Russia's Critical Minerals Strategy: From the Perspective of National Security

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Abstract: With rapid progress in the global green transition over recent years, the sustained and stable supply of critical minerals essential for the green transition has garnered increased attention. As the largest country by landmass, Russia has a wealth of natural resources, particularly fossil fuels and critical minerals. In the current context of major-country rivalries, geopolitical conflicts, Western sanctions, and the green transition, Russia hopes to reduce excessive dependency on the oil and gas industry and diversify its sources of revenue. More importantly, it intends to use critical minerals as a new strategic tool for a long-term confrontation with the West and effectively ensure its national security and development interests. Towards this end, Russia has formulated strategic plans, encouraged import substitution, increased policy support, promoted geological study and exploration, and accelerated Arctic development. However, Russia faces many constraints in critical mineral development. Whether Russia can consolidate its status as a resource power in the future depends not only on the intensity, depth, and breadth of Western sanctions but also on its ability to break through the Western blockade, sustain the import of necessary equipment and technologies, develop alternative technologies, and gradually transform itself to adapt to the new circumstances.

Keywords: critical mineral, national security strategy, Russia

Russia differs from the United States and other Western countries in that its government prefers to use the term "*стратегические виды полезных*

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ископаемые" (literally meaning "strategic minerals"), rather than "critical/key minerals," to denote the mineral raw materials that are particularly important for the stable operation and strategic development of the national economy, national defense and security, meeting the needs of high-tech industries, and achieving a competitive advantage in the global trade of minerals and relevant deep-processed products. Commodities such as food, energy, and raw materials are crucial for Russia to stay connected with the global economy, maintain economic and trade relations with the West, and obtain fiscal revenue. Since the outbreak of the Ukraine crisis in 2022, the decoupling between Russia and the West has intensified on many fronts. Russia faces restrictions on the export of its oil, natural gas, coal, timber, gold, diamond, cement, and steel, among others. Against such a backdrop, Russia has attached greater importance to critical minerals, especially precious metals (such as gold and diamond) and rare earths (which have not yet been directly targeted by Western sanctions). Russia has ramped up the exploration and exploitation of such minerals, seeing them as an important tool to break through the blockade that the West currently imposes through sanctions and increase its bargaining power.

The Role of Critical Minerals in Russia's National Security

Russia is home to vast mineral resources and geological deposits of nearly all known elements. As an important sector of the Russian economy, mining contributes one-sixth of the country's gross domestic product (GDP) and 60% of total exports, closely linked with its industrial system and value chains. As the newly updated Strategy for the Development of the Mineral Resource Base until 2050[1] emphasized, mineral resources serve as the "bedrock of the Russian economy," a "basis for national security," and a "tool for achieving the strategic interests of the country," and are part of Russia's "long-term natural competitive advantage."

I. Oil, natural gas, and coal are the lifeblood of the Russian economy

Traditional fossil fuels, namely, oil, natural gas, and coal, are deemed essential components of critical minerals in Russia. Their massive reserves and

[1] Approved by the Order of the Government of the Russian Federation No. 1838-r of July 11, 2024.

production allow large-scale exports while ensuring domestic consumption. These resources have long been a vital source of national income for Russia and the backbone of its national economy.

In terms of reserves, as of January 1, 2023, Russia's proven oil reserves were the world's sixth largest at an estimated 80 billion barrels (or 10.96 billion tons); with 47 trillion cubic meters of natural gas, Russia possessed the world's largest proven reserves; the country held 173 billion tons of proven coal reserves, ranking second globally. In terms of production, Russia's oil output reached 493 million tons in 2022, accounting for 10.2% of the world total; natural gas production was 648.4 billion cubic meters or 15.8% of the world total; coal production was 398.4 million tons, representing 4.6% of the world total.[1] In terms of exports, crude oil and petroleum products accounted for 36% of Russia's total exports of goods in 2021; the share of pipeline natural gas and liquefied natural gas was 12%; the combined sales of the four main energy products reached US$243.8 billion, accounting for 49% of Russia's total goods exports.[2] The oil and gas industry has accounted for around 30%–50% of Russia's federal budget revenue since 2011, serving as a key factor underpinning the country's overall economic performance and crisis response capabilities. Russia is also the world's third-largest coal exporter. In 2021, Russia accounted for 18% of global coal exports; with incomes over US$17.7 billion, coal accounted for 3.8% of Russian export earnings, making it Russia's third-largest export good (after oil and natural gas) and fifth-largest source of revenue.[3]

After the Ukraine crisis broke out in 2022, the United States, together with its allies such as the European Union (EU), Japan, and South Korea, launched an unprecedented, all-round, and multi-layered "sanctions storm" against Russia. They have been closing sanctions loopholes and touting decoupling from Russia, with the Russian energy sector being the hardest hit. After over two years of sanctions, the energy ties between Russia and the

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[1] "Strategy for the Development of the Mineral Resource Base of the Russian Federation until 2050."

[2] "Экспорт Российской Федерации основных энергетических товаров [Export of the Russian Federation's main energy products]," Bank of Russia, https://www.cbr.ru/statistics/macro_itm/external_sector/etg/export_energy/.

[3] "Statistical Review of World Energy 2021," BP, July 8, 2021, https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/energy-economics/statistical-review/bp-stats-review-2021-full-report.pdf.

West, especially the EU, have significantly weakened. For example, imports of Russian oil, natural gas, and coal[1] to the EU fell from a high of US$16 billion per month in early 2022 to around US$1 billion per month at the end of 2023. Given relatively high international oil prices, Russia has vigorously formulated countermeasures and sought new export markets. So far, Russia has managed to maintain its export revenues from traditional energy fuels. Russia's oil and gas revenues in 2023 amounted to about 9 trillion rubles, Deputy Prime Minister Alexander Novak said in an interview. The fuel and energy complex accounted for approximately 27% of Russia's GDP, 57% of its total export revenues, and one-third of its budget revenues.[2]

II. Some minerals provide powerful tools for strategic rivalries

Russia's vast resources and decades-long development efforts have won it a favorable position and a significant market share in some critical minerals supply chains, affording it some leverage to counter Western sanctions. These minerals have effectively sustained Russia's trade relations with the outside world, especially with the West, while providing sustainable fiscal revenues and strategic rivalry tools.

Take enriched uranium as an example. Russia ranks fourth in global uranium reserves. Rosatom, Russia's State Atomic Energy Corporation, is a world leader in uranium enrichment technology, controlling about 44% of global uranium enrichment capacity—by comparison, only a few Western companies enrich uranium. More than a fifth of enriched uranium used in the United States and Europe for reactor fuel is now imported from Russia. According to an analysis by the Royal United Services Institute (RUSI) of the United Kingdom, Rosatom supplied some 30% of the enriched uranium purchased by EU countries in 2022, and 23% of that purchased by US utility companies. France is one of Russia's biggest customers for enriched uranium, importing 223 tons from Russia in 2023, a 103% growth over 2021. Despite the ban on importing Russian low-enriched uranium, which took effect in August 2024, the United States purchased US$209.5 million (91.1 tons) of enriched

[1] The EU forbade Russian coal imports from August 2022.

[2] "Новак сообщил, что нефтегазовые доходы РФ в 2023 году составят около 9 трлн рублей [Novak reported that Russia's oil and gas revenues in 2023 will amount to about 9 trillion rubles]," TACC, December 27, 2023, https://tass.ru/ekonomika/19635935.

uranium from Russia in May 2024, the highest level since March 2023. The US Department of Energy estimated that a quarter of the enriched uranium used by US nuclear power plants comes from Russia, and American companies are paying around US$1 billion per year to buy the fuel from Russia.[1]

Another example is titanium products. The Russian VSMPO-AVISMA Corporation[2] is the world's largest manufacturer of high value-added titanium products with a complete technological cycle. VSMPO is deeply involved in the global aerospace industry and is the strategic supplier for many leading aircraft and engine manufacturing companies. Before the Ukraine crisis, VSMPO collaborated closely with many Western airlines (even signed a strategic cooperation agreement with Boeing), supplying 35% of titanium for Boeing, 65% for European Airbus, and up to 100% for Brazilian Embraer.[3] After the crisis, VSMPO continued to export 15,000 tons of titanium worth US$370 million in 2022, mostly sent to Western countries such as Germany, France, the United States, and the United Kingdom. Airbus Chief Executive Guillaume Faury admitted, "Sanctioning titanium from Russia would be sanctioning ourselves."[4]

In the case of refined nickel and palladium, according to data from the US Geological Survey, Russia was the world's third-largest nickel producer in 2022, holding 7.4% of global nickel reserves. Norilsk Nickel (or Nornickel) is the world's largest producer of refined nickel and palladium, accounting for 19% of high-grade nickel and 41% of palladium output globally.[5] Between February and July 2022, Nornickel exported US$7.6 billion worth of nickel and copper into the EU. Hitherto, Nornickel and its metal products have not yet been targeted by Western sanctions. Nevertheless, the company has felt the impact

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1 Max Bearak, "The U.S. Is Paying Billions to Russia's Nuclear Agency. Here's Why," *New York Times*, June 14, 2023, https://www.nytimes.com/2023/06/14/climate/enriched-uranium-nuclear-russia-ohio.html.

2 25% of VSMPO's shares are controlled by the state corporation Rostec.

3 "VSMPO and Boeing Agreed on Long-Term Supplies of Titanium Products," January 26, 2021, https://metallurgprom.org/en/news/russia/6792-vsmpo-i-boeing-dogovorilis-o-dolgosrochnyh-postavkah-titanovoj-produkcii.html.

4 Benjamin Katz and Yusuf Khan, "Airbus Calls on West to Avoid Sanctions on Russian Titanium," *Wall Street Journal*, June 21, 2022, https://www.wsj.com/articles/airbus-calls-on-west-to-avoid-sanctions-on-russian-titanium-11655817028.

5 "Meet Nornickel: Nornickel Is the Leader in the Metals and Mining Industry in Russia and Globally," https://nornickel.com/company/about/.

to a certain extent in terms of logistics, insurance, equipment, and technology supply.

Concerning aluminum, Rusal is one of the three world leaders in the industry, supplying more than 4.3 million tons of primary aluminum metal and alloys annually. Despite frequent sanctions in recent years, Rusal's trade with the West has remained uninterrupted. A complete ban on Rusal will force the EU to turn to the Middle East. As substitutes, however, Middle Eastern aluminum products are more expensive, have higher carbon footprints, and face risks transiting the Red Sea. All these will inevitably increase relevant costs and, by extension, hinder the EU's green transition process. So far, the 27-member bloc has banned aluminum products, including wire, tubes, and foil, supplied from Russia. Imports of aluminum ingots, slabs, and billets, comprising 85% of the EU's aluminum imports from Russia, remain exempt. Some European metal manufacturers acknowledge that the European processing industry still relies, directly or indirectly, on imports from Russia for primary aluminum, alloys, or alloy components. In the 16 months after the Ukraine crisis erupted, the EU's imports of Russian primary aluminum remained significant despite some decline. According to Rusal, it supplied at least US$2.6 billion of aluminum to the EU. In August 2023, Rusal said that Europe accounted for more than 30% of its revenue.

III. Certain scarce minerals affect the security of Russia's industrial and supply chains

Geologically, critical minerals are not evenly distributed; they are concentrated in a particular area or rock formation. This characteristic has greatly intensified competition among the world's major countries. Depending on the degree to which they satisfy the needs of the national economy and their necessary export volumes, critical minerals in Russia are broken down into three groups: (i) those for which reserves are sufficient for any development scenario through 2035, including natural gas, helium, copper, nickel, cobalt, platinum, iron ore, apatite, potash, coal, minerals for cement production, bromine, tin, and certain rare metals (such as vanadium, germanium, rubidium, cesium, scandium, indium, gallium, and hafnium); (ii) those for which reserves are insufficient for current production levels, including crude oil, natural gas condensate, lead, zinc, antimony, gold, silver, diamond, and high-purity quartz;

and (iii) those for which current consumption is heavily reliant on imports, including scarce strategic minerals such as uranium, manganese, chromium, titanium, bauxite, molybdenum, tungsten, lithium, beryllium, zirconium, niobium, tantalum, rhenium, rare-earth metals, graphite, and maskelynite, as well as other scarce minerals including bentonite, kaolinite, iodine, and muscovite.[1]

Although Russia possesses abundant reserves, its share of global production in some mineral sectors is relatively small, relying on imports for both production and consumption. For example, Russia's uranium, manganese, chromium, lead, tin, high-purity quartz, barite, fluorite, and apatite can only partially satisfy domestic consumption, indicating that certain imports are required. Titanium, thallium, niobium, zirconium, and bauxite are the rarest minerals in Russia. The domestic supply of these minerals is minimal (the ore quality is relatively low despite large reserves), and the consumption mainly relies on imports. Among them, the imports of zirconium, molybdenum, and tungsten as a share of domestic demand reach 87%, 40.5%, and 18%, respectively.[2] The first reason behind this phenomenon is that Russia's main reserves are located in complex, hard-to-reach deposits, which have barely been developed due to technological limitations. Given the current context of sufficient supply of imported raw materials, import is more cost-effective than investment and production, thus dampening enthusiasm for domestic mining. The second reason lies in Russia's high-tech industries, which are relatively weak and do not generate enough demand. This has hampered the domestic production and development of related minerals.

A report released by the Accounts Chamber in May 2021 pointed out that Russia relies on imports to meet its needs for 12 of the 29 types of scarce raw materials. In the period under review, Russia imported more than a third of strategic minerals and 60% of scarce minerals. The imbalance between strategic mineral mining and high-tech manufacturing is evident in Russia.

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[1] "Strategy for the Development of the Mineral Resource Base of the Russian Federation until 2050."

[2] Василий Милькин, Николай Николаев, and Александр Волобуев, "Россия столкнулась с необходимостью создать свою добычу редких металлов [Russia is faced with the need to create its own rare metal mining industry]," *Ведомости*, September 12, 2022, https://www.vedomosti.ru/business/articles/2022/09/13/940517-sozdat-dobichu-redkih-metallov.

There is almost no demand for deep-processed minerals because of the lack of high-tech manufacturing equipment. Weak domestic consumption cannot provide enough stimulus to build a complete value-added chain from raw materials to high-tech products in the country. Take rare earths as an example. The Federal Agency for Mineral Resources (Rosnedra) estimates that Russia's rare earth reserves are large and characterized by a wide variety. Russia has up to 28.7 million tons of rare earth reserves, including 18 major deposits, ranked second globally and boasting significant development potential. However, due to insufficient demand and a lack of metal separation technologies, Russia has made little progress in rare earth beneficiation and production. Only a few deposits have been developed to extract metals and produce finished products. Russia's share of global rare earths output is less than 1%, and processing is practically non-existent. Therefore, almost all the exports by Russian rare earth manufacturers are in the form of concentrates. In sum, the lack of interconnected and mutually complementary value chains between Russia and global high-tech industries has limited the Russian mineral sector's ability to provide final products relevant to its domestic consumer market. It is a weakness that external forces might exploit in their critical minerals strategies targeting Russia and poses a hidden danger to Russia's industrial and supply chain security.

Russian Measures to Ensure Critical Mineral Security

As critical minerals play an increasingly important role in promoting energy transition and the growth of high-tech industries, their availability has become a vital national security issue. Russia has also attached great importance to this issue and vigorously introduced a series of measures supporting the exploration and exploitation of critical minerals. Thus far, Russia has achieved considerable progress in finding new drivers for economic growth and strengthening resource and technology sovereignty.

I. Accelerating the formulation of strategic plans

The intensification of Western sanctions has prompted the Russian government to pay close attention to critical minerals, planning strategically at the top level.

Clarifying strategic goals for development. The Russian Ministry of Natural Resources and Environment (Minprirody) forecast that the world demand for energy resources, ferrous, non-ferrous, precious, rare, and rare-earth metals, and scarce raw materials will grow several times by 2050. For example, the demand for uranium, manganese, molybdenum, chromium, and titanium will increase at least two-fold; niobium, three-fold; zirconium and tungsten, four-fold; lithium, 80-fold. "Our task is to provide mineral raw materials for our domestic industry and ensure stable exports in the long term."[1] Russia sees mineral resource base as a natural competitive advantage of its national economy and industrial sectors, which injects fresh blood into the Russian economy and ensures economic development and a transition towards the new technological order.

Updating the list of strategic minerals. The list of strategic minerals is established by the Russian government. It may vary depending on such factors as the military, political, and economic priorities of the country, the structure of material production and forecasts of its development, world market conditions, and the state of foreign economic connections. In 1996, Russia formulated its first "strategic minerals" list, including 29 materials such as oil, natural gas, diamond, uranium, manganese, chromium, titanium, bauxite, copper, lead, antimony, tin, nickel, molybdenum, tungsten, cobalt, zirconium, tantalum, niobium, scandium, beryllium, lithium, germanium, rhenium, yttrium, gold, silver, platinum, and high-purity quartz. In August 2022, the list was upgraded and expanded to 61 types of mineral raw materials, including helium, phosphate, zinc, rare metals (such as lithium, rubidium, cesium, beryllium, scandium, indium, gallium, and germanium), rare-earth metals (such as yttrium, cerium, neodymium, and samarium), potash, groundwater, and graphite. Russia has decided to update the list at least every three years to cope with the new situations, changes, and challenges related to critical minerals.

Issuing industrial development plans. In late December 2022, the Russian government approved the Strategy for the Development of the Metallurgical Industry for the period up to 2030, clarifying the priorities, goals, and tasks

[1] "Минприроды подготовило стратегию развития минерально-сырьевой базы до 2050 года [The Ministry of Natural Resources has prepared a strategy for the development of the mineral resource base until 2050]," TACC, April 1, 2024, https://tass.ru/ekonomika/20411051.

of Russia's metallurgical industry under the new circumstances. The Strategy focused on three main areas: (i) broadening the scope of production, deepening metal processing to manufacture high value-added products, and developing new deposits for manganese, chromium, zinc, and lithium, among others, to ensure raw materials self-sufficiency; (ii) expanding domestic demand for metallurgical products; and (iii) reorienting exports to China, the Eurasian Economic Union, the Commonwealth of Independent States, Latin America, Africa, the Middle East, and Southeast Asia.[1] It also set import substitution targets for some rare metals and related ores, including ilmenite (a primary source of titanium), lithium, tungsten, molybdenum, and niobium, as well as chromium and manganese (despite not belonging to rare metals according to Russia's GOST standards and tax laws, these two are considered strategic minerals). In March 2023, Minprirody prepared a draft Strategy for the Development of the Mineral Resource Base for the period up to 2035, with an extended planning horizon until 2050. In April 2024, the draft was adjusted into the Strategy for the Development of the Mineral Resource Base until 2050 and submitted to the Russian government for review once again, which was officially approved in July of that year. The Strategy identified priorities for Russia's raw material processing to overcome the impact of Western sanctions and included two scenarios for the development of the mineral resource base: the basic one maintains the reserves and extraction of minerals at the current level, and the target one aims to accelerate the development of mineral resources, especially the exploration and deep processing of scarce raw materials.

II. Encouraging import substitution to ensure resource sovereignty

Under Western sanctions, ensuring sovereignty in fields such as finance, technology, and resources and safeguarding national security have become Russia's priorities in development. It is widely held among Russian politicians and academics that technological sovereignty and resource sovereignty complement and reinforce each other. For example, Russian President Vladimir

[1] "Денис Мантуров рассказал о долгосрочных стратегиях развития металлургической промышленности и автопрома [Denis Manturov spoke about long-term development strategies for the metallurgical and automotive industries]," Ministry of Industry and Trade of Russia, December 26, 2022, https://minpromtorg.gov.ru/press-centre/news/e41551ae-2332-4369-be83-a9b891fc542c?ysclid=lc5xpi523s439530274.

Putin spoke of resource sovereignty at the 2023 Eastern Economic Forum, noting that the average percentage of explored subsurface resources in the Russian Far East is now only 35%.

> What does this mean? It shows that there is every opportunity for the mining industries to grow by leaps and bounds, including the strategic raw materials that are in short supply, and which will be in demand in the economy of the future. All this is not only a guarantee of the country's resource sovereignty, but also a basis for the production of new materials, microelectronics and promising energy sources, for the promotion of domestic environmental and nature-saving technologies and scientific developments, for the creation of good jobs, and for making use of the natural competitive advantages of the Far East and the whole of Russia at a new level.…To reiterate, the potent raw material base for economic development that we are laying down allows us to move forward.[1]

The Russian government believes that relying on Russia's own strength to develop mining technologies and establish a full-fledged product chain (spanning raw materials, finished products, and the utilization of these products) in the technological field is the only path to resource sovereignty. Therefore, Russia has paid particular attention to the import substitution of critical minerals, and the issue of import dependency for scarce raw materials has been repeatedly discussed at various levels, including with Putin. As early as December 2020, then Minister of Industry and Trade Denis Manturov proposed in his report to Putin that by 2024, Russia should lower its dependence on imported rare metals to 50% and raise its output of such metals to 20,000 tons per year (and to more than 70,000 tons per year by 2030).[2] In the strategic initiative "Geology: Revival of a Legend" (a plan for the development

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[1] "Plenary Session of the 8th Eastern Economic Forum," September 12, 2023, http://en.kremlin.ru/events/president/news/72259.

[2] "Денис Мантуров доложил Президенту о развитии высокотехнологичных отраслей промышленности [Denis Manturov reported to the President on the development of high-tech industries]," *РИТМ Машиностроения*, December 10, 2020, https://ritm-magazine.com/ru/news/novosti-otrasli/denis-manturov-dolozhil-prezidentu-o-razvitii-vysokotehnologichnyh-otrasley.

of domestic geological exploration until 2030) launched in October 2021, achieving 100% reproduction of strategic raw materials such as manganese, chromium, and titanium was included in the planned targets. In the Strategy for the Development of the Metallurgical Industry for the period up to 2030, Russia reiterated its commitment to ensure raw materials self-sufficiency and secure an independent supply of rare metals, chromium, and manganese. Russian Minister of Natural Resources and Environment Alexander Kozlov said that his country aims to achieve complete self-sufficiency in mineral raw materials vital to economic development and that his ministry will concentrate on looking for scarce minerals, planning to develop seven projects involving chromium, manganese, titanium, uranium, and tungsten. Starting in 2023, Russia has shifted its exploration priorities from precious and non-ferrous metals to scarce ones.[1]

III. Increasing policy support and enhancing government–business interaction

At the practical level, the Russian government has spared no effort to enhance the initiative and self-sufficiency of its domestic mining industry through measures such as cutting taxes, approving new projects, and creating a sovereign audit system for mineral reserves.

Providing tax incentives. In order to attract foreign investors, the Russian government simplified the basic tax rates on extracted rare metals and relaxed its regulation on some metals in 2020. In the Strategy for the Development of the Metallurgical Industry for the period up to 2030, the Ministry of Industry and Trade (Minpromtorg) outlined multiple supportive measures to stimulate the mining of rare metals in Russia, such as reducing mineral extraction taxes based on mineral reserve categories and mining conditions and adding titanium, zirconium, tungsten, and molybdenum to the list of rare metals and cutting mineral extraction taxes for related new projects. Prior to the formulation of the Strategy, Russia had lowered the basic mineral extraction taxes on lithium, niobium, beryllium, and other rare metals by nearly 50%. Minpromtorg is now developing an inter-agency plan, hoping to extend the tax cuts to all

[1] "Редкоземельные металлы остаются в недрах [Rare-earth metals remain in the ground]," *Независимая Газета*, March 25, 2024, https://www.ng.ru/economics/2024-03-25/1_8978_metals.html.

scarce, strategic mineral raw materials. Furthermore, Minpromtorg is drafting additional measures to support related projects, including encouraging domestic geological exploration, mining, and processing equipment manufacturing.

Strengthening government–business interaction to accelerate mining projects. As stipulated in the Strategy for the Development of the Mineral Resource Base until 2050, the Russian government will play a leading role during the geological exploration and evaluation stage, including objectively assessing the reserves of scarce raw materials and predicting industrial demand and domestic resource self-sufficiency; all federal entities will partake in the geological exploration, development, and management of mineral resources. Meanwhile, the Russian government has, in collaboration with businesses, implemented several projects to support domestic mining and import substitution. In January 2023, the Russian government signed a letter of intent with Rosatom concerning the development of new materials, supporting the latter's efforts to develop nearly 100 types of new products in four fields, including rare-earth metals, before 2030 to meet the demand of the civilian and defense sectors for high-tech materials and ensure Russia's technological leadership in the field of new materials. In addition, the Russian government plans to sign similar cooperation agreements with other enterprises and scientific research institutions. Backed and encouraged by the government, major Russian companies such as Rosatom, Rostec, Nornickel, and Gazprom have announced development plans concerning rare and rare-earth metals. For example, Rosatom plans to begin producing lithium, targeting 10% of the global market.

Establishing a system of sovereign audit for mineral reserves. Mineral reserves auditing is a necessary step for major mineral transactions, evaluating the technological feasibility and profitability of mineral production. Before the Ukraine crisis, Russia mainly relied on American companies to audit its mineral reserves. After the crisis, with the intensification of Western sanctions, the auditing task has shifted to Russian nationals certified by Australian experts. Rosnedra admitted that the lack of a domestic certification mechanism for mineral auditing experts has posed a significant obstacle for mining companies and investors needing to audit reserves according to international standards. To defend national resource sovereignty, ensure necessary auditing of mineral

reserves, and attract foreign investors, Rosnedra is planning to create a system of sovereign audit for mineral reserves, including an expert certification agency governing the field of mineral mining, which will be tasked with promoting the recognition of Russian mineral reserves and resources evaluation results by partner countries. If established, this system will be free from the influence of third countries and will represent a strategic achievement of mineral-producing countries striving for national reserve sovereignty.

IV. Promoting geological study and exploration

Geological study and exploration constitute the basis for mineral development. After the dissolution of the Soviet Union, Russia slashed support for large-scale geological exploration activities, dampening private investment in this field. As a result, geological study in Russia is seriously underfunded, its proven reserves of mineral resources have declined, and the development of mineral resources still relies on the geological exploration basis laid down in the Soviet era.

Gradually, Russia has stepped up its efforts to strengthen geological study and exploration. The 2021 geological plan "Geology: Revival of a Legend" vowed to update equipment for state-owned enterprises, geological exploration enterprises, and mineral research institutions, develop deep-processing technologies for hard-to-recover complex ores, and improve the level of geological exploration to provide conditions for expanding Russia's mineral resource base and boosting its economy. The plan intended to raise the reproduction rate for oil, natural gas, gold, silver, and lead to 100% and 150% by 2024 and 2030, respectively—for manganese, uranium, chromium, and titanium, the reproduction rate is expected to increase to 75% and 100%, respectively.[1] After 2025, the plan will enter its second phase, focusing on scarce metal minerals. Guided by this plan, the Russian government has allocated 70% of the funding for solid mineral resources exploration to Siberia and the Far East. As an incentive for the private sector, the Russian government has shortened the time required for a development license to be issued by two-thirds. Rosnedra and Minpromtorg have jointly compiled a list of 310

[1] Василий Милькин, "Правительство потратит на развитие геологоразведки 30 млрд рублей [The government will spend 30 billion rubles on the development of geological exploration]," *Ведомости*, October 8, 2021, https://www.vedomosti.ru/business/articles/2021/10/07/890271-pravitelstvo-geologorazvedki.

deep-processed products made from scarce raw materials; enterprises deep processing these scarce raw materials will be granted preferential treatment.

V. Stepping up Arctic development

The Russian Arctic zone possesses a complete diversity of mineral resources. Its rare metals and rare-earth metals reserves are particularly vast, offering enormous development potential. The Russian government estimated that 95% of the country's platinum-group metals reserves (99% of production), 74% of nickel reserves (100% of production), 55% of cobalt reserves (92% of production), 67% of apatite ore reserves (99% of production), 61% of rare-earth metals reserves (100% of production), and 14% of bauxite reserves (64% of production) are concentrated in the Arctic region. As of 2023, there were 887 licenses for the right to use subsoil for geological study, exploration, and production of solid minerals within the boundaries of the Russian Arctic zone.[1]

As the ice retreats, the Arctic Ocean is becoming easier to navigate. That, combined with the advancement of mining technologies, has highlighted the strategic value of Arctic resources, raising the appeal of investment there. Recent years have witnessed intensifying Russian investment in the Arctic region through developing natural resources, transportation, and military activities. By doing so, Russia aims to get a head start in Arctic resource development. The Russian government has established several mineral resource centers in the Arctic zone, launched multiple new projects, and provided enterprises with supportive measures such as tax cuts, subsidies, and infrastructure financing. For example, in the Murmansk region, which accounts for about half of Russia's proven lithium reserves, authorities are launching a facility for processing lithium raw materials and producing high value-added products. In February 2023, Polar Lithium obtained the exploration and development license of the Kolmozerskoye lithium deposit. The project

[1] "Приказ Министерства природных ресурсов и экологии РФ от 9 июня 2023г. N358 'Об утверждении Программы лицензирования участков недр твердых полезных ископаемых в Арктической зоне Российской Федерации на период до 2035 года, ресурсная база которых потенциально может обеспечить загрузку Северного морского пути' [Order of the Ministry of Natural Resources and Environment of the Russian Federation dated June 9, 2023, No. 358 'Regarding the approval of the program for licensing subsoil areas of solid minerals in the Arctic zone of the Russian Federation for the period up to 2035, the resource base of which can potentially ensure the loading of the Northern Sea Route']," Government of the Russian Federation, June 26, 2023, https://www.garant.ru/products/ipo/prime/doc/406958202/.

is expected to produce the first pilot batch of lithium in 2026 and reach a full annual production capacity of 45,000 tons of lithium carbonate and hydroxide by 2030, becoming the third or fourth largest lithium mine globally.[1] In 2021, Eurasia Mining, a United Kingdom-based mining company, signed a cooperation agreement with Russian state-owned company RosGeo, teaming up in the mining of Monchetundra (a deposit of cobalt, copper, and nickel located in the Murmansk region). Beloye Zoloto was awarded the license to develop the Kyuchus gold deposit in the Republic of Sakha (Yakutia). According to preliminary estimates, the deposit holds about 175 tons of gold. After further exploration, gold reserves are expected to increase to 250 tons.[2] In addition, Rustitan, one of Russia's largest titanium producers, plans to launch the first stage of development of the Pizhemskoye titanium field, which is located in the Komi Republic. The project also involves the construction of a new railroad and the development of the Indiga deep-water port.

Critical Minerals as Foreign Strategic Tools

Considering the protracted war between Russia and Ukraine, the escalation of Western sanctions, and a dim long-term prospect of Russian–Western relations, critical minerals are undoubtedly crucial for Russia's domestic development. More importantly, they provide significant tools and constitute new sources of strength for Russia's foreign strategies. Russia is using critical minerals as a bargaining chip to actively prepare itself for the global energy transition and effectively ensure its national security and development interests while competing with the West in the long haul.

I. "Winning big with small bets" to break the Western blockade and even reciprocate

Despite their small export volumes, critical minerals can play a significant role in Russia's long-term confrontation with the West. They may serve as tools

[1] "Прирост запасов Колмозерского месторождения лития может достичь 25%–30% [The growth of the Kolmozerskoye lithium deposit reserves could reach 25%–30%]," TACC, June 6, 2024, https://tass.ru/ekonomika/21013435.

[2] "'Селигдар' инвестировал более 1, 6 млрд рублей в проект месторождения Кючус [Seligdar invested over 1.6 billion rubles in the Kyuchus deposit project]," TACC, August 28, 2023, https://tass.ru/ekonomika/18602691.

for Russia to dodge Western sanctions, accumulate bargaining chips, and even put a stranglehold on the West.

Providing Russia with a source of funds and trading tools. After the Ukraine crisis, Russian financial transactions were unprecedentedly restricted. Critical minerals such as gold and diamond mined domestically and overseas provided an important means for Russia to circumvent Western sanctions, obtain economic income, and sustain economic transactions. Russia is one of the world's biggest gold producers and hoarders, mining over 300 tons of the precious metal annually. The latest research by the Rand Corporation shows that Russia has acquired 1,701 tons of gold over the last decade; if the National Welfare Fund is factored into its overall reserves, Russia has accrued far more gold than any other country over the last two decades, including China.[1] The Blood Gold Report, a research program dedicated to tracking Russian and Western presence in Africa, estimated that since the outbreak of the Ukraine crisis, Russia has earned at least US$2.5 billion from trade in African gold. For example, in the Central African Republic (CAR), a Wagner front company has been awarded exclusive rights to Ndassima, the country's largest gold mine; in Sudan, "the Russian company" controls a major refinery that has allowed Wagner to become the dominant buyer of unprocessed Sudanese gold.

Putting a stranglehold on the West in some industrial chains. Russia has a relatively high market share in such metals as nickel, titanium, platinum, and palladium. These metals are raw materials essential for industries ranging from aviation to automobiles, communications, and energy. Completely getting rid of dependency on Russian minerals is difficult now. Western countries, especially EU states, are hesitant about decoupling from Russia. According to a 2023 report by the Organization for Economic Cooperation and Development, apart from China, the major recipients of Russia's mineral products exports included the Netherlands (US$33.1 billion), Italy (US$18.2 billion), the United States (US$17.1 billion), and Germany (US$13 billion).[2] The EU excluded

[1] John Kennedy, Elena Grossfeld, Zsofia Wolford, and Thomas Kenchington, "Gold Rush: How Russia Is Using Gold in Wartime," September 9, 2024, https://www.rand.org/pubs/research_reports/RRA3230-1.html.

[2] Md. Monirul Islam, Kazi Sohag, Andrey Berezin, and Bruno S. Sergi, "Factor Proportions Model for Russian Mineral Supply-Driven Global Energy Transition: Does Externality Matter?," *Energy Economics*, Vol. 129, January 2024.

the Russian titanium giant VSMPO from its sanctions, worrying about the disruption of Airbus's titanium supply chains. Data from Eurostat and the EU's Joint Research Centre showed that between March 2022 and July 2023, Europe imported €13.7 billion worth of critical raw materials from Russia; more than €3.7 billion arrived between January and July 2023, including €1.2 billion of nickel. The European Policy Centre estimates that up to 90% of some types of nickel used in Europe come from Russian suppliers.[1]

Apropos of the supply chains of uranium and nuclear fuel, the West is even more reliant on Russia. Russia owns 40% of the world's uranium conversion infrastructure and 46% of the total uranium enrichment capacity. Besides Russia, these uranium conversion and enrichment capabilities also exist in countries such as Canada, Germany, and the United States, which nevertheless cannot fully replace the Russian capacity in the short term.[2] Especially, Rosatom is an important player. Despite the limited measures some Western countries have taken targeting Rosatom, which have increased the difficulty of nuclear fuel trade with Russia, the EU has, after intense discussions, refrained from imposing all-encompassing sanctions on the Russian nuclear industry.

Triggering volatility in international commodity markets. Russia is a major supplier of oil, natural gas, coal, and various metal ores, influencing the stability of international commodity markets. At the beginning of the Ukraine crisis, global raw material prices rose sharply due to logistics disruptions, unstable supply conditions, and impeded Russian trade. Brent crude once hit a fresh high of US$140 per barrel. After months of coordination, in December 2022 and February 2023, the EU and the G7 decided to implement a price cap—instead of a complete ban—on Russian seaborne crude oil and petroleum products, in the hope of minimizing Russia's energy revenues and increasing its war costs while avoiding undesirable volatility in international energy markets and oil prices. In April 2024, the United States and the United Kingdom jointly introduced new sanctions on Russian metals, prohibiting the London Metal

[1] Pascal Hansens, Sigrid Melchior, Maxence Peigné, and Harald Schumann, "Russia: Europe Imports €13 Billion of 'Critical' Metals in Sanctions Blindspot," October 24, 2023, https://www.investigate-europe.eu/posts/russia-sanctions-europe-critical-raw-materials-imports.

[2] Catherine Clifford, "Russia Dominates Nuclear Power Supply Chains—and the West Needs to Prepare Now to Be Independent in the Future," May 23, 2022, https://www.cnbc.com/2022/05/23/russia-dominates-global-nuclear-reactor-and-fuel-supply-chains.html.

Exchange (LME), Chicago Mercantile Exchange, and other metal exchanges from accepting aluminum, copper, and nickel produced by Russia. Russia is a major metals producer. Its share in global production is 6% of nickel, 5% of aluminum, and 4% of copper.[1] Unsurprisingly, the latest move by the United States and the United Kingdom was immediately met with drastic price fluctuations in international metal markets. LME copper, aluminum, and nickel 3-month futures jumped by 1.6%, 9.4%, and 8.3%, respectively. It is conceivable that a complete embargo on critical Russian metals will push global metal prices even higher, thereby aggravating the supply chain risks facing Western industries.

Affecting Europe's green transition and energy security to a certain extent. After 2021, Europe accelerated its efforts to reduce imports of Russian oil and gas and promote the energy transition in terms of both resolve and action. However, the development of new energy requires massive quantities of critical minerals, whose reserves are relatively small and unevenly distributed, controlled by a few countries such as Russia. Although the EU is gradually lowering its dependency on Russian fossil energy, it still needs to buy many of the critical minerals necessary for its green transition from Russia at the current stage to achieve carbon neutrality by 2050. On the other side, Russia has gained more bargaining chips and acquired the ability to influence the pace of the EU's energy transition, at least to a certain extent, by expanding its critical mineral reserves and controlling mineral resources in eastern Ukraine. Russia can even force the EU to maintain and increase dependency on it, exerting an influence on Europe's energy security.

II. Prioritizing three regions globally

With the depletion of easy-to-mine resources in its Far East and Arctic zone, Russia is paying increased attention to overseas resource bases and viewing Africa, the Middle East, and the Asia-Pacific as priority regions for expanding its critical minerals-related interests. Russia is attempting to reduce dependency on foreign critical minerals and gain the upper hand in the contest over mineral resources by ramping up lithium and other critical minerals

[1] "Washington, London Ban Exchange Trading of New Russian Metal," Reuters, April 15, 2024, https://www.reuters.com/markets/commodities/washington-london-ban-exchange-trading-new-russian-metal-2024-04-15/.

mining activities globally via large companies.

Scrambling for more critical minerals in Africa. Africa is a continent rich in mineral resources. It possesses a significant share of global mineral reserves, including 40% of gold, 90% of chromium and platinum, over 75% of manganese, nearly 50% of cobalt, and 20% of graphite. African reserves of cobalt, diamond, platinum-group metals, and uranium rank first in the world.[1] According to statistics, the total value of Africa's resources accounts for about 23% of the world's total; however, due to the lack of beneficiation and refining support, its output only accounts for 9% of the world's.[2] During recent years, Russia has increased its strategic investment—and hence influence—in Africa. By establishing political, military, and economic networks, Russia has acquired mining rights in many African countries, with the explicit intent of strategically replacing Western, more specifically American, dominance over African critical minerals.

Militarily, Russia has established military and political alliances in critical minerals-producing countries. It has been expanding its presence in Africa through the use of paramilitary forces, increasing the deployment of private military companies typified by the Wagner Group. It has helped maintain regime stability in African countries by providing security guarantees, defense cooperation, and military training in exchange for mineral mining and operating rights and to protect the security of Russian-run gold, uranium, and diamond mines. After the Wagner Group's "one-day rebellion," which occurred in June 2023, the Russian Defense Ministry created a new Africa Corps and has since further consolidated Russia's influence in the continent.

Economically, Russia prioritizes critical minerals (precious and rare-earth metals, especially) in Africa. Russia has been actively conducting resources diplomacy via mining giants such as Rusal, Alrosa, and Nornickel to expand its business interests and strengthen control over African critical minerals. For example, the Democratic Republic of the Congo (DRC) has been on Russia's radar because of its abundant cobalt reserves; Alrosa is mining uranium in

[1] Anthony Milewski, "Russia's Military Scramble for African Critical Minerals," May 1, 2024, https://theoregongroup.com/commodities/gold/russias-military-scramble-for-african-critical-minerals/.

[2] "Mining Indaba: Strengthen Cooperation to Tap into Africa's Mining Potential," *People's Daily*, June 7, 2022, http://world.people.com.cn/n1/2022/0607/c1002-32439644.html.

Angola, Zimbabwe, and the DRC; and Rusal is running bauxite mines in Guinea.

Diplomatically, Russia conducts mineral diplomacy through platforms such as the Russia–Africa Summit and the International Parliamentary Conference "Russia–Africa." It has been using the development of mining as a nexus to cultivate a favorable business environment and create better development opportunities for Russian mining companies in Africa.

Simultaneously, Russia has been aiding African countries in exploiting resources and developing infrastructure by establishing strategic partnerships or signing investment agreements, deepening ties with these countries through political and military pacts. For example, military cooperation with the CAR has paved the way for Russia to obtain gold and diamond mining rights in the country and expand its sphere of influence to sub-Saharan Africa. Russia and Mali signed agreements on gold refining and oil, natural gas, uranium, and lithium production after the Malian armed forces, backed by the Wagner Group, recaptured the country's northern territory from rebel groups. Russia now provides safety protection for Burkina Faso's leader and has acquired gold, zinc, manganese, copper, graphite, and lithium mining rights in the country. In Sudan, Russia is helping train the army and protect the country's gold, uranium, and diamond mines. RUSI experts opine that after Wagner's rebellion, the Main Directorate of the General Staff of the Armed Forces of the Russian Federation (commonly known by its previous abbreviation GRU) has taken the paramilitary group's functions in house and offered "regime survival packages" for African governments, including military and diplomatic support and political, economic, and military protection, in exchange for strategic resources.[1]

Proposing the creation of a platform analogous to OPEC for solid minerals in the Middle East. Besides oil and natural gas, the Middle East also holds abundant reserves of other minerals, which are mostly awaiting development. Meanwhile, the Middle East is a geographically important region, connecting the continents of Asia, Africa, and Europe and serving as a corridor for

[1] Jack Watling, Oleksandr V Danylyuk, and Nick Reynolds, "The Threat from Russia's Unconventional Warfare beyond Ukraine, 2022–24," February 20, 2024, https://www.rusi.org/explore-our-research/publications/special-resources/threat-russias-unconventional-warfare-beyond-ukraine-2022-24.

Russia to sell its goods to Asian markets. Therefore, Russia has highly valued its cooperation with Middle Eastern countries. Apart from direct economic cooperation, Russia has acquired operating rights at multiple critical mineral mines through the presence and activities of the Wagner Group in Syria, Libya, and other Middle Eastern countries. For instance, Russia has strengthened cooperation with resource-rich countries such as Saudi Arabia on the exploitation of critical minerals. UDS Golden Group and other Russian companies have entered the Saudi Arabian market. In January 2024, Saudi Arabia and Russia signed a memorandum of understanding for cooperation in the field of geology and mineral resources. During the Future Minerals Forum, which took place in Saudi Arabia in the same month, Kozlov proposed creating a platform similar to OPEC with the participation of Russia and African and Middle Eastern countries on the exploration, mining, and processing of critical types of minerals. The platform Russia visions "would allow effective coordination of our efforts and development of a joint technological policy in the field of management of 'minerals of the future.'" Kozlov emphasized that Russia has almost all critical metals and is a global leader in raw materials. "Russia is open to all options for cooperation. We cannot just engage in mineral exploration and extraction, we are ready for bilateral technology transfer, and we see this partnership primarily as a technological one," Kozlov said.[1]

Shifting towards the Asia-Pacific for new markets. With the escalation of Western sanctions, Russia is being squeezed in traditional Western markets and, as a result, is placing greater importance on its relations with Asia-Pacific nations, in the hope of enhancing its economic and political influence in the Asia-Pacific region and increasing energy and resources exports to the Asia-Pacific market. While attending the 2023 Eastern Economic Forum, Putin re-emphasized the abundant natural resources in the Russian Far East and said that his country has designated the development of the Far East as a national priority for the 21st century. The resource potential of Siberia and the Russian Far East is still far from being fully tapped. In addition, their geographical proximity to the Asia-Pacific region makes them a promising source of impetus

[1] "Russia Proposing Platform Analogous to OPEC for Solid Minerals," Interfax, January 9, 2024, https://interfax.com/newsroom/top-stories/98213/.

for the future development of Russia and Asian countries. In September 2023, the Udokan project started production. As Russia's largest untapped copper deposit, Udokan is located in eastern Siberia and adjacent to Asian markets. The plant is expected to produce 150,000 tons of copper annually in the first stage and raise its capacity by three times in 2028. The Russian government is seeking a greater role in the copper market, a metal essential for the global energy transition.

III. Accumulating mineral reserves and strategic assets in Russia-controlled eastern Ukraine

Russia's control of eastern Ukraine is driven primarily by geopolitical considerations, attempting to seize the resources there to expand its mineral base. Ukraine has a rich profusion of mineral resources: it accounted for 30% of the former Soviet Union's natural gas production; the Donbas region was a major coal field in the Soviet era; Ukraine used to be an important source of uranium for the Soviet Union to build nuclear power plants and weapons. In addition, Ukraine abounds in mineral resources such as titanium, manganese, gold, kaolinite, and zirconium and holds Europe's largest reserves of rare earths. Ukraine has an estimated 500,000 metric tons of mostly untapped lithium reserves. Its proven titanium reserves rank among the top 10 in the world, and output accounts for 7% of the global total. "About 5% of all the world's 'critical raw materials' are located in Ukraine, which occupies only 0.4% of the Earth's surface," Ukraine's Deputy Minister of Environmental Protection and Natural Resources Svetlana Grinchuk once said.[1] The EU identified 30 natural resources needed for its green energy transformation, two-thirds of which could be sourced from Ukraine.[2] Long before the Ukraine crisis, the EU had realized the value of Ukrainian critical minerals and intended to strengthen mining cooperation with Ukraine. In 2019, the EU and Ukraine launched a Raw Materials Working Group, focused on sharing information on the critical raw materials supply chain. In July 2021, the EU entered a strategic partnership with Ukraine on raw materials. This emboldened Western investors' interest in

[1] "Rare Earths and Strategic Minerals in Ukraine," United Nations, February 20, 2025, https://unric.org/en/rare-earths-and-strategic-minerals-in-ukraine/.

[2] Eugen Theise, "Russia Plundering Ukraine's Natural Resources," August 28, 2023, https://www.dw.com/en/russia-ukraine-war-natural-resources-grain/a-66639269.

Ukraine's deposits.

After 2021, the investment environment in Ukraine deteriorated sharply, and Western investment plans were aborted consequently. Since most of Ukraine's coal, oil, and rare-earth minerals (such as beryllium and niobium) are in its eastern and southern parts partially or fully occupied by Russian forces, notably Zaporizhzhia and Donetsk, Russia has de facto controlled a significant proportion of Ukrainian critical mineral reserves. This trend continues as Russia expands its hold on Ukrainian territory. According to an analysis for *The Washington Post* by the Canadian geopolitical risk firm SecDev, Ukraine is home to 117 of the 120 most widely used minerals and metals. However, at least US$12.4 trillion worth of its energy deposits, metals, and minerals are now under Russian control. Russia has seized 11% of Ukraine's oil deposits, 20% of its natural gas deposits, 63% of its coal deposits, 42% of its metals, and 33% of its rare earths and other critical minerals (including lithium). According to Ukrainian mining and steel industry executives, as of August 2022, Russia had seized 41 coal fields, 27 natural gas sites, 14 propane sites, nine oil fields, six iron ore deposits, two titanium ore sites, two zirconium ore sites, one strontium site, one lithium site, one uranium site, one gold deposit, and a significant quarry of limestone previously used for Ukrainian steel production.[1] In addition to directly controlling resources, Russia has blocked Ukrainian ports in the Black Sea, making Ukraine's exporting critical minerals more difficult.

Conclusion

Nowadays, Russia has increasingly recognized the importance of critical minerals in preserving national security, maintaining sovereignty, promoting development, strategically competing with the West, and consolidating its status as a resource power. However, a confluence of the global energy transition, the COVID-19 pandemic, and the supply chain disruptions caused by the Ukraine crisis has aggravated many countries' concerns about critical minerals supply security. From the perspective of Russia's external environment, Donald

[1] Anthony Faiola and Dalton Bennett, "In the Ukraine War, A Battle for the Nation's Mineral and Energy Wealth," August 10, 2022, https://www.washingtonpost.com/world/2022/08/10/ukraine-russia-energy-mineral-wealth/.

Trump's return is accelerating the changes shaping the world today. Whether Russia can consolidate its status as a resource power via critical minerals, gradually reduce excessive dependency on the oil and gas industry, and thereby achieve the development and modernization of its entire industrial system depends not only on the evolution of the Ukraine crisis and Western sanctions but also on Russia's counter-crisis and counter-sanction capabilities. Russia's success or failure will significantly impact the adjustment and reshaping of the global critical minerals industrial and supply chains.

To sharpen its comparative advantages related to critical minerals, Russia has accelerated the formulation of strategic plans, enhanced resource sovereignty, increased policy support, strengthened geological exploration and study, stepped up Arctic development, and actively engaged itself in critical mineral competition with the West. However, practical factors persist, domestically and internationally, hampering the growth of relevant industries in Russia. Russia's mining sector has long been plagued by such difficulties as underdeveloped infrastructure, insufficient investment, complex geological conditions, and human resource shortages. Development activities in the Arctic must overcome technological limitations since exploration and production in such difficult regions are particularly costly and complicated. Besides, Western sanctions have increased Russia's difficulty concerning international cooperation and import substitution. Apart from objective obstacles, the stringent controls the Russian government has imposed on strategically important mineral resources also render this industry hardly accessible to foreign investors.

The comprehensive strategic partnership of coordination between China and Russia continues to move forward in the new era. China–Russia cooperation on critical minerals has great potential since the two countries share a similar understanding of "strategic minerals." China and Russia view strategic minerals as a holistic and regional concept spanning energy, non-energy, advantage, and scarce minerals. The definition of strategic minerals in China and Russia is more macro, encompassing all minerals crucial for national security and economic stability. Their connotations and denotations far exceed the "critical minerals" Western countries generally identify. As major mineral countries, China and Russia have the basis for enhancing their

international influence via domestic resources, and they share the practical need to utilize their advantage resources to boost discourse power and foster a new mining order globally. Indeed, there is a natural complementarity between the two countries in the field of critical minerals. Both sides should strengthen cooperation.

(edited by Chen Qingyi)