

# CHINA

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In 2002, the Chinese economy continued to flourish, reaching Yu10,240 billion, an increase of 8% over 2001 measured at constant prices. International trade increased greatly, with total import and export trade valued at US\$620.8 billion in 2002, 21.8% higher than in 2001. The total value of exports rose by 22.3% to US\$325.6 billion and the total value of imports rose by 21.2% to US\$295.2 billion. The international balance of payments position was healthy, with a foreign trade surplus of US\$30.4 billion.

Foreign direct investment increased steadily. There was a total of 34,171 foreign investment entities newly established in 2002 in China, a 31% increase compared with the previous year. Signed contracts of foreign direct investment were worth US\$82.768 billion, an increase of 19.6% over the previous year. Approximately US\$52.7 billion had been committed, an increase of 12.5% over the previous year, and ranking China, for the first time, the largest foreign investment attractor in the world. Fixed assets investment increased sharply at a rate of 16.1% to Yu4,320 billion.

## **Mining summary**

In 2002, the total value of China's mining industry was estimated at Yu508.5 billion. Production of the main minerals and metals increased in varying degree: the ten principal non-ferrous metals (copper, aluminum, lead, zinc, nickel, tin, magnesium, mercury, antimony and titanium) increased in volume from 8.83 Mt to 10.12 Mt; phosphoric ore increased from 21 Mt to 23 Mt; cement from 661 Mt to 725 Mt; and crude oil from 165 Mt to 167 Mt.

Encouraging results have been achieved from nation-wide geological surveying, a component of the new round of national land and resources investigations. During 2002, there were more than 100 large-to-medium mineral deposits discovered, of which about 80 were found by the nation-wide Geological Survey Programme. Exploration expenditures by the geological and exploration industry reached Yu23.60 billion, of which Yu1.16 billion, or 4.9% of the total expenditure, was contributed by government-funded geological exploration. Positive results were achieved in the exploration for coal, petroleum and natural gas (which account for some 90% of total exploration spending), with newly-identified resources estimated at 760 Mt for coal, 1,053,000 Mt for petroleum and 441.1 million m<sup>3</sup> for natural gas. Other newly-identified resource additions included iron ore, estimated at 102 Mt, copper (813,100 t), bauxite, (58.14 Mt), lead (1.63 Mt), zinc (1.82 Mt) and gold (428.6 t). A total of 48 exploration permits and 39 mining permits involving foreign investment were granted during 2002.

According to data from the *National Land and Resources* newspaper, the total value of imports and exports of minerals and metals, and processing

products, amounted to US\$111.15 billion, approximately 18% of the total value of exports and imports and 20.1% or US\$18.61 billion higher than the previous year. The value of imports rose by 16.4% to US\$69.93 billion and exports rose by 12.7% to US\$41.21 billion, reflecting a further widening of the trade deficit. Imports of all bulk mineral products increased in varying degree, with the exception of copper imports, which fell by 8.4% in 2002. Imports of mineral products, among others, included 69.41Mt of crude petroleum, 112 Mt of iron ore, 2.08 Mt of manganese ore and 1.14 Mt of ferrochrome.

### **Policies and regulations**

In 2002, the Chinese Government issued Regulations on Guiding the Directions of Foreign Investment (effective on April 1, 2002) and renewed (on April 1, 2002) the Categories for Guiding Foreign Investment in Industry. In China, all mineral projects are grouped into four categories: encouraged, permitted, restricted and prohibited. Mineral projects falling within the encouraged category or, under some circumstances, within the permitted category are eligible for prescribed preferential tax benefits. Projects falling within the encouraged, restricted and prohibited categories are listed in the regulation, while the projects which do not fall within the above three categories are permitted projects.

Projects within the 'encouraged category' include: high-cost and high-risk exploration and exploitation of petroleum and natural gas; exploration and exploitation of coal-bed methane; mining and processing of those gold deposits which are low grade and/or difficult to concentrate and smelt; exploration, mining and processing of iron and manganese; exploration and mining of copper, lead and zinc; exploration and mining of bauxite deposits; and exploitation and processing of sulphur, phosphorus and other chemical elements. Mineral-related projects that fall within the 'restricted category' include: exploration and mining of tungsten, tin, antimony, molybdenum, barite and fluorite; exploration and mining of precious metals; exploration and mining of precious minerals, including diamond; exploitation of celestite, and boron-bearing minerals; and exploration and exploitation of some types of coal. Projects falling within the 'prohibited category' include exploration, exploitation and concentration of radioactive minerals and rare earth minerals.

A Rule on Geological Reports Management was issued on March 19, 2002 and was put into effect on July 1, 2002. According to the rule, restrictions on access to geological reports could be lifted. Foreign investment enterprises seeking access to geological data in China should benefit considerably.

The system of administrative examination and approval of mineral projects was reformed in 2002. Among 31 items previously subject to prior examination and approval by the Ministry of Land and Resources (MLR), 18 are now excluded from this requirement. They include:

- mineral reserve valuator;
- mineral reserve valuation agency;
- engineering and geophysical prospecting unit;
- technical appraisal of natural mineral water;
- exploration valuation of the mineral property;

- fees paid for exploration, mineral rights and mining rights;
- geological survey team; and
- qualification of the agency applying for mineral exploration and mining rights on behalf of the investor.

## **Production, Consumption and Trade**

### **Coal**

According to data from the State Bureau for Supervising Coalmine Safety, China's crude coal production in 2002 jumped significantly, by 26% to 1,393.4 Mt from the 2001 total of 1,105.6 Mt. Production exceeded by 19.27 Mt, the record output of 1,374.09 Mt achieved in 1996. Coke production in 2002 was up slightly by 1.7% over 2001, to 133.5 Mt.

A significant change in the share of production in terms of ownership has occurred since 1996. Of the total output in 2002, 711.63 Mt were produced by major state-owned mines, an increase of 93.05 Mt or 15% on 2001; 263.45 Mt were contributed by local government-owned mines, an increase of 40.29 Mt or 18% over 2001; and 418.27 Mt were contributed by township coal mines, an increase of 154.42 Mt or 59% over 2001.

Coal production in China comes from mines located in 27 jurisdictions, which include provinces, autonomous regions and municipalities directly under the control of central government. Coal production levels in 21 jurisdictions increased in 2002, with total increases of 293.58 Mt. The provinces of Jilin, Jiangsu, Zhejiang, Guangdong and Guangxi, and Chongqing municipality, all experienced slight declines in production, however, the total decrease amounting to 5.82 Mt.

According to statistics from China Coal Industry Import and Export Corp. and China Coal Association, coal export in 2002 amounted to 85.75 Mt, virtually unchanged from 2001. Import was 10.81 Mt in 2002, more than a threefold increase compared with the same period of the previous year.

There are only four producers with an annual production exceeding 40 Mt – Shenhua Group, Yanzhou Coal Mining Corp., Datong Coal Corp. and Shangxi Coke Group Co. The Shenhua Group is the leading producer, with production in 2002 comprising 77.33 Mt of crude coal, and 65.94 Mt of commodity coal. Production in the Shenfu Dongsheng coalfield was around 51.65 Mt, an increase of 13 Mt compared with the previous year. The Shenfu Dongsheng coalfield is located in the northern part of Shanxi Province and owned by Shenhua Group. It

is one of the largest coalfields in China and ranks among the world's seven largest. It was discovered in the 1980s, covers a total area of 31,172 km<sup>2</sup>

### **Iron ore and steel**

In 2002, the government reduced the resource tax on iron ore by 40% for those vertically-integrated entities involved in both mining and metallurgical processing. The tax reduction was in line with the government's policy to

promote integrated iron and steel operations, balance the tax burden among different enterprises and encourage competition.

After four consecutive years of decline, China's production of iron ore in 2002 posted an increase. Output during the first 10 months totalled 188 Mt, an increase of 6% compared with the corresponding period of 2001, and the country's state-owned, large-and-medium-scale enterprises, after having experienced continuous losses during the preceding ten years, began to make profits.

The iron and steel industry in China has been stimulated by strong domestic demand, particularly from the construction industry, manufacturing and automotive sectors, hence the rapid growth of the iron and steel industry in recent years. Production of steel and steel products reached 181.55 Mt and 192.18 Mt respectively in 2001, representing increases of 20% and 19% over 2001. It is predicted that steel production in 2003 will exceed 200 Mt.

Exports of steel products in 2002 amounted to 2.67 Mt, 4% lower than in 2001. Imports of iron and steel, however, rose dramatically. In the first ten months of the year they reached 20.57 Mt, an increase of 45.5% compared with the same period of the previous year. Imports rose as a result of a combination of factors – China's custom tariffs for iron and steel imports were reduced, controls on allocated quota permits were cancelled following China's entry into the World Trade Organisation (WTO) and, because the world markets were in oversupply, some countries took special or provisional measures to protect their own iron and steel industries by restricting imports and reducing output.

### **Copper**

According to *China Non-ferrous Metals* newspaper, domestic production of copper concentrates (contained copper) was 554,000 t, 1.8% higher than in 2001. Imports of copper concentrates were down by 8.4% to 2.07 Mt. Production of refined copper in 2002 was 1.56 Mt, up 12.2% from 2001. Imports of refined copper rose by 41% to 1.18 Mt. Production of copper products reached 2.3 Mt, ranking China as the second-largest producer after the US.

Output of refined copper by Jiangxi Copper Corp., the leading copper producer in China, reached 231,600 t. Tongling Non-ferrous Metals Group ranked second, with 224,600 t, and Yunnan Copper third, with 185,100 t.

Jiangxi Copper Corp. is also the top producer of copper concentrate, and its output in 2002 rose by 8.4% to 151,000 t (contained copper), representing 27% of total domestic production. Wushan copper mine, which is owned by Jiangxi Copper, is a large-scale underground operation, and mined and processed more than 1.0 Mt of ore during the year.

China's total copper consumption in 2002 is estimated at 2.5 Mt, about 15% higher than in the previous year, accounting for 17% of world consumption and ranking the country as the largest consumer in the world.

In 2002, important progress was made in discovering new copper deposits in China. Guizhou Geological Mineral Bureau discovered many mineralised zones and occurrences, with grades ranging from 2.05% to 1.8% Cu. The copper resource in just one of the occurrences is estimated at 684,000 t. In the Tibet Autonomous Region, the region's Geological Survey Bureau, while conducting exploration in the eastern part of the Yalu Tsangpo River area, identified the Qulong and Chongjiang properties as large-scale copper deposits, and seven copper zones were also delineated while conducting a mineral resource survey in Nierong-Ba Tsing.

In terms of joint-venture agreements involving foreign investment, several were signed in 2002.

An exploration agreement between the Geological Survey of the Tibet Autonomous Region and Quantum to in respect of the polymetallic copper prospects located in the eastern part of the Yalu Tsangpo River. The exploration is scheduled to start in 2003, and could extend for 30 years. The investment over the first seven years will be spent by Quantum. It is planned that US\$15 million will be spent on exploration over the period 2003-07, and US\$20 million during the period 2008-09 on feasibility studies and deposit appraisal.

Yunnan Geological and Mining Co. signed agreements with Ivanhoe Capital Corp. and Pacific Minerals Inc., both of Canada, to explore and develop copper prospects in Yunnan Province. It is the largest project in Zaotong to date. Under the terms of the agreements, two separate co-operative joint-venture companies will be set up. Pacific Minerals can earn a 74% interest in one and a 70% interest in the other by contributing US\$4 million to the capital of each JV company over three years. Yunnan Geological and Mining Co. will contribute some of its mineral rights. Pacific Minerals also has the right to increase its interests to 90% and 87.5% respectively by being the sole provider of further funding to the JV companies. The acquisitions will be subject to regulatory approvals in China and Canada. It was reported that in early September, 2002, 11 experts from Ivanhoe and Pacific Minerals, led by Robert Friedland, Ivanhoe's chairman and president, conducted field investigations of polymetallic prospects in Lunan county. At the start of October, an exploration group organised by Yunnan Bureau of Geological and Mineral Resources explored the Xiaozai prospect, and the preliminary results indicated that a zone of large-scale, high-grade copper mineralisation could exist in the area.

### **Aluminum**

China's consumption of aluminium reached 3.26 Mt during the first ten months of 2002, 11.4% higher than in the corresponding period of 2001, ranking China as the world's second-largest aluminum consumer.

In response to the high and rapid growth of the Chinese economy, production of aluminum climbed by an impressive 29% to 4.4 Mt. Output has risen at an annual average rate of 14.4% since 1990, and it is predicted that the trend will continue in the years ahead as new smelter projects are established. The

existing capacity is 5 Mt/y. Alumina production also rose strongly in 2002, by 15% over the full year to 5.48 Mt. Imports of alumina climbed by 37% to 4.57 Mt.

Aluminum Corp. of China Ltd (Chalco) is the largest aluminium producer in China and the third-largest alumina producer in the world. According to *China Metal Bulletin*, it produced 5.41 Mt of alumina and 742,000 t of electrolytic aluminium last year, 14.3% and 4.5% higher respectively compared with 2001. Chalco's existing capacity is 750,000 t/y, with a further 660,000 t/y under construction and 750,000 t/y at the proposal stage.

At the end of 2001, Chalco and Alcoa Inc. of the US finalised agreements for a strategic alliance in the form of a 50:50 joint venture at Chalco's Pingguo refinery and smelter. Pingguo is regarded as one of the most efficient alumina and aluminum production facilities in China and draws its bauxite ore from extensive bauxite deposits nearby. According to the agreement, Alcoa will provide management, operational and technical expertise, and best practices to Chalco. Pingguo has an existing alumina refining capacity of 400,000 t/y and a smelting capacity of 130,000 t/y. The parties have committed to contribute equally to a US\$540 million expansion programme that will virtually double refining and smelting capacity at Pingguo over the next few years.

Alcoa had expected to complete negotiation of the definitive Pingguo joint-venture agreement by the end of 2002. The joint venture is subject to clearance by regulatory authorities in China but no US regulatory approvals are required. However, in December 2002, Chalco and Alcoa announced that the joint venture would be concluded set in 2003 so as to allow the parties to complete the necessary commercial terms and to obtain the necessary government approvals.

As part of its overall expansion and upgrading programme over the period 2001-05, Chalco launched its Shanxi alumina and electrolytic aluminium project at the end of 2002. Production is planned to begin in 2006, with a capacity of 800,000 t/y of alumina and 280,000 t/y of aluminium.

### **Nickel**

Nickel production in 2002 rose by 14% to 57,000 t, of which 52,000 t was produced by Jinchuan Co. Ltd. The remainder was contributed by Chengdu Electric Smelting Factory, Xinjiang Non-Ferrous Metal Corp., Jilin Jien Corp. and Chongtsing Smelting Factory. China's consumption of nickel in 2002 was estimated at 92,000 t, 11.3% higher than the previous year. Imports of nickel concentrates totalled 7,074 t, 1.3% higher.

A perennial shortage of nickel ore is causing a bottleneck for the development of all the Chinese nickel producers and in order to overcome this problem, some are making efforts to secure ore through co-operation agreements with foreign companies. For example, Jilin Nickel Industrial Group Co. has signed a joint venture agreement with Inco Ltd. The joint venture will be primarily engaged in mining nickel ore in China; Inco will hold a 60% stake in the

venture via a cash injection and Jilin Nickel (40%) will provide relevant geological data and prospecting rights.

In Gansu Province in northwest China, Jinchuan Non-Ferrous Metal Corp. (JNMC), China's largest nickel producer, has set up a joint project with Anaconda Nickel Ltd of Australia, to engage in nickel exploration in Australia. JNMC expects that the venture will ensure that it has a sufficient supply of nickel ore supply. In a separate development, another Australian company, Titan Resources, announced that its negotiations with JNMC had reached the stage involving the legal and structural form of a joint-venture agreement. Titan said that the likely structure for a joint venture involves the formation of a jointly-owned Chinese technology company with Titan having 75% control. Titan's BioHeap™ process would be used to treat Jinchuan's ore and it is reported that Jinchuan would increase its capacity to 100,000 t/y of nickel by 2010 and thereby meet domestic demand for nickel.

Meanwhile, Jinchuan is seeking new feed sources for its 50,000 t/y facility which is forecast to produce 55,000 t in 2003. The company has signed a preliminary offtake agreement with Sally Malay Mining Ltd in Australia to purchase the entire output of the Sally Malay nickel mine. A bulk nickel-copper-cobalt concentrate will be produced for shipment to China yielding 6,600 t/y of nickel, 3,000 t/y of copper and 600 t/y of cobalt, starting in 2004. Sally Malay is expected to have a mine life of 5.5 years based on proven and probable reserves of 3.42 Mt at 1.56% Ni, 0.64% Cu and 0.08% Co.

### **Tin**

In 2002, China's production of refined tin was 77,300 t, 17% lower than that of the previous year. The three top tin producers, Yunnan Tin Co., Liuzhou China Tin and Gejiu Zili Smelting Corp., produced 29,375 t, 17,360 t and 17,360 t of tin and accounted for 38%, 18% and 18% respectively of total domestic output.

As a main tin-producing region, Guangxi Zhuang Autonomous Region decreased its production sharply to 18,000 t, less than half of its production in 2001, as a result of a series of mine shutdowns sparked by fatal accidents in Nandan, the southern region of Guaxi.

The largest tin-producing area in China in 2002 was Yunnan Province. Refined output in this province was up 13% to 50,148 t, accounting for 65% of total domestic production.

As a result of depressed tin prices and insufficient world consumption, exports of tin products in 2002 fell sharply, by 35% to 45,600 t. Imports of tin products increased by 4.7% to 28,100 t. It was predicted that China is likely to produce and export less in 2003.

### **Molybdenum**

According to statistics from the National Customs and National Non-ferrous Information Centre, exports of molybdenum products were worth US\$359

million in 2002, an increase of 37% compared with the previous year. However, the value of imports of molybdenum fell by 9% to US\$51.92 million.

China is the world's second-largest molybdenum producer and produced 54,535 t molybdenum concentrate from January to October 2002, 3.43% higher than the corresponding period of the previous year. There are identified reserves of approximately 8.55 Mt. Of the six largest molybdenum mines in the world, three are located in China — Luanchuan in Henan Province, with reserves of 1.3 Mt, Daheishan in Jilin Province, with 1.1 Mt and Jinduicheng in Shanxi Province, with 970,000 t.

Daheishan Molybdenum, which was established in the 1980s, is an entity with abundant reserves but was on the verge of bankruptcy for various reasons. It was reorganised in June, 2002, and Jilin Nickel Daheishan Ltd was established.

### **Tungsten**

According to *China Metal Bulletin*, tungsten concentrate production in 2002 jumped by 26% to more than 65,000 t. National Customs data indicate that exports of tungsten products were 12.4% lower than in the previous year, at 24,582 t.

China continued with its policy of not granting mining permits for tungsten so as to control output. In 2002, 123 entities, representing 50% of the total entities, ultimately passed the examination of qualification by the related authorities and were allowed to conduct operations, which meant that half of the entities were shut down.

### **Gold**

In 2001, China saw a series of preparatory efforts to liberate the gold market. These included: launching a weekly quotation system for gold by the central bank; establishing the National Gold Group Co.; forming a Gold Association; and trial operation of the Shanghai Gold Exchange. The exchange was officially opened in October 2002, and thereby brought to an end more than 50 years of government monopoly over the gold market. Since the founding of the People's Republic of China in 1949, Chinese gold producers had sold all of their products to the central bank, which had then allocated the precious metal to gold processors. The central bank will stop purchasing gold from producers in China in the short term, now that the Shanghai Gold Exchange has opened. Thus far, the exchange has signed up more than 100 Chinese trading members. Members include miners, jewellery makers, gold importers and exporters, and commercial banks. Members are permitted to conduct spot gold transactions, and are exempt from a 17% value-added tax. The weekly quotation system for domestic gold prices, implemented by the central bank, was automatically cancelled after the launch of the gold exchange.

In recent years, gold production in China has been maintaining a steady increase, at an annual average rate of 7%. According to the *China Gold* newspaper, gold production in 2002 was 189.8 t, compared with 182 t in 2001, and was worth a record high of Yu1.58 billion. Domestic demand for gold has

been on the decline in recent years, falling steadily from 342 t in 1997 to 184 t in 2000. However, since 2000, demand has begun to rise again in anticipation of the liberation of the market, and in 2002 it reached 213.2 t, thereby ranking China as the world's fourth-largest consumer. It is predicted that demand for gold in China will increase further in the future because it will be much easier to purchase gold from the exchange than from the central bank. Annual demand is forecast to reach 500 t or more within the next few years.

Around 60% of gold mines in China are small-scale operations. The four principal gold-mining areas are the Jiaodong Peninsula, Xiaoqinling, Dianqiangui and Jinsanjiao, with several northwestern provinces also contributing significant amounts. The largest gold producer in China is the Zaojin Group, which was established at the end of 2001. Last year, its output was 15.1 t. As one of the largest gold suppliers in China, the group provided one fifth of the volume of trade on the Shanghai Gold Exchange. The group spent Yu17.64 million on exploration in 2002 and increased its reserves by 12.8 t to bring the group total to 260 t, equivalent to 10% of China's total reserves.

### **Lead**

Production of lead in 2002 was 1.26 Mt, 3.7% higher than in the previous year. Lead concentrate production was 640,000 t, 4.3% lower than in the previous year. The main reason was that many small-scale mines were forced to shut down after the Nandan accident. However, all but two of the top six concentrate producers increased their production in varying degree. According to the statistics from January to November 2002, Yuguang Gold Lead Ltd raised output by 28% to 123,800 t, Yubei Gold Lead Co. increased output by 12% to 72,000 t, Zhuzhou Smelting Factory by 3% to 88,400 t and Shuikoushan Mineral Bureau by 2% to 61,900 t. The exceptions were Zhongjinlingnan Co. Ltd, with a production of 71,400 t, little changed from 2001, and Yunnan Xinli Co. which posted a 4% decline to 52,300 t.

Depressed prices of refined lead on the world market, coupled with increased domestic demand for refined lead by China's automotive industry, had an impact on China's exports of lead. They decreased by 10% to 394,000 t. However, surplus smelting capacity in China combined with the strong domestic demand resulted in imports of lead concentrate jumping by 39% to 430,000 t.

### **Zinc**

Zinc production in 2002 was up 1.1% to 2.08 Mt, and consumption rose by 6% to 1.58 Mt, indicating a supply surplus of some 500,000 t. Net exports of refined zinc, zinc alloy and zinc oxide totalled 350,000 t, a decrease of 120,000 t compared with the previous year. After taking exports into account, the net supply surplus was about 150,000 t and is even higher if imports of zinc are taken into account.

### **Magnesium**

China's production of magnesium increased by 15% in 2002 to 231,700 t, and accounted for almost half of world production. Exports climbed by 35% to

158,000 t, valued at US\$288 million, 20% higher than in the previous year. During the period 2001-05, the Chinese Government is focusing on the technology to development and utilise magnesium alloys. As a consequence, China's large-scale magnesium producers are experiencing a new round of expansions.

### Production of Main Minerals and Metals

		2001	2002
Petroleum	Mt	165	167
Coal	Mt	1,106	1,393
Coke	Mt	131	134
Copper	Mt	1.39	1.56
Copper conc.	t	544,000	554,000
Refined tin	t	93,000	77,300
Nickel	t	50,000	57,000
Lead	Mt	1.215	1.26
Lead conc.	t	669,000	640,000
Zinc	Mt	2.04	2.08
Aluminium	Mt	3.41	4.40
Alumina	Mt	4.76	5.48
Gold	t	182.00	189.80
Pig Iron	Mt	155	170
Tungsten (WO <sub>3</sub> )	t	51,000	65,000
Magnesium	t	202,000	231,700

Note: All the 2002 data in this report are preliminary.