



2023 Minerals Yearbook

UKRAINE [ADVANCE RELEASE]

U.S. Geological Survey, Reston, Virginia: 2025

For more information on the USGS—the Federal source for science about the Earth, its natural and living resources, natural hazards, and the environment—visit <https://www.usgs.gov> or call 1–888–392–8545.

For an overview of USGS information products, including maps, imagery, and publications, visit <https://store.usgs.gov/> or contact the store at 1–888–275–8747.

Any use of trade, firm, or product names is for descriptive purposes only and does not imply endorsement by the U.S. Government.

Although this information product, for the most part, is in the public domain, it also may contain copyrighted materials as noted in the text. Permission to reproduce copyrighted items must be secured from the copyright owner.

THE MINERAL INDUSTRY OF UKRAINE

By Elena Safirova

In 2023, Ukraine was among the world's leading producers of several minerals despite the ongoing Russia-Ukraine conflict that began in February 2022. Ukraine was the 4th-ranked producer of rutile (16% of world output); the 5th-ranked producer of bromine (2.0%, excluding the United States); the 10th-ranked producer of iron ore (Fe content) (1.7%), ilmenite (1.5%), and peat (2.2%); and the 12th-ranked producer of pig iron (0.5%, tied with Canada). Ukraine was also a significant world producer of graphite, lime, and raw steel. The country had large coal and uranium resources but depended on imported petroleum and natural gas (Apodaca, 2025; Briocche, 2025; Schnebele, 2025; Stewart, 2025; Tolcin, 2025; Tuck, 2025a, b).

Minerals in the National Economy

In 2023, Ukraine's real gross domestic product (GDP) increased by 5.3% compared with a 28.8% decrease in 2022.¹ The nominal GDP in 2023 totaled \$177.6 billion.² Manufacturing activities accounted for 8.2% of GDP, and mining and quarrying, for 4.0% (State Statistics Service of Ukraine, 2024b, d).

Total industrial production in 2023 was 4.40 trillion hryvnias (about \$119.6 billion), which was a 6.8% increase compared with that in 2022. Mining and quarrying constituted 495.8 billion hryvnias (about \$13.5 billion), or 11.3% of industrial production. The State Statistics Committee of Ukraine reported that in 2023 the share of manufacturing in industrial production was 52.2%; that of metallurgical production was 8.1%; that of chemicals and chemical products, 2.1%; and that of coke and refined petroleum, 0.9%. Manufacturing production increased by 13.3%, including a 17.7% increase in manufacturing of chemicals and chemical products and a 9.0% increase in metallurgical production, although manufacturing of coke and refined petroleum decreased by 31.4%. Mining and quarrying production decreased by 2.1%, including a 3.0% decrease in mining of coal, an unchanged amount in the production of crude petroleum and natural gas, a 10.2% decrease in mining of metal ores, and a 5.7% increase in other mining and quarrying (State Statistics Service of Ukraine, 2024c, p. 119–122, 124).

According to Ukraine's Institute for Geological Sciences, Ukraine had a total of 2,160 deposits, of which 700 were in areas that Ukraine did not control. These 700 deposits accounted for 80% of the country's coal deposits and 24% of its petroleum and natural gas fields. Other important deposits under occupation included those of gold, iron ore, lithium, manganese, salt, and uranium. Reconstruction of some enterprises damaged during the conflict, such as coal mines, may not be economically feasible (Malinovskaya, 2023).

¹The data in this section exclude the territory of the Autonomous Republic of Crimea, the city of Sevastopol, and part of the territory in Donetsk and Luhansk Oblasts.

²Where necessary, values have been converted from Ukrainian hryvnia (UAH) to U.S. dollars (US\$) at the annual average exchange rate of UAH36.812=US\$1.00 for 2023, UAH32.154=US\$1.00 for 2022, and UAH25.813=US\$1.00 for 2019.

Government Policies and Programs

Ukraine's major law regulating mining relations in the country is the Law on Subsoil of 1994. The goal of the law is to protect the rights and interests of enterprises, institutions, organizations, and citizens and to ensure the safety of people, property, and the environment during the use of subsoil (Urst.com.ua, 2025).

In the spring of 2023, changes to the Law on Subsoil allowed companies that already held development licenses to sell these licenses for the development of mineral deposits to other companies. Following the change, PFK Velta (Velta) decided to sell its special license for the development of the Lekaryovskoye deposit in Kirovohrad Oblast,³ only 6 kilometers (km) from Velta's Birczulovskoye Mine. The new owner of the special license was OOO Dekart Minerals, which did not have prior experience in the mining industry (Strizhak, 2023a).

Production

The production of most mineral commodities decreased in 2023 compared with that in 2022 owing to the Russia-Ukraine conflict. Production of the following was estimated or reported to have decreased in 2023: manganese metal, by 100%; ferromanganese, by 78%; zirconium, by 69%; ilmenite and leucoxene (Ti₂O content), by 63%; manganese concentrate (gross weight), by 62%; manganese concentrate (Mn content), by 61%; mined ilmenite and leucoxene (gross weight), by 51%; refined petroleum, by 50%; metallurgical coke and silicomanganese, by 47% each; ferrosilicon, by 45%; rutile, by 33%; secondary lead, by 20%; kaolin, by 17%; and salt, by 14%. Production of the following was estimated or reported to have increased in 2023: graphite, by 97%; uranium, by 50%; sulfuric acid, by 33%; cement, by 22%; nitrogen, ammonia (N content), by 20%; and steel pipe, by 10%. Alumina, ferronickel, gallium (estimated), magnesium metal, other ferroalloys, secondary copper, and titanium sponge were not produced. Data on mineral production are in table 1.

Structure of the Mineral Industry

The State Service of Geology and Mineral Resources of Ukraine (GosGeoNadra) was responsible for implementing Government policy for geologic exploration and rational use of the subsoil, issuing exploration and production licenses for all mineral resources, monitoring companies' performance, and establishing production sharing agreements. The Ministry of Energy was responsible for the formation and implementation of Government policy regarding the coal industry, electric power, natural gas and petroleum production and processing, and the nuclear industry. Table 2 is a list of major mineral industry facilities.

³The word "Oblast" means "province" in the Ukrainian language.

Mineral Trade

The total value of Ukraine's exports of goods decreased by 18.0% to \$36.2 billion in 2023. One of Ukraine's leading export categories in terms of value was base metals and products made thereof, and in 2023, these were valued at \$3.9 billion and made up 10.8% of the total value of all exports of goods. Of this amount, exports of ferrous metals totaled \$2.6 billion, or 7.3% of the total exports of goods. Exports of mineral products were valued at \$2.4 billion and made up 6.7% of the total value of exports of goods, of which ores, slag, and ashes totaled \$1.9 billion (5.2% of the total value of exports of goods); exports of mineral fuels and petroleum products totaled \$392 million (1.1% of the total value of exports of goods); and exports of salt, soil, stones, and sulfur totaled \$152 million (0.4% of the total value of exports of goods). Together, the value of exports of mineral products and metals made up 16.0% of the total value of the exports of goods. The main export partners for Ukraine in goods trade were Poland (which received 13.1% of Ukraine's exported goods), Romania (10.4%), China (6.7%), Turkey (6.5%), Germany (5.6%), Spain (5.5%), Italy (4.2%), and the Netherlands (4.1%) (State Statistics Service of Ukraine, 2024a; 2024c, p. 190–192, 194).

The total value of Ukraine's imports of goods increased by 15.0% to \$63.6 billion in 2023. Mineral products accounted for 16.7% of the total value of imports of goods in 2023, and base metals and products made thereof accounted for 5.3%. One of the leading imported commodities was mineral fuels and refined petroleum products, which made up about 16.3% of total imports (State Statistics Service of Ukraine, 2024a; 2024c, p. 194).

Commodity Review

Metals

Beryllium.—As of 2023, Ukraine had never mined beryllium. In April 2019, OOO Perzhanskaya Rudnaya Co. (PRC) (a subsidiary of BGV Group Management) signed an agreement with GosGeoNadra, according to which the company received a license for the development of the Perzhanske beryllium deposit in Zhytomyr Oblast' and paid \$2.9 million (76 million hryvnias) as a license fee to the Government. The exploration of the Perzhanske deposit was conducted from 1962 to 1977, and the beryllium resources of the deposit were estimated to be 15,300 metric tons (t) of beryllium oxide, which would be the equivalent of 5,500 t of beryllium. Also, the deposit had resources of 39,800 t of zinc and lesser amounts of lithium, molybdenum, niobium, rare-earth elements (REEs), silver, tantalum, and zirconium. In 2023, BGV Group worked on a prefeasibility study and, once completed, planned to present it to investors. The Perzhanske deposit is located 20 km from the Olevska railway station. An automobile asphalt road and a 10-kilowatt power line were directly adjacent to the deposit (Kazhanov and Borovikov, 2019; Yarosh, 2019; Inventure.com.ua, 2023a; Strizhak, 2023b; BGV Group Management, 2025a).

Ferroalloys.—Prior to the conflict with Russia, the four ferroalloy plants operating in Ukraine were the Kramatorskiy ferroalloys plant (KZF), the Nikopol'skiy ferroalloys plant (NZF), the Pobuzhskiy ferronickel plant (PFK), and the

Zaporozhskiy ferroalloys plant (ZZF). In 2021, more than 80% of the output was exported, and the primary consumers of Ukraine's ferroalloys were China, Italy, and Turkey. In 2022, the ferroalloy plants significantly reduced production owing to the closing of the maritime ports and the destruction of two metallurgical plants in Mariupol in the spring (table 2; Kolisnichenko, 2022; Kryoka, 2023).

In 2023, according to the Ukrainian Ferroalloys Association, Ukraine reduced production of ferroalloys by 57.4% compared with production in 2022. Reduction in production was attributed to active military operations, lower ferroalloy prices, and logistics restrictions. In addition, increased energy prices and personnel military mobilization contributed to lower output. The PFK stopped operations in October 2022 owing to a lack of power. In November 2023, the NZF and the ZZF completely stopped operations. The two major manganese suppliers, the Marganetskiy GOK (which stands for gornobogatitel'nyi kombinat [mining and beneficiation complex]) and the Pokrovskiy GOK, also stopped operations in November (Kryoka, 2023; Leart.com.ua, 2023; Lityo.com.ua, 2023; Kolisnichenko, 2024b).

In 2023, Ukraine exported 344,200 t of ferroalloys, which was a 4.9% decrease compared with that in 2022, and the export revenue decreased by 48.9% to \$297.6 million. Between January and September, average monthly exports were 36,150 t, but by the end of the year, monthly exports decreased to 8,900 t in October, to 7,700 t in November, and to 2,500 t in December. The primary recipients of Ukraine's ferroalloy exports were Poland (which purchased 52.8% of Ukraine's ferroalloys), Turkey (14.1%), and the Netherlands (13.1%) (Kolisnichenko, 2024a).

Iron and Steel.—In 2023, pig iron production in Ukraine decreased by 6.1% to 6.0 million metric tons (Mt) compared with production in 2022 and raw steel production, by 0.6% to 6.2 Mt. Steel pipe production increased by 10% to 670,000 t, and rolled steel, by 0.4% to 5.4 Mt. Overall, production of steel and steel products remained at a similar level to that in 2022. The decreased pig iron production was due to a lack of production at the destroyed Mariupol plants. When comparing only the plants located in territory controlled by Ukraine, pig iron production increased by 17.0% compared with production in 2022. By March 2023, Ukraine had five steel producers: PAO ArcelorMittal Kryvyi Rih, PAO Interpipe, PAO Zaporizhstal', ChAO Kametstal', and ChAO Dniprovskiy Metallurgical Plant. In 2023, ArcelorMittal Kryvyi Rih had in operation only one blast furnace (out of four) and was able to operate at between 20% and 30% of full capacity. Interpipe operated at 50% to 55% of capacity and, during the first 9 months of 2023, increased steel production by 14.5% compared to the first 9 months of 2022. Zaporizhstal' operated at 65% to 75% of total capacity. In March 2023, Zaporizhstal' put in production its blast furnace #2 and, through the end of 2023, operated three of its four furnaces. Kametstal' operated two of its three blast furnaces and overall worked at 65% to 75% of total capacity. The Dniprovskiy Metallurgical Plant in 2023 produced only rolled steel and operated only at 10% of its rolled steel capacity (tables 1, 2; Gluschenko, 2024; Kolisnichenko, 2024c; Metalinfo.ru, 2024).

In 2023, revenue from exports of ferrous metals decreased by 41.6% to \$2.65 billion, which accounted for 7.3% of total

revenue from goods exports; whereas in 2022, the revenue from ferrous metals exports accounted for 10.3%. In 2023, imports of ferrous metals increased by 37% to \$1.31 billion. Also in 2023, Ukraine's revenue from exports of products made of ferrous metals decreased by 16.6% to \$878 million, and the cost of imports of products made from ferrous metals increased by 40.3% to \$903 million (Open4business.com.ua, 2024b).

Manganese.—In 2023, Ukraine produced 126,000 t of mined manganese (Mn content), which was a 61% decrease compared with 2022 production. The only two producers of manganese were in Dnipropetrovsk Oblast': ChAO Pokrovskiy GOK, located near the city of Pokrov, and PAO Marganetskiy GOK, which mined manganese from seven mines and was located next to the city of Marganets. The Marganetskiy GOK was in operation during most of the year but operated only at a small fraction of its full production capacity. For example, in February 2023, it produced 34,780 t of manganese ore, which was 12.2% of the amount it had planned to produce. The Pokrovskiy GOK stopped operations in December 2022 and reopened in the spring of 2023, but also at a low production level. Then, in late October to early November 2023, both mining enterprises stopped operations again owing to shortages of water, electricity, damaged production facilities and infrastructure, and military operations and bombing in the area. During the stoppage of operations, some employees worked on fixing damaged equipment (Il'chenko, 2023; Kolisnichenko, 2023).

Rare-Earth Elements.—As of 2023, Ukraine has never mined REEs. In April 2019, GosGeoNadra auctioned seven mineral deposits through its ProZorro system and collected a total of \$5.54 million (143 million hryvnias). TOV CFR Group (a subsidiary of BGV Group) paid \$395 thousand (10.2 million hryvnias) for a 5-year development license for the Yastrebitske zircon-rare-earth-fluorite deposit in Zhytomyr Oblast'. TOV CFR Group was active in acquiring licenses for critical minerals in Ukraine. The resources of the deposit were estimated to contain 513,000 t of zirconium dioxide, 135,000 t of REEs, and 1.23 Mt of fluorite. The southwestern part of the deposit was considered ready for industrial development. In 2015, an examination of the zirconium mineralization was conducted and evaluated for both open pit and underground mining, but no mining activity was reported. The deposit is located within 2 km of the village of Perga and geologically is a part of the Ukrainian Shield (Kazhanov and Borovikov, 2019; Yarosh, 2019; Strizhak, 2023b; BGV Group Management, 2025b; TOV CFR Group, 2025).

Titanium.— In 2023, Ukraine decreased production of ilmenite and leucoxene concentrates by 51% to an estimated 200,000 t (gross weight). In 2023, Ukraine's exports of titanium ores decreased by 96.4% to 11,648 t, and export revenue decreased by 85.1% to \$19.4 million. Most titanium was exported to Turkey (38.2% in terms of value), followed by Japan (16.5%) and India (6.1%). The recipients were very different from those in 2022, when titanium ores were primarily exported to Czechia (47.9% of all exports), the United States (11.9%), and Romania (9.7%) (table 1; Grigorenko, 2023; Open4business.com.ua, 2024a).

As of 2023, titanium ore in Ukraine was mined by the AO United Mining and Chemical Co. (OGKhK) that managed the Vlnogorskiy GOK in Dnipropetrovsk Oblast' and the Irshanskiy GOK in Zhytomyr Oblast', both of which had been recently nationalized. Other producers of mined titanium included OOO Mezhdurechenskiy GOK and OOO Valki-II'menit, both of which were located in Zhytomyr Oblast', and OOO PFK Velta that operated the Birzulovskoye Mine in Kirovohrad Oblast'. In February 2023, the Demurinskiy GOK in Dnipropetrovsk Oblast', which previously was owned by Russian businessmen, was confiscated and transferred to Ukrainian Government ownership (table 2; Prasad, 2023; Open4business.com.ua, 2024a).

In 2023, Velta Medical (a subsidiary of Velta) planned to begin production of titanium medical implants in Ukraine with the goal of selling the products domestically. In another venture, Velta Additive Technologies planned to use titanium powder in final products. In 2017, Velta opened its research Center, Velta RD Titan, where it developed a new low-carbon and zero-emission technology for producing titanium powder. In 2023, the company purchased equipment to expand production to 1,000 kilograms per year of titanium powder. By implementing the new projects, Velta planned to complete a full cycle production—from mining to final products (Interfax.com.ua, 2023).

Industrial Minerals

Cement.—In 2023, Ukraine's cement production totaled an estimated 6.6 Mt, which was a 22% increase compared with that in 2022. According to the Association of Cement Producers of Ukraine (Ukrcement), most of Ukraine's cement producers continued operations in 2023. The only cement plant that stopped operations was PAO Eurocement Ukraine, which was located in the city of Balakliya in Kharkiv Oblast'. Domestic consumption of cement totaled 5.4 Mt compared with 4.6 Mt in 2022 and 10.5 Mt in 2021. Ukrcement estimated, as of 2023, Ukraine's cement plants had the capacity to produce 13.6 million metric tons per year (Mt/yr) of cement, but financial and human resources allowed them to produce only 12.5 Mt/yr of cement. Also, the Association expected that after the end of the conflict, the demand for cement would gradually increase and all cement plants would operate at 100% of capacity. According to industry experts, after the conflict ends, annual demand for cement in Ukraine would amount to between 15 and 16 Mt, and total monetary demand for cement, including intermediary demand, could amount to between \$2 and \$5 billion (table 1; Bukatyuk, 2023; Kul'bachnyi, 2023; Interfax-Ukraine, 2024).

In September 2023, the Antimonopoly Committee of Ukraine (AMCU) began consideration of the purchase of two cement plants by CRH plc (Ireland) from Buzzi (Italy). The two plants were PAO Volyn'Cement in Volyn Oblast' and OAO YuGCement in the city of Mykolayiv, both of which were owned by Buzzi through its subsidiary PAO Dyckerhoff Cement Group. One of the requirements imposed by the AMCU was the involvement of an independent investor that would hold between 25% and 28% of the company's shares. In December, CRH signed an agreement with the European Bank for Reconstruction and Development (EBRD) in which the EBRD agreed to invest in Dyckerhoff cement plants in Ukraine. The

AMCU also required CRH to retain the production capacities of the plants, to guarantee equal rights for workers, to guarantee competitive prices for cement in Ukraine, and to regularly provide reports on production volumes and sales on Ukraine's domestic cement market for a period of 5 years after the transaction. The final decision to approve the proposed acquisition was expected in 2024. CRH already owned three other cement plants in Ukraine: OOO Cement in Odesa, PAO Nikolayevtsement in Mykolayiv, and PAO Podolsk Cement in Khmelnytskyi Oblast' (table 2; Kovalenko, 2024; Solovchuk, 2024).

Graphite.—In 2023, Ukraine's graphite production increased by 97% to 1,670 t. The only graphite producer in Ukraine was Zavalievskiy Graphite Complex, a 70% stake of which was acquired by the graphite and gold explorer Volt Resources of Australia in 2021. Zavalievskiy Graphite operated an open pit mine and had the capacity to produce 20,000 metric tons per year (t/yr) of crystalline flake graphite and exported its output to countries in Europe and Asia. In October, Volt Resources announced that it had signed a letter of intent with M2i Global of the United States, which specialized in developing and implementing a complete global supply chain for critical minerals for the U.S. Government and partners. M2i Global was seeking a contract to supply the U.S. Department of Defense with up to 20,000 t/yr of graphite with a purity of between 94% and 99.5% for a period of 3 years (tables 1, 2; Ivanov, 2023; Nadra.info, 2023).

In November 2022, OOO Spis Ukraina obtained a special mining permit from the GosGeoNadra for the development of the Gorodnyavskiy section of the Burtinskiy Mine that is located in Khmelnytskyi Oblast'. The deposit had an area of 105 hectares (about 260 acres), and the resources of the deposit were estimated to be 130 Mt with an average graphite content of 5.14%, which, according to the GosGeoNadra, was enough to mine the deposit for 130 years. According to the GosGeoNadra, annual production could be as high as 1 Mt/yr of ore and 55,900 t/yr of graphite concentrate. OOO Spis Ukraina was registered in 2010 in the city of Lviv, and at some point, between 2010 and 2022, the company became a subsidiary of Onur Group of Turkey. It was expected that the total investment in the graphite deposit would amount to between \$60 million and \$280 million. The development of the deposit was expected to begin in 2024 (Kolishnichenko, 2021; Antikor.com.ua, 2022; Inventure.com.ua, 2023b; Zasyad'ko, 2023).

In May, residents of the Mikhaylyuchka village, where the Burtinskoye deposit is located, expressed their disagreement with issuing a license to Spis Ukraina for a variety of reasons, from environmental and health-related reasons to economic and financial reasons. The residents called on the President of Ukraine to ban the development of the Burtinskoye deposit. By yearend, it was not known if the dispute between local residents and OOO Spis Ukraina was resolved (Antikor.com.ua, 2023).

Lithium.—As of 2023, Ukraine had never produced lithium. The country, however, had four known lithium deposits: the Dobra and the Polikhovske deposits in Kirovohrad Oblast', the Kruta Balka deposit in Zaporizhzhia Oblast', and the Shevchenkivske deposit in Donetsk Oblast'. As of 2023, the Kruta Balka deposit was located in Russian-occupied territory, and the Shevchenkivske was in close proximity to the military frontline (Chayka, 2023; Dzyuba, 2024; Khaustov, 2024).

In 2018, OOO Petro-Consulting obtained special permits for exploration and production at the Dobra deposit and the Shevchenkivske deposit; however, the GosGeoNadra issued the permits without conducting an auction or using any other competitive mechanisms. In 2021, competitors of OOO Petro-Consulting filed lawsuits asserting that the special permits were issued in violation of Ukraine's laws. In 2022, OOO Petro-Consulting changed its name to European Lithium Ukraine. The company planned to begin development of the Dobra deposit, which, according to the estimates made in the 1980s and 1990s, had resources of 19 Mt of lithium-containing mineralized material. It was not clear whether the lithium in the deposit was amenable to concentration to produce battery-grade material. The Shevchenkivske deposit reportedly had greater lithium resources, but its development was not possible until the end of the conflict because of its proximity to the front lines (Chayka, 2023; Ukrenergy.dp.ua, 2023).

The permits for exploration and production at the Polikhivske deposit, which is located within 70 km of the Dobra deposit, were held by the Ukrlitiydobycha Co. The company conducted a Joint Ore Reserves Committee (JORC)-compliant resource assessment, which estimated the proven deposit reserves to be 75 Mt of ore. The lithium is contained in the mineral petalite, and the company planned to build a mine, a concentrating plant, and required infrastructure. A total investment was estimated to be \$300 million, and production of lithium could potentially commence in 2027. The company planned to eventually build a plant to produce either lithium carbonate or lithium hydroxide from the concentrate. As of 2023, the company was looking for international investors and was hoping to expand its lithium resources through additional exploration (Dzyuba, 2024; Khaustov, 2024).

Mineral Fuels and Related Materials

Uranium.—In 2023, production of mined uranium in Ukraine increased by an estimated 50% to 150 t. The only enterprise producing uranium in Ukraine in 2023 was Vostochnyi GOK, which mined uranium at three deposits: the Ingul's'ka, the Novokonstantyniv's'ka, and the Smilins'ka. In the past 10 years, Vostochnyi GOK had financial problems owing to high production costs that exceeded uranium market prices (tables 1, 2; Uatom.org, 2022; Yarosh, 2022; Maskalevich, 2023).

For the operation of its nuclear powerplants, Ukraine needed about 2,350 t/yr of uranium. In 2019, Ukraine produced 800 t, which could cover about one-third of its needs. However, since 2019, production has steadily decreased to just 100 t in 2022 and was 150 t in 2023. In 2022, Vostochnyi GOK had a debt to National Nuclear Energy-generating Company (NAEK) Energoatom, the operator of all of Ukraine's nuclear powerplants, of more than 2 billion hryvnias (about \$62 million), which prevented Vostochnyi GOK from regular wage payments to its workers. Every fifth employee served in the military during the conflict with Russia, and the mines were 33% understaffed (table 1; Maskalevich, 2023; Strizhak, 2023a).

In 2023, the Government stated that it had signed an agreement with Cameco Corp. of Canada, according to which Cameco would supply uranium hexafluoride to NAEK Energoatom to meet 100% of its needs during 2024–2035. In

return, the Government would sell to Cameco 100% of the uranium produced at its mines. In September, Ukraine exported to Canada the first shipment of its uranium for conversion into uranium hexafluoride. Also, in April, NAEK Energoatom and Holtec International of the United States agreed to construct in Ukraine up to 20 SMR-160 nuclear powerplants and connect them to the Ukrainian grid by March 2029 (Holtec International, 2023; Nickel and Polityuk, 2023).

In June, NAEK Energoatom proposed to the Government that it merge with Vostochnyi GOK. Both companies were Government owned. NAEK Energoatom's management specified that they intended to merge only with competitive mines that, in general, could produce uranium at costs below market prices. According to NAEK Energoatom, to make Vostochnyi GOK profitable, the company would need to invest a total of 12 billion hryvnias (about \$373 million), although at the first stage of development, it would be enough to invest 2 billion hryvnias (about \$62 million) (Pavlysh, 2022).

Outlook

Ukraine's mining, metallurgy, and other mineral sectors had significant setbacks during the past few years: ferroalloy plants lacked inexpensive electricity to run profitably, coal mines and petroleum refineries were outdated and required significant investments, and uranium production was insufficient to meet domestic demand. The conflict with Russia further exacerbated the situation. Some facilities faced reduced demand for their products, had difficulties exporting their output, faced reduced power supplies for normal operations, and experienced shortages of labor owing to workers serving in the military. In addition, some plants and deposits were either damaged or seized by Russia. It appears, however, that in 2023 production of several mineral commodities had stabilized.

Ukraine is likely to remain one of the world's leading producers of manganese ore, titanium ore, and iron ore. Remaining competitive in metallurgy may prove difficult owing to high energy costs, the need for new investments, and the often-differing interests of plant owners and the Government—the plant owners are likely to feel that energy subsidies and other forms of Government support may be needed for profitable operations, but the Government does not necessarily agree. After the conflict ends, some industries, such as construction and cement production, will likely sharply increase production, but most mineral production operations will require several years to recover. At the same time, the mineral industry might have an opportunity to restructure and modernize. It remains to be seen whether Ukraine will be able to seize this opportunity.

References Cited

- Antikor.com.ua, 2022, Turki s boyem vzjali Khmel'nitskiy grafit [The Turks won the battle for Khmel'nitskiy graphite]: Antikor.com.ua, November 23. (Accessed January 3, 2025, at https://antikor.com.ua/ru/articles/590757-turki_s_boem_vzjali_hmel'nitskiy_grafit.) [In Russian.]
- Antikor.com.ua, 2023, Mikhaylyuchka-protiv—Vladimira Zelenskogo procyat vmeshat'sya v grafitovyie plany ONUR [Makhaylyuchka is against—Vladimir Zelenskii is asked to intervene in graphite plans of ONUR]: Antikor.com.ua, May 4. (Accessed March 14, 2025, at https://antikor.com.ua/ru/articles/626654-mihajljuchka_protiv_vladimira_zelenskogo_prosjat_vmeshatjsja_v_grafitovyie_plany_onur.) [In Russian.]

- Apodaca, L.E., 2025, Lime: U.S. Geological Survey Mineral Commodity Summaries 2025, p. 108–109.
- BGV Group Management, 2025a, BGV beriliy [BGV beryllium]: Kyiv, Ukraine, BGV Group Management. (Accessed March 14, 2025, at <https://bgv.com.ua/bgv-beryllium/>.) [In Ukrainian.]
- BGV Group Management, 2025b, BGV tsirkon ta ridskinozemel'ny elementy [BGV zirconium & rare earth elements]: Kyiv, Ukraine, BGV Group Management. (Accessed March 14, 2025, at <https://bgv.com.ua/en/bgv-zirconium-and-rare-earth-elements/>.)
- Brioche, A.S., 2025, Peat: U.S. Geological Survey Mineral Commodity Summaries 2025, p. 130–131.
- Bukatyuk, Ul'ana, 2023, Sdelka god ana rynku tsementa—Zachem irlandskaya CRH pokupayet v Ukraine dva tsementnyh zavoda za 100 mln euro (i mozhet zakhvatit' polovinu rynka) [A deal of the year on the cement market—Why Irish CRH buys 2 plants in Ukraine for 100 million euros (and could capture one-half of the market)]: Forbes.ua, September 6. (Accessed March 14, 2025, at <https://forbes.ua/ru/money/ugoda-roku-na-rinku-tsementu-navishcho-irlandska-crh-kupue-v-ukraini-dva-tsementnikh-zavodi-za-100-mln-05092023-15821>.) [In Russian.]
- Chayka, Ol'ga, 2023, Gotovy investirovat' odin milliard v dobychu litiya na Ukraine [We are ready to invest \$1 billion in lithium production in Ukraine]: Forbes.ua, July 18. (Accessed March 14, 2025, at <https://forbes.ua/ru/company/gotovi-investuvati-1-mlrd-u-vidobutok-litiyu-v-ukraini-avstraliyska-european-lithium-khoche-zarobiti-na-litievomu-bumi-odin-z-proektiv-ukrainske-rodovishche-intervyu-z-kerivnikom-toni-seydzhem-18072023-14865>.) [In Russian.]
- Dzyuba, Oleksiy, 2024, U Ukrainy est' 1% mirovyh zapasov litiya, kotoryye pravitel'stvo khochet ispol'zovat' dlya proizvodstva elektrokarov [Ukraine has 1% of the world lithium resources that the Government wants to use to produce electric cars]: Dev.ua, February 15. (Accessed March 14, 2025, at <https://dev.ua/ru/news/uriad-khoche-vykorystaty-ukrainski-poklady-litiu-dlia-umovno-stvorennia-natsionalnoi-tesla-rozbyraemos-z-perspektyvamy-takoi-idei-1707849095>.) [In Russian.]
- Grigorenko, Yuriy, 2023, Ukrainskiy titan—V 2022 godu eksport titanosoderzhashih rud iz Ukrainy snizilsya na 42% g./g. [Ukrainian titanium—In 2022 exports of titanium-containing ores from Ukraine decreased by 42% year-on-year]: Kyiv, Ukraine, GMK Center, February 2. (Accessed January 3, 2024, at <https://gmk.center/posts/ukrainskiy-titan-v-2022-godu-eksport-titanosoderzhashih-rud-iz-ukrainy-snizilsya-na-42-g-g/>.) [In Russian.]
- Gluschenko, Andrei, 2024, Kak ukrainskaya metallurgiya proshla ispytaniye na prochnost' v 2023 godu [How Ukrainian metallurgy passed the strength test in 2023]: Kyiv, Ukraine, GMK Center, January 17. (Accessed March 14, 2025, at <https://gmk.center/posts/kak-ukrainskaya-metallurgiya-proshla-ispytaniya-na-prochnost-v-2023-godu/>.) [In Russian.]
- Holtec International, 2023, Ukraine's Energoatom and Holtec International sign cooperation agreement to deploy SMR-160 reactors in Ukraine: Camden, NJ, Holtec International, April 21. (Accessed April 9, 2025, at <https://holtecenternational.com/2023/04/21/ukrains-energoatom-and-holtec-international-sign-cooperation-agreement-to-deploy-smr-160-reactors-in-ukraine/>.)
- Il'chenko, Lia, 2023, Marganetskiy GOK ostanovil dobychu iz-za obstrelov i nehvatki vody posle podryva Kakhovskoy GES [The Marganetskiy GOK stopped production because of shootings and water shortage after the explosion at the Kakhovskaya hydropower plant]: Ekonomicheskaya provda, Kyiv, Ukraine, October 30. (Accessed March 14, 2025, at <https://pravda.com.ua/rus/news/2023/10/30/706021/>.) [In Russian.]
- Interfax.com.ua, 2023, Velta zamykayet polnyi tsikl izgotovleniya konechnykh izdeliy iz titana—Ot dobychi do kommercheskogo producta [Velta closes the full cycle of making final titanium products—From mining to commercial product]: Interfax.com.ua, September 11. (Accessed March 14, 2025, at <https://ru.interfax.com.ua/news/economic/934232.html>.) [In Russian.]
- Interfax-Ukraine, 2024, Potrebleniye tsementa v Ukraine v 2023 godu vyroslo na 17%—Assotsiatsiya "Ukrtsement" [Cement consumption in Ukraine increased by 17% in 2023—Association "Ukrtsement"]: Interfax-Ukraine, Kyiv, Ukraine, April 17. (Accessed March 14, 2025, at <https://ru.interfax.com.ua/news/press-conference/981002.html>.) [In Russian.]
- Inventre.com.ua, 2023a, BGV Group Management of Gennady Butkevich invested over \$100 million in mining projects: Kyiv, Ukraine, Inventre.com.ua, June 28. (Accessed March 14, 2025, at <https://inventre.com.ua/en/news/world/bgv-group-management-of-gennady-butkevich-invested-over-dollar100-million-in-mining-projects>.)

- Inventure.com.ua, 2023b, Turetskaya Onur Group vlozhit \$50 mln v dobychu grafita na Ukraine [Onur Group of Turkey will invest \$50 million in graphite production in Ukraine]: Kyiv, Ukraine, Inventure.com.ua, February 8. (Accessed January 3, 2025, at <https://inventure.com.ua/news/ukraine/tureckaya-onur-group-vlozhit-dollar50-mln-v-dobychu-grafita-v-ukraine>.) [In Russian.]
- Ivanov, Aleksandr, 2023, Vopros natsional'noy bezopasnosti—Ukraina nachinayet postavlyat' grafit dlya Monoborony SSHA [The question of national security—Ukraine begins supplying graphite for the U.S. Department of Defense]: Biz.nv.ua, October 16. (Accessed March 14, 2025, at <https://biz.nv.ua/markets/avstraliyskaya-kompaniya-nachnet-postavki-ukrainskogo-grafita-dlya-minoborony-ssha-poslednie-novosti-50361007.html>.) [In Russian.]
- Kazhanov, Yegor, and Borovikov, Vladislav, 2019, Butkevich stal redkozemel'nym [Butkevich became rare-earth-y]: Oligarkh Media, Kyiv, Ukraine, May 31. (Accessed March 14, 2025, at <https://oligarh.media/2019/05/31/butkevich-stal-redkozemelny/>.) [In Russian.]
- Khaustov, Vladimir, 2024, Ukrainskiy lityi—Kakie perspektivy [Ukrainian lithium—What is the outlook]: Zn.ua, February 6. (Accessed April 9, 2025, at Kyiv, Ukraine, <https://zn.ua/business/ukrainskiy-litij-kakie-perspektivy.html>.) [In Russian.]
- Kolisnichenko, Vadim, 2021, Spis Ukraina vyigral tender na razrabotku uchastkas grafitom za 45 mln griven [Spis Ukraine won a tender for the development of a graphite lot for 45 million hryvnias]: Kyiv, Ukraine, GMK Center, April 1. (Accessed December 15, 2024, at <https://gmk.center/news/spis-ukraina-vyigral-tender-na-razrabotku-uchastka-s-grafitom-za-45-mln-gr/>.) [In Russian.]
- Kolisnichenko, Vadim, 2022, Ferroalloys exports from Ukraine increased in September 2022 by 39% month-to-month: Kyiv, Ukraine, GMK Center, October 17. (Accessed December 3, 2024, at <https://gmk.center/en/news/ukraine-increased-exports-of-ferroalloys-by-39-m-m-in-september-2022/>.)
- Kolisnichenko, Vadim, 2023, Pokrovskiy GOK v aprele 2023 gods planiruyet vosstanovit' dobychu rudy [In April 2023 Pokrovskiy GOK plans to restart ore production]: Kyiv, Ukraine, GMK Center, March 14. (Accessed March 14, 2025, at <https://gmk.center/news/pokrovskiy-gok-v-aprele-2023-goda-planiruet-vozobnovit-dobychu-rudy/>.) [In Russian.]
- Kolisnichenko, Vadim, 2024a, Ukraina po itogam 2023 goda eksportirovala 344,2 tys. t. ferrosplavov [Ukraine exported 344,200 t of ferroalloys in 2023]: Kyiv, Ukraine, GMK Center, January 18. (Accessed March 14, 2025, at <https://gmk.center/news/ukraina-po-itogam-2023-goda-eksportirovala-344-2-tys-t-ferrosplavov/>.) [In Russian.]
- Kolisnichenko, Vadim, 2024b, Ukrainskiye ferrosplavshiki v 2023 godu sokratili vypusk produktsii na 57% g./g. [Ukrainian ferroalloys producers in 2023 decreased production by 57% year on year]: Kyiv, Ukraine, GMK Center, February 19. (Accessed March 14, 2025, at <https://gmk.center/news/ukrainskie-ferrosplavshiki-v-2023-godu-sokratili-vypusk-produktsii-na-57-g-g/>.) [In Russian.]
- Kolisnichenko, Vadim, 2024c, Ukrainskiye metallurgi po itogam 2023 goda proizveli 5,37 mln t prokata [Ukrainian metallurgists in 2023 produced 5.37 million tons of rolled steel]: Kyiv, Ukraine, GMK Center, January 10. (Accessed March 14, 2025, at <https://gmk.center/news/ukrainskie-metallurgi-po-itogam-2023-goda-proizveli-5-37-mln-t-prokata/>.) [In Russian.]
- Kovalenko, Elena, 2024, Odnaz iz krupneyshih sdelok s nachala voyny—AMKU ozvuchil usloviya pokupki investorem CRH srazu dvuh tsementnyh zavodov [One of the largest transactions since the beginning of the war—AMKU sounded out conditions for the purchase of two cement plants by CRH investor]: Kyiv, Ukraine, Biz.nv.ua, July 26. (Accessed December 3, 2024, at <https://biz.nv.ua/markets/amku-odobril-sdelku-crh-budet-investirovat-v-ukrainskie-cementnye-zavody-50437677.html>.) [In Russian.]
- Kryoka, Stepan, 2023, My sokhranili svoi traditsionnyye rynki, no seychas za nih nuzhno borot'sya—Ispolnitel'nyy direktor UkrFA Sergey Kudryavtsev [We saved our traditional markets but now we have to fight for them—UkrFA executive director Sergey Kudryavtsev]: Kyiv, Ukraine, Delo.ua, March 1. (Accessed December 3, 2024, at <https://delo.ua/ru/industry/my-soxranili-svoi-traditsionny-ryunki-no-seicas-za-nix-nuzno-borotsya-ispolnitelny-direktor-ukrfa-sergei-kudryavcev-411761/>.) [In Russian.]
- Kul'bachnyi, Aleksandr, 2023, Posle pobedy rynek budet razogrevat'sya 3-4 goda:Glava Uktsementa o tom, kak uspehi VSU dali otrasli plus 35% ob'emov proizvodstva [After the victory the market will be heating up for 3-4 years—The head of UkrCement about how the successes of Ukraine's Armed Forces gave the industry plus 35% of production volumes]: Kyiv, Ukraine, Telegraf.com.ua, July 19. (Accessed January 3, 2025, at <https://telegraf.com.ua/jekonomika-i-finansy/2023-07-17/5800022-pislyaperemogi-rinok-rozigrivatimetsya-3-4-roki-golova-ukrtsementu-pro-te-yak-uspikhi-zsu-dali-galuzi-plyus-35-obsyagiv-virobnitstva>.) [In Russian.]
- Leart.com.ua, 2023, Zagruzka ferrosplavnyh zavodov v Ukraine v kontse 2022 goda sostavila 30% [Ferroalloys plants in Ukraine were loaded at 30% at the end of 2022]: Dnipro, Ukraine, Leart.com.ua. (Accessed December 3, 2024, at <https://leart.com.ua/news/zagruzka-ferrosplavnyx-zavodov-v-ukraine-v-konco-2022-goda-sostavila-30/>.) [In Russian.]
- Lityo.com.ua, 2023, Ferrosplavnyye predpriyatiya Ukrainy v 2022 godu byli zagruzheny na 30% [Ferroalloys plants in Ukraine in 2022 were loaded by 30%]: Kyiv, Ukraine, Lityo.com.ua. (Accessed December 3, 2024, at <https://lityo.com.ua/2023/ferrosplavnyye-predpriyatiya-ukrainy-v-2022-godu-byli-zagruzheny-na-30/>.) [In Russian.]
- Malinovskaya, Angelina, 2023, Pochti polovina mestorozhdeniy pod okkupatsiyey: Kakie posledstviya eto budet imet' dlya Ukrainy [Almost half of the deposits are under occupation—What consequences will it have for Ukraine]: Kyiv, Ukraine, Fakty.com.ua, May 31. (Accessed December 3, 2024, at <https://fakty.com.ua/ru/ukraine/20230531-majzhe-polovyna-rodovyshh-pid-okupacziyeyu-yaki-naslidky-cze-matyme-dlya-ukrainy/>.) [In Russian.]
- Maskalevich, Igor', 2023, AES est', urana net [There is a nuclear power plant, there is no uranium]: Kyiv, Ukraine, Zn.ua, August 21. (Accessed April 9, 2025, at <https://zn.ua/energetics/aes-est-urana-net.html>.) [In Russian.]
- Metalinfo.ru, 2024, V 2023 g. metallrgi Ukrainy vyplavili 6,23 mln t. stali [In 2023, Ukraine's metallurgists produced 6.23 million metric tons of steel]: Moscow, Russia, Metalinfo.ru, January 16. (Accessed March 14, 2025, at <https://www.metalinfo.ru/ru/news/156971>.) [In Russian]
- Nadra.info, 2023, Letter of intent—The US will source 20,000 tons of Ukrainian graphite per year for defense needs: Kyiv, Ukraine, Nadra.info, October 13. (Accessed March 14, 2025, at <https://nadra.info/2023/10/letter-of-intent-20000-tons-of-ukrainian-graphite-per-year-will-be-supplied-to-the-usa-defense-needs/>.)
- Nickel, Rod, and Polityuk, Pavel, 2023, Insight—Ukraine's nuclear deal with Canada's Cameco carries big risks, rewards: Thomson Reuters, May 5. (Accessed April 9, 2025, at <https://www.reuters.com/world/ukraines-nuclear-deal-with-canadas-cameco-carries-big-risks-rewards-2023-05-05/>.)
- Open4business.com.ua, 2024a, Eksport titanovyh rud Ukrainy snizilsya na 43,7% v yanvare-oktyabre tekushhego goda [Exports of titanium ores in Ukraine decreased by 43.7% in January through October of the current year]: Open4business.com.ua, November 11. (Accessed March 14, 2025, at <https://open4business.com.ua/ru/eksport-titanovyh-rud-ukrainy-snizilsya-na-437-v-yanvare-oktyabre-tekushhego-goda/>.) [In Russian.]
- Open4business.com.ua, 2024b, Metallurgicheskiye predpriyatiya Ukrainy uvelichili postupleniya ot eksporta chernyh metallov na 65,4% [Metallurgical enterprises of Ukraine increased export revenues from ferrous metals by 65.4%]: Open4business.com.ua, February 16. (Accessed March 14, 2025, at <https://open4business.com.ua/ru/metallurgicheskiye-predpriyatiya-ukrainy-uvelichili-postupleniya-ot-eksporta-chernyh-metallov-na-654/>.) [In Russian.]
- Pavlysh, Aleksey, 2022, Edinstvennogo v Ukraine proizvoditelya uranovoy rudy mogut prisoedit' k Energoatomu [The only producer of uranium ore in Ukraine could be annexed to Energoatom]: Kyiv, Ukraine, Epravda.com.ua, June 13. (Accessed January 3, 2025, at <https://www.epravda.com.ua/rus/news/2022/06/13/688100/>.) [In Russian.]
- Prasad, Anita, 2023, Ukraina natsionalizirovala zavody i agroholding podsanktsionnogo rossiyskogo biznesmena na 2 mlrd griven—SBU [Ukraine nationalized plants and an agricultural holding of the Russian businessman under sanctions for 2 billion hryvnias—Security Service of Ukraine]: Forbes.ua, February 6. (Accessed March 14, 2025, at <https://forbes.ua/ru/news/ukraina-natsionalizovala-zavody-i-agroholding-rosiyskogo-milyardera-shelkova-na-2-mlrd-grn-sbu-06022023-11552>.) [In Russian.]
- Schnebele, E.K., 2025, Bromine: U.S. Geological Survey Mineral Commodity Summaries 2025, p. 50–51.

- Solovchuk, Lesya, 2024, Ne boyatsya voyny: Irlandtsy zaymut l'vinuyu dolyu ukrainskogo rynku [They are not afraid of the war—The Irish will capture the lion's share of Ukraine's cement market]: Kyiv, Ukraine, Delo.ua, July 26. (Accessed March 14, 2025, at <https://delo.ua/ru/business/ne-boyatsya-voiny-irlandcy-zaimut-lvinuyu-dolyu-ukrainskogo-rynka-cementa-434727/>.) [In Russian.]
- State Statistics Service of Ukraine, 2024a, Commodity pattern of foreign trade of Ukraine: Kyiv, Ukraine, State Statistics Service of Ukraine (Accessed January 2, 2024, via <https://www.ukrstat.gov.ua/>.)
- State Statistics Service of Ukraine, 2024b, Gross domestic product at current prices: Kyiv, Ukraine, State Statistics Service of Ukraine (Accessed January 2, 2024, via <https://www.ukrstat.gov.ua/>.)
- State Statistics Service of Ukraine, 2024c, Statistical yearbook of Ukraine 2023: Kyiv, Ukraine, State Statistics Service of Ukraine, 264 p. (Accessed January 2, 2024, at https://www.ukrstat.gov.ua/druk/publicat/kat_u/2023/zb/11/year_23_e.pdf.)
- State Statistics Service of Ukraine, 2024d, The change of gross domestic product volume: Kyiv, Ukraine, State Statistics Service of Ukraine (Accessed January 2, 2024, via <https://www.ukrstat.gov.ua/>.)
- Stewart, A.A., 2025, Graphite (natural): U.S. Geological Survey Mineral Commodity Summaries 2025, p. 84–85.
- Strizhak, Alina, 2023a, Generaly titanovyh rud: Kto kontroliruyet strategicheskiye mestorozhdeniya Ukrainy [Generals of titanium ores—Who controls strategic deposits of Ukraine]: biz.liga.net, September 18. (Accessed March 14, 2025, at <https://biz.liga.net/all/all/article/generaly-titanovyh-rud-kto-kontroliruet-strategicheskie-mestorozheniya-ukrainy>.) [In Russian.]
- Strizhak, Alina, 2023b, Grafit, berilliy i zoloto—Kto kontroliruyet strategicheskiye mestorozhdeniya Ukrainy [Graphite, beryllium, and gold—Who controls strategic deposits of Ukraine]: Biz.liga.net, October 9. (Accessed March 14, 2025, at <https://biz.liga.net/all/all/article/grafit-berilliy-i-zoloto-kto-kontroliruet-strategicheskie-mestorozheniya-ukrainy>.) [In Russian.]
- Tolcin, A.C., 2025, Titanium mineral concentrates: U.S. Geological Survey Mineral Commodity Summaries 2025, p. 188–189.
- TOV CFR Group, 2025, Home page: Kyiv, Ukraine, TOV CFR Group. (Accessed March 14, 2025, at <https://cfr-group.com.ua/>.) [In Ukrainian.]
- Tuck, C.C., 2025a, Iron and steel: U.S. Geological Survey Mineral Commodity Summaries 2025, p. 94–95.
- Tuck, C.C., 2025b, Iron ore: U.S. Geological Survey Mineral Commodity Summaries 2025, p. 100–101.
- Uatom.org, 2022, Uran v Ukraine i za eyo predelami—Realii i perspektivy [Uranium in Ukraine and outside of Ukraine—Reality and perspectives]: Uatom.org. (Accessed December 15, 2024, at <https://www.uatom.org/ru/49717-2>.) [In Russian.]
- Ukrenergy.dp.ua, 2023, Mir: Ukrainskiy zalezhi litiya sostavlyayut priblizitel'ni tret' ebropeyskih [Ukraine's lithium resources are about one-third of European resources]: Ukrenergy.dp.ua, August 2. (Accessed March 14, 2025, at <https://ukrenergy.dp.ua/2023/08/02/mir-ukrainskie-zalezhi-litiya-sostavlyayut-primerno-tret-obshheevropejskih.html>.) [In Russian.]
- Urst.com.ua, 2025, Kodeks Ukraini pro nadra [On subsoil code]: Urst.com.ua. (Accessed February 24, 2025, at https://urst.com.ua/act/pro_nadra.) [In Ukrainian.]
- Yarosh, Yaroslav, 2019, Supermarket redkih metallov [Supermarket for rare metals]: Minprom.ua, May 7. (Accessed March 14, 2025, at <https://minprom.ua/articles/253041.html>.) [In Russian.]
- Yarosh, Yaroslav, 2022, Radioaktivnaya aktivnost' [Radioactive activity]: Minprom.ua, January 20. (Accessed December 15, 2024, at <https://minprom.ua/articles/281225.html>.) [In Russian.]
- Zasyad'ko, Nikolay, 2023, Onur Group ukhodit v nedra [Onur Group goes into the depths]: Forbes.ua, February 7. (Accessed December 15, 2024, at <https://forbes.ua/ru/money/onur-group-ide-u-nadra-turetska-kompaniya-investue-50-mln-u-rozrobku-naybilshogo-grafitovogo-rodovishcha-v-ukraini-skilki-vona-mozhe-zarobiti-07022023-11554>.) [In Russian.]

TABLE 1
UKRAINE: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons, gross weight, unless otherwise specified)

Commodity ²	2019	2020	2021	2022	2023
METALS					
Alumina	1,690,000	1,725,000	1,769,000	300,000	--
Copper, refinery, secondary	20,409	24,335	28,817	--	-- ^e
Ferroalloys:					
Ferromanganese	151,090	122,960	100,600	20,690 ^r	4,500 ^e
Ferronickel, electric furnace:					
Gross weight	74,400	73,700	61,700 ^e	44,700 ^e	--
Ni content	14,200	14,719	14,000 ^e	7,800 ^e	--
Ferrosilicon, electric furnace	62,560	60,800	87,600	21,600	11,800 ^e
Silicomanganese	804,680	559,880	662,700	356,500 ^r	190,000 ^e
Other, unspecified	20,670	13,605	-- ^{r,e}	900 ^e	-- ^e
Gallium ^c kilograms	--	--	1,000	--	--
Germanium, Ge content ^c do.	400	400	400	100	100
Iron ore, mine:					
Crude ore	168,000,000 ^e	210,000,000 ^e	223,000,000 ^e	78,700,000 ^r	76,600,000
Usable ore	63,204,900	78,837,700	83,844,900	29,600,000 ^r	28,800,000
Fe content	39,500,000	49,300,000	52,400,000	18,400,000 ^r	17,900,000
Iron and steel:					
Pig iron	20,055,900	20,423,132 ^r	21,165,303 ^r	6,391,117	6,003,250
Steel:					
Raw steel thousand metric tons	20,848	20,550	21,366	6,263	6,228
Products:					
Pipe do.	1,005	850	980	608	670
Rolled do.	18,202	18,430	19,080	5,350	5,370
Lead, refinery, secondary	24,704	24,649	25,000 ^e	15,000 ^e	12,000 ^e
Magnesium, metal, primary ³	8,000 ^e	6,000 ^e	6,000 ^{r,e}	1,000 ^{r,e}	--
Manganese:					
Mine, marketable:					
Gross weight	1,687,000	1,887,950	1,760,000	950,000 ^e	359,000
Mn content	574,000 ^e	642,000 ^e	600,000 ^e	323,000 ^e	126,000
Metal	6,140	2,800	7,750	2,000 ^e	10
Titanium:					
Ilmenite and leucoxene:					
Gross weight ⁴	818,543	773,093	702,249	410,000 ^e	200,000 ^e
TiO ₂ content ^e	330,000	310,000	280,000	162,000	60,000
Rutile, 95% TiO ₂ ^e	100,000	100,000	100,000	15,000 ^r	10,000
Sponge	8,000	6,000	6,000 ^e	1,000 ^e	-- ^e
Zirconium, zircon concentrates ^e	17,000	16,000	29,000	8,900	2,800
INDUSTRIAL MINERALS					
Bromine	7,500 ^e	8,500	10,800	8,000 ^e	8,000 ^e
Cement, hydraulic thousand metric tons	9,201	9,568	10,780	5,400 ^e	6,600 ^e
Clay:					
Bentonite ^e	180,000	180,000	180,000	90,000	90,000
Kaolin thousand metric tons	1,844	1,681	2,318	600 ^e	500 ^e
Kaolinitic clay do.	396	400 ^e	400 ^e	100 ^e	100 ^e
Feldspar ^e	60,000	50,000	60,000	30,000	30,000
Graphite, crystalline flake	16,000 ^e	10,000 ^e	10,000 ^e	846 ^r	1,670
Gypsum, including anhydrite	1,409,400	1,529,000	1,753,500	450,000 ^e	450,000 ^e
Lime thousand metric tons	2,245	2,341	2,622	1,023	1,000 ^e
Nitrogen, ammonia, N content do.	1,502	2,304	2,170	700	840
Salt, all types	2,092,800	1,717,096	1,800,000 ^e	700,000 ^e	600,000 ^e
Soda ash, synthetic	489,700	450,000 ^e	460,000 ^e	100,000 ^e	100,000 ^e
Stone, crushed, limestone thousand metric tons	6,891	7,003	7,141	3,500 ^e	3,500 ^e
Sulfur, compounds, sulfuric acid do.	674	683	782	300 ^e	400 ^e

See footnotes at the end of table.

TABLE 1—Continued
UKRAINE: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons, gross weight, unless otherwise specified)

Commodity ²	2019	2020	2021	2022	2023	
MINERAL FUELS AND RELATED MATERIALS						
Coal:						
Anthracite	thousand metric tons	6,323	5,764	7,234	6,700	6,800 ^e
Bituminous	do.	24,901	23,054	22,153	20,500 ^e	21,000 ^e
Lignite ^e	do.	4,600	4,200	4,300	4,000	4,000
Total	do.	35,800	33,000	33,700	31,200	31,800
Coke, metallurgical		10,055,200	9,526,100	9,327,900	3,800,000	2,000,000 ^e
Natural gas	million cubic meters	20,520	20,171	19,362	18,500	18,600
Peat:						
Fuel use		539,500	271,700	332,300	300,000 ^e	300,000 ^e
Horticultural use		139,900	120,500	163,000	140,000 ^e	140,000 ^e
Total		679,000	392,000	495,000	440,000	440,000
Petroleum:						
Crude, including condensate ⁴	thousand 42-gallon barrels	17,700	17,300	17,000	15,600 ^e	15,300
Refinery ⁵	do.	16,000	18,800	19,500	5,000 ^e	2,500 ^e
Uranium, mine, U content		800	744	455	100	150 ^e

^eEstimated. ^fRevised. do. Ditto. -- Zero.

¹Table includes data available through December 5, 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, ball clay, native sulfur, and secondary zinc may have been produced, but available information was inadequate to make reliable estimates of output.

³Used in production of titanium sponge.

⁴Figures were converted to barrels from metric tons, which were reported as follows: 2019—2,453,000; 2020—2,429,700; 2021—2,391,900; and 2023—2,100,000. Production was not reported for 2022.

⁵Figures were converted to barrels from metric tons, which were reported as follows: 2019—1,998,100; 2020—2,354,000; and 2021—2,439,000. Production was not reported for 2022 and 2023.

TABLE 2
UKRAINE: STRUCTURE OF THE MINERAL INDUSTRY IN 2023

(Metric tons)

Commodity	Major operating companies and major equity owners ^{1,2}	Location or deposit names ^{1,3}	Annual capacity ^c
Aluminum:			
Alumina	Nikolayevskiy Alumina Refinery (NGZ) (Government) ⁴	Plant, 20 kilometers south of Mykolaiv	1,800,000
Metal, primary	Zaporozhskiy Aluminum Complex (ZAIK) (Government) ⁵	Plant in Zaporizhzhia, Zaporizhzhia Oblast'	114,000
Bromine	AO Brom	Plant in Krasnoperekopsk, Crimea	11,000
Cement	Facilities:	Plants in the following locations:	13,600,000 ⁶
	OAO KyivCement (PAO Dyckerhoff Cement Group)	Kyiv	NA
Do.	OAO YuGCement (PAO Dyckerhoff Cement Group)	Mykolaiv	1,250,000
Do.	OOO Cement (CRH plc)	Odesa, Odesa Oblast'	NA
Do.	Overin Ltd. (Concorde Capital Group)	Plants in Amvrosiivka, Kamenskoye, and Kryvyi Rih	3,800,000
Do.	PAO Eurocement Ukraine ⁴	Balakliya, Kharkiv Oblast'	NA
Do.	PAO Ivano-Frankovsktsement	Ivano-Frankivsk	3,600,000
Do.	PAO Kramatorskiy Tsementnyi Zavod PUSHKA	Kramatorsk, Donetsk Oblast'	NA
Do.	PAO Nikolayevtsement (CRH plc)	Mykolaiv	NA
Do.	PAO Podolsk Cement (CRH plc)	Khmelnitskiy Oblast'	NA
Do.	PAO Volyn'Cement (PAO Dyckerhoff Cement Group)	Volyn Oblast'	NA
Clay:			
Bentonite	ChAO Weighting Agents Plant	Mine in Kostyantynivka, Donetsk Oblast'	NA
Do.	PAO Dashukovskiye Bentonity	Mine in Dashukivka, Cherkasy Oblast'	NA
Kaolin	AKW Ukrainian Kaolin Co.	Mine in Hlukhivtsi, Vinnytsia Oblast'	380,000
Do.	Kirovohrads'ke Rudoupravlenne	Mine in Katerinivka, Kirovohrad Oblast'	NA
Do.	OOO Mineral Mining Co.	Mine in Polohy, Zaporizhzhia Oblast'	200,000
Do.	OOO UkrRosKaolin	Mine in Ekaterinivka, Donetsk Oblast'	NA
Do.	ProscO Resources Ltd.	Mine in Prosyana Deposit, Dnipropetrovsk Oblast'	NA
Coal	About 150 surface and underground mines, including: Dobropolyeugol' (Government) Donbass Fuel and Energy Co. (DTEK) (System Capital Management, 100%): DTEK Komsomolets Donbassa Mine DTEK Pavlogradugol DTEK Rovenkyanthracite DTEK Sverdlovanthracite Krasnoarmeiskaya-Zapadnaya No. 1 OAO Krasnodon Coal Co. (Metinvest B.V.) Smaller producers	About 95% of coal produced in Donetsk, Dnipropetrovsk, and Luhansk Oblasts: 5 mines near Dobropillia, Donetsk Oblast' Kirovs'ke, Donetsk Oblast' 10 mines in Dnipropetrovsk and Donetsk Oblasts 6 mines and 3 processing plants in Luhansk Oblast' 5 coal mines and 3 processing plants in Luhansk Oblast' 1 mine at Pokrovs'k, Donetsk Oblast' 7 mines and 2 processing plants in Luhansk Oblast' Donetsk, Dnipropetrovsk, Luhansk, Lviv, and Volyn Oblasts	40,000,000 ⁶
Coke, metallurgical	Evraz plc facilities: OAO Baglykoks coke plant OAO Dneprkoks coke plant OAO Dneprodzerzhinsk coke plant	Plants in Dnipropetrovsk Oblast': Kamians'ke Dnipro Kamians'ke	3,000,000
Do.	Horlivka coke plant	Horlivka, Donetsk Oblast'	440,000
Do.	Kharkiv coke plant	Kharkiv	225,000
Do.	Makiivka coke plant	Makiivka, Donetsk Oblast'	NA
Do.	Metinvest B.V. facilities: OAO Avdiivka coke plant	Locations: Avdiivka, Donetsk Oblast'	2,700,000
Do.	OAO Azovstal Iron and Steel Works ⁴	Plant in Mariupol, Donetsk Oblast'	NA
Do.	OAO Alchevsk coke plant [Industrial Union of Donbass (ISD Corp.)]	Alchevsk, Luhansk Oblast'	3,700,000
Do.	OAO Donetskkoks ⁴	Plant in Donetsk, Donetsk Oblast'	390,000
Do.	OAO Yasinovskiy coke plant	Makiivka, Donetsk Oblast'	NA

See footnotes at end of table.

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

(Metric tons)

Commodity	Major operating companies and major equity owners ^{1,2}	Location or deposit names ^{1,3}	Annual capacity ^c
Coke, metallurgical —Continued	OAo Zaporozhkoks (JSC Zaporizhstal, 42%, and Metinvest B.V., 25%)	Plant in Zaporizhzhia, Zaporizhzhia Oblast'	800,000
Do.	PAO ArcelorMittal Kryviy Rih	Plant in Kryviy Rih, Dnipropetrovsk Oblast'	3,300,000
Do.	Yenakiiieve coke plant	Yenakiiieve, Donetsk Oblast'	NA
Ferroalloys:			
Ferromanganese	Kostyantynivka Iron and Steel Works ⁴	Plant in Kostyantynivka, Donetsk Oblast'	NA
Do.	Kramatorskiy ferroalloys plant (KZF) ⁴	Kramatorsk, Donetsk Oblast'	35,000
Do.	Nikopol'skiy ferroalloys plant (NZF) (PrivatBank Group and EastOne Group)	Nikopol'	100,000
Do.	Stakhanovskiyy ferroalloys plant (PrivatBank Group) ⁴	Luhansk Oblast'	NA
Do.	Zaporozhskiy ferroalloys plant (ZZF) (PrivatBank Group)	Zaporizhzhia, Zaporizhzhia Oblast'	100,000
Ferronickel	Pobuzhskiy ferronickel plant (PFK) (Solway Investment Group) ⁴	Plant in Pobuz'ke, Kirovohrad Oblast'	100,000
Ferrosilicon	Stakhanovskiyy ferroalloys plant (PrivatBank Group) ⁴	Luhansk Oblast'	120,000
Do.	Zaporozhskiy ferroalloys plant (ZZF) (PrivatBank Group)	Zaporizhzhia, Zaporizhzhia Oblast'	100,000
Silicomanganese	Nikopol'skiy ferroalloys plant (NZF) (PrivatBank Group and EastOne Group)	Nikopol'	600,000
Do.	Stakhanovskiyy ferroalloys plant (PrivatBank Group) ⁴	Luhansk Oblast'	50,000
Do.	Zaporozhskiy ferroalloys plant (ZZF) (PrivatBank Group)	Zaporizhzhia, Zaporizhzhia Oblast'	250,000
Gallium	Nikolayevskiy Alumina Refinery (NGZ) (Government) ⁴	Plant, 20 kilometers south of Mykolaiv	5
Germanium	Zaporozhskiy Titanium and Magnesium Complex (ZTMK) (Government, 100%) ⁴	Plant in Zaporizhzhia, Zaporizhzhia Oblast'	1
Graphite	Zavaliyevskiy Graphite Complex (Volt Resources, 70%; private investors, 30%)	Mine in Zavaliyevskiy deposit, Kirovohrad Oblast'	20,000
Gypsum	AO Dekonskiy Gips (Knauf Gips KG)	Plant in Soledar, Donetsk Oblast'	NA
Do.	OAo Mamalygovskiy Gypsovyi Zavod	Plant in Mamalyha, Chernivtsi Oblast'	NA
Do.	PAO Gipsovik	Plant in Kamyanets-Podol'skiy, Khmelnytskyi Oblast'	NA
Iron ore:			
Open pit mining	ChAO Inguletskiy GOK (Metinvest B.V.)	Ingulets Mine south of Kryvyi Rih	35,000,000
Do.	ChAO Severnyi GOK (Metinvest B.V.)	2 mines in Dnipropetrovsk Oblast'	30,000,000
Do.	ChAO Tsentral'nyi GOK (Metinvest B.V.)	3 mines in Dnipropetrovsk Oblast'	12,000,000
Do.	PAO ArcelorMittal Kryvyi Rih	2 mines at Kryvyi Rih	24,900,000
Do.	PAO Yuzhnyi GOK (Evraz Holding, 50%, and Smart Holding, 50%)	Mine at Kryvyi Rih	22,000,000
Do.	Poltavskiy GOK (Ferrexpo plc)	Gorishne-Plavninskoye and Lavrikovskoye (GPL) Mines, 15 kilometers east of Kremenchuk	30,000,000
Underground mining	ChAO Tsentral'nyi GOK (Metinvest B.V.)	Mine in Dnipropetrovsk Oblast'	2,200,000
Do.	ChAO Zaporozhskiy Iron Ore Complex	Ekspluatatsionnaya Mine in Zaporizhzhia Oblast'	4,500,000
Do.	PAO ArcelorMittal Kryvyi Rih	2 mines at Kryvyi Rih	1,500,000
Do.	PAO Krivorozhskiy Iron Ore Complex (Metinvest B.V., 50%, and PrivatBank Group, 50%)	4 mines in Kryvorizkiy iron ore basin	6,000,000
Do.	Sukha Balka GOK (Berklemont Investments Ltd.)	2 mines in Dnipropetrovsk Oblast' (Yubileynaya and Frunze Mines)	3,100,000
Lead, refinery, secondary	CJSC Svinets	Plant in Kostyantynivka	30,000
Magnesium metal, primary	Magnii concern ⁴	Plant in Kalush	22,000
Do.	Zaporozhskiy Titanium and Magnesium Complex (ZTMK) (Government, 100%) ⁴	Plant in Zaporizhzhia, Zaporizhzhia Oblast'	8,000

See footnotes at end of table.

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

(Metric tons)

Commodity	Major operating companies and major equity owners ^{1,2}	Location or deposit names ^{1,3}	Annual capacity ^c
Manganese:			
Ore, marketable, Mn content	ChAO Pokrovskiy GOK (PrivatBank Group)	Mine in Pokrov, Dnipropetrovsk Oblast'	700,000
Do.	PAO Marganetskiy GOK (PrivatBank Group)	7 mines in Marhanets, Dnipropetrovsk Oblast'	300,000
Metal	Zaporozhskiy ferroalloys plant (ZZF) (PrivatBank Group)	Plant in Zaporizhzhia, Zaporizhzhia Oblast'	NA
Natural gas	Olesskoye deposit (Chevron Corp.)	Lviv and Ivano-Frankivsk Oblasts	NA
Do.	Yuzovskoye deposit (Royal Dutch Shell plc)	Kharkiv and Donetsk Oblasts	NA
Nickel, Ni content in FeNi	Pobuzhskiy ferronickel plant (PFK) (Solway Investment Group) ⁴	Plant in Pobuz'ke, Kirovohrad Oblast	20,000
Peat	SC Ukrtorf	Plants in Chernihiv, Lviv, Rivne, and Volyn Oblasts	600,000
Petroleum, refined	Halychyna oil refinery (Ukraine Oil Co.) ⁴	Drohobych, Lviv Oblast'	NA
Do.	JSC Naftokhimik Prykarpattya oil refinery ⁴	Nadvirna, Ivano-Frankivsk Oblast'	NA
Do.	Kherson oil refinery ⁴	Kherson	NA
Do.	Kremenchug oil refinery (CJSC Ukrtatnafta)	Kremenchuk	NA
Do.	Lisichanskiy oil refinery (TNK-BP) ⁴	Lysychansk	NA
Do.	Odessa oil refinery (OAO Lukoil) ⁴	Odesa	NA
Do.	Shebelinskiy oil refinery ⁴	Plant in Shebelinka, Kharkiv Oblast'	NA
Soda ash, synthetic	AO Krymskiy Sodovyi Zavod	Plant in Krasnoperekopsk, Crimea	NA
Steel, raw	ChAO Kametstal'	Plant in Dnipro	NA
Do.	Donetskiy electrometallurgical plant (Mechel OAO, 100%) ⁴	Plant in Donetsk, Donetsk Oblast'	1,000,000
Do.	Donetskstal4	Plant in Donetsk, Donetsk Oblast'	NA
Do.	Dnepropetrovsk Metals Plant "Petrovskogo" (DMZP) (Evraz plc, 96.77%) ⁴	Plant in Dnipro	1,360,000
Do.	Dneprospeksstal4	Plant in Zaporizhzhia, Zaporizhzhia Oblast'	918,000
Do.	Industrial Union of Donbass Corp. (ISD Corp.): ChAO Dniprovskiy Metallurgical Plant	Dnipropetrovsk Oblast'	NA
Do.	OOO Alchevskiy Metallurgical Complex ⁴	Alchevsk, Luhansk Oblast'	NA
Do.	JSC Energomashspetsstal (OJSC Atomenergomash)	Plant in Kramatorsk, Donetsk Oblast'	NA
Do.	PAO Zaporizhstal' (Metinvest B.V., 24.9%)	Plant in Zaporizhzhia, Zaporizhzhia Oblast'	4,350,000
Do.	Kramatorskiy Metal Plant "Kuibysheva" ⁴	Kramatorsk, Donetsk Oblast'	NA
Do.	Metinvest B.V. facilities: OAO Azovstal Iron and Steel Works ⁴	Mariupol, Donetsk Oblast'	NA
Do.	OAO Ilyich Iron and Steel Works ⁴	do.	NA
Do.	OAO Yenakievskiy Iron and Steel Works ⁴	Yenakieve, Donetsk Oblast'	NA
Do.	OOO Elektrostal ⁴	Plant in Kurakhove, Donetsk Oblast'	565,000
Do.	PAO ArcelorMittal Kryvyi Rih	Plant in Kryvyi Rih, Dnipropetrovsk Oblast'	7,500,000
Do.	PAO Interpipe	Interpipe Stal' Plant in Dnipro	NA
Do.	PJSC Azovelectrostal (JSC Azovmash) ⁴	Plant in Mariupol, Donetsk Oblast'	500,000
Titanium:			
Mineral concentrate:			
Ilmenite	Demurinskiy GOK (Government)	Mine in Dnipropetrovsk Oblast'	NA
Do.	Irshanskiy GOK [AO United Mining and Chemical Co. (OGKhK), Government]	Mine in Irshansk, 50 kilometers north of Zhytomyr	220,000
Do.	OOO Valki-II'menit (Group DF)	Mine in Zhytomyr Oblast'	65,000
Do.	OOO Mezhdurechenskiy GOK (Group DF)	Mine in Zhytomyr Oblast'	180,000
Do.	OOO PFK Velta	Birzulovskoye Mine, Kirovohrad Oblast'	270,000
Do.	do.	Mine in Korobchino, Novomirgorod district, Kirovohrad Oblast'	NA
Do.	Vil'nogorskiy GOK [AO United Mining and Chemical Co. (OGKhK), Government]	Mine, Vil'nohirsk, 70 kilometers west of Dnipro	NA
Rutile	do.	do.	NA

See footnotes at end of table.

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

(Metric tons)

Commodity	Major operating companies and major equity owners ^{1,2}	Location or deposit names ^{1,3}	Annual capacity ^c
<u>Titanium:—Continued</u>			
Sponge	Zaporozhskiy Titanium and Magnesium Complex (ZTMK) (Government, 100%) ⁴	Zaporizhzhia, Zaporizhzhia Oblast'	NA
Ingots	OOO Antares	Plant in Kyiv	NA
Do.	OOO Fico	do.	NA
Do.	Zaporozhskiy Titanium and Magnesium Complex (ZTMK) (Government, 100%) ⁴	Zaporizhzhia, Zaporizhzhia Oblast'	NA
Titanium dioxide, pigment	Crimea Titanium (Russian Hydrogen)	Plant in Crimea	NA
Do.	OAo Sumykhimprom	Mine in Sumy	NA
<u>Uranium, U content:</u>			
Ore	Vostochnyi GOK (Government)	Ingul'ska Mine at Kirovohrad (Vatutinskoye deposit)	450
Do.	do.	Novokonstantiniv'ska deposit in Kirovohrad Oblast'	1,500
Do.	do.	Smilins'ka (Michurinskoye and Tsentral'noye deposits)	600
Concentrate	do.	Hydrometallurgical concentration plant at Zhovty Vody	1,000
Do.	Ukrzinc plant	do.	25,000
<u>Zirconium:</u>			
Mineral concentrate	Vil'nogorskiy state mining-metals complex (Government, 100%)	Mine in Vil'nohirsk, 70 kilometers west of Dnipro	30,000
Metal and compounds	State Research and Production Enterprise "Zirconium" ⁴	Plant in Kamians'ke	NA

^cEstimated; estimated data are rounded to no more than three significant digits. Do., do. Ditto. NA Not available.

¹Inconsistencies in enterprise and location names may appear in this table because both Ukrainian and Russian spellings were used for transliterations. English versions of company names are used as given by official company sources (web sites, press releases, and so forth). Ukrainian versions of location names are used whenever possible.

²GOK is the abbreviation for gorno-obogatitel'nyy kombinat, which translates as "mining and beneficiation complex."

³The word "Oblast" means "province" in the Ukrainian language.

⁴Not in operation at the end of 2023.

⁵Stopped operations in March 2023.

⁶Capacity estimates are totals for all enterprises that produced that commodity.