



2014 Minerals Yearbook

MONGOLIA

THE MINERAL INDUSTRIES OF MONGOLIA

By Sean Xun

Mongolia is a landlocked country located between China and Russia. The vast territory of Mongolia has rich mineral deposits, including copper, coal, gold, and uranium. The mineral sector plays an important role in the country's economy. The Oyu Tolgoi copper mine and the Tavan Tolgoi coal mine are Mongolia's world-class mining projects under development. In 2014, mineral materials produced in Mongolia included cement, coal, copper, crude oil, fluorspar, molybdenum, and silver (table 1).

Minerals in the National Economy

According to the National Statistical Office of Mongolia, preliminary estimates of the 2014 real gross domestic product (GDP) indicated an increase of 7.8% compared with that of 2013; the rate of growth in 2014 was lower than that of 2013 (11.6%). Growth in the mining sector, which contributed 17.6% of the GDP in 2014, remained robust, expanding by 19.1% compared with that of 2013; the rate of growth of the mineral sector in 2013 was 18.5%. Strong mine production overall was attributed to increased copper production at the new Oyu Tolgoi (OT) Mine despite the decrease in coal production owing to the decline in coal prices. Growth in the nonmining sectors, however, registered lower rates in 2014 owing to contraction in the construction and the wholesale and retail sectors. The agriculture, forestry, and fishing sector, which contributed 14% to the GDP, expanded by 13.7% in 2014 compared with 19.2% in 2013, and the manufacturing sector, which contributed 10.6% to the GDP, expanded by 4.6% in 2014 compared with 10.3% in 2013 (World Bank, The, 2014, p. 7; National Statistical Office of Mongolia, 2015b).

In 2014, 71,565 people were employed by the country's industrial sector compared with 73,014 in 2013. The mining and quarrying sector employed 25,263 people in 2014 compared with 26,705 in 2013; 12,457 were engaged in the mining of metal ores compared with 13,197 in 2013, 8,247 were engaged in the mining of coal and lignite and the extraction of peat compared with 8,384 in 2013, 2,798 were engaged in the extraction of crude petroleum compared with 2,712 in 2013, and 1,761 were engaged in other unspecified mining and quarrying compared with 2,412 in 2013 (National Statistical Office of Mongolia, 2015a, p. 18).

From 2010 to 2012, total investment in the country increased by an average of 38% annually and was a primary driver of economic growth, and foreign direct investment was a major source of financing for investment. Total investment, however, decreased by 35.4% in 2013 compared with that of 2012, followed by a more significant decrease of 73.6% in 2014. The sharp decreases were owing to the completion of the Oyu Tolgoi Mine in 2012. In 2014, investment in the mining and quarrying sector accounted for 14% of the country's total investment compared with 46% in 2013 and 50% in 2012 (World Bank, The, 2014, p. 8; National Statistical Office of Mongolia, 2015a, p. 8).

Government Policies and Programs

The Mineral Resources Authority of Mongolia is the Government agency that oversees the mining sector, provides assistance and support in developing the state's policy for the mining industry, provides services to businesses and investors, and implements the Minerals Law and related legislation (Mineral Resources Authority of Mongolia, 2015).

On January 16, a new State Minerals Policy (the Minerals Policy) was adopted by the Mongolian Parliament. The purpose of this policy is to improve the stability of the investment environment; to improve the quality of mineral exploration, mining, and processing; to promote advanced technology; and to make the mining sector more competitive on the international market. The Government expected that implementation of this policy would lead to more openness and transparency of state organizations and state-owned companies. Plans for gradual privatization of state-owned companies in the mining sector were outlined in the policy. The Minerals Policy was expected to serve as the basis for amendments to the existing Minerals Law and other laws relating to the mining sector (Allens, 2014a).

On July 1, amendments to the Minerals Law of Mongolia (the Amendments) and several new laws relating to the mining sector were passed by the Mongolian Parliament. One of the laws lifted the ban on the issuance of new exploration licenses, which had been in place since 2010, and was intended to encourage investment and exploration activity in the country. The Amendments proposed the establishment of a National Geology Office to collect and maintain mining-related information in support of the development of Mongolia's mining sector (Allens, 2014b).

On July 1, a revised version of the Law of Mongolia on Petroleum (the Petroleum Law) was adopted by the Parliament of Mongolia. The Petroleum Law replaced the previous petroleum law, which was enacted in 1991, and identified just three types of petroleum-related activities—research, exploration, and extraction—while the old law had seven categories—exploration, preservation, production, processing, transportation, storage, and trade. In addition to simplifying the categories, the licensing procedure was also modified to reduce complexity. Obtaining a license is a more complicated process than obtaining permission, and is required for exploration and extraction activities for oil and unconventional oil. For such activities as research, storage, and transportation, the Government only requires operators to obtain permission, which is a simple approval process. The revised Petroleum Law represents another positive measure adopted by the Government to attract more foreign and domestic investment in the petroleum sector. In addition, in 2013 the Parliament adopted the Law of Mongolia on Investment, which became effective on July 20, 2014, and was also intended to encourage investment in the mining sector (Woolley and Odkhuu, 2014).

Production

In 2014, cement production increased by 59% compared with that of 2013 owing to operations resuming at the country's largest cement plant, the Khutul plant, which had been refurbished over a 1.5-year period. Fluorspar production increased by 65%; crude petroleum, by 44%; copper (mine output), by 34% owing to the first full year of operation at the Oyu Tolgoi Mine; silver (mine output), by 34%; gold (mine output), by 29%; crude steel, by 15%; and molybdenum (mine output), by 10%. Production of coal, decreased by 16% compared with that of 2013 owing to decreased demand from China. Production of salt (mine output) decreased by 15%, and that of zinc (mine output) decreased by 10% (table 1; National Statistical Office of Mongolia, 2015a, p. 118–119).

Structure of the Mineral Industry

Table 2 is a list of the major mineral industry facilities operating in Mongolia in 2014. The locations and production capacities of these facilities are also provided. Most of the producing mining companies in Mongolia were owned jointly by private international companies and the Mongolian Government, whereas some were state owned and some were wholly owned by foreign investors.

Mineral Trade

In 2014, the total value of trade was about \$11 billion with a trade surplus of \$537.9 million. In comparison, the total value of trade in 2013 was \$10.6 billion with a deficit of about \$2 billion. Exports were valued at \$5.77 billion in 2014, representing a 35% increase compared with that of 2013; imports were valued at \$5.24 billion, representing an 18% decrease compared with that of 2013. China was the leading recipient of Mongolia's exports in terms of value, accounting for about \$5.07 billion compared with \$3.71 billion in 2013; the United Kingdom followed, accounting for \$399 million, and Russia accounted for \$61.7 million (National Statistical Office of Mongolia, 2015a, p. 57–58).

The country's increase in exports was largely accounted for by the increase in mineral exports. In 2014, the value of exported mineral products amounted to \$4.79 billion compared with \$3.5 billion in 2013 owing to the increased production at the Oyu Tolgoi copper mine. About 1.38 million metric tons (Mt) of copper concentrate (gross weight), which was valued at about \$2.57 billion, was exported in 2014 compared with about 650,000 metric tons (t) valued at \$949 million in 2013. Other notable mineral exports in 2014 included 19.5 Mt of coal valued at about \$849 million compared with about 18.4 Mt valued at \$1.12 billion in 2013, 6.88 million barrels (Mbbbl) of crude petroleum oil valued at \$635 million compared with 5.2 Mbbbl valued at \$515 million in 2013, 6.3 Mt of iron ore valued at about \$446 million compared with about 6.7 Mt valued at \$654 million in 2013, 10,000 kilograms (kg) of gold (unwrought or in semimanufactured forms) valued at \$405 million compared with 7,600 kg valued at \$310 million in 2013, 99,400 t of zinc concentrate valued at \$113 million compared with 130,900 t valued at \$120 million in 2013, 313,900 t of fluorspar ores and concentrates valued at \$71.5 million compared with 338,100 t valued at \$83.2 million

in 2013, 6,327 t of refined copper and copper alloy valued at \$41.9 million compared with 2,201 t valued at \$16.1 million in 2013, and about 4,000 t of molybdenum ore and concentrate valued at \$35.7 million compared with about 4,000 t valued at \$29.5 million in 2013 (National Statistical Office of Mongolia, 2015a, p. 57–61).

In 2014, China received 100% of Mongolia's exports of coal, copper concentrate, iron ore, and zinc ores and concentrate; 74% of molybdenum ores and concentrate; and 46% of fluorspar ores and concentrate. The remainder of the exports of fluorspar ores and concentrate mainly went to Russia (52%), and the remainder of the exports of the molybdenum ores and concentrate mainly went to the Republic of Korea (22%). The leading import partners and their share of Mongolia's mineral exports remained unchanged from 2013 to 2014 (National Statistical Office of Mongolia, 2015a, p. 60).

Imports to Mongolia were provided by a few countries. In 2014, China provided 34% of Mongolia's imported goods in terms of value; Russia, 30%; Japan, 7%; and the United States, 4%. The value of imported mineral products amounted to \$1.46 billion, or 28% of total imports. The leading imported mineral products were fuel and cement, which were valued at \$1.1 billion and \$91.6 million, respectively, in 2014 compared with \$1.37 billion and \$97.8 million, respectively, in 2013 (National Statistical Office of Mongolia, 2015a, p. 62–66).

Commodity Review

Metals

Copper and Gold.—On January 24, 2012, Rio Tinto plc obtained a controlling interest in Turquoise Hill Resources Ltd., which held a 66% interest in Oyu Tolgoi LLC (OT). The Oyu Tolgoi copper and gold mine is located in the South Gobi region and was being developed by OT. At the end of 2014, Rio Tinto had a 50.79% interest in Turquoise Hill and, therefore, a 33.5% indirect interest in the Oyu Tolgoi project. The remaining 34% of the Oyu Tolgoi project was held by the Government. Rio Tinto was responsible for the management of the development process of the Oyu Tolgoi Mine. OT held three mining licenses that covered the majority of the identified mineralization at the Hugo Dummett and the Southern Oyu Tolgoi (SOT) deposits. The company also held two additional licenses in joint venture with Entree Gold LLC. Under the Minerals Law of Mongolia, the licenses were valid for 30 years with the possibility of two 20-year extensions. The first renewal was due in 2033 for the Oyu Tolgoi licenses and in 2039 for the Entree Gold licenses (Rio Tinto plc, 2015, p. 158, 212; Turquoise Hill Resources Ltd., 2015, p. 20, 58, 63).

In 2010, an initial investment decision was made to construct the SOT open pit mine with a nominal 100,000-metric-ton-per-day (t/d)-concentrator and supporting infrastructure. The mine entered commercial production in September 2013, and the first concentrate was exported in October 2013. In 2014, which was the first full year of operation, OT produced 148,400 t of copper compared with 76,700 t in 2013, 18,311 kg of gold compared with 4,883 kg in 2013, and 27,775 kg of silver compared with 15,209 kg in 2013. In 2014, OT sold about 733,700 t of concentrate and generated about \$1.6 billion in net revenue.

According to the company, the recovery rate improved in 2014 owing to operational improvements throughout the year and the development of a high-grade zone in the second half of the year. Concentrate inventories were drawn down to normal levels by the end of 2014 owing to improvements in marketing and logistics in 2014 (Rio Tinto plc, 2015, p. 197; Turquoise Hill Resources Ltd., 2015, p. 19, 59).

As of yearend 2014, the proved ore reserves at the Oyu Tolgoi operating mines were 383 Mt grading 0.54% copper, 0.39 gram per ton (g/t) gold, and 1.41 g/t silver; probable ore reserves were 612 Mt grading 0.40% copper, 0.23 g/t gold, and 1.12 g/t silver. The probable ore reserves at the Hugo Dummett North deposit (one of the Oyu Tolgoi development projects) were 464 Mt grading 1.66% copper, 0.34 g/t gold, and 3.37 g/t silver. The total resources at the Oyu Tolgoi deposits were about 4.9 Mt grading 0.39% to 1.19% copper, 0.07 g/t to 0.44 g/t gold, and 0.91 g/t to 3.18 g/t silver. Inferred molybdenum resources were about 1.817 billion metric tons grading 0.011% molybdenum (Rio Tinto plc, 2015, p. 200–201, 205, 207).

The Hugo North underground mine was the most significant economic component for the initial investment decision at the Oyu Tolgoi Mine. In August 2013, however, the development of the underground mine was delayed owing to unresolved matters with the Government of Mongolia. The issues included agreement on a comprehensive funding plan, completion and approval of the feasibility study by all shareholders and acceptance of the study by the Mongolian Minerals Council, and issuance of all necessary permits required for operations and development. In February 2014, Turquoise Hill Resources Ltd., Rio Tinto, and the Government announced that they were committed to continue construction of the underground mine and to develop the Oyu Tolgoi subject to resolution of the unresolved issues (Rio Tinto plc, 2015, p. 31; Turquoise Hill Resources Ltd., 2015, p. 17, 59–60).

China supplied power to the Oyu Tolgoi Mine, which is located less than 100 kilometers (km) from the China border, from its power grid and a supplementary diesel power generation site. In August 2014, OT and the Government entered into a Power Sector Cooperation Agreement to explore the possibility of establishing an independent power producer. Under the agreement, the Government would import and supply power to meet OT's needs until Mongolia developed a domestic power source. A long-term framework for strategic cooperation aimed at a comprehensive energy solution for the South Gobi region was outlined in the agreement (Rio Tinto plc, 2015, p. 213; Turquoise Hill Resources Ltd., 2015, p. 36).

Industrial Minerals

Cement.—Cement consumption in Mongolia in 2014 was reported to be about 2 Mt, and consumption for 2015 was projected to be 3 Mt. The increased demand was in part owing to high levels of investment in mining and infrastructure in recent years. Mongolia produced 411,000 t of cement in 2014 and 259,000 t in 2013. The shortfall in production had been met by imports, mostly from China. About 1.5 Mt of cement was imported in 2014 (Oxford Business Group, 2014b; National Statistical Office of Mongolia, 2015a, p. 8, 119).

In May, the Khutul plant (owned by Khutul Cement and Lime JSC) began production after a 1.5-year period of refurbishment in which outdated technology from an inactive Soviet-era cement factory was replaced with a modern dry-process system. The plant was located 250 km north of Ulaanbaatar and had a 1-Mt capacity. The updated plant was expected to reduce power consumption and pollution. The plant was expected to meet about 50% of the nation's annual cement consumption (Oxford Business Group, 2014b).

In May 2013, the European Bank for Reconstruction and Development (EBRD) obtained a stake in Senj Sant, a company owned by Monpolymet Group, through an equity investment of \$20 million. In late April 2014, the EBRD agreed to lend Senj Sant \$65 million to fund the construction, commissioning, and operation of a new cement plant. The new Senj Sant plant was strategically located in southern Mongolia about 450 km from the capital, Ulaanbaatar, and was expected to have a total capacity of about 3,000 t/d of cement. The plant, which was expected to start production in 2015, would employ a technologically advanced, environmentally friendly dry-process to produce high-quality cement. According to Monpolymet Group, the EBRD's financing was expected to help Senj Sant raise its business standards to international levels and diversify the economy by targeting an industry that was relatively underdeveloped locally (Oxford Business Group, 2014b; Pyrkalo, 2014).

Mineral Fuels and Related Materials

Coal.—In 2014, Mongolia produced 24.4 Mt of coal compared with 29.2 Mt in 2013. The majority of the production was exported to China, where the effects of economic deceleration and the oversupply of coal became more acute in the second half of 2014. As a result, Mongolia's exports of coal to China decreased by 23.7% in the second half of 2014 compared with the 26.2% year-on-year increase reported in the first half of 2014. In 2014, China imported 14.8 Mt of coking coal from Mongolia compared with 15.4 Mt on 2013, owing to the deceleration in the rate of growth of crude steel production in the country (Mongolia Mining Corp., 2015, p. 19, 22, 23).

Mongolia Mining Corp. was a leading coal producer in Mongolia. The company was the only major producer and exporter of washed coal and accounted for approximately 28% of the country's total coal exports. As of yearend 2014, the company held three mining licenses. The UHG mining license covered 29.6 square kilometers (km²) across the Ukhua Khudag coal deposit, which had 700 Mt of resources (360 Mt measured, 220 Mt indicated, and 120 Mt inferred) and 315 Mt of reserves (218 Mt proved and 97 Mt probable). The BN mining license covered 44.82 km² across the Baruun Naran deposit, which had 280 Mt of resources (210 Mt measured and 70 Mt indicated) and 165 Mt of reserves (141 Mt proved and 24 Mt probable). The THG mining license covered 83.4 km² across the Tsaikhar Khudag coal deposit, which had 50 Mt of inferred resources. In 2014, coal production for Mongolia Mining was 4.6 Mt compared with about 9.7 Mt in 2013. About 4.9 Mt of coal was processed and 2.4 Mt of coking coal primary product was produced (Mongolia Mining Corp., 2015, p. 26–33).

Guildford Coal Ltd. (Guildford) of Australia operated the Baruun Noyon Uul coal mine through the company's wholly owned subsidiary Terra Energy LLC. In February 2014, the company announced the formal commissioning of the mine in South Gobi and its subsequent approval for operations and sales by the Mongolian Government. In August 2014, Terra Energy shipped 8,000 t of coking coal to China. In the last quarter of 2014, the Government of Mongolia formally approved an increase in the allowable mining capacity to 1.5 Mt in 2015 and 2.0 Mt in 2016. Guildford expected that the Baruun Noyon Uul Mine would enter full-scale production in 2015. At the end of 2014, Guildford Coal had total resources of 289 Mt (15 Mt measured, 41 Mt indicated, and 233 Mt inferred) in Mongolia (Guildford Coal Ltd., 2015a, p. 5–6; 2015b).

In August, Mongolia Mining Corp., through its subsidiary Energy Resources, formed and led a consortium with China Shenhua Energy Company Ltd. and Sumitomo Corp., to bid for the right to develop the Tavan Tolgoi coal mine, which is located about 240 km north of the China border. On December 23, the Government announced that the consortium was selected to develop the mine rather than Peabody Energy Corp. of the United States. The formal negotiation process would start in early January 2015. The consortium was expected to produce 30 million metric tons per year (Mt/yr) of coal at Tavan Tolgoi, to deliver coal to at least two export markets, and to become a leading global producer in the coking coal industry. Mongolia's Government would retain full ownership of the Tavan Tolgoi deposit, which was estimated to have 7.4 billion metric tons of coal reserves (Kohn, 2014; Mongolia Mining Corp., 2015, p. 37).

Petroleum and Natural Gas.—Mongolia produced 7.4 Mbbl of crude oil in 2014 compared with 5.1 Mbbl in 2013. The country had produced and refined oil domestically before the 1960s but had no production since then. PetroChina Company Ltd. (a subsidiary of China National Petroleum Corp.) and Sinopec Ltd. (also known as China Petroleum & Chemical Corp.) of China started producing oil in Mongolia in 2005, and production increased significantly in recent years. According to the Petroleum Authority of Mongolia, 16 companies were conducting petroleum exploration activities in Mongolia in 2014, including PetroChina Daching Tamsag-Mongolia LLC (China), Dong Sheng Petroleum Mongolia LLC (China), Petro Matad LLC (Mongolia), Shaman Resources LLC (Canada), and Gobi Energy Partners LLC (Switzerland) (Forster, 2014; Petroleum Authority of Mongolia, 2015).

Genie Oil Shale Mongolia LLC (GOSM), a subsidiary of Genie Oil and Gas of the United States, explored for unconventional sources oil and gas in Mongolia. On September 16, GOSM signed an agreement with the Government to explore a new block covering 25,000 km² in Central Mongolia, southeast of Ulaanbaatar. Under the agreement, the company could request a commercial production agreement once a specific suitable resource and a location were identified. Combined with previously signed exploratory agreements, GOSM held exclusive rights to explore for oil shale in a total area of about 60,000 km² in Mongolia. According to GOSM, analysis of the available geologic evidence suggested that the exploration area could contain world-class deposits of thick, rich oil shale that was well suited for GOSM's extraction technology (Genie Energy Ltd., 2014a, b).

Wolf Petroleum of Australia conducted exploration for, operation of, and development of oil and gas in Mongolia. The company held an exploration area of 74,400 km², which was the largest area held by any petroleum company in Mongolia. The company's wholly owned SB block, which is located in eastern Mongolia and is close to the China border and existing infrastructure, was its most advanced project and was at the drill-ready stage. According to Wolf, the block had the potential to hold between 462 Mbbl and 2,200 Mbbl of recoverable oil. In 2014, the company continued to look for potential industry and financial partners to advance the development of the block (Forster, 2014; Wolf Petroleum, 2015).

In 2011, Sod Mongol Group announced that it would start building a petroleum refinery with a 1.5-Mt/yr capacity. Construction had not begun as of yearend 2014. Mongolia, in 2014, exported \$635 million worth of crude petroleum oil and imported \$1.1 billion worth of refined products. As petroleum production and exploration activities continued to increase in the country, the Government of Mongolia was considering the possibility of building a petroleum refinery (Narantuya, 2014; National Statistical Office of Mongolia, 2015a, p. 61, 66).

Uranium.—As of January 1, 2013, recoverable uranium resources in Mongolia were estimated to be 142,000 t of uranium, which are ranked 5th worldwide on a cost base of less than \$80 per kilogram of uranium and 13th on a cost base of less than \$260 per kilogram of uranium. The resource increased compared with that of January 1, 2011, owing to increased resources at the Gurvansaikhan, Ulziit, Zoovch Ovoo sandstone-type deposits located in the Gurvansaikhan basin, Ulziit basin, and Zuunbayan basin of southeastern Mongolia. From 1988 to 1995, the Soviets extracted uranium from an underground mine at the Mardai deposit in eastern Mongolia; there has been no uranium production in Mongolia since the Soviets left the mine in 1995. In 2014, companies from China, France, Russia, and the United States had begun developing uranium projects in Mongolia (Pressenza Hong Kong, 2014; Organization for Economic Co-operation and Development Nuclear Energy Agency, 2014, p. 23, 313, 314).

On October 26, 2013, a joint venture, AREVA Mines LLC, was formed by AREVA S.A. of France (66%) and state-owned MON-ATOM (34%) to develop uranium mines in Mongolia. Under a separate agreement, Mitsubishi Corp. of Japan took an equity interest in the joint venture. AREVA had been carrying out exploration work in Mongolia since 1997 and had discovered two uranium deposits in the Provinces of Dornogobi, Dulaan Uul, and Zoovch Ovoo. The ore grade at the Zoovch Ovoo deposit was 0.022% uranium, and the total uranium content was 67,706 t; the ore grade at the Dulaan Uul deposit was 0.022% uranium, and the uranium content was 6,259 t. According to the company's plan, AREVA Mines would produce 2,000 to 3,000 metric tons per year of uranium, or about 5% of global output. In May, AREVA Mines released an open letter to organizations that oppose AREVA's uranium mining in Mongolia. The purpose of the letter was to address the public's concerns about the environmental and health effects of uranium mining. In the letter, AREVA Mines stated that the company respected the law of Mongolia and would not engage in any activity that was harmful to the environment,

local citizens' health, or animal health. In June, during a peaceful demonstration, several nongovernmental organizations expressed their opposition to uranium mining in Mongolia, citing the fatal effects of uranium mining in Ulaanbadrakh soum (AREVA S.A., 2013; AREVA Mongol LLC, 2014; Organization for Economic Co-operation and Development Nuclear Energy Agency, 2014, p. 20; Oxford Business Group, 2014a).

Outlook

In its December 2014 Mongolia Economic Update, the World Bank projected that the growth of Mongolia's GDP in 2015 would be 6.1% and the mining sector's GDP would increase by 11.3%. Long-term economic prospects remain strong despite the challenges from persistent large economic imbalances caused by the decrease in foreign direct investment inflows and the weakness of the global minerals market. In the short term, decreasing demand for Mongolia's major commodities, such as copper and coal, is expected owing to reduced economic growth in China, which was a major export partner (World Bank, The, 2014, p. 37).

The mining sector is expected to continue to play a significant role in Mongolia's economy. The increase in the mining sector in 2014, which was attributed to the first full year of production at the OT Mine, is expected to moderate in 2015. Foreign direct investment in mining may increase in the short term if the plan to develop the OT underground mine is approved. Coal mining companies will likely continue to face significant challenges from deteriorating market conditions. The development consortium for the Tavan Tolgoi coal deposit is likely to become a leading global producer of coking coal. Development of the project, however, is not expected in the short term considering the policy uncertainty as well as the unfavorable market conditions. The intensive activities in petroleum and uranium exploration may expand production capacity for these strategic resources. Cement production is expected to increase in 2015, and the country may become self-sufficient in the coming years.

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TABLE 1
MONGOLIA: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity ²	2010	2011	2012	2013	2014
Cement, hydraulic thousand metric tons	323	426	349	259 ^r	411
Coal, unspecified do.	25,246	30,940	28,561 ^r	29,164 ^r	24,415
Copper:					
Mine output, Cu content	124,985	121,590	121,660	186,655	249,200
Metal, refined	2,746	2,390	2,282	2,344 ^r	2,132
Fluorspar:					
Acid grade thousand metric tons	141	116	157	76	128
Submetallurgical and other grade do.	259	232	484	150	247
Total do.	400	348	641	226	375
Gold, mine output, Au content kilograms	6,037	5,703	5,995	8,904	11,504
Iron ore:					
Gross weight thousand metric tons	3,203	5,678	7,561	6,736 ^r	6,389
Iron content do.	1,900	3,400	4,537	4,042 ^r	3,833
Lime, hydrated and quicklime do.	50	45	68	57 ^r	58
Molybdenum, mine output, Mo content	2,198	1,960	1,904	1,819	2,000
Petroleum, crude thousand 42-gallon barrels	2,181	2,549	3,636	5,129 ^r	7,405
Salt, mine output	1,861	2,183	2,461	2,179 ^r	1,852
Silver, mine output, Ag content kilograms	28,710	28,254	27,982	42,931	57,300 ^e
Steel, crude	64,200	60,000	68,100	56,000 ^r	64,400
Stone, crushed thousand metric tons	101	94	233	230 ^r	240
Tungsten, mine output, W content	20	20	66	--	--
Zinc, mine output, Zn content	56,300	52,300	59,500	52,050	46,600

^eEstimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. ^rRevised. do. Ditto. -- Zero.

¹Table includes data available through August 13, 2015.

²In addition to the commodities listed, crude construction materials, such as gypsum, sand and gravel, and varieties of stones, such as limestone, were produced, but available information was inadequate to make reliable estimates of output.

TABLE 2
MONGOLIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities ¹	Annual capacity ^c
Calcium oxide	Qinhua MAK Naryn Sukhait LLC (Mongolia-China joint venture)	316 km from Ulaanbaatar at the Olon Oovoot station of the Trans Mongolia railway	50
Cement	Khutul Cement and Lime JSC	Darhan, Darhan-Uul Aimag	1,000
Coal	Baganuur Joint Stock Co. (Government, 51%, and public, 49%)	Baganuur Mine, Tov Aimag	3,000
Do.	Government, 95%, and public, 10%	Shivee Ovoo Mine, Dornogovi and Govisumber Aimag, 20 km from Choir City	2,000
Do.	SouthGobi Resources Ltd. (Turquoise Hill Resources Ltd., 58%, and China Investment Corp. 13.5%)	Ovoot Tolgoi Mine, Omnogovi (South Gobi) Aimag	4,600
Do.	do.	Tsagaan Tolgoi, Dornogovi Aimag, 95 km north of the China border	3,000
Do.	Mongolian Mining Corp., 100%	Ukhaa Khudag Mine, Omnogovi (South Gobi) Aimag, 61 km east of Dalanzadgad	8,600
Do.	MAK Mongolyn Alt Group, 100%	Naryn Sukhait Mines, Gurvantes Soum, Omnogovi Aimag	3,000
Do.	Terra Energy LLC (Guilford Coal Ltd., 100%)	Baruun Noyon Uul (BNU) coking coal mine, Omnogovi (South Gobi) Aimag, 80 km east of Naryn Sukhait Mines	1,000 ²
Do.	Mongolian Mining Corp., 100%	Baruun Naran Mine, Omnogovi (South Gobi) Aimag, 61 km east of Dalanzadgad	3,000
Copper, Cu in concentrates	Samsung Corp., 51%, and Erdenet Mining Corp. (Mongolia-Russia joint venture), 49%	Erdenet Ovoo open pit mine and processing plant, Orkhon Aimag, 180 km west of Darkhan City	140
Do.	Turquoise Hill Resources Ltd., 66%, and Government, 34%	Oyu Tolgoi Mine, Omnogovi (South Gobi) Aimag, 80 km north of the China border	150
Do.	MAK Mongolyn Alt Corp., 100%	Tsagaan Suvarga Mine, Omnogovi (South Gobi) Aimag, 560 km southeast of Ulaanbaatar	70
Copper, Cu in cathodes	Erdenet Mining Corp. (Mongolia-Russia joint venture), 51%, and Strand Holdings Ltd., 49%	Erdmin solvent extraction-electrowinning plant, 180 km west of Darkhan City	3
Fluorspar, ore	Mongolrostsvetmet LLC	Bor-Undur Mine and processing plant, Hentiy Aimag, 310 km southeast of Ulaanbaatar; 2 underground and 3 open pit mines	450 ³
Do.	do.	Urgen Mine, Dornogovi Aimag, 535 km from Ulaanbaatar	100 ³
Gold, ore	Zinjin Mining Group Co. Ltd., 70%	Nari Tolgoi Mine, Jierigron Sumu, Tov Aimag	90 ³
Do.	North Asia Resources Holdings Ltd.	Khar Yamaat placer mine, 180 km north of Ulaanbaatar	NA
Do.	Mogolian Resource Corp. Ltd., 90%	Blue Eyes Mine, Bornuur Soum, Tov Aimag	36 ³
Do.	thousand cubic meters Mongolrostsvetmet LLC	Zaamar placer gold operation, Tov Aimag, 240 km southwest of Ulaanbaatar	300 ³
Do.	do. do.	Zeregtsee placer mine, 240 km southwest of Ulaanbaatar	500 ³
Gold, Au in concentrates	kilograms Turquoise Hill Resources Ltd., 66%, and Government, 34%	Oyu Tolgoi Mine, Omnogovi (South Gobi) Aimag, 80 km north of the China border	19,000
Iron, Fe in concentrates	Lung Ming Mining Co. Ltd., 66.7%, and China Investment Corp., 33.3%	Eruu Gol Mine	2,500
Lead, ore	Shandong Xianglong Co. Ltd.	Tsav Mine, Dornod Aimag Ulaanbaatar	117 ³
Limestone	MAK Mongolyn Alt Group, 100%	14 km from the Olon Oovoot station of the Trans Mongolia railway	NA

See footnotes at end of table.

TABLE 2—Continued
MONGOLIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities ¹	Annual capacity ^c
Molybdenum	metric tons	Erdenet Mining Corp. (Mongolia-Russia joint venture)	Erdenet Ovoo open pit mine and processing plant, Bulgan Aimag, 180 km east of Darkhan City	3,000
Do.		Turquoise Hill Resources Ltd., 66%, and Government, 34%	Omnogovi (South Gobi) Aimag, 80 km north of the China border	NA
Petroleum, crude		PetroChina Daching Tamsag-Mongolia LLC (PetroChina)	Tamsag basin	NA
Do.		Sinopec	Southeast Gobi basin	NA
Silver	kilograms	Turquoise Hill Resources Ltd., 66%, and Government, 34%	Omnogovi (South Gobi) Aimag, 80 km north of the China border	30,000
Steel		Darkham metallurgy plant	Darhan, Darhan-Uul Aimag	100
Tungsten	metric tons	Samsung Corp., 51%, and Erdenet Mining Corp. (Mongolia-Russia joint venture), 49%	Erdenet Ovoo open pit mine and processing plant, Bulgan Aimag, 180 km west of Darkhan City	140
Zinc		Tsairt Minerals Co. Ltd. (China-Mongolia joint venture)	Sukhe Bator, Suhbaatar Aimag	70
Do.		China Nonferrous Metals Group, 51%, and Government, 49%	Tumurtiin Ovoo Mine, Sukhe Bator, 180 km southwest of Choibalsan	34
Zinc, ore		Shandong Xianglong Co. Ltd.	Tsav Mine, Dornod Aimag Ulaanbaatar	117 ³

^cEstimated. Do., do. Ditto. NA Not available.

¹Abbreviations used for units of measure in this table include the following: km—kilometer.

²Resumed operations in December 2014.

³Mill capacity.