Critical Minerals, Rare Earths and Escalating Geopolitical Tensions

Assessing U.S., Chinese, and EU strategies

- \rightarrow The global race for rare earths and critical minerals is intensifying as China maintains dominance and uses its leverage to exert influence, and the United States pursues an aggressive approach to increase access to resources overseas.
- → The EU has developed a strategy, but this is not a top priority for Europe for now, making the bloc more vulnerable to supply chain disruptions.

Introduction

Critical materials and rare earth elements have become central to 21st-century industrial competitiveness and geopolitical strategy. Once niche commodities, the global market has surged, doubling to \$320 billion in the past five years, with demand expected to double again by 2030.¹

These materials are essential for clean energy, defense technologies, electric vehicles (EVs), and AI systems, sectors that will determine economic and military power.² China dominates mining, processing, and refining, leveraging its control to advance its strategic interests. The United States is racing to secure supply chains, reshape industrial policy, and bolster economic sovereignty, while the EU is struggling to keep up.

Critical and rare earths and why they matter

The United States has deemed 50 minerals essential to the economy and national security, while the EU lists 34 critical raw materials that are important for its economy and are at risk of supply disruptions.^{3,4}

The United States and the EU recognize 17 rare earth elements (REEs), a group of chemically similar metallic elements. REEs have narrower supply chains and are often more difficult to extract, requiring more work to separate them from other minerals.

Aluminum and steel are key for solar panels and wind turbines. Lithium, cobalt, nickel, manganese, and graphite support rechargeable batteries. Copper and various rare earths are essential in solar panels, electronics, and AI technologies. Silicon is needed for photovoltaic panels, and graphite is used in lithium-ion batteries.

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Rising demand and global supply concentration

Demand is surging for these resources. Global demand for copper may double by 2035 to meet net-zero carbon emissions by 2050.⁵ U.S. data centers that support AI could require as much as 200,000 tons of copper per year.⁶ The EU demand for lithium batteries, which power electric and energy storage vehicles, will increase 12-fold by 2030.⁷

China has one-third of global rare earth reserves, produces 70 percent, processes nearly 90 percent, and refines over 91 percent of the worldwide supply.⁸

The United States, by contrast, has just one percent of global rare earth reserves and produces 11 percent of rare earths. It is either fully or 50 percent import-reliant for 41 of the 50 critical minerals. China is the top producer of 29 of these critical minerals.⁹

The EU's Green Deal goals rely on stable access to critical inputs for EVs, batteries, and wind turbines. However, Europe is more vulnerable than the United States. It relies heavily on imports: 97% of its magnesium comes from China, and 98% of borate from Turkey.¹⁰ It has no large REE mines and only one commercial-scale processing facility–in Estonia.¹¹ It has modest and underdeveloped reserves, the largest of which are in Spain, Portugal, and Finland.

The growing demand and geographic concentration create strategic vulnerabilities, exposing the United States and particularly Europe to potential supply chain disruptions.

Comparing strategic approaches

United States

The Biden administration focused on reshoring and diversifying supply chains by providing tax credits and funding for mining, processing, and R&D via newly adopted laws, and pursuing trade policies protecting domestic industry. It also negotiated bilateral agreements with allies and funded mining investment projects.

In his second term, President Trump has adopted a more aggressive approach: Signing an agreement with Ukraine and proposing a deal with the Democratic Republic of Congo, invoking emergency powers to fast-track domestic mining, and calling for the annexation of Greenland and Canada In his second term, President Trump has adopted a more aggressive approach: Signing an agreement with Ukraine and proposing a deal with the Democratic Republic of Congo to increase access to minerals, invoking emergency powers to fast-track domestic mining, and calling for the annexation of Greenland and Canada. In late April, he issued a controversial executive order to expedite permits for companies to mine in U.S. and international territorial waters.¹²

China

China's strategy dates to the 1970s, with decades of state-led investment in mining, refining, and downstream technologies. Today, industrial policy and state-backed financing maintain Beijing's grip on the market. It provides

The growing demand and geographic concentration create strategic vulnerabilities, exposing the United States and particularly Europe to potential supply chain disruptions subsidies and tax incentives for mining. State-owned enterprises act as companies and arms of state policy. It has also integrated rare earths into its broader industrial targets for EVs, semiconductors, and military tech. China has also pursued mining rights abroad in Africa, Latin America, and Southeast Asia, using state-backed financing to fund infrastructure-for-minerals deals. Chinese companies too flood markets with cheap supplies to drive out domestic competition. And since 2020, it has made export controls a key component of its economic statecraft.

European Union

The EU's nascent strategy is based on the green and digital transition, sustainability, and strategic autonomy. The Critical Raw Materials Act, adopted in 2023, and the European Raw Materials Alliance, launched in 2020, shape Brussels' approach. Europe has a centralized strategy, with clear targets and frameworks. It emphasizes environmental standards, recycling, reuse, and waste reduction in its processes. However, permitting is slowed by strict environmental standards and public resistance. It also has limited infrastructure and lags in midstream capacity.

Emergence as a geopolitical tool

U.S.-China tensions are escalating into a mineral trade war. After Trump raised tariffs on Chinese imports to 145% in April, China imposed export restrictions on seven key REEs and magnets, which are particularly important to the United States. China's response will protect its domestic industry while undermining U.S. competitiveness in key sectors. Trump responded with threats of further tariffs and directed the government to review U.S. supply chain vulnerabilities and the development of ways to increase production without relying on imports. Tariffs may raise input costs for U.S. manufacturers before alternative supply chains can be established. The United States faces long lead times for new mining and processing infrastructure.

The EU reality gap and policy recommendations

The race to secure critical and rare earths will define global power dynamics in the coming decades. Yet for now, the issue of rare earths and critical minerals is primarily a policy concern for the United States and China.

The EU has taken steps to reconfigure its critical mineral supply chains. However, it lags far behind. The EU should accelerate action, forge new alliances, and invest in resilient, sustainable supply chains before it falls too far behind. Rising prices, supply chain disruptions, or import restrictions will erode the EU's industrial competitiveness, energy security, and clean energy goals. U.S.-China tensions are escalating into a mineral trade war

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Source: U.S. Geological Survey.



Notes

- ¹ https://www.goldmansachs.com/insights/articles/resource-realism-the-geopolitics-of-criticalmineral-supply-chains
- ² https://www.ft.com/content/aa03e3b0-606d-4106-97dc-bac8ad679131
- ³ https://www.usgs.gov/news/national-news-release/us-geological-survey-releases-2022-list-critical-minerals
- ⁴ https://single-market-economy.ec.europa.eu/sectors/raw-materials/areas-specific-interest/ critical-raw-materials_en
- ⁵ https://www.spglobal.com/commodity-insights/en/news-research/latest-news/energytransition/071422-world-copper-deficit-could-hit-record-demand-seen-doubling-by-2035-s-pglobal
- ⁶ https://www.wsj.com/articles/ai-siphons-copper-supplies-needed-for-green-transition-8fef79e6
- ⁷ https://www.mckinsey.com.br/industries/automotive-and-assembly/our-insights/battery-2030-resilient-sustainable-and-circular
- ⁸ https://www.mining-technology.com/analyst-comment/china-global-rare-earth-production/
- ⁹ https://ca.rbcwealthmanagement.com/xiangzhou-kong/blog/4512911-The-New-Great-Game-How-the-race-for-critical-minerals-is-shaping-tech-supremacy
- ¹⁰ https://www.europarl.europa.eu/RegData/etudes/ATAG/2022/733586/EPRS_ATA(2022)733586_EN.pdf
- ¹¹ https://www.nytimes.com/2024/10/26/business/china-critical-minerals-semiconductors.html
- ¹² https://www.nytimes.com/2025/04/24/climate/trump-seabed-mining.html