merger guidelines also urge companies to merge across regions. According to the guidelines, the top 10 aluminum producers are expected to produce about 90% of the country's total output in 2015, and producers of aluminum, coal, and power are encouraged to form joint ventures. The guidelines stress the importance of upgrading technology and efficiency through mergers, improving the quality of products, controlling production capacity, and reducing competition in nine industrial sectors, including automobile and electronics manufacturing, cement and rare-earth production, and shipbuilding (Ministry of Industry and Information Technology, 2013a).

Production

China was one of the world's leading producers of aluminum, antimony, barite, bismuth, cement, coal, copper, fluorspar, gold, graphite, indium, iron and steel, lead, lime, magnesium, manganese, molybdenum, phosphate rock, rare earths, salt, silver, talc, tin, tungsten, and zinc. The country's output quantities of these mineral commodities were sufficient to have a significant effect on world markets. In 2012, China's production of alumina, aluminum, bauxite, cement, coal, copper, gold, graphite, iron and steel, lead, phosphate rock, silver, titanium sponge, tungsten, and zinc increased compared with that of 2011 (table 1).

China's reform priorities were to improve the efficiency of resource allocation and to boost economic growth. The Government understood that the unbalanced growth of consumption, investment, and net exports could not continue unabated forever. During the past several years, the Government reduced the export tax rebates on ferrous and nonferrous metal products, increased the export duties on energy-intensive metals, and encouraged producers to produce high-value-added products. Owing to increasing domestic and overseas demand, China's minerals and metals output was expected to continue to increase.

Structure of the Mineral Industry

China's mining industry is highly fragmented and has had a poor safety record. Several companies often mined in a single mining area. The State Council approved a mining consolidation plan that had been proposed jointly by the Ministry of Land and Resources (MLR), the National Development and Reform Commission (NDRC), and other agencies. Fifteen mineral commodities—antimony, bauxite, coal, copper, gold, iron ore, lead, manganese, molybdenum, phosphorus, potassium, rare earths, tin, tungsten, and zinc—were on the consolidation plan. The Central Government worked with local governments to implement the plan. Small mine operators were targeted to be integrated into large operators through such means as acquisition or joint-management agreements. The State-Owned Assets Supervision and Administration Commission would transfer state-owned assets of these small operators to the large operators. The Government would not allow any expansion of mining boundaries during the consolidation period. The Government would not issue mining operation permits to uncooperative mine operators. Local governments were required to submit their consolidation plans to the MLR for recording. During the past several years, the Government enabled state-owned enterprises to diversify their core business into other sectors, such as by allowing Aluminum Corporation of China (Chinalco) to be a major shareholder of copper companies in the Provinces of Hebei and Yunnan and rare-earth companies in Jiangsu Province and Guangxi Zhuangzu Autonomous Region. Baoshan Iron and Steel (Group) Corp. invested in coal mining in Shanxi Province, and Jiangxi Copper Co. Ltd. took charge of the consolidation of rare-earth mining activities in Sichuan Province. Minmetal Group Co. took charge of consolidation of the Hunan Nonferrous Metal Co. and invested in rare-earth separation plants in Jiangxi Province.

Mineral Trade

China was one of the most important producing and consuming countries in the world. According to customs statistics, China's total trade was valued at \$3.87 trillion in 2012, which was an increase of 6.2% compared with that of 2011. The value of exports increased by 7.9% to \$2.05 trillion. The United States replaced the European Union (EU) as the leading destination for China's exports followed by Hong Kong and Japan. The value of China's imports increased by 4.1% to \$1.82 trillion. The EU was China's leading source of imports followed by Japan, the Republic of Korea, and the United States. Imports of raw materials, such as chromium ore, coal, copper ore and concentrate, iron ore, nickel ore, and oil, increased sharply. In 2012, the total value of mineral and metal products trade was \$991.9 billion. China's main exports were low-end and semimanufactured goods. Large amounts of capital, designs, technologies, and even raw materials were coming from abroad. Consequently, China posted a trade surplus with countries that consumed manufactured goods, such as the United States and the countries of the EU, and trade deficits with such countries as Australia, Brazil, Chile, and Indonesia, which produced and exported fuels and minerals (General Administration of Customs

of the People's Republic of China, 2013; Ministry of Land and Resources, 2013, p. 12).

The Ministry of Commerce (MOC) issued circular No. 97, which details the mineral commodities that are under the Government's monitoring list for export. The commodities are ammonium paratungstate; bauxite and refractory clay; coal; coke; concentrates of antimony, cobalt, gold, molybdenum, silver, tin, tungsten, and zinc; dolomite; fluor spar; magnesite; oxides of antimony, magnesium, and tungsten; rare earths; silicon carbide; silver; talc; and unwrought metal and alloys of antimony, beryllium, bismuth, copper, gallium, germanium, nickel, niobium, platinum-group metals, tantalum, tin, and zirconium. Of these exported mineral commodities, antimony and its products, coal, petroleum and its products, silver, and tungsten and its products were under state management. In 2012, the Government encouraged the import of raw materials, such as concentrates of chromite, nickel, niobium, tantalum, titanium, and uranium; antimony concentrates with metal content higher than 30%; copper concentrates with metal content higher than 20%; cobalt concentrates with cobalt content higher than 6%; lead concentrates with lead content higher than 55%; molybdenum concentrates with metal content higher than 51%; zinc concentrates with zinc content higher than 40%; and ferronickel. Beginning on January 1, 2012, the tariff rate on imports of rare-earth compounds was reduced to zero from 5.5%. The MOF announced that the export tariff rates would be changed, including those for many minerals and metals (Ministry of Commerce, 2012a, p. 1–20).

The Government adjusted the 2013 export quota for magnesia to 1.67 Mt; phosphate rock, to 1.0 Mt; talc, to 750,000 t; antimony and antimony products (metal content), to 59,400 t; molybdenum, to 25,000 t; tin and tin products (metal content), to 17,000 t; tungsten and tungsten products (metal content), to 15,400 t; silver, to 5,387 t; and indium, to 231 t. Bauxite (alumina clay) and silicon carbide were not included in the export quota control system after the World Trade Organization's (WTO's) appellate body upheld the panel's decision that China's export restrictions on these raw materials were inconsistent with its obligations in 2012. The 2013 export quotas for magnesia and tin decreased compared with those of 2012. The first batch of export quotas for mineral products usually accounted for 60% of the total annual export quota. Analysts predicted that exports of rare metals would decrease gradually at a rate of 2% to 3% per year in the future. A planned reduction of the value-added tax rebate and reduced export quotas on energy-intensive products were expected to force producers to reduce their output, which was, in turn, expected to help protect and conserve mineral resources and minimize environmental damage. Although the annual export quotas for coal, coking coal, and rare earths were not publicly available, the announcement of the changes in the export allocations and an increase in tariffs for those commodities indicate that the export volumes of the commodities would likely be at the same level in 2013 as in 2012 (Ministry of Commerce, 2012b).

The MOC allocated a total rare-earth export quota of 30,996 t for 2012, which was a slight increase from the quota of 30,184 t in 2011. The Government specified how much light or middle and heavy rare earths each company was allocated in 2012.

This policy was different than in previous years, when the Government had assigned export quotas without specification. The Government withheld export quotas for companies that did not meet the environmental protection guidelines. Of the 27 companies and traders, only 9 were cleared to export rare-earth products in February, and the total rare-earth export volume was 10,546 t. The remaining 18 companies met the environmental protection guidelines in mid-year. The MOC announced a first-batch rare-earth export quota of 15,501 t for 2013, of which light rare earths was 13,563 t and middle and heavy rare earths was 1,938 t (Ministry of Commerce, 2012c, d).

Commodity Review

Metals

Aluminum.—China's aluminum production continued to increase in 2012. During the first half of 2012, aluminum smelters, which were located in central and southern areas of the country, reduced their output. Aluminum smelters gradually restarted their operations because local governments provided subsidies. Also, the commissioning of newly built aluminum smelters in the northwestern part of the country resulted in several facilities starting commercial operations in the second half of the year. Provinces in the northwest and Shandong Province were the major contributors to the country's growth in aluminum production. In 2012, China remained a net importer of aluminum. The net trade volume of unwrought aluminum increased to 392,913 t in 2012 from 143,172 t in 2011 but was still less than the 1.44 Mt traded in 2009. China's unwrought aluminum imports came mainly from (in descending order of volume) Russia, Australia, Oman, India, and South Africa, and the country's exports went to (in descending order of volume) the Republic of Korea and Japan (Alumina and Aluminum Monthly, 2013d).

The aluminum price in China resembled the London Metal Exchange price in 2012. The domestic market price of aluminum decreased to 15,169 yuan (\$2,446) per metric ton in December 2012 from 16,002 yuan (\$2,540) per metric ton in December 2011. Without the Government decision to stockpile about 160,000 t of aluminum during the last quarter of 2012, the price of aluminum might have been lower at yearend. The average market price of aluminum for the year was 15,706 yuan (\$2,533) per metric ton on the Shanghai Metal Exchange in 2012. In 2012, about 78,500 t of production capacity, mainly in the central and southern parts of the country, was closed down because of the high price of electricity. About 2 Mt of new capacity was installed, mainly in the northwestern part of the country, especially in Xinjiang Uygur Autonomous Region, where the price of electricity was the lowest in the country in 2012. China's average production cost per metric ton of aluminum was about 16,000 yuan (\$2,580), and electricity accounted for about 43% of the total production cost. Each ton of aluminum output consumed about 1,400 kilowatt-hours (kWh) of electricity. In Xinjiang, each kWh cost about 0.2 yuan (\$0.03), whereas in the Provinces of Henan and Shandong, the cost was 0.5 yuan (\$0.08) from company-owned powerplants. As a result, many aluminum investors built their aluminum smelters in Qinghai Province and Xinjiang Uygur Autonomous Region. The

country's aluminum output capacity reached 27.6 Mt/yr in 2012 and 30.2 Mt/yr in 2013. The construction sector was the leading consumer of aluminum and accounted for about 39% of total consumption followed by transportation, 18%; electronics, 9%; machinery and household appliances, 8% each; packaging, 7%; and others, 11%. China consumed about 21 Mt of aluminum in 2012 (China Metal Bulletin, 2012d, 2013e; Alumina and Aluminum Monthly, 2013b, p. 2–10).

Diaspore (orthorhombic hydrous aluminum oxide) accounted for more than 90% of China's bauxite deposits; the remaining 10% was of the gibbsite (monoclinic aluminum hydroxide) type. China followed Australia as the second-ranked bauxite-producing country in the world. Owing to the expansion of alumina production during the past 10 years, the country required extensive imports of bauxite to meet the demand from its alumina refineries, and this dependence was expected to continue into the future. China imported 39.6 Mt of bauxite in 2012 compared with 44.8 Mt in 2011, and bauxite imports from Indonesia and Australia accounted for 70.2% and 24.0% of the total, respectively, compared with 79.7% and 18.8%, respectively, in 2011. The decrease in bauxite imports was the result of the Government of Indonesia's restriction on raw materials exports, which the Government of Indonesia announced would continue. The restrictions on Indonesia's raw materials exports would affect the coastal Province of Shandong's alumina refineries in the future because these refineries produced alumina solely from imported bauxite. China's imports of bauxite from India were expected to increase during the next few years. The Government encouraged enterprises to explore for bauxite resources in African countries and in Australia. A few Chinese companies, including Chalco, planned to build alumina refineries in Indonesia that would use Indonesian bauxite resources (Alumina and Aluminum Monthly, 2013c).

China's output of alumina increased by more than 20% in 2012 compared with that of 2011, but China continued to experience a shortage of alumina. To support the aluminum sector, the country imported large quantities of alumina to meet the demand. In 2012, China imported 5.0 Mt of alumina compared with 1.9 Mt in 2011, of which about 92% was from Australia. China consumed about 42.4 Mt of alumina in 2012, of which 40.6 Mt was for metallurgical use and 1.8 Mt was for nonmetallurgical use. The balance was about 300,000 t of surplus alumina. By yearend 2012, more than 5 Mt/yr of alumina output capacity was installed, which increased the country's alumina output capacity to 57 Mt/yr. The additional alumina capacity was from greenfield and brownfield projects, including those of Shanxi Jiaokou Feime Aluminum Co. (1.2 Mt/yr), Guangxi Jinjiang Tiandong Co. (1 Mt/yr), Shandong Weiqiao Aluminum Co. (1 Mt/yr), Guizhou Qiya Aluminum Co. (600,000 t/yr), Shanxi Xinfu Xiaoyi Alumina Plant (600,000 t/yr), Chalco Shanxi Co. (500,000 t/yr), Bosai Group Nanchuan Pioneer Aluminum Co. (300,000 t/yr), and Shanxi Zhaofeng Aluminum Co. As a result, imports of alumina were expected to decrease in the future (Alumina and Aluminum Monthly, 2013a).

Shanxi Senze Coal Aluminum (Group) Co. Ltd. extracted alumina from coal gangue at its pilot plant in Liulin, Shanxi Province. The extracting technology was jointly

developed by Northeast University, Shanxi Senze, and Shanxi University. The pilot plant had the capacity to process 50,000 t/yr of coal gangue to produce 12,600 t/yr of alumina. Shanxi Senze owned several bauxite mines that had a combined output capacity of 2 Mt/yr. The company's 700,000-t/yr alumina refinery was put into operation in 2012 (Alumina and Aluminum Monthly, 2013e).

Despite the Government's macroeconomic policy on investment in some commodities, the output of aluminum metal continued to increase rapidly. In 2005, the State Council issued a development policy "in principle" for the aluminum sector and assigned the NDRC to work with relevant agencies to prepare a plan for sustainable aluminum development. According to the MIIT-issued 12th 5-year development plan for the aluminum sector, the country was expected to produce 24 Mt of primary aluminum in 2015, and the top 10 smelters would account for 90% of the total output. To take advantage of investment incentives offered by local governments, many aluminum companies, including Chalco, China Power Investment Corp., Shandong Xinfu Group, Tiashan Aluminum-Power Co. Ltd., and Zhonghe Aluminum Co. Ltd., moved some of their operations to the northwestern part of the country. The government of Xinjiang Uygur Autonomous Region urged enterprises to develop an integrated coal-power-metallurgy industry in the region. Primary aluminum output capacity in Xinjiang increased to 2.3 Mt/yr in 2012 from 50,000 t/yr in 2007; Qinghai Province, to 2.2 Mt/yr from 1 Mt/yr; Gansu Province, to 2.1 Mt/yr from 96,000 t/yr; and Shandong Province, to 4.9 Mt/yr from 2.1 Mt/yr. Domestic analysts estimated that about 5.3 Mt of output capacity would be installed in 2013, of which Xinjiang would add 2.1 Mt and Shandong would add 1 Mt. By yearend 2015, the aluminum output capacity in Xinjiang was expected to increase to 13 Mt/yr. In April, the MIIT and eight other Government agencies jointly issued a circular to urge local governments to stop providing preferential policies to aluminum producers. The rapid expansion of aluminum output capacity in the western part of country would contribute to serious financial losses for existing producers in the country. It also would create infrastructure bottlenecks, as alumina would need to be transported from the eastern and southern parts of the country to the northwest, and finished products would need to be shipped to consumers in the coastal areas (China Nonferrous Metals Monthly, 2012e, 2013; China Metal Bulletin, 2013c).

Antimony.—China was the leading antimony producing country in the world. Changes in the volume of China's production and exports could affect prices of antimony in the world market. China's antimony resources are located in the Provinces of Guangdong, Guangxi, Hunan, Jiangxi, and Yunnan. In 2012, Guangxi, Hunan, Jiangxi, and Yunnan were the top mined antimony producing Provinces in China and accounted for more than 90% of the country's total. Guangxi, Hunan, Jiangxi, and Yunnan were also the top antimony metal producing Provinces in the country.

During the past several years, owing to environmental and safety problems, the Government shut down many illegal mining and smelting activities in the Provinces of Guangxi, Hunan, and Yunnan. The Government also monitored illegal exporting activities through Vietnam to other countries. Owing to the expansion of smelting capacity during the past decade, the

supply of domestic antimony concentrates was insufficient to meet the smelters' demand; therefore, the country imported large quantities of antimony concentrates. In 2012, China imported 68,577 t of antimony concentrates, mainly from Australia, Burma, Kazakhstan, Russia, and Thailand. The country exported 40,598 t of antimony oxide, mainly to Japan, Taiwan, and the United States. In 2012, 9,583 t of unwrought antimony was exported mainly to Japan, the Netherlands, and the United States (Minor Metals Monthly, 2013b).

The Chinese Government considered antimony to be one of the protected and strategic minerals, and exploitation and production of antimony was strictly controlled. In 2012, the MLR allocated a total production quota of 105,000 t (metal content) of mined antimony, of which 75,360 t was assigned to individual Provinces and 29,640 t was recovered as byproduct or coproduct, which the MLR withheld. The MLR continued to refuse any exploration and exploitation applications in 2012. Many antimony producers in Lingshuijiang, Hunan Province, and in the Guangxi Zhuang Autonomous Region shut down their operations temporarily in 2012. Domestic analysts estimated that reported antimony metal output data might be double counted because the reported production of antimony metal was much higher than the supply of antimony in concentrates in the domestic market. China consumed about 60,000 t of antimony, and the Government stockpiled about 4,500 t in 2012. The flame retardant sector was the leading consumer of antimony and accounted for about 50% of the total followed by battery alloys, 17%; plastic stabilizers, 15%; glass, 10%; and others, 8% (Minor Metals Monthly, 2013a).

Copper.—Because it has limited copper resources, China imported a considerable amount of copper concentrates, scrap, anode, and refined metal from overseas markets. Domestic copper mines supplied less than 30% of the country's requirements for copper concentrates. In 2012, China imported 7.83 Mt of copper concentrates, which was 22.8% more than in 2011. Copper concentrates were imported from Chile (24.0%), Peru (19.0%), Australia (7.7%), Mexico (7.5%), Mongolia (6.8%), Canada (4.7%), the United States (4.5%), and others (25.8%). China imported 4.89 Mt of copper scrap from the United States (20.8%), Hong Kong (16.6%), Germany (8.4%), Australia (6.4%), Spain (6.2%), Japan (5.8%), the Netherlands (5.5%), the United Kingdom (4.7%), France (3.9%), Malaysia (3.3%), and others (18.4 %); and 3.40 Mt of refined copper from Chile (36.7%), India (7.9%), Japan (6.6%), the Republic of Korea (4.5%), Belgium (4.4%), Australia (4.2%), Zambia (3.7%), and others (32.0%). In 2012, imports of refined copper and copper scrap increased by 20.0% and 3.7%, respectively, compared with those of 2011. During the same period, China exported 274,014 t of refined copper, which was 75.3% more than in 2011. Even though the production of refined copper was at record-high levels and demand for refined copper in the domestic market was weak, the record-high import volume was attributed to the appreciation of the Chinese currency against the U.S. dollar, and traders took advantage of it for their financial purpose. The price of refined copper in the international market decreased to an average of \$7,949 per metric ton in 2012 compared with \$8,823 per metric ton in 2011. Also, some traders were hedging against projected higher demand in 2013. As a

result, domestic analysts estimated that about 1 Mt of imported copper was stored in the bond warehouses. The availability of copper scrap in the international market was low; therefore, many downstream copper products producers used refined copper instead of copper scrap as raw material. In 2012, the apparent consumption of refined copper was about 8.8 Mt; however, producers and traders stockpiled more than 1 Mt of copper in their warehouses, and real copper consumption was about 7.7 Mt, which was about 5% higher than that of 2011. The power sector was the leading consumer of copper and accounted for about 47% of the total followed by household appliances, 15%; transportation, 10%; construction, 9%, electronics, 7%; and others, 12% (China Metals 2013c; Copper Monthly, 2013a).

Owing to domestic smelter and refinery expansions, China's copper output increased sharply during the past several years. China's copper production continued to expand despite the constrained supply of copper concentrates on the world market. In 2012, China's copper smelting and refining output capacities increased by 350,000 t and 930,000 t, respectively, and reached 4.4 Mt/yr and 7.9 Mt/yr, respectively. The output of domestic mined copper was expected to increase. Copper resources discovered in the western part of the country in Xinjiang Uygur Autonomous Region and Xizang Autonomous Region were expected to be put into development during the next several years. Copper resources in the Gangdise metallogenic belt in Xizang and the Tishan area in Xinjiang would be developed during the next several years. Significant copper resources were discovered recently in the southwestern part of the country and were expected to help replace depleted copper resources in the eastern part of the country (Recycling Resources, 2012).

The MOF and State Administration of Taxation issued a circular about value-added tax (VAT) and consumption tax policies on export goods and labor services in 2012. The new policy indicates that the tax on processing trade of copper would be changed. Under the current trade policy, copper producers paid a 17% VAT on imported copper concentrate, and the tariff rate on imported copper cathode was between 5% and 10%, depending on the purity of the copper cathode. The proposed new policy would reduce the VAT to 3% on imported copper concentrate for processing trade. Domestic copper mines supplied only about 30% of the country's copper demand and this new policy would reduce the tax burden for many domestic copper producers. Detailed guidelines on the implementation of the new policy were planned to be released later (China Nonferrous Metals Monthly, 2012b).

According to the Government's 12th 5-year plan, the output of secondary refined copper would account for 40% of the total copper output in 2015, although China's recycling sector remained fragile. More than 5,000 enterprises were involved in nonferrous metal recycling, and most of them used obsolete technology or manual labor. China imported more than 7 Mt/yr of nonferrous metal scrap, and domestic households generated about 2 Mt/yr of nonferrous metal scrap. Domestic analysts estimated that the secondary nonferrous metals output capacity was about 20 Mt/yr. Jiangxi Copper Co. Ltd., which was the leading copper producer in China, had the capacity to produce 1 Mt/yr of refined copper, of which more than 350,000 t was from copper scrap. Other Chinese copper producers also

expanded their secondary copper capacities in the coastal areas. In 2012, China imported 4.89 Mt of copper scrap, and the average copper content was about 30%; however, copper content in domestic scrap was only one-third of imported scrap. According to the MIIT guidelines on the secondary copper sector, greenfield secondary copper smelters were required to have 100,000 t/yr of capacity by 2015, and secondary copper producers would be required to shut down existing smelters, that had less than 50,000 t/yr of capacity. The Government also provided guidelines on energy consumption and the recycling rate requirements for greenfield and brownfield copper smelters. The MIIT also published a draft on conditions under which companies would be allowed entry into the copper sector. China's copper sector was expected to continue to be dependent on imported copper concentrate and scrap to meet the country's demand (China Nonferrous Metals Monthly, 2012a; Ministry of Industry and Information Technology, 2013b).

The MIIT published a list of obsolete production technologies and ordered producers to close down those production plants that used these production technologies in 2012. Copper plants that used small reverberatory or electric furnaces were included on the list.

Several greenfield and brownfield copper projects were recently completed or under construction. Tiandilong Copper Co. Ltd. completed the construction of its 150,000-t/yr copper plant in Guangfeng, Jiangxi Province. Baiyin Nonferrous Metals Co. started the construction of a 200,000-t/yr copper plant in Baiyin, Gansu Province. Duobaoshan Copper Co. Ltd. [a joint venture between Zijin Mining Co. Ltd. and Heilongjiang Mining (Group) Co. Ltd.] completed the construction of the Duobaoshan copper mine, which had the capacity to produce 30,000 t/yr of copper in concentrates in 2012, and was scheduled to complete the construction of a 100,000-t/yr copper smelter in 2015. Zijin planned to expand its refined copper capacity to 300,000 t/yr from 200,000 t/yr in Fujian Province (China Metal Bulletin, 2012a; Copper Monthly, 2012; Ministry of Industry and Information Technology, 2012b).

Guangxi Nonferrous Metal Group Co. Ltd. completed its 300,000-t/yr-capacity secondary copper cathode project at Wuzhou Recycling Industrial Park in Guangxi Zhuang Autonomous Region. The first phase of the project included a 200,000-t/yr-capacity tilting furnace and a 100,000-t/yr-capacity Kaldor smelting furnace. Shangrao Hefeng Copper Co. Ltd. planned to put its 50,000-t/yr-capacity high-purity copper cathode plant, which was located in Shangrao, Jiangxi Province, into operation in early 2013. Jiangxi Copper and Hangzhou Fuchunjiang Smelting Co. Ltd. agreed jointly to invest \$1.3 billion in a copper project in Fuyang, Zhejiang Province. The project was designed to produce 200,000 t/yr of blister copper and 370,000 t/yr of refined copper. The project was scheduled to be completed in late 2013 (China Metal Bulletin, 2012b; Copper Monthly, 2013b).

Germanium.—About 90% of China's identified germanium resources are located in the Provinces of Guangdong, Guangxi, Guizhou, Jilin, Shanxi, Sichuan, and Yunnan, and the Nei Mongol Autonomous Region. In China, germanium was produced as a byproduct of lead and zinc operations or was extracted from coal. Germanium was used mainly in the

chemical, optical, and solar-cell-battery sectors. In early 2012, demand for germanium was sluggish, and the domestic market price for germanium decreased to 7,200 yuan (\$1,161) per kg in May from 8,600 yuan (\$1,387) per kg in January. In December, after Yunnan Lincang Xinyuan Germanium Industrial Co. Ltd.'s subsidiary, Dongcheng Metal Co. Ltd., announced that the company had signed a contract to supply a total of 375 t of germanium oxide to Hanenergy Group between 2012 and 2018, the price of germanium subsequently increased to 10,750 yuan (\$1,734) per kg. In 2012, the country consumed about 75 t of germanium; the optical sector accounted for 30% of the total and the solar-cell-battery and chemical sectors consumed about 25% each. The consumption of germanium by the optical sector was expected to increase by between 10% and 15% during the next several years, especially as the country had ungraded its germanium tetrafluoride production technology. The Government stockpiled 20 t of germanium in 2012 (Zhang and Xu, 2012; China Metal Bulletin, 2013d).

Sparton Resources Inc. of Canada announced that the company had signed an agreement for the sale of its subsidiary, Lincang Linxiang 306 Huajun Coal Industry Co. Ltd. (located in Lincang, Yunnan Province), to Yunnan Lincang Xinyuan Germanium Industrial Co. Ltd., which included all Huajun's germanium assets. The sale of Huajun was in response to the Chinese Government's decision to consolidate all small coal mining operations into larger coal mining operations within the next 2 years. The government of Lincang appointed Xinyuan to purchase all the smaller coal (germanium) operations in the Lincang area, including the Huajun assets (Sparton Resources Inc., 2013).

Iron Ore and Iron and Steel.—China was the world's leading iron and steel producer and accounted for more than 57% of the world's pig iron production and 45% of the world's crude steel production in 2012. The output of the country's iron and steel sector continued to increase in 2012. Production of pig iron and crude steel increased by about 3% or more each in 2012 compared with production in 2011. The rate of growth was the slowest of the past several years owing to weak demand for steel products in both the domestic and international markets. In 2012, the total fixed-asset investment in the iron and steel sector was \$106.2 billion, which was an increase of 3.0% from that of 2011; of that amount of investment, iron ore mining accounted for \$24.7 billion of the total. The ironmaking and steelmaking output capacity increased by 50 Mt and 45 Mt, respectively, in 2012. The ironmaking capacity reached 878 Mt in March 2012 and was expected to be about 1 billion metric tons (Gt) by 2015. The Provinces of Hebei, Jiangsu, and Liaoning ranked as the top three Provinces for fixed-asset investment in the iron and steel sector in the country. Other Provinces and cities, such as Chongqing, Henan, Hunan, and Shandong, also increased investments in the iron and steel sector. Private funds accounted for about 80% of the investment. Apparent consumption of crude steel was 659 Mt, which was 3.1% higher than that of 2011. Domestic analysts estimated that producers and traders stockpiled more than 20 Mt of steel products in their warehouses. In 2013, the China Iron and Steel Association projected that the country's crude steel consumption would increase by about 3.1% in 2012. In 2012, China exported

55.7 Mt of steel products, which was an increase of 0.4% from that of 2011, and imported 13.6 Mt of steel products, which was a decrease of 12.3% from that of 2011. China was a net exporter of 44.1 Mt of steel products. This indicated that more than 50% of the increase in crude steel output was targeted for exported steel products. Exports of China's steel products to Asian countries accounted for 59% of the total exports. Steel products imports from, in descending order of export value, Japan, the Republic of Korea, Taiwan, and the EU accounted for 90% of the total imports (Chen, 2013; Hu, 2013; Wang, 2013).

During the past several years, the country's iron ore production increased sharply; however, the percentage of iron ore (iron content) supplied by domestic producers remained at less than 50% of demand in 2012, and China continued to depend on iron ore imports to fill the gap. China had iron ore reserves of about 19.3 Gt; however, owing to the low iron content and high impurities of domestic ore, pig iron producers preferred imported ore to domestic ore. Also, the production cost for salable iron ore was about \$90 to \$100 per metric ton in China compared with about \$40 to \$50 per metric ton in Australia and Brazil. Imports of iron ore increased to more than 743 Mt in 2012 from 686 Mt in 2011 and 618 Mt in 2010. Australia remained the leading iron-ore-supplying country and accounted for 47% of the total followed by Brazil, 22%; South Africa, 5%; India, 4%; and others, 22%. The total amount of iron ore stockpiled at China's 25 major ports was more than 80 Mt at yearend 2012. About 50% of seaborne iron ore in the world was destined for China. The country was expected to import about 770 Mt of iron ore in 2013 (China Metals, 2012c; Li, 2012; General Administration of Customs of the People's Republic of China, 2013).

The Chinese Government was considering adjusting the total tax levied on iron ore companies. Currently, iron ore companies paid about 10 different types of taxes, including the VAT and resource taxes, and the total tax rate was about 25%. The MIIT and the MOF submitted a joint proposal to reduce the tax rate to between 10% and 15% to the State Council for consideration (China Metals, 2012b).

The Government hoped that the consolidation of the iron and steel industry would help the sector's efficiency, increase its bargaining power with suppliers of raw materials, and reduce competition within the sector. The Government also urged iron and steel producers to create transregional enterprises. If Government targets are met, the top 10 iron and steel producers would account for 60% of the country's total iron and steel output in 2015 compared with 46% in 2012. Because of environmental concerns, the Central and local governments urged iron and steel producers to relocate their facilities away from the cities and urban areas. Shoudu Iron and Steel (Group) Co. (Shougang) moved its production facilities to Hebei Province from Shijiangshan, Beijing. In 2012, the government of Shanghai issued the 12th 5-year plan for iron and steel development in Shanghai. The city government planned to shut down 5.8 Mt of ironmaking capacity and 6.6 Mt of steelmaking capacity within the city limits. Baoshan Iron and Steel (Group) Corp. (Baogang), which was located in Shanghai, planned to increase the company's crude steel output capacity to 66 Mt/yr in 2015 from about 43 Mt/yr in 2011, of which about 16 Mt/yr

of crude steel capacity would be produced from steel plants in Shanghai. The company would shut down at least 6 Mt/yr of output capacity to reach the target of 16 Mt/yr in Shanghai by 2015. Steel facilities in Shanghai would concentrate on producing high-value-added steel products for automobile manufacturing, shipbuilding, and special steel production. The construction of Baogang's 10-Mt/yr iron and steel complex in Zhanjiang, Guangdong Province, was underway. The steel output capacity in Baogang's subsidiaries was expected to increase within the next 5 years (China Metals, 2012a; 2013d).

The Government continued its effort to curb the fast growing output capacity in the country, including by ordering iron and steel producers to phase out obsolete facilities. Major iron and steel enterprises continued to expand their output capacity, however, either by replacing smaller furnaces with larger furnaces or by relocating to coastal areas and building steel complexes with larger output capacity. Anshan Iron and Steel (Group) Co. built greenfield iron and steel production facilities at Bayuquan in Yingkou and at Chaoying to add output capacity of more than 8.5 Mt/yr during the past 5 years. Shougang and Tangshan Iron and Steel Co. jointly built a 10-Mt/yr iron and steel complex in Hebei Province. The Government approved Baogang and Wuhan Iron and Steel Group's construction of two iron and steel complexes in the Provinces of Guangdong and Guangxi, respectively. The Government also approved the merger of 12 privately owned iron and steel producers in Hebei Province to form a large iron and steel enterprise, Tangshan Bohai Iron and Steel (Group) Co. Ltd., which proposed to build a 15-Mt/yr iron and steel complex in the coastal area of Hebei. The government of Shandong planned to build a 17.5-Mt/yr iron and steel complex at Dongjiakou, Shandong Province (Shandong Provincial Government, 2012; China Metals, 2013a).

Rhenium.—Rhenium was produced as a byproduct of molybdenite concentrates from porphyry copper-molybdenum ore. Rhenium sulfide was collected as dust from molybdenum roaster-flue gas from copper-molybdenum ore; rhenium sulfide was then oxidized into rhenium oxide. Dirhenium heptoxide is readily dissolved in water, but rhenium dioxide has a low solubility in water. Rhenium oxide was usually leached out with acid and then purified by an anion exchange and solvent extraction process.

In China, the Huanglong polymetallic mine at Luonan County in Shaanxi Province contained more than 300 grams of rhenium per metric ton of ore. Western Xinxing Metal Materials Co. Ltd. constructed a plant that had the capacity to produce 10,000 t/yr of molybdenum concentrates and to recover 200 kilograms per year of ammonium perrhenate. Jiangxi Copper Co. Ltd.'s Guixi Smelter had the capacity to produce about 3 t/yr of ammonium perrhenate mainly from imported copper concentrates. Zhuzhou Kete Industries Co. Ltd. at Zhuzhou in Hunan Province was also reported to have the capacity to produce high-purity rhenium products (Ma and others, 2012).

Industrial Minerals

Lithium.—China has abundant salt lakes that contain lithium, and these lakes accounted for 80% of the country's total lithium resources. Most of the lakes are located in the western part of

the country, however, and the infrastructure in these areas was relatively undeveloped. Spodumene resources were located mainly in the Altai and the Keketuohai areas in Xinjiang Uygur Autonomous Region and in the Kangding area in Sichuan Province. Lepidolite resources were found at the Yichun area in Jiangxi Province. Brine resources were found in salt lakes at the Qaidam basin in Qinghai Province and Zabuye Lake in Xizang Autonomous Region. The country's primary lithium products, which were lithium carbonate, lithium hydroxide, and lithium salt, were produced from domestic and imported raw materials. These compounds could be further processed into lithium metal or lithium cobalt oxide. In 2012, China's lithium carbonate output was estimated to be about 35,000 t; lithium hydroxide, 18,000 t; and lithium metal, 2,000 t. The total output capacity of lithium salt was about 100,000 t/yr in 2011. In 2012, lithium production from spodumene and lepidolite increased to about 160,000 t of spodumene concentrates, but lithium from brine decreased because producers were working on technology to increase the efficiency to extract lithium from brine. Output of lithium from brine was expected to increase during the next several years. Xizang planned to expand the capacity of its Jieze Chaka salt lake operation. China Minmetals expanded its output capacity in the Qaidam basin (China Metal Bulletin, 2013h).

Sichuan Tianqi Lithium Industry Co. Ltd., which used imported spodumene to produce lithium compounds (including carbonate, chloride, and hydroxide), received Government approval to mine spodumene resources at Yajiang in Sichuan Province. The Cuola lithium deposit had resources of 20 Mt grading 1.3% lithium oxide. The company planned to design a mine to produce 1.2 Mt/yr of ore for about 20 years. The deposit also contained beryllium, niobium, and tantalum. The company planned to increase its total output capacity of lithium carbonate, anhydrous lithium chloride, and lithium hydroxide to about 20,000 t/yr. The country depended on imported spodumene resources to meet its demand. In 2012, Tianqi invested \$850 million to acquire the outstanding shares and stock options for Talison Lithium. Talison operated the Greenbushes Mine in Australia, which supplied about 80% of China's lithium needs (China Metal Bulletin, 2013i).

Rare Earths.—China was rich in rare-earth resources, and the country produced different kinds of rare-earth products. China's rare-earth production accounted for about 90% of the world total, and the volume of exports had a significant effect on the world markets. During the past several years, the Government adjusted the rare-earth production and export quota to protect the domestic resources and the environment. In 2012, the State Council issued "Situation and Policies of China's Rare Earth Industry," which provided a plan for the development of the country's rare-earth industry during the next several years. The goal was to establish orderly rare-earth operations, including the development of rare-earth resources, followed by separation, smelting, and marketing. The Government would control unregistered exploitation, environmental damage, unapproved production capacity expansion, and illegal trading. According to a 2009 MLR rare-earth resources survey, China's rare-earth reserves were 18.59 Mt of rare-earth oxide (REO) equivalent content, which accounted for 23% of the world's total reserves of 81.1 Mt. This estimate of China's reserves

was much lower than the previous MLR estimate. In 2011, the country had 126 rare-earth companies with a combined total output capacity of 320,000 t of REO. In 2012, the MLR issued rare-earth mining production was 93,800 t. Rare-earth consumption in China had increased steadily, and the country consumed more than 84,000 t/yr of REO in 2012 compared with 19,300 t in 2000. To maintain the same volume of rare-earth production, the Government decided to reduce the rare-earth export quota to less than 31,000 t in 2010, 2011, and 2012 from 65,000 t in 2005. China, however, continued to have difficulty controlling global rare-earth prices because a significant volume of rare-earth products was exported through unofficial channels. Domestic analysts estimated that about 20,000 t/yr of rare-earth products was unaccounted for (Ma, 2012; State Council, The, 2012, p. 1–5; China Metal Bulletin, 2013b).

In 2012, the MLR issued a total 67 rare-earth mining licenses, which was 46 fewer than before. Jiangxi Province had 45 mining licenses, of which Ganzhou Rare Earth (Group) Co. Ltd. received 43 of the total. The MLR assigned seven mining licenses to seven companies in Sichuan Province. Five mining companies in Fujian Province received a total five mining licenses. In Guangdong Province, Guangdong Rising Group Co. Ltd.'s subsidiaries had three mining licenses. Baotou Iron and Steel was the only company to receive two mining licenses in Nei Mongol Autonomous Region. Yunnan Province had two mining licenses, and the Provinces of Guangxi, Hunan, and Shandong each had one. The MLR also issued 10 rare-earth exploration licenses (Ministry of Land and Resources, 2012).

The consolidation of the rare-earth industry continued in 2012. The Government of Nei Mongol Autonomous Region assigned Baotou Iron and Steel [through its subsidiary Baotou Rare Earth Hi-Tech Holding Co. Ltd. (Baotou Hi-Tech)] to be the sole producer and manager of all rare-earth mining, separation, and trading activities in the Autonomous Region. Those domestic producers in the Autonomous Region that met the asset transfer requirement were required to sell their assets to Baotou Hi-Tech. The remainder would be shut down without compensation. The consolidation of 35 rare-earth producers was set to be completed in June 2011; however, many rare-earth producers refused to shut down. In December 2012, Baotou Hi-Tech signed tentative agreements with 12 rare-earth companies—Baotou Damao Rare Earth Co. Ltd., Baotou Feida Rare Earth Co. Ltd., Baotou Hongtianyu Rare Earth Magnet Co. Ltd., Baotou Jinneng Rare Earth Co. Ltd., Baotou Sanlong Rare Metal Material Co. Ltd., Baotou Shengyou Rare Earth Co. Ltd., Baotou Xijun Rare Earth Co. Ltd., Baotou Xinye New Material Co. Ltd., Baotou Xinyuan Rare Earth Hi-Tech Material Co. Ltd., Inner Mongolia Jinxia Chemical Engineering Co. Ltd., Inner Mongolia Shengyilum Rare Earth Co. Ltd., and Wuyuan Runzhe Rare Earth Co. Ltd. Each company transferred 51% of its shares to Baotou Hi-Tech without compensation. An official agreement would be signed within 1 year. Otherwise, agreements would be voided after the expiration date. The integration of 12 rare-earth companies into Baotou Hi-Tech appeared to depend on the establishment of state-owned China Northern Rare Earth (Group) Hi-Tech Co. Ltd., which would include rare-earth producers from the Provinces of Shandong and Sichuan. The company would invest in the development

of innovative technologies to improve mining, smelting, and product development. This would further consolidate the rare-earth sector in the northern part of China, where most of the light rare-earth producers were located (China Metals, 2013b).

The Provincial government of Guangdong established a Guangdong Rare Earth Industry Group to manage the rare-earth sector in Guangdong. Guangdong-based Guangdong Rising Group Co. Ltd., which was the parent company of Guangdong Rising Nonferrous Metals Co. Ltd. and which had three rare-earth mining licenses in Guangdong, was a member of the Guangdong Rare Earth Industry Group. The Guangdong Rare Earth Industry Group would be in charge of the integration of exploration, mining, and smelting, and the development of high-value-added products in the Province. The Provincial government of Fujian established an integrated rare-earth enterprise, Fujian Rare Earth Group Co. Ltd., in the Province in 2012. Province-owned Fujian Metallurgy Holdings Co. Ltd. transferred 33% of its shares in Xiamen Tungsten Co. Ltd. to Fujian Rare Earth. Xiamen Tungsten would be transformed into a leading company to perform prospecting, mining, smelting, and downstream product development. The Provincial government of Fujian would assist the acquisition by local rare-earth companies in Longyan and Sanming within the next 2 years (China Metal Bulletin, 2012c; China Nonferrous Metals Monthly, 2012c).

Dingnan Nanfang Rare Earth Co. Ltd., Ganzhou Rare Earth, and Xunwu Nanfang Rare Earth Co. Ltd. reached an agreement to merge. Ganzhou Rare Earth also acquired Longnan Wanbao Rare Earth Separating Co. Ltd. and Longnan Kaisheng Nonferrous Metal Co. Ltd. Ganzhou Rare Earth became an integrated rare-earth enterprise in Jiangxi Province. The government of Hunan Province announced its intent to establish an integrated rare-earth company, Hunan Rare Earth Group. State-owned Hunan Jinxin Gold Group Co. Ltd. would be the leading shareholder of Hunan Rare Earth. It appeared that local governments wanted to protect their own rare-earth resources and had no intention of letting state-owned enterprises participate in the reform of their rare-earth sectors. Two state-owned companies, Chalco and Minmetals, established their integrated rare-earth companies in Guangxi Zhuang Autonomous Region and Hunan Province, respectively (China Nonferrous Metals Monthly, 2012d; China Metal Bulletin, 2013f).

Strontium.—China's strontium sector developed quite rapidly during the past decade, and the country became one of the leading producers of strontium carbonate in the world. Strontium carbonate was produced from celestite and strontianite by either the carbon reduction method or the decomposition method. China's celestite resources are located in the Provinces of Hubei, Jiangsu, Qinghai, Sichuan, and Yunnan; Xinjiang Uygur Autonomous Region; and Chongqing City. Strontianite resources are located in Chongqing City. Compared with that of such countries as Iran, Mexico, and Spain, the strontium sulfate content in Chinese celestite and strontianite was lower. Dafengshan Celestite Mine in Qinghai Province, which is the largest celestite mine in China, contains between 38% and 40% strontium sulfate, and concentrates contain about 70% strontium sulfate. Chongqing's Dazu and Tongliang

Mines were the country's leading celestite and strontianite mining sites, and the combined output capacity of the two mines was 300,000 t/yr of ore to produce about 100,000 t/yr of concentrates. After more than 20 years of exploitation, most of the high-grade resources had been depleted, and production costs were increasing. Other significant celestite mining areas included the Hubei Strontium Mine in Hubei, the Jiangsu Strontium Mine in Jiangsu, the Xinjiang Strontium Mine in Xinjiang, and the Lanping Strontium Mine in Yunnan (Yang, Wu, and Xu, 2012).

In the early 2000s, numerous strontium carbonate producers in China had a total combined output capacity of 350,000 t/yr. The television cathode ray tube (CRT) glass sector was the leading consumer of strontium carbonate. Owing to the development of new generation televisions, the demand for CRT glass had decreased significantly during the past several years. As a result, strontium carbonate producers closed down their operations partially during the past few years, and the total combined output capacity had decreased to about 170,000 t/yr in 2011. The Government urged celestite producers to mine low- and high-grade ore together and to increase the recovery efficiency and strontium sulfate content in concentrates (Yang, Wu, and Xu, 2012).

Mineral Fuels

Coal.—China had undergone significant economic reform and had one of the world's fastest growing economies. Coal consumption had increased to meet the high demand for industrial production and power generation. Coal was the country's primary source of energy—two-thirds of the country's electricity was produced by coal-fired powerplants. About 50% of the country's total coal output was consumed by the power sector. Even though China's coal production continued to increase in 2012 because of an increase in demand for coal by every industrial sector, China became a net coal importing country. In 2012, the country imported a total of 289 Mt of coal, which was an increase of 59% from that of 2011. China exported a total of 14.7 Mt of coal, which was the same as in 2011. The increase in coal imports was the result of the price of coal on the international market being lower than that on the domestic market. Also, the Government had gradually eliminated import tariff rates on coal during the past several years and imposed tariff rates on coal exports. Coal-fired powerplants, especially in the coastal Provinces, increased the use of imported coal to reduce their production costs. The price of electricity was set by the Government, and electricity producers faced financial loss for more than a decade. In 2012, demand for coal was low, and the country faced a surplus of coal. At yearend 2012, coal producers stockpiled about 85 Mt of coal in their warehouses, which was an increase of 58% from the beginning of the year. Major coal ports stockpiled about 43 Mt, and major coal-fired powerplants had about 81 Mt on their sites. In 2012, the price per metric ton of 5,500-kilocalorie coal decreased by 170 yuan (\$27) to 640 yuan (\$103) at Qinhuangdao Port, which was the country's major transshipment port (China Metal Bulletin, 2013a; General Administration of Customs of the People's Republic of China, 2013).

The Government identified 1,256 coal mines that would be shut down in 2013, which would eliminate 64.2 Mt of production capacity. In China, there was two-tier system of coal prices—contract and market. The coal contract price was negotiated between coal producers and coal-fired powerplant producers at prices under conditions established by the Government. In 2012, the Government decided not to participate in the yearend coal contract meeting. The cancellation of this key coal contract meeting indicated the removal of Government intervention. Coal producers thus had more freedom to sell their coal at higher prices; however, coal-fired powerplant producers could face increased financial losses if the Government does not adjust the power supply rate. Alternatively, coal-fired powerplant producers could import more coal from overseas. The growth rate in the demand for coal in China was expected to be lower during the next several years. Imports accounted for about 7% of the country's coal consumption; however, coal imports accounted for almost 30% of the seaborne coal trade in the Asia and the Pacific region. The country's coal output capacity and production were targeted by the Government to be 4.1 Gt and 3.9 Gt, respectively, at yearend 2015. In 2012, the country consumed about 3.7 Gt of coal. China's coal-fired powerplant producers were sensitive to overseas coal prices. Coal imports would increase if coal prices on the international market were cheaper than in the domestic market. The volume of coal imports also depended on the railway transportation system. Major coal-producing provinces were located in the northern and northwestern parts of the country, and coal consumers were located in the southern and in the coastal Provinces. The Government planned to develop a more reliable coal transportation system to release the constraint during the next few years (Citigroup Global Market Inc., 2013c).

Outlook

China's economy is expected to continue to grow in the near future. The country has replaced Japan as the second largest economy in the world behind the United States, and the Government has set the economic growth rate target at 7% for the next 5 years. The Government recognizes that the country cannot depend solely on exports to sustain its economic growth and that the country needs to increase domestic consumption and to have a more transparent financial and legal system. The expected continuation of China's economic growth implies that a strong demand for mineral commodities is likely to continue. China has shortages of supply of most major minerals, including bauxite, chromium, copper, iron, lead, manganese, nickel, oil, and potash, and it relies on imports to meet its demand. This trend is expected to continue. The Government, therefore, encourages enterprises to invest in such mineral-rich countries as Australia, Brazil, Burma, Chile, Indonesia, and Mongolia to secure minerals for domestic economic development and growth. The Government is expected to continue its effort to protect the country's resources of minerals, such as antimony, coal, molybdenum, rare earths, tin, and tungsten, and to avoid overexploitation.

China's imports of raw minerals have been increasing in recent years. As a result, the Chinese Government has been promoting reduced dependence on mineral commodity imports

and encouraging the production of high-value-added and high-quality downstream products. The Government also promotes the secondary nonferrous metals industry to reduce energy consumption. The Government has not yet achieved great success in meeting these goals. As progress is made toward these goals, the country's dependence on most major mineral commodities could decline; however, China will likely continue to play an important role in the world's metal and mineral markets. Also, China's overseas investments will probably continue until the transition to resource independence takes place. China's overall outward investment is expected to continue to increase and may soon exceed inward foreign direct investment.

The environmental, health, safety, and social performance of the mining and metal enterprises are of concern to the Government. The Government has set guidelines for the development of these enterprises in an attempt to improve protection of the environment, but progress has been slow. The Government plans to continue its effort to address the sustainable development of the mining and metal sectors through air and water pollution prevention and treatment, land protection, mine safety, and reclamation of mine sites.

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

(Metric tons unless otherwise specified)

Commodity ³	2008	2009	2010	2011	2012	
METALS						
Aluminum:						
Bauxite, gross weight	thousand metric tons	35,000	40,000	44,000	45,000	47,000
Alumina	do.	22,800	23,800	29,000	34,100	37,700
Metal, refined:						
Primary	do.	13,200	12,900	16,200	18,100	20,300
Secondary	do.	2,700	3,100	4,000	4,100	4,200
Total	do.	15,900	16,000	20,200	22,200	24,500
Antimony:						
Mine, Sb content		166,000	140,000	150,000	150,000	145,000
Metal		158,000	168,000	193,000	200,000	230,000
Bismuth:						
Mine output, Bi content		5,000	6,000	6,500	7,000 ^r	6,000
Metal		13,100	12,300	14,000	15,000 ^r	14,000
Cadmium, smelter		6,960	7,050	7,360	6,670 ^r	7,000
Chromite, gross weight	thousand metric tons	200	200	200	200	200
Cobalt:						
Mine output, Co content		6,630	6,000	6,380	6,800	6,800
Metal		6,700	6,000	4,120	5,430 ^r	5,500
Copper:						
Mine output, Cu content		1,070,000	1,040,000	1,160,000	1,270,000	1,550,000
Metal:						
Smelter, primary	thousand metric tons	2,500	2,700	2,900	3,030 ^r	3,200
Refined:						
Primary	do.	2,700	2,750	2,950	3,390	3,930
Secondary	do.	1,200	1,400	1,700	1,850 ^r	1,950
Total	do.	3,900	4,150	4,650	5,240 ^r	5,880
Germanium		100	95	100	110	105
Gold, mine output, Au content		285	320	345	362	403
Indium, primary and secondary		340	340	330	380	405
Iron and steel:						
Iron ore, gross weight	thousand metric tons	824,000	880,000	1,070,000	1,330,000	1,310,000
Pig iron ⁴	do.	470,670	552,830	597,330	640,510	663,500
Ferroalloys	do.	18,300	22,100	24,300	28,400	31,300
Steel, crude ⁴	do.	500,490	572,180	637,230	685,280	723,880
Steel, rolled ⁴	do.	584,770	694,050	802,760	886,190	955,780
Lead:						
Mine output, Pb content	do.	1,550	1,600	1,980	2,400	2,800
Metal:						
Smelter, primary	do.	2,430	2,630	2,800	3,110 ^r	3,200
Refined:						
Primary	do.	2,350	2,630	2,800	3,200	3,300
Secondary	do.	850	1,150	1,360	1,400	1,400
Total	do.	3,200	3,780	4,160	4,600	4,700
Magnesium, metal and alloy		559,000	501,000	654,000	675,000	698,000
Manganese:						
Ore, Mn content	thousand metric tons	2,200	2,400	2,600	2,800	2,900
Metal		1,130,000	1,310,000	1,370,000	1,480,000 ^r	1,500,000
Mercury, mine output, Hg content		1,300	1,430	1,600	1,500	1,350
Molybdenum, mine output, Mo content		81,000	93,500	96,600	103,000	105,000
Nickel:						
Mine output, Ni content		79,500	84,800	80,000	90,000 ^r	93,300
Matte		114,000	143,000	139,000	166,000 ^r	170,000
Smelter		129,000	165,000	159,000	175,000	229,000

See footnotes at end of table.

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

(Metric tons unless otherwise specified)

Commodity ³	2008	2009	2010	2011	2012
METALS—Continued					
Niobium and tantalum, mine output:					
Nb ₂ O ₅ content	300	30	32	25 ^r	20
Ta ₂ O ₅ content	900	90	86	75 ^r	70
Rhenium, Re content in NH ₄ ReO ₄ ⁵	1,900	1,900	2,000	2,100	2,200
Silicon, metal	1,100	993	1,140	1,350 ^r	1,300
Silver, mine output, Ag content	2,800	2,900	3,500	3,700	3,900
Tin:					
Mine output, Sn content	110,000	97,200	115,000	120,000	110,000
Metal	140,000	140,000	149,000	156,000	148,000
Titanium:					
Ilmenite, TiO ₂ equivalent	550,000	550,000	700,000	850,000	800,000
Sponge	57,000	45,800	57,000	68,000	76,800
Tungsten, mine output, W content	50,000	51,000	59,000 ^r	61,800	64,000
Vanadium, V ₂ O ₅ in vanadiferous slag product	46,000	52,000	58,000	65,000	70,000
Zinc:					
Mine output, Zn content	3,340	3,330	3,840	4,050	4,900
Refined:					
Primary	4,000	4,200	5,030	5,040	4,720
Secondary	37	90	175	173	170
Total	4,040	4,290	5,210	5,210	4,890
INDUSTRIAL MINERALS					
Asbestos	380,000	440,000	400,000	440,000	420,000
Barite	4,600	3,400	4,000	4,100	4,200
Bentonite	3,300	3,400	3,400	3,500	3,500
Boron, mine, B ₂ O ₃ equivalent	140,000	145,000	150,000	150,000	160,000
Bromine	135,000	93,000	100,000	100,000	105,000
Cement, hydraulic ⁴	1,400	1,644	1,882	2,099	2,210
Diatomite	440,000	440,000	400,000	440,000	420,000
Dolomite	8,000	8,100	8,200	8,200	8,300
Feldspar	2,000	2,000	2,000	2,100	2,100
Fluorspar	4,200	3,800	4,600	4,200	4,600
Graphite	650,000	450,000	700,000	800,000	820,000
Gypsum	4,600	4,500	4,700	4,800 ^r	4,900
Kaolin	3,200	3,000	3,260	3,200	3,300
Lime	180,000	185,000	190,000	200,000	220,000
Lithium, Li content, all types	4,500	5,500	6,000	7,200	9,500
Magnesite	15,600	13,000	14,000	19,000 ^r	16,000
Mica	750,000	700,000	750,000	760,000	770,000
Nitrogen, N content of ammonia ⁴	41,140	42,290	40,870	43,250	45,520
Phosphate rock, P ₂ O ₅ equivalent	15,200	18,000	20,400	24,000	28,500
Potash, marketable, K ₂ O equivalent	2,750	3,200	3,600	3,800	4,100
Rare earths, rare-earth oxide equivalent	125,000	129,000	120,000	105,000	100,000
Salt ⁴	66,640	66,630	70,380	67,420	69,120
Sodium compounds:					
Mirabilite	6,600	6,000	6,500	6,000	5,500
Soda ash, natural and synthetic ⁴	18,540	19,450	20,350	22,940	24,010
Strontium carbonate	335,000	159,000	150,000 ^r	145,000 ^r	140,000
Sulfur:					
Native	960	1,000	1,100	1,100	1,200
Content of pyrite	4,300	4,370	4,400	5,300 ^r	5,400
Byproduct, all sources	3,350	4,000	4,100	3,300 ^r	3,300
Total	8,610	9,370	9,600	9,700	9,900
Talc and related materials	2,200	2,300	2,000	2,200	2,200

See footnotes at end of table.

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

(Metric tons unless otherwise specified)

Commodity ³	2008	2009	2010	2011	2012	
MINERAL FUELS AND RELATED MATERIALS						
Coal:						
Anthracite	thousand metric tons	447,000	426,000	500,000 ^r	450,000	500,000
Bituminous	do.	2,110,000	2,320,000	2,420,000 ^r	2,800,000	2,830,000
Lignite	do.	196,000	256,000	320,000 ^r	270,000	330,000
Total	do.	2,750,000	3,000,000	3,240,000	3,520,000	3,660,000
Coke, all types ⁴	do.	323,590	345,020	388,640	432,710	447,790
Gas, natural:						
Gross	billion cubic meters	80	85	95	102	107
Marketed	do.	68	73	83	90	95
Petroleum:						
Crude, including crude from oil shale	million 42-gallon barrels	1,380	1,370	1,480	1,480	1,510
Refinery products	do.	3,700	3,750	4,220	4,470	4,640

^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 July 29, 2013.

³In addition to the commodities listed, China also produces beryllium, diamond, gallium, iodine, platinum-group metals, selenium, stone, tellurium, uranium, and zirconium, but available information is inadequate to make reliable estimates of output.

⁴Reported by China's National Statistical Bureau.

⁵Includes rhenium from imported copper and molybdenum concentrates.

TABLE 2
CHINA: STRUCTURE OF THE MINERAL INDUSTRY IN 2012

(Thousand metric tons unless otherwise specified)

Commodity	Facilities, major operating companies, and major equity owners ¹	Location of main facilities ²	Annual capacity ^c
Aluminum:			
Alumina	Chongqing Aluminum Co. [Aluminum Corporation of China (Chinalco)]	Chongqing	800
Do.	Chongqing Dingtai Tuoyuan Alumina Co.	do.	150
Do.	Nanchuan Pioneer Alumina Co.	do.	200
Do.	Guangxi Huayin Aluminum Co. Ltd.	Guangxi, Bose	2,000
Do.	Pingguo Aluminum Co. [Aluminum Corporation of China (Chinalco)]	Guangxi, Pingguo	1,200
Do.	Guizhou Aluminum Plant [Aluminum Corporation of China (Chinalco)]	Guizhou, Guiyang	1,200
Do.	Chalco Zunyi Aluminum Co. Ltd. [Aluminum Corporation of China (Chinalco)]	Guizhou, Zunyi	1,000
Do.	Luoyang Wanji Xiangjiang Aluminum Co. Ltd.	Henan, Luoyang	800
Do.	Sanmenxia Yixiang Aluminum Co. Ltd. (Henan Yima Coal Group)	Henan, Mianchi	600
Do.	Pingdingshan Huiyuan Chemical Co.	Henan, Pingdingshan	300
Do.	Yangquan Coalmine Aluminum (Sanmenxia) Co. Ltd.	Henan, Sanmenxia	1,200
Do.	Orient Hope (Sanmenxia) Aluminum Co. Ltd.	do.	1,200
Do.	Zhengzhou Aluminum Plant [Aluminum Corporation of China (Chinalco)]	Henan, Zhengzhou	2,200
Do.	Zhongzhou Aluminum Plant [Aluminum Corporation of China (Chinalco)]	Hunan, Zhongzhou	2,800
Do.	Shandong Huayu Alumina Co. Ltd. (Shandong Chiping Xinfu Aluminum and Electricity Group)	Shandong, Chiping	1,800
Do.	Longhou Donghai Alumina Co. Ltd. (Nanshan Group)	Shandong, Nanshan, Longkou	1,600
Do.	Shandong Aluminum Plant [Aluminum Corporation of China (Chinalco)]	Shandong, Zibo	2,000
Do.	Bingzhou Weiqiao Aluminum Co.	Shandong, Zouping	1,600
Do.	Shanxi Aluminum Plant [Aluminum Corporation of China (Chinalco)]	Shanxi, Hejin	2,700
Do.	Liulin Senze Group	Shanxi, Liulin	600
Do.	Coalmine Aluminum (Sanmenxia) Co. Ltd.	Shanxi, Sanmenxia	1,200
Do.	Shanxi Luneng Jinbei Aluminum Co. Ltd.	Shanxi, Yuanping	2,000
Do.	Wenshan Aluminum Co. Ltd. (Yunnan Aluminum Co.)	Yunnan, Wenshan	800
Metal	Baiyin Aluminum Plant	Gansu, Baiyin	150
Do.	Lanzhou Aluminum Plant	Gansu, Lanzhou	210
Do.	Liancheng Aluminum Plant	do.	235
Do.	Gansu Dongxi Aluminum Co. Ltd. (formerly Gansu Longxi Aluminum Plant)	Gansu, Longxi	360
Do.	Yinhai Aluminum Co. Ltd.	Guangxi, Laibin	125
Do.	Pingguo Aluminum Co. [Aluminum Corporation of China (Chinalco)]	Guangxi, Pingguo	380
Do.	Guizhou Aluminum Plant [Aluminum Corporation of China (Chinalco)]	Guizhou, Guiyang	400
Do.	Chalco Zunyi Aluminum Co. Ltd. [Aluminum Corporation of China (Chinalco)]	Guizhou, Zunyi	250
Do.	Henan Zhongfu Industry Co. Ltd.	Henan, Gongyi	180
Do.	Jiaozuo Wanfang Aluminum Co. Ltd.	Henan, Jiaozuo	420
Do.	Henan Wanji Aluminum Co. Ltd.	Henan, Luoyang	125
Do.	Henan Zhongmai Mianchi Aluminum Plant	Henan, Mianchi	400
Do.	Shangqiu Aluminum Smelter	Henan, Shangqiu	180
Do.	Yichuan Yugang Longquan Aluminum Co.	Henan, Yichuan	600
Do.	Shangqiu Shenhua Foguang Aluminum Co. Ltd.	Henan, Yongcheng	280
Do.	Hanjiang Danjiangkou Aluminum Co. Ltd.	Hubei, Danjiangkou	110
Do.	Hunan Chuanquan Aluminum Co. Ltd.	Hunan, Taoyuan	210
Do.	Fushun Aluminum Plant [Aluminum Corporation of China (Chinalco)]	Liaoning, Fushun	340
Do.	Baotou Aluminum Plant	Nei Mongol, Baotou	250
Do.	Orient (East Hope) Aluminum Plant (Orient Group)	do.	800
Do.	Nei Mongol HMHJ Aluminum Electricity Co. Ltd.	Nei Mongol, Holin Gol	400
Do.	Qingtongxia Aluminum Plant (China Power Investment Corp. and Ningxia Qingtongxia Energy Group Co. Ltd.)	Ningxia, Qingtongxia	1,150
Do.	Qiaotou Aluminum Co. Electrolysis Branch	Qinghai, Datong	750
Do.	Qinghai Aluminum Smelter [Aluminum Corporation of China (Chinalco)]	Qinghai, Xining	560
Do.	Qinghai West Mining Baihe Aluminum Co. Ltd.	do.	112
Do.	Tongchuan Xingguang Aluminum Co. Ltd.	Shaanxi, Tongchuan	250
Do.	Shandong Chiping Xinfu Aluminum and Power Group	Shandong, Chiping	360
Do.	Taishan Aluminum-Power Co. Ltd.	Shandong, Fecheng	125

See footnotes at end of table.

TABLE 2—Continued
CHINA: STRUCTURE OF THE MINERAL INDUSTRY IN 2012

(Thousand metric tons unless otherwise specified)

Commodity	Facilities, major operating companies, and major equity owners ¹	Location of main facilities ²	Annual capacity ^c
Aluminum—Continued:			
Metal—Continued	Shandong Nanshan Aluminum Co. Ltd. (Nanshan Group)	Shandong, Nanshan, Longkou	156
Do.	Shandong Aluminum Plant [Aluminum Corporation of China (Chinalco)]	Shandong, Zibo	120
Do.	Bingzhou Weiqiao Aluminum Co.	Shandong, Zouping	250
Do.	Zouping Aluminum Co. Ltd.	do.	150
Do.	Huaze Aluminum and Power Co. Ltd.	Shanxi, Hejin	400
Do.	New Orient Aluminum Co. Ltd.	Shanxi, Taiyuan	75
Do.	Chalco Shanxi Huasheng Aluminum Co. Ltd. [Aluminum Corporation of China (Chinalco)]	Shanxi, Yongji	220
Do.	Shanxi Guanlv Aluminum Co. Ltd.	Shanxi, Yuncheng	210
Do.	Qient (East Hope) Aluminum Plant (Orient Group)	Xinjiang, Changji Prefecture	540
Do.	Xinjiang Qiya Aluminum Co. Ltd.	do.	450
Do.	Xinjiang Nongliushi Aluminum Co. Ltd.	Xinjiang, Wujiaqu	1,200
Do.	Yunnan Aluminum Plant	Yunnan, Kunming	500
Antimony	Huaxi (China Tin) Group Industrial Co.	Guangxi, Hechi	25
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. 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	Hebei Provincial Government	Hebei	70,000
Do.	Heilongjiang Provincial Government	Heilongjiang	100,000
Do.	Henan Provincial Government	Henan	100,000
Do.	Liaoning Provincial Government	Liaoning	70,000
Do.	Nei Mongol Provincial Government	Nei Mongol	90,000
Do.	Shandong Provincial Government	Shandong	60,000
Do.	Shanxi Provincial Government	Shanxi	400,000
Do.	Sichuan Provincial Government	Sichuan	80,000
Do.	Shenhua Coal Corp.	Nei Mongol, Ningxia, and Shaanxi	150,000
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	600
Do.	Luoyang Copper Processing Factory	Henan, Luoyang	50
Do.	Daye Nonferrous Metals Co.	Hubei, Daye	400
Do.	Zhangjiagang United Copper Co. (Tongling Nonferrous Metals Group Holding Co. Ltd.)	Jiangsu, Zhangjiagang	200
Do.	Guixi Smelter (Jiangxi Copper Co. Ltd.)	Jiangxi, Guixi	1,200
Do.	Dongfang Copper Co. (Huludao Nonferrous Metals Group)	Liaoning, Huludao	100

See footnotes at end of table.

TABLE 2—Continued
CHINA: STRUCTURE OF THE MINERAL INDUSTRY IN 2012

(Thousand metric tons unless otherwise specified)

Commodity		Facilities, major operating companies, and major equity owners ¹	Location of main facilities ²	Annual capacity ^e
Copper, refined—Continued		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.		Zhongtiaoshan Nonferrous Metals Co.	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	250
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.	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 Refining 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
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

See footnotes at end of table.

TABLE 2—Continued
CHINA: STRUCTURE OF THE MINERAL INDUSTRY IN 2012

(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:			
Iron ore	Ma'anshan Iron and Steel Co.	Anhui, Maanshan	10,000
Do.	Shoudu (Capital) Mining Co.	Beijing	20,000
Do.	Jiuquan Iron and Steel Co.	Gansu, Jiayuguan	4,000
Do.	Hainan Iron Mine	Hainan, Changjiang	4,600
Do.	Handan Xingtai Metallurgical Bureau (Hebei Iron and Steel Group Co.)	Hebei, Handan	3,800
Do.	Tangshan Iron and Steel Co. (Hebei Iron and Steel Group Co.)	Hebei, Tangshan	3,000
Do.	Wuhan Iron and Steel (Group) Co. (Wugang)	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	13,700
Do.	Baotou Iron and Steel and Rare Earth Co.	Nei Mongol, Baotou	10,000
Do.	Taiyuan Iron and Steel Co.	Shanxi, Taiyuan	4,000
Do.	Dabaoshan Mining Co.	Guangdong, Qujiang	1,670
Do.	Panzhuhua Mining Co.	Sichuan, Panzihua	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
Crude steel	Ma'anshan Iron and Steel Co.	Anhui, Maanshan	10,000
Do.	Liuzhou Iron and Steel Group	Guangxi, Liuzhou	6,000
Do.	Shougang-Tangshan Iron and Steel Group Co. Ltd.	Hebei, Caofeidian	10,000
Do.	Handan Iron and Steel General Work (Hebei Iron and Steel Group Co.)	Hebei, Handan	12,000
Do.	Shougang Qianan Iron and Steel Co. Ltd. (Shougang)	Hebei, Qianan	7,800
Do.	Tangshan Iron and Steel Co. (Taigang) (Hebei Iron and Steel Group Co.)	Hebei, Tangshan	15,000
Do.	Wuhan Iron and Steel (Group) Co. (Wugang)	Hubei, Wuhan	12,000
Do.	Shagang Group Co. Ltd.	Jiangsu, Zhangjiagang	30,000
Do.	Anshan Iron and Steel (Group) Co. (Angang) (Anben Iron and Steel Group)	Liaoning, Anshan	16,000
Do.	Benxi Iron and Steel Co. (Bengang) (Anben Iron and Steel Group)	Liaoning, Benxi	6,000
Do.	Anshan Iron and Steel (Group) Co. (Angang) (Anben Iron and Steel Group)	Liaoning, Yingkou, Bayuquan	6,500
Do.	Baotou Iron and Steel and Rare Earth Co. (Baogang Group)	Nei Mongol, Baotou	10,000
Do.	Baoshan Iron and Steel (Group) Corp. (Baosteel) [Baogang Group]	Shanghai	19,000
Do.	Shanghai Iron and Steel Co. Ltd.	do.	6,000
Do.	Shandong Jinan Iron and Steel Group Co. (Shandong Iron and Steel Group)	Shandong, Jinan	10,000
Do.	Shandong Laiwu Iron and Steel Group Co. (Shandong Iron and Steel Group)	Shandong, Laiwu	10,000
Do.	Taiyuan Iron and Steel Co. (Taigang)	Shanxi, Taiyuan	5,000
Do.	Panzhuhua Iron and Steel (Group) Co. (Pangang)	Sichuan, Panzihua	6,000
Do.	Xinjiang Biyi Iron and Steel Group (Baogang Group)	Xinjiang, Urumqi	6,000

See footnotes at end of table.

TABLE 2—Continued
CHINA: STRUCTURE OF THE MINERAL INDUSTRY IN 2012

(Thousand metric tons unless otherwise specified)

Commodity	Facilities, major operating companies, and major equity owners ¹	Location of main facilities ²	Annual capacity ^e
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, Shaoguan	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	160
Do.	Jinli Smelter (Jiyuan Jinli Smelting Co.)	Henan, Jiyuan	300
Do.	Jiyuan Smelter (Yuguang Gold-Lead Co. Ltd.)	do.	350
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. (former Xinjiang Lithium Co.)	Xinjiang, Urumqi	5
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

See footnotes at end of table.

TABLE 2—Continued
CHINA: STRUCTURE OF THE MINERAL INDUSTRY IN 2012

(Thousand metric tons unless otherwise specified)

Commodity		Facilities, major operating companies, and major equity owners ¹	Location of main facilities ²	Annual capacity ^e
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
Palladium and platinum	kilograms	Jinchuan Nonferrous Metals Corp.	Gansu, Jinchang	3,500
Petroleum, crude		Shengli Bureau	Hebei, Shengli	33,500
Do.		Daqing Bureau	Heilongjiang, Daqing	55,000
Do.		Liaohe Bureau	Liaoning, Liaohe	15,000
Do.		Bohai Offshore Oil Corp.	Bohai	4,000
Do.		Nanghai East Corp.	Nanghai	5,000
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		Fujian Changting Jinlong Rare Earth Co. Ltd.	Fujian, Changting	4
Do.		Gansu Rare Earths Co.	Gansu, Baiyin	32
Do.		Zhujiang Smelter	Guangdong, Guangzhou	5
Do.		Jiangyin Jiahua Advanced Material Resources Co. Ltd. (Neo Material Technologies)	Jiangsu, Jiangyin	3
Do.		Liyang Rhodia Rare Earth New Material Co. Ltd. (Rhodia Group)	Jiangsu, Liyang	12
Do.		Jiangsu Guosheng Rare Earth Co. Ltd.	Jiangsu, Taixing	5
Do.		Yixing Xinwei Leeshing Rare Earth Co. Ltd. (China Rare Earth Holdings Ltd.)	Jiangsu, Yixing	6
Do.		Dingnan Nanfang Rare Earth Co. Ltd.	Jiangxi, Ganzhou, Dingnan	4
Do.		Longnan Guangdong Rising Rare Earth Smelting Co. Ltd.	Jiangxi, Ganzhou, Longnan	4
Do.		Baotou Iron and Steel and Rare Earths Corp. (Baogang Group)	Nei Mongol, Baotou	55
Do.		Leshan Primet (Puruimei) New Materials Co. Ltd. (US Primet LLC)	Sichuan, Leshan	8
Do.		Sichuan Jiangxi Copper Rare Earth Co. Ltd. (Jiangxi Copper Co. Ltd.)	Sichuan, Mianning	18
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

See footnotes at end of table.

TABLE 2—Continued
CHINA: STRUCTURE OF THE MINERAL INDUSTRY IN 2012

(Thousand metric tons unless otherwise specified)

Commodity		Facilities, major operating companies, and major equity owners ¹	Location of main facilities ²	Annual capacity ^e
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 Smelter (Yuguang Gold-Lead Co. Ltd.)	Henan, Jiyuan	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, Panzihua	5
Do.		Hengwei Titanium Co. Ltd.	do.	5
Do.		Panzhuhua Iron and Steel (Group) Co. (Pangang)	do.	15
Do.		Yunnan Metallurgical Group	Yunnan, Lufeng	10
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, Gangzhou	15

See footnotes at end of table.

TABLE 2—Continued
CHINA: STRUCTURE OF THE MINERAL INDUSTRY IN 2012

(Thousand metric tons unless otherwise specified)

Commodity	Facilities, major operating companies, and major equity owners ¹	Location of main facilities ²	Annual capacity ^e
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. (former Liuzhou Zinc Products Factory)	Guangxi, Liuzhou	100
Do.	Yugang Gold-Lead Co. Ltd.	Henan, Jiyuan	300
Do.	Shuikoushan Nonferrous Metals Co. Ltd.	Hunan, Hengyan	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, Bayannar 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, Xilinuole	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

^eEstimated; 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.

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

TABLE 3
CHINA: EXPORTS OF SELECTED MINERAL COMMODITIES IN 2012

Commodity	Quantity (metric tons)	Value (thousands)
METALS		
Aluminum:		
Alumina	43,293	\$39,414
Metal and alloys:		
Unwrought	631,214	1,467,688
Semimanufactures	2,830,000	9,798,654
Antimony:		
Metal, unwrought	9,583	118,324
Oxide	40,598	430,144
Barium sulfate	2,890,000	241,911
Copper, metal and alloys:		
Unwrought	274,180	2,284,400
Semimanufactures	493,049	4,223,854
Iron and steel:		
Pig iron and cast iron	300,000	145,053
Steel:		
Bars and rods	11,760,000	8,193,287
Shapes and sections	3,480,000	2,364,937
Sheets and plates	26,970,000	22,339,222
Tube and pipe	1,560,000	4,195,360
Wire of steel or iron	1,800,000	2,071,884
Ferroalloys	640,000	2,067,012
Scrap	923	551
Manganese, unwrought	42,746	123,912
Molybdenum, ores and concentrates	11,499	205,521
Tin, metal and alloys, unwrought	1,738	43,610
Tungsten, tungstates	2,533	87,723
Zinc:		
Metal and alloys, unwrought	7,937	19,560
Oxide and peroxide	11,567	21,114
INDUSTRIAL MINERALS		
Barite	2,940,000	358,073
Cement	12,000,000	683,627
Fluorspar	430,000	156,744
Granite	7,450,000	3,165,931
Graphite, natural	260,000	287,568
Magnesia, fused	2,130,000	611,823
Rare-earth products	16,265	905,999
Talc	750,000	189,484
MINERAL FUELS AND RELATED MATERIALS		
Coal	9,260,000	1,585,995
Coke, semicoke	1,020,000	445,059
Petroleum:		
Crude oil	2,430,000	2,226,025
Refinery products	24,290,000	21,328,891

Source: General Administration of Customs of the People's Republic of China, 2012, China monthly exports and imports, no. 12.

TABLE 4
CHINA: IMPORTS OF SELECTED MINERAL COMMODITIES IN 2012

(Metric tons unless otherwise specified)

Commodity	Quantity	Value (thousands)
METALS		
Aluminum:		
Bauxite	39,637,831	\$1,887,890
Alumina	5,020,000	1,818,301
Metal and alloys, unwrought	639,812	1,400,385
Semimanufactures	531,133	3,389,576
Scrap	2,590,000	4,127,913
Chromium, chromite	9,290,000	2,033,813
Cobalt:		
Ore and concentrates	166,491	347,499
Unwrought and powder	9,979	128,909
Copper:		
Ore and concentrates	7,830,000	16,908,979
Metal and alloys, unwrought	3,979,074	31,843,552
Semimanufactures	668,552	6,743,245
Scrap	4,860,000	14,862,098
Iron and steel:		
Iron ore	743,550,000	95,605,352
Steel:		
Bars and rods	890,000	1,519,660
Seamless pipe	430,000	1,735,102
Shapes and sections	370,000	411,772
Sheets and plates	11,660,000	12,854,279
Scrap	4,970,000	3,090,323
Manganese ore	12,370,000	2,185,360
Nickel:		
Ore and concentrates	64,999,859	5,261,148
Metal, refined greater than 99.95% Ni	10,888	194,627
Metal, other refined	146,695	2,596,966
Titanium dioxide	163,440	545,191
INDUSTRIAL MINERALS		
Diamond	kilograms 3,274	5,756,262
Nitrogen, phosphorus, and potassium fertilizers:		
Compound fertilizers	1,320,000	753,927
Diammonium phosphate	160,000	102,950
Potassium chloride	6,340,000	2,918,533
Potassium sulfate	170,000	85,593
Urea	170,978	71,349
MINERAL FUELS AND RELATED MATERIALS		
Coal	288,510,000	28,706,582
Liquefied natural gas	14,680,000	8,222,584
Petroleum:		
Crude oil	271,020,000	220,665,916
Refinery products	39,820,000	32,992,995

Source: General Administration of Customs of the People's Republic of China, 2012, China monthly exports and imports, no. 12.