

THE MINERAL INDUSTRY OF

CHINA

By Pui-Kwan Tse¹

China, the most populous country in the world, faced enormous challenges in managing its transition from a central planning system to a market oriented system. At the fourth plenary session of the 14th central committee held in September 1994, the Communist Party emphasized the theme of stability rather than reform in a resolute way. The Government expressed concerns about rising prices, unrest among the unemployed, agitation by peasants whose incomes have been squeezed by rising costs, and the greater incidence of crime across the country.

In 1994, China's gross domestic product (GDP) grew 11.8%, the cost of living increased by 24.1%, and retail prices rose by 21.7% compared with those of previous year.² The Government also found the task of reforming state-owned enterprises more challenging and politically riskier than expected. According to an official from the State Statistics Bureau, more than 40% of state-owned companies showed a loss. China's state-owned enterprises had a surplus work force of at least 17 million people and more than 120 million surplus laborers in the rural areas. Additionally, there were millions of jobless peasants in the rural areas where the Government did not measure the unemployment rate. The planned implementation to rationalize 100 state-owned enterprises in 18 cities was postponed until 1995 because of the fear of worker unrest. More than 8,000 workers in the Karamay Oilfield in Xinjiang Uygur Zizhiqu³ were on strike in September 1994, demanding higher wages and better welfare benefits.

Government Policies and Programs

On March 25, 1994, the State Council issued policy guidelines for developing industries for the 1990's in China. China would accelerate the development of the machinery, electronic, petrochemical, automobile, and construction sectors. In the fuels sector, China would place equal emphasis on the development and conservation of energy to achieve a balanced development of both the economy and the environment. The country would accelerate the construction of state-owned coal mines and would make efforts to improve local mines operated by townships. It would continue to develop both thermal and hydroelectric power and expand nuclear power.⁴

In 1994, China overhauled its tax system by simplifying collection procedures and boosting the central Government's

dwindling share of revenues. A uniform 33% tax rate on all enterprises replaced the 55% tax levied on large- and medium-size enterprises. Preferential taxes on foreign enterprises and joint ventures would not be affected initially, but these taxes would eventually be brought in line with the rate of those levied on domestic enterprises. A value-added-tax (VAT) would be applied at an uniform rate of 17% on all goods in circulation, but an additional excise tax would be levied on such luxury items as cigarettes, alcohol, cosmetic products, gas, and petroleum. A mineral resource fee, or a tax from 1% to 4%, would be levied on each mining operator. Also, China replaced its official two-tiered exchange rate with a single unified rate.

An important legal framework, the Company Law, was passed in 1994. The Company Law provided a legal and unified basis for the establishment and operation of a company in China. Under the law, two forms of companies may be established—a limited liability company and a joint-stock company. The law covered all ownerships—private, public, and foreign-funded enterprises. The Government aimed to achieve a separation of the ownership function of the State from the management of the enterprises within a framework of greater autonomy and accountability. This allowed a fundamental restructuring of the state-owned enterprises. However, the Government also reemphasized that state-owned enterprises are the cornerstone of the Chinese economy. The Government has been seeking foreign investors to finance technical renovation in state-owned enterprises.

The reform of an independent financial system was on hold. The People's Bank of China (PBC) is supposed to be a independent central bank, but its independence has not been guaranteed. Its right to handle basic currency and enforce financial regulations remained under the monetary policy committee of the Government. Any reform progress depended on the Bank's obligation to continue funding ailing state-owned enterprises. The central bank also lacked authority under the law to adequately supervise nonbank financial institutions, such as trust and investment companies.

Mineral resources are considered a part of the national heritage. The mining industry has been mostly off-limits to foreign investment. Recently, Chinese authorities realized that the development of mineral resources required a large amount of capital and advanced technology, both of which

China lacked. However, international mining companies doing business in China faced many obstacles. State agencies battled over jurisdiction on mining ventures. Rules on taxation, operating policies, and project examination procedures needed to be clarified.

The State Planning Commission announced a halt on investments for aluminum and copper semimanufactured products. In recent years, commerce among these commodities was distorted and the supply of raw materials remained limited.⁵

According to a company official, China National Nonferrous Metals Industry Corp. (CNNC) was waiting for Government approval to become a holding company in 1995. The Government would set up a national association to manage the nonferrous industry. CNNC would hold shares in its subsidiaries but would not be directly involved in their business operations. CNNC would focus on diversifying its business and tapping overseas resources and capital to secure the supply of raw materials needed for expansion. CNNC would select a few of its subsidiaries to be listed on the domestic stock market.⁶

Beginning in the 1980's, China devoted significant attention to protecting the environment. The National Environmental Protection Agency was established during the 1980's to supervise environmental protection, to promulgate national standards, and to establish environmental monitoring systems. In 1989, National People's Congress issued mineral resources laws and environmental protection laws to safeguard the country's natural resources and to limit pollution levels.

Production

The demand for steel was expected to reach 120 million metric tons (Mmt) by the year 2000 in China. China planned to expand total steel output capacity from the current level of 100 Mmt to 135 Mmt by the year 2000. The development of China's steelmaking industries would focus on expansion and renovation of existing facilities. According to the Ministry of Metallurgical Industry (MMI), domestic steel companies were expected to supply 95% of the different types of steel products for the construction of railways, power stations, and ships by the end of this century. Nearly 80% of oil pipes and automobile steel parts would be supplied by domestic sources. By the year 2000, MMI anticipated that domestic steel enterprises would produce about 90% of rolled steel products to meet international standards. Much of today's equipment still conforms to 1950 standards in China and currently, only about 25% of the country's steel equipment is considered modern. Approximately 34% of steel output is from continuous casting. The Government has initiated plans to improve the quality and efficiency of rolled steel production. It also sought to maintain energy consumption below 1.45 metric tons (mt) of standard coal equivalent per ton of steel and to increase annual production to 55 mt of

steel per worker.

The Chinese Government estimated that the country's manufacturers will require about 4 Mmt of strip steel, 20 Mmt of sheet steel, and 14 Mmt of steel plate by the end of the decade. Domestic steel enterprises can supply most of these products. Even though the output capacity of high-grade steel products for rails, oil pipe, cold rolled plate, and silicon steel sheet had increased at an annual rate of 9%, the country was expected to remain in short supply by 5.7 Mmt of high-grade steel products.

MMI planned to renovate open-hearth furnaces with converters in existing steel plants in the Ninth Five-Year Plan (1996-2000). The aim was to reduce China's open-hearth furnace output capacity to 8 million metric tons per year (Mmt/a) by the year 2000 and to phase it out completely by 2005. Presently, China's electric arc furnace (EAF) output capacity is about 20 Mmt/a. The output capacity for the majority of them is about 15 mt each. MMI estimated that the total EAF output capacity will be about 25% of total steel production capacity in the next 10 years. The limited supply of domestic scrap and restricted power supplies in most parts of the country would restrict the share of EAF steel production in China.

In 1994, the world demand for nonferrous metals recovered and nonferrous metal prices increased. Prices for nonferrous metals also had risen in China. Compared with January 1994, the average domestic market price in October 1994 had increased by 39% for aluminum, 28% for copper, 43% for lead, 10% for nickel, and 15% for tin. The rapid price increase for raw materials and energy caused metal production costs to rise sharply. In June, the Government stopped Futures Market trading in rolled steel, coal, and sugar. Large amounts of speculative capital turned up in the nonferrous market, pushing prices higher. Following the stabilizing steps taken by the Government, metal prices held constant at the Shanghai and the Shenzhen Metal Exchange Markets at yearend.

China imported more than 1 Mmt of alumina in the first 7 months of 1994⁷ and that reportedly forced domestic alumina producers to cut their output. The demand for aluminum metal and other metals in the construction sector was lower than expected because of a Land Tax Regulation imposed on the capital gains tax on the assignment of real property in the first half of the year. To boost the market, the Government reduced the VAT, originally introduced in January 1994, on nonferrous metals from 17% to 13% and loosened its macrocontrol measures in mid-1994. In mid-1994, the domestic demand for aluminum increased. The price of aluminum metal rose sharply because of the decrease in imports and the increase in exports of aluminum in China. The Yangcheng Evening News in Guangzhou, Guangdong Province, reported that "hoarders" in Guangzhou and Hainan Province kept large stocks of aluminum off the market to drive the price up. The price in the Shenzhen Metal Exchange Market went up from 11,700 yuan/mt of aluminum

in January to 18,000 yuan/mt in December 1994. China was expected to produce 1.45 Mmt of aluminum in 1994.

According to an official from CNNC, about 51% of the alumina consumed at China's 69 smelters in 1994 was imported. The Government expected that domestic smelters would increase the consumption of domestic alumina to 70% in 1995. In an attempt to reduce the imported alumina supply, CNNC's four alumina producers—the Great Wall Aluminum Corp. (the Zhengzhou Aluminum Plant and the Zhongzhou Aluminum Plant), the Guizhou Aluminum Plant, the Shandong Aluminum Plant, and the Shanxi Aluminum Plant, reportedly planned to lower their second-grade alumina price from 1,750 yuan/mt in 1994 to 1,650 yuan/mt in 1995. The Government planned to increase the import tax of alumina from the current 7% to 20% in 1995. According to officials from CNNC, it planned to stockpile 120,000 mt of alumina and to import less than 1 Mmt of alumina in 1995.⁸

China's output of antimony accounts for about 75% of the world's total. In the past several years, world supply of antimony exceeded the demand in the world market. In 1993, the State Council and the Ministry of Foreign Trade and Economic Cooperation (MFTEC) approved the formation of the China National Tungsten and Antimony Import Export Corp. to oversee the export of antimony and to clamp down on illegal exports. At the same time, the Government removed subsidies and increased the tax burden on antimony production enterprises. China antimony producers began to cut back on production and reduced the export of antimony at low price. Heavy rainstorms caused great difficulty in shipping products from the Guangxi and Hunan areas in the summer of 1994 and most western antimony consumers faced shortages of antimony in the third quarter of 1994. In April 1994, the price of antimony was about 15,000 yuan/mt in China. In August 1994, the price of antimony went up to 36,000 yuan/mt. By October 1994, western antimony consumers had difficulties in obtaining antimony from China, even though they were willing to pay premium prices.

Domestic copper mine production remained at around 350,000 mt in 1994. The output of refined copper fell short of the 720,000 mt target by 3%. The inadequate domestic supply of copper ore restrained the output of copper.

Demand for nickel exceeded supply in China. China was expected to produce 31,000 mt of nickel in 1994. With the expansion of stainless steel and steel alloy production, the price of nickel went up by 10% to 57,000 yuan/mt in the first 6 months of the year. The demand of nickel dropped considerably in the second half of the year. However, the per-ton price of nickel was maintained at 57,000 yuan.

China's tungsten production accounted for 70% of the world's total. The price of tungsten has continually declined in the past several years. Chinese tungsten enterprises faced serious losses since the State Government eliminated subsidies on production and exports in the early 1990's. In

addition, beginning in 1994, the Government levied a resources tax, a VAT, and a consumption tax on mines, thus decreasing profits of tungsten enterprises. In July 1994, the China Tungsten Association, consisting of 21 large and medium tungsten producers in China, formed a task force to monitor the production and market price of tungsten in both the domestic and international markets. China would reportedly adopt measures to limit production and maintain a world market price to ensure a profit margin. Although the price of tungsten concentrates (containing 65% tungsten trioxide) in the domestic market had risen from 9,000 yuan/mt at the end of 1993 to 20,000 yuan/mt in August 1994, the average production costs reportedly remained higher than the selling price in China. Chinese tungsten producers expected to maintain the price level of tungsten concentrates above 30,000 yuan/mt. The production of tungsten was expected to drop by 14% from that of the previous year.

China's bismuth production ranked first in the world. In the summer of 1994, heavy flooding in the southern part of China hampered bismuth mine and refinery production facilities in that region. The price of bismuth in both domestic and international markets went up sharply at that time. Between January and May, 99.99% pure bismuth cost about 46,000 yuan/mt in China. By July 1994, the supply of bismuth was tightened and bismuth prices soared to 78,000 yuan/mt. The production of major mineral commodities is listed in table 1.

Trade

According to the General Administration of Customs of China, total foreign trade in 1994 reached \$236.7 billion,⁹ accounting for almost 46% of China's GDP. The value of imports was \$115.7 billion, an increase of 11.2% from that of 1993. The value of exports was \$121 billion, up 31.9% from that of 1993. Following a year of trade deficits, China returned to a favorable trade balance.

MFTEC published regulations for quota controls on export commodities in July 1994. Mineral and metal commodities under import quota control were crude oil, oil refinery products, and chemical fertilizers, such as potash and phosphate. Crude oil and oil refinery products would be handled by the China National Chemical Import and Export Corp. (Sinochem), China International Petrochemical United Corp. (Unipec), and the United China Petroleum Corp. The Tariff Policy Commission of the State Council announced provisional rates for 255 items that were subject to change beginning March 1, 1995. China reduced export tariffs on lead ore and concentrates, zinc ore and concentrates, and unforged lead and scrap lead to 0%; tin ore and concentrates from 50% to 20%; phosphate from 20% to 10%; and forged zinc and scrap zinc from 20% to 5%.¹⁰

The soaring price in the international market and tightened Government credit control limited imports of copper to China. In 1994, China reduced its imports of copper

concentrates and copper metal from the previous year by 5% and 20%, respectively. The domestic copper price rose by more than 60% in 1994, reaching 29,000 yuan/mt in November.

The United States is China's largest supplier of copper scrap. In the first three quarters of 1994, China imported more than 600,000 mt of copper scrap, mainly from the United States and European countries. This was higher than total copper scrap imports in 1993. Low labor costs for dismantling and reprocessing allowed small Chinese copper producers to compete for copper scrap. Also, the 17% VAT did not apply to imported scrap if products made from that material were reexported. While China's imports of copper scrap increased, imports of primary copper metal and its alloy decreased so that the total copper consumption remained constant in 1994 compared with that of 1993.

The supply of lead and zinc exceeded demand on the domestic market. The increase in demand for lead in the international market led China to raise its exports of lead to earn foreign exchange. According to the General Administration of Customs of China, in the first 10 months of 1994, China exported 122,700 mt of lead, up 86% from that of 1993. However, the excessive export of lead led to a shortage in supply in the domestic market in the second half of the year. At the beginning of the year, the price of lead was 3,400 yuan/mt, but in August, the lead price soared to 5,000 yuan/mt. In 1994, China was expected to produce 410,000 mt of lead. The combination of domestic consumption and exports to other countries was to be about 440,000 mt. As a result, there was a shortfall of 30,000 mt of lead.

Structure of the Mineral Industry

All Chinese large minerals and metals enterprises are state-owned. However, considerable overlapping of authority existed for various mineral and metal commodities. MMI is responsible for barite, iron ore, iron, manganese, and steel production, as well as some magnesite and dolomite mines and plants. CNNC is in charge of nonferrous metals and byproduct outputs of bismuth, gold, and silver. Gold production is supervised by the China National Gold Corp. The Ministry of Chemical Industry has responsibility for boron, potassium, phosphate, salt, sulfur, various inorganic salts, and chemical fertilizers. The China Non-metallic Mineral Industry Corp. is responsible for the operation of mines and processing facilities for a wide array of industrial minerals and subordinate processing enterprises. The State Administration of Building Materials is in charge of cement, dolomite, limestone, sand and gravel, and stone aggregates used for construction. For the energy sector, the following are responsible for all aspects of energy exploration, production, or mining: the Ministry of Coal Industry (coal); China National Petroleum and Natural Gas Corp., generally known as China National Petroleum Corp. (onshore oil and

natural gas); China National Offshore Oil Corp., (offshore oil and natural gas); and China National Nuclear Corp. (uranium). Major nonfuel and fuel producers are listed in table 2.

Commodity Review

Metals

Aluminum.—The second-stage construction of the Shanxi Aluminum Plant in Hejin Xian, Shanxi Province, was completed. Trial runs began in August 1994. The 3.9 billion yuan investment project took 5 years to complete and, with a total output capacity of 1.2 Mmt, is China's largest alumina producer. The Government planned to continue increasing the plant output capacity of alumina to 2 Mmt/a. An aluminum smelter, aluminum alloy plant, and a cement plant were included in the Shanxi Aluminum Plant's third-phase expansion plan.¹¹

CNNC and the People's Government of Guangxi Zhuangzu Zizhiqu joint-investment project, the Guangxi Pingguo Aluminum Co. at Pingguo Xian, was nearly completed in 1994. The 100,000 metric tons per year (mt/a) aluminum smelter began trial runs in September. Alumina production was scheduled to be put into operation in early 1995. The construction of five bauxite mines was completed. Initial output capacity would be 1.9 Mmt/a of bauxite. The first-phase construction site covered an area of 1,750 square kilometers (km²) and reportedly contains bauxite reserves of 240 Mmt. The main equipment and technology for producing alumina and aluminum metal were imported from Denmark, France, Holland, Japan, and Sweden, whose Governments made preferential loans to purchase the technology, equipment, and staff training.¹²

Alumax Inc. of the United States opened a representative office in Beijing. According to an official from Alumax Inc., the company planned to invest \$250 million in pursuing joint ventures on manufacturing aluminum building products in China. Alumax Inc. would provide technical assistance through a co-operative agreement with CNNC.¹³

CNNC and Hwangs International Holdings Ltd. (Hwangs) of the United States signed a contract for a joint venture. Under the agreement, CNNC's subsidiary, the Lanzhou Aluminum Plant in Lanzhou, Gansu Province, with a 51% share and Hwangs with a 49% share would invest \$188.4 million to develop the aluminum industry in China. The joint venture was named the Yellow River Aluminum Co. Ltd. Hwangs would introduce advanced smelting technology and modern management to the joint venture. The joint venture planned to add about 100,000 mt of aluminum output capacity to the Lanzhou Aluminum Plant.¹⁴

The China International Trust and Investment Corp. (Citic) of Australia, a Chinese state-owned company, reached an agreement with Portman Mining Ltd. of Australia to purchase 45 million shares or 52.5%, (with each share

valued at 84 Australia cents) from Portman Mining Ltd. The purchase was subject to shareholder and Australian Foreign Investment Review Board approval. The formal deal was expected to be completed in February 1995. Citic (Australia), through Portman Mining Ltd., planned to secure mineral resources to supply to China and other Asian countries. Citic (Australia) was set up by Citic in 1986 when it bought 10% of the Portland Aluminium Smelter.¹⁵

Chromium.—The Xinhua News Agency reported that a large chromium deposit was found in Xizang Zizhiqu. The Xizang government completed the first-phase construction of its Luobusa chromium/iron mine. The mine had a reported annual output of 50,000 mt of chromium ore having a metal content as high as 50%. According to the Xizang Statistical Yearbook, Xizang Zizhiqu produced 84,175 mt of chromium ore in 1992.

Copper.—The Government approved the proposed expansion plan of the Guixi Smelter by Jiangxi Copper Co. in Jiangxi Province. The second-phase construction will cost about 1.9 billion yuan. After completion, annual output capacity of electrolytic copper would increase from the current 86,000 mt/a to 200,000 mt/a. Most of the key equipment and technology would be obtained from other countries.¹⁶

The Tongling Nonferrous Metals Co., in Anhui Province, and a Hong Kong company formed a joint venture to invest \$161 million for the expansion of refined copper production at the Tongling copper smelter. The new plant was scheduled to be in operation in 1996 and was expected to increase the company's annual output capacity to 170,000 mt of refined copper.¹⁷

Gold Mines of Australia Ltd. (GMA) signed a letter of intent with CNNC and Asia Resource Capital Ltd. on GMA's Mount Lyell copper-gold mine in Tasmania, Australia. Under the agreement, CNNC would purchase 100% of the Mount Lyell Mine's output for 4 years, from January 1, 1996 to December 31, 1999, at the London Metal Exchange (LME) copper price at the time of purchase. CNNC would also guarantee GMA that the company will pay a minimum copper price of \$1.98 per kilogram (kg) [\$0.90 per pound (lb)] for 77% of the mine's output. In return, GMA granted CNNC an option to acquire 20% of the Mount Lyell Mine for \$19.4 million at any time before mine startup or February 1, 1996. If CNNC exercised its option, the \$1.98 per kg (\$0.90 per lb) price guaranteed by CNNC would increase from 77% to 96.25% of the mine output share. GMA reportedly planned to invest \$40 million to restart production at the mine in 1995. The mine was closed in 1991 by the former owner, Renison Goldfield Consolidated. After restart, the mine would have an initial production capacity of 1.5 Mmt/a, increasing to 2 Mmt/a in the second year, and to 3.5 Mmt/a in 1998. The ore contained about 1.2% of copper and 0.3 gram per metric ton

(g/mt) of gold.¹⁸

LME brokers, including Crédit Lyonnais Rouse, Merrill Lynch, Lehman Brothers, and Prubache Securities, reportedly claimed that Citic's subsidiary, Citic Shanghai, owed them about \$40 million for copper trade in 1994. The Chinese Government arrested four staff employees in Shanghai on corruption charges relating to unauthorized trading. According to Citic, no domestic subsidiary of Citic was permitted to acquire foreign credit from overseas except the Citic Industrial Bank. Citic also claimed that, under the laws of China, Citic's Shanghai Branch was an independent legal entity and that the parent company would not be liable to pay the debt. However, the LME brokers insisted that Citic Shanghai was a branch and not a subsidiary of Citic. Negotiations on this matter were to begin in mid-January 1995.^{19,20}

Gold.—The State Council decided to permit foreign investors to invest in certain types of gold mines in China. Foreign investors could participate in mines with either low-grade ores or which required advanced smelting technology. China has selected 10 gold mines, with proven reserves of ranging from 10 mt to 50 mt, as pilot projects in the provinces of Guizhou, Guangdong, Jilin, Liaoning, Shandong, and Yunnan, and in Guangxi Zhuang Zizhiqu. The China National Gold Corp. (CNGC), on behalf of the Government, would negotiate and sign the contracts with foreign investors. Any gold output must be sold to the Government at a price of about 10% below the international gold market price.²¹

Statistical information on gold and silver was considered a state secret in China. However, an official from the Ministry of Geology and Mineral Resources (MGMR) disclosed that the 1993 output of gold in China was about 90 mt.²² This was well below estimates by Western gold observers. Chinese gold producers were required to sell their gold to PBC at a fixed price of 96.96 yuan/g. According to an official of MMI's State Gold Bureau, only about 84% of all gold output was sold to the PBC in August 1994, while the rest was illegally traded. Shandong is the largest gold-producing province in China. In August, the Provincial Government of Shandong reportedly closed down 641 illegal gold mines and 50 retailing and processing shops in Shandong. The Government estimated that more than 300,000 illegal entities were involved in private gold mining. The State Gold Bureau, PBC, security departments, and local governments made efforts to eliminate illegal gold exploration and marketing.

According to an official of the State Gold Bureau, the Government decided to allocate \$47.1 million to finance gold geological prospecting programs in 1995. The funds would be provided to domestic gold enterprises at low interest rates.

Barrick Power Gold Corp., a joint venture of America Barrick Resources Corp. of the United States and Power Corp. of Canada, signed letters of intent to set up two joint

ventures with CNGC to develop the Paishanlou deposit in Liaoning Province and the Changkeng deposit in Guangdong Province. In the first agreement, Barrick Power Gold Corp. would acquire a 75% interest and provide management, technology, and financing in the Paishanlou deposit. Initial capital investment would be \$40 million. A prefeasibility study reportedly envisaged an open pit mine producing 30,000 metric tons per day (mt/d) of ore and milling 4,000 mt/d. The Paishanlou deposit reportedly has gold reserves of about 50 mt. Construction was expected to take 3 years to complete.²³

In the second agreement, Barrick Power Gold Corp. and CNGC would conduct joint exploration, development, and production at the Changkeng deposit. Changkeng is reportedly a refractory deposit and the Barrick Power Gold Corp. believed that its autoclaving technology would be particularly suitable for the development. Samples from the Changkeng deposit have already been tested at Barrick's Goldstrike Mine in Nevada. An exploration program was planned for the Changkeng deposit in 1995 when the joint venture company is established.²⁴

The Asia Minerals Corp. of Canada and the Shandong Zhaoyuan City Gold Corp. of China signed an agreement to invest \$35.2 million in the development of the Yingezhuang Mine in Shandong Province. A feasibility study indicated that the mine has minable ore reserves of 19.4 Mmt at a grade of 2.82 grams per metric ton (g/mt) of gold.²⁵ According to Asia Minerals Corp., the Yingezhuang Mine, which started up in 1992, has a current capacity of 400 mt/d. In 1993, the mine produced 340 kg of gold from 140,000 mt of ore, at a reported cost of \$6.10 per gram. Gold occurs in a shear zone within an altered granite. The mineralogy is described as "simple" and recovery from flotation and cyanide leaching was 91% in 1993. The feasibility study proposed to increase daily capacity to 2,000 mt. In addition, more work was required to evaluate the mine's economic potential and define mining reserves. According to the agreement, Asia Minerals Corp. must finance \$3.5 million on underground drilling, engineering, and design work in order to earn its 50% of interest of the mine. The agreement would be submitted to the Government for approval. Asia Minerals Corp. also has shown interest in developing the Lannigou Mine in southern Guizhou Province, which reportedly contains 45 mt of gold.²⁶

Iron and Steel.—At the beginning of 1994, the Government removed the quota and licensing system for steel imports. China planned to import 12 Mmt of rolled steel in 1994, but imports reached more than 14 Mmt of rolled steel in the first 8 months; most of the receipts were imported through unofficial channels.²⁷ Total rolled steel imports were expected to reach 20 Mmt in 1994. Reportedly, 3,900 domestic companies were importing steel in the first quarter of 1994. The number of steel importers reportedly increased to more than 6,900 by the end of June. Steel imports

substantially exceeded demand and increased steel stockpiles. In addition, the Government tightened the bank credit policy to control investments in order to bring down inflation. The price of most steel products has declined more than 10% since early 1994.

In September 1994, the Chinese Government issued a series of regulations to control steel imports. All shipments of steel products had to be registered. Imported rolled steel used in making products that were exported was not allowed to be sold on the domestic market. Steel imported through barter, border trade, or through other non-cash transactions required the payment of normal tariffs instead of receiving preferential treatment as before. The Government's justification was that this move was necessary to protect Chinese steel production. Officials from the ministries of Foreign Trade, Planning, Metallurgy, and Internal Trade, as well as the State Administration for the Inspection of Import and Export Commodities participated in setting up a steel subcommittee under the China Chamber of Commerce of Metals, Minerals, and Chemicals Importers and Exporters. The subcommittee was to coordinate import and export prices, marketing, business contracts, and product quality. The Government ordered steel companies to reduce their production of rolled steel products by 10% in the second half of the year. The subcommittee also announced that the China National Metals and Minerals Import and Export Corp. (Minmetal) was the sole company that could negotiate on steel imports with Japanese steel export companies.²⁸

Most of China's iron and steel enterprises have reportedly experienced very difficult financial situations. The price of raw materials and energy have increased sharply in the past 2 years. Triangle debts (inter-enterprise debts) between steel producers increased. The Government miniretrenchment plan, put into effect in July 1993, reportedly resulted in iron and steel enterprises owing billions of yuan to coal suppliers and electric powerplants. In order to continue providing coal and electricity to the steel plants, fuel and energy suppliers insisted that steel plants first repay the funds owed them. Anshan Iron and Steel Corp. (Angang), China's largest steel producer until 1994, was forced to shut down two blast furnaces in December 1994 because it had no cash to pay for coal. Many other steel plants also were facing the same problem. Shoudu Iron and Steel Complex (Shougang), long regarded as an economically efficient enterprise in China, had to obtain a bank loan in order to pay its workers for 1 month in 1994.²⁹

Brazil's Companhia Vale do Rio Doce (CVRD) and MMI agreed to construct a new deepwater port in northern Brazil. Construction of a new port would reduce the cost of transporting ore across the country. MMI's agreement for port construction was one of the remaining obstacles to the proposed joint venture between CVRD and MMI to mine iron ore in Carajas, northern Brazil. The joint-venture project included installation of a new mining unit to expand the output capacity by 8 Mmt/a. In 1994, CVRD reportedly

sold 7 Mmt of iron ore to China. CVRD expected to sell 15 Mmt of iron ore to China by 1996.³⁰

Angang and the Schloemann-Siemag International Engineering Co. Ltd. of Germany formed a joint venture, Angang-SMS, to design and manufacture metallurgical equipment. The major task of the joint venture was to carry out technical renovation at Angang. The cooperative agreement would last for 11 years with equal partnership.³¹

The third-phase expansion of the Baoshan Iron and Steel Complex (Baogang) was expected to be completed in 1998. With an additional 4.3 Mmt steelmaking capacity, Baogang would have an annual output capacity of 11.5 Mmt of crude steel. The third-phase expansion focused on the production of hot-rolled and cold-rolled steel sheet and strip, including tinplate, electrical sheet, hot-rolled steel for welded oil pipes, and plate for shipbuilding. Upon completion, Baogang's continuous casting capability was expected to increase from 60% to 90%. The No. 3 blast furnace, with a design capacity of 4,350 cubic meters (m³) and an annual production capacity of 3.5 Mmt of iron, went into operation in September 1994. The total pig iron output capacity increased to 9.75 Mmt/a. The hot rolling mill was being supplied by Mitsubishi Heavy Industries. Clecim of France and Danieli of Italy won a contract to supply a 1.5 Mmt/a DC electric furnace and a continuous caster to produce 980,000 mt/a of pierced billet. SMS Schloemann-Siemag, Mannesmann-Demag, and Siemens of Germany, Nippon Steel of Japan, and Littel of the United States would supply a 1,420-millimeter (mm) cold-rolled strip mill and tinning line. Baogang imported about 95% of its iron ore from Australia, Brazil, India, and South Africa.³²

Baogang and Mannesmann Demag AG of Germany reportedly established Demag Metal Plant Technology Ltd., a 49% to 51% equity joint venture, with a total investment of \$5 million. The joint venture would design, manufacture, and sell metallurgical equipment and was expected to begin operation in January 1995, focusing on markets in China and Southeast Asia.³³

Since 1992, Bao-Trans Enterprises Ltd., a joint venture between Baogang and a Hong Kong company, provided Baogang with shipping services for imports of iron ore. It also transported coal and other commodities to export customers. Baogang has set up two more joint ventures in Hong Kong—Bao Island with Island Navigation Corp. International Ltd. and Bao Hercules with a Chinese state-owned metal company in New York.³⁴

Shougang formed a subsidiary, Shougang Concord International Transport, to handle its iron ore imports. It chartered vessels to transport iron ore from its Hierro Peru Iron Mine in Peru to China. Shougang hoped to establish a company fleet during the next 2 years.

Shougang's Hierro Peru Iron Mine reportedly produced 6.86 Mmt of iron ore in 1994. Shougang reported profits of more than \$5 million in the first year after it took over the operation. In September, the Hierro Peru Iron Mine workers

went on strike for 2 days in a dispute over medical care, housing, profit-sharing, and pay-related issues. Agreements were reached on most issues, with the exception of profit-sharing, which was reportedly to be settled in court.³⁵

The Guangzhou Iron and Steel Co., Boulder Gold of the United States, and Australia Oversea Resources signed a joint-venture agreement to build a mill that would have the capability to produce 55,000 mt/a of stainless bars from 12 mm to 35 mm diameter and wire rod from 5.5 mm to 8 mm diameter in Guangzhou, Guangdong Province. The mill would also be technically capable of producing structural shapes with minor equipment modifications. The mill was based on primary melting in coreless induction furnaces and secondary refining and featured an in-line arrangement between casting and reheating. Total investment was to be about \$85 million. In addition, the joint venture also proposed to build a stainless steel bar and wire rod plant. The plant would have an output capacity of 500,000 mt/a of steel products. The joint-venture arrangement was submitted to the Provincial and State Governments for approval.³⁶

The Taiyuan Iron and Steel Co. at Lufan Xian, Taiyuan Shi, Shanxi Province, completed the construction of its Jianshan Iron Mine in 1994. The mine had proven reserves of 158 Mmt and was designed to have an annual output capacity of 4 Mmt of iron ore.³⁷ Taiyuan Iron and Steel Co. also built a 1.6 Mmt/a iron concentrate plant near the mine site. In addition, Taiyuan Iron and Steel Co. completed the installation of its hot strip mill purchased more than 5 years ago from Nisshin Steel of Japan. The installed hot strip mill at the Taiyuan Iron and Steel Co. was a reconstructed mill that formerly was the No. 1 hot strip mill at Nisshin's Kure Works, closed in 1986. The mill has a capacity of 2.6 Mmt/a. Taiyuan Iron and Steel Co. planned to produce 1.35 Mmt/a of hot-rolled coil at this facility.³⁸

The Wuhan Iron and Steel Co. (Wugang) appointed SMS Schloemann-Siemag AG as the consortium leader to supply one two-strand wire rod mill with a capacity of 700,000 mt/a. Another consortium partner would be General Electric of the United States to supply electrical equipment. The mill will be designed for wire-rod production ranging from 5.5 mm to 20 mm diameter. The rolling speed will be at a maximum of 120 meters per second. The total cost was \$30 million and the mill was scheduled to start production in 1996.³⁹

Danieli and C. Officine Meccaniche SpA of Italy was awarded a contract by the Tangshan Iron and Steel Complex in Hebei Province to build an 800,000 mt/a bar rolling mill. The mill would produce deformed bars and long products in low-, medium-, and high-carbon steels. The mill was expected to commence operation at the beginning of 1996. Danieli also signed a contract with Laiwu Iron and Steel Co. in Shandong Province to construct a 600,000 mt/a multiproduct steel rolling mill.⁴⁰

The China Metallurgical Import and Export Corp. (CMIEC), a subsidiary of MMI, established a joint venture

with Mideast Integrated Steel Limited of India for the production of steel in the Cuttak District of Orissa, India. According to the agreement, CMIEC will supply steelmaking technology and buy back 100% of the steel products at prevailing international prices. The project would cost about \$100 million.⁴¹

The Chongqing Special Steel Plant in Chongqing Shi, Sichuan Province, was to build a new plant in 1994 about 5 km from the existing plant using advanced steelmaking technology. The new plant would be equipped with a 100 mt electric furnace, continuous casting facilities, and rolling mills. It would increase Chongqing's annual output capacity from 250,000 mt to 520,000 mt of crude steel and from 250,000 mt to 440,000 mt of rolled steel products. The total investment was expected to cost about \$400 million.⁴²

New Zealand's Pacific Steel agreed with Datong Iron and Steel to form a joint venture with a 58% to 42% equity of the total investment of \$25 million in an expansion project at Datong Iron and Steel plant in Datong Shi, Shanxi Province. Datong Iron and Steel retained 100% interest in the current operation that consists of three blast furnaces producing 230,000 mt/a of pig iron and a bar mill. The expansion project was planned to produce 270,000 mt/a of continuous cast billets, of which 70,000 mt/a would be rolled into finished products and the remainder to be sold locally. The expansion project was expected to be completed in 1995. On completion of the expansion project, Datong Iron and Steel would be renamed as Xin Da Iron and Steel.⁴³

Broken Hill Proprietary (BHP) Steel International of Australia received approval from the Shanghai Municipal Government to build two rolling and forming lines to produce roof and wall products for the local market in the Pudong District of Shanghai. The Guangzhou Municipal Government also gave approval BHP to build a rolling and forming line in the Guangzhou Economic and Technical Development District in Guangzhou, Guangdong Province. Each plant will have a capacity of about 15,000 mt/a. Raw materials will be imported from Australia. The Shanghai line was scheduled for commissioning in May 1995 and the Guangzhou plant would be placed into operation at the end of 1995. Both plants were to be wholly owned by BHP.⁴⁴

Lead and Zinc.—According to an official of Crédit Lyonnais Rouse Derivatives, Crédit Lyonnais was to provide \$20 million loan to Zhuzhou Smelter, under a trade financing agreement loan. According to an official of Zhuzhou Smelter, the repayment from the sale of metal was underway. Zhuzhou Smelter, one of the largest lead and zinc smelters in China, has an annual output capacity of 70,000 mt of lead and 110,000 mt of zinc. The smelter's officials planned to use the loan to expand its annual output capacity to 80,000 mt of lead and 130,000 mt of zinc. During September and October, Zhuzhou Smelter was reportedly forced to shut down production because of mechanical problems and a shortage of lead concentrates. The Zhuzhou operation

accounted for about one-half of China's total lead exports. The smelter signed contracts in early 1994 to supply 48,000 mt of refined lead to customers in southeast Asia. The smelter sought to import concentrates to fulfill its obligations.⁴⁵

According to CNNC, the Changba lead and zinc mine in Gansu Province was scheduled to expand its concentrate output. The Changba Mine came on-stream at the beginning of 1994. It reportedly planned to increase its current annual concentrate output capacity of 1,800 mt of contained lead and 38,000 mt of contained zinc to 5,000 mt and 50,000 mt, respectively, in 1996. Lijiagou, a new lead and zinc mine in the northern part of Gansu Province, was awaiting approval from the Government to go ahead with the planned expansion.⁴⁶

Progress in developing the Qiandongshen lead and zinc mine in Shaanxi Province was not known. The Asia Minerals Corp. of Canada and CNNC were reportedly having difficulties in developing the mine due to differences over technical and commercial issues.⁴⁷

Nickel.—On December 8, 1994, Inco Ltd. of Canada announced that it had entered into a joint venture with the Jinchuan Nonferrous Metals Corp., a subsidiary of CNNC, to produce nickel salts for the Asian market. The joint venture planned to construct a nickel chemical plant in the Shanghai area at a cost of about \$10 million. Inco will have a 65%-share in the venture, with Jinchuan holding the remaining 35%. Inco Pacific Ltd., Inco's Hong Kong-based affiliate, planned to open a representative office in Shanghai to further develop Inco's position in China.⁴⁸

Jinchuan Nonferrous Metals Corp. is the largest nickel and cobalt producer in China. Its annual output accounts for more than 80% of the country's total output. The second phase of its expansion, which reportedly cost about \$270 million, was scheduled to be completed by yearend 1994. After completion, Jinchuan would be able to increase its annual output to 50,000 mt of refined nickel.

Rare Earths.—Advanced Material Resources Ltd. (AMR) of Canada, through its subsidiary AMR International Corp., acquired an 80%-joint-venture interest in a rare-earths plant at Zibo, Shandong Province. It was AMR's second joint-venture rare-earths plant in China, the first being in Jiangyin, Jiangsu Province. The Zibo plant had a reported annual output capacity of 500 mt of rare-earth chlorides, of which about 50% was cerium. The Jiangyin plant has an annual production capacity of 300 mt of rare-earth compounds.⁴⁹

AMR also signed a contract to establish a rare-earths joint venture with Mianning Xian Mining Co. in Sichuan Province. AMR would provide the technology for the project and would reportedly have the exclusive right to market output internationally. Total cost for the first phase of construction was expected to be \$7.65 million.⁵⁰

Silver.—The State Council decided to increase the purchase and sale price for silver. PBC set the purchase price per kilogram for silver at 1,330 yuan and 1,350 yuan for silver contents of less than 99.9% and more than 99.9%, respectively. PBC also set the retail prices for each kilogram of silver at 1,480 yuan and 1,500 yuan, respectively. Foreign enterprises and trading companies could purchase silver at the state market price, plus a surcharge. The transfer action would be settled in foreign exchange.⁵¹

Tin.—In June 1994, China officially joined the Association of Tin Producing Countries (ATPC) and pledged to reduce its tin exports to 20,000 mt in 1994. China, the world's largest producer of tin, produced most of its output for internal consumption. According to the General Administration of Customs of China, in the first 11 months of 1994, China exported 38,965 mt of tin and tin alloys. However, since the reform of the foreign trade system in the late 1980's, the Government lost control over exports of tin. In an effort to meet its ATPC quota, the Government published new regulations concerning tin exports in mid-1994. Under the new rules, all tin exports, including tin bars, tin ores, and welded tin, must be licensed as part of the state's annual export plan. The Government extended its control over any foreign trading companies operating in China. Under the new rules, foreign traders wishing to export tin must coordinate with the China Chamber of Commerce of Importers and Exporters of Metals, Minerals, and Chemicals. In the first half of the year, a significant amount of tin was reportedly exported without being monitored by government officials.⁵²

Tungsten.—A trading company under CNNC withdrew from a minimum price agreement negotiated between China and the European Commission (EC) when tungsten duties were imposed in September 1990. The EC imposed provisional antidumping duties on tungsten products originating from China. A duty of 37% was reportedly imposed on imported Chinese tungsten ores and concentrates, 35% on tungsten oxide and acid, and 33% on tungsten carbide and fused tungsten carbide.⁵³

According to CNNC, China planned to produce a total of 23,830 mt of tungsten concentrates in 1994. However, domestic mines were reportedly still suffering from increased financial burdens due to new taxes imposed on the mining industry. Production costs reportedly increased more than 200% and nonproductive mines were closed during the past several years.

Industrial Minerals

Lithium.—The Xinhua News Agency reported that Chinese geologists discovered a large lithium deposit in Henan Province. The 40-km² deposit, along the border between Henan and Shaanxi Provinces, had two main ore

zones reportedly containing an estimated 5 Mmt of ore grading 10% lithium oxide (Li₂O).⁵⁴

Phosphorus.—The Mitsui Engineering and Shipbuilding Co. and Mitsubishi Heavy Industry Ltd. of Japan signed a contract with the China National Technical Import and Export Corp. to supply phosphate-based fertilizer equipment to the Wengfu Phosphorus Mine and the Wengfu Phosphate Fertilizer Plant. The Wengfu Phosphorus Mine, at Wengan Xian and Fuquan Xian, Guizhou Province had a reported total exploitable reserve of 580 Mmt with an average phosphorus pentoxide (P₂O₅) content of 25%. The first phase of construction reportedly included a 2.5 Mmt/a phosphorus ore dressing plant and an 800,000 mt/a calcium superphosphate plant. The \$1.4-billion investment first-phase project, including a \$62.7-million World Bank loan, was expected to be completed in 1997. Upon completion of the entire project, the facility would have an annual dressing capacity of 7.5 Mmt of phosphorus ore and an annual output capacity of 1.2 Mmt of calcium superphosphate.⁵⁵

Potash.—China and Israel reportedly reached a financial agreement for the Qinghai potash project at a total cost of about \$474 million. Of this, \$170 million was reportedly to be financed by equity and the remainder through loans. The Chinese-Israeli Potash Co. (Cipco) was formed by Dead Sea Works and United Development Inc. of Israel and Chinese partners in 1992. The Israeli partners each held 16.67% of the equity, while Chinese state and provincial enterprises would have 66.6%. Cipco planned to build a complex producing 800,000 mt/a of potash using Dead Sea Works' technology. Construction of the complex was expected to be completed in April 1995.⁵⁶

Talc.—The Haicheng Talc Mine Co. in Haicheng Xian, Liaoning Province, reportedly expanded its talc production capacity. The \$1.2 million investment in the Fanjiapu Mine commenced in 1994. The Haicheng Talc Mine Co. planned to expand its talc output capacity of superfine grade and powder grade by 7,400 mt and 27,000 mt, respectively. The Fanjiapu Mine was one of six underground mines operated by the Haicheng Talc Mine Co., Liaoning, Shandong, and Guangxi are China's main talc producing provinces. China produces more than 2 Mmt of talc annually.⁵⁷

Mineral Fuels

The development of the power industry in China was impressive in the past several years. However, China's power industry remains under pressure to catch up with the country's double-digit economic growth. Currently, the energy supply by share is made up of coal, 74.4%; crude oil and gas, 19%; hydropower, 4.6%; and nuclear, less than 0.05%. The Chinese power industry was expected to increase its power generating capacity to 300,000 megawatts

(MW) by the year 2000. To achieve this goal, the Government was encouraging various forms of cooperation, including export credits granted by foreign governments, the issuance of bonds and stocks, and joint-venture investments with foreign investors. An official from the Ministry of Power Industry (MPI) indicated that energy development priority would go to hydroelectric projects, coal-fired plants, and long-distance power transmission projects.

In recent years, electricity consumption sharply increased and the electricity shortage intensified, especially in the economically developing coastal regions. The Government set up a new electricity pricing system to ease the shortage of electricity. The North China Power Group supplying electricity to Beijing and Tianjin as well as Hebei Province increased electricity prices and charged different fees for commercial consumers in different time zones.

Foreign investors were frustrated by the bureaucratic gridlock as officials debated how to deal with foreign investment. In spring 1994, the Government considered a 12% to 15% return on investment in Chinese powerplants to be adequate. Even though the Government denied that it was setting a cap on investment return, many foreign investors terminated their negotiation and switched their funds to other Asian countries.⁵⁸

According to an MPI official, China planned to build more than 10 nuclear powerplants in the next 20 years. By 2020, total nuclear power installed capacity would be 20 gigawatts in China.⁵⁹ Currently, China has two commercial nuclear powerplants in operation—Qinshan in Zhejiang Province and Daya Bay in Guangdong Province. The Government designated feasibility studies for nuclear powerplants in the Provinces of Fujian, Hainan, Heilongjiang, Jiangsu, Jiangxi, Jilin, Liaoning, Shandong, Sichuan, and Zhejiang.

In November 1994, Atomic Energy of Canada Ltd. and China National Nuclear Corp. signed an agreement in principle that Canada would sell two 700-MW Candu-6 reactors to China. The \$2.6 billion nuclear reactors would be built at Qinshan. The Candu-6 reactor uses natural uranium and heavy water for cooling. Similar plants were operating or under constructing in Argentina, India, South Korea, and Romania.⁶⁰

In October 1994, China and South Korea signed an agreement to build two 1,000-MW light-water nuclear reactors in China. Location for the two reactors will be determined later.⁶¹

Second-phase construction of the Qinshan Nuclear Plant began in 1994. The two 600-MW reactors were designed by the China Nuclear Power Research and Design Institute in Sichuan and the Beijing Nuclear Engineering Research and Design Institute. With the approval from the Chinese and French governments, the design and construction contracts of the second phase of the Daya Bay nuclear powerplant (also called Ling'ao plant) were awarded to Framatome SA of France and GEC-Alsthom, a joint venture of GEC PLC of the United Kingdom and Electricite de France of France.

Banque National de Paris and China Development Bank signed letters of award to cover the project, which will be financed by export credits.⁶²

Coal.—On March 25, 1994, the State Council issued a circular to abolish the China Northeast and Nei Mongol United Coal Corp. (East Coal Corp.). The Ministry of Coal Industry (MCI) and local governments were assigned to take over all of the East Coal Corp.'s administration activities.⁶³

In December 1994, the State Council issued two decrees—Provisions on Management of Township Coal Mines and Measures on Management of Coal Production Permits. The decrees were to put an end to the history of managing township coal mines without legal backing and to herald a new era for those mines to be run and developed in accordance with legally binding regulations. Township coal mines had a labor force of 2 million and produced about 40% of the country's coal output. Illegal mining has reportedly spread to every part of the country. About one-half of the country's 80,000 township coal mines were reportedly operated without a permit. The Government shut down more than 13,000 illegal coal mines in 1994. Township coal mining has reportedly resulted in serious accidents, wasted resources, and damaged the environment.⁶⁴

China was the largest coal-producing country in the world. In 1994, China produced a total 1.21 billion mt of different kinds of coal and planned to produce 1.25 billion mt in 1995. The coal industry was hamstrung under the central planning system. It faced difficulties in gearing itself for a free market. Since 1993, MCI put forward a new policy for both liberalizing coal prices and canceling financial subsidies in 3 years. MCI required that the cadres of coal enterprises take the initiative to solve difficult problems rather than waiting for instruction from MCI. Concepts of marketing, quality, competition, and efficiency would be implemented at all levels of the workplace. However, coal enterprises continued to have too many employees and very low efficiency. Currently, major state-owned collieries have a total workforce of 3.5 million and produce 1.4 mt of coal per person per day. Local government-owned collieries have a workforce of 2 million and produce 0.7 mt of coal per worker per day. MCI stressed that the pace for reducing numbers of workers, raising efficiency, and developing tertiary industries must be quickened and that the coal industry should further open up to the outside world. MCI is drafting guidelines for foreign investors and would reportedly hold international bidding on the development of new coal deposits. In 1994, total Government subsidies to coal enterprises was reportedly 4 billion yuan. The Government reportedly planned to reduce its subsidies to 2 billion yuan in 1995 and to phase out subsidies in 1996.⁶⁵

The Government would reportedly implement a sale contract system between coal producers and consumers in 1995, with coal prices being settled by both sides through negotiation. All contracts were to be properly honored and

implemented and violators would be fined, all of which was intended reportedly as counter measures to avoid the system of deferral payment used by coal consumers. In 1994, the country's reported unpaid coal bill was more than \$1.2 billion. However, under the new system, the Government would maintain exclusive rights to buy an unspecified amount of coal in 1995, as it did in 1994, to support the power, metallurgical, and fertilizer sectors.

According to the General Administration of Customs of China, China exported 24.3 Mmt of coal and 4.04 Mmt of coke in 1994. MFTEC appointed the China National Coal Import and Export Corp. to coordinate all of China's coal exports. The latter corporation would export the coal under its management and undertake meeting the country's shipments in accordance with the coal export quota set by the Government.⁶⁶

China planned to build more coal-dressing plants near mines to increase the present annual dressing level of 300 Mmt to 600 Mmt in the year 2000. In 1993, only about 200 Mmt of raw coal was washed. Washing the coal would cut down on pollution and shipping costs. Currently, about 40% of China's railway capacity is allocated to transport coal from pits in the interior to coastal users and export terminals.

The Custom Coals Corp. of the United States, MRI Ltd. of Australia, and China Strategic (Holdings) Ltd. signed a cooperative venture with the Chinese Government to build a \$900-million coal slurry pipeline in China. The consortium would operate as China Pipeline Holdings Ltd., and hold a 51% equity interest in the pipeline, as well as have developmental and operational control of the project. The remainder of the interest was held by the China Coal Construction and Development Corp., a subsidiary of MCI. The 800-km-long underground Yu-Wei pipeline would run from Yu Xian, Shanxi Province, to Weifang Shi, Shandong Province. In addition to the pipeline, the project included the construction and operation of a coal-cleaning plant and port facilities. The project will use coal-cleaning technology developed by Custom Coals Corp. in conjunction with the U.S. Department of Energy, along with coal slurry technology developed by U.S.-based Williams Technologies Services.⁶⁷

Petroleum.—China's crude oil production increased at a rate 1% per year in the past several years, while crude oil demand grew more than 5% per year during the same period. However, China may become a net importer. According to the General Administration of Customs of China, in the first 11 months of 1994, China exported 16.58 Mmt of crude oil while importing 8.75 Mmt.⁶⁸ However, China exported only 3.18 Mmt of refined petroleum products while imports of refined petroleum products increased to 11.41 Mmt. Beginning in 1994, the price for domestic petroleum products dropped sharply compared with that of 1993. In March, the Government first announced an import restriction on crude oil and petroleum products in the northern China.

The domestic oil market remained unstable. In May 1994, China banned imports on crude oil and petroleum products and shut down the Shanghai Petroleum Exchange for 2 months. The Government also revoked petroleum import licenses issued in 1993, which the Government had originally extended, rather than issuing new ones for 1994. In June, the Government set up import quotas on a quarterly basis and imposed price ceilings for crude oil and petroleum products. Under the regulations, all imports were to be handled by Sinochem and Unipet.⁶⁹

China faced heavy pressure to strike a balance between the surplus oil available in the north and the oil shortage in the south. The Government believed that policies posted in the early 1994 would improve the north-south imbalance. However, according to an official from Sinochem, the fundamental problem remained unchanged: Southern end-users did not want to be restricted to buying only northern products. Even with addition of taxes, the cost of imported oil was cheaper on the domestic market.

In the past, China imported oil mainly from Southeast Asian countries. China was considering the Persian Gulf region as a long-term, main oil supplier to overcome its own production shortfall. China signed oil supply agreements with Saudi Arabia and Oman in 1993 and expressed interest in signing a long-term supply contract with Kuwait.

China National Offshore Oil Corp. (CNOOC) bought 32.58% shares from Atlantic Richfield Co. of the United States in Indonesia's oilfields near the Malacca Strait. The deal was approved by both the Chinese and Indonesian governments and the Indonesian state-own oil company, Pertamina. Atlantic Richfield Co. had been the principal shareholder in the block. Other shareholders included Nippon Oil Co. of Japan, Oryx Energy Co. and Kondur of the United States, and Lasmo PLC of the United Kingdom. The area covered 10,000 km² with a total of 13 oilfields in operation. The agreement set the terms for CNOOC's participation in the contract block until the year 2000, but it could be extended if the block proves worthy of further development.⁷⁰

China and Vietnam agreed to negotiate the dispute on the Spratly Inlands in Nan Hai (South China Sea). The two sides considered joint exploration for oil reserves in that region.

In 1994, CNOOC opened up 13 additional blocks in Nan Hai for international bidding. The concessions were in Yinggehai and Qiongdongnan at the mouth of Zhu Jiang (Pearl River). Chinese geologists estimated that potential gas resources in that region was 13 trillion m³. The depth of the water varies from 10 meters (m) to 300 m.⁷¹

The Xijiang 24-3 oilfield, a \$600 million investment, jointly developed by Phillips Petroleum Co., Pecten Orient Co., and Shell Exploration (China) Ltd., all of the United States, and China National Offshore Oil Nanhai East Co. (a subsidiary of CNOOC with the Chinese partner holding 51% equity) went on-stream in 1994. Initial production was

20,000 barrels per day (bbl/d) with a peak flow expected at 66,000 bbl/d within 2 years after a second field went into production.⁷²

Phillips Petroleum Co. of the United States signed a contract with CNOOC to explore for oil and gas in Bo Hai. The 11/05 block was in the central part of the Gulf of Bo Hai, 220 km east of Tianjin. According to the terms of contract, Phillips would carry out exploratory work, including a seismic survey and sinking wildcat wells. Phillips was solely responsible for the investment and would be entitled to operate any discoveries, while CNOOC has the right to participate up to 51% in any proposed development.⁷³

Kerr-McGee Corp. and Murphy Oil Corp., both of the United States, signed an agreement with CNOOC for exploration at the 4/36 block in Bo Hai. The block, 90 km east of Tianjin, covered 1,250 km², with seismic work to begin in 1995.⁷⁴

Exxon Corp. of the United States signed a contract with CNOOC for oil and gas exploration in the Dong Hai (East China Sea). The Dong Hai 34/02 block was 250 km off the coast of Wenzhou in Zhejiang Province. During the 7-year contractual period, U.S.-based Exxon Corp. would bear all exploration risks.⁷⁵

MGMR disclosed the discovery of oil and gas deposits in Xizang Zizhiqu, concentrated in the Lunpola and Qiangtang Basins in north Xizang. Good prospects of oil and gas deposits also were discovered in Lhasa, Jiangzi, and Gangba. Physical and chemical prospecting and satellite remote sensing proved the sedimentary rock in the Lunpola Basin to be over 4,000 m thick. Two rock systems contained oil between 1,000 m to 1,500 m thick.⁷⁶

According to British Petroleum, China's refineries ran at 77% of their 3.3 million barrels per day (Mbbbl/d) capacity in 1993. The Chinese Government discouraged construction of new refinery plants in China in the future but was promoting investments to expand or refurbish older plants. The 5 Mmt/a refinery project at Dalian, Liaoning Province, was expected to start a test run in March 1995. The new project, Dalian West Pacific Petrochemical Co., was a joint venture between Total of France and its Chinese partners—Sinochem, Dalian Municipal Government, and the Ministry of Chemical Industry. The refinery will process 50% Saudi Arabian heavy crudes and 50% Saudi Arabian light grades. Shell Oil Co. of the Netherlands planned to build a 5 Mmt/a refinery plant in Huizhou, Guangdong Province, but was a waiting Government approval.⁷⁷

Reserves

China is the world leader in proven reserves of antimony, barite, molybdenum, rare earths, titanium, tungsten, and vanadium. China has 55 billion mt of iron ore, albeit with an average grade of only 30% elemental content. Moreover, only 5% of the ore reserves contain more than 40% iron.

Major deposits occur in Anhui, Hebei, Liaoning, and Nei Mongol. Major gold deposits are in Hebei, Heilongjiang, Henan, Hunan, Jilin, Nei Monggol, and Shandong. Bauxite deposits occur in Guangxi, Guizhou, Henan, and Shandong. Lead and zinc deposits are in Fujian, Gansu, Guangdong, and Guangxi.

With the exception of some commodities, such as chromium, copper, and potash, China produces significant quantities of a wide array of minerals and metals, based on its production and/or export capability for these commodities.

Infrastructure

An inadequate transportation sector and telecommunications system are major factors hindering economic growth in China. The total capacity of its telephone network was targeted at 48 million units in 1995 and 65 million units in the year 2000. China was preparing a series of flexible policies to attract foreign investors in post and telecommunications, but it will not allow foreigners to become involved in management decisions.

In the next 3 years, the Ministry of Railways plans to spend \$15.9 billion on capital construction of new railways to meet the demands of China's economic development. In a new development program, China will build 6,600 km of new lines; double-track another 4,100 km; and electrify 5,600 km of old lines. China will develop large containers, cold storage, and bulk freight in cargo transportation.

China expected to build 29 new airports in southwest China in the 1990's, including Ganzi, Guangyuan, Jiangbe, Jiuzhaigou, Mianyang, Neijiang, Qiangjiang, and Wanxian in Sichuan Province; Bijie, Tongren, Xingyi, and Zunyi in Guizhou Province; and Diqing, Lincan, Tengchong, and Wenshan in Yunnan Province.

Outlook

China is one of the world's leading producers of industrial minerals, metals, and fuels. It plans to increase output capacity of aluminum, cement, copper, fertilizer, iron and steel, lead, nickel, salt, soda ash, and zinc. Despite an extensive minerals base, constraints based on a lack of both hard currency and advanced technology have forced the Chinese Government to delay capital investments in mine and plant construction and plant expansion. China also has opened the interior of the country for foreign exploration and development in an effort to increase the production of its fuel and nonfuel minerals sectors. China is expected to continue to be a major force in the world market for such commodities as antimony, barite, fluorspar, magnesite, rare earths, and tungsten. As the result of industrial development being achieved under its ambitious modernization program, China's industry will be technologically better suited to the production of value-added manufactures and advanced

materials, to meet international quality specifications. By the end of this century, China hoped to become a newly industrialized country.

¹Text prepared June 1995.

²China Economic News, Economic Information and Agency (Hong Kong). Mar. 27, 1995, Supplement No. 1.

³Zhizhiqiu has the similar meaning as autonomous region in English. Names of mines, manufacturing facilities, and location are translated according to Hanyu Pinyin for this manuscript in order to avoid confusion.

⁴China Economic News, Economic Information & Agency (Hong Kong). July 25, 1994, p. 5.

⁵China, Foreign Broadcast Information Service (Washington, DC). Sept. 6, 1994, p. 50.

⁶China Daily (Beijing). Mar. 13, 1995, p. 5.

⁷China's Customs Statistics, Economic Information and Agency (Hong Kong). Sept. 1994.

⁸Journal of Commerce (New York). Feb. 3, 1995, p. 3B.

⁹Where necessary, values have been converted from renminbi (RMB) to U.S. dollars at the rate of RMB8.50 yuan=US\$1.00 for 1994.

¹⁰Journal of Commerce (New York). Mar. 2, 1995, p. 5A.

¹¹China Daily (Beijing). Aug. 15, 1994, p. 2.

¹²Platt's Metals Week. Oct. 17, 1994, p. 10.

¹³Journal of Commerce (New York). Nov. 15, 1995, p. 5B.

¹⁴China Daily (Beijing). Jan. 17, 1995, p. 5.

¹⁵_____. 10, 1995, p. 2.

¹⁶China, Foreign Broadcast Information Service (Washington, DC). Dec. 13, 1994, p. 43.

¹⁷Mining Journal (London). July 22, 1994, p. 57.

¹⁸Platt's Metals Week. Dec. 19, 1994, p. 5.

¹⁹American Metal Market (New York). Dec. 20, 1994, p. 2.

²⁰Financial Times (London). Jan. 12, 1995, p. 3.

²¹Metal Bulletin (London). Dec. 12, 1994, p. 11.

²²Journal of Commerce (New York). Nov. 21, 1994, p. 6B.

²³China Daily (Beijing). Nov. 21, 1994, p. 5.

²⁴Financial Times (London). Nov. 9, 1994, p. 6.

²⁵The Northern Miner (Toronto). V. 80, Sept. 5, 1994, p. 10.

²⁶Journal of Commerce (New York). Dec. 20, 1994, p. 4B.

²⁷China Daily (Beijing). Oct. 4, 1994, p. 2.

²⁸China, Foreign Broadcast Information Service (Washington, DC). Aug. 23, 1994, p. 39.

²⁹Pacific Rim Economic Review, Foreign Broadcast Information Service (London). Aug. 24, 1994, p. 13.

³⁰Metal Bulletin (London). Sept. 29, 1994, p. 22.

³¹Far East Weekly Economic Report, British Broadcasting Corp. (London). June 22, 1994, p. WG/1.

³²China Economic News, Economic Information and Agency (Hong Kong). Jan. 16, 1995, p. 11.

³³China Daily (Beijing). Nov. 28, 1994, p. 5.

³⁴Journal of Commerce (New York). May 11, 1994, p. 7B.

³⁵China Daily (Beijing). Dec. 5, 1994, p. 2.

³⁶Steel Times International (London). July 1994, p. 9.

³⁷Far East Weekly Economic Report, British Broadcasting Corp. (London). Oct. 5, 1994, p. WG/11.

³⁸Metal Bulletin (London). Oct. 17, 1994, p. 20.

³⁹Steel Times (London). Sept. 1994, p. 342.

⁴⁰Steel Times International (London). Sept. 1994, p. 7.

⁴¹Far East Weekly Economic Report, British Broadcasting Corp. (London). Sept. 14, 1994, p. WA/1.

⁴²Steel Times International (London). Sept. 1994, p. 3.

⁴³Metal Bulletin (London). Oct. 17, 1994, p. 17.

⁴⁴China Daily (Beijing). Jan. 23, 1995, Business Weekly, p. 2.

⁴⁵Metal Bulletin (London). Sept. 26, 1994, p. 5.

⁴⁶Platt's Metals Week. Oct. 10, 1994, p. 4.

⁴⁷Metal Bulletin (London). May 2, 1994, p. 6.

⁴⁸Inco Media Information, IN 25/94, Toronto, Ontario, Canada, Dec. 8, 1994.

⁴⁹Industrial Minerals (London). Jan. 1994, p. 9.

⁵⁰China Daily (Beijing). Nov. 14, 1994, p. 5.

⁵¹China, Foreign Broadcast Information Service (Washington, DC). Aug. 22, 1994, p. 50.

⁵²Platt's Metals Week. Oct. 3, 1994, p. 12.

⁵³Metal Bulletin (London). Sept. 29, 1994, p. 11.

⁵⁴Far East Weekly Economic Report, British Broadcasting Corp. (London). Sept. 14, 1994, p. WG/11.

⁵⁵China Economic News, Economic Information and Agency (Hong Kong). Dec. 19, 1994, p. 5.

⁵⁶Chemical Week. May 6, 1994, p. 22.

⁵⁷Industrial Minerals (London). May 1994, p. 11.

⁵⁸Far Eastern Economic Review (Hong Kong). Nov. 10, 1994, p. 56.

⁵⁹Petroleum Economist (London). Sept. 1994, p. 22.

⁶⁰Journal of Commerce (New York). Nov. 9, 1994, p. 7.

⁶¹Far East Weekly Economic Report, British Broadcasting Corp. (London). Nov. 9, 1994, p. WG/14.

⁶²Journal of Commerce (New York). Jan. 15, 1995, p. 6B.

⁶³Zhonghua Renmin Gongheguo Guowuyuan Gongbao (Beijing). No. 4, Mar. 25, 1994.

⁶⁴China Daily (Beijing). Dec. 31, 1994, p. 3.

⁶⁵_____. Jan. 9, 1995, p. 1.

⁶⁶China, Foreign Broadcast Information Service (Washington, DC). Nov. 9, 1994, p. 45.

⁶⁷Journal of Commerce (New York). Aug. 19, 1994, p. 10B.

⁶⁸China's Customs Statistics, Economic Information and Agency (Hong Kong). Nov. 1994.

⁶⁹Journal of Commerce (New York). Sept. 8, 1994, p. 4B.

⁷⁰China Daily Supplement (Beijing). June 27, 1994, p. 1.

⁷¹China Daily (Beijing). June 1, 1994, p. 2.

⁷²Oil and Gas Journal (Chicago). Nov. 28, 1994, p. 32.

⁷³Journal of Commerce (New York). Dec. 9, 1994, p. 10B.

⁷⁴China Economic News, Economic Information and Agency (Hong Kong). Sept. 12, 1994, p. 17.

⁷⁵Far East Weekly Economic Report, British Broadcasting Corp. (London). Dec. 8, 1994, p. WG/4.

⁷⁶China Economic News, Economic Information and Agency (Hong Kong). Sept. 26, 1994, p. 5.

⁷⁷Journal of Commerce (New York). June 24, 1994, p. 4B.

Major Sources of Information

China National Nonferrous Metals Industry Corp.

12B Fuxing Lu

Beijing 100814

China National Offshore Oil Corp.

1A Sidaskou Lu, Dazhongshi Nau, Haidianqu

Beijing 100086

China National Petroleum Corp.

Liupukang

Beijing 100724

China National Offshore Oil Corp.

Jingwin Building 2A, Donsanhuan Beilu

Beijing 100027

China Non-metallic Minerals Industry Corp.

Bai Wan Zhuang

Beijing

Ministry of Chemical Industry

Building 16, Hepingli Qiqu, Dongcheng District

Beijing 100013

Ministry of Coal Industry

21 Hepingli Bei Lu

Beijing 100713

Ministry of Foreign Trade and Economic Corp.

2 Dong Chang'anjie, Dongcheng District

Beijing 100731

Ministry of Geology and Mineral Resources

64 Funei Dajie

Beijing 100812

Ministry of Metallurgical Industry

46 Dongsi Xi Dajie

Beijing 100711

Ministry of Power Industry
137 Fuyoujie, Xicheng District
Beijing 100031
National Environmental Protection Agency
115 Xizhimennei Nanxiaojie, Xicheng District
Beijing 100035
People's Bank of China
410 Fuchengmen Dajie
Beijing 100034

Major Publications

Almanac of China's Economy, annual.
Beijing Review, 24, Baiwanzhuang Road, Beijing 100037,
China.
China's Customs Statistics, Economic Information and
Agency, Hong Kong, 342, Hennessy Road, 10th floor,
Hong Kong.

China Daily, 15, Huixin Dongjie, Chaoyang District,
Beijing, China.
Far Eastern Economic Review, 181, Gloucester Road, Hong
Kong.
Intertrade, Intertrade Press, 28, Dong Hou Xiang, An Ding
Man Wai Street, Beijing 100710, China.
Metallurgical Industry Press, Beijing: The Yearbook of Iron
and Steel Industry of China, annual.
Ministry of Coal Industry, Beijing: China Coal Industry
Yearbook, annual.
Research Institute of the Ministry of Chemical Industry of
China, Beijing: China Chemical Industry.
State Statistical Bureau, Beijing: Energy Statistical
Yearbook of China, annual.
China Statistical Publishing House, Beijing: Statistical
Yearbook of China, annual.

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

(Metric tons unless otherwise specified)

Commodity	1990	1991	1992	1993	1994	
METALS						
Aluminum:						
Bauxite, gross weight	thousand tons	2,400	2,600	2,700	3,500	3,700
Alumina, gross weight	do.	1,460	1,520	1,580	1,820 r/	1,900
Metal, refined, primary and secondary	do.	850	963	1,100	1,260 r/	1,450
Antimony:						
Mine, Sb content		54,800	58,300	59,400	60,000 r/	80,000
Metal		60,000	61,400	68,100	81,300	75,000
Bismuth:						
Mine output, Bi content		1,060 r/	1,040 r/	820 r/	740 r/	700
Metal		1,060	1,270	1,060	1,050	1,000
Cadmium, smelter		1,100	1,200	1,150	1,160 r/	1,150
Cobalt:						
Mine output, Co content		250	230	260	240	270
Metal		325	300	220	190 r/	200
Copper:						
Mine output, Cu content		285,000	304,000	334,000	345,000 r/	350,000
Metal:						
Smelter, primary		359,000	385,000	418,000	443,000	480,000
Refined, primary and secondary		560,000	560,000	659,000	730,000 r/	684,000
Gold, mine output, Au content		100	120	140	160	160
Iron and steel:						
Iron ore, gross weight	thousand tons	168,000	176,000	198,000	235,000	240,000
Pig iron	do.	62,400	67,200	72,000	87,300	96,400
Ferroalloys	do.	2,400	2,460	2,650	3,000 r/	3,100
Steel, crude	do.	66,100	70,600	80,000	88,700	91,500
Steel, rolled	do.	51,200	56,400	65,300	75,900	80,000
Lead:						
Mine output, Pb content		315,000	352,000	330,000	338,000 r/	340,000
Metal:						
Smelter, primary		264,000	270,000	295,000	326,000	330,000
Refined, primary and secondary		296,000	330,000	365,000	412,000 r/	407,000
Magnesium metal, primary		5,900	8,600	10,600	11,800 r/	11,000
Manganese ore, gross weight	thousand tons	4,080	5,150	5,300	5,860 r/	5,900
Mercury, mine output, Hg content		1,000	760	580	520 r/	400
Molybdenum, mine output, Mo content		15,700	13,200	19,200	18,300 r/	17,500
Nickel:						
Mine output, Ni content		33,000	30,400	32,800	30,700 r/	33,000
Matte		33,400	31,900	36,100	34,600	35,000
Smelter		27,500	28,900	30,800	30,500 r/	31,000
Silver, mine output, Ag content		130	150	170	200	210
Tin:						
Mine output, Sn content		42,000	42,100	43,800	49,100 r/	50,000
Metal, smelter		35,000	36,400	39,600	52,100 r/	61,900
Tungsten, mine output, W content		32,000	31,800	25,400	21,600 r/	16,500
Zinc:						
Mine output, Zn content		619,000	750,000	758,000	775,000 r/	780,000
Refined, primary and secondary		550,000	612,000	719,000	857,000 r/	976,000
INDUSTRIAL MINERALS						
Asbestos		221,000	200,000	240,000	240,000	240,000
Barite	thousand tons	1,700	1,600	1,500	1,500	1,500
Boron, mine B ₂ O ₃ equivalent		75,000	92,500	127,000 r/	100,000	120,000
Bromine		8,080	12,100	16,700	18,000	19,000
Cement, hydraulic	thousand tons	203,000	253,000	308,000 r/	368,000 r/	400,000
Fluorspar	do.	1,700	1,920	1,890	2,050 r/	1,900
Graphite		455,000	289,000	300,000	310,000	360,000
Gypsum	thousand tons	10,200	10,500	11,000	10,600	10,500
Kyanite and related materials		2,500	2,500	2,500	2,500	2,500
Lithium minerals, all types		15,000	15,500	15,500	15,500	1,600
Magnesite	thousand tons	2,170	1,650	1,510	1,230 r/	1,200
Nitrogen: N content of ammonia	do.	17,500	18,100 r/	19,000 r/	18,000 r/	19,000
Phosphate rock and apatite, P ₂ O ₅ equivalent	do.	6,400	6,500	6,800	7,000	7,100
Potash, marketable, K ₂ O equivalent	do.	29	32	21	25	25
Salt	do.	20,000	24,100	28,100	29,500	29,700
Sodium compounds: Soda ash, natural and synthetic	do.	3,750	3,940	4,500	5,270	5,680
Sulfur:						
Native	do.	320	320	320	330	330
Content of pyrite	do.	4,400	4,940	4,500	5,000	5,000
Byproduct, all sources	do.	650	650	650	700	700
Total	do.	5,370	5,910	5,470	6,030	6,030
Talc and related materials	do.	2,550	2,600	2,500	2,300	2,400

See footnotes at end of table.

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

(Metric tons unless otherwise specified)

Commodity	1990	1991	1992	1993	1994	
MINERAL FUELS AND RELATED MATERIALS						
Coal:						
Anthracite	thousand tons	213,000	214,000	214,000	220,000	230,000
Bituminous and lignite	do.	841,000	876,000	896,000	920,000	980,000
Total	do.	1,050,000	1,090,000	1,110,000	1,140,000	1,210,000
Coke, all types	do.	73,300	73,500	79,800 r/	93,200 r/	90,000
Gas, natural:						
Gross	billion cubic meters	15	16	16	17	17
Marketed	do.	13	13	14	15	15
Petroleum:						
Crude (including crude from oil shale)	million 42-gallon barrels	1,010	1,020	1,050	1,060	1,080
Refinery products	do.	730	800	830	860	950

r/ Revised.

1/ Previously published and 1994 data are rounded by the U.S. Bureau of Mines to three significant digits; may not add to totals shown.

2/ Table includes data available through May 10, 1995.

TABLE 2
CHINA: STRUCTURE OF THE MINERAL INDUSTRY FOR 1994

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies 1/	Location of main facilities	Annual capacity	
Aluminum:				
Alumina	Pingguo Aluminum Industry Co.	Guangxi, Pingguo	300	
Do.	Guizhou Aluminum Plant	Guizhou, Guiyang	400	
Do.	Changcheng (Great Wall) Aluminum Corp.	Henan, Zhongzhou	200	
Do.	do.	Hunan, Zhengzhou	640	
Do.	Shandong Aluminum Plant	Shandong, Zibo	500	
Do.	Shanxi Aluminum Plant	Shanxi, Hejin	1200	
Metal	Hefei Aluminum Plant	Anhui, Hefei	25	
Do.	Baiyin Aluminum Plant	Gansu, Baiyin	50	
Do.	Liancheng Aluminum Plant	Gansu, Lanzhou	85	
Do.	Lanzhou Aluminum Plant	do.	82	
Do.	Pingguo Aluminum Industry Co.	Guangxi, Pingguo	100	
Do.	Guizhou Aluminum Plant	Guizhou, Guiyang	160	
Do.	Changcheng (Great Wall) Aluminum Corp.	Hunan, Zhengzhou	32	
Do.	Fushun Aluminum Plant	Liaoning, Fushun	100	
Do.	Qingtongxia Aluminum Plant	Ningxia, Qingtongxia	82	
Do.	Qinghai Aluminum Smelter	Qinghai, Xining	200	
Do.	Shandong Aluminum Plant	Shandong, Zibo	35	
Do.	Jiaozuo Aluminum Plant	Henan, Jiaozuo	33	
Do.	Sanmenxia Aluminum Plant	Henan, Sanmenxia	30	
Do.	Yanji Aluminum Plant	Jilin, Yanji	15	
Do.	Baotou Aluminum Plant	Nei Mongol, Baotou	70	
Do.	Tongchuan Aluminum Plant	Shaanix, Tongchuan	35	
Do.	Taiyuan Aluminum Plant	Shanxi, Taiyuan	15	
Do.	Yunnan Aluminum Plant	Yunnan, Kunming	15	
Asbestos	China National Nonmetallic Minerals Industry Corp.	Nei Mongol, Baotou; Shanxi, Lai Yuan and Lu Liang	130	
Barite	do.	Guizhou, Xiangshou	NA	
Coal	Ministry of Coal Industry	Hebei	70,000	
Do.	do.	Heilongjiang	100,000	
Do.	do.	Henan	100,000	
Do.	do.	Liaoning	70,000	
Do.	do.	Nei Mongol	90,000	
Do.	do.	Shandong	60,000	
Do.	do.	Shanxi	400,000	
Do.	do.	Sichuan	80,000	
Cobalt	tons	Jinchuan Nonferrous Metals Corp.	Gansu, Jinchang	400
Copper, refined		Tongling Nonferrous Metals Co.	Anhui, Tongling	30
Do.		Wuhu Smelter	Anhui, Wuhu	45
Do.		Baiyin Nonferrous Metals Co.	Gansu, Baiyin	50
Do.		Jinchuan Nonferrous Metals Corp.	Gansu, Jinchuan	20
Do.		Daye Nonferrous Metals Co.	Hubei, Daye	20
Do.		Zhuzhou Smelter	Hunan, Zhuzhou	10
Do.		Jiangxi Copper Metals Co.	Jiangxi, Guixi	86
Do.		Huludao Zinc Smelting Co.	Liaoning, Huludao	60
Do.		Shenyang Smelter	Liaoning, Shenyang	100
Do.		Shanghai Smelter	Shanghai	80
Do.		Taiyuan Copper Industry Co.	Shanxi, Taiyuan	25

See footnotes at end of table.

TABLE 2--Continued
CHINA: STRUCTURE OF THE MINERAL INDUSTRY FOR 1994

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies 1/	Location of main facilities	Annual capacity
Copper, refined--Continued:				
Do.		Tianjin Copper Electrolysis Factory	Tianjin	25
Do.		Yunnan Smelter	Yunnan, Kunming	95
Gas, natural	billion cubic meters	China National Petroleum Corp.	Sichuan	10
Gold, refined	thousand kilograms	China National Gold Corp.	Henan, Lingbu	3
Do.		Laizhou Gold Co.	Shandong, Laizhou	15
Do.		Zhaoyuan Gold Co.	Shandong, Zhaoyuan	6
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 Iron and Steel 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 Co.	Hubei, Wuhan	5,100
Do.		Banshigou Iron Mine Mining Co.	Jilin, Hunjiang	1,400
Do.		Anshan Iron and Steel Co.	Liaoning, Anshan	30,000
Do.		Benxi Iron and Steel Co.	Liaoning, Benxi	13,700
Do.		Baotou Iron and Steel 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.		Kuming Iron and Steel Co.	Yunnan, Kuming	1,400
Ferrous alloys		Shoudu Iron and Steel 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
Do.		Liaoyang Ferroalloy Co.	Liaoning, Liaoyang	70
Do.		Shanghai Steel Co.	Shanghai	180
Do.		Emi Ferroalloy Co.	Sichuan, Emei	70
Do.		Hengshan Ferroalloy Co.	Zhejiang, Jiande	70
Crude steel		Maanshan Iron and Steel Co.	Anhui, Maanshan	2,500
Do.		Shoudu Iron and Steel Co.	Beijing	10,000
Do.		Tangshan Iron and Steel Co.	Hebei, Tangshan	2,000
Do.		Wuhan Iron and Steel Co.	Hubei, Wuhan	6,000
Do.		Anshan Iron and Steel Co.	Liaoning, Anshan	10,000
Do.		Benxi Iron and Steel Co.	Liaoning, Benxi	2,700
Do.		Baotou Iron and Steel Co.	Nei Mongol, Baotou	3,500
Do.		Baoshan Iron and Steel Co.	Shanghai	10,000
Do.		Shanghai Steel Co.	do.	6,000
Do.		Taiyuan Iron and Steel Co. No. 2.	Shanxi, Taiyuan	2,500
Do.		Panzhuhua Iron and Steel Co.	Sichuan, Panzhuhua	2,500
Do.		Tianjin Iron and Steel Co.	Tianjin	2,000
Lead		Baiyin Nonferrous Metals Co.	Gansu, Baiyin	50
Do.		Shaoguan Smelter	Guangdong, Shaoguan	30
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
Nickel, refined		Jinchuan Nonferrous Metals Corp.	Gansu, Jinchuan	40
Do.		Chengdu Electro-Metallurgy Factory	Sichuan, Chengdu	3
Magnesium		Fushun Aluminum Plant	Liaoning, Fushun	5
Do.		Minhe Magnesium Plant	Qinghai, Minhe	4
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	1,000
Do.		Nanghai East Corp.	Nanghai	5,000
Potash		Ministry of Chemical Industry	Qinghai	40
Rare earths		Gansu Rare Earths Co.	Gansu, Baiyin	12
Do.		Jiangxi Rare Earth Co.	Jiangxi, Nanchang	1
Do.		Zhujiang Refinery	Guangdong, Guangzhou	5
Do.		Baotou Iron and Steel Co.	Nei Mongol, Baiyunebo	12
Salt		Ministry of Chemical Industry	Anhui	200
Do.		do.	Qinghai	320
Talc		China National Nonmetallic Industry Corp.	Guangxi, Longshen	130
Do.		do.	Liaoning, Haicheng	50
Do.		do.	Shandong, Qixia	5

See footnotes at end of table.

TABLE 2--Continued
 CHINA: STRUCTURE OF THE MINERAL INDUSTRY FOR 1994

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies 1/	Location of main facilities	Annual capacity
Tin, smelter	Dachang Mining Administration	Guangxi, Dachang	5
Do.	Yunnan Tin Industry Co.	Yunnan, Gejiu	15
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	Baiyin Nonferrous Metals Co.	Gansu, Baiyan	100
Do.	Shaoquan Smelter	Guangdong, Shaoquan	70
Do.	Liuzhou Zinc Products Factory	Guangxi, Liuzhou	22
Do.	Shuikoushan Mining Bureau	Hunan, Hengyan	28
Do.	Zhuzhou Smelter	Hunan, Zhuzhou	140
Do.	Huludao Zinc Smelting Co.	Liaoning, Huludao	180
Do.	Shenyang Smelter	Liaoning, Shenyang	20

e/ Estimated. NA Not available.

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