

Perspective from  
**Franklin Templeton**  
**Franklin Equity Group**

# Why trade negotiations won't solve the US rare earth dilemma

July 2025



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## Key takeaways

- Beijing's recent temporary easing of rare earth minerals, and magnet restrictions does little to mitigate long-term vulnerabilities of US supply chains.
- China's vast ore deposits and rare earths processing dominance will likely continue to grant it significant leverage over the global economy, posing critical materials-sourcing risks for the United States and the rest of the world.
- Current and potential future rare earth export restrictions could severely impact critical industries such as autos, semiconductors, aerospace, defense and energy, underscoring the necessity for new critical mineral supply chain investment.

## Rare earths: short-term relief, long-term vulnerabilities

In recent negotiations, China has agreed to ease restrictions on rare earth minerals and magnets for six months. While this short-term truce helps to avert immediate supply chain disruptions, it fails to address the long-term vulnerabilities of the United States surrounding rare earths.

For over a decade, China has steadily expanded its control over the extraction and processing of vital metals and minerals. Today, China mines approximately 70% of the world's rare earth minerals and processes around 90% of them.<sup>1</sup> These minerals are essential for everything from fighter jets and electric vehicle (EV) batteries to nuclear reactor control rods and semiconductors. Leveraging this dominance, China's recent restrictions and outright bans on shipments of rare earths caused significant supply chain disruptions, exposing national security risks and creating ripple effects across multiple industries.

The United States has worked to reduce reliance on China for rare earth magnets and other essential inputs by prioritizing domestic production, exploring strategic partnerships, utilizing substitutes, and redoubling recycling efforts. However, achieving critical mineral independence may be a long and challenging journey for the United States and many other countries.

## Escalation of US-China Trade Restrictions

### Exhibit 1: Timeline of Persistent Trade Tensions Spanning the Biden and Trump Administrations



Source: Franklin Templeton.

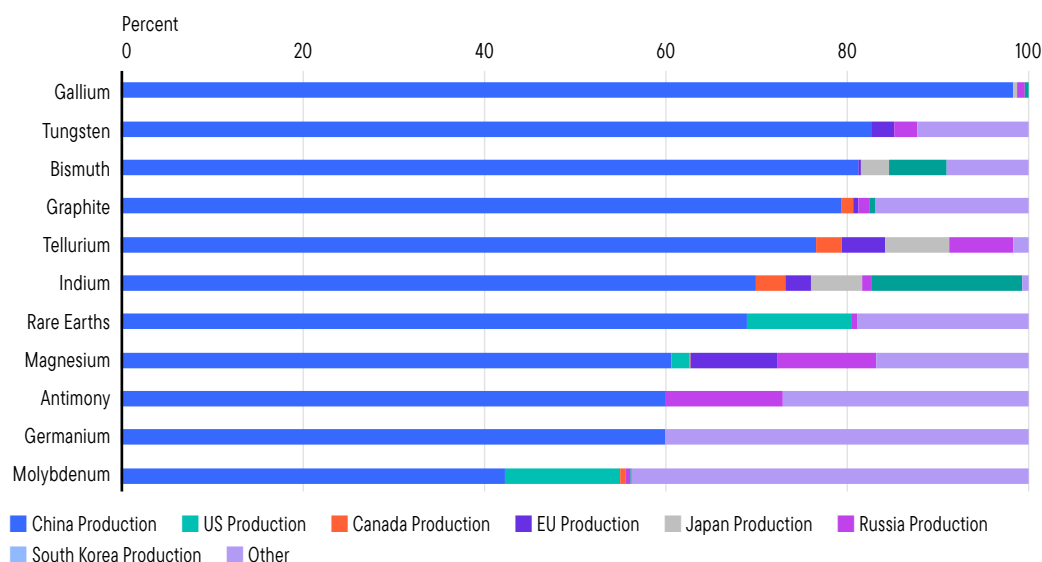
## China's rare earth dominance

China's rare earth production spans oxides, metals, alloys, permanent magnets and specialized compounds, with a particular emphasis on high-value products dependent on heavy rare earths.<sup>2</sup> China controls 99% of global heavy rare earth element (REE) processing, maintaining market share by offering this service at a fraction of the cost of global competitors. China's control over processing and refining solidifies its position as the leading supplier for industries ranging from clean energy to defense.

Despite intensified efforts by the United States, Australia, and other countries to break China's near monopoly, its dominance persists. Many industries rely on components from South Korea, India, Japan, and other allies, which China has also threatened to cut off, which would significantly hurt American firms.

## China's Dominance of Critical Minerals and Rare Earths

### Exhibit 2: China's Share of Global Production



Sources: US Department of the Interior / US Geological Survey. Mineral Commodities Summary. March 2025.

## Potential industry impacts of export restrictions

Ongoing export restrictions could have far-reaching effects, impacting products from mobile phones to satellite solar panels. Although critical minerals and REEs can constitute a small fraction of end-use products, production is often simply not feasible without them. Some examples of critical vulnerabilities across industries include the following:

**Technology:** The iPhone exemplifies the critical role of various minerals and REEs. Indium enables touch screens, REEs are vital for magnets in vibrations, speakers and cameras, titanium is used in vibration motors, magnesium in frames and casings, and gallium in power adapters. Beyond phones, gallium and germanium are pivotal for future semiconductor technology, allowing for smaller, more powerful chips.

**Aerospace:** Critical minerals and REEs are advancing space exploration, aircraft efficiency, and radar precision. Refined germanium wafers are essential for high-efficiency solar panels, powering satellites and lunar orbiters for NASA's Artemis Mars mission. Magnesium, with its high strength-to-weight ratio, is crucial for aircraft like the Airbus A380 and Boeing 787.

**Defense:** Over 78% of US military weapons rely on materials dominated by Chinese mining. Tungsten is indispensable for armor-piercing munitions, gallium has over 3,800 military uses, and destroyers and submarines require significant amounts of REEs.<sup>3</sup>

**EVs/Autos:** EVs depend heavily on critical minerals and REEs for components like motors, batteries and interior technology. Lithium-ion batteries contain about 28% graphite,<sup>4</sup> and heavy REEs like dysprosium and terbium are essential for the permanent magnets required for EV motors to operate at high temperatures.

**Renewable energy:** Several critical minerals and rare earths are essential for sustainable energy solutions. For example, cadmium telluride solar cells deliver 18% efficiency, converting 18% of sunlight into energy, compared to 6% for traditional silicon cells.<sup>5</sup> Molybdenum will be in high demand for wind turbines, nuclear reactors and geothermal plants, with an estimated annual requirement of up to 100 million pounds until 2050.<sup>6</sup>

### Secondary and Tertiary Impact of Trade War

#### Exhibit 3: Potential Impact of Import Restrictions

Materials	Technology / Semiconductors	Aerospace	Defense	EVs/Auto	Renewable Energy	Healthcare	Industrials
Antimony	●		●		●		●
Bismuth	●		●			●	●
Gallium	●	●	●	●	●	●	●
Germanium	●	●	●	●	●	●	
Graphite		●	●	●	●		●
Indium	●	●	●	●	●	●	●
Magnesium	●	●	●	●	●	●	●
Molybdenum		●	●		●	●	●
Tellurium	●		●		●		●
Tungsten	●	●	●			●	●
Rare Earths	●	●	●	●	●	●	●

● High Disruption Potential ● High/Med Disruption Potential ● Med/Low Disruption Potential

Source: Franklin Templeton.

## US efforts to mitigate supply-chain disruptions

Supply shock has driven up prices of “minor metals,” making many mining projects more economically viable. This has led to increased exploration, the reopening of dormant mines, and greater government funding support. The US Department of Defense has allocated over US\$400 million since 2020 to establish critical mineral supply chains domestically.<sup>7</sup>

Even with a near-term trade agreement in place, the United States has strong incentive to strengthen partnerships with resource-rich nations like Canada and Australia, as well as emerging developments in South America, Southeast Asia and Europe. However, many of these countries still rely on China for processing, making it extremely challenging to break China’s control over the mine-to-product pipeline.

Recycling has become a viable solution for certain critical minerals like tungsten, bismuth, and antimony, meeting significant portions of US demand. However, for most other minerals and rare earths, US recycling either contributes minimally to supply or lacks the necessary infrastructure. The European Union, China, and Japan have already invested in more robust recycling systems, causing the United States to often ship electronic waste overseas.

Finally, while substitutes for certain critical minerals and rare earths can alleviate some supply-chain challenges, many require compromise on properties or cost-effectiveness, or can result in inferior end products.

## Conclusion

Recent shortages highlight a significant challenge for US industry: developing a modern, tech-intensive manufacturing base without relying on inputs monopolized by China. Establishing vertically integrated supply chains will require considerable time and investment, leaving the United States and much of the world vulnerable in the interim.

Despite substantial efforts to enhance processing capabilities domestically or through reliable allies, estimates suggest that Washington is still at least a decade away from achieving critical mineral independence from Beijing. However, we are already seeing significant funding support from the United States and other governments for critical mineral supply chain development. This support includes loans, tax incentives and credits, strategic investments and government stockpiles, and it is already impacting investment in the mineral industry.

Near term, we believe trade cooperation—not retaliation—is paramount. Until other nations can achieve mineral independence from China, critical minerals represent mutual interdependence rather than unilateral dependence, making mineral weaponization a risky and ultimately self-defeating strategy for China.

The trade environment remains volatile, with both sides retaining the potential to escalate tensions at any time. Investors should carefully assess the profound implications of potential critical mineral restrictions on manufacturing and end products. The stakes are high, and strategic foresight is essential.

## Endnotes

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1. Source: "China currently controls over 69% of global rare earth production." Mining Technology. January 18, 2025.
2. Source: "Mineral Commodity Summaries 2025." US Department of the Interior, US Geological Survey. March 2025.
3. Source: "China's rare-earth mineral squeeze will hit the Pentagon hard." Defense One. April 23, 2025.
4. Source: "EV batteries need graphite—here's what's forecast for the vital mineral's supply." Electrek. June 9, 2022.
5. Source: "Cadmium Telluride Solar Cell—an Overview." ScienceDirect.
6. Source: "Moly 101." Moon River Moly.
7. Source: "Securing Critical Minerals Vital to National Security, Official Says." US Department of Defense. January 10, 2025.

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The government's participation in the economy is still high and, therefore, **investments in China** will be subject to larger regulatory risk levels compared to many other countries.

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