

The New Geopolitics of Mineral Supply Chains

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Introduction

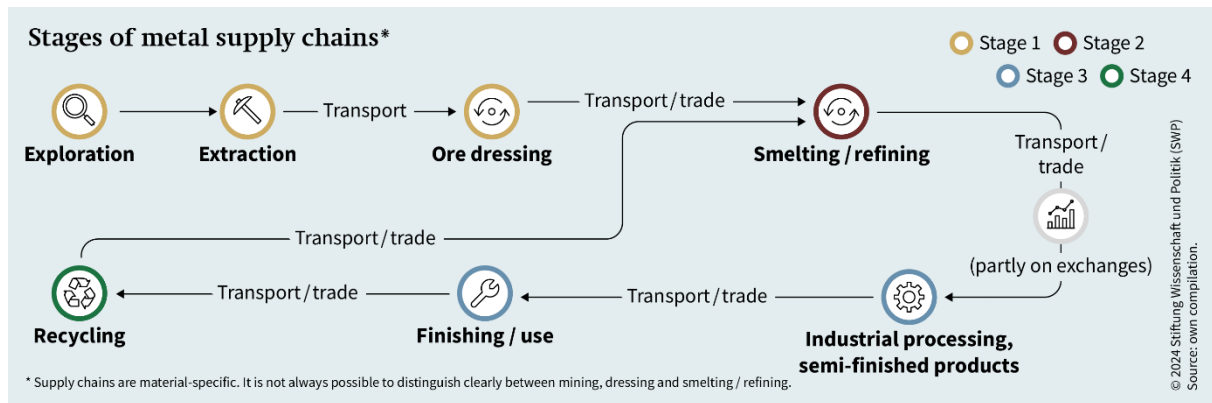
The growing geopolitical relevance of securing minerals and metals has transformed global supply chains into a strategic battleground. As the world grapples with shifting economic powers, the drive for decarbonization, and the pressing need for sustainable development, securing reliable supply to minerals and metals has become paramount for industrialized countries across the globe. China's dominance in mineral supply chains, the U.S. emerging "friendshoring" strategies, and the intensifying focus on environmental, social, and governance (ESG) standards all reflect this new reality. Against this backdrop, resource-rich countries in Africa, Latin America, and Asia are increasingly exploring ways to harness their own raw materials sectors for greater economic benefit, aiming to capture value beyond mere extraction.

This article explores the changing geopolitical landscape of mineral supply chains and policies of industrialized countries and how resource-rich countries are adapting to these shifts. It begins with an analysis of China's role in the minerals sector. The next section delves into the new geopolitics of mineral supply chains, examining recent shifts in U.S. and EU policies, such as the U.S. Inflation Reduction Act (IRA) and the EU's Critical Raw Materials Act (CRMA), and their implications for supply chain resilience and diversification. Following this, the article addresses the role of new players like Saudi Arabia and the United Arab Emirates (UAE) into the minerals sector, as well as recent developments in BRICS+ that indicate potential new alliances in commodities cooperation. The final section highlights how countries in the Global South are rethinking their roles, striving to capture more value locally through refining, and advanced stages of production.

Through this analysis, the article provides a view of the challenges and opportunities emerging in the minerals sector as countries worldwide adapt to the evolving geopolitical landscape of mineral supply chains.

China's role in mineral supply chains

Broadly, mineral supply chains can be divided into four stages: (1) extraction, (2) refining, (3) industrial processing, and (4) recycling.



Chinese companies participate in various stages of supply chains, though their involvement varies in degree. Since the 1990s, China has pursued an active industrial policy, expanding its influence across the supply chains of minerals and metals. While some minerals are mined within China, most are sourced from resource-rich countries in other regions of the world—often with the participation of Chinese companies. The Chinese government has actively supported these companies in accessing new markets by reducing bureaucratic barriers and facilitating access to necessary capital. China's 'going-out' strategy enabled Chinese state-owned enterprises (SOEs) to invest in strategically important sectors (Gao 2022). In this context, the "infrastructure-for-minerals" approach was developed: Chinese state-owned banks and other commercial entities provide these countries with favorable loans for infrastructure development, often structured as resource-backed loans, where repayment is made through commodity deliveries or resource-related income streams. In some cases, mining licenses or resources are used as collateral, and contracts frequently specify Chinese companies as contractors for infrastructure projects. This approach has been a key factor in boosting investments by Chinese companies in major resource-rich countries across Africa and Latin America (Mihalyi et al. 2020).

Another key component is China's 'Grand Diplomacy' approach, which seeks to build soft power globally, particularly with partner countries involved in the Belt and Road Initiative (BRI) (Yongnian und Chi 2018). Through the Belt and Road Initiative (BRI), China has established critical energy infrastructure in resource-rich partner countries, which is essential for the large-scale industrial mining sector. The construction of ports and rail networks ensures efficient transport of raw materials back to China. As a result, China was able to significantly expand its position in the second stage of the supply chain, with the supply chains of many minerals and metals passing through China. This central role makes China a key trading partner both for countries where extraction occurs and for those requiring processed minerals for industrial production (Carry et al. 2023a).

China's dominant position in the supply chains of minerals and metals creates a cluster risk at the second stage of the supply chain, making China an especially influential and powerful

player. European companies are predominantly positioned at the third stage of the supply chain, making them highly dependent on imports of minerals and metals. In contrast, the U.S. is more integrated into commodity supply chains, with some American companies actively engaged in mining. According to the European Commission, "only a few countries in Europe have active mines," and European mining has contributed minimally to global production of metals and industrial minerals (EU Commission 2024).

The “new geopolitics” of mineral supply chains

Until the COVID-19 pandemic, this high concentration was primarily a concern for the U.S. rather than Europe. However, the pandemic highlighted the vulnerabilities and risks associated with economic and political dependencies in a globalized world. In this context, the need to create resilient supply chains has gained increased attention. This is particularly relevant for large European economies—such as Germany—that are deeply integrated into the global economy and have experienced risks from supply disruptions. Since the Russian invasion of Ukraine political decision-makers in the EU and the U.S. are shifting their perspectives on global value chains (GVCs) again, leading to a ‘new geopolitics’ of supply chains (Maihold 2022). Particularly in the minerals sector, there is a noticeable shift from a narrow focus on securing raw materials to a broader, more strategic geopolitical approach aimed at reducing dependencies on potentially high-risk partners (Nakano 2021; Müller 2023). Consequently, dependencies on China are receiving increased scrutiny.

In May 2024, the EU enacted the Critical Raw Materials Act (CRMA) to diversify its supply chains which is part of a broader EU industrial policy. The CRMA establishes benchmarks based on a list of critical raw materials, first introduced in 2011 and updated every three years. As of 2024, this list includes 34 materials identified as critical due to their economic importance and supply risk. Within this group, 17 materials are further classified as “strategic”, reflecting their crucial role in the EU's industry and the heightened risk associated with their supply. The CRMA aims to expand European capacities in mining, processing, and recycling while reducing high import dependencies. In the future, the goal is to limit sourcing of any single strategic mineral to a maximum of 65% from a single non-EU country (Schulze 2024).

This is a highly ambitious goal, as the EU's supply chain dependencies for certain minerals are substantial: for example, nearly 100 percent for rare earths and 87 percent for magnesium. To reduce dependencies in these supply chains and encourage European companies, in particular, to engage in joint projects and long-term offtake agreements, the EU must commit substantial investments. Funding for the CRMA will primarily come from EU member states; for instance, Germany, France, and Italy have established national mineral funds, which will now be used to finance related projects. At the same time, the funds pledged so far and the EU's political efforts are insufficient to incentivize the European private sector and to compete effectively with cooperation offers of other industrialized economies to mineral-rich countries (Schulze 2024).

While these geopolitical considerations only became significant in Europe in 2022, they had already played a role in the U.S. beforehand. To some extent, the U.S. presidential administrations of Barack Obama (2008–2016) and Donald Trump (2016–2020) pursued nearshoring and reshoring strategies in response to China's growing influence in global supply chains even before the Russian invasion of Ukraine. In February 2021, the administration of former U.S. President Joe Biden announced a new strategy to enhance supply security in strategic sectors. This involved reviewing U.S. supply chains to identify those with the highest

risks and formulating policy measures to address them. The minerals sector was recognized as particularly relevant (Müller 2023). One strategic goal of the U.S. government has been to "invest in sustainable domestic and international production and processing of critical minerals" (The White House 2021). Since August 2022, under the Inflation Reduction Act (IRA), the U.S. has adopted a more transformative approach aimed at restructuring supply chains by offering incentives for American companies to relocate production, or certain production steps, for climate-friendly technologies to the United States.

Through efforts to enhance coordination within groups like the G7 and Mineral Security Partnership (MSP), the U.S. is advancing the concept of 'friendshoring,'. 'Friendshoring' refers to building economic relationships with "a network of trusted suppliers from friendly countries that provide multiple independent supply paths" (Rojas et al. 2022). This concept combines economic cooperation with the strengthening of political relations with countries that share similar norms and values. The MSP "aims to accelerate the development of diverse and sustainable critical energy minerals supply chains through working with host governments and industry to facilitate targeted financial and diplomatic support for strategic projects along the value chain" (US Department of State 2024). It has become a transnational initiative of various allied nations to pool state and private investments in the minerals sector. It currently includes 14 countries, among them EU and certain European countries, the UK, Sweden and Australia and Canada (ibid). Such cooperation among like-minded states is considered a 'low-hanging fruit' as it builds on existing economic relationships and favorable investment conditions. But this alone will not be sufficient to ensure long-term supply security for the U.S. and the EU.

One key challenge is the high concentration within the minerals market. For certain minerals, extraction and/or production is limited to a small number of countries, offering little opportunity for diversification and limiting options for partnerships with friendly or allied nations. Furthermore, bypassing China as a player in the minerals sector is challenging – and in certain countries almost impossible because Chinese companies are often active in the minerals sector, either through raw material extraction or local processing. Lithium mining in Chile or the cobalt sector in the Democratic Republic of Congo are notable examples of this dynamic, because Chinese companies have a strong presence in the mining and processing. This highlights once again the complexity of supply chain diversification: establishing new raw material partnerships does not necessarily counter the influence of Chinese players within the supply chain. China is actively working to counter American and European efforts to establish new supply relationships. China is increasingly pledging support for Africa's industrialization, particularly in the mineral sector. China is initiating projects to develop the solar industry in African nations, assisting them in advancing supply chains up to solar panel production—a move that also benefits Chinese companies.

New kids on the bloc

New players are increasingly entering the raw materials sector, including Saudi Arabia and the United Arab Emirates (UAE). Under its Vision 2030 initiative, Saudi Arabia aims to diversify its economy by developing new industries, while the minerals sector is one focus. Leveraging its extensive experience in fossil fuel extraction, Saudi Arabia is investing in the mining sector. Currently, the kingdom is securing minerals through international investments and purchase agreements, with the long-term goal of expanding domestic mining. Many projects are still in

the conceptual phase, and Saudi Arabia relies on international partners to realize these plans. That is why the kingdom actively seeks partnerships and international cooperation. In 2021, Riyadh hosted the inaugural Future Minerals Forum, a major conference that has become an annual event, underscoring the government's commitment to this sector. Political and economic actors are also active in African countries, seeking new project opportunities (Schulze und Schrolle 2024). The UAE is adopting a similar strategy, expanding its diplomatic relations with African countries and emerging as an active financial player in the commodities sector.

With the expansion of BRICS to BRICS+, resource-rich countries have joined the group, raising the question of whether enhanced BRICS cooperation in the commodities sector is feasible. Since its establishment in 2015, the New Development Bank (NDB) has primarily focused on infrastructure and sustainable development projects among its member countries. As of November 2024, the NDB has approved 196 projects, with a significant portion dedicated to sectors such as transport, energy, and urban development, and only one project that is indirectly related to the mineral sector, as it involves the development of battery production (own analysis). Other infrastructure projects can also indirectly benefit minerals sector by improving logistics and energy supply, the NDB has not directly financed projects specifically targeting mineral extraction or processing (New Development Bank 2024). This indicates that, to date, cooperation in the minerals sector has not been a primary focus within the BRICS framework or the NDB's investment strategy, even though the U.S. and the EU, in particular, are concerned about increased cooperation.

However, the evolving global emphasis on securing critical raw materials for technological and industrial needs may prompt the NDB to consider more direct involvement in this sector in the future. Such a shift would align with the bank's mandate to support sustainable development and could address the growing demand for resources essential to member countries' economic growth. During Russia's BRICS presidency in 2024, the Russian government advocated for enhanced collaboration in the raw materials sector, proposing more intensive partnerships. This initiative is particularly significant for Russia, as international sanctions have excluded the country from certain supply chains (Sergeenkov 2024). In July 2024, the geological services of BRICS nations convened and agreed to strengthen cooperation, including the development of a list of critical raw materials vital to their economies (Interfax 2024). This cooperation is particularly beneficial for countries like South Africa, Brazil, and India, which have invested minimally in exploring their raw material deposits in recent decades. New BRICS members and, in the long term, the "Friends of BRICS" could also stand to gain from this collaboration. Nevertheless, while this cooperation aligns with a "friendshoring" strategy, it is far from establishing a joint commodities cartel. Such a cartel is unlikely to align with the interests of countries like South Africa, India, and Brazil, which aim to diversify their relationships with a range of global partners.

Changing perspectives of resource-rich countries

These explanations demonstrate that geopolitical developments are also reshaping the prospects for resource-rich countries in Africa, Latin America, and Asia. They have recognized geopolitical competition as an opportunity to move beyond their role as raw material suppliers and establish further stages of industrial production domestically. In the minerals sector, activities with the highest profit margins are predominantly located in highly industrialized

Global North countries, while production steps with the lowest value-added—such as extraction and initial processing—are primarily concentrated in countries of the Global South. In addition to generating less value than other segments of the value chain, mineral extraction also incurs significant external costs, including environmental degradation, social conflicts, and health risks. This unequal distribution of profits and costs across the value chain plays a key role in current discussions around the establishment of new mineral partnerships. The question of how resource-rich developing countries can capture a greater share of value added in global mineral supply chains has become a prerequisite for successfully diversifying resource partnerships (Carry et al. 2023b).

Various resource-rich countries worldwide—particularly in Africa and Latin America, but also in Asia—are striving to increase the value generated within their commodities sectors. In Africa, these considerations are increasingly being approached at a regional level—both through the African Union (AU) and the expansion of the African Continental Free Trade Area (AfCFTA), as well as within sub-regional organizations such as the Southern African Development Community (SADC) and the Economic Community of West African States (ECOWAS). The AU is close to releasing its ‘Green Minerals Strategy’ which identifies opportunities for African states to enhance their minerals sector. Different countries are in the process of preparing their own mineral strategies. And some countries - such as Namibia, Ghana, and Zimbabwe-, are taking additional – and more radical - steps by imposing export bans on unprocessed raw materials. These countries expect new partners to support infrastructure development, which is crucial for enabling further stages of industrial production, and—similar to the approaches of the U.S. and China—to offer lucrative supply packages and long-term commitments (Schulze und Müller 2024). In Latin America and Asia, regional cooperation efforts are less pronounced than on the African continent, with national strategies playing a more significant role.

National strategies for the raw materials sector are more prominent in this context. Overall, there is a clear trend toward greater state intervention in supply chains, a pattern the IMF has also observed in other economic sectors (International Monetary Fund 2024). Indonesia has been one of the pioneers in this approach. Early on, Indonesia implemented an export ban on unprocessed raw materials—similar to some African countries—enabling the establishment of a domestic processing industry in the nickel sector. However, there are also other examples, such as Chile. Chile, a major supplier of copper and lithium, has actively fostered an investment climate open to foreign direct investment, thereby attracting various players in the raw materials sector. This approach contrasts sharply with Indonesia’s strategy (Altenburg et al. 2024). This demonstrates that countries worldwide are developing their own strategies to capitalize on the commodities sector. They are examining which minerals and metals can be considered critical for their own industrialization strategies, while aiming to minimize susceptibility to international developments—though these influences cannot be entirely ignored.

Conclusion and outlook

In a rapidly evolving global landscape, the raw materials sector has become a focal point for countries navigating economic transformation, geopolitical competition, and environmental challenges. China’s dominant position in mineral supply chains and the recent shifts in U.S. and EU strategies underscore a "new geopolitics" of supply chains, where strategic partnerships,

friendshoring, and diversification have become essential for supply security. As China remains a central player, bypassing its influence in supply chains is complex, and new partnerships may still involve Chinese companies at various stages. For countries rich in resources, these geopolitical dynamics present an opportunity to redefine their role in global supply chains. Rather than remaining raw material suppliers, countries in Africa, Latin America, and Asia are increasingly focused on capturing more value domestically by advancing into stages of refining, processing, and industrial production.

The election of Donald Trump in November 2024 is very likely going to have a significant influence on global supply chains, particularly in the context of geopolitical competition and sustainability efforts. Protectionist trade policies are likely to intensify under his renewed leadership, potentially leading to increased trade tensions and a reevaluation of international supply chain dependencies. One of the primary concerns is the potential for a subsidy race, especially in sectors involving minerals essential for emerging technologies. Such a race, which the IMF has described as "geoeconomic fragmentation" or a "reversal of globalization" (International Monetary Fund 2024), has become more likely following recent developments in November. For countries that are deeply integrated into global supply chains or heavily dependent on China – many countries in the transatlantic-, an escalation of geopolitical tensions could have significant economic impacts, especially in the commodities sector.

Geopolitical competition is also expected to impact the willingness of both public and private entities to invest in sustainable supply chains. While there has been a growing emphasis on Environmental, Social, and Governance (ESG) criteria in recent years, heightened geopolitical tensions and protectionist policies may shift focus towards national security and economic resilience. This shift could deprioritize sustainability initiatives, as countries and companies prioritize securing their supply chains over environmental and social considerations.

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