



# 2005 Minerals Yearbook

---

## MONGOLIA

---

# THE MINERAL INDUSTRY OF MONGOLIA

By Pui-Kwan Tse

Mongolia is a landlocked country that is bordered by China to the south and Russia to the north. It has one of the lowest population densities in the world; the population is about 2.56 million, and the total land area is about 1.56 million square kilometers. In 2005, the country's economic growth rate was 6.2% compared with 10.1% in 2004. The gross domestic product (GDP) increased to \$18.5 billion, and inflation in terms of the consumer price index increased by 12.7% in 2005. The double-digit increase in the inflation rate was caused by higher food and fuel prices. Expansion of the mining and service sectors was the main contributor to economic growth. The increased contribution to the economy was owing to higher copper and gold prices of the mining sector and to the increase in gold production. The value of industrial production declined because of cutbacks in the textile sector that followed full implementation of the agreement on textile and clothing on December 31, 2004. The textile sector was built through foreign investment, mostly from China, because Mongolia did not have an export quota for textiles shipped to the United States. In 2005, most China-based producers closed their production lines in Mongolia (National Statistical Office of Mongolia, 2005, p. 21).

Mongolia has rich mineral deposits of coal, copper, fluorspar, and gold. Since the economic reform of the 1990s, the Mongolian Government has gradually privatized the mining sector. The mining and quarrying sector accounted for 52% of the total industrial output value and 18% of the GDP. In the past, mineral exploration was hampered by limited infrastructure and significant climate change in Mongolia. During the past several years, economic and governmental reforms have led to increased foreign investment in mineral exploration and exploitation in the country. The mining sector accounted for 47% of total foreign direct investment in 2005 (Mineral Resources and Petroleum Authority of Mongolia, 2006).

The current mineral law was adopted in 1997 and amended in 2001. The amended mineral bill recommended an increase in the minerals royalty to 5% from 2.5%, an increase of the license fee, and an added export customs tax on mining products. The bill also proposed reducing tax incentives for mining. Under the current mineral law, companies receive 100% tax exemption for the first 5 years of operation followed by 50% for the next 5 years. The proposed bill would reduce the 100% tax exemption to the first 2 years followed by a 50% exemption for the next 3 years. The duration of exploration licenses would be changed to 2 years with a discretionary extension of 3 years and the option of a 2-year extension. The proposed changes could provide more opportunity to local companies without affecting foreign investment. The draft bill also proposed changing the term of mineral resource licenses to 20 years with the possibility of two 10-year extensions for a total of 40 years instead of the

current terms of 60 years with a possible extension of 40 years for a total of 100 years. The drafted amendments to the mineral law would enhance the accountability of mining companies with respect to production activities and rehabilitation of the environment and could improve the relationship between the local government and mining entities. The proposed amendments included up to 30% Government ownership of "strategically significant" resources, which were defined to include coal, copper, gold, lead, silver, uranium, and zinc, and mineral deposits owned by foreign investors. The proposed amendments on the mineral law were submitted to the Parliament for approval in December and were expected to be enacted in 2006 (Mining Journal, 2005; UB Post, 2005<sup>1</sup>).

In 2005, the Government also submitted to the Parliament a "windfall profit tax on some products" bill, which would establish export customs tariffs on some types of minerals being extracted and processed. Major export-related minerals, which included coal, copper, fluorspar, gold, and molybdenum, were expected to be affected. An additional tax on profits would be imposed on copper and gold if the price of copper and gold exceed \$2,600 per metric ton and \$500 per troy ounce, respectively, on the London Metal Exchange. The new law was expected to be passed by the Parliament in spring 2006. The proposed new laws may affect foreign investor confidence in the future of Mongolia's mineral sector (Mining Journal, 2006b).

Since the 1990s, the Asian Development Bank and the World Bank have provided loans and assistance to the Mongolian Government to promote the development of a sound financial sector to support private-sector-led growth. The Ministry of Finance submitted a package of revised taxation laws to the Parliament for approval in 2005. The amendments will change personal and corporate income taxes and value-added taxes (VAT). The revised law is intended to eliminate double taxation and reduce taxes. The personal income tax rate will be set to a single rate of 10% to replace the existing three-tiered rate. The corporate income tax rate will be changed to a single rate of 25% of total income instead of the current rates of 30% and 15% depending on earned income. The VAT will be reduced to 10% from 15% in the proposed package. The proposed changes are based on the recommendation by the International Monetary Fund and the need to improve the country's competitiveness globally (U.S. Agency for International Development, 2006).

The country's trade has been heavily influenced by economic developments in China and Russia. In 2005, Mongolia's total trade increased by 19.0% to \$2.25 billion. Because of high global metal market prices, the value of exports increased by 22.4% to \$1.07 billion. Owing to an increased demand for agricultural products and mineral fuels, the value of imports increased by 16.0% to \$1.18 billion. The value of metal and mineral exports and imports accounted for about 70.2% of the country's total export value. Mongolia exported nearly all its output of concentrates of copper, molybdenum, and zinc to China and shipped fluorspar to Russia, Ukraine, and the

---

<sup>1</sup>References that include a section mark (§) are found in the Internet References Cited section.

United States. Gold was exported mainly to, in descending order of amount exported, Canada, the United Kingdom, the United States, and the Republic of Korea. Petroleum and petroleum products remained the leading imported commodities followed by textiles and flour. Mineral exports from Mongolia were expected to increase in the next few years because of the increased output of copper, gold, and zinc when new mines are put into operation. China and Russia were Mongolia's two major trading partners. China accounted for 48.3% of Mongolia's total export value, and the United States, 14.3%. Russia was the leading source of Mongolia's imports; it accounted for 35.3% of the total imported value followed by China, with 25.9% (National Statistical Office of Mongolia, 2005, p. 48-56).

The leading mining operation in Mongolia, Erdenet Mining Corp., increased its mining output to more than 27 million metric tons per year (Mt/yr) of ore from 25 Mt/yr and produced concentrates that contained more than 130,000 metric tons (t) of copper and 1,500 t of molybdenum. Because of a decline in the average ore grade, the output of copper in concentrates decreased to 126,547 t, but the output of molybdenum in concentrates increased slightly to 1,188 t because of higher metal content in the ore. Outokumpu Group of Finland signed a memorandum of understanding (MOU) with Erdenet to build a 35,000-metric-ton-per-year (t/yr) copper rod plant; Outokumpu's HydroCopper process would be used for low-grade copper concentrates. When the Erdenet ore was tested at a pilot plant, the test results indicated that the process produced 1 metric ton per day of pure copper powder and that the copper content in the powder was higher than London Metal Exchange's grade A purity. The powder was used to produce copper wire rod by Outokumpu Upcast (Erdenet Mining Corp, 2006§).

The permit for the Oyu Tolgoi (Turquoise Hill) deposit at Oyu Tolgoi, Umnogovi Aimag (South Gobi Province) in the southern Gobi region was originally held by BHP Inc. in 1996; Ivanhoe Mines Ltd. acquired it in the late 1990s. Four major ore bodies have been identified at Oyu Tolgoi. GRD Minproc Ltd. estimated that the proven and probable reserves at the Southern Oyu pits of Oyu Tolgoi were 930 million metric tons (Mt) at average grades of 0.50% copper and 0.36 gram per metric ton (g/t) gold (Ivanhoe Mines Ltd., 2006). Ivanhoe completed the feasibility study for the development of the Southern Oyu gold-rich open pits. During the first stage, the initial throughput rate of the mine would be 70,000 t/d during the first 5 years and would increase to 85,000 t/d in the sixth year. The average annual production was projected to be 450,000 t of copper and 10.2 t of gold for 35 years. Initial capital investment was estimated to be \$1.15 billion. The mine was expected to begin production in 2008 (Ivanhoe Mines Ltd., 2005).

Ivanhoe and the Mongolian Government were discussing a formal investment contract for the Oyu Tolgoi project that included tax restructuring and infrastructure development. The proposed amendments in the mineral resources law and tax laws would be the basis of final negotiations. The mineral law amendments would give the Government the option to acquire interests in mineral deposits that were considered to be "strategic" because they could have an impact on Mongolia's national security and economic and social development. The Government could acquire up to 34% interest in projects that

were discovered and/or explored with the use of private funds and 50% interest in projects that were discovered with the use of state funds (Open Society Forum, 2006§).

Gold mining in Mongolia increased significantly during the past decade, and the number of companies engaged in gold mining grew in the 1990s to more than 100 and produced a total of more than 12 t of gold. Because most of the companies were placer gold producers and many placer deposits were nearly depleted, gold output decreased in the early 2000s. In 2004, a number of gold mines were under development. Gold mines at Borro, Bumbat, and Olon Ovoot were put into operation. Gold output increased sharply and was expected to continue to increase in the near future. Domestic gold demand was mainly for jewelry. Boroo Gold Co., in which Centerra Gold Inc. of Canada had a 95% equity interest, was the leading gold producer and accounted for nearly 40% of Mongolia's total gold output. Centerra completed its feasibility study of the Gatsuurt gold deposit, which is located 35 kilometers from the Boroo Mine. The probable reserves of the Gatsuurt deposit at the central and main zones were 30.7 t of gold. The company planned to haul oxide ore from Gatsuurt to the Boroo processing facility. A biooxidation treatment plant to process refractory ore will be constructed at the Boroo facility in 2008. Centerra continued its exploration work in 2006 (Mining Journal, 2006a).

In 2002, QGX Ltd. of Canada discovered a massive sulfide deposit, Golden Hills, in Western Mongolia. The deposit covered an area of 7,500 square kilometers (km<sup>2</sup>) and contained measured and indicated resources of 175,000 t of copper, 113 t of silver, and 12.7 t of gold. Metals are contained in oxide, sulfide, and quartz-telluride veins in three distinct zones—central, north, and south. QGX can earn an 80% interest in the Golden Hills prospect by investing \$450,000 in the property by 2005 and can increase its interest to 100% by spending \$1 million. Batch tests on extraction of gold and silver from oxide ore showed promising results in 2005. Work will continue in 2006 (QGX Ltd., 2006).

Tumurtei Iron Ore Co. Ltd. signed an agreement with Baotou Iron and Steel Group Co. Ltd. of Nei Mongol Autonomous Region, China, to supply 60% of its iron output to Mining Material Co. Ltd. (a subsidiary of Baotou). Tumurtei was a joint-venture of three Chinese companies—Helongjiang International Economic and Technical Cooperative Corp., Qinglong International Industrial Co. Ltd., and Shougang Mining Investment Co. Ltd.—and a Mongolian company. Tumurtei's iron ore mine has proven reserves of 230 Mt at a grade of from 51% to 54% iron. Construction of the mine started in 2004 and was scheduled to be put into operation in 2006; the design output capacity was 4 Mt/yr (China Metals, 2005).

The construction of Tsairt Minerals' Tumurtiin Ovoo Mine near the town of Sukhe Bator, Sukbataar Province, began in October 2003 and was completed in August 2005. The mine was jointly owned by China Nonferrous Metal Industry Engineering Co. Ltd. (51%) and Mentalimpex of Mongolia (49%). The mine had 7.5 Mt of ore reserves with an average grade of 13.67% zinc. The open pit mine was designed to mine 300,000 t of ore and could produce 66,000 t/yr of zinc in concentrates for 25 years. The construction cost was \$43 million (China Nonferrous Metals News, 2006).

Asia Gold Corp. of Canada and Ivanhoe reached an agreement for Asia Gold to acquire Ivanhoe's coal division in exchange for common shares of Asia Gold. As a result of this agreement, Asia Gold became a subsidiary of Ivanhoe. The agreement required approval from the Toronto Stock Exchange Venture Exchange and fulfillment of other regulatory requirements. Ivanhoe owned the Nariin Sukhait coal deposit, which has measured and indicated coal resources of 124 Mt. Asia Gold focused on exploring for coal, copper, and gold in Mongolia. In 2005, Asia Gold discovered the Khongor porphyry copper-gold prospect and the Naran Bulag gold prospect at Asia Gold's Western property in the Gobi region. The Western Gobi property has an area of 24,748 km<sup>2</sup> and its eastern boundary is located about 150 kilometers (km) west of Ivanhoe's Oyu Tolgoi deposit. Asia Gold will continue exploring on the property in 2006. Asia Gold also explored its West Falcon Gobi property, which covers an area of 12,662 km<sup>2</sup>. BHP Billiton also explored coal in the West Falcon Gobi property (Asia Gold Corp., 2006).

Mongolia has a potential 100 billion metric tons of coal resources. During the past decade, annual coal production was about 5 Mt/yr. During the past 2 years, coal output increased sharply because the Government privatized several state-owned mines in the Gobi region and expanded their output to meet the increasing demand for coal in China. The Tavan Tolgoi deposit in the South Gobi was the largest discovered coal deposit in Mongolia and contained more than 5 billion metric tons of coking and steam coal. BHP Billiton expressed interest in developing the Tavan Tolgoi deposit. Other potential coal deposits for development included Tevshiin Govi, Tsaidam, and Tugrong Nuur (Mineral Resources and Petroleum Authority of Mongolia, 2006).

Geologists had discovered that the geologic formations of the East Gobi and the Tamsag Basins in eastern Mongolia have many similarities with the Erlian and the Khailaar Basins in China. Estimations of oil resources in Mongolia ranged between 4 billion and 6 billion barrels (Gbbbl). Recent studies showed that the Tamsag Basin had oil reserves of between 50 million barrels (Mbbbl) and 1.5 Gbbbl. SOCO International plc of the United Kingdom explored contract block areas XIX, XXI, and XXII in the Tamsag Basin. Dongsheng Petroleum of China and Roc Oil Co. of Australia jointly explored contract block areas XIII and XIV in the eastern Gobi Basin under a production-sharing contract (PSC). SOCO drilled four wells in area XIX. During the pilot production runs, wells 19-21 and 19-20 flowed at rates of 120 barrels per day (bbl/d) and 70 bbl/d, respectively. Mongolian-based Petro Matad signed an agreement with the Mongolian Government to explore for oil in the Matad-20 field in Dornod Province and planned to invest more than \$10 million in the next 5 years in exploration (Mongolia Development Gateway, 2006§).

## References Cited

- Asia Gold Corp., 2006, Mongolia—A new mineral frontier: Toronto, Ontario, Canada, Asia Gold Corp. press release, August 8, 10 p.  
 China Metals, 2005, Baotou Steel to source iron ore from Mongolia: China Metals, v. 11, no. 233, p. 15.

- China Nonferrous Metals News, 2006, Tumurtiin Ovoo Mine: China Nonferrous Metals News, June 29, p. 1.  
 Ivanhoe Mines Ltd., 2005, Independent integrated development plan for Oyu Tolgoi: Toronto, Ontario, Canada, Ivanhoe Mines Ltd. press release, September 25, 3 p.  
 Ivanhoe Mines Ltd., 2006, New mineral resource estimate adds 281 million tonnes of high-grade inferred resources to the Hugo North copper-gold deposit in Mongolia: Toronto, Ontario, Canada, Ivanhoe Mines Ltd. press release, February 1, 11 p.  
 Mineral Resources and Petroleum Authority of Mongolia, 2006, Mongolia 2006: Ulaanbaatar, Mongolia, Mineral Resources and Petroleum Authority of Mongolia, 12 p.  
 Mining Journal, 2005, Mongolia moves to reassure investors: Mining Journal, December 2, p. 10.  
 Mining Journal 2006a, Centerra outlines Gastsuurt reserve: Mining Journal, March 31, p. 10.  
 Mining Journal, 2006b, More Mongolian concern: Mining Journal, May 19, p. 12.  
 National Statistical Office of Mongolia, 2005, Monthly bulletin of statistics: Ulaanbaatar, Mongolia, National Statistical Office of Mongolia, December, 113 p.  
 QGX Ltd. 2006, QGX received positive metallurgical results for gold and silver contained in oxide at the central valley zone (CVZ), Golden Hills, Mongolia: Waterdown, Ontario, Canada, QGX Ltd. press release, May 11, 3 p.  
 U.S. Agency for International Development, 2006, Economic policy reform and competitiveness monthly newsletter: Ulaanbaatar, Mongolia, U.S. Agency for International Development, June, 8 p.

## Internet References Cited

- Erdenet Mining Corp., 2006, Main activity indicators of EMC, accessed May 19, 2006, at URL <http://www.emc.erdnet.mn/work.htm>.  
 Mongolia Development Gateway, 2006 (May 30), Product share agreement concluded, accessed September 14, 2006, at URL <http://www.Mongolia-gateway.mn/modules.php?name=News&file=print&sid=9600>.  
 Open Society Forum, 2006, Mongolia launches working group for Ivanhoe mine agreement, accessed September 13, 2006, at URL <http://www.openforum.mn/print.php?coi=1490>.  
 UB Post, 2005 (September 15), Draft mineral law worries international investors, accessed September 27, 2005, at URL [http://www.ubpost.mongolnews.mn/index.php?subaction=showfull&id=112673754&archive=&start\\_from=&](http://www.ubpost.mongolnews.mn/index.php?subaction=showfull&id=112673754&archive=&start_from=&).

## Major Source of Information

Mineral Resources and Petroleum Authority of Mongolia  
 State Property Building, Builders' Square 3  
 Ulaanbaatar 211238, Mongolia  
 Fax: 976-11-31-03-70  
 E-mail: [mram@magicnet.mn](mailto:mram@magicnet.mn)  
 Internet: <http://www.mram.mn>

## Major Publications

National Statistical Office of Mongolia, Ulaanbaatar, Mongolia:  
 Statistical Bulletin, monthly.  
 Mongolian Statistical Yearbook, annual.

TABLE 1  
MONGOLIA: PRODUCTION OF MINERAL COMMODITIES<sup>1</sup>

(Metric tons unless otherwise specified)

Commodity <sup>2</sup>	2001	2002	2003	2004	2005
Cement, hydraulic thousand metric tons	68	148	162	62 <sup>r</sup>	112
Coal do.	5,141	5,307	5,666	6,794 <sup>r</sup>	8,256
Copper:					
Mine output, Cu content	133,503	131,705	130,270	130,000	126,547
Metal, refined	1,476	1,500	1,341	2,376	2,475
Fluorspar:					
Acid grade thousand metric tons	127	86	120	148 <sup>r</sup>	134
Submetallurgical and other grade do.	72	99	150	206 <sup>r</sup>	233
Total do.	199	185	270	354 <sup>r</sup>	367
Gold, mine output, Au content <sup>3</sup> kilograms	13,675	12,097	11,119	19,240 <sup>r</sup>	24,120
Gypsum <sup>c</sup> thousand metric tons	25	25	25	25	25
Iron ore:					
Gross weight do.	--	--	--	33	168
Iron content do.	--	--	--	21	109
Lime, hydrated and quicklime do.	30	42	42	30 <sup>r</sup>	81
Molybdenum, mine output, Mo content	1,514	1,590	1,793	1,141	1,188
Petroleum, crude thousand 42-gallon barrels	74	139	183	216 <sup>r</sup>	201
Salt, mine output	1,800	1,268	1,971	1,550 <sup>r</sup>	1,896
Silver, mine output, Ag content <sup>c, 4</sup> kilograms	27,200	27,000	27,000	28,000	28,000
Steel, crude	10,000	15,900	39,300	54,900 <sup>r</sup>	65,500
Tungsten, mine output, W content	63	35	40	77 <sup>r</sup>	78

<sup>c</sup>Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. <sup>r</sup>Revised. -- Zero.

<sup>1</sup>Table includes data available through September 20, 2006.

<sup>2</sup>In addition to the commodities listed, crude construction materials, such as sand and gravel, and varieties of stones, such as limestone and silica, are produced, but available information is inadequate to make reliable estimates of output levels.

<sup>3</sup>Reported raw gold production but excludes gold contained in copper concentrate.

<sup>4</sup>Based on 55 grams per ton silver in copper concentrate.

Sources: National Statistical Office of Mongolia (Ulaanbaatar); Mongolian Statistical Yearbook 2001-2004; Mineral Resources Authority of Mongolia, Mining Office, Output of Mineral Commodities (Minerals Questionnaire 2001-2005).