



2022 Minerals Yearbook

MONGOLIA [ADVANCE RELEASE]

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World rankings for mineral production, shares of world production, and reserves presented in this chapter are derived from the referenced sources. Production data in this chapter may differ from data in other sources because of differences in the date of reporting.

THE MINERAL INDUSTRY OF MONGOLIA

By Jaewon Chung

Mongolia has extensive deposits of coal, copper, fluorite, gold, iron, rare earths, tungsten, uranium, and zinc. The country's trade was limited mainly to trade with China and Russia because Mongolia is landlocked by the other two countries. Historically, Mongolia's economy relied on herding and agriculture practices; however, it had become increasingly reliant on the mining sector since the mid-2000s. As of 2022, because of the lack of metal smelters (except some steelworks) and petroleum refineries, the country exported most of its metal ore concentrates and crude petroleum. In 2022, Mongolia was the world's third-ranked producer of fluorspar (excluding United States production), accounting for 5% of the world's production. The country had 34 million metric tons (Mt) of fluorspar reserves, accounting for 12% of the world's total. To stimulate the mining industry and attract foreign investors, the Government of Mongolia launched an annual conference, "Mining Week," in 2022 (Ministry of Mining and Heavy Industry, 2023, p. 31, 56–58; McRae, 2024).

Minerals in the National Economy

In 2022, Mongolia's real gross domestic production (GDP) increased by 4.8%; the nominal GDP was \$17.2 billion, and the mining and quarrying sector accounted for 25% of the GDP. Employment in the mining and quarrying sector was about 60,300 people, which accounted for 5% of the country's total employment of 1.18 million. The value added by the mining and quarrying sector decreased by 12% owing mainly to the effects of China's "Zero COVID" policy [restrictive measures enacted during the coronavirus disease 2019 (COVID-19) pandemic], which lasted through the first half of 2022 (Bank of Mongolia, The, 2023, p. 9, 102; National Statistics Office of Mongolia, 2023, p. 98, 379; World Bank, The, 2023).

The loosening of the Zero COVID policy in China started in the second half of 2022 and resulted in increased trade with Mongolia. In 2022, Mongolia's total exports of goods increased by 36% to \$12.5 billion, of which mineral products and unwrought gold accounted for 93%, including coal (52% of total exports), copper concentrates (22%), and unwrought gold (9%). The increase in total exports was mainly attributed to the increase in coal exports to \$6.5 billion in 2022 from \$2.8 billion in 2021. Total imports of goods were valued at \$8.7 billion, of which refined petroleum products accounted for 20%. Of Mongolia's mineral product exports and imports in 2021 (the latest year for which data were available), China was the leading recipient of exports, accounting for 95% (by value), whereas Russia was the leading supplier of imports, accounting for 80% (Bank of Mongolia, The, 2023, p. 14, 15; Zen Innovations AG, 2024).

Regulations governing the mineral sector include the Law on Petroleum Products of 2005, the Law on Petroleum of 2014, the 2014 amendments to the Minerals Law of 2006, and Government Resolution No. 355 of 2019 on artisanal and small-scale mining. Other laws related to the mineral industry

include the Law on Nuclear Energy of 2009 and the Law on Investment of 2013. In 2022, the Parliament passed the Law on Mining Commodity Exchange, which became effective on June 30, 2023. The intent of the law is to ensure transparent and fair trade of mineral commodities in Mongolia by creating a mining market database and disseminating information to the public. The Government expected that implementation of the law would facilitate investment in the mining sector, increase exports of mineral commodities, and add income to the state budget (Lkhasuren, 2022; Mineral Resources and Petroleum Authority, 2023).

Production

The evolving effects of the COVID-19 pandemic had caused some fluctuations in mineral production in 2020 through 2022. In 2022, major increases in production (those greater than 10% compared with production in 2021) included that of mined tin, by 7 times (estimated); mined zinc, by 162% (estimated); mined tungsten, by 100% (estimated); metallurgical coal, by 26% (estimated); and lime, by 18%. The production of acid-grade fluorspar decreased by 58%; crude petroleum, by 45%; metallurgical-grade fluorspar, by 32% (estimated); raw steel, by 30%; gravel, by 28%; iron ore, by 16%; mined silver, by 11%; and mined copper, by 10% (estimated). Data on mineral production are in table 1.

Structure of the Mineral Industry

Under the Ministry of Mining and Heavy Industry, the Mineral Resources and Petroleum Authority of Mongolia supports the development of state policy on mining and petroleum and administers mining activities in the country. The National Geological Survey produces the country's geologic maps and mineral resource database.

Most of the mining companies in Mongolia were owned by the Government (such as Erdenes Mongol LLC, Erdenet Mining Corp., and Mongolrrostsvetmet LLC) or by joint ventures between foreign companies and the Government of Mongolia (such as Oyu Tolgoi LLC). A few companies were wholly owned by foreign investors (such as PetroChina Daching Tamsag-Mongolia LLC). Table 2 is a list of major mineral industry facilities.

Commodity Review

Metals

Copper.—In 2022, Oyu Tolgoi LLC's Oyu Tolgoi Mine produced 129,500 metric tons (t) of copper (Cu content) compared with 163,000 t in 2021; the decrease was attributed to the development of low-grade ore areas. The underground expansion project at Oyu Tolgoi continued during the year, and the first production from the project was expected by 2023.

Once completed, the copper output from the open pit and underground mines was expected to reach an average of 500,000 t/yr between 2028 and 2036, making it one of the world's major copper mines. In December 2022, Rio Tinto plc of the United Kingdom acquired Turquoise Hill Resources Ltd. of Canada, which had operated the Oyu Tolgoi Mine on behalf of all shareholders. The acquisition doubled Rio Tinto's interest in Oyu Tolgoi to 66%; the remaining 34% was owned by the Government of Mongolia through Erdenes Oyu Tolgoi LLC (Basov, 2022; Rio Tinto plc, 2023, p. 32, 41, 281).

Industrial Materials

Fluorspar.—Mongolia's fluorspar production in 2022 was at a 5-year low. Production of acid-grade fluorspar grading about 97% calcium fluoride (CaF_2) and used in the manufacture of hydrofluoric acid was 25,000 t in 2022. Production of metallurgical-grade fluorspar grading about 75% CaF_2 and used as a steelmaking flux was estimated to be 400,000 t. The decrease in fluorspar production was attributed to China's transportation restrictions in foreign trade under the Zero COVID policy. Mongolrostsvetmet LLC was Mongolia's leading fluorspar producer, accounting for more than 35% of the country's fluorspar output. All outputs of fluorspar were exported owing to the lack of domestic consumption (table 1; Bank of Mongolia, The, 2023, p. 102; Ministry of Mining and Heavy Industry, 2023).

Rare Earths.—As of 2022, there were neither active mines nor processing plants for rare earths in Mongolia, although about 80 rare-earth occurrences were identified in the country. Rare-earth resources (mainly light rare earths) in seven major deposits were estimated to be about 1 billion metric tons containing 3.6 Mt of rare-earth oxide (REO) equivalent. Khotgor in Omnogovi Aymag (South Gobi Province) was known as the most promising deposit because it was estimated to have 135 Mt of resources grading 1.26% REO equivalent (Erdmann and Altangerel, 2023, p. 32, 38; Ministry of Mining and Heavy Industry, 2023, p. 56–58).

In 2022, the Governments of Mongolia and the Republic of Korea agreed to build a research center in Mongolia for processing rare earths into high value-added products. If some rare-earth deposits in the country were to be developed in the future, this project would enable local processing of the concentrates and air shipping of downstream products and thus avoid land transportation of raw materials through China and Russia (Jo, 2022; Erdmann and Altangerel, 2023, p. 38).

Mineral Fuels

Coal.—The 240-kilometer (km) railway from the Tavan Tolgoi coal mines in Omnogovi Aymag to Gashuun Sukhait (along the Mongolia–China border, southeast of Tavan Tolgoi) commenced operations in September 2022. This new railway line, which was expected to have a capacity of about 40 million metric tons per year, would enable Mongolia to boost metallurgical coal exports to China by reducing export costs from \$47 per metric ton to \$12 per metric ton for coal exports from Tavan Tolgoi. Construction of the 415-km railway between the Tavan Tolgoi and Zuunbayan (northeast of Tavan Tolgoi)

continued during the year. Completion of this railway would connect southern Mongolia to eastern routes to transport coal and other mineral commodities (Unurzul, 2022).

In December 2022, the Government of Mongolia announced its intent to expedite a public offering of Erdenes Tavan Tolgoi JSC (ETT) following protests earlier in the month. The demonstrators called for a Government investigation into allegations that 385,000 t of coal from the Tavan Tolgoi coal mines, which was intended for export, was reportedly missing from stockpiles on the Mongolia–China border. ETT was the country's leading metallurgical coal producer and was majority owned by the Government (81.5%) (Associated Press, 2022; Thomson Reuters, 2022).

Outlook

In the short and medium terms, Mongolia's new policies and events, such as the Law on Mining Commodity Exchange and Mining Week, will likely increase transparency in the mineral industry and promote foreign investment for further development of the mining sector. Mine outputs of metallurgical coal and copper are likely to increase if the railway projects from the Tavan Tolgoi coal mines boost coal exports to China, and the Oyu Tolgoi underground project can be completed as planned. Because Mongolia's mining sector relies on exports, it will likely remain sensitive to foreign markets, especially that of China. A lack of sufficient infrastructure will continue to be a challenge to the mineral industry. Rare-earth extraction and export are unlikely to start in the near future because there are no active development projects in the country.

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TABLE 1
MONGOLIA: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons, gross weight, unless otherwise specified)

Commodity ²	2018	2019	2020	2021	2022
METALS					
Copper:					
Mine, Cu content:					
Concentrates ^e	301,000	290,000	294,000	305,000	274,000
Solvent extraction ³	14,175	11,758	9,488	9,690	9,736
Total ^e	315,000	302,000	303,000	315,000	284,000
Refinery, electrowon	14,175	11,758	9,488	9,690	9,736
Gold, mine, Au content	20,655	16,251	20,226	19,054	19,383
Iron ore, mine:					
Gross weight	thousand metric tons				
Fe content	do.				
Iron and steel, raw steel	29,169	28,433	15,286	35,900	24,973
Lead, mine, Pb content ^e	11,000	12,000	12,000	11,200 ^r	12,200
Molybdenum, mine, Mo content	3,254 ^r	3,203 ^r	3,443 ^r	3,543 ^r	3,312
Silver, mine, Ag content	53,000 ^r	50,000 ^r	53,000 ^r	56,000 ^r	50,000
Tin, mine, Sn content	17	26	-- ^{r, e}	8 ^{r, e}	56 ^e
Tungsten, mine, concentrate, W content ^e	430	370	33	120	240
Zinc, mine, Zn content ^e	44,000	41,600	38,200	37,600	98,600
INDUSTRIAL MINERALS					
Cement, hydraulic	thousand metric tons	934	1,098	1,182	1,293
Fluorspar:					
Acid grade ⁴	do.	81	48	85	60
Metallurgical grade ^{e, 5}	do.	470	650	640	590
Total ^e	do.	551	698	725	650
Lime, hydrated and quicklime	do.	59	77	70	94
Salt		997	533	2,624	1,349
Sand and gravel, construction, gravel ⁶		280,000	340,000	520,000	400,000
MINERAL FUELS AND RELATED MATERIALS					
Coal:					
Anthracite		115,700	90,100	22,000	59,700
Bituminous		8,387,000	11,052,000	9,122,000	6,446,000 ^r
Lignite		7,525,000	8,053,000	7,246,000	7,513,000
Metallurgical		35,374,000	36,604,000	27,454,000	20,596,000 ^r
Total		51,400,000	55,800,000	43,800,000	34,600,000 ^r
Coke, metallurgical		66,200	60,200	59,100	67,200
Petroleum, crude	thousand 42-gallon barrels	6,389	6,876	4,106	4,667

^eEstimated. ^rRevised. do. Ditto.

¹Table includes data available through November 21, 2023. All data are reported unless otherwise noted. Totals and estimated data are rounded to no more than three significant digits; may not add to totals shown.

²In addition to the commodities listed, gypsum and limestone may have been produced, but available information was inadequate to make reliable estimates of output.

³The copper content of solvent extraction output at the mine level is the same as electrowon refinery output because copper produced in the solvent extraction and electrowinning process is typically reported only at the refinery level.

⁴Flotation concentrate, includes some material less than 97% CaF₂.

⁵May include some submetallurgical-grade fluorspar.

⁶Converted from cubic meters using a conversion factor of 1.6 metric tons of sand and gravel per cubic meter.

TABLE 2
MONGOLIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2022

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities ¹	Annual capacity ^e
Cement	Khutul Cement and Lime JSC (Government, 100%)	Khutul plant, Saikhan Soum, Selenge Aymag	1,000
Do.	Lian He Cement Corp.	Sergelen plant, Sergelen Soum	1,000
Do.	MonCement (Monpolymet Group, 100%)	Senj Sant plant, Orgun Soum	1,000
Do.	Mongolyn Alt (MAK) Corp.	Mak Eruo plant, Dalanjargalan Soum	1,000
Coal:			
Bituminous	do.	Eldev Mine, Dalanjargalan Soum, Dornogovi Aymag	500
Do.	do.	Naryn Sukhail Mine, Gurvantes Soum, Omnogovi (South Gobi) Aymag	3,000
Do.	Silver Elephant Mining Corp. (formerly Prophecy Development Corp.)	Ulaan Oovo Mine, Tushig Soum, Selenge Aymag	3,000
Lignite	Baganuur JSC [Erdenes Mongol LLC (on behalf of the Government), 75%]	Baganuur Mine, border area between Tov Aymag and Ulaanbaatar	3,000
Do.	Shivee-Ovoo JSC [Erdenes Mongol LLC (on behalf of the Government), 90%]	Shivee Ovoo Mine, Dornogovi and Govisumber Aymguud, 20 km from Choir	2,000
Metallurgical	Erdenes Tavan Tolgoi JSC [Erdenes Mongol LLC (on behalf of the Government), 81.5%]	Tavan Tolgoi Mine, Omnogovi (South Gobi) Aymag, 200 km north of the China border	17,000
Do.	Moenco LLC	Khushuut Mine, Darvi Soum, Hovd Aymag	3,000
Do.	Mongolyn Alt (MAK) Corp.	Naryn Sukhail Mine, Gurvantes Soum, Omnogovi (South Gobi) Aymag	3,000
Do.	Mongolian Mining Corp.	Baruun Naran Mine, Omnogovi (South Gobi) Aymag, 60 km east of Dalanzadgad	5,500
Do.	do.	Ukhaa Khudag Mine, Omnogovi (South Gobi) Aymag, 80 km east of Dalanzadgad	8,600
Do.	SouthGobi Resources Ltd. (JD Zhixing Fund L.P., 29%; Land Grand International Holding Ltd., 15.7%; Voyage Wisdom Ltd., 8.7%)	Ovoot Tolgoi Mine, Omnogovi (South Gobi) Aymag	5,000
Do.	Terra Energy LLC (TerraCom Ltd., 100%)	Baruun Noyon Uul (BNU) Mine, Omnogovi (South Gobi) Aymag, 80 km east of Naryn Sukhail Mine	1,500
Unspecified	Ikh Gobi Energy LLC	Mandakhnuur Mine, Mandakh Soum, Dornogovi Aymag	1,000
Do.	Usukh Zoos LLC	Khuren Shand Mine, Gurvantes Soum, Omnogovi (South Gobi) Aymag	3,000
Copper:			
Mine, concentrate, Cu content	Erdenet Mining Corp. (Government, 100%)	Erdenetiin-Ovoo Mine, and processing plant, 180 km west of Darkhan	150
Do.	Mongolyn Alt (MAK) Corp.	Tsagaan Suvarga Mine, Omnogovi (South Gobi) Aymag, 560 km southeast of Ulaanbaatar	70
Do.	Oyu Tolgoi LLC [Rio Tinto, 66%, and Erdenes Oyu Tolgoi LLC (Government, 100%), 34%]	Oyu Tolgoi Mine, Omnogovi (South Gobi) Aymag, 80 km north of the China border	210
Refined	Achit Ilkt LLC (Head of the Presidential Office, 51%, and Erdenet Mining Corp., 34%)	Solvent extraction-electrowinning plant in Orhon Aymag (near Erdenetiin-Ovoo Mine)	10
Do.	Erdenet Mining Corp. (Government, 100%)	Erdmin solvent extraction-electrowinning plant, 180 km west of Darkhan	3
Fluorspar:			
Ore, gross weight	Mongolrostsvetmet LLC (Government, 100%)	Bor-Undur Mine, Hentiy Aymag, 310 km southeast of Ulaanbaatar	600
Do.	Various artisanal and small-scale operators	Mines in various locations	NA
Concentrate, gross weight	Mongolrostsvetmet LLC (Government, 100%)	Processing plant at Bor-Undur Mine, Hentiy Aymag, 310 km southeast of Ulaanbaatar	120

See footnotes at end of table.

TABLE 2—Continued
MONGOLIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2022

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities ¹	Annual capacity ^e
Gold, mine, Au content	kilograms	Bayan Airag Exploration LLC	Bayan-Airag Mine, Durvunjin Soum, Zavkhan Aymag	NA
Do.	do.	Erdenet Mining Corp. (Government, 100%)	Erdenetiin-Ovoo Mine, and processing plant, 180 km west of Darkhan	200
Do.	do.	Mongolrostsvetmet LLC (Government, 100%)	Zeregtsee placer mine, 240 km southwest of Ulaanbaatar	180
Do.	do.	Oyu Tolgoi LLC [Rio Tinto, 66%, and Erdenes Oyu Tolgoi LLC (Government, 100%), 34%]	Oyu Tolgoi Mine, Omnogovi (South Gobi) Aymag, 80 km north of the China border	15,000
Do.	do.	Steppe Gold Ltd.	Altan Tsagaan Ovoo Mine, Tsagaan Ovoo Soum, Dornod Aymag	1,000
Iron ore, gross weight		Altain Khuder LLC	Tayan Nuur Mine, Gobi-Altay Aymag	3,000
Do.		Boldtumur Eruu Gol LLC	Bayangol Mine, Selenge Aymag	2,000
Do.		Darkhan Metallurgical Plant JSC (Government, 100%)	Tumur Mine, Khongor Soum, Darhan-Uul Aymag	1,000
Do.	do.		Tumurtei Mine, Khuder Soum, Selenge Aymag	2,000
Do.		Mongolrostsvetmet LLC (Government, 100%)	Bargilt Mine and ore dressing plant, 20 km from Bor-Undur	2,400
Iron and steel, raw steel		Erdenes Steel LLC (Beren Group, 50%, and Erdenes Mongolia LLC, 50%)	Plant in Choir, Bayantal Soum, Govisumber Aymag	200
Do.		Darkhan Metallurgical Plant JSC (Government, 100%)	Plant in Darkhan	100
Lead, mine, Pb content		Shandong Xianglong Co. Ltd.	Tsav Mine, Dornod Aymag	15
Do.		Tsairt Minerals Co. Ltd. (China Nonferrous Metals Group, 51%, and Government, 49%)	Tumurtiin Ovoo Mine, Sukhe Bator, 180 km southwest of Choibalsan	10
Lime		Khutul Cement and Lime JSC	Khutul plant, Saikhan Soum, Selenge Aymag	65
Limestone		E-Trans LLC	Quarry in Bayantsagaan Soum, Tov Aymag	NA
Do.		Mongolyn Alt (MAK) Corp.	Quarry, 14 km from the Olon Ovoot station of the Trans Mongolia railway	NA
Molybdenum, mine, Mo content		Erdenet Mining Corp. (Government, 100%)	Erdenetiin-Ovoo Mine and processing plant, 180 km west of Darkhan	3
Do.		Oyu Tolgoi LLC [Rio Tinto, 66%, and Erdenes Oyu Tolgoi LLC (Government, 100%), 34%]	Oyu Tolgoi Mine, Omnogovi (South Gobi) Aymag, 80 km north of the China border	NA
Petroleum, crude	thousand 42-gallon barrels	China Petrochemical Corp. (Sinopec)	Oilfield in Southeast Gobi Basin	2,500
Do.	do.	PetroChina Daching Tamsag-Mongolia LLC	Oilfield in Tamsag Basin	2,000
Silver, mine, Ag content	kilograms	Erdenet Mining Corp. (Government, 100%)	Erdenetiin-Ovoo Mine and processing plant, 180 km west of Darkhan	31,000
Do.	do.	Oyu Tolgoi LLC [Rio Tinto, 66%, and Erdenes Oyu Tolgoi LLC (Government, 100%), 34%]	Oyu Tolgoi Mine, Omnogovi (South Gobi) Aymag, 80 km north of the China border	28,000
Do.	do.	Steppe Gold Ltd.	Altan Tsagaan Ovoo Mine, Tsagaan Ovoo Soum, Dornod Aymag	5,000
Tin, mine, Sn content	metric tons	NA	Mines in various placer deposits	100
Tungsten, mine, W content	do.	Erdenet Mining Corp. (Government, 100%)	Erdenetiin-Ovoo Mine and processing plant, 180 km west of Darkhan	140
Do.		SS Mongolia LLC	Khovd River Mine, Tsengel Soum, Bayan-Ulgii Aymag	NA
Zinc, mine, Zn content		Shandong Xianglong Co. Ltd.	Tsav Mine, Dornod Aymag	NA
Do.		Tsairt Minerals Co. Ltd. (China Nonferrous Metals Group, 51%, and Government, 49%)	Tumurtiin Ovoo Mine, Sukhe Bator, 180 km southwest of Choibalsan	50

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

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