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# STRATEGIC RESOURCE COMPETITION IN THE U.S.-CHINA RIVALRY: SECURING MINERALS IN AFRICA

*Abstract:*

The United States and China increasingly compete on the global stage for technological supremacy in a struggle over access to major minerals. China expanded its acquisition of resources with the recent discovery of niobobaotite, a mineral rich in niobium and in demand in high-tech production and defense systems. In response, the United States intensified efforts to establish mineral partnerships in Africa in the Democratic Republic of the Congo (DRC) and Zambia in order to acquire supplies of cobalt, lithium, and other strategic minerals. This competition is further intensified by the growing trend of resource weaponization, as exemplified by China's recent export controls on critical minerals such as gallium and germanium. This paper examines how such a strategy of resources impacts the larger geopolitical dynamics and influences policy in international trade, security in the supply chain, and regional diplomatic alignments. Through an examination of recent trends between 2023 and 2025, the essay shows how mineral dominance affects U.S.-China relations and foresees potential geopolitical shifts in global power dynamics. The findings show China maintains a commanding lead in rare earth supply chains but the United States is leveraging economic and security agreements to counter Chinese influence. Ultimately, this struggle over resources illustrates the increasing convergence of economic security, technological advancement, and international relations in the 21st century.

*Key words:*
USA, China, geoeconomics, mineral resource, supply chain, Africa



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## INTRODUCTION

Competition for strategic resources in the US-China rivalry is emerging as a critical component of international geopolitics. As two of the most powerful nations on earth, the United States and China are both vying for control of strategic resources essential for economic growth and national security. The transition to clean energy globally and the diffusion of new technologies have driven demand for strategic resources to historic highs. This surge, combined with existing geopolitical tensions, has sparked a heated rivalry between China and the United States as both nations compete to secure access to critical resources that power their economies and sustain their strategic advantage. The competition is being observed in various domains, including energy resources, rare earth elements, and technological advancements.

One of the most important domains of strategic rivalry over resources between the U.S. and China is in the field of energy resources. Both countries are heavily reliant on energy resources such as oil, natural gas, and coal to power their economies, but with increasing energy demand worldwide, competition for these resources is increasing. China, along with other nations, has been fervently looking for sources of energy within the Middle East, Latin America, and Africa to ensure its energy prospects for the future.

One other competitive area that is strategic among the U.S. and China includes rare earth minerals. Rare earth minerals are essential components of numerous high-technology technologies like smartphones, electric vehicles, and advanced weapons. China currently controls a significant market share in producing the world's rare earth minerals, thus holding a strategic upper hand in the sensitive sector.

REEs refer to a set of 15 lanthanides and one yttrium that have become vital for modern technology due to their uncommon physical and chemical properties. Both neodymium and dysprosium are fundamental for high-performance magnets, and yttrium is vital for superconductors and laser technology. They are vital for wind turbines, electric vehicles, and military uses, and currently, there is not a ready



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replacement without compromise in performance (Du & Graedel, 2013).

China has dominated REE production and mining for over two decades, and countries like the U.S. and Japan have been highly dependent on Chinese exports. Additionally, China's growing domestic demand for REEs will dampen exports, putting further strains on supply chains worldwide. With limited facilities for mining and production outside China, countries like the U.S. and Europe lost processing capacity for REEs domestically and hence create supply chain weaknesses. The convergence of Chinese domination, increasing demand, and supply chain vulnerabilities worldwide increase concerns over the future availability and sustainability of REE. Limited quantitative data on REE end-use also makes it more difficult to plan strategically to access these important materials.

Technological innovation is another key battlefield of the U.S.-China competition. Both countries are investing considerably in research and development to create technologies such as artificial intelligence, quantum computing, and 5G telecommunications. The U.S. has long been the leader in technological innovation, but China is rapidly closing the gap and aggressively investing in strategic areas to challenge American primacy.

As U.S.-China competition continues to heighten, strategic rivalry for dominant resources is most likely to further intensify. Both nations are competing to ensure their access to critical resources and technology in order to secure their economic and military dominance. Such rivalry is most likely to have long-lasting implications for the geopolitics of the entire world and could even result in more tensions and clashes between the two superpowers. Competition for strategic resources in U.S.-China rivalry is a complex and intricate phenomenon encompassing many dimensions such as energy sources, rare earths, technological advancement, cybersecurity, and information technology. Both countries are engaged in an ongoing fight to ensure access to important resources and technologies in order to maintain their competitive edge. As competition between the U.S. and China deepens, strategic competition for vital resources will most likely determine future global geopolitics trends and have far-reaching implications for

the world at large. As the strategic importance of rare earth elements, the competition between China and the U.S. is not just about technological superiority, it is a struggle for resource security. China tried to maintain its dominance in resource acquisition, while the U.S. turned to Africa in a bid to diversify supply chains. This essay will examine the multifaceted nature of the U.S.-China rivalry for strategic resources, focusing on the competition for rare earth elements and the strategies employed by both nations to secure resource supplies and examining how this competition influences global power dynamics.

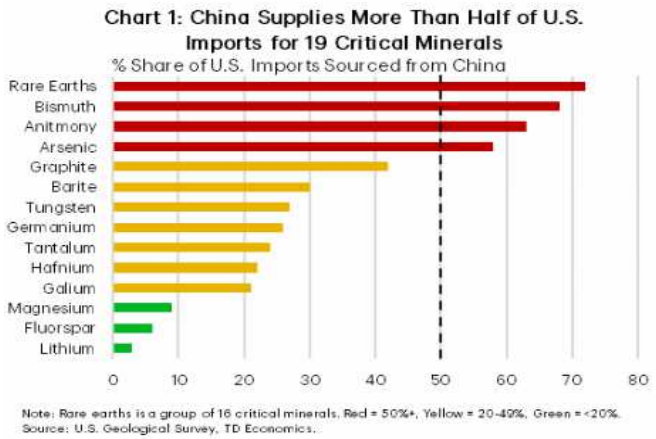
## THE STRATEGIC IMPORTANCE AND SUPPLY CHAIN CHALLENGES OF RARE EARTH ELEMENTS

Rare earth elements (REEs) are integral to modern technology, forming the backbone of industries such as renewable energy, advanced electronics, and defense. These 17 chemical elements, known for their unique electrochemical, luminescent, and magnetic properties, are irreplaceable in applications ranging from high-performance magnets and superconductors to laser technologies. The growing global demand for REEs is driven by advancements in artificial intelligence, clean energy initiatives, and expanding military capabilities. However, their supply chains remain highly vulnerable and concentrated only in a few key regions.

China has maintained a commanding dominance over the global REE market for decades, supplying more than 60% of world production and controlling approximately 85% of processing capacity (Trends Research, 2025). This near-monopoly creates strategic vulnerabilities for import-reliant nations such as the United States, Japan, and the European Union. Unlike geological abundance, which is more evenly distributed, China's dominance stems from its state-controlled economic system, relaxed environmental regulations, and aggressive industrial policies. These factors have allowed Beijing to establish itself as the dominant global producer, reinforcing its strategic advantage in the sector.

The global REE supply chain faces severe challenges. The "balancing problem", that is the difficulty in producing specific rare earths independently of others, results in fluctuating availability, supply chain disruptions, and market volatility. Certain REEs become oversupplied, while others face shortages, creating imbalances that complicate long-term resource planning. The problem has worsened over time, with growing discrepancies between demand and supply leading to recurring shortages, particularly after 2010. Moreover, REE extraction and processing have significant environmental consequences, including pollution and hazardous waste, further complicating diversification efforts outside of China.

**Fig. 1: U.S. dependence on China for mineral imports**




Source: Foran, A. (2024). 'U.S. trade vulnerabilities in critical minerals: Pressure points amid rising tensions'.

The strategic importance of securing REE access cannot be overstated. Demand has surged since the mid-20th century and is expected to grow exponentially as countries transition toward green energy systems. Electric vehicles, wind turbines, solar panels, and rechargeable batteries all rely heavily on REEs, making their supply chains a geopolitical priority. However, limited availability, rising extraction costs, and supply monopolization by China continues to pose risks. The business policies of dominant producers influence global pricing, exacerbating economic vulnerabilities for dependent nations.

Amid this intensifying competition, China announced on February 4th 2025, that it would restrict exports of five critical minerals, namely tungsten, tellurium, bismuth, indium, and molybdenum, citing national security concerns (Exiger, 2025). These materials are essential for industries including defense, renewable energy, electronics, and manufacturing. Given China's dominant role in their production, the restrictions are expected to create global supply chain disruptions, leading to price surges and supply bottlenecks. This announcement follows a pattern of Chinese export controls on critical minerals. In July 2023, China restricted exports of gallium and germanium, metals that are essential for semiconductor manufacturing, leading to price spikes of nearly 20% in the United States and Europe. In August 2024, China imposed restrictions on antimony, a metal used in defense technology, which resulted in a 97% drop in shipments to the U.S. and a 200% increase in prices (Exiger, 2025). By December 2024, China completely banned exports of gallium, germanium, and antimony to the United States.

The United States, heavily reliant on tungsten, faces particular challenges as it stopped domestic mining of the mineral in 2015. In December 2024, the U.S. imposed a 25% tariff on certain tungsten imports from China, encouraging importers to seek alternative suppliers such as Vietnam, Russia, Bolivia, and Rwanda. However, while alternative sources exist, China's restrictions could still drive global price surges and impact U.S. industries.

In response to China's market control, the United States and its allies are actively seeking to diversify supply chains, particularly by securing REE sources in Africa. Yet, reducing dependency on China has proven to be a daunting challenge. Despite efforts to invest in alternative sources, including recycling and technological innovations, China's processing and refining infrastructure remains unmatched. The development of a stable, non-Chinese supply chain is critical, yet remains a long-term goal rather than an immediate solution.

As strategic resources, rare earth elements significantly impact business investment, economic development, and global geopolitics. Competition for these materials reflects broader

struggles over technological dominance and national security. Addressing REE vulnerabilities requires a combination of international cooperation, investment in alternative mining and refining projects, and enhanced recycling technologies. While some progress has been made in these areas, significant risks remain, making REEs one of the most contested resources in the U.S.-China strategic rivalry.

**Fig. 2. Minerals under export restrictions by China and their uses**

| Mineral | Uses |
|---|---|
|  Tungsten | Artillery shells, armor plating, cutting tools, engine parts, airplane balancing weights. |
|  Tellurium | Solar panels, thermoelectric devices, infrared optics, steel alloys, and rechargeable batteries. |
|  Bismuth | Medical treatments, lead-free solder, cosmetics, flame retardants, and ammunition. |
|  Indium | Phone screens, TV displays, fiber-optic technology, semiconductors, and solar panels. |
|  Molybdenum | Missile components, nuclear reactors, steel alloys, lubricants, and high-temperature electronics. |

Source: Exiger. 'China Announces Export Controls on Five Critical Minerals'.

## AFRICA: A STRATEGIC BATTLEGROUND FOR MINERALS

As China tightens its grip on mineral exports, the United States is looking to Africa to secure alternative sources. With nearly a third of the world's strategic mineral reserves, Africa has become a key battleground in the race for resource security. Countries like the Democratic Republic of the Congo (DRC), Zambia, and Namibia are rich in cobalt, lithium, and manganese, critical materials used in electric vehicles, batteries, and defense technology.

The DRC alone supplies nearly 70% of the world's cobalt, but much of its mining sector is already under Chinese control through direct ownership and long-term contracts. This dominance gives Beijing a stronghold over global supply chains and pricing, making it harder for Western nations to secure these essential minerals. In response, the Biden administration has pushed to develop non-Chinese-controlled supply chains

through initiatives like the Mineral Security Partnership (MSP). The U.S. has also backed the $4 billion Lobito Corridor Project, which aims to improve transportation and export infrastructure for minerals from the DRC and Zambia, reducing dependence on Chinese-built logistics.

However, the U.S. faces serious challenges in expanding its influence in Africa. Over decades, China's Belt and Road Initiative (BRI) has made it a trusted partner for many African nations, giving Beijing an edge in infrastructure financing and development. By contrast, the U.S. has historically been less involved in direct resource extraction, which has limited its immediate impact. Additionally, African governments are asserting greater control over their mineral wealth, demanding better contract terms and more local processing instead of simply exporting raw materials. This shift presents further challenges for Western companies, which must comply with stricter environmental and labor standards than their Chinese competitors.

China's commitment to securing Africa's resources is clear from its massive investments. In 2023 alone, Chinese companies poured $21.7 billion into African mining and infrastructure projects, with $8-10 billion specifically targeting minerals (Tucker, 2025). As part of its green energy transition, China has prioritized securing supplies of cobalt from the DRC (90% of its imports) and nickel from Côte d'Ivoire (Tucker, 2025). Meanwhile, the U.S. has stepped up its engagement—but at a much smaller scale. The 2022 U.S. Strategy Toward Sub-Saharan Africa emphasized support for African nations in managing their resources, and the U.S.-led MSP held talks with African leaders in 2023 to strengthen mineral partnerships. Still, the total U.S. investment in Africa that year was just $7.4 billion, with only $300 million allocated to minerals—a fraction of China's spending (Tucker, 2025).

As Africa takes more control over its own resources, managing U.S. and Chinese interests will become even more complex. African governments are demanding fairer deals, more local value addition, and greater transparency in mining operations, which will force both the U.S. and China to adapt their strategies. The competition is not just about owning mines but also about who builds the infrastructure, like



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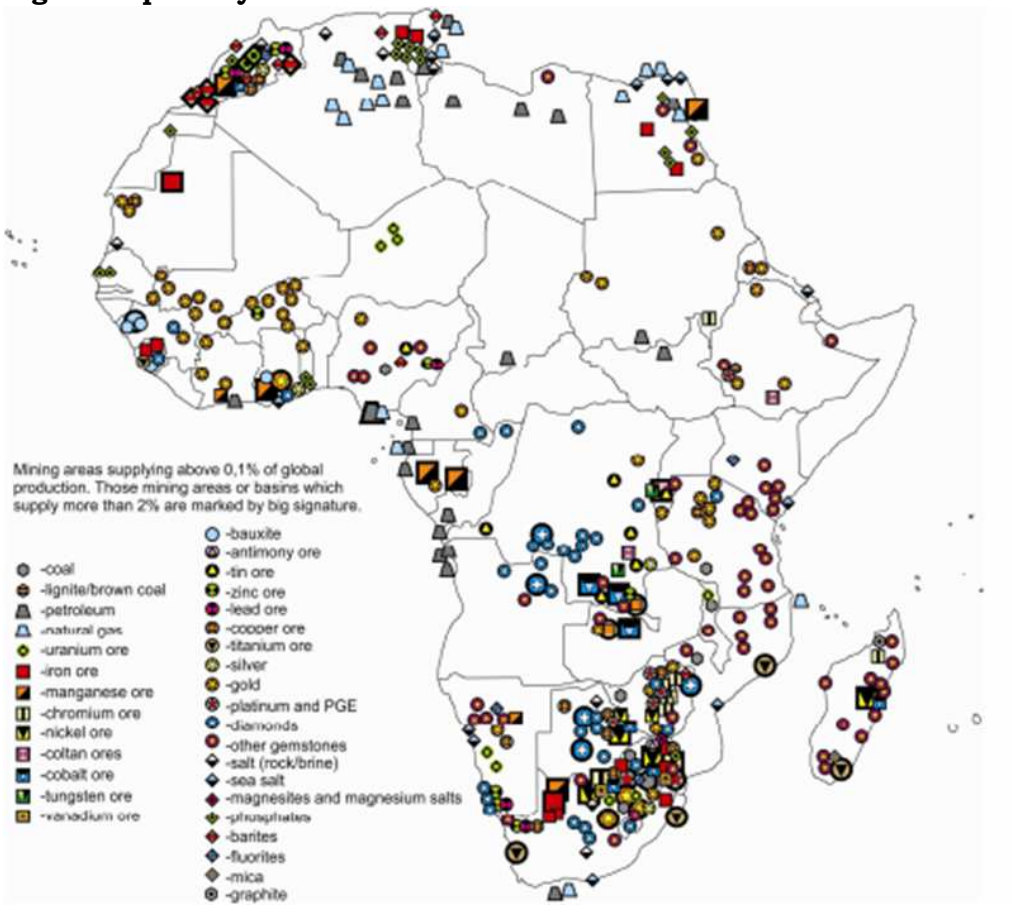
railways, roads, and ports, that dictate how these resources move across the globe. For decades, China has led the way in African infrastructure development, financing and constructing vital transportation links. One of the most significant examples is the Tanzania-Zambia Railway (TAZARA), built in the 1970s with Chinese funding to give Zambia an export route to the Indian Ocean (Marchetto, 2025). More recently, Beijing reaffirmed its presence by signing a memorandum of understanding (MoU) with Zambia and Tanzania to modernize the railway, further cementing its role in Africa's mineral trade.

**Fig. 3. Map of key African mineral resource extraction zones**




Source: Wilczyński, P. L. (2021). 'Arms trade and resources exploitation: Survey of neo-colonialism and neo-imperialism in Africa'.

But China's ambitions are not limited to Eastern and Central Africa. In Guinea, Chinese companies are heavily

invested in the Simandou iron ore project, which is set to produce high-grade iron ore. Given China's push to reduce dependence on Australian iron, securing a direct supply chain from Guinea aligns with its long-term goals. Similarly, China has played a major role in revamping Angola's Benguela Railway, which connects the Copperbelt region of Zambia and the DRC to Angola's Atlantic coast, facilitating mineral exports.

For years, China faced little competition—but now, the West is pushing back. A turning point came in July 2023, when management of the Lobito Atlantic Railway (LAR) was transferred from the Angolan government to a Western-led consortium that includes Trafigura, Mota-Engil, and Vecturis. Shortly after, the U.S. and EU signed a MoU under the G7's Partnership for Global Infrastructure and Investment (PGI) to expand the Lobito Corridor, linking Angola and Zambia (Marchetto, 2025). This is not just an economic project, it is a strategic countermeasure to China's growing control over African infrastructure. The West sees the Lobito Corridor as a way to diversify global mineral supply chains, reducing dependence on China while offering African nations an alternative development partner. Still, long-term U.S. and EU engagement in Africa remains uncertain. The recent U.S. presidential election could bring major policy shifts, particularly if Donald Trump's return to office leads to an adoption of protectionist policies that reduce America's focus on African infrastructure. If that happens, China could strengthen its hold over Africa's mineral supply chains even further.

There are also challenges on the African side. Nations like DRC and Zambia continue to struggle with governance issues, corruption, and weak regulatory frameworks. While the EU and U.S. emphasize transparency and sustainability, their slow bureaucratic processes and strict investment conditions can make China's fast, no-strings-attached approach more appealing to African leaders. The battle for Africa's minerals is no longer just about who owns the mines, it's about who controls the infrastructure that transports those resources. China, with its decades-long investments, still holds the upper hand, but Western-backed initiatives like the Lobito Corridor present a real challenge. As Africa asserts greater control over

its mineral wealth, balancing U.S. and Chinese interests will become increasingly complex. African governments are pushing for more equitable deals, greater local value addition, and improved transparency in mining operations. This growing assertiveness will reshape the competitive landscape, forcing both superpowers to adapt their strategies in the evolving resource race.

## CONSEQUENCES OF THE MINERAL RIVALRY

The increasing competition for minerals is already reshaping international economic and political configurations. Both China and the United States are pursuing a policy of resource nationalism, implementing policies that privilege national and ally-saturated access to strategic resources and restrict exports to rivals. The policy follows greater geopolitical realignments, as critical minerals become a fulcrum of economic security and strategic influence. China itself has utilized control of vital mineral supply chains as a tool of geopolitics. Its 2023 export prohibitions on gallium and germanium, affecting major inputs into producing semiconductors, were broadly perceived as an exercise of geopolitical restraint in response to U.S. moves that shut off China's access to top-end chip technology. But such restrictions were not isolated; they formed part of an extended trend in China using its control of minerals to impose economic and political pressure. The 2010 rare earth export restrictions on Japan were an early example of the use of such weapons in geopolitics. The competition for resources in Africa has also put the place of the continent in international value chains into perspective again. Since the U.S. and its allies are attempting to form independent mineral blocs, African nations are seeking more aggressively to mine the fullest economic benefit of their resources. This has pushed resource nationalization policies forward, seeking increased local processing, employment guarantees, and revenue-sharing agreements. These trends are reshaping China-U.S.-African government talks as both the U.S. and China compete to create supply chains in the midst of African political and economic drama. China, in some cases,



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has bid to tighten its grip by taking direct investments in African mining and infrastructure projects, doubling up on control of processing capacity.

The global rare earth market is undergoing a fast transformation with increasing demand in defense, industrial, and clean energy sectors. China, the United States, and Japan remain the biggest users of rare earth elements (REEs), but the dynamics of this competition are shifting. As much as China's demand is expected to increase further, demand in the United States and Japan can level off due to efforts to diversify sources of supply. Despite such alterations, these three nations are going to remain the largest global consumers of REEs, and competition for supply chains is going to be a defining feature of global geopolitics.

One of the largest issues faced by the rare earth market is monopoly in supply. These nations, China, Brazil, Russia, India, the United States, and Australia, produce the majority of the world's REE, with China maintaining its supremacy due to its sheer refining capability. This hegemony is further reinforced by China's hegemony in midstream and downstream processing, which renders other nations reliant on Chinese factories even when they are acquiring raw materials in Africa. This makes the effort to establish independent supply chains by the U.S. and its allies immensely ineffective. Further, the rising costs and hazards of REE mining exacerbate supply challenges.

As readily available deposits are exhausted, new mines become increasingly technologically advanced and capital-intensive. This creates a special problem for nations that wish to diversify away from Chinese REEs because alternative mines and refineries in countries other than China need high levels of investment and governmental sanction. China can also control worldwide supply chains by imposing export controls or price ceilings, further entrenching its strategic position. One of the proposed remedies for this problem is the creation of REE recycling programs, which could reduce reliance on newly mined material. Both the U.S. and EU have been looking into recycling technology, but changes are only now starting and will not likely be a large-scale alternative in the near term.

In the end, these forces demonstrate the vulnerabilities of international rare earth supply chains and the weakness of an industry where China virtually has a monopoly on processing capabilities. The U.S. and its allies are confronted with enormous difficulties in tapping alternative supply chains, so geopolitical competition for REEs will remain a characteristic hallmark of U.S.-China strategic competition.

This is added to China's long-term economic vision of innovation, digitalization, and green technology as its key pillars to its world strategy. The Belt and Road Initiative (BRI) stands at the center here, integrating Eurasia, Africa, and South America into a massive web of trade and infrastructure investments (Kalantzakos, 2019). BRI emphasis on "high connectivity" by land, sea, air, and digital channels puts China at the forefront of global trade and supply chains of strategic minerals. BRI has presented an unprecedented challenge to the U.S., EU, and Japan, which have historically dominated leading industries, business, and technology. The rise of China, in the guise of the BRI, is what some analysts view as a re-centering of global power. In response to China's rising influence, the U.S. has accelerated its strategic competition, and it is undertaking what can be termed as a "geopolitical showdown." The competition is defined by the pursuit of resource nationalism, where both China and the U.S. are interested in national control of major resources and restricting exports to respective competitors. As the competition advances, it will presumably decide the fate of international trade, security alliances, and the balance of economic power.

## THE US-CHINA RIVALRY: STRATEGIES AND IMPLICATIONS

The US-China rivalry for strategic minerals is characterized by distinctive strategies and deep implications for the global geopolitical landscape. China's strategy for obtaining strategic minerals is characterized by large-scale economic engagement in Africa, primarily through the Belt and Road Initiative, with a significant proportion of these investments going towards strategic mineral projects. China is interested in



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clean tech investment and actively imports important minerals from Africa to supply core industries that are core to its clean tech development policies as well as overall economic initiatives. China's policies, such as the "New Energy Vehicle Industry Development Plan (2021-2035)" and the emphasis on the "new three" (electric vehicles, lithium batteries, and solar photovoltaic commodities), reflect China's strategic aim to ensure stable supply chains for strategic minerals, with Africa at the forefront of fulfilling this requirement and in sustaining the development of China's strategic industries (Tucker, 2025). China is especially reliant on Africa for specific minerals, such as DRC's cobalt (a key component in electric vehicle batteries) and Côte d'Ivoire's nickel ore, reflecting its reliance on the continent for vital resources. Moreover, China has a monopoly in processing and refining the world's strategic minerals, giving it a strategic asset that further secures its access to African resources and affirms its position in the world's value chain. This control over processing is crucial because even if raw materials are sourced elsewhere, the reliance on Chinese refining capacity creates a bottleneck, limiting other countries' ability to establish truly independent supply chains.

Conversely, the United States, with a mix of economic, national security, and clean energy objectives, also aims to gain access to key minerals but does so with a different strategy in a number of significant respects. The U.S. is most anxious about its reliance on China for minerals, which it regards as posing a "U.S. national security with a grim economic threat," a reflection of the growing unease throughout the U.S. government regarding supply risks and threats of disruption. The U.S. aims to decrease its dependence on China and broaden its mineral supply chain from a combination of policy initiatives, diplomatic engagement, and strategic alliances with countries located in Africa as well as in other regions around the globe. US government efforts to increase its strategic mineral relationship with Africa include the release of the US strategy toward Sub-Saharan Africa in August 2022 and the establishment of the Mineral Security Partnership, showing an enhanced level of coordination in working with African nations and advancing collaboration within the industry. While China has established a broader portfolio of minerals in Africa with its

enormous investments, the U.S. is actually going after individual projects and initiatives to construct its own supply chain and reduce its reliance on China. This includes not only securing access to raw materials but also investing in developing processing capabilities, although these efforts lag behind China's existing capacity.

These rival strategies have deep significance for trade, investment, and diplomacy. China's economic engagement in Africa, particularly under the Belt and Road Initiative, involves major investments in priority mineral projects, most often with connected infrastructure development and other types of economic cooperation. China's economic relations with African nations are usually crafted to grant access to vital minerals, sometimes creating a condition of interdependence where both parties rely heavily on the other for economic benefit. This can lead to situations where African nations, while benefiting from Chinese investment, also become reliant on China for markets and financing, potentially limiting their economic options. The U.S., in contrast, is deepening its investments in Africa's strategic minerals sector but is also laying greater stress on diplomacy to form strategic alliances, advance transparency and sustainability, and challenge China's position in the continent. The U.S. has established the Mineral Security Partnership to encourage collaboration with mineral-rich African countries, and other like-minded nations with similar interest in supply chain security, to address the challenges and opportunities in the minerals space in a multilateral environment. This reflects a growing emphasis on "responsible sourcing" and supply chain diversification among Western nations.

The struggle for African minerals represents a potential new front of great power competition between China and the U.S. with both risk of conflict and cooperation. Increasing U.S.-China competition and weaponization of supply chain dependence, as evidenced in Chinese export controls on key minerals, increase significant risks of potential supply chain disruption and exposure of countries reliant on these materials. The 2010 rare earth crisis, where China restricted exports to Japan, serves as a stark reminder of how control over mineral supply can be used as a geopolitical tool.

However, the need to address climate change and transition to clean energy also creates potential avenues for cooperation. Both the U.S. and China have a vested interest in ensuring a stable supply of minerals for renewable energy technologies, which could incentivize collaboration on certain aspects of the supply chain or technology development. This complex interplay of competition and potential cooperation will likely define the future of resource geopolitics.

## CONCLUSION

The competition for minerals is not simply an economic competition but a real defining element of U.S.-China strategic competition that conditions global trade, supply chains, and geostrategic reach. As demand continues to rise for critical minerals and rare earth elements, access to such resources will become even more determinative of technological advancement and national security. The ability to secure such resources will likely determine who will dominate developing key 21st-century technologies like AI, renewable energy, and high-performance computing.

Though China has a current dominant position through deeply integrated mining, processing, and infrastructure networks, the United States is actively engaged in challenging Beijing's control by cultivating new partners in Africa and investing in alternative supply chains. But significant structural impediments remain. The lack of refining and processing capacity outside of China continues to hinder Western attempts at securing autonomous supply routes. In addition, political and economic realities of African states with resources complicate matters still further, as such states seek to exercise more control over their mineral wealth. Many African states are insisting on more favorable terms of extraction of their resources, including local beneficiation and more investment in domestic industries, a development that is a reflection of their increasing agency in this competition. These are conditions that Western companies, subject to environmental and labor regulations, will find hard to satisfy as effectively as their Chinese counterparts.

As the energy transition accelerates and the world shifts to electrification, the stakes of this competition will rise still further. The success or failure of the United States and its allies to establish a viable, China-free mineral supply line can well shape power balances decades hence and result in a realignment of global power and new geopolitics. It is not a contest over economic leverage but over technological supremacy and political authority in the 21st century. Whatever nation or group is able to have secure access to those critical resources will not just drive innovation but will shape the geopolitics of the future.

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