

## CHINA

*By Chen Liping, Ding Xiaohong, Zhang Xin'an*

*Division of Resources Strategy, Information Center, Ministry of Land and Resources of China*

**W**hile the world economy declined generally in 2001, China's economy grew steadily at a rate of 7.3%, with its GDP exceeding Yu9,580 billion. During the year, China formally became a member of the World Trade Organisation and successfully won the bid for the 2008 Summer Olympic Games. Both events have had a favourable influence on China's economic development and it is predicted that economic growth will remain at around 7% in 2002.

In 2001, foreign investment in China reached a record level, with the amount of foreign capital actually spent rising by 15% to US\$46.88 billion. In the past nine years, China has ranked first among developing countries in terms of attracting foreign investment. As at end-December 2001, there was a total of 390,025 foreign enterprises established in China, with signed contracts worth US\$745.3 billion of which some US\$395.2 billion had been committed.

Because China has become a member of the WTO, the Chinese Government has reviewed all the laws and regulations concerning foreign investments, and has amended those which are not in line with the WTO rules. The main laws and regulations amended include: the Sino-Foreign Equity Joint Venture Law; the Sino-Foreign Contractual Joint Venture Law; the Wholly Foreign Owned Enterprise Law; as well as the regulations for implementing these laws. In addition, the provisions concerning balance of payments in foreign currencies, local content, export requirement, and submission of an enterprise's production plan etc, have been repealed.

### **Summary of the Mining Industry**

Land and Resources Daily reports that China's mining industry value in 2001 was around Yu479 billion, 7% higher than in the

previous year. The production of ten principal non-ferrous metals increased in volume from 7.6 Mt to 8.56 Mt; phosphoric ore production increased from 19.37 Mt to 21 Mt; and cement production increased from 580 Mt to 630 Mt.

During 2001, there were 106 large to medium mineral deposits discovered in China, exploration spending reached Yu22.74 billion and the government issued 533 exploration licences. The value of mineral imports and exports exceeded US\$100 billion and the trade deficit was further increased. Imports of all bulk mineral products increased in varying degree with the exception of chromite imports which remained at much the same level as in 2000. Imports included 84.04 Mt of iron ore, 2.26 Mt of copper and 5.43 Mt of potash. There was further diversification in the sources of supply.

### **Policies and Regulations for the Mining Industry**

For the purpose of supporting the development of China's western region, the government promulgated a number of preferential policies on January 1, 2001. According to these policies, the western region can enjoy favourable treatment in terms of capital investment, investment conditions, the encouragement of foreign and domestic private enterprises, and in science and technology education. The Ministry of Land and Resources has also made a number of preferential policies for mineral development in the western region.

The National Mineral Resources Plan, which was approved by the State Council in April 2001, has been promulgated by the Ministry of Land and Resources. This is the first overall mineral resources plan made on the basis of the Mineral Resources Law of the People's Republic of China, and symbolises that China

has preliminarily set up the macro-control mechanism suitable to the market economy system for mineral resources exploration, development and utilisation.

During 2001, some provinces issued certain incentive policies to stimulate foreign investment in mining. On July 1, the Sichuan Provincial Government promulgated the Incentive Statute for Foreign Investment in Mineral Exploration and Exploitation in Sichuan Province, clearly stipulating seven preferential policies which foreign investors can enjoy in the field of mining. According to these policies, foreign investors conducting mineral exploration and exploitation projects in the ethnic minority regions shall be exempt from exploration and mining royalties for the first two years, and exempt from 50% of these royalties for the next three years. Fees for the temporary use of land for mineral exploration shall also be exempt.

On January 8, 2001 the Yunnan Provincial Government promulgated the Regulation on the Registration of Foreign Investments in Mineral Exploration and Exploitation. The regulation was put into force on March 1, 2001. According to the regulation, foreign investors can obtain geological maps needed for their mineral exploration and exploitation projects from the provincial land and resources authorities by showing valid certifications or credentials, and paying a fee equivalent to the cost of producing these maps. But, approvals by related authorities are required for obtaining the confidential maps. As regards applying for an exploration or mining licence, the regulation stipulates that in the case of a Sino-Foreign equity joint venture, the application should be put forward by the legal person of the joint venture; in the case of a Sino-Foreign contractual joint venture, the application should be put forward by the legal person of the contractual joint venture enterprise (if the legal person is established). If the joint venture enterprise is not a legal person, the issue on application for an exploration licence should be included in the

contractual arrangement drawn up by the two parties. For foreign enterprises, applications for an exploration licence or a mining licence should be submitted by the legal person of the foreign enterprises. The regulation stipulates for the first time in China that, foreign investors, whether enterprises are established or not, can apply directly to the relative authorities for an exploration licence. Where a mineral project is brought to the production stage, foreign investors can consider all expenses related to exploration as deferred assets and amortise according to the regulations concerned. The expenses include exploration spending, the cost of acquiring mineral rights and so on.

The Shandong Provincial Government also promulgated incentive policies in 2001 for promoting foreign investments in non-oil/gas minerals development. Besides enjoying the general preferential policies of the country, according to these policies, foreign investors engaged in non-oil/gas mineral exploration and exploitation in Yunnan can also benefit from the following:

1. The foreign investment project can be listed, according to its scale, into the main construction projects, and enjoy the related preferential treatments.
2. Projects using advanced technology to develop low grade and refractory ores shall be exempt from 50% of the exploration and mining royalties for the first three years.
3. Foreign investors seeking to buy mineral deposits discovered by government - funded organisations and to explore them further have two years in which to pay for the expenses incurred, and the costs for obtaining the mining rights from the Chinese Government can be paid within six years. If the deposit eventually mined by the foreign investor is of low grade and refractory, the price of the deposit can be reduced by a maximum of 30%.

### Important Events Influencing the Mining Industry

The nation-wide geological survey, which is a component of the new round of national land and resources investigations, has achieved good results. As an important project for the country, it was organised and implemented by the Ministry of Land and Resources. Sixty organisations, including enterprises, universities and research Institutes, participated. The project comprises six parts: basic geological survey, mineral resources evaluation, ground water evaluation, land resources data digitalisation, exploration technology development and special research topics. The project began in May 1999 and thus far has resulted in the discovery of more than 200 mineral fields.

On November 3, 2001, the Ministry of Land and Resources formally authorised the establishment of the Geological Survey of China (GSC). The GSC will carry out basic and geological work in the public interest as distinct from commercial mining activities. The GSC is made up of three components: the former Geological Survey Bureau of the Ministry of Geology and Mineral Resources and the Academy of Geological Sciences etc; provincial Geological Surveys; and those geological survey staff formerly attached to other sectors.

In 2001, the nine state bureaux responsible respectively for domestic trade, coal, machinery, metallurgy, oil and chemicals, light industry, textiles, building materials and non-ferrous metals, ceased to exist, and their administrative functions were combined into the State Economy and Trade Commission (SEATC). Also, the State Supervision Bureau of Production Safety was established, to include a unit specifically responsible for the supervision of safety in the coal production sector.

Also during the year, the Ministry of Land and Resources and the government of Xingjiang Autonomous Region jointly invited bids for copper exploration in Xingjiang's eastern Tianshan mountain area within longitudes 91°

38' and 94° 00' east, and between latitudes 42° 00' and 42° 30' north. The area for bidding is divided into nine units, four of which are divided into blocks; investors can apply for the blocks they are interested in to the authorities concerned. The exploration rights in the other five units are owned by the Bureau of Mineral Exploration and Development of Xingjiang Autonomous Region. Qualified investors can negotiate with this Bureau for equity joint venture, contractual joint venture, or purchase of the exploration rights. The bidding is open to all the foreign investors, non-corporate enterprises legally established in China, Chinese domestic enterprises and other economic entities, so long as they can meet the conditions defined by the related regulations.

The newly-discovered copper deposit in the eastern Tianshan mountain area is a giant orebody and preliminary geological exploration indicates a length of 800 -1,400 m, a width of 50 - 200 m, and a maximum thickness of 380 m. Experts believe that the deposit contains a copper resource in excess of 10 Mt and that more than 92% of the contained copper can be recovered. The associated minerals are gold, silver and molybdenum. On March 6, 2002, a bidding ceremony was held in Beijing. A mining company from Fujian Province secured the winning bid for a three-year exploration programme.

With the assistance of the Canadian Embassy and the Australian Agency for Foreign Aid, the Ministry of Land and Resources, the World Bank and Shaanxi Provincial Government sponsored the international symposium, 'China Mining 2001'. More than 200 delegates from the central bank, international financial institutes and the mining communities of various countries attended the meeting. The participants held broad discussions on the sustainable development of China's mining industry and the reforms that will be needed. It was the third time since 1999 that this kind of international symposium on China's mining industry had been held in China.

## **Production, Consumption and Trade Coal**

China's raw coal production in 2001 was 1,090 Mt, an increase of 9.1% or 90.5 Mt compared with the previous year. Restructuring of the industry continued according to the directions of the State Council; the production share of the major state-owned coal mines increased and there were further closures of more small, illegal coal mines. Of the total output, 618.3 Mt were produced by the major state-owned mines, an increase of 82.6 Mt or 15.4% on the previous year; 225.4 Mt were produced by provincially-owned mines (31.15 Mt or 16% higher than 2000); and 246 Mt were produced by township coal mines (23.2 Mt, or 8.6% lower).

Coal supply and demand in 2001 were basically in balance, and the growth in production generally matched the growth in industrial production. Coal exports maintained their momentum and the State Planning Committee and the Ministry of Finance have postponed the expiry date of the incentive policy for coal exports from March 31, 2001 until March 31, 2003, in order to encourage the export of coal and to ease the excessive supply in the domestic market. Exports in 2001 hit a record high of 85.9 Mt, an increase of 27 Mt, or 46%, over the previous year, and making China the second largest coal exporter in the world. Although world economic growth slowed down, and China's foreign trade growth rate dropped, coal exports became a prominent new growth point in China's foreign trade.

By the end of 2001, China's coal stocks stood at 115.2 Mt. This was 27.2 Mt or 19.1%, lower than the stock level at the start of the year. Stocks held by coal enterprises fell by 47.4% or 25.3 Mt, to 28.1 Mt.

During the year, coal prices improved and sales income increased. The average coal price received was Yu150.59/t, or Yu10.90/t more than in 2000.

In 2001, major state-owned coal mines completed 664,324 m of development, a 20% increase on the previous year. Washed coal production rose by 12% to 78 Mt, and the average unit production at the coal face was 30,109 t/mth, a 12.5% improvement on 2000. The average unit development of face advance was 144.4 m/mth, 4.9 m/mth or 3.5% higher than in the previous year.

## **Iron ore**

China's iron and steel industry has developed rapidly in the past ten years. Steel production was 65.35 Mt in 1990 but by last year it had reached 149 Mt, the average annual growth rate being 7.8%. Over the same period, iron-ore production experienced an up and down process - 179 Mt in 1990, 262 Mt in 1995 and 217 Mt in 2001. At present, many iron-ore mines in China are in the medium to late stages of their lives, therefore, production will further decrease in the future.

Along with the increase in demand and decrease in domestic supply, imports of iron ore and scrap have been escalating annually. Iron-ore imports have risen from 14.2 Mt in 1990, to 41.2 Mt in 1995 and to 92.3 Mt in 2001, and it is predicted that this year they will exceed 100 Mt. As the imported iron ore is of higher grade than Chinese ore, the demand for imported iron ore in 2001 accounted for nearly half of the total demand of China. Furthermore, the import of steel scrap has increased sharply, rising from just 120,000 t in 1990, to 1.4 Mt in 1995 and to some 9.8 Mt in 2001.

In 2001, iron-ore prices in China rose sharply as a result of a strong steel market and the accompanying increased demand for iron ore. According to statistics for the 31 iron-ore producing regions, prices last year rose by 61% in 19 regions, with an average increase of Yu40/t; there was a 13% price decrease in four regions, with an average fall of Yu27/t; and in the remaining four regions prices remained largely unchanged. Prices remained relatively stable in all regions through the second half of 2001.



### Aluminium

Alumina production increased steadily in 2001 and totalled 4.73 Mt, 9.3% higher than the previous year, and imports reached record levels. By the end of the year there were six alumina producers with a total annual capacity of 4.9 Mt. China also became the world's largest aluminium producer, with production capacity increasing by 930,000 t. This was as a result of two main factors: first, several new bauxite mines went into production at the same time and many established mines expanded their capacity; second, the continuing low price of alumina and the steady closing of the gap between the domestic and world price of aluminium stimulated the development of more Chinese smelters. Preliminary statistics indicate that aluminium production rose by 21% last year to 3.43 Mt. Consumption is estimated at 3.7 Mt, 8.8% higher than the preceding year.

Investment in smelter projects reached a new high, and many old plants expanded or planned to expand their capacities. According to the incomplete calculation of An-tai-ke company, five new smelters went into operation last year and 22 old plants expanded their production capacities.

There are 128 operating aluminium smelters in China and the total annual production capacity at the end of 2001 had reached 4.26 Mt. The ten largest smelters increased their production to varying degrees. At two of them, output last year exceeded 200,000 t, eight exceeded 100,000 t and ten exceeded 50,000 t.

The average price of aluminium on the domestic market fell steadily through the year, and the monthly average price for spot material was Yu14,351/t.

In December 2001, Aluminium Corp. of China Ltd (Chalco), the largest aluminium producer in China and the third largest aluminium producer in the world, launched an initial public offering (IPO), with a dual listing in New York and Hong Kong. The intention was to

raise US\$460 million, part of which would be used to reduce debt and the remainder for capital expenditure.

In 2001, Chalco produced 4.7 Mt of alumina and 710,000 t of aluminium, 9.3% and 5.6% higher respectively compared with the preceding year. The company plans to raise Yu17.8 billion (US\$2.15 billion) during the period 2001- 2005, of which Yu7.8 billion will be used to expand and upgrade its alumina facilities, increasing the total capacity by 44.5% to 6.04 Mt, and almost Yu10 billion will be used to double aluminium production to 1.39 Mt/y by 2005.

A Chalco subsidiary, Shandong Aluminium Co. plans to build a new 240,000 t/y capacity smelter by 2005 and to increase its capacity to 280,000 t/y by the end of 2006.

### Copper

Based on forecasts of a strong world market for copper, China's major copper producers increased their output last year. The smaller producers, however, decreased their production, and the total output of copper concentrate in 2001 dipped by 4% to 564,700 t. Although world demand decreased, China's demand for copper last year remained strong, owing to the rapid development of copper-consuming sectors such as electric line, electric cable, domestic appliance, construction and vehicle industries. Total consumption of copper reached 2.1 Mt, 16.7% higher than in 2000.

During the first 11 months of 2001, net imports of copper concentrates reached 1.93 Mt, 22.9% higher than the same period of 2000; net imports of scrap were 35% higher at 3.0 Mt, and net copper imports were 15% higher at 720,000 t. Because of the sluggish demand in the world market, copper exports over the first 11 months of 2001, decreased sharply to 48,000 t, 54% lower than the same period of 2000. The import and export of rolled copper was respectively 674,000 t and 114,000 t, 0.9% and 15.1% lower than the same period of 2000.

Copper exploration achieved good results and 2.38 Mt of copper resources were discovered, 14.4% higher than the previous year. The main new discoveries include:

- Three deposits in Xingjiang Autonomous Region. Respectively, they have strike lengths 400 m, 450 m and 200 m; average widths of 18.28 m, 8 m and 9 m; and average grades of 0.38%, 0.71% and 0.31% Cu. There is potential to develop these deposits into large-scale mines.
- A giant zone in Tibet encompassing more than 80 anomalies and more than 10 deposits. It is predicted that one deposit in the southern part of the zone contains a copper resource of 640,000 t.
- A giant deposit discovered in Qinghai province, with a predicted resource of more than 1.5 Mt.

Yunnan Copper Co. intends to raise Yu370 million to develop the Dahongshan mine. There are proven iron-ore reserves of more than 400 Mt and copper reserves exceeding 1.0 Mt. There are also a number of recoverable associated metallic minerals such as silver, gold and thallium, and the potential economic value could be more than Yu11 billion. It is predicted that Dahongshan mine will be put into production after two and half years, with the capacity to produce 2,400 t/d of copper ore, plus 159,000 t/y of high-grade iron ore, 59 kg/y of gold and 536 kg/y of silver.

China has more than 700 copper mines, of which only seven are large scale, and only a few suited to open-pit operation. After decades of exploitation, their resources have decreased substantially. At present, China has some 30 copper smelters with a combined annual capacity of around 1.04 Mt, and about 200 refineries with a combined annual capacity of more than 1.6 Mt.

### Nickel

As the world market price for nickel weakened during 2001, China's domestic nickel prices

followed suit. Nickel production in 2001 was 49,490 t, 2.82% lower than the previous year; nickel concentrate production was little changed at 51,509 t. The domestic market was widely influenced by imported nickel, especially towards the latter part of the year when the cost of the nickel produced in China was relatively high, and the world and imported nickel became more competitive. Imports were mainly from Russia (15,290 t) and Australia (5,323 t), and totalled 35,600 t, 217% higher than in 2000. Nickel exports were 41% lower at 5,420 t and went mainly to Japan (5,139 t) and South Korea (252 t). Imports of nickel concentrates last year amounted to 6,986 t. Nickel consumption increased by 30% to reach 84,000 t.

### Tin

In 2001, both production and imports of tin decreased. Low prices and a serious accident at one of the big mines were two of the main reasons. Neither of the two largest tin producers performed well and total output (tin metal) was down by almost 19% on the previous year, at 78,782 t; tin concentrate production was 17% lower at 91,619 t.

China is a large tin consumer and apparent consumption averaged some 43,000 t in the period 1995 -1999. In 2000, apparent consumption reached a record 52,000 t and was in line with a rapid increase in production. Last year, however, exports increased and apparent consumption was about 49,000 t. Tin exports last year were affected by the worldwide economic decline, especially the decline in the US and Japan. The net export of tin products amounted to 46,437 t which compares with a total of 62,000 t exported in the previous year.

There were a number of major events affecting the industry last year:

- Yunnan Tin Co. suspended production for two months which equated to 4,000 t of capacity; the Gejiu smelter reduced production by 3,000 t and its total production was 23% lower than the

previous year; two other companies reduced their output by 2,500 t and 1,000 t respectively.

- A serious accident in the Nandan area of Guangxi Zhuang Autonomous Region, reduced tin production there by about 10,000 t, and government safety measures introduced at tin mines as a result of the Nandan accident also affected tin concentrate production in Yunnan and Guizhou provinces.
- In Guangdong Province, many enterprises were shut down or asked to suspend their operations because of taxation issues and this led to a substantial reduction in output.

### **Molybdenum**

The Import-export value of molybdenum products in 2001 was US\$319.02 million.

According to Chinese Non-ferrous Metal Association statistics, molybdenum production in 2001 was 28,200 t, 2.84% lower than in the previous year. Low prices on the world market led to a number of the smaller Chinese operators halting their production. Consumption of molybdenum in China last year is estimated at 12,000-13,000 t, about 1,000 t higher than in 2000.

China is one of the main molybdenum producers in the world and, as it consumes less than half of its production, it is a major exporter. In 2001, because of the effects of September 11, China's import-export value of molybdenum products fell by 40% to US\$192 million, of which US\$136 million was the export value and US\$56 million was the cost of imports.

According to National Customs' statistics, the total foreign trade value of molybdenum in 2001 decreased by 0.88%. Imports rose by 29% to US\$57 million and exports were 5.7% lower and worth US\$262 million. The trade surplus was US\$205 million, 12.2% lower. Among the import/export molybdenum

products, imports of molybdenum concentrate, and exports of roasted Mo sand and ferro-molybdenum, increased. Imports of molybdenum sand and concentrate totalled 22,948 t, 40.4% higher than in 2000; roasted molybdenum sand and concentrate exports totalled 22,582 t, 61.16% higher than in 2000; ferro-molybdenum exports decreased by 15.4% to 37,545 t.

Along with China's steady economic growth and the restructuring of its iron and steel industry, special steel production was estimated to have risen by almost 9% last year, to 14.5 Mt. The increase is having a favourable impact on molybdenum consumption and it estimated that molybdenum consumption in this sector was around 10,000 t in 2001.

In February 2001, Jinduicheng Molybdenum Co., the International Molybdenum Association (IMA) and Phelps Dodge jointly held a symposium on international co-operation for advancing the application of molybdenum technologies. In October 2001, Jinduicheng Molybdenum Co., the IMA, the Canadian Nickel Development Association, the Chinese Special Steel Association, the International Chromium Association and Sweden's Awestapuleyu Ltd (Asia) held a joint symposium on the manufacturing technology of stainless steel equipment. Both meetings have promoted the potential consumption of molybdenum in China.

### **Tungsten**

The total import/export value of tungsten in 2001 was US\$264.4 million, 32% higher than in 2000. Exports of tungsten products amounted to 23,278 t by volume, 1% higher than in the previous year, and US\$245 million by value, or 37.8% higher. Imports totalled 866 t, 22.2% higher, and US\$19.7 million by value, or 12.2% lower. Exports of ferro-tungsten and the rolled tungsten both increased. Since 1999, there have been government controls on exports of some tungsten products, and exports decreased by 6.7% in 1999, by 2.9% in 2000 and by 6.3% in

2001. Domestic consumption of tungsten last year is estimated at 9,000 t.

For the purpose of conserving tungsten resources and ensuring their rational development and utilisation, the Chinese Government published in 2001 some policies and administrative measures governing tungsten operations and management. Accordingly, local governments closed down illegal small mines and control of tungsten production improved as a consequence.

As part of China's industrial restructuring, some tungsten-mining enterprises merged with those enterprises engaged in mineral processing and smelting. Thus, Zhuzhou Hard Alloy Co. and Shizhuyuan Non-ferrous Metal Co. signed a joint-venture contract during the year to establish Diamond Tungsten Products Ltd. The total investment will be Yu140 million and the company will construct a modern plant capable of producing 10,000 t/y of tungsten oxide.

Zhuzhou Hard Alloy Co. is China's largest hard alloy producer and possesses the most advanced tungsten smelting and deep processing technologies. It requires as feed, more than 10,000 t/y of tungsten concentrate. Shizhuyuan Non-ferrous Metal Co. is China's largest tungsten concentrate producer. The Shizhuyuan area is very rich in tungsten resources and scheelite reserves total some 690,000 t, equivalent to 49% of China's proven reserves and 21% of the world's proven scheelite reserves.

Also during 2001, Xiamen Tungsten Ltd and Luoyang Luanchuan Molybdenum Group signed a contract to establish Luoyang Yulu Mining Ltd. The Luanchuan molybdenum-wolfram mine is world class and one of the largest mines of this kind in China, with 2.06 Mt of molybdenum reserves and 620,000 t of associated Tungsten. Luoyang Luanchuan Molybdenum Group is a major state-owned enterprise with an ore dressing capacity of 10,000 t/d.

## China Metals and Minerals

### Production ('000 t)

	2000	2001
Copper	1,325.8	1,426.5
Copper concentrate	588.5	564.7
Crude copper	983.4	1,082.2
Aluminium	2,827.7	3,424.6
Alumina	4,326.8	4,729.1
Lead	1,033.5	1,171.6
Lead concentrate	569.6	599.2
Zinc	1,919.3	2,078.5
Zinc concentrate	1,710.2	1,572.1
Nickel	50.9	49.5
Nickel concentrate	51.1	51.5
Tin	110.4	91.6
Tin concentrate	97.1	78.8
Antimony	106.4	134.0
Antimony concentrate	98.6	92.4
Magnesium	138.8	186.0
Asbestos	314.6	300.0
Gypsum*	31,605.8	32,876.4
Graphite	1,650.0	1,600.0
Flake graphite	280.0	250.0
Talc	1,900.0	2,000.0
Kaolinite	2,950.0	3,100.0
Wollastonite	268.0	270.0
Coal	999,170.0	1,089,670.0

Sources Non-ferrous industry.

\*Estimation

The main references:

1. Land and Resources Daily.
2. China Mining Daily.
3. China Metallurgical Daily.
4. China Non-Ferrous Metal Daily.
5. Yearbook of the Customs Statistics.
6. China Non-ferrous Metal Industry (magazine).
7. Land Resources (magazine).