



2023 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 mainly limited to China and Russia because Mongolia was landlocked between these 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. 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 2023, Mongolia was estimated to be the world's second-ranked producer of fluorspar (excluding United States production), accounting for 13% of the world's production. The country had 34 million metric tons (Mt) of fluorspar reserves, accounting for 12% of the world's total. Other major mineral commodities produced in the country included coal, copper, and gold (Ministry of Mining and Heavy Industry, 2023; McRae, 2024; Londono, 2025).

Minerals in the National Economy

In 2023, Mongolia's real gross domestic production (GDP) increased by 7.0%; the nominal GDP was \$19.9 billion. The mining and quarrying sector accounted for 29% of the GDP in the year. Employment in the mining and quarrying sector was about 67,200 people, which accounted for 6% of the country's total employment (1.216 million) (Bank of Mongolia, The, 2024, p. 9; National Statistics Office of Mongolia, 2024a, p. 98, 381; World Bank, The, 2024).

In 2023, Mongolia's total exports of goods increased by 21% to \$15.2 billion, of which mineral products and unwrought gold accounted for 91%, including coal (58% of total exports), copper concentrates (17%), and unwrought gold (5%). The increase was due partially to the completion of the railways from Zuunbayan to the country's border with China (Gashuun Sukhait in Omnogovi Aymag and Khangai in Dornogovi Aymag) between late 2022 and early 2023. Total imports of goods were valued at \$9.3 billion, of which refined petroleum products accounted for 20%. China was the leading recipient of Mongolia's exports of mineral products and unwrought gold, receiving 86% of these exports, by value, in 2022 (the latest year for which data were available); Russia was the leading supplier of imports of mineral products and unwrought gold, accounting for 85% of the imports (Ministry of Mining and Heavy Industry, 2023, p. 17; Bank of Mongolia, The, 2024, p. 15, 16; Zen Innovations AG, 2024).

Government Policies and Programs

Regulations governing the mineral sector included the Law on Petroleum Products of 2005, the Law on Petroleum of 2014, and Government Resolution No. 355 of 2019 on artisanal and small-scale mining. Other laws related to the mineral industry included the Law on Nuclear Energy of 2009 and the Law on Investment of 2013.

The 2014 amendments to the Minerals Law of 2006 provided that the state's share (up to 34% if private investors funded the exploration, or up to 50% if the Government and private investors jointly funded the exploration) in strategic mineral deposits can be replaced by a royalty payment. A strategic mineral deposit was defined as a deposit that has the potential to affect the national development or to account for greater than 5% of the GDP. As of 2023, there were 16 strategic mineral deposits of coal, copper, gold, iron, phosphorite, silver, uranium, and zinc (Ministry of Mining and Heavy Industry, 2023, p. 30, 31).

The Law on Mining Commodity Exchange became effective in June 2023. The law ensured that the trade of mining products in Mongolia is transparent and fair by creating a mining market database and disseminating information to the public. The Government expected that the implementation of the law would facilitate investment in the mining sector and increase the export of mining products and add to the state budget income (Enkhbat, 2023; Ministry of Mining and Heavy Industry, 2023, p. 25).

In June 2023, the Governments of the United States, Mongolia, and the Republic of Korea commenced the first trilateral "Critical Mineral Dialogue": in Ulaanbaatar, Mongolia. Through the dialogue, the three Governments aimed to advance information exchange and collaboration on critical mineral supply chains. The three parties agreed that experts from each Government would follow up on the dialogue's key themes to pursue strategic opportunities (U.S. Embassy in Mongolia, 2023).

In November, the Governments of Mongolia and the Republic of Korea launched a joint committee on cooperation in the supply of rare metals and other critical minerals. During the Mongolian Mining Week 2023 (a conference held annually in October), the two countries began a project to establish the Rare Metals Cooperation Center at the Geological Center for Research and Analysis (GCRA) in Ulaanbaatar. The project aimed to disseminate beneficiation and smelting technology of the Korea Institute of Geoscience and Mineral Resources to Mongolia (Kim, 2023; Korea Institute of Geoscience and Mineral Resources, 2023).

Production

In 2023, production increases greater than 10% compared with production in 2022 included that of acid-grade fluorspar, by 336%; metallurgical-grade fluorspar, by 175% (estimated); crude petroleum, by 91%; raw steel, by 51%; mined tungsten, by 33% (estimated); cement, by 25%; mined silver, by 18%; and mined copper and mined tin, by 17% each (estimated). The production of mined lead decreased by 34%; iron ore, by 30%; mined gold, by 23%; and lime, by 12%. 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 implements and regulates laws applicable to the mineral industry. The National Geological Survey produces the country's geologic maps and mineral resource database. The GCRA performs geologic research and explores mineral resources (Geological Center for Research and Analysis, 2024; National Geological Survey, 2024).

Major mining companies in Mongolia were either owned by the Government, such as Erdenes Mongol LLC (coal), Erdenet Mining Corp. (copper and molybdenum), and Mongolrostsvetmet LLC (fluorite and iron ore), or they were joint ventures of foreign companies and the Government of Mongolia, such as Oyu Tolgoi LLC (copper and gold). Table 2 is a list of major mineral industry facilities.

Commodity Review

Metals

Copper.—In 2023, Mongolia mined 331,000 metric tons (t) of copper (copper content), representing about 1.5% of the world's production. Mongolia's leading copper mine, Oyu Tolgoi, produced 168,100 t of copper compared with 129,500 t in 2022. The increase was attributed to Oyu Tolgoi's rampup of the underground operation. The underground expansion project at Oyu Tolgoi continued during the year, and the first production from the project took place in the first quarter of 2023. Once completed, the average copper output from both the open pit and underground operations would be 500,000 metric tons per year between 2028 and 2036. The Oyu Tolgoi Mine, which is in a strategic mineral deposit, was owned by Rio Tinto plc of the United Kingdom (66%) and Government-owned Erdenes Oyu Tolgoi LLC (34%) (table 1; Flanagan, 2024; Rio Tinto plc, 2024, p. 37, 297, 329).

Gold.—Mongolia's major gold-mining companies included Boroo Pte. Ltd., Oyu Tolgoi, and Steppe Gold Ltd. In 2023, about 14,900 kilograms (kg) of gold was produced, and 11,700 kg of unwrought gold (valued at \$738 million) was exported. Because there were no commercial gold refineries in the country, most gold was domestically processed to unwrought gold (up to 94% pure) through domestic beneficiation facilities and small refinery workshops. In 2022 (the latest year for which data were available), Switzerland and the Republic of Korea were the recipients of Mongolia's unwrought gold exports, accounting for 93% and 7%, by quantity, respectively (tables 1, 2; Bank of Mongolia, The, 2024, p. 15; Zen Innovations AG, 2024).

Industrial Materials

Fluorspar.—Mongolia's fluorspar production in 2023 was at a 5-year high. Acid-grade fluorspar [about 97% calcium fluoride (CaF_2)] production for the year was about 109,000 t, and metallurgical-grade fluorspar (about 75% CaF_2) production was estimated to be 1.1 Mt. The increased fluorspar production in 2023 was likely attributed to increased exports to China, which were boosted by the new railway transport, the high

global price in response to China's low supply of fluorspar, and the increasing global demand for polyvinylidene fluoride used for the manufacture of the lithium-ion batteries. All Mongolia's fluorspar outputs were exported owing to the lack of domestic consumption. In 2022 (the latest year for which data were available), the recipients of Mongolia's fluorspar exports were China (which received for 58%, by value) and Russia (42%) (table 1; Hu, 2024; National Statistics Office of Mongolia, 2024b, p. 123; Zen Innovations AG, 2024).

Outlook

Mongolia will likely continue to increase its production and export of mineral commodities, such as coal, copper, and fluorspar, because the new railways to the Mongolia-China border can boost exports to China. It is also expected that the ongoing development of the Oyu Tolgoi underground project could increase the country's copper production in the medium and long terms. Mongolia's mining activities oriented toward exports are expected to remain highly dependent on foreign markets, especially that of China. Insufficient infrastructure will continue to be a challenge to the mineral industry of Mongolia. The Government is expected to continue to encourage domestic and foreign enterprises to invest in the mineral industry through the country's new policies, such as the Law on Mining Commodity Exchange, and events, such as Mining Week.

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TABLE 1
MONGOLIA: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons, gross weight, unless otherwise specified)

Commodity ²	2019	2020	2021	2022	2023
METALS					
Copper:					
Mine, Cu content:					
Concentrates ^c	290,000	294,000	305,000	274,000	321,000
Solvent extraction ³	11,758	9,488	9,690	9,736	9,661
Total ^c	302,000	303,000	315,000	284,000	331,000
Refinery, electrowon	11,758	9,488	9,690	9,736	9,661
Gold, mine, Au content kilograms	16,251	20,226	19,054	19,383	14,855
Iron ore, mine:					
Gross weight thousand metric tons	8,572	9,224	9,172	7,660	5,332
Fe content do.	5,140	5,530	5,500	4,600	3,200
Iron and steel, raw steel	28,433	15,286	35,900	24,973	37,681
Lead, mine, Pb content	12,000 ^e	12,000 ^e	11,200	12,200	8,000
Molybdenum, mine, Mo content	3,203	3,443	3,543	3,312	3,161
Silver, mine, Ag content kilograms	50,000	53,000	56,000	50,000	59,000
Tin, mine, Sn content	26	-- ^e	8 ^e	78 ^{r, e}	91 ^e
Tungsten, mine, concentrate, W content ^c	370	33	120	240	320
Zinc, mine, Zn content ^c	41,600	38,200	37,600	55,000 ^r	60,000
INDUSTRIAL MINERALS					
Cement, hydraulic thousand metric tons	1,098	1,182	1,293	1,374 ^r	1,714
Fluorspar:					
Acid grade ⁴ do.	48	85	60	25	109
Metallurgical grade ^{c, 5} do.	650	640	590	400	1,100
Total ^c do.	698	725	650	425	1,210
Lime, hydrated and quicklime do.	77	70	51 ^r	67 ^r	59
Salt	533	2,624	1,349	1,400 ^e	1,400 ^e
Sand and gravel, construction, gravel ⁶	340,000	520,000	400,000	290,000	300,000
MINERAL FUELS AND RELATED MATERIALS					
Coal:					
Anthracite	90,100	22,000	60,000 ^r	28,000 ^r	30,000 ^e
Bituminous	11,052,000	9,122,000	6,446,000	3,885,000 ^r	4,000,000 ^e
Lignite	8,053,000	7,246,000	7,513,000	4,802,000 ^r	5,000,000 ^e
Metallurgical	36,604,000	27,454,000	20,596,000	19,496,000 ^r	20,000,000 ^e
Total	55,800,000	43,800,000	34,600,000	28,200,000 ^r	29,000,000 ^e
Coke, metallurgical	60,200	59,100	67,200	65,000 ^r	65,000 ^e
Petroleum, crude thousand 42-gallon barrels	6,876	4,106	4,667	2,565 ^r	4,889

^cEstimated. ^rRevised. do. Ditto. -- Zero.

¹Table includes data available through November 7, 2024. 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.

TABLE 2
MONGOLIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2023

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities ¹	Annual capacity ^c
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 Sukhait Mine, Gurvantes Soum, Omnogovi [South Gobi] Aymag	3,000
Do.	Silver Elephant Mining Corp. (formerly Prophecy Development Corp.)	Ulaan Ovoo 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, Shiveegovi Soum, Govisumber Aymag	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	31,000
Do.	Moenco LLC	Khushuut Mine, Darvi Soum, Hovd Aymag	3,000
Do.	Mongolian Mining Corp.	Baruun Naran Mine, Omnogovi [South Gobi] Aymag, 60 km east of Dalanzadgad	10,000
Do.	do.	Ukhaa Khudag Mine, Omnogovi (South Gobi) Aymag, 80 km east of Dalanzadgad	8,600
Do.	Mongolyn Alt (MAK) Corp.	Naryn Sukhait Mine, Gurvantes Soum, Omnogovi [South Gobi] Aymag	3,000
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 Sukhait 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, Bayan-Undur Soum, Orhon Aymag	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 plc, 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 Ikht LLC [Head of the Presidential Office, 51%, and Erdenet Mining Corp., (Government, 100%), 34%]	Solvent extraction-electrowinning plant in Orhon Aymag (near Erdenetiin-Ovoo Mine)	10
Do.	Erdenet Mining Corp. (Government, 100%)	Erdmin solvent extraction-electrowinning plant, Bayan-Undur Soum, Orhon Aymag	3

See footnotes at end of table.

TABLE 2—Continued
MONGOLIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2023

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities ¹	Annual capacity ^c
Fluorspar		MongolCzech Metal LLC	Chuluut Tsagaan Del Mine, Bayantsagaan Soum, Tov Aymag	150
Do.		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
Gold, mine, Au content	kilograms	Boroo Pte. Ltd.	Boroo Mine, Selenge Aymag	1,200
	do.	do.	Ulaanbulag Mine, Selenge Aymag	1,500
	do.	Erdenet Mining Corp. (Government, 100%)	Erdenetiin-Ovoo Mine, Bayan-Undur Soum, Orhon Aymag	200
	do.	Oyu Tolgoi LLC [Rio Tinto plc, 66%, and Erdenes Oyu Tolgoi LLC (Government, 100%), 34%]	Oyu Tolgoi Mine, Omnogovi [South Gobi] Aymag, 80 km north of the China border	12,000
Do.		Steppe Gold Ltd.	Altan Tsagaan Ovoo (ATO) 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, 20 km from Bor-Undur, Hentiy Aymag	2,400
Iron and steel, raw steel		Erdenes Steel LLC (Beren Group, 50%, and Erdenes Mongolia LLC, 50%)	Plant in Choir, Bayantal Soum, Gobisumber Aymag	200
Do.		Darkhan Metallurgical Plant JSC (Government, 100%)	Plant in Darkhan, Darhan-Uul Aymag	100
Lead, mine, Pb content		Shandong Xianglong Co. Ltd.	Tsav Mine, Dornod Aymag	15
Do.		Steppe Gold Ltd.	Altan Tsagaan Ovoo (ATO) Mine, Tsagaan Ovoo Soum, Dornod Aymag	2
Do.		Tsairt Minerals Co. Ltd. (China Nonferrous Metals Group, 51%, and Government, 49%)	Tumurtiin Ovoo Mine, Baruun-Urt, Suhbaatar Aymag	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, Bayan-Undur Soum, Orhon Aymag	3
Do.		Oyu Tolgoi LLC [Rio Tinto plc, 66%, and Erdenes Oyu Tolgoi LLC (Government, 100%), 34%]	Oyu Tolgoi Mine, Omnogovi [South Gobi] Aymag, 80 km north of the China border	2
Petroleum, crude	thousand	China Petrochemical Corp. (Sinopec)	Oilfield in Southeast Gobi Basin	NA
	42-gallon barrels			
Do.		PetroChina Daching Tamsag-Mongolia LLC	Oilfield in Tamsag Basin	7,000
Silver, mine, Ag content		Erdenet Mining Corp. (Government, 100%)	Erdenetiin-Ovoo Mine, Bayan-Undur Soum, Orhon Aymag	31,000
Do.		Oyu Tolgoi LLC [Rio Tinto plc, 66%, and Erdenes Oyu Tolgoi LLC (Government, 100%), 34%]	Oyu Tolgoi Mine, Omnogovi [South Gobi] Aymag, 80 km north of the China border	32,000
Do.		Steppe Gold Ltd.	Altan Tsagaan Ovoo Mine, Tsagaan Ovoo Soum, Dornod Aymag	5,000
Tin, mine, Sn content		Multiple operators	Mines in various placer deposits	100

See footnotes at end of table.

TABLE 2—Continued
MONGOLIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2023

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities ¹	Annual capacity ^c
Tungsten, mine, W content	metric tons	Erdenet Mining Corp. (Government, 100%)	Erdenetiin-Ovoo Mine, Bayan-Undur Soum, Orhon Aymag	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.		Steppe Gold Ltd.	Altan Tsagaan Ovoo (ATO) Mine, Tsagaan Ovoo Soum, Dornod Aymag	3
Do.		Tsairt Minerals Co. Ltd. (China Nonferrous Metals Group, 51%, and Government, 49%)	Tumurtiin Ovoo Mine, Baruun-Urt, Suhbaatar Aymag	50

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

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