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The Mineral Industry of China

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China ranked second behind the United States as the world's leading economic power, was one of the world's top destinations for foreign investment, and was a significant world importer of minerals. During the past 2 years, China's own economic prospects remained strong when most developed countries in the world were trying to recover from recession. The Government's stimulus program that was implemented in 2008 continued to boost domestic demand in 2010. The country's economy grew by 10.3% in 2010, with all sectors recording solid growth. The value of output in the industrial sector increased by 12.2% and accounted for about two-thirds of the total gross domestic product; the services sector grew by 9.5%. As a result, the value of the country's imports of goods increased by 38.7% in 2010 compared with that of 2009 (National Bureau of Statistics of China, 2011a, p. 1–9).

The consumer price index increased by 3.3% compared with a decrease of 0.7% in 2009. The ex-factory price of manufactured products increased by an average of 5.5%, and food prices increased by 7.2%. The People's Bank of China (the Central Bank) raised the reserve requirement for banks six times—to 20% for large banks—and increased the benchmark interest rate twice in 2010. The Government imposed price controls on some food items, provided subsidies to farmers, and limited the increase in the price of fuel in the domestic market. In 2010, the country's fixed-asset investment increased by 24.5% to $3.7 trillion, of which the mining sector (including coal) received $148.5 billion and the natural gas and oil sector received $44.5 billion. In 2010, foreign direct investment increased to $105.7 billion (an increase of 12.4% from that of 2009) and went mainly to such sectors as manufacturing, real estate, and services. The country invested a total of $59 billion abroad, targeting the agriculture, energy, and mining sectors. The Asia and the Pacific region was the world's leading destination for overseas investment followed by South America and Africa (National Bureau of Statistics of China, 2011a, p. 5–15; World Bank, The, 2011, p. 2–6).

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 2010. 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 demand for chromium, cobalt, copper, iron ore, manganese, nickel, petroleum, platinum-group metals, and potash exceeded domestic supply, and imports were estimated to account for more than 40% of domestic consumption. Mineral trade accounted for 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. The labor force in the mining sector was 5.62 million, or 4.3% of the country's total workforce in 2010 (Ministry of Land and Resources, 2011d, p. 3–7; National Bureau of Statistics of China, 2011b, p. 115).

Government Policies and Programs

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 existing pattern of growth was energy- and natural-resource intensive and environmentally unsustainable. The constrained supply of major mineral resources and environmental degradation limited the country's economic growth. Even though the Government declared the country to be a "social market economic state" more than a decade ago, some sectors remained under Government control, including electricity, gasoline, and coal. The Government projected that the country's economy would grow by about 7% during the next 5 years and that the consumer price index would remain low during that time. The exchange rate of China's currency, the yuan, would be kept at an "appropriate and balanced" level. In 2010, the exchange rate was about $1.00 = 6.53 yuan. The Government declared that, by yearend 2015, the country would reduce its energy consumption and carbon dioxide emissions by 16% and 17%, respectively; sulfur dioxide, by 8%; and nitric oxide, by 10% from the level of 2010. The Government indicated that it intended to support and build an energy-saving and ecologically friendly society. The plan to reduce carbon emissions would focus on the energy-intensive sectors, such as cement, chemicals, iron and steel, and nonferrous metals. The Government issued a series of technological and fiscal support policies in 2010 to promote the use of renewable energy (Citigroup Global Market Inc., 2011; State Council, The, 2011a, p. 2; 2011d, p. 1–5).

The Central Committee of the Communist Party of China met in October and issued a policy guideline (the 12th five-year plan) for the economic development of the country during the next 5 years (2011 through 2015). The Committee set up goals for the country to achieve sustained rapid growth and development in a way that is is more people oriented and causes less degradation of the environment. During the past three decades, economic development in the coastal region was much faster than in the inland region, which created economic disparities between the two regions. The Government's plan would divide the country into five regions, with different priorities for each region. In the western part of the country, which was rich in mineral resources, the Government planned to construct infrastructure networks so that the inland region would become the mining and processing center. The northeastern region was the old industrial base of

the country and mining activities there were in decline; the Government planned to upgrade the industrial output in that region to value-added production based on such activities as equipment manufacturing and the production of value-added mineral and metal products. The central region of the country would be the central agricultural production and transportation hub. The eastern region of the country would focus on high-technology and value-added industries, which would be globally competitive. The fifth region comprises the poorer areas of the country, especially ethnic minority enclaves and rural areas; the development of this region would be concentrated on protecting the environment (State Council, The, 2011d, p. 29–30).

According to the 12th five-year plan, the development of the manufacturing sector would be divided into traditional industries and strategic new industries. For the traditional industries, the Government urged steel producers to produce high-speed-rail track, high-grade silicon steel, and high-magnetic-induction cold-rolled steel products. The nonferrous metal sector would focus on manufacturing products for the aviation and aerospace sector, on upgrading smelting technology, and on increasing the use of recycled materials. The Government urged the construction sector to use energy and environmentally friendly materials, such as glass fiber, photovoltaic glass, and recycled products, when constructing buildings. The Government planned to build large metal refining and petrochemical bases in the country and to integrate the development of coal and electricity generation facilities. The Government encouraged automobile researchers to develop advanced batteries, high-efficiency internal combustion engines, and new materials for energy-saving vehicles. For the strategic new industries, the Government planned to accelerate the development of the next generation of information technology, to promote research and development in biomedical engineering fields, to implement projects for saving energy and for environmental protection, and to develop new applications for high-performance fiber, composite, rare-earth, and nano materials for the aeronautics and astronautics industries (China Chemical Reporter, 2010b; State Council, The, 2010a; 2010c, p. 49–54; 2011c, p. 11; 2011d, p. 9–10).

The economic interdependence among China and the rest of the world had become more pronounced during the past 5 years. In the years 2006 through 2010 (the period of the country's 11th five-year plan), China's economic growth rate increased by more than 9% per year, which was higher than the target growth rate of 8% per year set in 2006, even though many developed countries in the West were in recession in 2009. For the period of the 12th five-year plan (2011 through 2015), the Government set the annual economic growth rate target at 7%. The lower growth target signaled that the Government planned to accelerate structural reform in the industrial sector and to tighten bank lending to soak up excess liquidity. In previous years, China's economic growth had been investment and export based. The 2008 stimulus package boosted the rapid construction of high-speed railways, airports, highways, and powerplants, which created a hidden debt problem between local governments and banks. The growing debt problem was largely obscured outside of China because of opaque bookkeeping among domestic institutions. The Government might have to address this issue in the coming years (Citigroup Global Market Inc., 2010).

During the next 5 years, the Government would seek more-balanced growth by targeting increased domestic demand as a source of growth. To increase domestic consumption, the Government set an annual minimum wage increase target of 13% and planned to build 36 million affordable housing units in urban areas. During the past 3 years, the Government's stimulus funds had directly benefited state-owned enterprises because most large construction, iron and steel, and cement companies were state-owned. The number of privately owned enterprises, however, had substantially outgrown the number of state-owned enterprises during the past decade. The state-owned enterprises remained large only because of favorable policies, such as credit access from state-owned banks, and because the Government wished to retain control of certain industries. The Government had listed the development of private enterprises and the removal of entry barriers to private investment among its key reform tasks in the next 5 years (Kuijs, 2011; State Council, The, 2011c, p. 7).

The Government decided that 10 major industries in China—automobile manufacturing, electronic information, equipment manufacturing, iron and steel production, light industry, logistics, nonferrous metals production, petrochemicals, shipbuilding, and textile manufacturing—were to be reformed and upgraded. These industries accounted for more than 80% of the country's total industrial output value and about one-third of the GDP. The reform of these industries could help China compete more effectively with other developed countries. Under the reform guidelines, the Government planned to eliminate 74 million metric tons (Mt) of cement production capacity, 21 Mt of ironmaking capacity, 18 Mt of coking coal production capacity, 17 Mt of steelmaking capacity, 1.6 Mt of ferroalloy production capacity, and 314,000 metric tons (t) of aluminum production capacity in 2010. Provincial and municipal governments were required to eliminate all assigned quotas at yearend and to submit progress reports in February 2010. In May 2010, the State Council announced that, to meet energy saving guidelines set forth in the 12th five-year plan, additional production capacities for cement (50 Mt), ironmaking (25 Mt), steelmaking (6 Mt), and aluminum (330,000 t) would need to be eliminated in the third quarter of 2010. The Government committed $2.9 billion to a special fund for the technology renovation program, $6.2 billion to a bonus fund for producers who met the energy-saving guidelines, and a total of $22 billion for reform of the 10 target industries. According to the National Energy Bureau, electricity consumption by the industrial sector increased by 8.5% in July, and that of the heavy industrial sector increased by 9.7%; however, production by such energy-intensive sectors as aluminum, cement, copper, and iron and steel, were reported to have decreased in July. Domestic analysts believed that some of the supposedly eliminated capacities remained operating and that producers reported less than actual production to the Government (Ministry of Industry and Information Technology, 2010b, p. 2–8).

Even though it had been amended several times, the Government considered the 1984 resource tax law usable to meet the need for conservation of natural resources and protection of the environment. Under the current regulations,

the fuels and minerals tax was based on produced tonnage. The Government planned to change the fuels and minerals tax so that it is based on market prices. The tax rate proposed was between 3% and 5%. Another issue related to the resource tax was who would collect the tax revenue. Currently, local governments collected the resource tax revenue of mined minerals and fuels under their jurisdictions, except for offshore oil, which was under the Administration of Taxation. The new resource tax for natural gas and oil based on price started a trial run in Xinjiang Uygur Autonomous Region beginning on June 1, 2010. The tax rate for gas and oil was set at 5% in Xinjiang. Beginning on December 1, 2010, the tax rate for gas and oil sold in the Provinces of Gansu, Guizhou, Hubei, Ningxia, Qinghai, Shanxi, Sichuan, and Yunnan; in the Autonomous Regions of Guangxi and Nei Mongol; and in Chongqing City increased to 5%. The Government planned to implement the resource tax based on the sale price throughout the country in the near future. The Ministry of Finance (MOF) and the Administration of Taxation announced that the resource tax on high-alumina clay and fluorite increased to 20 yuan per metric ton effective June 1, 2010; that the resource tax on bastnasite and monazite would be taxed at 60 yuan per metric ton; and that middle and heavy rare earths would be taxed at a rate of 30 yuan per metric ton beginning on April 1, 2011 (China Chemical Reporter, 2010a; China Metal Bulletin, 2010a; Interfax China Energy Weekly, 2010b; Ministry of Finance, 2010a; Ministry of Industry and Information Technology, 2011b).

China was either the world's leading or one of the world's top three producers of high-alumina clay, antimony, fluorspar, molybdenum, rare earths, tin, and tungsten. The Government believed that these commodities had been over-exploited during the past several decades, which threatened to deplete these resources. Therefore, the Government decided to regulate the production of these commodities and to protect the country's nonrenewable mineral resources to support sustainable development for future generations. In 2010, the Ministry of Land and Resources (MLR) set an exploitation quota for fluorspar at 11 Mt; alumina clay at 4.5 Mt; tungsten concentrate (with tungsten trioxide content of 65%) at 80,000 metric tons (t), of which 66,480 t was primary and 13,520 t was byproduct recovery; antimony concentrate at 100,000 t, of which 69,520 t was assigned and 30,480 t was being held by the Ministry temporarily; molybdenum concentrate (with contained 45% Mo) at 185,000 t; tin concentrate (metal content) at 65,000 t; and rare-earth concentrate at 89,200 t [rare-earth oxide (REO) equivalent], of which 77,000 t was light rare earths and 12,200 t was medium and heavy rare earths. In 2011, the MLR announced that the exploitation quota for antimony concentrate would be set at 105,000 t, of which 74,650 t was assigned and 30,350 t was on hold by the Ministry temporarily; rare-earth concentrate, at 93,800 t (REO), of which 80,400 t was light rare earths and 13,400 t was medium and heavy rare earths; tungsten concentrate, 87,000 t, of which 68,680 t was primary, 16,200 t was byproduct recovery, and 2,120 t was on hold; fluorspar (in ore), 10.5 Mt, of which 10 Mt was assigned and 0.5 Mt was on hold; and alumina clay, 4.3 Mt, of which 0.91 Mt was on hold. The Ministry of Industry and Information Technology (MIIT) announced that the 2011 exploitation quota for molybdenum would be 200,000 t; for rare-earth separated products, 90,400 t; and for tin concentrate, 73,000 t. Provincial governments were responsible for managing their allocated quotas and assigning the output quota to individual mining companies (Ministry of Industry and Information Technology, 2010a; 2011a; Ministry of Land and Resources, 2010a, b; 2011a, b).

The Government planned to add more commodities to its stockpile system, including antimony, beryllium, bismuth, gallium, germanium, indium, lithium, molybdenum, niobium, rare earths, selenium, strontium, tantalum, tellurium, tin, tungsten, vanadium, and zirconium. In 2006, the MLR had added aluminum, chromium, copper, iron, manganese, and potash—all nonenergy strategic minerals of which the country was in short supply in its stockpile system. The Government planned to stockpile these strategic materials for the future. During the past several years, the country depended on imports of tantalum and zirconium to meet domestic demand. In 2010, the government of Nei Mongol Autonomous Region authorized Baotou Iron and Steel and Rare Earths Corp. to stockpile up to 30,000 t of rare-earth concentrates in Baotou. The government of Jiangxi Province planned to stockpile rare earths and tungsten in Jiangxi (China Economic News, 2010a; Yin, 2010).

During the past 5 years, the output of China's mineral and metal industries expanded at an annual rate of more than 10%. The country's power supply could not meet the increased demand for power. In 2009, the country had power generation capacity of 870 gigawatts (GW). In 2010, the country had a power capacity shortage of about 40 GW. As a result, local governments in the central and eastern Provinces ordered intensive-energy-consuming industries, such as nonferrous metals and iron and steel, to shut down part of their operations. Other contributing factors to the power shortage were that coal producers were not willing to sell extra coal to powerplants at the Government's reduced contract price, and the major power companies, all of which had financial problems, were unwilling to purchase coal at the market rate to generate more electricity during the peak season. The price discrepancy began in 2004 when the Government set a base price for the coal that producers contracted to sell to powerplants, but allowed the general market for coal to fluctuate, depending on supply and demand in the country. As a result, there were two prices of coal in China: the market price and the contract price. Since 2003, the market price of coal had increased by 150% whereas the power tariff rate (which determined the coal contract price) had increased by only 32%. In 2010, coal producers contracted to sell a total of 769 Mt of coal to powerplants, but only 380 Mt of the coal was under the Government's contracted coal price of 570 yuan ($87.70) per metric ton of 5,500-kilocalorie (kcal) coal compared with the coal market price at Qinhuangdao of 830 yuan ($127.70) per metric ton.

In August 2010, the National Development Reform Commission (NDRC) ordered the nonferrous metals and iron and steel producers to shut down their operations to reduce power consumption to meet the energy consumption guidelines of the 11th five-year plan, which called for reducing energy consumption by 20%. Domestic analysts predicted that the country's power consumption would double by 2020. To meet this demand, the Government planned to add power generation

capacity of 920 GW from thermal power, 320 GW from hydroelectric power, about 150 GW from wind power, and 70 GW from nuclear power (Interfax China Energy Weekly, 2010a; China Metal Bulletin, 2011k, n).

The 11th National People's Congress amended the 1986 coal law, which was the second amendment within 2 years, effective July 1, 2011. The Government considered the 1986 coal law usable to meet the need for conservation of natural resources and protection of the environment. The amended coal law specified the obligation of coal producers to meet all safety requirements. Local governments could approve and issue coal mining permits only under their administrative areas. The Coal Department within the State Council was the sole approving authority for coal mining operations across Provinces and Autonomous Regions (Zhonghua Renmin Gongheguo Guowuyuan Gongbao, 2011).

The MLR announced that 10 large mineral resource districts had been discovered during the past several years. These mineral resource districts included copper in Xizang; gold in Dachang; iron ore in Awulale; nonferrous metals in Nyainqentanghla, Qimantage, Tianshan, and Yunnan; potash in Lop Nor Lake; and uranium in North China. At yearend 2009, China's proven reserves of gold, bauxite, coal, potash, copper, and iron ore increased by 42%, 30%, 28%, 23%, 16%, and 11%, respectively, from those of 2001. The MLR encouraged companies to explore for and develop bauxite, copper, and iron deposits because the country depended on imports of these mineral commodities. The Government would provide special funding for these projects (China Economic News, 2010b; China Metal Bulletin, 2010g).

Production

China was one of the world's leading countries in the production 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 can have a significant effect on world markets. In 2010, production of such commodities as alumina, aluminum, bauxite, bismuth, cement, coal, copper, gold, graphite, iron and steel, lead, mercury, phosphate rock, silver, tin, titanium, tungsten, and zinc increased compared with that of 2009 (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 had a poor safety record. Several companies often mined in a single mining area. As a result, miners searched for resources and ignored laws and regulations regarding safety and the environment. The State Council approved a mining consolidation plan that had been proposed jointly by the MLR, the 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 to consolidate rare-earth mining activities in Sichuan Province.

Mineral Trade

China had become one of the most important production and consumption centers in the world. According to customs statistics, China's total trade was valued at $2.97 trillion in 2010, which was an increase of 34.7% compared with that of 2009. The value of exports increased by 31.3% to $1.58 trillion. The United States remained the leading destination for China's exports followed by the European Union (EU), Hong Kong, and Japan. The value of China's imports increased by 38.7% to $1.39 trillion. Japan was China's leading source of imports followed by the Republic of Korea and the EU. Imports of raw materials, such as bauxite, chromium ore, iron ore, manganese ore, potassium fertilizer, and oil, increased sharply. In 2010, the total value of mineral and metal product trade was $712.5 billion, which accounted for 24.0% of the country's total trade. China's main exports were low-end and semimanufactured goods. Large amounts of capital, technologies, designs, 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 European Union, 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, 2010, p. 3; Ministry of Land and Resources, 2011d, p. 11).

The Ministry of Commerce (MOC) issued circular No. 111, 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; fluorspar; magnesite; oxides of antimony, magnesium, and tungsten; platinum; 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. In 2011, 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. Starting on February 1, 2010, the Government reduced the tariff rate on imports of cobalt, copper, and nickel concentrates to zero and reduced the tariff rate on exports of refined copper, unwrought aluminum, and nickel to zero. Beginning on July 15, 2010, the MOF eliminated the value-added rebate on some iron and steel products and on nonferrous metal products of antimony, beryllium, bismuth, chromium, cobalt, lead, magnesium, molybdenum, nickel, tantalum, tin, and zinc. The MOF announced that export tariff rates would be changed, including those for many minerals and metals (Ministry of Commerce, 2010a, p. 1–20; Ministry of Finance, 2010b, various pages; 2010c, p. 8–9; National Development and Reform Commission, 2010, p. 13).

The Government adjusted the 2011 export quotas for magnesia to 1.85 Mt, phosphate rock to 1.5 Mt, bauxite (alumina clay) to 830,000 t, talc to 680,000 t, silicon carbide to 216,000 t, antimony and antimony products (metal content) to 60,300 t, molybdenum to 25,500 t, tin and tin products (metal content) to 18,900 t, tungsten and tungsten products (metal content) to 15,700 t, silver to 5,670 t, and indium to 233 t. The 2011 export quotas for antimony, magnesia, silver, talc, and tungsten increased whereas those for bauxite and tin decreased compared with those of 2010. 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 a reduced export quota on energy-intensive products would force producers to reduce their output; this would help to protect and conserve mineral resources and minimize environmental damage. The MOC also issued guidelines for enterprises that had the right to supply and export antimony, coke, ferroalloys, indium, molybdenum, rare earths, silver, and tungsten. The import quota in 2011 was the same as in 2010 for ammonium phosphoric acid, 6.90 Mt; complex fertilizer, 3.45 Mt; and urea, 3.30 Mt. Imports of mined mineral products would be subject to a 17% mineral tax, as was that for domestically mined mineral products (Ministry of Commerce, 2010d, g, h).

Owing to an increase in domestic demand and to conserve domestic mineral resources, the Government also reduced the export quotas on certain key mineral commodities. Although the 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 decrease in 2011 compared with those of 2010. In 2010, the first batch export quota for coke was 6.60 Mt, the second batch was 2.90 Mt, and the total was 9.5 Mt, which was lower than that total of 11.91 Mt in 2009. The first batch export quota for coke producers was 4.6 Mt for 2011. The first batch export quota for rare-earth producers was 22,282 t (16,304 t for domestic producers and 5,978 t for Sino-foreign joint-venture producers) and the second batch was 7,976 t for both domestic and Sino-foreign joint-venture producers in 2010. The first batch export quota was 14,446 t (a total for domestic and Sino-foreign joint-venture producers) in 2011, which was about 35% less than the first batch of 2010. The rare-earth export quota was in tonnage and was not in REO equivalent. The Government did not specify what kind of rare-earth products were allowed to be exported, such as metal, oxides, or salts, for the second batch of 2010 and in 2011. The NDRC announced that the export quota for coal was 38 Mt in 2011, which was higher than the 25.50 Mt quota in 2010; however, during the past several years, China's coal exports decreased to 19.03 Mt in 2010 from 82.98 Mt in 2003. Therefore, the increased coal export quota had no effect on domestic coal producers. Coal demand in China increased significantly during the past several years, and the country became a net coal importer during the past 2 years (Ministry of Commerce, 2010a, b, e, f; China Mining and Metals Weekly, 2011b).

In 2009, the EU, Mexico, and the United States requested that the World Trade Organization (WTO) schedule dispute-settlement consultations regarding China's export restraints in the form of export quotas on bauxite, coke, fluorspar, magnesium, manganese, silicon carbide, silicon metal, yellow phosphorus, and zinc. China imposed additional requirements and procedures in connection with the materials, including restricting the right to export based on prior export experience; establishing criteria that foreign-invested enterprises must satisfy in order to export that were different from those that domestic enterprises must satisfy; and requiring exporters to pay fees. The parties maintained that the restraints were significant enough to distort the international market and provide preferential conditions for Chinese industries that used these materials. The Chinese Government's position was that these policies were to protect the environment and natural resources. Consultations are the first step in a WTO dispute. A WTO dispute settlement panel was established in 2010 to examine the dispute. The panel ruled that China's restriction on exporting these raw materials was inconsistent with its obligations when the country was admitted to the WTO. Also, the Chinese Government had not imposed restrictions on production and consumption of these materials in the country. China has the right to appeal the panel's decision (World Trade Organization, 2011, p. 263–271).

Metals

Aluminum.—The global financial crisis in the world during 2009 and the Government's energy policy and the shortage of electricity in the second half of 2010 reduced aluminum production in the country; however, China's aluminum production continued to have a positive growth rate in 2010. In 2010, China remained a net importer of aluminum. The net volume of unwrought aluminum decreased sharply to 36,322 t in 2010 from 1.44 Mt in 2009. The decrease of imports might have been a result of the Government's sale of its aluminum stockpile, which it had bought to support the domestic aluminum price in 2008 and 2009. In November 2010, the Government sold 213,000 t of unwrought aluminum in the domestic market. In 2010, China became a net exporter of 332,680 t of unwrought aluminum alloy compared with 20,996 t exported in 2009. The aluminum price in China resembled the London Metal Exchange price in 2010. The market price of aluminum reached 18,685 yuan ($2,874) per metric ton in the early months of 2010, decreased to about 15,000 yuan ($2,381) per metric ton at mid-year, and increased to 16,000 yuan ($2,461) per metric ton at yearend. The average market price of aluminum for the year was 15,791 yuan ($2,429) per metric ton. The Government sold its aluminum stockpile at an average of 15,343 yuan ($2,360) per metric ton. China's unwrought aluminum imports came mainly from Russia, Australia, Oman, South Africa, Tajikistan, and North Korea (in descending order of volume) and the country's exports went to the Republic of Korea and Japan (in descending order of volume). China consumed about 16.1 Mt of aluminum output in 2010. The country's aluminum output capacity reached 23 million metric tons per year (Mt/yr) at yearend 2010 (China Metals, 2010d; Alumina and Aluminum Monthly, 2011c; China Metal Bulletin, 2011a).

China's output of alumina increased by more than 20% in 2010 compared with that of 2009, 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 2010, China produced about 29 Mt of alumina and imported 4.31 Mt, which was about 16% less than the amount imported in 2009. China's alumina imports were mainly from Australia (92.5%) and India (6.2%). China consumed about 33.6 Mt of alumina in 2010, of which 32.4 Mt was for metallurgical use and 1.2 Mt was for nonmetallurgical use. The shortage of supply of alumina was met from the past year's surplus. By yearend 2010, China's alumina output capacity reached 40 Mt/yr. The additional alumina capacity was from greenfield and brownfield projects, including Shanxi Luneng Jinbei Aluminum Co. Ltd. [which had a capacity of 1.4 Mt/yr), Chalco Zunyi Alumina Co. Ltd. [800,000 metric tons per year (t/yr)], Chalco Chongqing Co. (800,000 t/yr), Guangxi Xinfa Aluminum and Power Co. Ltd. (800,000 t/yr), Guangxi Huayin Aluminum Co. Ltd. (400,000 t/yr), Longkou Donghai Alumina Co. Ltd. (400,000 t/yr), Sanmenxia Yixiang Aluminum Co. Ltd. (400,000 t/yr), Nanchuan Pioneer Alumina Co. (300,000 t/yr), and Nei Mongol Datang International Recycle Resources Co. Ltd. (240,000 t/yr). Several greenfield and brownfield projects were under construction, and China's alumina output capacity was expected to increase to 45 Mt by yearend 2011. Imports of alumina were expected to decrease in the future (China Metals, 2011).

China's bauxite deposits are largely underlain by carbonate bedrocks and genetically related to karstification; however, some are underlain by aluminosilicates. The country's bauxite resources were found in the Provinces of Fujian, Guangdong, Guizhou, Hainan, Hebei, Henan, Hubei, Hunan, Jiangxi, Liaoning, Shaanxi, Shandong, Shanxi, Sichuan, and Yunnan; in the Guangxi, Nei Mongol, and Xinjiang Autonomous Regions; and in Chongqing City. Of the known bauxite deposits, more than 90% was of the diaspore (natural hydrous aluminum oxide) type; the remaining 10% was of the gibbsite (monoclinic aluminum hydroxide) type. There were more than 400 known bauxite occurrences in China for a total resource of about 2 billion metric tons (Gt), of which more than 700 Mt was reserves. The Provinces of Guizhou, Henan, and Shanxi and the Autonomous Region of Guangxi together accounted for about 93% of the total. Most of the diaspore ore contained between 45% and 65% alumina, 4% and 14% silicon oxide, and 5% and 25% iron oxide. During the past several years, the Government invested significant funds to explore bauxite resources in Chongqing City, Guangxi Autonomous Region, and Guizhou, Henan, Hubei, and Shanxi Provinces and discovered more than 150 Mt of bauxite resources in these areas. The country's bauxite reserves increased to more than 830 Mt in 2010. 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 aluminum refineries. Refineries in the coastal Province of Shandong relied on overseas bauxite for their alumina production. During the past 4 years, China's bauxite imports were 30.0 Mt in 2010, 19.7 Mt in 2009, 25.8 Mt in 2008, and 23.2 Mt in 2007. In 2010, bauxite imports from Indonesia and Australia accounted for 76.6% and 21.5%, respectively, of the total. The trend toward increased bauxite resources was expected to continue in the future, and the country also would depend on imports to meet its demand. The Government also encouraged enterprises to explore for bauxite resources in African countries and in Australia (China Metal Bulletin, 2010f, k; Tian and Fan, 2010).

In September 2010, local governments ordered aluminum smelters to shut down their operations in order to meet the energy saving target for 11th five-year plan. The Government considered the development of secondary nonferrous metals production as a path to reduce energy consumption and to protect the environment. Secondary aluminum output was expected to account for 25% of the total aluminum output in 2011. In 2010, the country produced about 4 Mt of secondary aluminum. In 2010, China imported a total of 2.85 Mt of aluminum scrap; of that amount, the United States supplied 20.3%; Malaysia, 16.1%; Spain, 15.1%; Australia, 13.8%; Germany, 9.7%; Hong Kong, 6.5%; and others, 18.5%. Domestic analysts estimated that imported aluminum scrap contained about 70% aluminum. In 2010, about 2.1 Mt of secondary aluminum output was produced from domestic

aluminum scrap, including wastes from aluminum smelters and aluminum semimanufacturing, and from recycling used products. The production of secondary aluminum was projected to increase to about 14 Mt by 2020 (China Metal Bulletin, 2011i, o).

The NDRC issued the "Promote Utilization of High Aluminum Coal Ash" guideline to accelerate the development process to recover alumina from coal. In northwestern China and Nei Mongol Autonomous Region, coal contained a significant amount of alumina. In local thermal powerplants, alumina content in coal ash was as high as 50%. Nei Mongol Datang International Renewable Energy Resource Development Co. Ltd. invested $510 million to develop a technology to extract alumina from coal ash and spent 3 years designing and constructing a plant to produce alumina. The plant, which was located at Tuokeduo County in Nei Mongol Autonomous Region, had a designed output capacity of 240,000 t/yr and was put into operation in August 2010. Analysts estimated that every 4 t of coal consumed would produce 1 t of coal ash in China. The Tuokeduo powerplant of Datang Group produced about 4 Mt/yr of coal ash. The Erdos basin had a coal resource of 50 Gt, which contained about 20% to 30% alumina (Alumina and Aluminum Monthly, 2011b, d).

The MIIT and eight Government agencies issued a circular to warn about the excess capacity of aluminum smelters and to stop construction of redundant aluminum projects. The Government originally disseminated the warning in 2003; however, the aluminum producers and local governments ignored the warning. China's aluminum output capacity increased to 23 Mt/yr in 2010 from 9 Mt/yr in 2003. The Government would not approve any new aluminum project during the next 3 years. About two-thirds of current aluminum construction projects were either approved or endorsed by the local governments and the warning would not affect those facilities under construction. Domestic analysts projected that aluminum output capacity would reach 25 Mt/yr in 2011. The Government encouraged aluminum and power enterprises to merge and to relocate energy-intensive aluminum facilities to the western part of the country, which was rich in energy resources, in order to reduce production costs. In Shandong Province, the price of electricity was about 0.63 yuan per kilowatt and 0.50 yuan per kilowatt in the Provinces of Henan and Shanxi. The electricity price for smelters, which were associated with power enterprises, was about 0.40 yuan per kilowatt. The electricity price in the western Province of Xinjiang was about 0.20 yuan per kilowatt. In general, about 41.4% of aluminum production costs were from electricity; alumina, 33.8%; carbon paste, 11.5%; salary, 11.3%; and other materials, 2.0%. Forty-four aluminum projects were under construction or in the planning stage; of that number, seven were located in Xinjiang and Gansu; Nei Mongol, Ningxia, Qinghai, and Yunnan had four each. Aluminum smelting projects that were expected to be completed in 2011 included Gansu Dongxiing Aluminum Co. Ltd.'s (a subsidiary of Jiuquan Iron and Steel Corp.) 85,000-t/yr-capacity plant in Dingxi, Gansu Province; Chalco Liancheng Aluminum Co. Ltd.'s 388,000-t/yr-capacity plant in Lanzhou, Gansu Province; China Power Investment Corp.'s Qingtongxia Aluminum Co. Ltd. 580,000-t/yr capacity expansion project in Qingtongxia, Ningxia Hui Autonomous Region; Huanghe Xinye Aluminum Co. Ltd.'s (a subsidiary of Huanghe Hydropower Co. Ltd.) 250,000-t/yr-capacity plant in Xining, Qinghai Province; Qiaotou Aluminum Co.'s 400,000-t/yr capacity expansion project in Datong, Qinghai Province; Fushun Aluminum Plant's 100,000-t/yr capacity expansion project in Fushun, Liaoning Province; and Tianshan Aluminum Co.'s 400,000-t/yr-capacity plant and Nongliushi Aluminum Plant's 400,000-t/yr-capacity plant in Xinjiang Uygur Autonomous Region. China's aluminum output capacity was expected to reach 35 Mt if all proposed and ongoing construction projects were completed within the next 5 years (China Metal Bulletin, 2010i; 2011j, m, q; Alumina and Aluminum Monthly, 2011a).

Antimony.—China was the leading antimony-producing country in the world. China's antimony resources are located in the Provinces of Guangdong, Guangxi, Guizhou, Hunan, Sichuan, and Yunnan. Hunan was the leading antimony-producing Province followed by Guangxi, Guizhou, and Guangdong. Hunan was the leading refined-antimony-producing Province followed by Guangxi, Yunnan, and Jiangxi. Hunan Nonferrous Metals Co. Ltd. and Hunan Chenzhou Mining Group Co. Ltd. (former Xiangxi Gold Mine) were the leading mined and refined antimony producers in the country. Owing to the expansion of smelting capacity during the past several years and to the Government's closure of many illegal mining activities in the Provinces of Guangxi, Hunan, and Yunnan, the supply of domestic antimony concentrates was insufficient to meet the smelters' demand; therefore, the country imported a large quantity of antimony concentrates mainly from Canada, Kazakhstan, and Turkmenistan. China imported 46,214 t of antimony concentrates in 2010, which was more than double the volume in 2009. The country also imported 1,920 t of antimony oxide. China exported 52,130 t of antimony oxide and 5,173 t of unwrought antimony, which was 40% and 12%, respectively, more than in 2009. The increase in exports indicated that the international demand for antimony products was gradually recovering. Exports of antimony products went mainly to Japan, the Republic of Korea, and the United States (Precious and Minor Metals Monthly, 2011a).

Antimony was one of the protected and strategic minerals. Exploitation and production of antimony was controlled strictly. In 2010, the government of Hunan Province shut down about 100 illegal antimony smelters in Lengshuijiang, where the leading antimony production base in the country was located. State-owned China Minmetals Group signed an agreement with the government of Hunan Province to take a major share of Hunan Nonferrous Metals Co. Ltd., which was the parent company of Xikuangshan Twinkling Star Antimony Co. Ltd. This would be the first stage of consolidating the antimony sector. Hunan-based Chenzhou Mining planned to take over the Nanxing Antimony Co. Ltd. from Nandan County's Bureau of Finance in Guangxi. Hechi Wuji Co. Ltd. decided to merge into the Province-owned Guangxi Nonferrous Metals Group. Guangxi Nonferrous would have about 20% of the country's antimony concentrate output. Nei Mongol Yulong Co. Ltd. discovered antimony resources at the boundary of its Hua'aobaote silver-lead-zinc mine at Xi Ujimqin Qi, Nei Mongol Autonomous Region. The deposit had estimated antimony resources of 151,000 t at an average grade of 0.69% antimony

(China Metal Bulletin, 2010b, 2011s; Precious and Minor Metals Monthly, 2010; China Nonferrous Metals Monthly, 2011b).

Cobalt and Nickel.—China's cobalt resources were located in the Provinces of Gansu, Hainan, Jilin, Shaanxi, and Sichuan, and in the Xinjiang Autonomous Region. Jinchuan Nonferrous Metals Corp. was the leading cobalt producer in the country. China was one of the leading mobile phone producers in the world. The demand for cobalt batteries was driving the rapid expansion of cobalt-refining facilities in China. The country had limited cobalt resources and was required to import a large quantity of cobalt concentrates to support the development of the cobalt battery sector. In 2010, China imported 349,544 t of cobalt concentrates and 16,907 t of unwrought cobalt. The cobalt content in imported concentrates was about 6%, which was equal to about 21,000 t of cobalt. The Democratic Republic of the Congo and South Africa accounted for 93% of the total imports. The country also imported 55,551 t of intermediate cobalt products, which were produced through hydrometallurgical processes. These products contained about 16% cobalt. Domestic analysts estimated that the supply of cobalt in the domestic market was about 41,000 t in 2010. The consumption of cobalt in batteries increased to 63% of the total consumption in 2010 from 50% in 2008, followed by cement carbide, 11%; magnets and glazing, 7% each; chemical catalysts, 6%; and others, 6%. Estimated total consumption of cobalt was about 21,000 t in China, and stockpiled cobalt totaled about 12,000 t (China Metal Bulletin, 2010j, 2011f; Precious and Minor Metals Monthly, 2011b).

In 2010, Jiangwu Cobalt Co. Ltd. commissioned the first stage of a 2,000-t/yr-output-capacity cobalt refinery in Ganzhou, Jiangxi Province. Jiangwu was a joint venture between Jiangxi Rare Earth and Rare Metals Tungsten Group Corp. (JRTC) (68.75%), Ganzhou City State Asset Management Co. Ltd. (20%), and Ganzhou Highway Co. Ltd. (11.25%). The refinery took 3 years to complete and was designed to produce cobalt acetic acid, cobalt carbonate, and cobalt sulfate. JRTC and Aluminum Corp. of China Ltd. (Chalco) signed an agreement to establish Jiangxi Jiangwu Nickel Cobalt New Materials Co. Ltd. The partners would construct a 40,000-t/yr-capacity plant to produce nano cobalt-nickel powder and electro-nickel plate. The total investment of the first phase would be $46 million. The ownership shares of Chalco and JRTC were 51% and 49%, respectively (China Metal Bulletin, 2010d, 2011g).

China had limited nickel resources, and copper-nickel sulfide resources accounted for about 90% of the total. Nickel resources had been discovered in the Autonomous Region of Xinjiang and the Provinces of Gansu, Hubei, Jilin, Sichuan, and Yunnan. The country produced less than 100,000 t/yr of mined nickel and consumed an average of more than 300,000 t/yr of nickel during the past several years. The gap in supply was met by imports. China imported 25.0 Mt and 16.4 Mt of nickel ore in 2010 and 2009, respectively. Indonesia and the Philippines accounted about 90% of the total imports. Nickel ores from Indonesia and the Philippines were laterite ores, in which nickel content in the ore was less than 2%. Owing to an increase in the price of refined nickel in the world markets since 2006 and the expansion of stainless steel production in the country, China's iron and steel producers imported a large volume of laterite ore to produce nickel pig iron as a substitute for refined nickel in stainless steel production (Copper and Nickel Monthly, 2010a, 2011b).

China was one of the fastest growing markets for stainless steel in the world. China's stainless steel production increased to 8.8 Mt in 2009 from 4.6 Mt in 2005. In 2010, the output of stainless steel was expected to reach 10 Mt. Nickel was one of the major raw materials for stainless steel production. About 70% of nickel was consumed by the stainless steel sector in China. In 2010, the country's imports and exports of refined nickel were 181,513 t and 53,170 t, respectively. The apparent consumption of refined nickel was about 300,000 t; however, this accounted for only part of the country's total nickel consumption. China imported about 24.5 Mt of laterite ores from Indonesia and the Philippines in 2010 and 15.8 Mt in 2009. Assuming that the laterite ore contained an average of 1.5% nickel in 2010, about 360,000 t of additional nickel was supplied in the domestic markets. Even though no reliable report was available on how much nickel pig iron was produced in the country, domestic analysts estimated that the nickel content in nickel pig iron was about 101,000 t in 2009 and 160,000 t in 2010. In China, nickel pig iron was produced using a blast furnace and submerged arc furnace. In the production of nickel pig iron from the blast furnace, coke was used as a reducing agent, and the product contained high amounts of phosphorus and sulfur. This process could be used for laterite ore containing high amounts of iron and low amounts of magnesium. If laterite ore contained 1.5% nickel and 35% iron, the nickel content in the nickel pig iron was about 4% in the blast furnace process. Coke was also used as a reducing agent in the submerged arc furnace process, which was better for laterite ore containing high magnesium and low iron. In the submerged arc furnace process, nickel content could be as high as 20% in the nickel pig iron, depending on the input ratio of coke and limestone; however, nickel pig iron producers had difficulties controlling the silicon content in their products. In China, nickel pig iron was divided into three categories: low grade (1.5% to 4% nickel); middle grade (4% to 10% nickel); and high grade (10% to 15% nickel) (China Metal Bulletin, 2011d, p; Copper and Nickel Monthly, 2011c; Jin, Wang, and Yue, 2011).

In China, the price of nickel pig iron corresponded to the price of pig iron. Based on the percentage of contained nickel, the price of the nickel content in nickel pig iron was lower than that of nickel metal in the domestic markets. The iron content in the nickel pig iron was free of charge. Most of the blast furnaces for nickel pig iron production were small in size (30 cubic meters to 450 cubic meters), which were on the Government's disbanded list. Therefore, the volume of nickel pig iron output from blast furnaces had gradually decreased and the volume of nickel pig iron output from submerged arc furnaces had increased during the past 2 years. As the quality and quantity of nickel pig iron continued to improve, more stainless steel producers used nickel pig iron to replace nickel metal in their stainless steel production. In 2010, the output capacity of stainless steel reached 17 Mt. As a result, companies expanded their output to meet demand. Greenfield and brownfield projects were underway, including Anhui Tenglong Ferroalloys

in Anhui Province; Fujian Dingrui Co., Fujian Haihe Co., Fujian Maituo Co. Lituo (Fujian) Co., and Fujian Tonghai Nickel Co. in Fujian Province; Beihai Chengde Nickel Co. Ltd. and Jinchuan Group in Guangxi Autonomous Region; Yuanda Group in Guizhou Province; Hubei Xinniexin Co. in Hubei Province; Delong Nickel Co. and Jiangsu Runtong Co. in Jiangsu Province; Hanwang International Nickel Co. in Liaoning Province; Fengzhen Chengfeng Nonferrous Metals Co. and Jien Nickel Co. in Nei Mongol Autonomous Region; and Zhanhua Weihua Co. in Shandong Province. Imports of laterite ore from overseas were expected to increase in the future; however, the Indonesian Government was considering banning the export of nickel ore, which contained less than 6% nickel, in 2014 (China Metal Bulletin, 2011c, p; Interfax China Mining and Metals Weekly, 2011a).

Xinjiang Nonferrous Metals (Group) Co. Ltd.'s subsidiary Xinjiang Xinxin Mining Co. Ltd., started the construction of its 4,000-metric-ton-per-day-output-capacity processing plant in Hami, Xinjiang Uyghur Autonomous Region. The processing plant was part of the company's Huangshan copper-nickel project. The Huangshan Mine was located about 130 kilometers southeast of Hami. The mine had ore resources of 84 Mt, which had nickel content of 380,000 t; copper, 220,000 t; and cobalt, 32,000 t. The mine construction began in 2008 and was scheduled to be completed in 2011. Total investment was estimated to be $153 million (China Metal Bulletin, 2010l).

Copper.—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 2010, Chinese copper smelters accepted a treatment charge/refining charge (TC/RC) of $46.5 per metric ton/4.65 cents per pound (46.5/4.65) copper concentrate contract with BHP Billiton Ltd. of Australia and Freeport McMoRan Copper & Gold Inc. of the United States, which was lower than the TC/RC charges of 75/7.5 in 2009. With low TC/RC fees, most of China's copper producers faced financial difficulties because of increased production costs; they relied on the recovery of such byproducts as gold, silver, and sulfuric acid to increase revenue. The economic recovery of Western countries remained slow, and there was a surplus of copper concentrates in the world markets. As a result, the TC/RC fees negotiated between BHP Billiton and the Tongling Nonferrous Metals Group Holding Co. Ltd. for 2011 was 72/7.2 and the agreement between BHP Billiton and the China Smelters Purchase Team was 90/9. Strong copper prices in the international and domestic markets and increased copper demand in China encouraged China copper producers to expand their output capacity. China's copper smelting and refining output capacities reached 3.5 Mt/yr and 6.3 Mt/yr, respectively, in 2010, and the capacities were expected to increase to 5.5 Mt/yr and 8.0 Mt/yr, respectively, in 2015. The output of domestic mined copper was expected to increase to about 1.3 Mt/yr in 2015 (China Metal Bulletin, 2010e; China Mining and Metals Weekly, 2011a).

With limited copper resources, China imported a considerable amount of copper concentrates, scrap anode, and refined metal from overseas markets. Domestic copper mines supplied about 30% of the country's requirements for copper concentrates. In 2010, China imported 6.47 Mt of copper concentrates from the countries of Chile (28.0%), Peru (13.8%), Australia (8.6%), Mongolia (8.0%), Mexico (5.2%), Kazakhstan (4.8%), Turkey (4.7%), and others (26.9%); 4.36 Mt of copper scrap from the United States (18.1%), Spain (13.7%), Australia (12.6%), Germany (10.9%), Malaysia (7.1%), the Netherlands (6.4%), Japan (5.9%), and others (25.3 %); and 2.92 Mt of refined copper from Chile (46.2%), Japan (8.7%), Kazakhstan (6.4%), Zambia (5.1%), Australia (4.3%), and others (29.3%). In 2010, imports of copper concentrates and copper scrap increased by 5.5% and 9.2%, respectively, compared with those of 2009; however, imports of refined copper decreased by 8.4%. Owing to excess imports in 2009, there was a surplus of refined copper in the domestic markets that led to the decrease of imports in 2010. The price of refined copper in the international market increased to $9,660 per metric ton at yearend from about $8,000 per metric ton during the first half of 2010, which was higher than that in the domestic market. If the import tax is included, the price of imported refined copper was higher than that of domestic refined copper; therefore, domestic traders were reluctant to import refined copper during the last quarter of 2010. In 2010, the apparent consumption of refined copper was 7.45 Mt; however, domestic analysts estimated that the producers and traders stockpiled about 670,000 t of copper in their warehouses and that real copper consumption was about 6.8 Mt, which was about 11% higher than that of 2009. The power sector was the leading consumer of copper and accounted for about 47% of the total followed by household appliances, 14%; transportation 10%; electronics, 7%; and others, 22% (China Metal Bulletin, 2010m, 2011e; Copper and Nickel Monthly, 2011a).

In 2010, the MIIT published a list of obsolete production technologies and ordered producers to close down those production plants. Six copper producers that used obsolete technologies were on the list; they had a combined output capacity of 140,000 t/yr. Jiangxi Copper Co. Ltd.'s subsidiary, Kangxi Copper Co. Ltd. in Xichang, Sichuan Province, planned to replace its 30,000-t/yr-capacity reverberatory furnace with a 100,000-t/yr-capacity flash furnace. The replacement project was divided into two stages. The first stage, which would have an output capacity of 50,000-t/yr, would be completed in 2011, and the second stage, which would have an output capacity of 50,000 t/yr, would be completed in 2015. Chifeng Jinjian Co. Ltd. in Chifeng, Nei Mongol Autonomous Region, completed the upgrade of its copper smelter and refinery in 2010, which would have an output capacity of 180,000 t/yr of blister copper and 70,000 t/yr of refined copper. Shandong Dongying Fangyuan Nonferrous Metals Co. Ltd. planned to add 200,000-t/yr of output capacity to its copper refinery in Shandong. Minmetals's subsidiary Hunan Shuikoushan Nonferrous Metals Group Co. Ltd. and Western Mining Holding Co. Ltd. planned jointly to build a 200,000-t/yr-output-capacity copper refinery in Hunan Province. Yunnan Tin Corp. started the construction of a 100,000-t/yr-output-capacity copper refinery in Yunnan Province. Western Mining Group Co. Ltd. announced that the company would build a 100,000-t/yr-output-capacity copper smelter in Xining, Qinghai Province. Hunan Baoshan Nonferrous Metals Mining Co. agreed with the Guiyang local

government to build a 150,000-t/yr output capacity copper cathode plant in Guiyang, Hunan Province. The company also planned to a 300,000-t/yr-output-capacity smelter in the area. Daye Nonferrous Metals Co. planned to expand its copper refinery output capacity to 400,000 t/yr in 2012 after the scheduled completion of its 200,000-t/yr blister copper expansion project in early 2011. Guangxi Jinchuan Nonferrous Co. Ltd. (a subsidiary of Jinchuan Nonferrous Metals Corp.) started the construction of a 600,000-t/yr-output-capacity copper complex in Fangchenggang, Guangxi Autonomous Region (China Metal Bulletin, 2010h; Copper and Nickel Monthly, 2010b).

In 2010, the Government issued guidelines for the sustainable development of mineral technology to encourage people to recycle metals and household appliances and develop recycling technologies. During the past several years, China's secondary copper production increased by more than 10% per year. China's copper scrap imports increased to more than 4 Mt in 2010 from about 2 Mt in 2000, and secondary copper producers depended on imports to meet their needs. Therefore, most of secondary copper producers were located in coastal Provinces, such as Guangdong, Jiangsu, and Zhejiang. Before 2005, most of these secondary copper producers used small reverberatory furnaces for smelting, and their output capacities were less than 50,000 t/yr. In recent years, China's leading copper producers, such as Jiangxi Copper, Jinchuan, Tongling, and Yunnan Copper, imported advanced furnaces, such as Ausmelt and Kaldo, for their secondary copper production. Domestic analysts estimated that about 900,000 t/yr of secondary copper output capacity was under construction in 2010. The Government was considering issuing secondary copper producer admission guidelines during the next 2 years (Zhou, 2010; China Metal Bulletin, 2011l; Ministry of Industry and Information Technology, 2011c).

Iron and Steel.—China was the world's leading iron and steel producer, accounting for about 57% of the world's pig iron production and 45% of the world's crude steel production in 2010. The country's iron and steel sector continued expanding its output in 2010. Production of pig iron and crude steel increased by about 8.1% and 11.4%, respectively, in 2010 compared with production in 2009. The rate of growth was the slowest of the past several years because many iron and steel producers were ordered to shut down their operations in August and September to meet the energy-saving target of the 11th five-year plan. In the first 9 months of 2010, the total fixed-asset investment in the iron and steel sector was $47.2 billion, which was an increase of 4.2% from that of 2009; of that amount, iron ore mining and processing accounted for 23.5% of the total. The ironmaking and steelmaking output capacity increased by 66 Mt and 56 Mt, respectively, in 2010. The Provinces of Hebei, Jiangsu, and Liaoning ranked as the top three Provinces in fixed-asset investment 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 84% of the investment. At yearend 2010, China had steelmaking capacity of 810 Mt, of which about 300 Mt of output capacity had not gone through the Government approval procedures. Owing to the Government stimulus program introduced in late 2008, demand for steel products increased. In January 2010, the apparent consumption of crude steel increased by 27.4% compared with that of the same month in 2009. The growth rate decreased to 10.0% in May. Between June and October, China's apparent consumption of crude steel was the same as in the same period in 2009, and for the year, apparent consumption of crude steel was 599 Mt, which was 5.0% higher than that of 2009. In 2010, China exported 42.6 Mt of steel products and 140,000 t of steel ingot and imported 16.4 Mt of steel products and 678,000 t of steel ingot. China was a net exporter of 26.2 Mt of steel products. This indicated that more than 40% of the increase in crude steel output was targeted for exported steel products. Exports of China's steel products to Asian countries accounted for 58% of the total exports. Steel products imports from Japan, the Republic of Korea, Taiwan, and the European Union (in descending order of value) accounted for 90% of the total imports (China Metals, 2010e; Hu, 2011).

The Government continued its effort to curb the fast-growing production capacity of iron and steel in the country. The Government ordered iron and steel producers to phase out obsolete facilities, enhance energy conservation, and reduce the emission of waste gas. The Government planned to retire all 300-cubic-meter blast furnaces and 20-t converters and electric arc furnaces (EAF) at yearend 2010. In September, 175 ironmaking producers closed down a total of 35.2 Mt of their pig iron output capacity and 28 steelmakers shut down a total of 8.7 Mt of their crude steel production capacity. During the past 5 years, the country shut down a total of about 117 Mt of ironmaking and 69 Mt of steelmaking output capacities. The Government ordered iron and steel producers to phase out 400-cubic-meter blast furnaces and 30-t converters and EAFs at yearend 2011. The MIIT identified a total of 125.4 Mt/yr of output capacity from small furnaces and small converters and 28.2 Mt/yr of output capacity from EAFs that would be eliminated in 2011. The Government planned to eliminate the value-added tax rebate on some hot- and cold-rolled steel products. Carbon steel producers would be required to have a minimum of 1 Mt/yr of output capacity, and special steel producers would be required to have more than 500,000 t/yr of output capacity. The Government banned the construction of new steel projects, greenfield or brownfield, until the end of 2011. Coking coal consumption in blast furnaces was to be less than 411 kilograms per metric ton (kg/t) for pig iron output and 0.1 kg/t in converter and 92 kg/t in EAFs for steel production. The amount of water use for steelmaking would be reduced to less than 5 metric tons per metric ton of steel output. Per metric ton of steelmaking, the sewage discharge would be controlled to within 2.0 cubic meters' fume, dust emissions to within 1.0 kilogram (kg), and sulfur dioxide emissions to within 1.8 kg. The Government could have difficulty enforcing these policies in rural areas because local governments depended on revenues from small iron and steel producers to support other projects (China Metals, 2010a, b; Li, 2010).

The Government hoped that the consolidation 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. In 2010, the consolidation continued. Shoudu Iron and Steel (Group) Co. (Shougang) acquired a major share of Tonghua Steel Co. and planned

to build a 2.7-Mt/yr-capacity greenfield steel plant in Jilin Province. Shougang also acquired Changzhi Iron and Steel Co. Ltd. in Shanxi Province, and Shuicheng Iron and Steel Group and Guiyang Specialty Steel Co. Ltd. in Guizhou Province. Shougang shut down its ironmaking and steelmaking plants in Beijing at yearend 2010 but the steel product facilities remained in operation. The Government approved the merger of Anshan Iron and Steel Group Co. (Angang) in Liaoning Province and Panzhihua Iron and Steel (Group) Co. in Sichuan Province, and the Government approved Angang to take over Sanming Iron and Steel Group Co. in Fujian Province. Benxi Iron and Steel Co. (Bengang) and Beitai Iron and Steel Group Co. in Beixi, Liaoning Province, agreed to merge. Taiyuan Iron and Steel Co. acquired Zhongyu Iron and Steel Co. and Linfen Iron and Steel Co. in Shanxi Province. Transregional mergers also faced many obstacles from local governments. Owing to local government objection, the Chongqing Iron and Steel Co. rejected the Wuhan Iron and Steel (Group) Co.'s acquisition. Local governments usually ignored the Government mandates if the Central Government did not provide financial support. The merger of Angang and Bengang to form Anben Iron and Steel Group was announced in 2005. Angang was owned by the state and Bengang was owned by the Provincial government. Because of revenue sharing issues, the two iron and steel producers remained operating independently in 2010. Province-owned Shandong Iron and Steel Group (Shandong) and privately owned Rizhao Group signed a letter of intent to merge in 2008; however, after 2 years of discussion on asset acquisition, the two parties remained far apart in 2010. In 2010, Hebei Iron and Steel Group Co. became the leading steel producer in the country followed by Baoshan Iron and Steel (Group) Corp., Angang, Wugang, Shagang Group Co. Ltd., Shougang, and Shandong (China Metals, 2010c, f; Li, 2011).

The Provincial government of Hebei issued guidelines for the consolidation of the iron and steel enterprises in the Province. At yearend 2015, the total number of iron and steel enterprises would be reduced to 10 from 88 in 2010. Tianjin Iron and Steel Group, Tianjin Metallurgy Group, Tianjin Steel Pipe Group, and Tianjin Tiantie Metallurgy Group agreed jointly to form Tangshan Bohai Iron and Steel Group. The four companies had a total combined steel output capacity of 20 Mt/yr. Seven local privately owned iron and steel companies in Handan agreed to form Hebei Baoshun Iron and Steel Group. Hebei Iron and Steel Group Co., Hebei Jinxi Iron and Steel Co. Ltd., Hebei Xinwuan Iron and Steel Group Co., Hebei Zongheng Iron and Steel Group Co., Tangshan Bohai Iron and Steel Group Co., and Tangshan Changcheng Iron and Steel Group Co. were expected to be part of the Province's 10 iron and steel enterprises after the consolidation. The steel production of the top five enterprises would increase to 75% of the total steel output of the Province by 2015 from 48% in 2009. Those companies unwilling to be part of the sector consolidation would not be allowed to continue their operations or to upgrade their operational technology or to expand their output capacity. Power companies would not be allowed to supply electricity to those steel plants. Local governments would not be allowed to approve any iron and steel construction projects without first consulting with the Provincial government (Provincial Government of Hebei, 2010).

Domestic iron ore production could not meet domestic demand; therefore, China depended on iron ore imports to fill the gap. Imports of iron ore increased to more than 618 Mt in 2010. Australia, Brazil, India, South Africa, and Canada, in descending order of amount imported, were China's key iron ore suppliers. The total amount of iron ore stockpiled at China's 22 major ports averaged more than 65 Mt in 2010. Except for 2010, the volume of domestic iron ore output increased sharply; owing to the low iron content and high impurities of domestic ore, pig iron producers preferred imported ore. Even though the country's iron ore production increased sharply during the past several years, the percentage of iron ore supplied by domestic producers remained at less than 50% of the demand in 2010. About 50% of seaborne ore in the world was destined for China. Owing to China's increased demand for iron ore, the contract prices of iron ore increased in four consecutive years, by 71.5% in 2005, 19.0% in 2006, 9.5% in 2007, and between 65.0% and 96.5% in 2008 compared with each of the previous years; however, China's iron and steel producers and the three leading iron ore producers in the world—BHP Billiton, Rio Tinto Ltd. of Australia, and Vale S.A. of Brazil—could not reach contract agreement in 2009. The three international iron ore producers scrapped the annual iron ore pricing system and replaced it with a quarterly pricing system based on the combination of the Steel Index, the Metal Bulletin iron ore indexes, and the Platts iron ore spot market assessment to determine the iron ore price. The data were collected from iron ore traders. As a result, the price of iron ore became more volatile during the year. The Indian Commodity Exchange introduced an iron ore futures contract system. The Singapore Mercantile Exchange planned to launch an iron ore futures trading system in 2011. China's state-owned iron and steel enterprises were prohibited from participating in iron ore derivative trading. China's Custeel planned to launch an iron ore spot index. The index would be based on imported and domestic iron ore transaction prices. Domestic iron ore price statistics would be collected from 33 locations in 15 Provinces (China Mining and Metals Weekly, 2011d).

Industrial Minerals

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. China's rare-earth consumption had increased steadily to 87,000 t in 2010 from 52,000 t in 2005 and 19,000 t in 2000. In China, rare-earth consumption in the new materials industry sectors, such as catalysts, magnets, phosphors, and polishing powder, increased to 61% of the total in 2010 from 47% in 2005 whereas rare-earth consumption in traditional industry, such as metallurgical, chemical and petroleum, ceramics and glass, and agriculture and textile production, decreased to 39% of the total in 2010 from 53% in 2005. Owing to the increase in rare-earth consumption in the new materials industry, the trend of increasing consumption was expected to continue in the future. In 2010, China's rare-earth exports decreased to about 39,800 t, which was equivalent to 34,600 t of REO. Japan remained the leading destination for

China's rare-earth products, accounting for 51.7% of the total exports, followed by the United States, 15.8%; the Netherlands, 5.1%; France, 4.4%; and others, 23% (Shang, 2010).

The State Council issued "Opinions on the Promotion of Sustainable and Healthy Development of the 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, separation, smelting, and marketing. The Government would control unregulated exploitation, environmental damage, unregulated production capacity expansion, and illegal trading. Within 3 years, the country's rare-earth industry would be transformed into a sustainable industry. Large rare-earth enterprises were expected to be the main producers and operators. The top three rare-earth enterprises were expected to produce more than 80% of the country's rare earths. Companies that planned to participate in the rare-earth industry would be required to meet Government standards; this would apply to traders also. Exports of primary products, such as rare-earth alloys, metals, oxides, and salts, would be strictly controlled and the export quota would not be salable. The Government would shut down those producers that did not meet the environmental standards. The Government would implement the exploration, exploitation, consumption, and export quota plan based upon the country's rare-earth resources and international rare-earth market conditions. The MLR would consult with other Government agencies to develop a plan to manage the country's rare-earth resources and would not issue any new exploration and exploitation licenses. Expansion of mining output capacity would be prohibited. The number of rare-earth producers would be reduced through mergers, and the MIIT and other Government agencies would issue the consolidation guidelines. The country would establish a rare-earth stockpile system. A rare-earth office would be established under the MIIT to coordinate and issue the exploitation and production quotas, the stockpile, and the export and import plan. The NDRC would be the lead agency to develop rare-earth investment and the export and import plan. The MLR would be the lead agency for management of the rare-earth resource stockpile, and the MOF would provide taxation policy (State Council, The, 2011b).

The MLR announced that the Government had established 11 state-managed rare-earth mining zones in Ganzhou, Jiangxi Province. The total area of the 11 rare-earth mining zones was 2,534 square kilometers. The total estimated rare-earth resource in the mining zone was 760,000 t. The Ganzhou area was rich in the ion adsorption type of rare earths. The government of Jiangxi Province issued more than 80 mining licenses to Ganzhou Rare Earth Co. Ltd. after the consolidation and shut down of illegal rare-earth mining activities in the Ganzhou area during early 2000. Several state-owned companies, including Baotou Iron and Steel, Chinalco, and Minmetals, had set up joint ventures with local rare-earth producers in Jiangxi; however, none of them had mining licenses. The local government planned to establish a company that would manage rare-earth production from mining to the production of value-added products. Revenues generated from rare-earth activities were a significant portion of the local government budget (China Metal Bulletin, 2010c; Ministry of Land and Resources, 2011a).

In 2010, Jiangxi Province had a rare-earth mining output capacity of about 12,000 t/yr. There were 17 rare-earth separation producers with a total output capacity of about 40,000 t/yr and 9 rare-earth smelting producers with a total output capacity of about 18,000 t/yr. In 2010, Jiangxi produced 8,013 t of rare-earth concentrates (REO) and separated 20,000 t of rare-earth products and also produced 16,600 t of rare-earth metals. In 2010, the rare-earth production quota assigned by the MIIT for Jiangxi was 8,500 t of rare-earth concentrates (REO) and 12,500 t of rare-earth smelting products. It appeared that Jiangxi produced 32.8% more than the assigned quota of rare-earth smelting products and produced about 5.7% less than the assigned quota of rare-earth concentrates. The excess raw material supply to the separation and smelting producers was either imported from other Provinces, obtained from the stockpile, or was the result of underreporting of rare-earth concentrates (China Metal Bulletin, 2011h).

The consolidation of the rare-earth industry continued in 2010. 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. No detailed information was released about the situation of Sino-foreign joint-venture producers in the announcement. Many joint-venture producers, however, had gradually shifted their operation towards producing downstream rare-earth products during the past 2 years because they had difficulties securing rare-earth concentrates, and they relied on supplies from Baotou Hi-Tech (Government of Nei Mongol Autonomous Region, 2011).

Chinalco, Guangxi Nonferrous Metals Group Co. Ltd., and Beijing General Research Institute for Nonferrous Metals (Grinm) jointly established Chinalco Guangxi Nonferrous Rare Earth Co. to develop the rare-earth resources in Guangxi Zhuang Autonomous Region. Guangxi Nonferrous Metals (a Province-owned company) was established in 2008 and received exclusive rare-earth development rights from the Guangxi government. Grinm was a Government-owned nonferrous metals institution located in Beijing. Guangxi's rare-earth industry began to develop, and the MLR assigned a 2,000-t rare-earth concentrates production quota to the Autonomous Region in 2010. Guangxi's rare-earth resources included ion adsorption, monazite, and xenotime types (China Daily, 2010; China Metal Bulletin, 2011b).

Chinalco, five rare-earth producers, and a rare-earth trading company in Jiangsu Province jointly established a rare-earth company, Chinalco Rare Earth (Jiangsu) Co. Ltd., in Jiangsu Province. The five rare-earth producers had a total output capacity of about 30,000 t/yr of REO. Many of Jiangsu's rare-earth companies were Sino-foreign joint ventures and these rare-earth producers processed rare-earth concentrates imported from other Provinces. Chinalco and the Qingyuan

municipal government signed a cooperation agreement to develop local rare-earth resources. About 35% of Guangdong's rare-earth resources were located in Qingyuan. According to the agreement, Chinalco would build a 500,000-t/yr-output-capacity copper smelter and an integrated rare-earth plant in Qingyuan (China Nonferrous Metals Monthly, 2011a).

Guangdong-based Guangdong Rising Nonferrous Metals Co. Ltd., which had two of the four rare-earth mining licenses in Guangdong Province, wanted to be the leading rare-earth producer in the Province. Rising and Baotou Hi-Tech signed a strategic cooperation agreement to develop rare-earth value-added products. Changshu Shencheng Rare Earth Mineral Co. Ltd., China Nonferrous Metal Foreign Engineering and Construction Co. Ltd. [a subsidiary of China Nonferrous Mining (Group) Co. Ltd.], Jiangsu Zhuoqun Nano Rare Earth Co. Ltd. (a subsidiary of Nano Material of Canada), and Xinfeng Fengyuan Development Co. Ltd. formed a joint-venture company, NFC Southern Rare Earth Co. Ltd., and started the construction of a 7,000-t/yr-output-capacity rare-earth separation plant in Xinfeng, Guangdong Province, which was scheduled to be completed in 2013. Minmetals and the Heyuan municipal government signed an agreement to explore mineral resources in Heyuan, where part of Guangdong's rare-earth resources were located. It appeared that Guangdong Province had become a second competition area after Jiangxi Province for rare-earth resources in China (China Metal Bulletin, 2011r; China Mining and Metals Weekly, 2011c).

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 primary source of energy—two-thirds of the country's electricity was produced by coal-fired plants. 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 2010 because of an increase in demand for coal by every industrial sector, China became a net coal importing country. In 2010, the country imported a total of 164.8 Mt of coal, which accounted for less than 4% of total demand, from Australia, 35%; Indonesia, 24%; Vietnam, 19%; Russia, 9%; Mongolia, 5%; North Korea, 3%; and others, 5%. China exported a total of 19.0 Mt of coal to the Republic of Korea, 44%; Japan, 29%; Taiwan, 22%; and others, 5% (General Administration of Customs of the People's Republic of China, 2011).

During the past two decades, Shanxi Province had been China's leading coal-producing Province, and its coal output accounted for more than 20% of the country's total coal output. Since 2007, the government of Shanxi Province consolidated state-owned coal producers into large enterprises and closed down small mines. The number of coal companies in Shanxi was reduced to 130 in 2010 from 2,200 in 2009, and the number of coal mines was likewise reduced to 1,053 in 2010 from 4,000 in 2005. As a result, coal output from Shanxi Province decreased. Shanxi exported about 510 Mt of coal to other Provinces or to overseas coal markets. Coal output from Nei Mongol Autonomous Region increased during the past several years and it became the leading coal-producing Province in China in 2009. Coal production from Nei Mongol increased to 782 Mt and that from Shanxi increased to 740 Mt. Nei Mongol's coal had a higher ash content and a lower heating value than Shanxi's coal (Interfax China Mining and Metals Weekly, 2011b).

The State Council urged Provincial governments to speed up their consolidation efforts, to reduce mine accidents, and to encourage cross-sector and regional mergers. Provincial governments were urged to provide financial and technological support to coal enterprises during their transformation into more efficient and safe coal producers. The consolidation of the coal sector would lead to 10 large coal enterprises with output capacities of more than 100 Mt/yr, and the number of coal producers would be reduced to about 4,000 by 2015. The 10 large coal enterprises would account for about 50% of the country's coal output. The average annual production of each coal company would increase to more than 800,000 t from 300,000 t. During the past 2 years, the governments of Fujian, Guizhou, Hebei, Heilongjiang, Hunan, Nei Mongol, Shandong, Sichuan, and Yunnan had developed consolidation plans. China's coal output was expected to increase to 3.8 Gt in 2015 (State Council, The, 2010b).

The Government planned to stockpile more than 30 Mt of coal for emergency use, and 5 Mt would be stockpiled in mid-2011. Ten coal enterprises, which had a combined output capacity of more than 20 Mt/yr and included China Coal Co. Ltd. and Shenhua Corp., were assigned to supply emergency coal. Coal stockpile bases would be located in the coastal areas. Initial locations were at Guangzhou and Zhuhai in Guangdong Province, Huanghua and Qinhuangdao in Hebei Province, Wuhan in Hubei Province, Wuhu and Xuzhou in Jiangsu Province, and Zhoushan in Zhejiang Province (National Development and Reform Commission, 2011).

Reserves and Resources

China's reserve and resource system [Classification for Resources/Reserves of Solid Fuels and Mineral Commodities (GB/T 17766-1999)] divides the country's natural minerals into reserves and resources. Reserves are divided into proved extractable reserves, probable extractable reserves, and basic reserves. Identified mineral resources are divided into measured, indicated, and inferred categories. Comparison of different reserve systems is difficult and always approximate. Basic reserves in the Chinese reserve classification system is the best approximation to reserves as defined by the U.S. Geological Survey and U.S. Bureau of Mines resource/reserve classification system (U.S. Bureau of Mines and U.S. Geological Survey, 1980). The MLR publishes the country's reserve and resource data yearly but the Ministry releases only limited information to overseas researchers. China's basic reserve data are listed in table 5 (People's of Republic China National Standard, 1999; National Bureau of Statistics, 2011b, p. 398).

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. The Government 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 continuation of China's economic growth implies that a strong demand for mineral commodities is likely to continue. China has shortages in the supply of most major minerals, such as bauxite, chromium, copper, iron, lead, manganese, nickel, oil, and potash, and relies on imports to meet 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 will continue its effort to protect the country's resources of minerals, such as antimony, coal, indium, molybdenum, tin, tungsten, and rare earths, and to avoid overexploitation. The Government has been promoting a reduction in resource dependency and the production of higher 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 this goal. As progress is made toward this goal, the country's dependence on most major mineral commodities could decline. For the near term, 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 become a major phenomenon 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; however, owing to ineffective enforcement through supervision and monitoring, 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]		2006	2007	2008	2009	2010
METALS						
Aluminum:						
Bauxite, gross weight	thousand metric tons	27,000	30,000	35,000	40,000	44,000
Alumina	do.	13,700	19,500	22,800	23,800	29,000
Metal, refined:						
Primary	do.	9,360	12,600	13,200	12,900	16,200
Secondary	do.	2,350	2,750	2,700	3,100	4,000
Total	do.	11,700	15,400	15,900	16,000	20,200
Antimony:						
Mine, Sb content		153,000	163,000	166,000	140,000	150,000
Metal		140,000	147,000	158,000	168,000	187,000
Bismuth:						
Mine output, Bi content		1,520	3,500	5,000	6,000	6,500
Metal		11,800	12,100	13,100	12,300 r	13,000
Cadmium, smelter		3,790	4,210	6,960	7,050 r	7,000
Chromite, gross weight	thousand metric tons	200	200	200	200	200
Cobalt:						
Mine output, Co content		1,840	6,100	6,630	6,000	6,000
Metal		8,200	7,580	6,700	6,000 r	7,700
Copper:						
Mine output, Cu content		873,000	928,000	1,070,000 r	1,040,000 r	1,160,000
Metal:						
Smelter, primary	thousand metric tons	1,920	2,110	2,500	2,700 r	2,900
Refined:						
Primary	do.	2,000	2,400	2,700	2,750	2,950
Secondary	do.	1,000	1,200	1,200	1,400	1,700
Total	do.	3,000	3,600	3,900	4,150	4,650
Gold, mine output, Au content		245	275	285	320	345
Indium, primary and secondary		400	380 r	340	340 r	330
Iron and steel:						
Iron ore, gross weight	thousand metric tons	601,000	707,000	824,000	880,000	1,070,000
Pig iron	do.	412,450 4	476,520 4	470,670 4	552,830 4	597,330 4
Ferroalloys	do.	14,300	17,500	18,300	22,100	24,300
Steel, crude	do.	419,150 4	489,290 4	500,490 4	572,180 4	637,230 4
Steel, rolled	do.	468,930 4	565,610 4	584,770 4	694,050 r, 4	802,760 4
Lead:						
Mine output, Pb content	thousand metric tons	1,330	1,410	1,550	1,600	1,850
Metal:						
Smelter, primary	do.	2,090	2,040	2,430	2,630 r	2,800
Refined:						
Primary	do.	2,130	2,140	2,350	2,630 r	2,840
Secondary	do.	590	650	850	1,150 r	1,360
Total	do.	2,720	2,790	3,200	3,780 r	4,200
Magnesium, metal and alloy		520,000	625,000	559,000	501,000	654,000
Manganese:						
Ore, Mn content	thousand metric tons	1,600	2,000	2,200	2,400	2,600
Metal		730,000	1,000,000	1,130,000 r	1,310,000 r	1,370,000
Mercury, mine output, Hg content		760	800	1,300	1,430 r	1,600
Molybdenum, mine output, Mo content		43,900	67,700	81,000	93,500	93,600
Nickel:						
Mine output, Ni content		82,100	67,000	79,500 r	84,800	81,000
Matte		99,800	105,000	114,000	143,000 r	150,000
Smelter		102,000	116,000	129,000	165,000	172,000
Niobium and tanlatum, mine output:						
Nb_2O_5 content		120	270	300	30 r	32
Ta_2O_5 content		440	920	900	90 r	95

See footnotes at end of table.

TABLE 1—Continued

CHINA: ESTIMATED PRODUCTION OF MINERAL COMMODITIES[1, 2]

(Metric tons unless otherwise specified)

Commodity[3]		2006	2007	2008	2009	2010
METALS—Continued						
Silicon, metal		900,000	1,080,000 r	1,100,000 r	993,000 r	1,050,000
Silver, mine output, Ag content		2,600	2,700	2,800	2,900	3,500
Tin:						
Mine output, Sn content		126,000	146,000	110,000	97,200 r	115,000
Metal		132,000	149,000	140,000	140,000 r	150,000
Titanium:						
Ilmenite, TiO_2 equivalent		500,000	550,000	550,000	550,000	500,000
Sponge		18,100	45,200	57,000	45,800 r	55,000
Tungsten, mine output, W content		45,000	41,000	50,000	51,000	59,100
Vanadium, in vanadiferous slag product		42,500	45,200	46,000	52,000	52,000
Zinc:						
Mine output, Zn content	thousand metric tons	2,840	3,040	3,340	3,330 r	3,700
Refined						
Primary	do.	3,150	3,710	4,000	4,200	4,980
Secondary	do.	20	30	37	90	180
Total	do.	3,170	3,740	4,040 r	4,290 r	5,160
INDUSTRIAL MINERALS						
Asbestos		360,000	390,000	380,000	440,000 r	400,000
Barite	thousand metric tons	4,400	4,400	4,600	3,000	4,000
Bentonite	do.	3,200	3,300	3,300	3,400	3,400
Boron, mine, B_2O_3 equivalent		145,000	145,000	140,000	145,000	150,000
Bromine		124,000	137,000	135,000	140,000	150,000
Cement, hydraulic	million metric tons	1,236 r, 4	1,361 4	1,400 4	1,644 r, 4	1,882 4
Diatomite		420,000	420,000	440,000	440,000	400,000
Dolomite	thousand metric tons	8,000	8,000	8,000	8,100	8,200
Feldspar	do.	1,950	2,000	2,000	2,000	2,000
Fluorspar	do.	3,000	3,200	3,250	3,000 r	3,300
Graphite		720,000	800,000	650,000 r	450,000 r	800,000
Gypsum	thousand metric tons	4,200	4,800	4,600	4,500	4,700
Kaolin	do.	3,000 r	3,210 r	3,200 r	3,000 r	3,200
Lime	do.	160,000	170,000	180,000	185,000	190,000
Lithium minerals, all types		20,000	22,000	25,000	26,000	27,000
Magnesite	thousand metric tons	6,700	14,000	15,600	13,000 r	14,000
Mica		700,000	720,000	750,000	700,000	750,000
Nitrogen, N content of ammonia	thousand metric tons	40,660 4	42,480 4	41,140 4	42,290 4	40,870 4
Phosphate rock, P_2O_5 equivalent	do.	11,600	15,100	15,200	18,000	20,400
Potash, marketable, K_2O equivalent	do.	1,800	2,600	2,750	3,200 r	3,400
Rare earths, rare-earth oxide equivalent		133,000	120,000	125,000	129,000	120,000
Salt	thousand metric tons	56,630 4	61,670 r, 4	66,640 r, 4	66,630 r, 4	70,380 4
Sodium compounds:						
Mirabilite	do.	6,500	6,600	6,600	6,000 r	6,500
Soda ash, natural and synthetic	do.	15,600 4	17,650 4	18,540 4	19,450 r, 4	20,350 4
Strontium carbonate		320,000	330,000	335,000	159,000 r	200,000
Sulfur:						
Native	thousand metric tons	950	960	960	1,000	1,100
Content of pyrite	do.	3,810	4,200	4,300	4,370	4,400
Byproduct, all sources	do.	3,000	3,300	3,350	4,000	4,100
Total	do.	7,760	8,460	8,610	9,370	9,600
Talc and related materials	do.	2,400	2,000	2,200	2,300	2,000

See footnotes at end of table.

TABLE 1—Continued

CHINA: ESTIMATED PRODUCTION OF MINERAL COMMODITIES[1, 2]

(Metric tons unless otherwise specified)

Commodity[3]		2006	2007	2008	2009	2010
MINERAL FUELS AND RELATED MATERIALS						
Coal:						
Anthracite	thousand metric tons	442,000	450,000	447,000	460,000	550,000
Bituminous	do.	1,780,000	2,000,000	2,110,000	2,300,000	2,450,000
Lignite	do.	105,000	100,000	196,000	200,000	240,000
Total	do.	2,330,000	2,550,000	2,750,000	2,960,000	3,240,000
Coke, all types	do.	280,540 [4]	335,530 [4]	323,590 [4]	345,020 [4]	388,640 [4]
Gas, natural:						
Gross	billion cubic meters	59	69 [r]	80 [r]	85 [r]	95
Marketed	do.	51	57 [r]	68 [r]	73 [r]	83
Petroleum:						
Crude, including crude from oil shale	million 42-gallon barrels	1,350	1,360	1,380	1,370	1,460
Refinery products	do.	3,000	3,500	3,700	3,750	4,220

[r]Revised. do. Ditto.

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

[2]Table includes data available through October 15, 2011.

[3]In addition to the commodities listed, China also produces diamond, gallium, germanium, platinum-group metals, rhenium, selenium, stone, uranium, and zicronium but available information is inadequate to make reliable estimates of output.

[4]Reported by China's State Statistical Bureau.

TABLE 2
CHINA: STRUCTURE OF THE MINERAL INDUSTRY IN 2010

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies[1]	Location of main facilities[2]	Annual capacity[e]
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	1,600
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.	Guizhou, Zunyi	800
Do.	Luoyang Wanji Xiangjiang Aluminum Co. Ltd.	Henan, Luoyang	800
Do.	Sanmenxia Yixiang Aluminum Co. Ltd. (Henan Yima Coal Group)	Henan, Mainchi	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	2,600
Do.	Zhongzhou Aluminum Plant [Aluminum Corporation of China (Chinalco)]	Hunan, Zhongzhou	3,000
Do.	Shandong Huayu Alumina Co. Ltd. (Shandong Chiping Xinfa 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	1,500
Do.	Bingzhou Weiqiao Aluminum Co.	Shandong, Zouping	1,600
Do.	Shanxi Aluminum Plant [Aluminum Corporation of China (Chinalco)]	Shanxi, Hejin	2,200
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.	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.	Guizhou, Zunyi	130
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	180
Do.	Henan Zhongmai Mianchi Aluminum Plant	Henan, Mianchi	400
Do.	Sanmenxia Tianyuan Aluminum Co. Ltd.	Henan, Sanmenxia	110
Do.	Shangqiu Aluminum Smelter	Henan, Shangqiu	180
Do.	Yichuan Yugang Longquan Aluminum Co.	Henan, Yichuan	600
Do.	Henan Shenhuo Aluminum-Electricity Co. Ltd.	Henan, Yongcheng	200
Do.	Zhengzhou Aluminum Plant [Aluminum Corporation of China (Chinalco)]	Henan, Zhengzhou	60
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.	East Hope Aluminum Plant	do.	800
Do.	Qingtongxia Aluminum Plant (China Power Investment Corp. and Ningxia Qingtongxia Energy Group Co. Ltd.)	Ningxia, Qingtongxia	850
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 Xinfa 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 2010

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies[1]	Location of main facilities[2]	Annual capacity[e]
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.		Shanxi Guanlv Aluminum Co. Ltd.	Shanxi, Yuncheng	210
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.		Xikuangshan Twinkling Star Antimony Co. Ltd.	Hunan, Lengshuijiang	37
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
Cadmium		Zhuzhou Smelter (Zhuye Torch Metals Co. Ltd.)	Hunan, Zhuzhou	1
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.		Baiyin Nonferrous Metals Group Co. Ltd.	Gansu, Baiyin	100
Do.		Jinchuan Nonferrous Metals Corp.	Gansu, Jinchuan	400
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	900
Do.		Dongfang Copper Co. (Huludao Nonferrous Metals Group)	Liaoning, Huludao	100
Do.		Chifeng Jingeng Copper Co. Ltd.	Nei Mongol, Chifeng, Harqin Banner	100
Do.		Shandong Dongying Fangyuan Nonferrous Metals Co. Ltd.	Shandong, Dongying	200
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

See footnotes at end of table.

TABLE 2—Continued
CHINA: STRUCTURE OF THE MINERAL INDUSTRY IN 2010

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies[1]	Location of main facilities[2]	Annual capacity[e]
Copper, refined—Continued:		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	Shandong Aluminum Plant	Shandong, Zibo	10
Gas, natural	billion cubic meters	China National Petroleum Corp.	Sichuan	10
Germanium	metric tons	Shaoguan Smelter (Shenzhen Nonfemet Co.)	Guangdong, Shaoquan	30
Do.	do.	Nanjing Germanium Co. Ltd.	Jiangsu, Nanjing	30
Do.	do.	Nei Mongol Xilingol Tongtai Germanium Refine Co. Ltd.	Nei Mongol, Xilinhot	20
Do.	do.	Shanghai Lontai Copper Co. Ltd.	Shanghai	10
Do.	do.	Lincang Xinyuan Germanium Co. Ltd.	Yunnan, Lincang	30
Do.	do.	Yunnan Chihong Zinc and Germanium Co. Ltd.	Yunnan, Qujing	10
Gold, refined	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
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, Shaoquan	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	75
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.	Xiangtan Zhengtan Nonferrous Metal Co. Ltd.	Hunan, Xiangtan	75
Do.	do.	Zhuzhou Smelter	Hunan, Zhuzhou	60
Do.	do.	Nanjing Germanium Co. Ltd.	Jiangsu, Nanjing	150
Do.	do.	Nanjing Sanyou Electronic Material Co. Ltd.	do.	50
Do.	do.	Huludao Nonferrous Metals Group Co.	Liaoning, Huludao	50
Do.	do.	Yunnan Chengfeng Nonferrous Metals Co. Ltd.	Yunnan, Gejiu	10
Do.	do.	Yunnan Mengzi Mining and Smelting Co. Ltd.	Yunnan, Honghe	30
Iron and steel:				
Iron ore		Ma'anshan Iron and Steel Co.	Anhui, Maanshan	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

See footnotes at end of table.

TABLE 2—Continued
CHINA: STRUCTURE OF THE MINERAL INDUSTRY IN 2010

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies[1]	Location of main facilities[2]	Annual capacity[e]
Iron and steel—Continued:			
Iron ore—Continued	Dabaoshan Mining Co.	Guangdong, Qujiang	1,670
Do.	Panzhihua Mining Co.	Sichuan, Panzhihua	13,000
Do.	Kunming Iron and Steel Co.	Yunnan, Kunming	1,400
Ferroalloys	Shoudu (Capital) Iron and Steel (Group) Co.	Beijing	35
Do.	Qingshan Holding Group Co. Ltd.	Fujian, Fu'an	300
Do.	Desheng Nickel Industry Co. Ltd.	Fujian, Luoyuanwan	920
Do.	Northwest Ferroalloy Co.	Gansu, Yongdeng	60
Do.	Zunyi Ferroalloy Co.	Guizhou, Zunhi	100
Do.	Zhejiang Huaguang Smelting Group	Jiangxi, Hengfeng	50
Do.	Jilin Ferroalloy Co.	Jilin, Jilin	250
Do.	Jinzhou Ferroalloy Co.	Liaoning, Jinzhou	90
Do.	Liaoyang Ferroalloy Co.	Liaoning, Liaoyang	70
Do.	Shanghai Iron and Steel Co. Ltd.	Shanghai	180
Do.	Emei Ferroalloy Co.	Sichuan, Emei	70
Do.	Hengshan Ferroalloy Co.	Zhejiang, Jiande	70
Crude steel	Ma'anshan Iron and Steel Co.	Anhui, Maanshan	10,000
Do.	Shoudu (Capital) Iron and Steel (Group) Co. (Shougang)	Beijing	4,000
Do.	Liuzhou Iron and Steel Group	Guangxi, Liuzhou	6,000
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.	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.	Panzhihua Iron and Steel (Group) Co. (Pangang)	Sichuan, Panzhihua	6,000
Do.	Xinjiang Biyi Iron and Steel Group (Baogang Group)	Xinjiang, Urumqi	6,000
Lead	Jiuhua Smelter (Tongling Nonferrous Metals Group Holding Co. Ltd.)	Anhui, Chizhou	80
Do.	Baiyin Nonferrous Metals Co. Ltd.	Gansu, Baiyin	80
Do.	Shaoguan Smelter (Shenzhen Nonfemet Co.)	Guangdong, Shaoquan	100
Do.	Laibin Smelter [Huaxi (China Tin) Group Co.]	Guangxi, Laibin	100
Do.	Hechi Nanfang Nonferrous Metals Smelting Co. Ltd.	Guangxi, Hechi	80
Do.	Anyang Smelter (Yubei Metal Co.)	Henan, Anyang	160
Do.	Jiyuan Wangyang Smelter (Jiquan Wangyang Smeltery Group Co. Ltd.)	Henan, Jiaozuo	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	Shaaxi, 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

See footnotes at end of table.

TABLE 2—Continued
CHINA: STRUCTURE OF THE MINERAL INDUSTRY IN 2010

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies[1]	Location of main facilities[2]	Annual capacity[e]
Lithium, $LiCO_3$	Baiyin Zabuye Lithium Co. Ltd. (Zabuye Lithium High-Tech Co. Ltd.)	Gansu, Baiyin	5
Do.	Sichuan Shehong Lithium Co. Ltd.	Sichuan, Shehong	2
Do.	Sichuan Tianqi Lithium Industry Co. Ltd. (Chengdu Tianqi Group Co. Ltd.)	Sichuan, Suining	7
Do.	Qinghai Yanhu Industry Group Co. Ltd.	Qinghai, Golmud	10
Do.	Xinjiang Lithium Co.	Xinjiang, Urumqi	5
Magnesium	Zunyi Titanium Co. Ltd.	Guizhou, Zunyi	24
Do.	Ningxia Huayuan Magnesium Group	Ningxia, Yinchuan	15
Do.	Huayu Interprises (Group) Ltd.	Shanxi, Jishan	35
Do.	Taiyuan Tongxiang Magnesium Metal Co. Ltd.	Shanxi, Taiyuan	45
Do.	Taiyuan Yiwei Magnesium Co. Ltd.	do.	21
Do.	Wenxi Biyun Magnesium Co. Ltd.	Shanxi, Wenxi	30
Do.	Wenxi Yinguang Magnesium Group	do.	40
Manganese, metal	Chongqing Tycoon Manganese Co. Ltd.	Chongqing	23
Do.	Guangxi Dameng Manganese Industry Co. Ltd.	Guangxi, Nanning	70
Molybdenum, concentrate	Luoyang Luanchuan Molybdenum Industry Group Co., Ltd.	Henan, Luanchuan	30
Do.	Jinduicheng Molybdenum Industry Group Co. Ltd.	Shaanxi, Huaxian	30
Nickel, refined	Jinchuan Nonferrous Metals Corp.	Gansu, Jinchuan	120
Do.	Guangxi Yulin Weinie Co. Ltd.	Guangxi, Bobai	18
Do.	Jiangxi Jiangli New Type Material Co. Ltd.	Jiangxi, Fenyi	10
Do.	Jilin Jien Nickel Industry Co. Ltd.	Jilin, Panshi	10
Do.	Inco New Nickel Materials (Dalian) Co. Ltd.	Liaoning, Dalian	32
Do.	Chengdu Electro-Metallurgy Factory	Sichuan, Chengdu	5
Do.	Huili Kunpeng Co. Ltd.	Sichuan, Huili	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.	Nanhai East Corp.	Nanhai	5,000
Potash	Qinghai Yanhu Industry Group Co. Ltd.	Qinghai, Charhan	2,000
Do.	Xinjiang Lup 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 metric tons rhenate	Guixi Smelter (Jiangxi Copper Co. Ltd.)	Jiangxi, Guixi	3

See footnotes at end of table.

TABLE 2—Continued
CHINA: STRUCTURE OF THE MINERAL INDUSTRY IN 2010

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies[1]	Location of main facilities[2]	Annual capacity[e]
Salt		Shandong Haihua Group Co. Ltd.	Shandong, Weifang	1,400
Do.		Zigong Zhangjiaba Salt Chemical Plant	Sichuan, Zigong	250
Silver	metric tons	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
Selenium	do.	Jinchuan Nonferrous Metals Corp.	Gansu, Jinchang	50
Do.	do.	Guixi Smelter (Jiangxi Copper Co. Ltd.)	Jiangxi, Guixi	300
Strontium, carbonate		Chongqing Chonglong Strontium Co. Ltd.	Chongqing	20
Do.		Chongqing Tongliang Redbutterfly Strontium Co.	do.	120
Do.		Shijiazhuang Zhengding Xian Jinshi Chemical Co. Ltd	Hebi, Shijiazhuang	55
Do.		Hebei Xinji Chemical Group	Hebei, Xinji	60
Do.		Nanjing Jinyan Strontium Co. Ltd.	Jiangsu, Lishui	25
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		Guizhou Southwest Titanium Co. Ltd.	Guizhou, Guiyang	3
Do.		Zunyi Titanium Co. Ltd.	Guizhou, Zunyi	15
Do.		Tangshan Tianhe Titanium Co. Ltd.	Hebei, Tangshan	6
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
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 2010

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies[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, Shaoquan	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	250
Do.	Shuikoushan Nonferrous Metals Co. Ltd.	Hunan, Hengyan	60
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 Foreign Engineering and Construction 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	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

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

[1]Most companies are owned by either the central Government or a Provincial government.

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

TABLE 3
CHINA: EXPORTS OF SELECTED MINERAL COMMODITIES IN 2010

Commodity	Quantity (metric tons)	Value (thousands)
METALS		
Aluminum:		
Alumina	57,040	$34,243
Metal and alloys:		
Unwrought	754,378	1,535,610
Semimanufactures	2,180,000	7,542,834
Antimony:		
Metal, unwrought	5,173	39,910
Oxide	52,130	391,457
Barium sulfate	2,570,000	174,671
Copper, metal and alloys:		
Unwrought	39,538	310,773
Semimanufactures	508,580	3,871,847
Indium, unwrought, including powder	124	65,928
Iron and steel:		
Pig iron and cast iron	710,000	303,003
Steel:		
Bars and rods	5,190,000	3,788,371
Shapes and sections	2,080,000	1,358,452
Sheets and plates	24,810,000	19,369,260
Tube and pipe	1,210,000	2,636,660
Wire of steel or iron	1,220,000	1,094,630
Ferroalloys	1,260,000	2,216,772
Scrap	372,831	161,209
Magnesium, metal and alloy:		
Unwrought, Mg not less than 99.8%	190,230	505,443
Other unwrought	85,851	259,579
Manganese, unwrought	102,890	294,411
Molybdenum, ores and concentrates	24,497	479,094
Silver, unwrought	1,421	887,966
Tin, metal and alloys, unwrought	714	18,402
Tungsten, tungstates	5,475	109,357
Zinc:		
Metal and alloys, unwrought	43,395	101,742
Oxide and peroxide	16,581	27,240
INDUSTRIAL MINERALS		
Cement	16,160,000	723,070
Fluorspar	600,000	133,809
Granite	8,040,000	2,563,517
Graphite, natural	590,000	207,192
Magnesia, fused	2,490,000	661,571
Rare-earth products	39,813	939,813
Talc	590,000	118,041
MINERAL FUELS AND RELATED MATERIALS		
Coal	19,030,000	2,252,219
Coke, semicoke	3,350,000	1,392,666
Petroleum:		
Crude oil	3,030,000	1,651,152
Refinery products	26,880,000	17,044,039

Source: General Administration of Customs of the People's Republic of China, 2010, China monthly exports and imports, no. 12.

TABLE 4
CHINA: IMPORTS OF SELECTED MINERAL COMMODITIES IN 2010

(Metric tons unless otherwise specified)

Commodity	Quantity	Value (thousands)
METALS		
Aluminum:		
Bauxite	30,360,023	$1,323,765
Alumina	4,310,000	1,498,562
Metal and alloys, unwrought	364,873	800,708
Semimanufactures	590,560	3,125,486
Scrap	2,850,000	4,293,668
Chromium, chromite	8,660,000	2,398,089
Cobalt:		
Ore and concentrates	340,543	832,978
Unwrought and powder	16,907	254,990
Copper:		
Ore and concentrates	6,470,000	12,678,559
Anode	398,991	2,932,705
Metal and alloys, unwrought	3,381,942	25,136,457
Semimanufactures	910,545	7,600,148
Scrap	4,360,000	12,236,478
Iron and steel:		
Iron ore	618,630,000	79,427,005
Steel:		
Bars and rods	1,130,000	1,635,302
Seamless pipe	480,000	1,722,262
Shapes and sections	460,000	418,424
Sheets and plates	13,920,000	14,853,496
Scrap	5,850,000	3,004,974
Manganese ore	11,580,000	2,805,053
Nickel:		
Ore and concentrates	25,078,528	1,946,418
Metal, refined greater than 99.95% Ni	1,975	44,043
Metal, other refined	179,347	3,779,740
Titanium dioxide	269,038	644,165
INDUSTRIAL MINERALS		
Diamond kilograms	3,624	3,998,101
Nitrogen, phosphorous, and potassium fertilizers:		
Compound fertilizers	1,080,000	445,864
Diammonium phosphate	420,000	157,676
Potassium chloride	5,240,000	1,840,566
Potassium sulfate	110,000	51,259
Urea	13,256	3,043
MINERAL FUELS AND RELATED MATERIALS		
Coal	164,780,000	16,935,080
Liquefied natural gas	9,360,000	3,020,534
Petroleum:		
Crude oil	239,310,000	135,151,090
Refinery products	36,880,000	22,343,018

Source: General Administration of Customs of the People's Republic of China, 2010, China monthly exports and imports, no. 12.

TABLE 5
CHINA: BASIC RESERVES OF MAJOR MINERAL COMMODITIES IN 2010

(Thousand metric tons unless otherwise specified)

Commodities		Basic reserves[1]
Antimony, Sb		710
Barite, ore	million metric tons	95
Bauxite	do.	897
Chromite, ore		4,400
Coal	billion metric tons	279
Copper, Cu		28,700
Fluorite, ore		40,600
Gas, natural	billion cubic meters	3,780
Gold, Au	metric tons	1,860
Graphite, mineral		54,000
Iron ore, ore	million metric tons	22,200
Kaolin	do.	639
Lead, Pb		12,700
Magnesite, ore	million metric tons	1,830
Manganese, ore	do.	195
Mirabilite, Na_2SO_4	do.	9,100
Molybdenum, Mo		4,630
Nickel, Ni		3,120
Petroleum	million metric tons	3,170
Phosphorus, ore	do.	2,900
Potash, KCl	do.	439
Pyrite, ore	do.	1,590
Salt, NaCl	billion metric tons	175
Silica, ore	million metric tons	1,460
Silver, Ag		36
Talc, ore	million metric tons	126
Tin, Sn		1,380
Titanium, ore	million metric tons	230
Tungsten, WO_3		2,200
Vanadium, V_2O_5		12,400
Zinc, Zn		32,500

[1]Rounded to three significant digits.

Source: China Statistical Yearbook 2011, p. 398.