

## KAZAKHSTAN

*By Interfax-CNA*

**K**azakhstan's GDP in 2002 grew by 9.5%. Industrial production grew by 9.8%, agricultural production by 2.7% and construction by 19.3%. Growth in the real sector of the economy, in turn, fostered growth in the service sector: 9.9% in transport in communications and 8.5% in trade. The increase in industrial output was due to a 14.7% rise in the mining sector and 7.7% in the manufacturing sector. Ferrous metallurgy production increased 7.8% over 2001 reflecting an increase in the production of pig iron, steel, iron and steel products, large and small diameter pipe, and ferroalloys. Non-ferrous metallurgy production increased by 4.9%.

Capital investment increased by 19% in 2002. The main sources of capital investment were the funds of domestic enterprises (67%) and foreign investment (25%). Most foreign investment was used to create fixed assets at enterprises in the mining industry (89%). The share of investment in the processing industry dropped to 8.3% from 10% in 2001. Investment in industry accounted for 68% of capital investment. Oil and natural gas production received 78% of industry investment.

Kazakhstan is working on a geological and economic model for the development of its mineral resource-base to the year 2030. So far, models have been created for lead, zinc and bauxite resources and models for gold, copper, iron, chromium, manganese and other metals are to follow. The model for bauxite states that Kazakhstan plans to mine 20.6 Mt of bauxite between 2001 and 2005, averaging 4.1 Mt/y; 24.1 Mt between 2006 and 2010 (4.8 Mt/y); 24.7 Mt between 2011 and 2015 (4.5 Mt/y); 22.7 Mt between 2016 and 2025 (4.5 Mt/y); and 23.1 Mt between 2026 and 2030 (4.6 Mt/y). Alumina production would be 7 Mt between 2001 and 2005 (average 1.4 Mt/y); 8.2 Mt between 2006 and 2010 (1.6 Mt/y); 8.4 Mt between 2011 and 2015 (1.6 Mt/y); 7.6 Mt between 2016 and 2025 (1.5 Mt/y); and 7.7 Mt between 2026 and 2030 (1.5 Mt/y).

Kazakhstan plans to invest about US\$16 billion in its fuel and energy sector from 2003 to 2006 and another US\$27 billion in 2006-2010. The share of the fuel and energy complex in industrial production amounted to 50.6% in 2001 and stayed at this level in 2002. The fuel and energy sector accounted for 16.4% of GDP in 2001 and about 16% in 2002, and contributed 53.4% of Kazakh exports in 2001 and over 52% in 2002.

In eastern Kazakhstan, there are plans to resume geological exploration after a 15-year break because of a depletion of resources in existing deposits: at current mining rates, metals companies and the region itself could end up with no raw material reserves within 12 to 15 years. The reserves of the Maleyevskoye nonferrous metal deposit, the largest in the region, will last until 2020. The regional budget for exploration in 2003 amounts to T150 million

(US\$1 = Tenge155). Overall investment in the mineral resource sector of the Eastern Kazakhstan region is expected to total about US\$3.34 billion in the period to 2011, and US\$3.64 billion in the subsequent period to 2030. The greatest interest is in the Aktogai copper deposit, as well as in projects to mine and process gold ores from the Bolshevik and Bakyrchik deposits (estimated reserves of respectively 14.1 t and 326 t of gold).

The government innovation fund of Southern Kazakhstan region plans to put together a map of semi-precious stones deposits in the region. A register of existing natural resources is not yet available. Geological prospecting data collected since the 1930s remain in archives in Moscow and Tashkent, access to them has been refused. There will first be a study of the deposits of agate, turquoise, rock crystal and Iceland spar. There are also considerable reserves of basalt, granite, marble and white quartz. In addition, the region has reserves of wollastonite and vermiculite.

### **Iron and steel**

Kazakhstan produced 13.38 Mt of iron ore in 2002, an increase of 5.5% over 2001. Production of iron-ore concentrates rose by 60% to 2.55 Mt, output of non-sintered iron ore rose by 30% to 4.28 Mt and pellet production was up by 20% to 7.31 Mt.

The Sokolovsko-Sarbaiskoye Mining Production Association (SSGPO) is Kazakhstan's biggest iron-ore producer and its output last year rose by 6.6% to 13.14 Mt. SSGPO's working mines are the Sarbaiskiy, Sokolovskiy, Kurzhunkolskiy and Katcharskiy open pits and the Sokolovskiy deep mine. SSGPO is a member of the Evraziyskiy Bank group, which also includes Aluminum of Kazakhstan, the company that controls Kazakhstan's alumina and bauxite industry, and Kazkhrom, the national chrome corporation. The Kazakh Government owns 39.5% of SSGPO and has included it on a list of potential blue chip companies.

SSGPO has launched the second stage of a programme of upgrades at its beneficiation complex by testing a US\$140,000 Norwegian five-deck Derrick Stack Sizer 48 to produce fine-screened ore. The first stage of the upgrades, which began in 2002, involves reducing the grain size of ore. After the second stage, the quality of products should be enhanced and the Fe content of the concentrates increased by 2%.

SSGPO also plans to start producing high-grade pellets. SSGPO is already upgrading its crushing and magnetic separation plants in a bid to raise the Fe content of concentrate to 70% in 2003. It is this quality of concentrate that is required to produce pellets with a metal content of 85%-87%.

In 2002, Kazakhstan's steel production increased by 3.8% to 4.87 Mt. Ispat-Karmet, the largest producer and based in the Karaganda region, produces 3.5 Mt to 4.0 Mt/y of metal products, about 94% of which is exported to more than 60 countries. Since 1995, the company has been controlled by Ispat International, a division of the LNM group.

Ispat-Karmet's main sources of iron ore are the Lisakovskoye and Atasuskoye deposits. The Atasu mine has proven reserves of 530 Mt of iron ore and 349 Mt of manganese ore, and a capacity to produce 2.2 Mt/y of ore. In 2002 Lisakov produced 1.44 Mt of iron ore and Atasu 847,000 t.

Ispat-Karmet is drafting a five-year strategic development programme that will cost about US\$580 million. Over the next five years the company plans to carry out three main projects: installation of a continuous steel casting machine; reconstruction of its No.3 blast furnace; and construction of a pipe mill at the Caspian Sea port of Aktau. The company also plans to modernise its communications systems over the next few years.

### **Gold**

Gold mining is one of the most important sectors of the non-ferrous metallurgy industry in Kazakhstan. The country possesses the world's ninth largest gold reserves and the average grade of its deposits are 6.3 g/t Au. Proven reserves amount to about 1,500 t. Last year, Kazakhstan produced 10,964 kg of gold, 28% less than in 2001.

Gold exploration has been conducted on some 225 deposits, including 30 placers and about 60 that also contain copper, silver and other ores. The remainder of the deposits comprise vein gold. The largest deposits are Bakyrchik and Suzdalskoye in eastern Kazakhstan, Vasilkovskoye in the north and Akbakaiskoye in the Zhambyl region. The Ridder-Sokolnoye and Novoleninogorskoye deposits possess the largest polymetallic ore reserves.

The large producer ABS-Balkhash Mining Co., planned to produce about 2.5 t of gold in 2002 compared with 1.4 t in 2001 and 2.4 t in 2000. The company holds mining licences in the Karaganda, Zhambyl and Aktyubinsk regions. Over the period 2002-04, it expects to exhaust reserves at five of its seven mines.

Vasilkovskoye Zoloto, a joint venture mining the eponymous gold deposit in the Akmola region, produced 915 kg in 2002, more than the target of 900 kg. It also produced 40 kg of silver. This year, the company plans to produce 1,000 kg. The overall reserves at the Vasilkovskoye deposit amount to about 360 t. The joint venture was set up in August 2000 on the basis of the Vasilkovskoye Mining and Beneficiation Combine, production did not start until January 2002. Floodgate Holdings BV of the Netherlands owns 60% of the company, and the Government of Kazakhstan owns the other 40%. The venture produces cathode gold, processing oxidised ore using the heap-leaching method. By 2005, the company plans to build a new gold recovery mill that is expected to boost gold output seven-fold. Bateman is drawing up the feasibility study, including the selection of the optimal ore-processing technology and new equipment.

The Bakyrchik Mining joint venture produced 198 kg (6,377 oz) of gold from its mine in eastern Kazakhstan in 2002. The company resumed mining at the deposit at the end of 2001. It processed 67,900 t of oxidised ore, recovering 2,670 oz. It sold 3,707 oz. It also produced 1,270 t of sulphide concentrate

from 7,500 t of sulphide ore. Work at the Bakyrchik deposit was halted in 1996 because of metallurgical problems, chiefly the high arsenic and carbon content of the ore. The ore is now processed using carbon-in-leach technology.

The Kazakh company Altyn Aimak has developed a new bacterial leaching technology for high-arsenic ore and has achieved gold recoveries of up to 88%. Last year the regional government provided a US\$1.5 million loan to introduce the new technology, which specialists believe will make it possible to produce about 10 t/y of gold at Bakyrchik where reserves have been estimated at 326 t (10.5 Moz). The average grade is 6.9 g/t Au. The Government of Kazakhstan owns 30% of the shares in the joint venture, which it plans to sell to a company that could maintain gold production at the deposit.

Celtic Resources plc of the UK announced encouraging diamond-drilling results at its Suzdal gold project, reporting significant grades in the sulphide ore zones. Orebody 1 has yielded grades ranging between 6.7 and 43.6 g/t Au, and Orebody 3 grades of 11.4 to 98.2 g/t Au. Suzdal has been in production since 1999, and 2001 production from the oxide ores amounted to 43,000 oz at a total cost of US\$140/oz. Additional oxide dumps at Suzdal, estimated to contain some 14.0 Mt at 0.8-1.0 g/t Au, are being considered for treatment. These resources are not included in the current 1.6 Moz reserve. The sulphide ores can initially be mined by open pit and then underground. It is expected that production would build up gradually to 500,000 t/y and yield 130,000 oz/y of gold. The sulphide ores are refractory and will require metallurgical processes such as flotation and bacterial leaching to recover the gold. Overall estimated gold recoveries will be about 80%-90%.

The local company Alel, a 100%-owned Celtic subsidiary, holds the Suzdal licence and received the development rights to the deposit in 1995, but actually started mining only in 1999 with the arrival of foreign investors. Four ore bodies have been found in the oxidation zone, according to which the reserves were estimated and confirmed.

The Kazakh mining-metallurgy corporation Altyn Aimak plans to establish a unit to extract gold from 'rebellious' ore using a biological leaching method at the Bolshevik deposit (eastern Kazakhstan). The plant will have a capacity of 350 t/d of ore and it is hoped to achieve a recovery of 88% which compares with 35% using the current technology. According to Altyn Aimak, gold content in the ore at the Bolshevik deposit averages 6.7 g/t, proven reserves amount to 30 t and probable reserves 100 t.

Another Kazakh company, Alir, has started to explore and test-mine the Terisairik gold placer in eastern Kazakhstan's Tarbagatai district. Alir started work at the deposit in 2002 and has so far invested US\$1 million, mainly on geological investigations and the acquisition of a Russian T-35 bulldozer. Kazakh geologists doubt that deposit contains more than one tonne of recoverable gold.

A new gold-mining company, TOO Teriskei, began operations in southern Kazakhstan's Suzak district at the end of 2002. The company was set up to develop the Kumisty gold-silver-copper deposit. The operation has the capacity to produce 12.5 t/y of gold-silver alloy per year. Kumisty was explored in the 1970s, but was deemed unprofitable to mine. One tonne of ore contains on average, 7-10 g/t Au and 150-170 g/t Agilver and up to 0.1% Cu. There are five such deposits known in southern Kazakhstan, all in the Suzak district and, collectively, they are estimated to contain 350 t of precious metals reserves.

### **Chromium, manganese and ferroalloys**

In 2002, Kazakhstan produced 2.37 Mt of chrome ore, up by 15.8% over 2001, 1.8 Mt of manganese ore (up by 30%), 1.23 Mt of ferroalloys (up by 8.9%), 835,800 t of ferrochrome, (up by 9.7%), 164,000 t of ferrosilicon manganese (up by 16%) and 102,200 t of ferrosilicon chrome (up by 28%). Production of high-carbon ferromanganese fell by 57.4% to 2,300 t and ferrosilicon output declined by 12.6% to 127,300 t.

Kazakhstan's chrome industry includes the Donskoi chrome mining complex in the Aktyubinsk region (the former Soviet Union's biggest chromite ore producer), the Ferrokrom Ferroalloy works also in the Aktyubinsk region and the Aksu Ferroalloys Plant in Pavlodar region. The principal metallurgical plants are operated by Kazkhrom, the national chrome corporation. Its units produce all types of ferrochrome, metallic chrome, high-grade ferrosilicon, ferrosilicon chrome, and low-phosphoric silicon-manganese. Kazkhrom is ranked second in the world in terms of both reserves and production of chromium ores, and is the third largest producer of ferrochrome, producing more than 1 Mt/y. It sells ferroalloys in all the world's leading markets, including the US, Europe and Southeast Asia, particularly Japan, Korea and Thailand. Kazkhrom plans to export up to 20% of its output to China in 2003.

Established in 1995, Kazkhrom has about 15,000 employees and operates 40 electric furnaces with a combined installed capacity of 850 MVA. Annual turnover is around US\$500 million. The state owns 31.37% of the company, and various corporate and individual investors own the remaining shares.

Kazkhrom's Ferrokrom Ferroalloy Works in the Aktobe region plans to boost annual production from 220,000 t to 250,000 t by 2007. Production will be boosted through furnace repairs, new technology and the processing of slag-heaps to recover ferrochrome. A new slag-heap processing division will treat 40,000-50,000 t/mth of slag. These slag-heaps contain approximately 15 Mt of waste which Ferrokrom plans to eliminate through reprocessing over 15 years.

Ferrokrom's products include high-carbon ferrochrome, refined ferrochrome, water glass, chrome-ore briquettes, lime-and-sand brick, ferrochrome slag refractories and metallic chrome. It is working on a method to obtain 70% ferrotitanium from ilmenite concentrate mined at the Shokash deposit in the Aktobe region.



The Aksu Ferroalloys Plant completed capital repairs to the No.13 electric furnace in its ferrosilicon manganese division at a cost of about US\$3 million. The division was switched to manganese alloys in 1998 and has six 33-MVA electric furnaces, five of which make manganese alloys. The company mines the Tur manganese deposit in Karaganda region with low-phosphorus ore. Previously, the plant produced silicon and chrome alloys. Manganese ore production at the Tur deposit was expected to reach design capacity of 700,000 t/y in 2002, compared with 417,720 t in 2001. Tur has reserves of 12 Mt, or 70% of all the explored reserves of oxidised manganese ores in Kazakhstan.

Aksu also plans to develop the Ulytau-Zhezdinskoye manganese field, which holds a probable 30 Mt of manganese. In excess of US\$695,000 will be spent on exploration and development, and there are plans to upgrade the Zhezdinskaya mill in the Karaganda region to process the ores.

Kazkhrom plans to explore for chromium and nickel deposits within the Kokpekty-Daul area of Aktyubinsk region. Geological studies were carried out 65-70 years ago, but work ceased when part of the territory was transferred to the military for a testing ground. Kazkhrom won a tender to explore in the region at the start of 2002 and will invest US\$6 million of its own money in the first stage.

The Zhairam Mining Combine is Kazakhstan's biggest producer of manganese and barite concentrates, and is developing several deposits in the Karaganda region where it mines low-phosphorus iron, manganese, iron-manganese, and barite ores. The combine includes a railroad plant, a construction division, a crushing and sorting complex, and the Saransk processing plant.

The Ushkatyn III deposit is the largest, encompassing several ore formations: iron-manganese, iron, barite-lead, and barite. Proven reserves amount to 82.3 Mt comprising 61.9 Mt of primary manganese ore for deep mining and 20.2 Mt amenable to open-pit mining: 1.6 Mt of oxidised manganese-iron ore, 14.2 Mt of primary manganese-iron ore and 4.4 Mt of primary iron ore. Reserves are sufficient for manganese production for at least 30 - 50 years, including open-pit mining for 17 years. The Perstnevskoye deposit currently being explored, is of comparable size to Ushkatyn III.

### **Fuel minerals**

Kazakhstan is the FSU's third biggest coal-producing country behind Russia and Ukraine. In 2002, production of bituminous coal fell by 7.7% to 70.6 Mt and production of brown coal was down by 2.3% to 2.62 Mt. Production is centred on the Karaganda and Ekibastuz basins. Karaganda, in north-central Kazakhstan, possesses high-quality coking coal and the mines supply both the domestic and Russian steel industries. Ekibastuz, in northern Kazakhstan, produces mainly thermal coal for use in Kazakh and Russian power plants. Total geological reserves of coal in Kazakhstan amount to in excess of 113,000 Mt.

Kazakhstan plans to increase annual coal production to 82 Mt in 2005 and to 90 Mt by 2010. The industry's annual material-technical requirements are now estimated at US\$80 million and this figure will increase to US\$96 million by 2010.

Bogatyr Access Komir (BAK), Kazakhstan's biggest coal producer, is a subsidiary of US company Access Industries Inc. And operates in the Bogatyr and Severny coalfields in northern Kazakhstan. Last year, it sold 28.7 Mt of bituminous coal, 15% less than in 2001. BAK is Kazakhstan's biggest supplier of coal to Russian and Kazakh power stations. The sales fell last year as a result of reduced supplies to Russian power stations. However, the company managed to re-establish ties with its former, traditional consumers of Ekibastuz coal - the Almaty and Kokshetau heat and power plants. The company shipped an additional 1 Mt of coal to the two Ekibastuz state district power plants. BAK is targeting sales of 30 Mt in 2003.

Kazakhstan's Eurasian Energy Corp. (EEC) produced 15.23 Mt of bituminous coal last year at its Vostochny strip mine, 7.4% less than in 2001. The main consumers of Vostochny coal include Aluminum of Kazakhstan, Karaganda Power, and Akmola Heat and Power Plant. EEC will invest US\$18.3 million in production in 2003 and will continue equipment repairs and capital construction at the Aksu Heat and Power Plant and the Vostochny mine. Investment will be unchanged from 2002.

The coal division of Ispat-Karmet produced 10.6 Mt of coal in 2002, 8.8% more than in 2001. The company plans to produce 12.6 Mt of coal in 2003 based on delivery contracts already signed. More than half of this - about 7.5 Mt of coking concentrate - will be delivered to Ispat-Karmet, and the remainder will be exported to steel mills in Russia, particularly the Magnitogorsk and Orsko-Khalilovsky mills. Companies in Romania also buy Ispat-Karmet coal, and there are plans to begin exporting to the Czech Republic.

Maikuben-Vest, a private joint-stock company in Kazakhstan's Pavlodar region, produced 2.43 Mt of lignite in 2002, down 6.1% from 2001. The company has almost finished drafting a programme of upgrades, and has also come up with plans to protect the mine from internal flooding and for obtaining special types of coke from coals. The company has, as part of the import-substitution programme in Kazakhstan, signed a protocol of intent to supply a trial consignment of 1,000 t of special coke to the Aksu Ferroalloy Works.

### **Oil and gas**

Kazakhstan plans to double GDP by 2010 by increasing production in the oil and gas industry. Under the plan for economic development in 2004 – 2006, oil and gas condensate production will be increased to 56 Mt in 2004, 61.2 Mt in 2005, and 80.3 Mt in 2006. A total of US\$11 billion will be invested in Kazakhstan's oil industry in 2003-2005 and more than US\$21 billion will be allocated in 2006-2010. Investment in the country's natural gas industry is planned at US\$2.5 billion for 2003-2005 and at more than US\$1.2 billion for 2006-2010.

Kazakhstan produced 47.22 Mt of oil and gas condensate in 2002, 18.2% more than in 2001. The figure included 5.19 Mt of gas condensate (+28.9%). Subsidiaries of national oil and gas company KazMunaiGaz produced 7.42 Mt of oil and gas condensate (+12.9%). The Ozenmunaigaz unit produced 4.90 Mt of oil (+17.6%), including 32,920 t of condensate (+0.5%) and Embamunaigaz produced 2.51 Mt of oil (+4.7%). Companies part-owned by KazMunaiGaz produced 19.59 Mt of oil (+10.5%). The Tengiz-Chevroil joint venture produced 13.2 Mt of this (+5.8%) and Karachaganak Petroleum Operating Co. (KPO) 5.12 Mt (+29.1%). Other Kazakh oil companies produced 20.21 Mt of oil (+29.1%). They included Mangistaumunaigaz with 4.62 Mt (+4.7%), Aktobemunaigaz with 4.75 Mt (+34%) and Hurricane Kumkol Ltd, with 4.75 Mt (+31.7%).

Kazakhstan exported 39.27 Mt of oil and gas condensate in 2002, up 21% from the same period in 2001. In monetary terms, exports of oil and gas condensate in 2002 amounted to US\$5.04 billion, up 18% year-on-year. Kazakhstan plans in 2006 to export 68.9 Mt of oil and gas condensate. According to an economic forecast for 2003 - 2006 by the Ministry for Economics and Budget Planning, Kazakhstan will export 44.2 Mt this year, 47.1 Mt in 2004 and 51.3 Mt in 2005.

Kazakhstan produced 11.33 billion m<sup>3</sup> of gas in 2002, 23.6% more than in 2001. The figure included 5.94 billion m<sup>3</sup> of natural gas (+19%). Subsidiaries of KazMunaiGaz produced 1.32 billion m<sup>3</sup>, 5% less than in 2001, including Ozenmunaigaz 1.22 billion m<sup>3</sup> (-5.4%), and Embamunaigaz, with 103.93 million m<sup>3</sup> (+3.1%). Companies part-owned by KazMunaiGaz produced 9.107 billion m<sup>3</sup> of gas (+29.3%), including the Tengiz-Chevroil joint venture with 4.16 billion m<sup>3</sup> (+31%), Karachaganak Petroleum Operating Co. (KPO) 4.83 billion m<sup>3</sup> (+26.9%), the Tenge joint venture 89.966 million m<sup>3</sup> (+38.1%) and the Arman joint venture with 29.40 million m<sup>3</sup> (no change). Other Kazakh companies produced 901.94 million m<sup>3</sup> (+23.3%), including Mangistaumunaigaz 172.64 million m<sup>3</sup> (+10.4%), Aktobemunaigaz at 603.56 million m<sup>3</sup> (+19.3%) and Hurricane Kumkol Ltd, with 62.45 million m<sup>3</sup> (+25.4%).

### **Bauxite and alumina**

Kazakhstan possesses 1.1% of the world reserves of bauxite and in 2002 it produced 4.38 Mt, a 20% increase on 2001. Alumina output rose by 12.6% to 1.39 Mt.

Aluminum of Kazakhstan is the company that controls Kazakhstan's alumina and bauxite industries. The state owns 31.64% of the shares. Aluminum of Kazakhstan controls the Pavlodar alumina refinery, the Torgai and Red October bauxite mines and the Keregetas limestone quarry. The company's main products are alumina, gallium, aluminum sulphate, fireclay and electricity.

Kazakhstan Aluminum operates the biggest alumina refinery in the CIS and is also one of the world's largest producers of 6N pure gallium (99.9999%) and 7N gallium (99.99999%). Most of the alumina is supplied to Russian smelters.



The Pavlodar alumina refinery is the company's main production unit. It produces alumina from low-grade bauxite produced at Turgai field, using the Bayer process to produce high-grade product from low-grade bauxite sourced from northern Kazakhstan (Krasnooktyabrskoye and Turgai mines). Reserves are close to exhaustion and the company has decided to develop and introduce production at Severnoye. Bauxite from east Ayatskoye, where overburden work has just begun, will also be used.

The government offered the 31.76% of the shares it holds in Aluminum of Kazakhstan at an investment tender on January 2003. The winner was required to organise the construction of a 240,000 t/y capacity aluminium smelter in the Pavlodar region but the tender flopped due to lack of interest.

### **Copper**

In 2002, Kazakhstan produced 36.7 Mt of copper ore, 446,198 t of blister copper, up 2.9% over 2001, and 452,991 t of copper blanks (+6.4%).

Output by Kazakhmys Corp., Kazakhstan's biggest copper producer, was 431,700 t of refined copper, up 3.2% from the 418,400 t produced in 2001. Kazakhmys also produced 673.9 t of silver, up from 654.2 t, 3,899 kg of gold, down from 5,581 kg and 72,300 t of zinc in concentrate (+6.6%). Ore production was 41.1 Mt (+4%). The increases were achieved thanks to upgrades and higher productivity. Kazakhmys specialises in refined copper and its key units are: Zhezkazgan Copper Smelter (formerly Zhezkazgantsvetmet); Balkhash Mining and Metals Combine; Zhezkent GOK (mining and milling)t; East Kazakhstan Copper and Chemicals Combine; and other facilities. Samsung Hong Kong Ltd holds 42.55% of the shares in Kazakhmys, Future Capital 10% and ABN Amro Bank Kazakhstan 9.51%. Kazakhstan's Government sold a 20%-share package in Kazakhmys Corp. for US\$184 million on December 27, 2002, on the Kazakhstan Stock Exchange (KASE).

During the year, Kazakhmys began development of its new Nurkazgan gold/copper mine in the Karaganda region. The mine, located 10 km from the city of Temirtau, contains some 109 Mt of ore, and will have a life of 30 years. Capital costs are estimated at US\$110 million. The open-pit operation should yield about 4 Mt/y of ore and supply concentrates to the Balkhash copper smelter.

Kazakhmys is expected to increase copper production by 2005 to 422,000 t from 400,000 t in 2001. Production will increase mainly by adding new production capacity. Within the next few years, Kazakhmys will complete construction of the Zhaman-Aibat mine and also plans to increase production of zinc by opening a new US\$100 million zinc plant in Balkhash (Karaganda region).

### **Lead and Zinc**

In 2002, Kazakhstan produced 6.21 Mt of lead-zinc ore, up 8% from 2001, and 753,600 t of zinc concentrate (+13.6%), 140,271 t of refined lead (+0.2%) and 286,283 t of zinc (+3.3%).

Kaztsink is the leading zinc producer and has a full production cycle for lead, zinc, gold, silver, sulphuric acid and rare metals. Kaztsink owns the Zyryanovsk, Leninogorsk, and Tekeli mining centres, a metallurgical plant, the Bukhtarmin hydroelectric plant, the Tekeli power plant and the Leninogorsk mechanical plant. It produces more than 30 products apart from zinc, including lead, various alloys and products using lead and zinc, gold and silver, rare metals, sulphuric acid, zinc white, mining equipment, plastic products, and semi-precious stone products.

Kaztsink has four ore-fields in production at present: Ridder-Sokolnoye, Tishinskoye, Maleyevskoye, and Tekeli, and is leasing the Zyryanovskoye and Grekhovskoye deposits. The company employs open-pit mining, and has a total mining capacity of about 5 Mt/y.

The Leninogorsk Complex processes ores containing copper, lead and zinc, and conducts flotation and fluxing of gold ore. The plant began extracting gold from ores produced at Tishinskoye using the gravitational method. The launch of the new gold extraction method was one stage of a programme to produce additional gold from all types of raw materials processed at the plant. The plant will soon launch the next stage to extract gold using this method from ores produced at Ridder-Sokolnoye.

The Zyryanovsk Mining Complex includes the Maleyevsky mine, the leased Zyryanovsk and Grekhovsk mines, an enrichment plant, and supporting enterprises. It produces and refines polymetallic ores. The beneficiation plant is being reconstructed and modernised in order to handle increased output from Maleyevskoye.

The Tekeli Mining Complex includes the Tekeli mine, a concentrator and other facilities. It extracts and processes lead and zinc ore, and currently produces about 350,000 t/y of ore. The concentrator produces lead and zinc concentrate, as well as silver and cadmium concentrate. Kaztsink plans to close the Tekeli Mining Complex because it is losing money and reserves are declining, but no date has been set for this.

Kaztsink also includes the Ust-Kamenogorsk lead and zinc plants and the Leninogorsk zinc plant. The Ust-Kamenogorsk lead plant uses standard technology for lead production and technology that makes it possible to recover lead from sulphide and acidic materials without preliminary sintering. Sulphur is fully recovered from gases and the use of coke is eliminated by maximising the use of the heat method. The Leninogorsk zinc plant processes zinc sulphide concentrates and tailings from lead production. It is one of the top five zinc plants in the CIS. The plant uses high grade zinc to produce zinc aluminum alloys, semi-spherical anodes for galvanizing, anti-corrosive protection for ships, and zinc disks.

## **Uranium**

Kazakhstan is estimated to possess some 25% of the world's known uranium resources, with 60% of them located in the Suzak district of South Kazakhstan. Kazakhstan mines about 3% of the world's uranium and

Kazatomprom has proven uranium reserves totalling 926,000 t, plus around 700,000 t in the probable category.

In 2002, uranium production climbed by 34% and output is expected to rise again in 2003 as new types of extraction technology are employed. Kazatomprom is Kazakhstan's uranium import and export monopoly and is already one of the world's top-ten uranium mining companies, with 5% of global output. It has 90% ownership of Volkovgeologia, a geological organisation, 90% of the Ulba Metallurgical Plant and 90% of Mine No.6 and the Stepnoye and Central mines, all of them in southern Kazakhstan. Kazatomprom aims to be the world's biggest uranium-mining company by 2027.

In January 2003, a court in Kazakhstan's Mangistau region adjudged the Mangistau Nuclear Energy Complex (MAEK) bankrupt. Kazatomprom is being tipped as the most likely new owner.

The government has approved a concept for the development of the uranium and atomic energy sector for the period 2002-2030. Kazakhstan plans to be producing 15,000 t of uranium annually by 2030 and in so doing to become the world's biggest uranium producer by mine-output. Kazakhstan would invest US\$293 million in uranium production during 2003-2015. Investment will total US\$85 million in 2003, US\$101 million in 2004-2006 and another US\$107 million by 2015.

### **Others minerals**

In 2002, Kazakhstan's production of magnesium and its products, including scrap and waste, increased by 8.6%, titanium production increased by 3.9%, and beryllium production by 39%. Kazakhstan produced 359 t of cadmium last year, including scrap and waste, and powder, up from 10 t in 2001.

The BerylliUM joint venture between Kazakhstan and Russia which is hosted by the Ulba Metallurgical Plant (UMZ) in Kazakhstan produced its first beryllium bronze ingots. The BerylliUM joint venture was set up on September 2002 on a 50:50 basis. UMZ is the world's second biggest beryllium producer and produces concentrates, metallic beryllium and beryllium alloys. Kazatomprom owns 90% of the shares in UMZ.

Kazakhstan will soon open a plant in Aksu, Pavlodar region, to produce 1,200 t/y of special electrodes. Swiss-German equipment for the plant has been purchased for the Zhanatass electrode plant. The quality of the electrodes produced using the equipment will be similar to that produced by Chinese and Russian companies. The new plant will use more than 10 types of product produced at the Aksu and Aktyubinsk ferroalloy plants and various natural minerals (quartz sand, marble) as raw material for electrode production.

The plant will be able to cover demand for the electrodes at the country's biggest metallurgical enterprises - Aksu Ferroalloy Plant, Aluminum of Kazakhstan and Sokolovskoye-Sarbaiskiy Mining Production Association.

Geologists from Kazakhstan are in favour of conducting a new appraisal of the Drozzhilovskoye emerald field in the Kostanai region. The appraisal could take three years and cost US\$653,000. Geologists from Yekaterinburg (formerly Sverdlovsk) discovered traces of emeralds in the area in the late 1960s and early 1970s when prospecting for molybdenum. In 1998, a local mining company, Muzben, found emerald fragments between 2 mm and 15 mm in size at shallow depth (4.7-9 m), but the stones were too small and were not of gem value. Work was discontinued due to a lack of funding.