

THE MINERAL INDUSTRY OF

CHINA

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Owing to a strong turnaround of exports, China's gross domestic product grew by 8% in 2000 compared with that of 7.1% in 1999; even with increased oil prices, however, the consumer price index rose by only 0.4% (China Statistical Information and Consultancy Service Center, 2000). After falling for seven consecutive years, the country's economic growth trend finally ended on a positive note in 2000, which was the final year of China's ninth Five-Year Plan period (1996-2000). As the Government continued its infrastructure spending and consumers increased spending, domestic economic activity picked up. The introduction of week-long holidays to celebrate Labor Day and National Day also boosted the growth of retail sales. Despite these measures, the gap between the living standard of rural and urban communities widened. In 2000, as part of the Government's effort to modernize the state-owned enterprises (SOEs), fixed investment increased by 9.7% compared with that of 1999.

In the 10th Five-Year plan, the Government will focus on initiatives that could increase the productivity of SOEs. In the past 3 years, the Government issued \$43.5 billion of bonds to stimulate economic growth through infrastructure spending and technical upgrades of state companies. The Government intended to spend an additional \$60 billion to complete ongoing projects in the next 2 years. The National Social Security Fund which was established in September 2000, would provide money for pensions, medical care, and unemployment. The increase in social security expenditure should boost consumer confidence and stimulate consumption that would transform domestic demand (China Daily, 2001a). In late 2000, the Government, however, decided to delay the implementation of the National Social Security Fund in domestic and international markets because of the discovery of share price manipulation in the domestic market.

Since the establishment of four asset management companies in 1999, nonperforming loans in state banks have been reduced. The Government continued the implementation of a debt-for-equity swap program to reduce the debt burden of SOEs and stepped up its effort to restructure the banking sector and SOEs. In an effort to reform the enterprises, the Government continued to promote private investment in SOEs. They received new capital through listing on the stock market, and shareholders forced them to improve efficiency. Since 1997, 307 SOEs have issued shares in domestic stock markets, and 22 have been listed in international stock markets (China Daily, 2000g). Small- and medium-sized SOEs, however, had difficulties in securing funds from banks to initiate new or renovation projects because banks were still cautious over lending. Because the renminbi interest rate was fixed by the Government and banks could only adjust the rate up or down by 10%, banks had no incentive to provide loans to small- and medium-sized SOEs. These SOEs also had

difficulties receiving Government approval for issuing shares in the domestic stock market.

To prevent nonperforming new loans in the future, the Government planned to liberalize interest rates within 3 years so that credit decisions would more closely reflect market risks. Within 5 years of becoming a member of the World Trade Organization (WTO), foreign banks will be permitted to offer services in renminbi to Chinese individuals. In 2000, several foreign banks only were allowed to offer services in renminbi to foreign companies (Financial Times, 2000b).

Government Policies and Programs

In 2000, the Chinese Government issued several laws and regulations that supplemented existing laws and regulations concerning mineral resource exploitation planning, land exploitation, mine ownership transfer, customs law, gold mining, silver imports, coal mine safety supervision, Sino-foreign contractual joint ventures, foreign capital enterprises, and mineral-resource-deposit size classification standards. The Government will allow foreign investors to take majority shares in petrochemical and all new projects. The implementation of new laws and regulations will improve the country's investment environment and foreign investors' confidence in China. Sino-foreign joint ventures or solely foreign fund enterprises are no longer required to report their production plans to the Government. Problems remained in some other existing laws and regulations concerning foreign investment, and the Government planned to revise them as soon as possible on the basis of the agreements to become a member of the WTO. The Government also planned to amend the existing company law (China Economic News, 2000b).

In 2000, the State Economic and Trade Commission (SETC) issued "An Interim Regulation on Using Foreign Investment by State-Owned Enterprises in Asset Regrouping." According to the circular, projects with a total investment of \$30 million or more should be submitted by the economic and trade commissions of provinces, autonomous regions, municipalities, and cities to relevant departments of the State Council and then to the SETC for approval before submission to the State Council. Projects with a total investment less than \$30 million should be examined by relevant departments of the State Council and economic and trade commissions of provinces, autonomous regions, municipalities, and cities and then submitted to the SETC for record. The examination and approval authority should not be delegated to lower levels. Within 3 months after issuing the business license, foreign-contributed capital must be paid in full (China Economic News, 2001c).

The Chinese Government continued its effort to restructure the mining and metal sectors in the country. The SETC announced the abolishment of nine bureaus—Coal Industry, Construction Material Industry, Internal Trade, Light Industry, Machinery Industry, Metallurgical Industry, Nonferrous Metals Industry, Petroleum and Chemical Industry, and Textile Industry. Part of the bureaus' responsibilities were transferred to relevant divisions in the SETC, and other responsibilities, such as industrial information collection and statistical data survey, were assigned to relevant industrial associations. The Government also decided to dissolve three state-owned nonferrous enterprises—China Aluminum Corp. (Chalco), China Copper Lead Zinc Corp. (CCLZ), and China Rare Metals and Rare Earth Group Corp. As part of the restructuring, China Aluminum Industry Corp. (Chinalco) was established to manage China Changcheng (Great Wall) Aluminum Corp. (Zhengzhou Aluminum Plant and Zhongzhou Aluminum Plant), China Nonferrous Metals Industry No. 6 Metallurgical Construction Co., China Nonferrous No. 12 Metallurgical Construction Co., the Guizhou Aluminum Plant, Luoyang Engineering and Research Institute for Nonferrous Metal Processing, the Pingguo Aluminum Industry Co., Shandong Aluminum Co., the Shanxi Aluminum Plant, the Shanxi Carbon Plant, Southwest Aluminum (Group) Co. Ltd., Qinghai Aluminum Co. Ltd., and the Zhengzhou Light Metal Research Institute (China Nonferrous Metals Monthly, 2001c; Zhonghua Renmin Gongheguo Guowuyuan Gongbao, 2001). Chinalco had contracted Morgan Stanley Dean Whitter & Co. and China International Finance Co. to advise its share listing in New York and/or Hong Kong in 2001. The management of the rest of the enterprises and research institutes under the three former nonferrous corporations were ceded to provincial and city governments. China National Nonferrous Metals Industry Trading Group Corp. (CNITC) [formerly China Nonferrous Metals Import and Export Corp. (CNMIEC)] has merged into China National Metals and Minerals Import and Export Corp. (Minmetals). Two listed companies in Hong Kong that were affiliated with CNMIEC were also transferred to Minmetals. CNITC ceded its provincial branches to local governments. Australian-based China Mining Industry International Co. Ltd., which was affiliated with the former China National Nonferrous Metals Industry Corp., was merged into Minmetals. Minmetals was put in charge of all nonferrous metals trading (China Chemical News, 2001b; China Daily, 2001d; Economic Daily, 2001; China Nonferrous Metals News, 2000d, 2001a). The Government believed that transferring the management responsibility to provincial governments would help the industry become more efficient. The SOEs will be under a “code of conduct,” which means to improve modernization and productivity. The special treatments, such as extra funding, will be phased out. Overseas companies and traders, however, worried that sale contracts for raw materials and metals to those plants may no longer be valid and would need renegotiation (Economic Daily, 2000).

In an effort to close the gap between the rich east and the poor west, \$18.2 billion of construction and special bonds will be issued in 2001. Under the Government's “go west” campaign, foreign and private enterprises were encouraged to invest in the country's western hinterland. Various preferential treatments,

which included exemption of income tax, tariffs, and import value-added tax (VAT), were given to companies that invested in Government-sponsored sectors and state-designated priority projects, such as exploration and mining in Xinjiang Uygur Autonomous Region. The Government believed that technology and expertise transfer and increasing investment into inner provinces would help the development in the western region and support sustained and economic growth in China in the future (China Daily, 2000a; China Economic News, 2000a; Zhongguo Guotu Ziyuan Bao, 2000b).

To revitalize the stock market as a source of capital, the China Securities Regulatory Commission (CSRC) lifted the ban that prohibited SOEs from participating in stock investment and allowed them to use their retained earnings to buy A-shares (domestic) that are issued in initial public offerings by companies with capital shares of more than 400 million renminbi in late 1999. In 2000, the CSRC allowed the SOEs to invest in initial public offerings in all companies. The ban on stock purchases on the secondary market was lifted. The Central Bank also lifted the ban that prevented banks from providing funds to finance stock investments. Selected brokerages and fund management companies were allowed to borrow money from banks in the interbank market for a maximum of 7 days. The Government hoped to induce more active trading in the local exchange (Business Weekly, 2001d).

The Government began to phase out the preferential taxes for foreign enterprises. The indicative industry tax preferential policy will be introduced to replace the existing preferential tax policy for foreign enterprises. Uniform tax rates for foreign and domestic enterprises will be implemented soon. Under current [2000] tax regulations, enterprises were not allowed to deduct production VAT from their income tax. The production VAT will be replaced by a consumption VAT to avoid repeated taxation. The export VAT rebate rate will be increased. The Government prepared to draft a “zero tariff rate” policy for exports (China Economic News, 2001e).

The Government issued guidelines to allow foreign enterprises to conduct mineral exploration in China. Explorers were entitled to extract mineral resources discovered within the exploration area. Expense for prospecting was considered to be deferred assets and would be amortized during the mining period. To encourage the participation of foreign enterprises in joint ventures with domestic mining enterprises, the Government allowed foreign enterprises that used advanced technologies and equipment as part of their capital in the joint venture or to purchase the prospecting and mining rights. For those engaged in processing tailings in existing mining areas to recover mineral resources, the associated mineral-compensation fee would be reduced to half, and those that used the minerals from tailings would be exempted from the mineral compensation fee. Foreign investors who use advanced technology in exploiting minerals in the Government's preferred list will be exempted from the mineral compensation fees for 5 years (Zhongguo Guotu Ziyuan Bao, 2000b).

Owing to high oil prices in domestic and international markets, the Government decided to delay the implementation of the fuel tax in 2000. The total value of the fuel tax, the VAT, and the consumption tax will account for more than 50% of fuel price. The Government feared the addition of fuel tax would

increase prices for consumer goods, especially for farmers in rural areas. The fuel tax was part of the Government tax reform to eliminate irregular levies and to increase tax revenue (China Daily, 2000d).

Production

According to the State Administration of Nonferrous Metals Industry (SANMI) in 2000, China produced a total of 7.51 million metric tons (Mt) of 10 nonferrous metals; this was an increase of 14.6% from that of 1999. The production in all 10 metals monitored by SANMI increased (China Nonferrous Metals Monthly, 2001b).

The five Chinese alumina refineries increased their production, but the demand exceeded supply. Therefore, the country's imports on alumina went up by more than 15% to 1.88 Mt in 2000. Even though alumina demand exceeded supply in China, Chinese aluminum refineries reduced their alumina prices to 2,800 yuan per metric ton (exchange rate Y8.27= US\$1.00) in September from 4,000 yuan per ton in July because alumina prices in the world market declined and forced Chinese producers to lower their prices to compete against imported alumina. Owing to the renovation of electricity networks in urban and rural areas and the development of western China, consumption of aluminum increased to 3.4 Mt. Also, the Government relaxed restrictions on the use of aluminum windows and doors in buildings. The building construction, packaging, communication, and transportation sectors accounted for 51% of the total aluminum consumption. In 2000, the aluminum prices in the overseas markets were lower than the price in the domestic market, and consumers found that it was cheaper to purchase aluminum abroad than at home. In addition, the Government reduced the border trade tariffs on aluminum; this led to a large quantity of aluminum being imported from Russia, which accounted for 50% of the total imports. The total imports of aluminum and its products increased by more than 46% in 2000 compared with that of 1999 (General Administration of Customs of the People's Republic of China, 2000).

At yearend 2000, China's aluminum output capacity increased by 473,000 metric tons (t) to a total of 3.31 Mt; the trend would continue because about 550,000 t of new capacity was scheduled to begin operation in 2001. By 2005, the total output capacity of aluminum will exceed 4.2 Mt. During that period, the gap between supply and demand of alumina is expected to widen. In 2001, China will consume about 6.6 Mt of alumina, 6.2 Mt for metallurgical uses and 400,000 t for nonmetallurgical uses, although domestic alumina output capacity is projected to be only 4.5 Mt. The supply and demand gap will be met by imports.

Owing to domestic demand, China's copper producers, which included the major producers—Baiyin Nonferrous Metals Co., Daye Nonferrous Metals Co., Huludao Zinc Co., Jiangxi Copper Co., Tongling Nonferrous Metals Co., Yunnan Copper Co., and Zhongtiaoshan Nonferrous Co.—increased their output in 2000. The output capacities of blister copper and refined copper (primary and secondary) were about 1.05 million metric tons per year (Mt/yr) and 1.5 Mt/yr, respectively. On the basis of the expansion plans released by Daye, Jiangxi, Tongling, and

Yunnan, the output capacity of blister and anode copper and refined copper will increase to 1.5 Mt/yr and 1.9 Mt/yr, respectively, in 2003. Domestic copper concentrates only supplied about 50% of the country's demand. In 2000, China imported 1.8 Mt of copper concentrates (45% more than that of 1999) mainly from Australia, Chile, and Mongolia. The sharp increase in concentrate imports was caused by the anticipation of a decline of treatment and refining charges (TC/RC) from overseas raw materials in 2001. Three major copper mining developing projects (Tongling's Dongguashan, Western Mining's Saishitang, and Yunnan's Dahongshan) were scheduled to be completed and would add a total of 100,000 t of output capacity by 2003. Domestic mines could supply only about 40% of smelters' needs (China Metals, 2001b).

In 2000, the total supply of refined copper in the domestic market was about 1.87 Mt; domestic output, 1.32 Mt; imports, 665,188 t; and exports, 109,767 t. The 1.87 Mt of refined copper in the domestic market may be a misleading figure. China's copper concentrates production, imports, and exports were about 588,000 t (Cu content), 1.81 Mt, and 39,800 t, respectively. Assuming that the copper content in concentrates in imports and exports was 30%, the estimation of total copper content in concentrates was 1.12 Mt. In the same period, China's blister copper imports and exports were 124,705 t and 2,430 t, respectively. Assuming a 90% recovery rate, the total refined copper output from concentrates and blister would be 1.02 Mt. The total primary refined copper supply in the domestic market was about 1.57 Mt. In 2000, China's copper scrap imports and exports were 2.50 Mt and 10,154 t, respectively. Assuming that imported scrap contained an average of 20% copper, China produced about 450,000 t of secondary refined copper. Thus, the total supply of refined copper in the domestic market could be 2.02 Mt and not include secondary refined copper produced from domestic copper scrap. Domestic analysts estimated that China consumed from about 1.6 to 1.8 Mt of copper. The excess supply may be stocked in warehouses. Domestic market prices of copper declined slightly—8,000 yuan per ton in December 2000 versus 17,300 yuan per ton in February 2001. In 2000, the strong demand of copper was driven by the massive 3-year power network upgrade project. The Government has invested more than \$10 billion to upgrade urban and rural power networks, which will be completed by the end of 2001. Also, information technology was the fastest growing sector in China. The production of personal computers and optical communication equipment has grown by more than 50% in the past 2 years (China Nonferrous Metals Industry, 2000b; China Nonferrous Metals News, 2001e, g).

In the past 4 years, China was the largest steel-producing country in the world with annual steel output exceeding 100 Mt. Low-grade steel products made up a large share of output. The volume output in the domestic steel sector could basically meet the domestic market demand. Indeed, output capacities of certain steel products, such as light rails, large and medium sections, and wire rods, were greater than domestic demand. To meet market demand for high-quality steel products, the country was a major importer. China imported about 16 Mt and exported 6 Mt of rolled steel products in 2000. Since 1998, the Government set output targets and urged Chinese steelmakers to

reduce their output of crude steel and steel products to meet the target. By yearend, the production of pig iron, crude steel, and steel products exceeded Government guidelines. In 2000, the Government assigned output quotas to major steelmakers and warned that violators would be excluded from the debt-to-equity swap program. Major steelmakers generally complied with the production quotas; small steelmakers, which were not entitled to debt-to-equity swap program and soft loans, however, ignored the Government guidelines. The outputs of crude steel and rolled steel exceeded the Government's plan for 110 Mt and 100 Mt, respectively, in 2000. For 2001, the SETC imposed production targets of 115 Mt for crude steel and 105 Mt for rolled steel. The Government relied on the closure of small steel plants to meet its targets. In 2000, the Government identified 103 steel plants whose output capacities were under 100,000 metric tons per year (t/yr) by using obsolete technology. Several major steel producers, however, had expanded their rolled-steel output capacities in 2000. Additionally, the State Administration of Metallurgical Industry (SAMI), which oversaw the implementation of Government policies, was abolished; this might affect the effectiveness of production control in 2001 (China Metals, 2001i).

In 2000, steel prices in the domestic market showed signs of increasing. Of the 23 steel products monitored by the SAMI at yearend, only 1 posted a price decline compared with those at the beginning of the year. Owing to Government enforcement of production quotas and restrictions on imports, the price of medium plate increased by more than 21% in 2000. The increased investment in construction for infrastructure and housing helped boost demand for steel and stabilize domestic steel prices. Domestic steel analysts predicted that even though the Government continued to adjust the country's steel products mix, domestic demand for construction and flat-rolled steel, however, would decline in 2001. Asia was China's largest steel export market, and economic growth in the region was slower than expected. China is expected to face strong competition from Japan, the Republic of Korea, and Taiwan for exporting steel products to East Asian and Southeast Asian countries. Therefore, prices of steel products could fall because of production backlog and continuation of increasing imports (China Metallurgical News, 2001).

Trade

By yearend 2000, China had signed bilateral agreements with 36 of the 37 WTO members. The negotiation of bilateral agreement between China and Mexico continued. In lengthy negotiations with WTO members, China agreed to reduce tariff rates and to eliminate import quotas. It also agreed to dismantle export subsidies. Banking, insurance, and legal services will be opened for foreign competitors. Much of the momentum generated in the past 2 years slowed, and China's entry into the WTO may take longer than expected. This slower schedule will give China more time to adjust to the changes to which it has committed in the bilateral agreements; the challenges and benefits after admission, however, are enormous.

The National People's Congress has amended and promulgated the law on Sino-foreign cooperative joint ventures and the law on foreign-funded enterprises to meet the

requirements of the WTO rules. The Government would not allow local governments to draft regulations to restrict foreign products and services that would contradict regulations upon which China and foreign countries agreed. In 2001, the Ministry of Foreign Trade and Economic Corp. (MOFTEC) will establish a notification and consultation agency to answer questions related to China trade policies to WTO members and provide consultations on WTO rules and foreign countries' economic and trade policies to domestic enterprises (China Economic News, 2001d).

According to the Customs statistics, the total trade reached \$474.3 billion in 2000; this was an increase of 31.5% compared with that of 1999. Exports posted an increase of 27.8% to \$249.2 billion, and imports went up by 35.8% to \$225.1 billion. Asian countries, which were China's largest export market, accounted for 62% of total exports, followed by North America 22% (the United States accounted for 21%). The iron and steel trade was valued at \$14.1 billion; nonferrous metals, \$10.1 billion; and nonmetallic minerals, \$7.1 billion. Imports, such as alumina, aluminum and its products, copper, copper ore, chromium ore, crude oil, diamond, and iron ore, increased by more than 10%. Exports of cement, copper products, coal, coke, steel products, and zinc and its products went up more than 10% (General Administration of Customs of the People's Republic of China, 2000).

The Government adjusted the preferential import and export tariffs on many commodities for 2001. Most adjustments were to nonmineral products, but some metal products were also affected. The export duties for unwrought antimony changed from 20% to 5%; ferrosilicon, 25% to 10%; and unwrought zinc, 25% to 0%. The import duties for aluminum, lead, nickel, steel, and zinc products were reduced to less than 10%. In addition, the Government decided to extend special tariffs on imports of 1.45 Mt of alumina at 8%. Import tariffs for copper concentrate and copper anode were 0%, but a VAT was levied. Beginning in 2001, the Government decided to provide a full VAT rebate for 800,000 t of copper concentrates and 200,000 t of copper anode for 3 years. Minmetals, which was responsible for trade negotiation and contract signing, imported and distributed concentrates to major copper smelters (China Metals, 2001f; General Administration of Customs of the People's Republic of China, 2001).

The MOFTEC issued a list of commodities that required export quota licence control in 2001; the list included some ferrous and nonferrous metals. Among the commodities that were in the Government's monitor list were ammonium paratungstate; bauxite and refractory clay; concentrates of antimony, tin, tungsten, and zinc; oxides of antimony and tungsten; platinum; rare earths; refractory magnesium; silver; and unwrought tin and zinc (China Metals, 2001c). Most export quotas were controlled and distributed by the MOFTEC, but the rare-earth quotas were determined by the State Development and Planning Commission (SDPC) and were distributed by the SETC, and the MOFTEC issued the licences. France, Japan, and the United States were major destinations for rare earths (China Metals, 2000g).

In 2000, the Government approved the opening of a diamond exchange market in Shanghai. The exchange acted as a bonded warehouse. No duty will be levied as long as diamond does not

enter the domestic market after having been traded in Shanghai. China has gradually become the world's eighth largest consumer of the precious stones. The actual amount of diamond consumed in China was difficult to account for because of smuggling and overseas purchases. Analysts believed that "Great China," which included Hong Kong and Taiwan, was the world's third largest diamond market after the United States and Japan (Financial Times, 2000d).

Commodity Review

Metals

Aluminum.—In 2000, the SDPC decided to continue providing preferential power prices to 13 aluminum smelters/companies. The average electricity price paid by aluminum smelters was 0.31 yuan per kilowatt. In the past several years, several aluminum companies built their own powerplants or formed joint ventures with power companies to bring down the cost of electricity (China Metals, 2001e).

The Gansu Government planned to establish Gansu Aluminum Industry Corp. in which the Baiyin, the Gansu, the Lintao, and the Longxi Aluminum Plants; Lanzhou Aluminum Co.; and the Northwest Aluminum Fabrication Plant will be subsidiaries of the new corporation (China Metal Market, 2000b).

The Government decided to overhaul the aluminum sector and issued an order to all aluminum producers in China to convert all Soderberg cells into prebaked cells. Many small smelters, which could not afford to undertake the technical improvements to maintain environmental standards, may be forced to close down. By 2003, the Government will shut down all Soderberg cell smelters (China Nonferrous Metals News, 2000a). The Shanxi Government also ordered calcined bauxite producers to replace their round and shaft kilns with more environmental friendly kilns; otherwise, their operations would be closed down (Industrial Minerals, 2000).

The State Council approved the proposed expansion plan submitted by Pingguo Aluminum Co. to increase its alumina output capacity to 700,000 t/yr from 400,000 t/yr. According to the expansion plan, output capacities of bauxite will be 2.4 Mt/yr; metallurgical grade alumina, 1.2 Mt/yr; nonmetallurgical grade alumina, 100,000 t/yr; aluminum, 300,000 t/yr; and graphite block, 50,000 t/yr in 2005. Pingguo signed a cooperation agreement with Pechiney of France to study the alumina expansion project. The estimated cost for the alumina expansion project was \$190 million. Pingguo will finance \$57 million, and the remainder will come from bank loans. In early 2000, Pingguo signed a debt-equity swap agreement with its creditor to convert \$181 million of its debts to equity; this reduced the company's debt-to-asset ratio to about 58% (China Nonferrous Metals Monthly, 2000; China Nonferrous Metals News, 2001d; Metal Bulletin, 2000b).

In August 2000, Lanzhou Aluminum Co. invested \$163 million to build a 100,000-t/yr aluminum smelter that would use 200-kiloampere (kA) prebaked cells. The smelter was designed by the Guiyang Aluminum and Magnesium Research Institute and the Shenyang Aluminum and Magnesium Research Institute. The funding for the project came mainly from bank

loans with interests to be subsidized by the Central Government (China Nonferrous Metals News, 2000h).

Sanmenxia Tianyuan Aluminum Co. Ltd. completed its first-phase 31,000-t/yr aluminum expansion project; the company had a total aluminum output capacity of 64,000 t/yr in 2000. The new potline was equipped with 62 units of 190-kA prebaked cells. A second potline was under construction and was expected to be completed in July 2001; this would increase aluminum output capacity by 31,000 t/yr. The company also planned to replace all 42-kA Soderberg cells with 160-kA prebaked cells by May 2002. After completion, the company will have a total aluminum output capacity of 100,000 t/yr (China Nonferrous Metals News, 2000k, l).

The SDPC approved the Shandong Government's proposal for the Luxi aluminum expansion plan. A 70,000-t/yr aluminum output capacity will be added to the existing 10,000 t/yr by 2001. The new potline will be equipped with 120 units of 190-kA prebaked cells. At the same period, all Soderberg cells in one of the initial potlines will be replaced by prebaked cells. A 100,000-t/yr-aluminum-output-capacity potline will be added to the smelter in the third phase. In 2005, the smelter will have a total aluminum output capacity of 250,000 t/yr. Alumina was sourced from the Shandong Aluminum Plant, and power was supplied by Shandong Renping Thermal Power Group Co. (a parent company of Luxi) (China Metals, 2000b).

The SETC approved in principle the expansion plan for Nanshan Group Co. in Shandong Province. The company intended to add 100,000 t/yr of output capacity to its smelter using 200-kA prebaked cells. During the same period, the company also planned to replace its 16,000-t/yr Soderberg cell potline with a 70,000-t/yr prebaked cell potline. The total cost was estimated to be \$154 million, of which \$109 million would come from bank loans. The SETC's final approval of this project will depend on the decision of the Shandong Government to shut down all Soderberg cells in the Province (China Metals, 2000d).

In November, Jiaozuo Wanfang Aluminum Co. Ltd. commissioned its 128,000-t/yr smelter. The \$116 million smelter was equipped with 280-kA prebaked cells. Jiaozuo Wanfang also had three 60-kA Soderberg cell potlines that had a total output capacity of 53,000 t/yr. Owing to environmental concerns, one potline with an output of 13,000 t/yr was forced to close down in 2000 (China Metals, 2000a).

In October, Baotou Aluminum Industry Group Co. Ltd. completed the technical renovation of its aluminum smelter. The company replaced its 60-kA Soderberg cells with 200-kA prebaked cells, and aluminum output capacity increased to 100,000 t/yr from 30,000 t/yr. The smelter also installed absorbers to reduce emission of pollutants to the environment (China Metal Market, 2000a).

Emeishan Aluminum (Group) Co. Ltd. planned to invest \$180 million within the next 4 years to become the largest aluminum producer in Sichuan Province. Emeishan was equipped with 116 units of 75-kA prebaked cells that produced 25,000 t/yr of aluminum. The company intended to install 190 units of 300-kA prebaked cells with an output capacity of 150,000 t/yr. After completion, Emeishan will have a total aluminum output capacity of 175,000 t/yr and a carbon anode output capacity of 120,000 t/yr (China Nonferrous Metals News, 2000c).

The construction of Baise Yin Hai Aluminum Co.'s smelter began in December 2000; the company is the joint venture of Guangxi Development Investment Co., Guangxi Power Co., Guangxi Baise Power Co., Guangxi Geological Prospecting and Development Bureau, and Guangxi Longling Aluminum Smelter. The 52,000-t/yr smelter will be equipped with 230-kA prebaked cells at an estimated cost of \$217 million. It was scheduled to be completed in June 2002. Alumina will be sourced from Pingguo. The company planned to build a 1.35-Mt/yr refinery and to expand aluminum output capacity to 200,000 t/yr by 2005. The total cost was estimated to be \$1.3 billion (China Metals, 2001d).

Henan geologists discovered a bauxite deposit in western Henan Province, and preliminary results indicated that the deposit contained a resource of about 50 Mt of bauxite, as well as a significant amount of gallium (Zhongguo Guotu Ziyuan Bao, 2000a). Geologists in Guangxi Province also discovered a bauxite deposit in Jingxi County that covered an area of 260 square kilometers (km²). Preliminary data indicated that the deposit contained a resource of 82 Mt of bauxite, of which 37 Mt could be economically developed. In addition, the deposit also contained about 100,000 t of gallium and a significant amount of niobium, scandium, and titanium (China Nonferrous Metals News, 2001b).

Copper.—The Government's policy of tax exemption on copper imports may have a significant effect on domestic copper producers and the market. Many analysts believed that this policy will benefit large state-owned copper smelters because the VAT rebate will be distributed to the major smelters that were associated with the former CCLZ on the basis of their output capacity. Copper producers, however, feared that the benefit would go only to Minmetals. Under the new structure, Minmetals will be in charge of copper imports and will charge 0.7% commission rate, which would be 0.1% higher than that charged by the former CCLZ (China Metals, 2001f). Major copper producers expressed an interest in direct negotiation with overseas copper mining companies. In September 2000, managers from six state-owned copper producers (Baiyin, Daye, Jiangxi, Tongling, Yunnan, and Zhongtiaoshan) reached an agreement to unify the import of copper concentrates into China. A trading office will be housed in Shanghai and will be empowered to negotiate the terms of imports; this should include long-term contracts, and each company will sign the contract. This agreement, however, may have difficulties receiving Government approval (China Metals, 2000m).

In September, the Ministry of Land and Resources (MLR) announced a discovery of a large porphyry copper deposit in eastern Tianshan, 80 kilometers (km) southwest of Hami City in Xinjiang Uygur Autonomous Region. Preliminary prospecting indicated that the copper deposit was 800 to 1,400 meters (m) long, 50 to 200 m wide, and up to 380 m thick. The ore contained about 0.5% to 1.5% of copper. Geologists estimated that it contained about 10 Mt of copper, 3,000 t of silver, 100 t of gold, and a significant amount of molybdenum. The 25.9-billion-metric-ton Nanhu Coal Mine is located about 50 km south of the copper deposit (China Gold News, 2000b). The Government planned to build a 100,000-t/yr copper smelter and refinery near the deposit. On March 6, 2001, MLR and the Xinjiang Government jointly invited domestic and foreign

enterprises to bid to prospect and develop the deposit (China Gold News, 2001). Billiton plc, Rio Tinto Ltd., and WMC Ltd. had visited the area and expressed an interest in bidding for further exploration in the area.

After several years of feasibility study, the Government approved the construction of the Ashel Copper Mine near Habahe, Xinjiang Uygur Autonomous Region. The mine also contains iron and zinc. The plan was to mine 2,000 to 3,000 metric tons per day (t/d) of ore and to produce concentrates that contain 25% copper and 53% zinc. The mine life was estimated to be about 38 years (China Nonferrous Metals Industry, 2000a).

In August, the Government approved Shenyang Smelter's declaration of bankruptcy. In the past several years, the Shenyang City Government had ordered the smelter to relocate to another area and to upgrade its smelting technology to avoid further pollution of the city. In addition to pollution problems, the smelter was in financial distress with debts that exceeded assets. In the early 1990s, the Government planned to replace Shenyang's blast furnaces with Noranda furnaces and approved \$68 million for the renovation. The money, which was provided by the Government, was not adequate, and the smelter had difficulties securing other funds. Shenyang had an output capacity of 50,000 t/yr of refined copper, 70,000 t/yr of refined lead, and 20,000 t/yr of refined zinc (China Nonferrous Metals News, 2000i). The smelter was auctioned in October and Huanxin Trade Co. Ltd. (an affiliate of the Liaoning Provincial Economic and Trade Commission) acquired one-fourth of the smelter's compound and the main equipment for \$15.7 million. Shenyang Xingye Industry, Trade, and Technology Co. Ltd. was established to take charge of restarting the smelter in December. The company planned to produce 20,000 t/yr of refined copper, 60,000 t/yr of lead, and 18,000 t/yr of zinc. The company also planned to install a Noranda furnace in its plant (China Metals, 2000g).

The Government approved the request by Xitieshan Mining Bureau in Qinghai Province to change its name to Western Mining Co. Ltd. and to move its office to Xining, the capital of the Province. Western Mining had a lead and zinc mining capacity of 1 Mt/yr and a refined lead output capacity of 50,000 t/yr. The SDPC approved Western Mining to develop the Saishitang Copper Mine, 350 km northwest of Xining. The mine has copper reserves of 420,000 t. The first phase of construction, which began in 2000, included a 500,000-t/yr mining and dressing facility that would produce 6,000 t/yr of copper in concentrates; it was scheduled to be completed in 2003. The estimated cost was \$28 million, of which \$9 million would come from the local government, \$18 million from Western Mining, and the remainder from bank loans. The SDPC also agreed to designate Western Mining as the developer of the Yulong deposit in Xizang Autonomous Region. Yulong is China's largest undeveloped copper deposit, which has estimated copper reserves of 6.5 Mt (China Metals, 2000o).

The CSRC approved issuance of 230 million shares in the Shanghai Stock Exchange by Jiangxi Copper Co. Ltd. (a subsidiary of Jiangxi Copper Co., which is listed on the Hong Kong Stock Exchange) in 2001. The company's Guixi Smelter expansion plan was approved by the Government. By the end

of 2002, the smelter's copper output capacity will increase to 350,000 t/yr from 200,000 t/yr in 2000; the company also considered increasing its copper output capacity to 500,000 t/yr in 2010. The output capacities of sulfuric acid, silver, and gold will increase to 1.03 Mt, 158 t, and 7.8 t, respectively. Construction work began in November 2000. The third-phase expansion work in Guixi was estimated to cost \$140 million, of which \$60 million will be raised through the issue of shares, and the remainder will come from bank loans. The company also acquired Wushan Copper Mine and the exploitation right of the Fujiawu Copper Mine from the former CCLZ. The Wushan Mine has copper reserves of 1.1 Mt. Jiangxi planned to raise the mine's daily ore output capacity to 5,000 t from the current 2,600 t. The Fujiawu Mine is located just outside the boundary of the Dexing Copper Mine, which has an estimated copper reserve of 2.1 Mt. Concentrate supply could be a problem for the Guixi Smelter. Jiangxi produced about 100,000 t/yr of copper in concentrate from its mines. The company had to secure copper resources from domestic and overseas sources. The Chambishi Mine in Zambia (partly owned by China Nonferrous Metals Overseas Engineering Co.) may supply 40,000 t/yr of copper concentrate in 2003. The company planned to expand its Chengmenshan Mine from 1,200 t/yr to 12,000 t/yr, but it would take awhile to go through the approval process (China Gold News, 2000a; China Nonferrous Metals News, 2000f, g, j).

Yunnan Copper (Group) Co. Ltd. planned to increase refined copper production capacity to 250,000 t/yr in 2005 from 150,000 t/yr in 2000. The plan also included an increase of its anode copper production capacity to 190,000 t/yr from 148,000 t/yr and to expand output capacities of copper fabrication plant to 100,000 t/yr; gold, 3 t/yr; silver, 200 t/yr, and zinc, 30,000 t/yr. Yunnan Copper Smelter and Refinery's [a subsidiary of Yunnan Copper (Group) Co. Ltd.] 125,000-t/yr copper plant using MIM Holding's Isasmelt technology was expected to be commissioned in the second half of 2001. The second phase of construction of Dahongshan Mine began in late 2000. After completion in 2003, it will increase the mine output capacity to 16,000 t/yr copper in concentrate. The company also planned to develop the Tangdan Mine (China Metals, 2001i, China Nonferrous Metals News, 2001e).

Tongdu Copper Co. [a subsidiary of Tongling Nonferrous Metal (Group) Co. (Tongling Group)] started construction of its Dongguashan Mine at Tongling, Anhui Province. The company acquired mining rights from the 321 Geological Team of Anhui Province for \$4 million. The construction plan was designed by the Beijing Nonferrous Metallurgical Research Institute to mine and process 10,000 t/d of ore and was scheduled to be completed in 2003. The mine has ore with an average grade of 1.01% copper and has proven reserves of 937,000 t of copper. A 1,023-m-deep shaft was sunk in June 2000. The total investment was estimated to be \$196 million, of which \$121 million would come from bank loans. In 2000, Tongdu also signed an agreement with Ausmelt Ltd. of Australia to upgrade its Jinchang Copper Smelter. Under the terms of the agreement, Ausmelt will install an Ausmelt furnace to replace the blast furnace at Jinchang by December 2001. The new furnace will enable Jinchang to treat 330,000 t/yr of copper concentrates that will be used to produce 130,000 t/yr of copper matte and then

refined into 65,000 t of copper (China Nonferrous Metals News, 2000b; Mining Journal, 2000c).

Jinlong Copper Co. Ltd. (a joint venture of Tongling Group, Sumitomo Metals and Mining Corp. of Japan, and Sharpline of Hong Kong) decided to expand its Jinlong Smelter's copper output capacity to 150,000 t/yr in 2002 from 100,000 t/yr in 2000. The company intended to upgrade some of its existing technical facilities and to increase the capacity of the converter furnace (Metal Bulletin, 2000a). Zhangjiayang United Copper Co. (a subsidiary of Tongling Group) was renovating its electrolysis system to increase its copper output capacity to 60,000 t/yr in 2001 from 40,000 t/yr in 2000 (China Nonferrous Metals News, 2000m).

Daye Nonferrous Metals Co. completed its technical renovation of one of its copper refineries, which would increase the refined copper output capacity by 40,000 t/yr. Daye's copper smelting output capacity exceeded refining output capacity by 80,000 t/yr. The company planned to add another 90,000-t/yr electrolytic copper output capacity to bring the total refined copper output capacity to 200,000 t/yr by 2003. The Government planned to form Central China Copper Co. in which Daye would be the core of the company (China Nonferrous Metals News, 2001c).

The Guangzhou Copper Fabricating Plant (a subsidiary of Guangzhou Copper Fabricating Co. Ltd.) completed technical renovation of its copper production facilities. This would increase its output capacities of copper cathode and copper strip and sheet to 23,000 t/yr and 30,000 t/yr, respectively. The technical renovation allowed the plant to produce a variety of brass and bronze sheets or strips, as well as wires for electrical devices (China Nonferrous Metals Monthly, 2001a).

Gold and Silver.—The Chinese Government planned to reform the gold sector, which included easing restrictions on foreign investment and establishing a gold exchange market, during the next 2 years. In 2000, domestic producers were required to sell all their gold to the Central Bank at a fixed price. The establishment of gold mining companies that were wholly owned by foreign investors were not permitted. The Government had set up committees to plan for the establishment of the exchange market. Initially, the exchange market will be mainly for gold producers and wholesalers, and the retail market for gold will come later. The Central Bank will gradually withdraw from its gold monopoly position. Foreign gold analysts believed that after a few years of deregulation, demand for gold would increase to 500 t from about 200 t at the 2000 level in China. Domestic gold analysts, however, estimated that gold consumption in China was 50% more than that estimated by World Gold Council. Because the Government published gold output data but withheld gold bullion import and export data, ascertaining reliable gold consumption figures in China is difficult (Business Weekly, 2001b; China Daily, 2001c).

In the past 3 years, gold prospecting investment by the Government has declined to about \$12 million per year compared with \$60 million per year in the 1980s and the early 1990s. Owing to the restriction of Government regulations, gold companies had difficulty in attracting foreign investors to form joint ventures for gold prospecting in China. Foreign investors were given access to mine low-grade ore but were prohibited from exporting gold to the international markets.

Gold companies were not allowed to issue shares on the stock markets. The SETC and the SDPC intended to develop guidelines to remove barriers to foreign investment for gold prospecting in China. Shrinking funding has restrained the development of the gold sector. At the end of 2000, proven gold reserves decreased to 2,300 t from 2,400 t in 1995. About 1,000 gold mines were in China, most of which were small and processed ores with obsolete technology that damaged the environment and wasted resources (China Daily, 2000b, c).

In Nei Mongol Autonomous Region, China's largest refined gold and silver company Qiankun Gold and Silver Refining Co. Ltd. was designated by the Central Bank to refine gold and silver ingots. The company was able to refine 100 t/yr of gold and 200 t/yr of silver and to produce 3 t/yr of gold and silver ornaments. The company was established on the core of the Nei Mongol Precious Metals Smelter and the Nei Mongol Gold Shop in 1999. Its brand of gold ingot—"Qiankun"—was registered at the London Gold Exchange, and the company was designated by the Huatong Nonferrous Metal Spot Market to process silver products (China Economic News, 2000c).

The Zhongyuan Gold Smelter in Henan Province signed an agreement with a Swedish company that would supply technology and equipment for its gold refinery. The \$8 million plant would have an output capacity of 30 t/yr of refined gold. The construction of the plant began in 2000 and was expected to be completed in 2001 (China Nonferrous Metals News, 2000n).

Naneco Minerals Ltd. of Canada signed a joint exploration and development agreement with China's Nei Mongol Sixth Geological, Mining, and Development Institute and Nei Mongol Hulunbeier League Nonferrous Metal General Corp. to explore for gold and silver in the Hulunbeier League. According to the agreement, Naneco will provide the capital required for further exploration and development of the Errentouligai gold and silver deposit, which is located about 45 km from the Jiawula polymetallic deposit. Chinese partners will acquire permits, assist in conducting exploration, provide published and unpublished geologic data, and serve as a liaison between the joint venture and local governments. Preliminary drilling indicated that the area contained from 0.75 to 5.5 grams per metric ton (g/t) of gold and from 448 to 3,295 g/t of silver (China Nonferrous Metals News, 2000e).

Alaskan Exploration Corp. (a wholly owned subsidiary of Vega-Atlantic Corp. of Germany) and Yunnan Northeast Silver Industry Co. Ltd. formed a joint venture to develop the Luomachang silver mine in Yunnan Province. The mine had estimated resources of 9 Mt of ore at a grade of 221.9 g/t Ag. The mine had operated for 3 years and had an output capacity of 17 t/yr. Vega-Atlantic would invest \$4 million to expand production, to increase reserves, and to improve the recovery rate. In return, Alaskan would receive 85% interest in the company that operated the Luomachang Mine (Mining Journal, 2000b).

The Government approved China Aircraft Imports and Exports Co., China Jewelry Imports and Exports Co., China Mintage Corp., Minmetals, Shuikoushan Mining Bureau, Qiankun Gold and Silver Co., Yuguang Gold and Silver Co., Yunnan Copper Co., Zhongjin Lingnan Metal Co., and the Zhuzhou Smelter to export a total of 420 t of silver in 2001. The Government required that these companies source silver

from the following designated producers: Jiangxi Copper Co., Qiankun Gold and Silver Refining Co. Ltd., Shuikoushan Mining Bureau, Yuguang Gold and Lead Group Co., Yunnan Copper Group Co. Ltd., Zhongjin Lingnan Nonferrous Metals Co., and the Zhuzhou Smelter; if they did not, their export quotas would be revoked (China Metals, 2001g).

Iron and Steel.—China was one of the fastest growing markets for tinplate in the world. In the past 5 years, the demand for tinplate has increased twofold. Tinplate consumption was expected to increase to 1.7 Mt by 2005 from 1.3 Mt in 2000. Because of technological and output capacity problems, China produced about 220,000 t/yr before 1998, which accounted for about 28% of domestic market supply. In 1998, China intended to reduce its dependence on imports and planned to increase its tinplate production. Many tinplate mills have been built or expanded in the past couple years. By 2000, China had a total tinplate output capacity of 1.5 Mt/yr from Baogang Group, Dongyuan Sanhe Tinplate Industry Co. Ltd., Fujian Tongyi Tinplate Co. Ltd., Fujian Sino-Japan Metal Corp. Ltd., Guangdong Zhongshan Zhongyue Tinplate Co. Ltd., Guangzhou Pacific Tinplate Co. Ltd., Hainan Haiyu Tinplate Industry Co. Ltd., Jiangsu Tongyi Tinplate Co., Shanghai No. 10 Steel Plant, Shanghai Yichang Tinplate Co. Ltd., Shenyang Zhongyi Tinplate Co. Ltd., and Wugang Group. Except for Baogang and Wugang, other producers need to import black plate to produce tinplate. In 2000, China produced about 1 Mt of tinplate, which accounted for about 76% of market share, and imported about 400,000 t, which was 120,000 t more than that of 1999. Prices on imported tinplate were quoted at 20% less than those domestic prices, which resulted in a surge of imports. Also, the unstable quality of domestic tinplate led consumers to prefer imported tinplate. Eight tinplate producers filed a petition with the MOFTEC and the SETC to control cheap tinplate imports, which depressed local prices (China Metallurgical News, 2000c; China Metals, 2001j).

As a major iron ore importer, China has imported more than 50 Mt of ore in the past several years. Owing to high production costs, low returns on investment, and low ore grade in domestic iron deposits, steel enterprises continued to look for joint-venture possibilities for iron mines in other countries. Under the 10th 5-year plan, the Government planned to shift more steel production to the coast and to those areas best able to handle iron ore imports. Because of shortage of water resources in northern and northwestern China, the volume of steel output in these areas should remain at the 2000 level. Steel output capacity in major cities or scenic areas would be reduced. Steel enterprises should consider merging together to become conglomerates in each province or region (China Metals, 2000j).

Officials from Heilongjiang Province and the Jewish Autonomous Republic of Russia discussed developing the Kimkan iron ore deposit at Khabarovsk, Russia. A joint-venture company, which will be majority owned by Chinese, will be established to secure investment funds for the development. The initial proposal was to mine 1 Mt of iron ore and to export the ore to Xilin Iron and Steel Plant in Yichun, Heilongjiang Province, which relied on imported iron ore for its iron production. Kimkan has reserves of 189 Mt; the contained Fe content ranged from 31.7% to 35.6% with some gold,

manganese, germanium, titanium, and vanadium (Mining Journal, 2000a; Metal Bulletin, 2001a).

The demand for galvanized sheet has increased sharply in the past 5 years. In 1999, China produced about 1.5 Mt of galvanized sheet and imported 1.5 Mt. The output and imports were about 86% and 50%, respectively, higher than those of 1998. In 1999, domestic apparent consumption was 2.6 Mt. Domestic producers had increased their share of the market to 50% in 1999 from 36% in 1992. In 2000, China's galvanized sheet output capacity was 1.75 Mt; about 750,000 t was expected to be added by the end of 2001. Major galvanized sheet producers were Baogang, Bengang, Handan, Pangang, and Wugang. About 60% of demand was for hot-dipped galvanized and 40% for electrozinc coat sheet. Baogang was the only domestic producer of electrozinc in 2000 (China Metallurgical News, 2000b).

Baogang received the CSRC's approval to issue 1.8 billion shares of its subsidiary Baoshan Iron and Steel Co. Ltd. in the domestic stock market. Baogang planned to raise \$948 million from Chinese investors. Baogang had hoped to be listed in the international stock market but decided to settle for the domestic. The company planned to use the stock funds for the construction of two galvanized lines, for a few renovation projects, and for paying back bank loans (China Metallurgical News, 2000a).

Baogang, Nippon Steel Corp. of Japan, and Pohang Iron and Steel Corp. of the Republic of Korea intended to form a strategic alliance to compete against steel enterprises from Europe and America in the Asian market. Three companies planned to cooperate in finance, research, source of raw materials, and e-commerce. Nippon and Pohang had holdings of each other's shares. In 2000, Nippon, Pohang, and Baogang were ranked as the first, second, and ninth largest steel producers in the world, respectively (Financial Times, 2000a; Metal Bulletin, 2001b).

In December, Shanghai Yichang Steel Sheet Co. (a subsidiary of Baogang) completed the renovation of its cold-rolling mill. The \$60 million renovation project included expanding the cold-rolled sheet output capacity to 770,000 t/yr from 500,000 t/yr and reducing the thickness of sheet to 0.365 millimeter (mm) from 0.52 mm. The new equipment was imported from Japan, and raw materials were sourced from Baogang's hot-rolled coil (China Metals, 2001k).

Angang New Steel Corp. Ltd. (a subsidiary of Angang) and ThyssenKrupp of Germany signed a joint-venture agreement to build a 400,000-t/yr hot-dipping galvanizing line at Dalian, Liaoning Province. Each will contribute \$30 million as initial capital for the joint venture. The total cost for the project was estimated to be \$180 million. The plant was designed to produce galvanized sheets for automobiles and household appliances and was scheduled to be completed in May 2003. It was ThyssenKrupp's second joint venture in China; the first had been with Shanghai Pudong Steel to build a 500,000-t/yr stainless steel plant in Shanghai. Angang completed renovating its No. 1 cold-rolling mill to an output capacity of 1.5 Mt/yr of cold-rolled coil for galvanizing in December 2000. Angang also planned to build a 1.7-Mt/yr cold-rolling mill and two more galvanizing lines by 2005. In 2000, Angang was able to

produce 6.5 Mt/yr of hot-rolled plate/sheet and 1.6 Mt/yr of cold-rolled sheet (China Metals, 2001a).

SMS Demag AG of Germany signed a contract to assist Wugang in building a 3.5-Mt/yr hot-strip mill. The mill will have two walking-beam furnaces, a sizing press, a reversing roughing stand with a flange-connected edger, and seven finishing stands. Siemens will supply the electrical and automation control part. The project was scheduled to start production by the end of 2002 at a cost of \$850 million, \$250 million of which would be a loan from the Japan Import and Export Bank (China Metals, 2000n).

The construction of Xinjiang Steel Co.'s 400,000-t/yr high-speed wire rod mill began in 2000 and was scheduled to be completed in 2001. The \$29 million mill was jointly invested by Xinjiang Steel Co., Nanjing-based Lianqiang Metallurgical Co., and Urumqi Xingtun Co. Italian Danieli Co. supplied the endless welding rolling technology and equipment for this project (China Metals, 2000e).

The CSRC approved the issuance of 120 million shares on the Shanghai Stock Exchange by Nanjing Iron and Steel Co. Ltd. (a subsidiary of Nanjing Steel Group). Nanjing planned to raise \$91 million from Chinese investors to fund repayment of bank loans and to renovate its steelmaking facilities. The company intended to increase the output capacity of its high-strength special plate to 400,000 t/yr from 142,000 t/yr and strip to 200,000 t/yr from 70,000 t/yr by 2005 (China Metals, 2000c).

In 2000, Shoudu Iron and Steel (Group) Co. (Shougang) and Tangshan Iron and Steel Co., located 350 km apart, discussed a merger. Shougang had annual output capacities of crude steel, 9 Mt; pig iron, 8 Mt; and steel products, 6.5 Mt. Tangshan had annual output capacities of pig iron, 3.34 Mt; crude steel, 3.15 Mt; and steel products, 2.73 Mt. Shougang planned to relocate its sintering plant to the Qian'an Mine, about 30 km from Tangshan. The Government encouraged such discussions because such a merger would consolidate steel producers in Beijing, Hebei, and Tianjin with a combined output capacity of 26.4 Mt/yr. About 82% of the steel products fabricated in the area were construction steel. As a result of excessive capacity, about 32% of the total output capacity was idle. Also, the Beijing Government had ordered Shougang to shut down its 20,000-t/yr ferroalloy plant in 2000, to reduce crude steel output to 6 Mt, and to close one of its blast furnaces, four sintering machines, one coke oven battery, and three converters by 2002 (China Metals, 2000h, i).

Tungsten.—Chinese tungsten output accounted for more than 70% of the world total; therefore, the country had a major influence on world tungsten prices. In the past couple of years, the Government and the tungsten producers have met and discussed ways to control production and exports. The Government forced major tungsten producers to reduce their output and closed down illegal mining. The export quota for tungsten decreased to 17,000 t (tungsten content) in 2000. Exporters reached a consensus on setting floor prices for major tungsten products. The reduction in tungsten exports drove tungsten prices up in the international markets. The average price per ton of ammonium paratungstate increased to \$90 in 2000 from \$50 in 1998; the price of tungsten concentrates in the domestic market, however, remained weak. The MLR and the SETC sent joint inspection teams to enforce the closure of

illegal tungsten mines. Between 1999 and 2000, 145 illegal mines were shut down. The MLR issued circulars to rectify the Government's position on illegal tungsten mining in China. According to the circulars, new mine operating licenses would be issued before the end of June 2001, and the Government would publish the names of all authorized tungsten mines. Mine operation licenses could not be transferred. Mining companies could not exceed their approved capacity, otherwise their licenses would be revoked. Small processing plants that were built after January 15, 1991, and processing plants that did not have their own mines would be closed down. Local authorities would be authorized to seize any tungsten concentrates from illegal mines and processing plants (China Metals, 2000k; 2001m).

In December, the Government approved the export of tungsten by 13 companies, 6 producers, and 7 trading companies in 2001. The producers were the Huaxin Hard Alloy Plant, the Langfang Tungsten and Molybdenum Plant, the Nanchang Hard Alloy Plant, Xiamen Tungsten Co., the Zhuzhou Hard Alloy Plant, and the Zigong Hard Alloy Plant. The export quota share of each producer will be based on its output capacity. Producers will be restricted to export only their own products, and traders must source tungsten products from authorized operating producers and miners. The China Chamber of Commerce of Metals, Minerals, and Chemicals Importers and Exporters will verify contracts between producers and traders and export prices, and then MOFTEC will issue an export license (China Metals, 2000k).

Industrial Minerals

Cement.—China ranked first in the world in cement output despite the cement sector facing a transition period. Much of its manufacturing plants are old and inefficient. In the past 2 years, the Government has been stepping up its efforts to close small plants and plants that use obsolete technology for production. The Government issued a decree that low-grade cement (325) production must be stopped and encouraged manufacturers to produce higher grade cement. With anticipated Government investment infrastructure projects in the next several years, demand for cement in China is expected to continue its upward trend. Such projects as bridges, dams, and highways need high-grade cement. In China, high-grade cement (525) accounted for about 10% of the total output, and the share of medium-grade cement (425) was about 60%, and the low grade made up the remainder. The Government planned to shut down manually operated shaft kilns and to convert many of shaft kilns to rotary kilns and ordered kiln manufacturers to stop producing any manual shaft kilns (Building Materials Industry Information, 2000).

Rare Earths.—China was the largest rare-earths producer and exporter in the world. The country exported more than two-thirds of its output. In 2000, China produced about 73,000 t of ore (in rare-earth oxide content) and 65,000 t of rare-earth products, which included 32,000 t of high-purity individual rare-earth oxide. Rare-earth concentrates were mainly produced from the provinces of Jiangxi, Nei Mongol, and Sichuan. In Nei Mongol, rare-earth concentrate, which is known as Baotou rare-earth concentrate, is the byproduct of producing iron

concentrates. The byproduct contains oxides of the light rare-earth group—lanthanum, cerium, praseodymium, neodymium, samarium, europium, and gadolinium. In Sichuan, rare earths are located in areas of Mianning and Dechang; mainly bastnasite and the ionic absorption type of rare earths are found in Ganzhou, Jiangxi. The Government established Ganzhou Nanfang Rare Earth Metallurgical Co. Ltd. to manage and control rare-earth output and prices in Jiangxi. Of the total rare-earth concentrate output, Nei Mongol accounted for more than 60%, followed by Sichuan, 18%; and Jiangxi, 17%. China's rare-earth processing has expanded quite rapidly in the past several years to 130,000 t/yr in 2000 from 50,000 t/yr in 1995. In 2000, the country consumed about 19,000 t, of which 27% was in the metallurgical and machinery industry; 24%, in the magnet and phosphor sector; 22%, in the oil and petrochemical area; 10%, in glass and ceramics; and 17%, in other industries (Rare Metals Letters, 2001).

Rare earths remained a highly controlled sector in China. The SDPC approved all mining and processing projects and export quotas. The Government had successfully shut down some illegal rare-earth mining in Jiangxi and Sichuan that had caused environmental damage. In 2000, China exported 46,700 t of rare-earth products, which did not include the permanent magnet sector. In 2001, the export quota of rare earths was set at 45,000 t, or about 2,000 t less than that of 2000 (China Metals, 2000f). The rare-earth quota was introduced in 1999 to control exports hoping to improve rare earth prices in the world market. In 2000, per-tonnage average export prices increased by \$120 compared with those of 1999. The Government intended to implement a quality-control guideline for the rare-earth sector. The Government also encouraged producers to export high-value-added rare-earth products and restricted the exporting of rare-earth concentrates. In 2000, China's rare-earth producers imported about 10,000 t of monazite to meet the gap between supply and demand (China Metals, 2001i).

Rhodia Rare Earths SA of France, Beijing Founder Group, and Liyang Lichen Economic General Industrial formed Liyang Rhodia Founder Rare Earth New Material Co. The joint venture was to produce rare earths and vanillin. Rhodia would benefit because it would gain access to the 9,000-t/yr rare-earth facility at its partners' Liyang plant in Jiangsu Province. Rhodia held 45% of the shares of the rare-earth operation in the forms of direct investment, new installations, and technology. The new manufacturing units in Liyang will use Rhodia's technology (Chemical and Engineering News, 2000b). Rhodia also completed the construction of its 5,000-t/yr rare-earth chloride-separation facility in Baotou, Nei Mongol, in 2000.

Baotou Hefa Rare Earth Group invested \$14.3 million for its two new projects—catalytic active cerium oxide and rare-earth hydrogen storage alloy powder. After the completion of the project, the company will produce 800 t/yr of cerium oxide, of which 400 t/yr can be used as a catalyst. The rare-earth hydrogen storage alloy powder project will be part of a nickel hydrogen power-cell project (China Chemical Reporter, 2000).

Mineral Fuels

Owing to the slowdown of economic growth and closure of the inefficient and high-energy-consuming SOEs, China's

energy sector experienced an oversupply of electricity. In response to the oversupply, the Government shut down small thermal powerplants and suspended the approval of new powerplant construction until 2002 (China Daily, 2000f). The State Power Corp. (SPC) controlled more than half of the country's powerplants and was the sole power transmitter in China. The Government planned to reform the power sector by changing the mission of SPC. According to the Government's plan, SPC will concentrate on power transmission and will retain about 10% of its powerplants for national security. SPC will establish several independent power companies to take over the operation of powerplants or will sell them to other companies. The Government believed that full competition in the country's power sector would reduce the current [2000] power price (average about 0.46 yuan per kilowatt hour) nationwide by 20% on average. The change also may help provincial utilities to reform. Provincial Governments were reluctant to purchase cheaper electricity from newer, more efficient powerplants in other provinces and regions because local powerplants were significant sources of revenue and employment. Such provinces as Guizhou and Sichuan have abundant hydropower for sale, but such coastal provinces as Jiangsu, Shanghai, and Zhejiang, which are short of power, tend to buy at high rates from local producers (Far Eastern Economic Review, 2000; Business Weekly, 2001c).

The Chinese Government planned to increase its installed hydropower electricity generating capacity to 150 million kilowatts (MkW) in 2015 from 75 MkW in 2000. The Three Gorges power station, which was scheduled to be completed in 2009, would be a hub base for the Chang Jiang (Yangtze River). The Shuibuya hydropower station on the Qingjiang, which is a tributary of the Chang Jiang, in Hubei Province will be constructed in the next several years. Two other hydropower projects on the Chang Jiang, Xiangjiaba and Xiluodu, were scheduled to be built in 2003. The southwestern provinces of Guangxi, Guizhou, and Yunnan accounted for about 67% of the country's hydro resources, but only 29% has been exploited. The Government also planned to build two hydropower stations, Gongboxia and Laxiwa, on the upper Huang He (Yellow River) (Business Weekly, 2000).

Coal.—China continued to reform its coal sector in 2000. The Government closed down more than 40,000 illegal small coal mines, which reduced the overall coal output capacity of 320 Mt, and coal production decreased to about 900 Mt. At yearend, the national coal stockpile totaled about 150 Mt, which was a decline of 22 Mt from that of January 2000. Owing to exhausted coal resources, 257 state-owned mines were forced to shut down in 2000. The Government also approved bankruptcy declarations from another 65 state-owned mines and wrote off \$110 million bank loans for these mines. The coal demand in such sectors as chemical, construction, metallurgy, and power generation increased. In 2000, China exported more than 55 Mt of coal, which was an increase of 47% compared with that of 1999; the coal went mainly to Japan, the Republic of Korea, and Taiwan (General Administration of Customs of the People's Republic of China, 2000, p. 24; Zhongguo Meitan Bao, 2001). By yearend, domestic coal market prices increased by an average of \$0.4 per ton. The increase in coal price in the domestic market and coal exports helped many state-owned coal

producers improve their cash flow and reduce their deficits. The total deficit in major state-owned coal producers declined to \$240 million in 2000, which was a 50% reduction compared with that of 1999. China planned to produce about 850 Mt of coal and export 63 Mt of coal in 2001.

In 1998, the Government transferred all state-owned coal producers under the supervision of the former Ministry of Coal Industry to the Provincial Governments. It planned to merge about 520 state-owned coal producers into seven groups so that they could compete in the international market. According to the Government plan, the seven coal groups will become enterprises similar to the two oil enterprises China Petroleum Co. Ltd. (PetroChina) and China Petroleum and Chemical Corp. (Sinopec Corp.) and will be listed on international stock exchanges. These seven groups will be placed under the State Council and will not be controlled by Provincial Governments. The seven groups will be Jing (Beijing)-Jin (Tianjin)-Ji (Hebei Province), East China, Northeast China, Central and South China, Southwest China, Xin (Xinjiang Uygur Autonomous Region)-Gan (Gansu Province)-Ning (Ningxia Hui Autonomous Region)-Qing (Qinghai Province), and Jin (Shanxi Province)-Meng (Nei Mongol Autonomous Region)-Shaan (Shaanxi Province) (Business Weekly, 2001a).

The Government continued its efforts to improve coal mine safety in China. In 2000, coal mine accidents claimed more than 5,300 lives in China (China Daily, 2001e). The State Administration of Coal Mine Safety Supervision and the State Administration of Safety in Production Supervision were established under the SETC to oversee the country's coal mine production safety. Although the function of these two administrations appeared to overlap, the difference was that work related to coal mine safety supervision would be executed in the name of the State Administration of Safety Supervision. In 2000, the Administration of Coal Mine Safety Supervision issued "provisional regulations of coal mine safety supervision" and "provisional regulations on administrative punishment for coal mine safety supervision," which would become effective on January 1, 2001, to standardize the enforcement and implementation of coal mine safety regulations in China (China Coal News, 2001a).

The Xinjiang Government planned to develop the E'huobulake coal mine in Kuche County in 2001. The mine has coal resources of 930 Mt; the recoverable coal reserve is 670 Mt. Initial output capacity was planned to be 1.5 Mt/yr, and the total investment cost was estimated to be \$59 million (China Coal News, 2001b).

After a 2-year survey, geologists discovered a large coal deposit in Fuyuan County, Yunnan Province. The deposit contains more than 8 billion metric tons (Gt) of low-sulfur bituminous coal resources with proven reserves of 4 Gt. The Government planned to develop the deposit within the next 5 years. The initial plan was to build the 2.4-Mt/yr coal mine Bailongshan in that area (Zhongguo Meitan Bao, 2000).

China United Coalbed Methane Co. Ltd. (CUCBM) or Zhonglian Coalbed Gas Co. Ltd. signed a contract with Texaco Inc. of United States to develop coalbed methane in the Baode, the Junggar, and the Shenfu areas, which were predicted to have 1 trillion cubic meters of gas. The exploration project covered a total area of 6,987 km². According to the contract, Texaco will

prospect and explore in the area for the next 5 years. If resources are proven to be commercially viable, then CUCBM and Texaco will develop the resources jointly. Profit share will be based on each contribution shares (China Economic News, 2001b). CUCBM also signed a contract with Virgin Oil Inc. of the United States to explore coalbed methane at Hengshanbao, southeast of Yinchuan City in Ningxia Hui Autonomous Region. It covers an area of 1,708 km² and contains an estimated 55 Gt of coal and 230 billion cubic meters (Gm³) of methane (China Economic News, 2001a).

Oil and Gas.—China's oil and gas sector has undergone major changes in the past 2 years. The Chinese Government reorganized the onshore oil and gas sector into two integrated enterprises—China National Petroleum Corp. (CNPC) and China Petrochemical Corp. (Sinopec). China National Offshore Oil Corp. (CNOOC) remained to handle offshore exploration and production and the China National Star Petroleum was placed under Sinopec. China National Chemicals Import and Export Corp. received the exclusive right from the Government to trade oil. During the same period, three state-owned oil and gas enterprises were regrouped and set up three holding companies—PetroChina under CNPC, Sinopec Corp. under Sinopec, and China Offshore Oil Co. Ltd. under CNOOC, which offered shares on the stock markets of New York and Hong Kong. International oil companies, such as BP Amoco PLC, Exxon Mobil Corp., and Royal Dutch/Shell Group, brought major shares in the international initial public offerings. Each investment accompanied separate agreements to cooperate in such areas as oil and gas exploration and marketing and distributing of oil products (Asian Wall Street Journal, 2000; Financial Times, 2000c). Funds from the share issue were used mainly to repay debts and to use for future projects.

The rapid economic growth increased the demand for oil; therefore, China has become more dependent on oil imports to balance supply and demand. In 2000, China's net crude oil and oil product imports were more than 60 Mt, which accounted for about 25% of the country's consumption. About 90% of Chinese oil output came from onshore wells. Daqing Oilfield in Heilongjiang Province, which began production in 1963, produced more than 50 Mt/yr of crude oil; this accounted for about one-third of the country's total output. Because Daqing is a mature field, output was expected to decline in the future. The country's second largest oilfield Liaohe looked for assistance from foreign companies to enhance its recovery rate and to extend production. The future hope for increased oil output was from the western oilfields; harsh weather and environmental extremes in the west, however, deterred an accelerated rate of development there. Demand for crude oil is expected to grow at a higher rate than domestic production in the future, which means that China will be more dependent on oil imports. China signed agreements with neighboring countries, such as Russia and Turkmenistan, to exploit oil and gas fields jointly in Irkutsk and on Sakhalin Island in Siberia and to import oil and gas from Russia and Turkmenistan (China Daily, 2000e).

ExxonMobil (Guangdong) Petroleum & Petrochemical Co. Ltd. (a subsidiary of ExxonMobil) and Sinopec signed a cooperation agreement for joint study of the manufacturing and the development of the fuel market in Guangdong Province. The study included increasing the Guangzhou Petrochemical

Complex's refinery output capacity to about 300,000 barrels per day (bbl/d) from 150,000 bbl/d in 2000 and building up to 500 service stations within 3 years in Guangdong Province. The partners also planned to develop a large-scale petroleum and petrochemical complex in the Fujian Petrochemical Refinery Complex in Fujian Province (Chemical and Engineering News, 2000a).

In China, natural gas was used mainly to produce fertilizer. In Sichuan Province, China's largest gas-producing area, the fertilizer sector consumed about 45% of gas output, and the remainder was used in the petrochemical sector; only a small fraction was used in the residential and commercial sector. To satisfy a growing demand for energy and to reduce pollution, the Chinese Government lifted the restrictions that mainly limited the use of natural gas in fertilizer production (China Chemical News, 2001a).

China's natural gas resources were discovered in the southwest, west, and offshore. The eastern and southeastern parts of China should be the fastest economic growth but were energy deficient. China's pipeline system was regionally segmented and only connected gasfields to nearby consumers. Natural gas from Sichuan and the west was unable to reach the energy-needy areas. The Chinese Government has given priority to the construction of long-haul natural gas pipelines from the producing areas to the deficient areas (China Daily, 2001b).

In October, PetroChina announced that the Yaha Condensate Field, Kuche County, Tarim Basin, Xinjiang Uygur Autonomous Region, had begun operation. The field has proven reserves of 36 Gm³ of natural gas and 28 Gt of condensed oil and was designed to produce 1.2 Gm³ of natural gas and 500,000 t/yr of condensed oil (Zhongguo Shiyou Bao, 2000c).

After 3 years of exploration, PetroChina announced the discovery of a natural gas field, Kela-2, at the south of Tianshan, about 100 km in the northwest of Kuqaguizi, Tarim Basin. The field, which covers an area of 47.1 km² with proven reserves of 250 Gm³ of natural gas, contains more than 95% methane and a very limited amount of condensed oil and hydrogen sulfide (Zhongguo Shiyou Bao, 2000a).

After more than a decade of exploration, the Changqing Bureau of PetroChina announced the discovery of a large gasfield, Sulige, at Ih Ju League, Ordos Basin, Nei Mongol Autonomous Region. The gasfield has proven reserves of 220 Gm³ of natural gas and inferred reserves of 700 Gm³. Shell and PetroChina signed a joint \$3 billion project to develop natural gas fields at Ordos Basin and to transport the natural gas to eastern China (Zhongguo Shiyou Bao, 2000b).

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TABLE 1
CHINA: ESTIMATED PRODUCTION OF MINERAL COMMODITIES 1/ 2/

(Metric tons unless otherwise specified)

Commodity 3/ METALS	1996	1997	1998	1999	2000
Aluminum:					
Bauxite, gross weight thousand tons	6,200	8,000	8,200	8,500	9,000
Alumina, gross weight do.	2,550	2,940	3,330	3,840	4,330
Metal, refined, primary and secondary do.	1,900	2,180	2,440	2,810 r/	2,830
Antimony:					
Mine, Sb content	129,000	131,000	97,400	89,600 r/	98,700
Metal	128,000	120,000	82,000	84,500 r/	106,000
Bismuth:					
Mine output, Bi content	610	550	240	2,680 r/	2,500
Metal	750	760	820	860 r/	900
Cadmium, smelter					
	1,570	1,980	2,130	2,150 r/	2,200
Cobalt:					
Mine output, Co content	190	200	40	250 r/	200
Metal	230	470	410	300 r/	350
Copper:					
Mine output, Cu content	439,000	496,000	487,000	520,000 r/	590,000
Metal:					
Smelter, primary	616,000	789,000	839,000	837,000 r/	990,000
Refined, primary and secondary thousand tons	1,120	1,180	1,210	1,180 r/	1,400
Gold, mine output, Au content					
	145	175	178	173 r/	180
Iron and steel:					
Iron ore, gross weight thousand tons	250,000	268,000	247,000	237,000 r/	224,000
Pig iron do.	107,200 4/	115,110 4/	118,600 4/	125,390 4/	131,030 4/
Ferroalloys do.	4,180 4/	4,040 4/	3,558 4/	3,810	4,030
Steel, crude do.	101,240 4/	108,940 4/	115,590 4/	124,260 4/	127,240 4/
Steel, rolled do.	93,380 4/	99,780 4/	107,380 r/ 4/	121,100 r/ 4/	131,460 4/
Lead:					
Mine output, Pb content	643,000	712,000	581,000	549,000 r/	570,000
Metal:					
Smelter, primary	363,000	467,000	567,000	597,000 r/	580,000
Refined, primary and secondary	706,000	707,500	757,000	918,000 r/	1,030,000
Magnesium metal, primary					
	73,100	76,000	70,500	120,000	140,000
Manganese ore, gross weight thousand tons					
	7,600	6,000	5,300	3,190 r/	4,000
Mercury, mine output, Hg content					
	510	830	230	200	200
Molybdenum, mine output, Mo content					
	29,600	33,300	30,000	29,700 r/	28,900
Nickel:					
Mine output, Ni content	43,800	46,600	48,700	49,500 r/	51,100
Matte	46,400	39,900	47,000	50,100 r/	50,000
Smelter	44,600	43,300	40,100	44,400 r/	50,900
Silver, mine output, Ag content					
	1,140	1,300	1,300	1,320	1,600
Tin:					
Mine output, Sn content	69,600	67,500	70,100	80,100 r/	97,000
Metal, smelter	71,500	67,700	79,300	90,800 r/	111,000
Titanium, sponge					
	2,130	2,340	2,250	1,660	1,900
Tungsten, mine output, W content					
	26,500	25,000	30,000 r/	31,100 r/	37,000
Vanadium (in vanadiferous slag product)					
	14,000	15,000	15,500	26,000 r/	30,000
Zinc:					
Mine output, Zn content thousand tons	1,120	1,210	1,270	1,480 r/	1,710
Refined, primary and secondary do.	1,180	1,430	1,490	1,700 r/	1,920
INDUSTRIAL MINERALS					
Asbestos					
	293,000	288,000	314,000	247,000 r/	370,000
Barite thousand tons					
	2,500	3,500	3,300	2,800	3,500
Boron, mine, boron oxide equivalent					
	157,000	136,000	137,000	110,000	100,000
Bromine					
	41,400	50,100	40,000	42,000	42,000
Cement, hydraulic thousand tons					
	491,190 4/	511,730 4/	536,000 4/	573,000 4/	583,190 4/
Diatomite					
	320,000	330,000	335,000	340,000	350,000
Dolomite thousand tons					
	5,520	6,500	6,700	6,600	6,700
Fluorspar do.					
	2,000	2,300	2,350	2,400	2,450
Graphite					
	185,000	310,000	224,000 r/	300,000 r/	400,000
Gypsum thousand tons					
	7,780	9,100	6,800 r/	6,700 r/	6,800
Kyanite and related materials					
	2,500	3,000	3,050	3,000	3,100
Lithium minerals, all types					
	16,500	17,000	16,000	15,500	16,000

See footnotes at end of table.

TABLE 1--Continued
CHINA: ESTIMATED PRODUCTION OF MINERAL COMMODITIES 1/ 2/

(Metric tons unless otherwise specified)

Commodity 3/	1996	1997	1998	1999	2000
INDUSTRIAL MINERALS--Continued					
Magnesite thousand tons	2,100	2,400	2,400	2,450	2,500
Nitrogen, N content of ammonia do.	25,200 r/	24,800 r/	26,100 r/	27,800 r/	28,000
Phosphate rock and apatite, phosphorus oxide equivalent do.	6,350	7,530	7,500	6,000 r/	5,820
Potash, marketable, potassium oxide equivalent do.	110	115	120	150 r/	250
Rare earths, rare-earth oxide equivalent	55,000	53,000	60,000	70,000	73,000
Salt thousand tons	29,035 4/	30,830 4/	22,420 4/	28,124 4/	31,280 4/
Sodium compounds, soda ash, natural and synthetic do.	6,693 4/	7,258 4/	7,440 4/	7,654 4/	8,342 4/
Sulfur:					
Native do.	170	200	210	250	250
Content of pyrite do.	5,990	6,040	4,490	3,860	3,370
Byproduct, all sources do.	1,100	1,400	1,450	1,580	1,600
Total do.	7,260	7,640	6,150	5,690	5,220
Talc and related materials do.	4,000	4,100	3,800	3,900	3,500
MINERAL FUELS AND RELATED MATERIALS					
Coal:					
Anthracite do.	286,000	242,000	250,000	230,000	190,000
Bituminous and lignite do.	1,090,000	1,110,000	985,000	820,000	690,000
Total do.	1,380,000	1,350,000	1,240,000	1,050,000	880,000
Coke, all types do.	136,400 4/	137,310 4/	128,060 4/	121,100 4/	96,960 4/
Gas, natural:					
Gross billion cubic meters	20	23	23	25	27
Marketed do.	17	18	18	20	22
Petroleum:					
Crude (including crude from oil shale) million 42-gallon barrels	1,170	1,180	1,200	1,190	1,200
Refinery products do.	980	980	950	920	930

r/ Revised.

1/ Table includes data available through June 15, 2001.

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

3/ The country also produces diamond, gallium, germanium, indium, platinum-group metals, and uranium; no reliable basis, however, is available for estimation of output levels.

4/ Reported by China's State Statistical Bureau.

TABLE 2
CHINA: STRUCTURE OF THE MINERAL INDUSTRY IN 2000

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies 1/	Location of main facilities	Annual capacity e/
Aluminum:			
Alumina	Pingguo Aluminum Co.	Guangxi, Pingguo	450
Do.	Guizhou Aluminum Plant	Guizhou, Guiyang	520
Do.	Changcheng (Great Wall) Aluminum Corp.	Henan, Zhongzhou	500
Do.	do.	Hunan, Zhengzhou	1,000
Do.	Shandong Aluminum Plant	Shandong, Zibo	800
Do.	Shanxi Aluminum Plant	Shanxi, Hejin	1,400
Metal	Baiyin Aluminum Plant	Gansu, Baiyin	50
Do.	Lanzhou Aluminum Plant	Gansu, Lanzhou	95
Do.	Liancheng Aluminum Plant	do.	90
Do.	Pingguo Aluminum Co.	Guangxi, Pingguo	125
Do.	Guizhou Aluminum Plant	Guizhou, Guiyang	240
Do.	Jiaozuo Wanfang Aluminum Co. Ltd.	Henan, Jiaozuo	53
Do.	Luoyang Xin'an Aluminum Smelter	Henan, Luoyang	55
Do.	Sanmenxia Tianyuan Aluminum Co. Ltd.	Henan, Sanmenxia	40
Do.	Hanjiang Danjiangkou Aluminum Co. Ltd.	Hubei, Danjiangkou	53
Do.	Changcheng (Great Wall) Aluminum Corp.	Hunan, Zhengzhou	50
Do.	Yanji Aluminum Plant	Jilin, Yanji	15
Do.	Fushun Aluminum Plant	Liaoning, Fushun	100

See footnotes at end of table.

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

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies 1/	Location of main facilities	Annual capacity e/	
Aluminum--Continued:				
Metal--Continued:	Baotou Aluminum Plant	Nei Mongol, Baotou	120	
Do.	Qingtongxia Aluminum Plant	Ningxia, Qingtongxia	200	
Do.	Qinghai Aluminum Smelter	Qinghai, Xining	200	
Do.	Shandong Aluminum Plant	Shandong, Zibo	60	
Do.	Tongchuan Xingguang Aluminum Co. Ltd.	Shaanxi, Tongchuan	55	
Do.	Taiyuan Aluminum Plant	Shanxi, Taiyuan	30	
Do.	Yunnan Aluminum Plant	Yunnan, Kunming	120	
Asbestos	China National Nonmetallic Industry Corp.	Nei Mongol, Baotou; Shanxi, Lai Yuan and Lu Liang	130	
Barite	do.	Guizhou, Xiangshou	NA	
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	
Cobalt	metric tons	Jinchuan Nonferrous Metals Corp.	Gansu, Jinchang	400
Copper, refined		Jinchang Smelter (Tongling Nonferrous Metals Co.)	Anhui, Tongling	80
Do.		Jinlong Smelter (Tongling Nonferrous Metals Co.)	do.	100
Do.		Wuhu Smelter (Hengxin Copper Industry Group Co.)	Anhui, Wuhu	60
Do.		Baiyin Nonferrous Metals Co.	Gansu, Baiyin	50
Do.		Jinchuan Nonferrous Metals Corp.	Gansu, Jinchuan	20
Do.		Luoyang Copper Processing Factory	Henan, Luoyang	50
Do.		Daye Nonferrous Metals Co.	Hubei, Daye	130
Do.		Guixi Smelter (Jiangxi Copper Metals Co.)	Jiangxi, Guixi	200
Do.		Huludao Copper Smelter (Huludao Zinc Smelting Co.)	Liaoning, Huludao	100
Do.		Shenyang Smelter	Liaoning, Shenyang	100
Do.		Shanghai Smelter (Jiangxi Copper Metals Co.)	Shanghai	80
Do.		Taiyuan Copper Industry Co.	Shanxi, Taiyuan	30
Do.		Zhongtiaoshan Nonferrous Metals Co.	Shanxi, Yuangu	80
Do.		Tianjin Copper Electrolysis Factory	Tianjin	25
Do.		Yunnan Smelter	Yunnan, Kunming	160
Gas, natural	billion cubic meters	China National Petroleum Corp.	Sichuan	10
Gold, refined	thousand kilograms	China National Gold Corp.	Henan, Lingbao	10
Do.		Laizhou Gold Co.	Shandong, Laizhou	15
Do.		Zhaoyuan Gold Co.	Shandong, Zhaoyuan	15
Graphite		China National Nonmetallic Industry Corp.	Shandong, Laixi and Pingdu	190
Iron and steel:				
Iron ore		Maanshan Iron and Steel Co.	Anhui, Maanshan	10,000
Do.		Shoudu (Capital) Mining Co.	Beijing	20,000
Do.		Meishan Metallurgical Co.	Shanghai	2,000
Do.		Jiuquan Iron and Steel Co.	Gansu, Jiayuguan	4,000
Do.		Hainan Iron Mine	Hainan, Changjiang	4,600
Do.		Handan Xingtai Metallurgical Bureau	Hebei, Handan	3,800
Do.		Tangshan Iron and Steel Co.	Hebei, Tangshan	3,000
Do.		Wuhan Iron and Steel (Group) Co. (Wugang)	Hubei, Wuhan	5,100
Do.		Banshigou Iron Mine Mining Co.	Jilin, Hunjiang	1,400
Do.		Anshan Mining Co.	Liaoning, Anshan	30,000
Do.		Benxi Iron and Steel Co.	Liaoning, Benxi	13,700
Do.		Baotou Iron and Steel and Rare Earth Co.	Nei Mongol, Baotou	10,000
Do.		Taiyuan Iron and Steel Co.	Shanxi, Taiyuan	4,000
Do.		Dabaoshan Mining Co.	Guangdong, Qujiang	1,670
Do.		Panzhuhua Mining Co.	Sichuan, Panzhuhua	13,000
Do.		Kunming Iron and Steel Co.	Yunnan, Kunming	1,400
Ferroalloys		Shoudu (Capital) Iron and Steel (Group) Co.	Beijing	35
Do.		Northwest Ferroalloy Co.	Gansu, Yongdeng	60
Do.		Zunyi Ferroalloy Co.	Guizhou, Zunhi	100
Do.		Jilin Ferroalloy Co.	Jilin, Jilin	250
Do.		Jinzhou Ferroalloy Co.	Liaoning, Jinzhou	90

See footnotes at end of table.

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

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies 1/	Location of main facilities	Annual capacity e/
Iron and steel--Continued:			
Ferroalloys--Continued:			
	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	Maanshan Iron and Steel Co.	Anhui, Maanshan	3,000
Do.	Shoudu (Capital) Iron and Steel (Group) Co. (Shougang)	Beijing	10,000
Do.	Handan Iron and Steel General Work (Handan)	Hebei, Handan	2,400
Do.	Tangshan Iron and Steel Co.	Hebei, Tangshan	2,300
Do.	Wuhan Iron and Steel (Group) Co. (Wugang)	Hubei, Wuhan	8,000
Do.	Anshan Iron and Steel (Group) Co. (Angang)	Liaoning, Anshan	10,000
Do.	Benxi Iron and Steel Co. (Bengang)	Liaoning, Benxi	2,700
Do.	Baotou Iron and Steel and Rare Earth Co.	Nei Mongol, Baotou	3,500
Do.	Baoshan Iron and Steel (Group) Corp. (Baogang)	Shanghai	10,000
Do.	Shanghai Iron and Steel Co. Ltd.	do.	6,000
Do.	Taiyuan Iron and Steel Co.	Shanxi, Taiyuan	2,500
Do.	Panzhuhua Iron and Steel (Group) Co. (Pangang)	Sichuan, Panzhihua	3,000
Lead	Baiyin Nonferrous Metals Co.	Gansu, Baiyin	50
Do.	Shaoguan Smelter	Guangdong, Shaoguan	35
Do.	Jiyuan Smelter (Yuguang Gold-Lead Co. Ltd.)	Henan, Jiyuan	55
Do.	Hanjiang Smelter	Hubei, Luhekou	50
Do.	Shuikoushan Mining Bureau	Hunan, Hengyang	30
Do.	Zhuzhou Smelter	Hunan, Zhuzhou	80
Do.	Shenyang Smelter	Liaoning, Shenyang	70
Do.	Kunming Smelter	Yunnan, Kunming	20
Magnesium	Fushun Aluminum Plant	Liaoning, Fushun	5
Do.	Minhe Magnesium Plant	Qinghai, Minhe	7
Nickel, refined	Jinchuan Nonferrous Metals Corp.	Gansu, Jinchuan	40
Do.	Chengdu Electro-Metallurgy Factory	Sichuan, Chengdu	5
Petroleum, crude	Shengli Bureau	Hebei, Shengli	33,350
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	40
Rare earths	Gansu Rare Earths Co.	Gansu, Baiyin	32
Do.	Jiangxi Rare Earths Co.	Jiangxi, Nanchang	1
Do.	Zhujiang Smelter	Guangdong, Guangzhou	5
Do.	Baotou Iron and Steel and Rare Earths Corp.	Nei Mongol, Baotou	25
Do.	Shanghai Yaolong Nonferrous Metals Co.	Shanghai	2
Salt	Shandong Haihua Group Co. Ltd.	Shandong, Weifang	1,400
Do.	Zigong Zhangjiaba Salt Chemical Plant	Sichuan, Zigong	250
Talc	China National Nonmetallic Industry Corp.	Guangxi, Longshen	130
Do.	do.	Liaoning, Haicheng	50
Do.	do.	Shandong, Qixia	5
Tin, smelter	Dachang Mining Administration	Guangxi, Dachang	5
Do.	Yunnan Tin Industry Co.	Yunnan, Gejiu	20
Do.	Laibin Smelter	Yunnan, Laibin	12
Titanium	Zunyi Titanium Plant	Guizhou, Zunyi	5
Do.	Fushun Aluminum Plant	Liaoning, Fushun	1
Tungsten, concentrate	China National Nonferrous Metals Industry Corp.	Guangdong, Guangxi, Hunan, Jiangxi, and Zhejiang	60
Zinc	Northwest China Lead-Zinc Smelter	Gansu, Baiyin	150
Do.	Shaoquan Smelter	Guangdong, Shaoquan	160
Do.	Liuzhou Zinc Products Factory	Guangxi, Liuzhou	32
Do.	Shuikoushan Mining Bureau	Hunan, Hengyan	28
Do.	Zhuzhou Smelter	Hunan, Zhuzhou	300
Do.	Huludao Zinc Smelting Co.	Liaoning, Huludao	320
Do.	Shenyang Smelter	Liaoning, Shenyang	20
Do.	Laibin Smelter	Yunnan, Laibin	50

e/ Estimated. NA Not available.

1/ Companies are owned by either the State Government or the Provincial Government.

TABLE 3
CHINA: EXPORTS OF SELECTED MINERAL COMMODITIES IN 2000

	Quantity (metric tons)	Value (thousands)
METALS		
Aluminum:		
Alumina	9,642	\$3,840
Metal and alloys:		
Unwrought	209,111	303,859
Semimanufactures	130,052	319,890
Antimony metal, unwrought	44,979	48,365
Barium sulfate	2,520,000	79,387
Copper, metal and alloys:		
Unwrought	118,739	164,637
Semimanufactures	144,484	507,969
Iron and steel:		
Ferrosilicon	490,000	229,095
Pig iron and cast iron	3,330,000	396,312
Steel:		
Bars and rods	860,000	220,393
Shapes and sections	390,000	108,120
Sheets and plates	3,470,000	996,035
Tube and pipe	390,000	355,891
Magnesium carbonate and oxide	2,040,000	266,378
Manganese, unwrought	92,971	85,238
Tin, metal and alloys, unwrought	77,733	387,776
Tungsten, tungstates	9,276	43,766
Zinc:		
Metal and alloys, unwrought	593,336	650,273
Oxide and peroxide	135,022	101,162
INDUSTRIAL MINERALS		
Cement	6,060,000	189,962
Fluorspar	1,200,000	117,914
Graphite, natural	333,460	50,971
Talc	710,000	58,478
MINERAL FUELS		
Coal	55,050,000	1,459,452
Coke, semicoke	15,200,000	915,806
Petroleum:		
Crude oil	10,310,000	2,128,009
Refinery products	8,270,000	2,128,079

Source: General Administration of Customs of the People's Republic of China, 2000, China monthly exports and imports, no. 12.

TABLE 4
CHINA: IMPORTS OF SELECTED MINERAL COMMODITIES IN 2000

	Quantity (metric tons) 1/	Value (thousands)
METALS		
Aluminum:		
Alumina	1,880,000	\$638,457
Metal and alloys, unwrought	914,099	1,325,443
Semimanufactures	457,032	1,219,327
Scrap	399,268	268,758
Chromium, chromite	1,110,000	96,834
Copper:		
Ore	1,810,000	805,783
Metal and alloys, unwrought	812,126	1,501,371
Semimanufactures	740,989	1,996,894
Scrap	2,501,131	1,007,569
Iron and steel:		
Iron ore	69,970,000	1,857,699
Steel:		
Bars and rods	650,000	383,440
Seamless pipe	660,000	536,006
Shapes and sections	190,000	104,561
Sheets and plates	14,100,000	7,173,198
Manganese ore	1,200,000	95,404
INDUSTRIAL MINERALS		
Diamond kilograms	1,503	693,935
Fertilizers:		
Compound fertilizers	5,680,000	976,011
Potassium chloride	5,990,000	715,719
Potassium sulfate	190,000	33,026
Sodium carbonate	134,953	14,600
Titanium dioxide	141,932	264,222
MINERAL FUELS		
Coal	2,120,000	68,598
Petroleum:		
Crude oil	70,270,000	14,860,657
Refinery products	18,050,000	3,657,061

1/Except for diamond.

Source: General Administration of Customs of the People's Republic of China, 2000, China monthly exports and imports, no. 12.