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Magnet Struggle: Strategic Moves in the Rare Earth Supply Chain

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The supply chain for rare-earth permanent magnets has become one of the principal fronts in strategic competition between the United States and China. China has used this supply chain as a strategic lever when necessary, while the United States increasingly views it as a structural risk with implications for industrial capacity and national security. As NdFeB (neodymium–iron–boron) magnets underpin the performance of electric vehicles, wind turbines, defense systems, and industrial motors, the competition surrounding this supply chain has moved beyond trade disputes and now reflects a series of deliberate strategic choices by both sides.

China's capacity to influence this sector stems from its resource endowment and the way it industrialized rare earths over time. Heavy rare earth elements (HREEs) such as dysprosium (Dy) and terbium (Tb) have long been produced primarily from ionic-adsorption clay deposits in southern China and Myanmar. Although HREE deposits have been identified in other regions, commercial-scale production remains concentrated in China due to economic, technological, and regulatory

constraints. Recognizing this early, China integrated mining, separation, alloying, and magnet manufacturing into a single value chain, consolidating its position.

The technical structure of permanent magnets further reinforces China's central role. NdFeB magnets rely principally on neodymium (Nd) and praseodymium (Pr), but high-performance applications—such as EV traction motors and wind turbines—require small quantities of Dy and/or Tb to enhance high-temperature resistance and coercivity. China's capacity to supply both light and heavy rare earths at scale has allowed it to anchor the global permanent-magnet industry in both quantity and quality.

The United States formally reassessed this structure through its Section 232 investigation into NdFeB magnets.[1] The 2022 report found that a substantial share of magnets used across U.S. and allied industries depended on Chinese alloys and finished magnets. It also noted that the supply of Dy and Tb—critical for high-performance magnets—was closely tied to China and Myanmar. This dependence was framed not simply as a cost issue but as a structural vulnerability with direct implications for national security and supply-chain resilience.

During the same period, China began institutionalizing its management of the sector. In 2023, it added key rare-earth separation and refining technologies to its export-control list. In 2024, controls expanded to include strategic metals such as gallium and germanium. By April 2025, China introduced licensing requirements for seven light and heavy rare earth elements and their oxides and alloys. In October 2025, the scope widened to include permanent-magnet products, related equipment, and raw materials—and some overseas-made finished products containing Chinese-origin rare earths were also brought under control. These steps reflect a shift toward managing the entire supply chain, from raw materials to downstream applications.[2]

The United States has adopted a range of measures to strengthen supply-chain resilience, but one in particular has drawn significant attention: a public–private price-floor mechanism guaranteeing a minimum purchase price for Nd and Pr. The initiative was designed to address a long-standing challenge in the rare-earth sector—the steep price declines that regularly undermine the economic viability of new projects.

Rare-earth prices have exhibited pronounced cyclicality for decades. Dysprosium surged during 2010–11, terbium during 2021–22, and neodymium reached over USD 330,000 per ton

1 US Department of Commerce, *The Effect of Imports of Neodymium-Iron-Boron (NdFeB) Permanent Magnets on the National Security* (Investigation Conducted Under Section 232 of the Trade Expansion Act of 1962, as Amended), 2022.
2 Cho and Choi, "US-China Strategic Competition over Rare Earths: Outlook and Policy Implications," KIEP World Economy Focus Vol.8, no. 41(2025).

in 2011 before falling and rising sharply again in 2021–22.[3] Praseodymium displayed similar patterns. These cycles generally follow a familiar sequence: supply disruption → price spike → new investment → Chinese low-price pressure → price collapse → project failure abroad → renewed concentration in China.

This cyclicality goes beyond normal commodity-market dynamics. China's repeated low-price responses have effectively turned the price cycle into a strategic instrument. Rather than functioning as a market disciplining mechanism, the cycle has operated as a form of *strategic foreclosure*, pushing overseas competitors out of the market and reinforcing China's dominance. In this sense, the problem is not the cycle itself, but the way it is amplified through strategic behavior.

The U.S. price floor seeks to moderate this cycle. After its introduction, Nd and Pr prices converged toward the guaranteed level of roughly USD 110,000 per ton, suggesting that the policy established a credible lower bound. A more stable price signal supports the economic viability of new projects, reduces financing uncertainty, and encourages investment in separation, alloying, and magnet facilities in allied countries. Over time, this may help lay the foundation for a more diversified and resilient supply chain outside China.

At the same time, a price floor is not a complete solution. A guaranteed minimum price can weaken market signals and may require sustained fiscal resources, which is why the United States structured it as a ten-year commitment. It stabilizes part of the supply chain but does not eliminate the underlying volatility of the broader rare-earth market.[4]

The rare-earth permanent magnet supply chain cannot rely on market mechanisms. Resource prices are inherently cyclical, and long-term industrial continuity requires buffers against volatility. The U.S. Nd–Pr price floor illustrates how policy intervention can help address structural weaknesses in a sector where private investment alone has repeatedly failed to sustain non-Chinese supply. Future debates will likely move beyond reducing dependence on China and focus instead on how to design supply-chain structures and policy instruments that can withstand price cycles and support durable capacity over time.KIEP

3 https://www.komis.or.kr/Komis/RsrcPrice/MinorMetals
4 The current mechanism covers Nd and Pr, while the most acute bottlenecks remain in HREEs such as Dy and Tb.