# KAZAKHSTAN

*By Interfax-CNA*

Kazakhstan's real GDP grew by 9.1% in 2003, industrial production grew by 8.8%, cargo transport by 9.8% and agricultural production by 1.4%. Exports rose by nearly one third. Capital investment grew by 10.6% last year; the equity component accounted for two-thirds of total investments, and foreign investment accounted for 21%. Some 63% of investments were directed to the private sector, and foreign companies operating in Kazakhstan used 22%. Oil and gas attracted 42% of total investments last year, followed by transport and communications, with 18.6%, the processing industry, with 9.1% andreal estate, with 8.5%. Most foreign investment was in the country's oil regions, with Atyrau receiving 41% and West Kazakhstan 40%. Investment was up in 13 of Kazakhstan's 16 regions last year.

Mineral production increased by 8.8% in 2003, with higher output of manganese and chromium ores (28.7% and 23.6%, respectively), natural gas (22.1%), iron ore pellets (21.1%), coal (14.9%) and crude oil (7.7%).

The Industry and Trade Ministry expects that investment in Kazakhstan's mining and metallurgy sector could total about US$2 billion by 2005. Many companies in the sector are now implementing major investment projects, and virtually all of them are investing primarily with their own resources and loans. There are nearly 80 companies processing mineral resources in Kazakhstan, including 41 beneficiation mills, 11 heap leaching gold recovery plants, seven in situ leaching plants for uranium, 19 crushing and sorting mills at manganese and iron ore deposits, and eight metallurgical plants. The mining industry accounts for 27% of the country's exports and generates 22% of industrial production.

Meanwhile, Kazakhstan has conducted a revaluation of its main mineral resources – hydrocarbons, lead, zinc, copper, bauxite, manganese, iron ore, phosphorite, barite, coal and chromium. This has enabled a critical assessment to be made for the main types of mineral resources and a forecast of the development of the mineral resource sector to 2030. Profitable and and inactive reserves have been identified, and similar efforts will be directed to other resources, including tungsten, molybdenum, lithium, cobalt, diamonds, zirconium and asbestos.

Consideration is being given to the establishment of a nickel-cobalt industry in the Aktyubinsk region where the Kimpersaiskoye nickel deposit has been mined since the late 1940s. At present, oxidised ores from this deposit are use as flux additives at metallurgical plants in the southern Urals. Kazakhstan also has probably the world's largest man-made cobalt deposit in the form of tailings at the Sokolov-Sarbai Mining Production Association.

 

In February 2004, the Majilis (the lower house of Kazakhstan's parliament) passed key amendments to remove a whole string of loopholes in existing laws on mineral development and oil-related transactions. The amendments empower national oil and gas corporation KazMunaiGaz to represent the state in agreements with contractors in the oil and gas sector by granting it a mandatory share in those agreements. The amendments also oblige mineral developers to avoid excess mineral waste during extraction and primary refining, and to prevent them from undertaking selective mining of mineral deposits selectively. In addition, the amendments impose requirements for the protection and rational use of subsurface resources and make the operator liable if the requirements are ignored. The power to license mineral development will pass from the government itself to an authorised government agency.

The government plans to prepare a draft law on production-sharing agreements (PSAs) that will guarantee Kazakhstan's interests in oil projects. The document will contain regulations providing Kazakh manufacturers with priority to act as suppliers, contractors and carriers, provided they meet international standards and other requirements. At the same time, the law will provide measures to increase the number of Kazakh personnel in oil operations and, where possible, to secure operator status in a PSA for a Kazakh company.

**Iron and steel**

Kazakhstan produced 17.31 Mt of iron ore in 2003, up 12.2% on 2002. Pellet production rose by 21% to 8.85 Mt. The country's biggest iron-ore producer, Sokolov-Sarbai Mining Production Association (SSGPO) increased output by 11%, to 14.53 Mt, and is targeting more than 15 Mt in 2004, including 9 Mt of pellets. SSGPO also plans to launch a hot-briquette iron (HBI) plant costing US$587 million in 2006. The company's operating mines include the Sarbai, Sokolov, Kurzhunkul and Kachar open pits, and the Sokolov underground mine. SSGPO is based in Kostanai region and is a member of the Eurasian Industrial Association, which also includes Aluminium of Kazakhstan, Eurasian Energy Corp and Kazkhrom, the national chrome corporation.

SSGPO increased its exports of iron ore pellets by 30% in 2003, to 7.3 Mt but concentrate deliveries fell by 13.3% to 3.51 Mt. The main export market is still Russia, particularly the Magnitogorsk Metallurgical Combine, to which SSGPO ships 10 Mt/y of product. It sells about 3 Mt/y of iron-ore commodities on the domestic market. In 2004, SSGPO plans to boost exports to 82% of sales, from 78% in 2003, 76% in 2002 and 72% in 2001.

Other iron-ore producers from Kazakhstan also boosted output. Lisakovsky GOK increased production by 7.5% to 1.55 Mt, and Atasusky GOK by 46%, to 1.24 Mt.

In 2003, Kazakhstan produced 4.14 Mt of pig iron in various forms, up 3%. Metallurgical enterprises produced 5.07 Mt of steel, up 4%. Flat-rolled production grew by 3% to 4.12 Mt, including a 17% increase in tin-plate and

tin-plated sheet to 246,000 t. Production of galvanized steel grew by 42% to 707,600 t.

Ispat-Karmet, Kazakhstan's largest steel producer, is based in the Karaganda region and produces 4 Mt - 5 Mt/y. It exports to more than 60 countries.

By 2008, Ispat International, a division of LNM Group, plans to invest US$400 - US$450 million in Ispat-Karmet. The company has invested more than US$1 billion in Ispat-Karmet over the past eight years and intends to introduce continuous casting technology and the first machine will be launched in 2004. The company also plans to complete construction of a plant in Aktau by the middle of 2005 to produce pipe for the oil and gas industry.

**Gold**

Kazakhstan’s refined gold production fell by 9% to 9.94 t in 2003.Gold mining is one of the most important sectors of Kazakhstan’s non-ferrous metallurgy industry. Gold reserves are reported to be the ninth-largest in the world and the average gold content of deposits is 6.3 g/t. Proven reserves amount to about 1,500 t, the third-largest in the CIS after Russia and Uzbekistan.

Gold exploration has been conducted in 225 areas, including 30 placer fields and about 60 fields that also contain copper, silver and other ores. Most gold, however, occurs in lode form and includes the country’s biggest deposits – Bakyrchik and Suzdalskoye in east Kazakhstan, Vasilkovskoye in north Kazakhstan and Akbakaiskoye in the Zhambyl region. The Ridder-Sokolnoye and Novoleninogorskoye fields possess the largest complex ore reserves.

The National Bank of Kazakhstan intends to boost its gold purchases on the domestic market in 2004, 35% to 3.1 t, after signing new contracts with producers.

Kazakhaltyn Mining and Metallurgy Concern, the biggest gold producer and processor in Kazakhstan, owns and operates the Aksu, Bestyube, and Zholymbek gold mines, each of which has 350,000 t/y capacity ore processing plants. The concern also includes the North Kazakhstan Geological Exploration Expedition and the Aksu Technical Base with trucks and railroad access. Kazakhaltyn has reserves estimated at 41.58 Mt containing around 160 t of gold. Probable resources amount to 604 t.

The company recently announced an ambitious new investment project to increase production to 10 t/y (from 1.8 t/y at present). The project includes the purchase of equipment for intensive cyanidation of flotation concentrate, construction of a leaching plant, development of new orebodies at existing operations, and additional exploration and development of the Vera block at the Aksu mine. The Aksu project will increase production to 0.8 Mt - 1 Mt/y of ore and will cost US$120 million. It will pay for itself in five and a half years. Of the planned spending, US$49 million will be allocated for underground mining, US$8 million for open-pit mining, US$27 million for beneficiation, US$15 million for leaching, US$3 million for flotation and US$18 million for exploration.

The Kazakh gold miner Charaltyn plans to produce 2-2.5 t of gold in 2004, up from 1.2 t in 2003. Charaltyn was formed in 1994 and produces gold in eastern Kazakhstan based on total reserves of more than 85 t. Charaltyn also plans to begin gold production at Zhaima, one of 12 gold districts in the Char gold zone. The company will employ leaching technology and mobile processing units and this is expected to reduce project costs significantly.

Vasilkovskoye Zoloto was formed in August 2000 and began producing gold in January 2002. It operates the Vasilkovskoye mine in the Akmola region and produced 955 kg of gold in 2003, 3.5% more than in 2002. By value, output rose by 17%. The company plans to construct a US$100- US$120 million gold recovery plant, to be ready early in 2007. Vasilkovskoye GOK is joint venture between Netherlands-based Floodgate Holdings BV (a subsidiary of Israel's Leviev Group), with 60%, and Kazakhstan's State Property Committee (40%). The upper portion of the deposit contains an estimated 50 Mt of ore averaging 2.9 g/t Au, and a further 30.8 Mt at 5.15 g/t Au are estimated to be present below 360 m. In July 2003 Kazakhstan's Energy and Mineral Resources Ministry signed a 23-year formal contract with Vasilkovskoye Zoloto for the development of the deposit. The event was highly significant as, until then, the company had operated under a temporary permit.

AIM-listed Celtic Resources Holdings plc operates the 100%-owned Suzdal gold mine in northern Kazakhstan. Suzdal contains an estimated 1.5 Moz of gold and production last year from the open pit and heap-leach operation was 37,000 oz at a cash operating cost of US$169/oz. Oxide ore is depleting and a US$25 million project is under way to expand output and construct a treatment plant to process the underlying sulphide ore. The plant is scheduled for completion by the end of 2004 and will treat sulphides at the rate of 300,000 t/y with average feed grades of 12 g/t, to produce some 100,000 oz/y at a costs of about US$150/oz. Alel Finance and Investment Corp, Celtic's wholly-owned subsidiary, holds the Suzdal licence. The deposit has confirmed reserves of 5.172 Mt averaging 8.96 g/t Au, and production is expected to more than triple output by 2005.

Celtic also owns 75% of the Zherek deposit, located about 28 km from Suzdal and in production since mid-2003. The operation is expected to produce 20,000 oz of gold in 2004 from an open-pit heap-leaching operation. Zherek has total reserves of 1.99Mt of oxidised ore averaging 2.62 g/t Au, plus 2.75 Mt of sulphide averaging 5.5 g/t Au. The oxides will be mined for seven years using heap leaching, after which the company will begin developing sulphide ores. Output could reach 50,000 oz/y by 2005.

Meanwhile, Celtic’s non-gold mineral interests in Kazakhstan are being pursued by 21.96%-owned Eureka Mining plc which listed on the London AIM in December 2003. Former Celtic interests now under Eureka’s wing include the Shorskoye molybdenum deposit, potentially one of the world’s largest undeveloped molybdenum deposits.

A new gold ore-processing complex was launched at the Komarovskoye deposit in the Zhitikara district in northern Kazakhstan in December 2003.

The deposit is expected to produce up to 1 t/y of gold. Metall Trading, which holds the gold exploration and mining rights, has invested US$10 million in exploration and construction since 2001. The company has confirmed the deposit's explored reserves of 4.5 t of contained gold and expects to increase this to 15 t. There has been almost no gold mining in the region since the Dzhetygara-zoloto combine closed in the 1960s. The Varvarinskoye, Tokhtarovskoye, Kovylnoye and Elevatornoye gold deposits in the same district have now also been prepared for development.

Kazakh copper producer Kazakhmys, which recently won a tender for the rights to mine gold at the Abyz deposit in the Karaganda region, planned to invest about US$14.3 million in the project duringn 2004. The money will be spent on construction of an open-pit mine and equipment. Abyz has proven reserves of 9 Mt averaging 4.3 g/t Au and 43 g/t Ag. The ore also contains 1.3% Cu and 3.6% Zn, along with lead, cadmium, selenium, tellurium, sulphur and other associated elements. There are for a 260,000 t/y open-pit mine, and and a 220,000 t/y underground mine to a maximum depth of 600-700 m.

In October 2003, Altyn Aimak, a Kazakh mining and metallurgy company, launched a hydrometallurgical mill in Ust-Kamenogorsk with design capacity to produce 1.1 t of gold per year. The mill can now produce 1.5-2 kg of gold per day, or 550-730 kg/y. Altyn Aimak invested US$9 million in construction of a beneficiation plant and the hydrometallurgy mill. Kazakhstan has some 15 rebellious ore deposits, the biggest of them being Bolshevik and the Bakyrchik lodes, which contain large quantities of arsenic and carbon. Existing methods have only been able to achieve recoveries of 35%, making operations unprofitable, but the new one is expected to achieve 88%.

During 2003, a new technology for processing rebellious ores was developed by Altyn Aimak in collaboration with the design institute of the Ulbinsk Metallurgical Plant (a division of national nuclear company Kazatomprom) and Russian specialists. In December 2002, Altyn Aimak opened a beneficiation plant employing bacterial leaching technology at the Bolshevik gold deposit. The ore at Bolshevik averages 6.7 g/t for Au, and contains a proven 30 t of contained gold and a further 100 t in the probable category.

**Chromium, manganese and ferroalloys**

In 2003, Kazakhstan mined 2.93 Mt of chrome ore, up by 16%, and 2.36 Mt of manganese ore, up by 29%. Ferroalloy production increased by 19% tof 1.4 Mt, and included 993,000 t of ferrochrome, 127,160 t of ferrosilicon (up by 0.2%), 178,920 t of ferrosilicon manganese (+9%) and 98,130 t of ferrosilicon chrome (- 9%).

Kazakhstan’s chrome industry includes the Donskoi mining complex in the Aktyubinsk region, the former Soviet Unin’s biggest chromite producer, the Ferrokhrom ferroalloy works in Aktyubinsk and the Aksu Ferroalloys Plant in Pavlodar region. The sector’s plants are represented by Kazkhrom, the national chrome corporation. Kazkhrom's 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 on the basis of reserves and production of chromium ores, and is the world's third-largest producer of ferrochrome. The government owns 31.37% of stock in Kazkhrom and legal entities about 60%.

Kazkhrom increased production of ferroalloys by 11% to 1.25 Mt in 2003. Poduction of chromium ores rose by 13.4% to 2.69 Mt. The company plans to switch to underground mining entirely in 2007 although it continues to develop the Poiskovy open pit, which had 5.5 Mt of ore remaining at the end of 2003. When Poiskovy closes, ore will come from two underground operations: Imeni 10-letiya Nezavisimosti Kazakhstana (formerly Tsentralnaya) and Molodyozhnaya. The first phase at the former, with capacity of 2 Mt/y of ore, came on stream in 2001, and construction of the second phase is now under way. Construction will continue until 2018, when the mine will have reached a depth of 1.5 km. Molodyozhnaya has been in operation since 1982, and was based on initial reserves of 62 Mt. As of January 1, 2003, 41 Mt remained in the ground. The chromium oxide content is high, averaging 50-51%, and current output is around 1.73 Mt/y of ore, which is in line with demand, although the design capacity is 2 Mt/y. Production is expected to increase to 1.8 Mt in 2004.

Kazkhrom is investing US$38.5 million in two projects to recycle slime and process low-grade chromium ores at the Imeni 40 let KazSSR production site, and began construction of a mill at at the beginning of 2003 to enrich low-grade ores (chromium oxide content of up to 35-36%). The project will cost US$3.5 million and the 600,000 t/y capacity mill is scheduled for completion in 2004. Imeni 40 let KazSSR, which includes the Molodyozhnaya mine and a second beneficiation mill, will also host a US$35 million pellet production line using ore enriched to 53% CrO content. This mill, which will make baked chromium ore pellets using technology from Finland's Outokumpu, will have a design capacity of 700,000 t/y and construction is expected to begin in 2004 for completion in 2005.

Kazkhrom's Ferrokhrom unit produces 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 (AZF) in the Pavlodar region was established in 1968 and is the world's biggest ferroalloy works. AZF produces ferrochrome, ferrosilicon, ferrosilicon chrome, ferrosilicon manganese and ferromanganese, and possesses four smelting divisions (24 electric furnaces intended for making high-quality ferroalloys needed for production of various brands of steel), two charge preparation divisions, a slag recycling plant, auxiliary repair shops, and an automobile transport and railroad division.

AZF invested more than US$20 million during 2003 in overhauling and modernising the plant. It opened an engineering-innovation centre, launched a gas scrubbing unit at the No. 1 manganese alloys division and a special coke plant. In December 2003, AZF completed a US$7 million overhaul of its

No. 64 electric furnace, which will boost ferrochrome output by 38,000-40,000 t in 2004, and by about 80,000 t/y once it reaches capacity in 2005. This project will complete the refurbishment programmes for all four electric furnaces in the plant's chrome alloys division. The 63-MVA furnaces are currently the largest in the world for making ferrochrome. All of AZF's 26 furnaces, ranging in capacity from 21 to 63 MVA, are now operating.

AZF's engineering and innovation centre launched a new experimental 1.2 MVA furnace in June 2003. The centre will work on improving production processes, developing new types of alloys, and using raw materials with fewer impurities. The R&D facility was set up in 1966, but closed in 1997 when Trans World Group (which held a controlling stake in AZF at the time), decided to close the unit and sell off the equipment. The plant will now be able to test new types of raw materials (quartzite, manganese ore, chrome pellets, etc) and improve technology for production of manganese alloys, taking into account the quality of manganese ore mined in Kazakhstan. The launch of the new furnace is the first step in restoring a comprehensive research centre. The next step will be to buy research equipment.

Zhairemsky GOK, Kazakhstan's biggest producer of manganese and barite concentrates, plans to increase production of manganese concentrates by 30% compared with 2001, to about 640,000 t/y by 2005. The enterprise is developing several mines in the Karaganda region where it produces low phosphorus iron, manganese, iron-manganese, and mono-barite ores. Zhairemsky consists of the Zhairem Dalnezapadny, Ushkatyn-III and Zapadny mines a railway depot, construction and installation depot, crushing and sorting complex and the Saranskaya enrichment and experimental enrichment plant. Switzerland's Nakosta AG holds the controlling interest, and Olberg Holding AG, another Swiss company, owns 4.62%.

**Fuel minerals**

Kazakhstan is the FSU's third biggest coal-producing country behind Russia and Ukraine. In 2003, coal enterprises produced 80.5 Mt of bituminous coal, up 14% from 2002, and 4.2 Mt of brown coal, up 41%. Production is centred on the Karaganda and Ekibastuz basins. Karaganda, in north-central Kazakhstan, mines coking coals of high quality and supplies both the domestic and Russian steel industries. Ekibastuz, in northern Kazakhstan, produces mainly coal for use in Kazakh and Russian power plants. Total geological reserves of coal in Kazakhstan amount to over 113,000 Mt. In 2003, coal exports increased by 11% to 26.9 Mt valued at US$245 million, a 50% increase on 2002.

The coal industry in the Pavlodar region could receive as much as US$600 million over the next ten years for new equipment and production upgrades. Already, some US$700 million had been pumped into the mines since they were privatised.

Bogatyr Access Komir (BAK, Pavlodar region) increased output by 15% in 2003 to 33 Mt and is the largest supplier of coal to power companies in Russia and Kazakhstan. It sold 337 Mt of coal in 2003, increasing sales in

Kazakhstan by 10.5% and sales to Russia by 19%. BAK's main customers in Russia are Chelyabenergo, Sverdlovskenergo and Omskenergo, plus eight power stations. Access Industries Inc of the US now controls BAK, having owned the Bogatyr mine since winning a public tender in 1996. The mine has projected capacity to produce 50 Mt/y of coal.

BAK will invest US$23.6 million in capital construction projects in 2004, up 36% from 2003. Most of this will be used to complete the construction of a loading complex, to buy equipment for new automobile-railroad technology at Severny mine, and to replace worn equipment. Investment in capital construction last year was used to reconstruct the rail conveyor complex at Bogatyr and to complete the switch to transporting coal to an electric system. The company also reconstructed the front of the Severny mine.

BAK plans to switch to conveyor and autoconveyor technology to bring coal to the surface because its open-pit mines are getting too deep for rail transport. The pits being mined by the company have reached a critical depth for rail transport of 230 m. In future, coal will be loaded into large-tonnage dump trucks using hydraulic excavators and taken to a special blending complex. Coal will then be loaded on conveyor systems to bring it to the surface. The company expects to invest about US$500 million on the project, which might be financed with loans from the European Bank for Reconstruction and Development (EBRD), the International Finance Corp (IFC) and commercial banks.

The Vostochny strip mine, a major supplier of coal to local consumers and users from Russia and Kyrgyzstan, produced 17.5 Mt of coal in 2003 and aims to increase production to17.5 Mt in 2004, 18 Mt in 2005 and 20 Mt in 2006. The mine is a division of Eurasian Energy Corp (EEK). The government owns 25.18% of the shares in EEK, which also includes the Aksu thermal power plant and a production and repairs division. Corporate shareholders have a 68% voting stake.

Ispat-Karmet steel mill's coal division increased output considerably in 2003, to 12.7 Mt.

Maikuben-Vest plans to produce 4.075 Mt of brown coal in 2004, up 10% from 3.7 Mt in 2003. Maikuben has been producing coal since 1986 and the coalfield contains an estimated resource of some 1,030 Mt. AES-Ekibastuz acquired 100% of Maikuben-Vest in March 2002. The company, owned by US corporation AES, acquired the Maikuben mine under Kazakh law after it paid the company's debts. AES aims to increase annual production from 4 Mt to 6 Mt and installed a new crushing complex in December 2003.

**Oil and gas**

Production of oil and gas condensate amounted to 51.3 Mt in 2003, 8.6% more than in 2002. This included 5.94 Mt of gas condensate - up 14.5% year-on-year. Subsidiaries of Kazakh's national oil and gas company, KazMunaiGaz, produced 7.92 Mt of oil and gas condensate, up 7% year-on-year. In particular, Ozenmunaigaz produced 5.28 Mt of oil, up 8.2% year-on-

year, and Embamunaigaz produced 2.63 Mt, up by 4.7%. Companies with KazMunaiGaz participation produced 20.38 Mt of oil, up 3.7% year- on-year. Most of this production was accounted for by Tengizchevroil (12.75 Mt) and Karachaganak Petroleum Operating Co (5.92 Mt). Other Kazakh oil companies produced 2.98 Mt of oil in 2003, up 13.9% year-on-year, and including Mangistaumunaigaz (4.82 Mt) Aktobemunaigaz (4.65 Mt) and Hurricane Kumkol Ltd (4.95 Mt).

Kazakhstan increased its oil and gas condensate exports by 13% to 44.34 Mt in 2003, with the value of exports increasing by 39% to US$7.023 billion.

Gas production in Kazakhstan in 2003 amounted to 13.88 billion $m^3$, up 22.7% year-on-year, including natural gas production of 7.3 billion $m^3$, 22.6% higher. KazMunaiGaz subsidiaries produced 1.26 billion $m^3$ of gas, down 4.4%, including Ozenmunaigaz (1.16 billion $m^3$) and Embamunaigaz (0.98 billion $m^3$. Companies with KazMunaiGaz participation produced 10.23 billion $m^3$ of gas, up 12.5% year-on-year, including Tengizchevroil (4.35 billion $m^3$), Karachaganak Petroleum Operating Co (5.78 billion $m^3$), Tenge (0.7 billion $m^3$) and Arman (0.25 billion $m^3$). Other Kazakh companies produced 2.39 billion $m^3$, up 160% year-on-year, and included Mangistaumunaigaz (0.19 bllion $m^3$), Aktobemunaigaz (0.93 billion $m^3$) and Hurricane Kumkol Ltd (0.27 billion $m^3$ - an increase of 320%).

**Bauxite and alumina**

Kazakhstan has 1.1% of the world's bauxite reserves and in 2003 it produced 4.74 Mt, 8.2% more than in 2002. Alumin output increased by 2% to 1.42 Mt. Aluminum of Kazakhstan, one of the world's ten largest alumina producers, raised production by 2.5% to 1.42 Mt. The company controls the Pavlodar alumina refinery, the Torgai and Red October bauxite mines in the Kostanai region, the Keregetas limestone quarry and a CHP plant in the Pavlodar region. Switzerland's Corica AG acquired 31.76% of the shares in Aluminum of Kazakhstan from the Kazakh Government in April 2003. As part of agreement, Corica is to build an aluminum smelter near Pavlodar, and will launch the first 60,000 t/y stage by the end of 2007. The Kazakhstan State Development Bank (BRK) will provide about US$100 million of the US$300 million needed to build the first stage, the balance to be provided by a foreign bank and Kazakhstan's Eurasian Industrial Association. The smelter will be built in three stages over eight-to-ten years. Its capacity will be augmented to 120,000 t/y during the second stage and 240,000 t/y during the third stage. Overall costs will be US$800-US$1,200 million. Initially, the smelter will be equipped with imported pre-baked anodes, but the second phase will have up to 70,000 t and the third phase up to 136,000 t/y of locally-produced anodes.

**Copper**

In 2003, Kazakhstan produced 34.7 Mt of copper ore, down 5.5%, 431,930 t of blister copper, down 3%, and 432,401 t of refined copper, down 5%. Kazakhmys is the ninth-largest copper producer in the world and the fourth-largest silver producer. The company specialises in refined copper and copper concentrate and consists of the Zhezkazgan Copper Smelter (formerly

Zhezkazgantsvetmet), Balkhash Mining and Metals Combine, Zhezkent GOK, East Kazakhstan Copper and Chemicals Combine and other facilities.

Kazakhmys produced 417,366 t of refined copper, down 3.3%. It produced 54,645 t of copper wire rods, down from 59,852 t in the previous year. The company mined 40.14 Mt of ore, down from 41.14 Mt. In addition, the company produced 78,078 t of zinc in concentrate (72,342 t), 607 t of silver (674 t) and 2.9 t of gold (3.9 t). The company also mined more than 10.38 Mt of coal.

Kazakhmys intends to boost investments in upgrades, chiefly at existing mines, from US$44.3 million in 2003 to US$70.1 million in 2004. Spending on the construction of new mines will decrease, from US$23 million to US$11 million. Money will be spent on expanding production at the state-of-the-art Nurkazgan copper-gold mine in the Karaganda region and at the No. 67 mine, both of which went on stream last year. Kazakhmys plans to introduce stage two of the No. 67 mine, which will enable it to increase ore production by 4 Mt/y. In addition, Kazakhmys intends to build a new furnace at its Balkhash smelter, renovate the Karagaily concentrator and build the new Abyz mine and other mines in the East Kazakhstan region. These mines will send their ore for processing at Karagaily.

In September 2003, Kazakhmys won an investment tender for the rights to develop the Akbastau and Kosmurun complex ore deposits in eastern Kazakhstan. Copper reserves are estimated at 300,000 t. Kazakhmys executives had earlier proclaimed the company's interest in a number of small, undeveloped deposits, including the Akbastau, Kosmurun and Abyz deposits, that had been given over to various foreign and Kazakh investors in the early 1990s. None of these companies had met its investment obligations.

Kaztsink, Kazakhstan's national zinc company, has begun producing M1K brand cathode copper at its beneficiation plant at the Zyryanovsk Mining and Beneficiation Complex (GOK). Zyryanovsk will host the first cathode copper line in the CIS to use electrowinning technology. Kaztsink has spent more than US$1.5 million on the new line, including refurbishment of production capacity and new equipment.

Meanwhile, MNPO Polimetall (Polymetal), a St. Petersburg-based precious metals corporation, is developing a US$150 million copper project in Kazakhstan. Polymetal signed a contract in early January 2004 with Yekaterinburg's Copper Technology to prepare a project for the development of the 50 Let Oktyabrya copper-pyrite deposit. The project calls for setting up a mining and milling complex for copper ore and is scheduled to come on stream in the fourth quarter of 2005. The deposit, with a copper content of 1.52%, has C1 reserves of 39,890 t of copper and C2 reserves of 5,230 t.

**Lead and zinc**

In 2002, Kazakhstan produced 6.35 Mt of lead-zinc ore, up 3.1%, and 765,600 t of zinc concentrate, up 1.6% Refined output was 116,006 t of lead, down 17%, and 294,965 t of unprocessed zinc, up 3%.

Kaztsink is the leading zinc producer, and has a full production cycle for lead, zinc, gold, silver, sulphuric acid and rare metals. The company includes the Ust-Kamenogorsk Metallurgical Combine (formerly the Ust-Kamenogorsk Industrial Complex), Riddersky Repair and Mechanical Plant, Bukhtarminsky Hydro Energy Complex, Tekelii Energy Complex and Tekelii GOK. Kaztsink produces more than 5 Mt/y of ore and Swiss firm Kazastur Zinc AG holds a controlling interest.

Kaztsink plans to assemble a gas cleaning system from Danish firm Haldor-Topse at its lead production division at the Ust-Kamenogorsk metallurgical complex. The system would cost about US$13 million, and another US$10 million will be spent on building pipes, service lines and gas ducts. The installation will reduce gross emissions of gas from lead production by half. Today, metallurgical production in Ust-Kamenogorsk emits about 80,000 t/y of sulfuric anhydride. Kaztsink plans to eliminate remaining emissions by constructing another such cleaning installation in 2005-06.

In November 2003, Kazakhmys launched a US$120-million, 100 t/y smelter to produce export zinc in the city of Balkhash. Kazakhmys will produce zinc from its own concentrate, the end product being metallic zinc in ingot form for export.

Yuzhpolimetall is building a plant to make batteries from secondary lead remelted by the company. The plant, scheduled for completion by the end of 2004, will make up to one million batteries annually. Yuzhpolimetall was formed in mid-1999, with the bankrupt Shymkent Lead Plant as its core. The company is privately owned. There is annual capacity top produce 60,000 t of refined lead, 36 t of gold doré and 300 t of bismuth.

**Uranium**

Kazakhstan is estimated to possess some 25% of the world's uranium resources, 60% of these being located in the Suzak district of south Kazakhstan. Kazakhstan mines about 3% of the world's uranium and Kazatomprom has reported proven uranium reserves totalling 926,000 t, plus proven and probable reserves of 1.65 Mt.

Kazatomprom is responsible for uranium imports and exports, and ranks among the world’s top four uranium miners, accounting for 8% of global output. The company controls Volkovgeologia, a geological unit (90%), Ulba Metallurgical Plant (90%), Mine No. 6 and the Stepnoye and Central mines, all in southern Kazakhstan and the MAEK-Kazatomprom nuclear power plant. Kazatomprom also has stakes in the Inkai, Katco, Zarechnoye and UKR TVS joint ventures.

Kazatomprom plans to mine 3,420 t of uranium in 2004, up from 2,840 t in 2003 and 2,665 t in 2002. Sales of US$97.6 million are being targeted compared with around US$74.5 million in 2003 and US$63.8 million in 2002.
In November 2003, Kazatomprom opened a refinery at its Central Mine Directorate in south Kazakhstan. The plant's initial capacity is projected at 1,700 t/y of uranium oxide and this will eventually be raised to 2,000 t/y. The

company has invested US$4.5 million from its own funds in the project and will be able to treat half of the uranium produced at its own operations. The remainder will be sent to the Ulba Metallurgical Plant in western Kazakhstan.

Under a government-approved programme for the development of Kazakhstan's uranium industry to 2015 (largely authored by Kazatomprom), annual production of natural uranium is targeted to increase to 11,700 t by 2015. By value, Kazatomprom's annual uranium sales are projected to grow to over US$380 million by 2015. Uranium production is targeted at 4,900 t in 2005, 6,550 t in 2006, 9,250 t in 2008, 10,050 t in 2010 and 11,000 t in 2013.

Kazatomprom intends to increase production by stepping up mining operations at deposits in areas of seam oxidation, processing mined uranium at its own refineries, as well as developing mining joint ventures with companies that have a high degree of vertical integration, down to end consumption of uranium products. Production will also be increased by introducing new technologies aimed at boosting the quality of productive solvents, use of more efficient methods for preparing and mining deposits, construction of new in situ leach (ISL) mines and development of existing mines.

Under the programme, there are plans to improve the reliability and efficiency of sales of nuclear fuel for Russian nuclear power stations, build a conversion plant, sell 3,000 t/y of natural uranium hexafluoride on the world market, as well as process uranium supplied by foreign companies for conversion into uranium dioxide powder and fuel pellets in annual amounts of up to 100 t.

The programme calls for the construction of mines at the Central Moinkum, Eastern Mynkuduk, Inkai and Kharasan deposits, as well as JV development of the Zhalpak, Moinkum, Tortkuduk, Irkol and Zarechnoye deposits.

Kazatomprom plans to change the current technology for processing ores over the next few years, phasing out conventional mining and metallurgical processing. The new Central mining group refinery will be expanded from 2,000 t/y to 8,000 t/y of natural uranium concentrate ($U_3O_8$) per year, and all new ISL mines will have new technology for producing rich desorbate. This technology is expected to lower costs and eventually generate all of the country's uranium concentrate.

**Others**

In 2003, Kazakhstan's production of magnesium and associated products fell by 21% and output of production of titanium and associated products was down by 16%.

Kazakhstan produced 1,351 t of cadmium, including scrap, waste, and powder, up 3% from 2002. Kaztsink is reviving production of cadmium in light of stronger demand. An economic analysis of the situation showed that the launch of the line is becoming profitable, so production of cadmium has been resumed. Demand for cadmium nosedived in recent years and prices fell to record lows, forcing Kaztsink to shut down production of refined cadmium at

the hydrometallurgy division of its Ust-Kamenogorsk metallurgical complex. Blister cadmium was stockpiled as there was no use for it. Cadmium sponge is turned into pure metal using vacuum refining technology.

Aluminium of Kazakhstan will close its chemical-metallurgical plant, the world's second-largest producer of primary metallic gallium, due to unfavourable world market trends. The plant produces 6N high frequency gallium, reportedly of superior quality to some of the gallium produced in Europe and Japan. Aluminium of Kazakhstan is able to produce 25,000 kg/y of gallium. The 6N purity metal is used in defence and aerospace equipment, production of mono crystals for computers, cellular phones, and other products.

In January 2004, Kazakhstan's Government sold 15.5% of the shares in Ust-Kamenogorsk Titanium-Magnesium Combine (UKTMK) for 1.318 billion tenge (US$9.4 million) to unspecified buyers on the Kazakhstan Stock Exchange (KASE). The combine produces high-grade titanium sponge and magnesium.