

China's rare-earth chokepoint is real and weaponisable, but it has a sunset, not an off-switch

*Sizing the leverage in the processing and
magnet links, the speed of the weapon, and the
2027–2030 squeeze the West must bridge*

The chokepoint is downstream, fast and asymmetric, but time-bounded, so size and bridge it

China's near-monopoly on rare-earth processing and magnets is a real, weaponisable chokepoint with a sunset, not an off-switch, so bridge the acute 2027–2030 squeeze.

- 1** The leverage is downstream and basket-wide: China refines 91% of rare earths, makes 94% of magnets and ~99% of heavy REEs, and leads refining of 19 of 20 strategic minerals, into demand set to triple to 176 kt by 2035.
- 2** The weapon has been fired and works in weeks: gallium –96.7%, antimony –97% with prices +2,600%, US magnets –22% over the year to Apr 2026, aimed harder at the US (100% yttrium-reliant) than Europe.
- 3** Defense is the sharpest edge: 78% of DoD programs are exposed and the heavy-REE stockpile is under one tonne, into a 1 Jan 2027 statutory ban that collides with a decade-long build-time.
- 4** The response is real but short · ~\$7.3B committed, 2035 non-China capacity only 50%/25%/<20% · yet China is now a net importer and its share dilutes to ~51%/76% by 2030–35, so bridge the 2027–2030 squeeze.

China's grip rises down the value chain · the chokepoint is in processing, not the ground

Situation. The West treats 'China controls 70% of rare earths' as a mining-share problem that new mines elsewhere can solve.

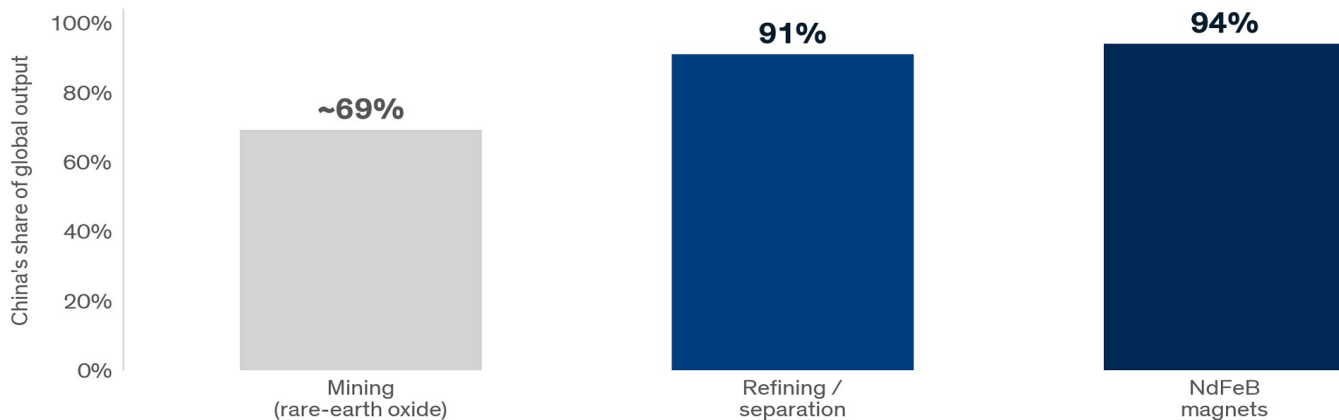
Complication. China's share rose down the chain · from ~70% of mining to 91% of refining to 94% of magnets · so the leverage shifted downstream, where it cannot be sourced elsewhere this decade.

Question. Where exactly does the leverage sit, and which links are contestable?

China's share climbs from ~70% of mining to 91% of refining to 94% of magnets

Exhibit 1

So what. Adding mines outside China does not touch the binding constraint, so a mining-led mitigation plan misses the chokepoint entirely.



Source: USGS · Mineral Commodity Summaries 2025, rare earths; IEA · Rare Earth Elements executive summary, 2024–2025.

¹ Refining is quoted 87–91% by boundary; the deck uses the IEA's 91%. The ~69% mining share is quoted via USGS digests as the MCS 2025 PDF is binary-encoded.

Heavy rare earths are a near-total monopoly • ~99% of dysprosium and terbium separation

Exhibit 2

So what. When the heat-resistant elements are a near-total monopoly, the highest-performance magnets the West needs are the ones it can least replace.

The heat-resistant elements — the ~1% of capacity outside China is the sliver the West has barely begun to contest

China ~99% of heavy-REE (Dy/Tb) separation

Light-REE mining is diversifying; heavy-REE separation is not — the elements that let magnets survive jet engines, missiles and EV motors

Source: IEA • Rare Earth Elements executive summary; Rare Earth Exchanges • heavy-element quandary, 2025.

This is not one mineral · China refines ~70% of a 20-mineral strategic basket

Situation. It is tempting to treat rare earths as a single contained problem with a single fix.

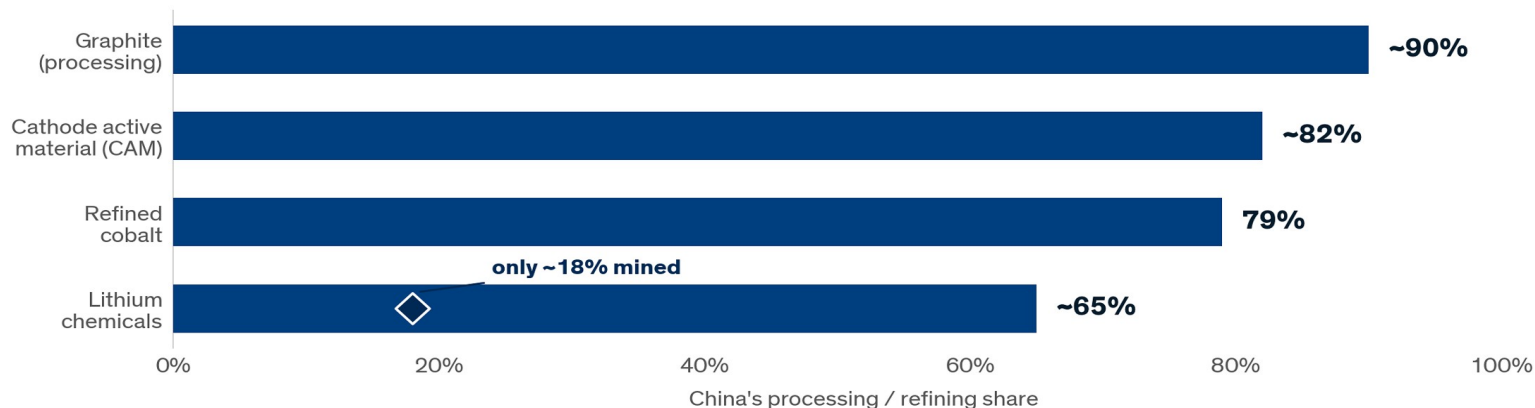
Complication. The pattern broadened across the basket · China's lead extended to refining of 19 of 20 strategic minerals · so the exposure widened from one element to a structural toolkit.

Question. How wide is the pattern, and which other inputs carry the same risk?

Battery minerals are a parallel chokepoint: graphite ~90%, cobalt 79%, lithium chemicals ~65%

Exhibit 3

So what. When the same mechanism repeats across batteries, a one-mineral mitigation plan under-covers the real exposure.



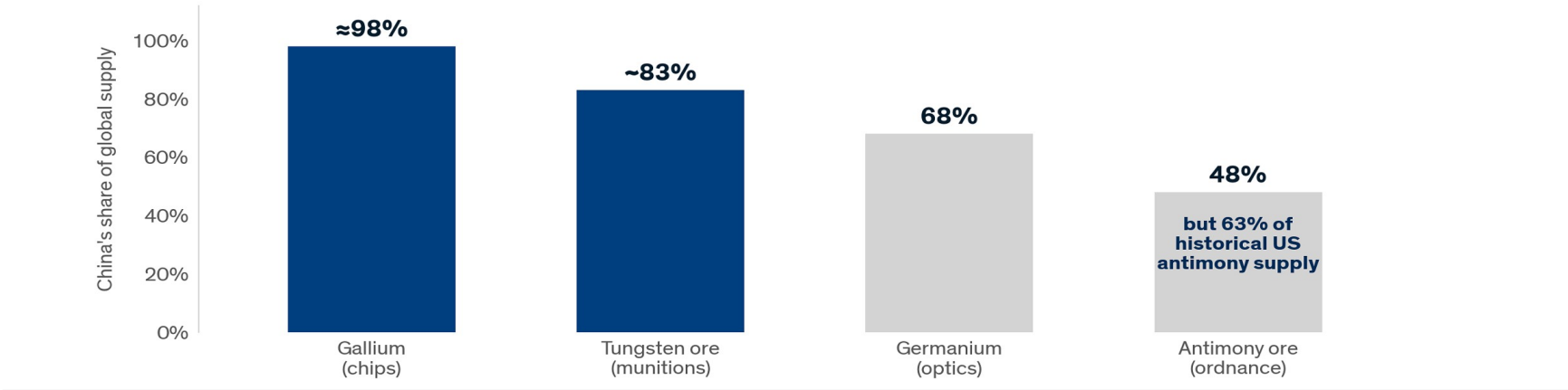
Source: US EIA · battery-minerals trade; Statista · refined cobalt share; Carbon Credits · lithium grip; Benchmark Mineral Intelligence · cathode output, 2024–2025.

¹ Cobalt 79% is refined output (131 kt); the mining-vs-refining gap is starkest for lithium (~65% refined vs ~18% mined).

The arsenal widens: China holds gallium 98%, germanium 68%, tungsten 83%, antimony 48% of ore

Exhibit 4

So what. The leverage is a whole arsenal of small, concentrated markets, so a single-element diversification effort leaves most of the risk uncovered.



Source: CSIS · beyond rare earths, gallium; USGS · Mineral Commodity Summaries 2025, tungsten; Quest Metals · antimony export ban, 2024–2025.

Demand is concentrating onto the scarce elements, not diversifying off them

Situation. A manufacturer might hope that efficiency and substitution would ease demand for the scarce elements over time.

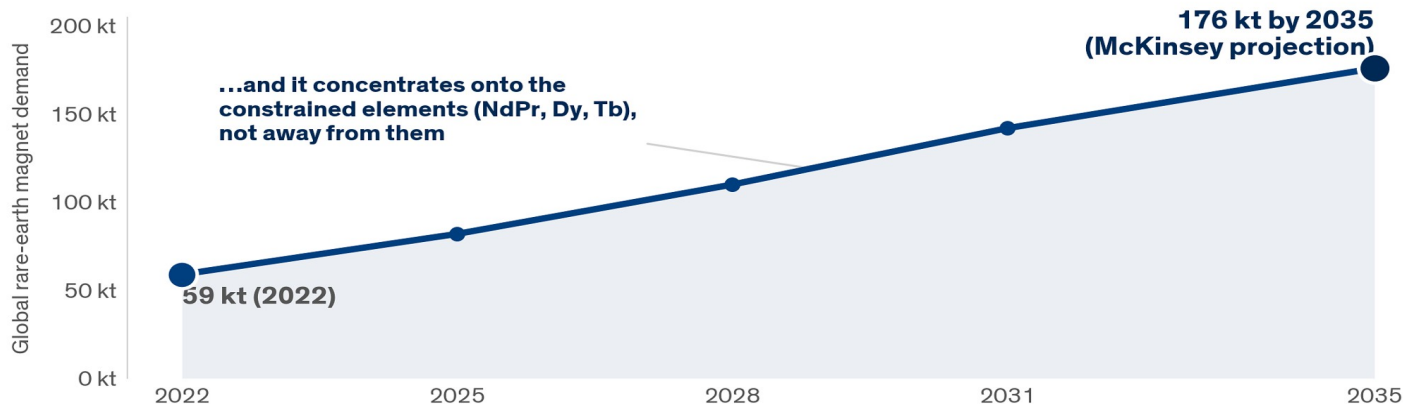
Complication. Magnet demand roughly tripled in the forecast · 59 kt to 176 kt by 2035 · as EVs, wind and robotics stacked onto the same NdPr, Dy and Tb, so demand climbed into the bottleneck.

Question. How fast is demand growing, and onto which elements is it concentrating?

Magnet demand is set to roughly triple · from 59 kt to 176 kt by 2035

Exhibit 5

So what. When the demand curve bends toward the constrained elements, the squeeze compounds rather than fades.



Source: Carbon Credits · demand to triple by 2035 (McKinsey); GlobeNewswire · magnet market 6.4% CAGR, 2025–2026.

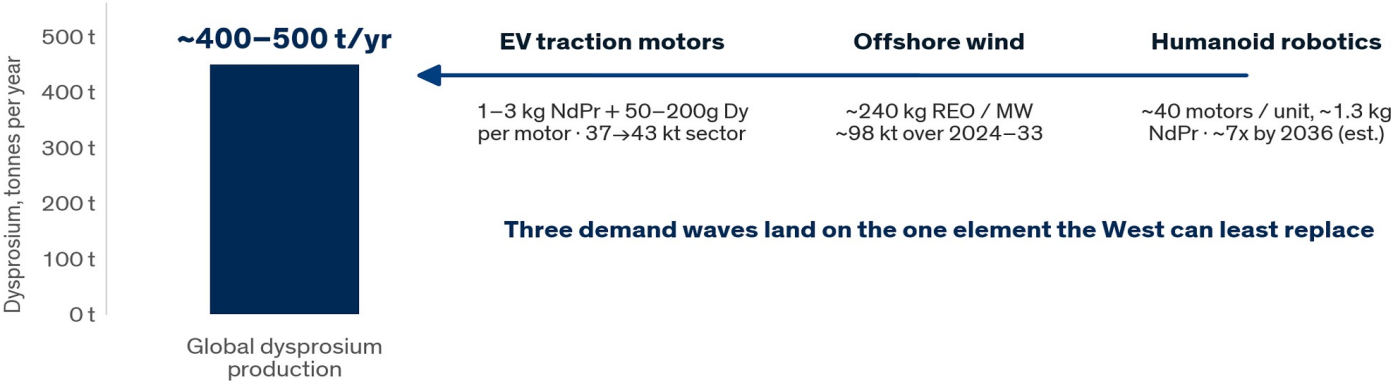
¹ 176 kt is a McKinsey projection; magnet-market-size estimates vary \$5.2–27.8B across firms, so the deck uses the commonly cited ~\$20–22B.

DEMAND IS CONCENTRATING ONTO THE SCARCE ELEMENTS, NOT DIVERSIFYING OFF THEM

Each EV motor needs 1–3 kg NdPr and 50–200g of dysprosium, against 400–500 t/yr of global Dy

Exhibit 6

So what. With Dy supply this thin and three demand waves landing on it, the constraint binds before any new mine or refinery can clear it.



Source: Visual Capitalist · rare earths in EV motors; Autonocion · per-motor NdPr and Dy (Benchmark); Rare Earth Exchanges · offshore wind turbines; IDTec hEx · robotics magnet demand; Morgan Stanley, 2025.

¹ Per-motor figures are a range, not a point estimate; the robotics ~7x-by-2036 figure is a trade-analysis estimate.

The chokepoint has been weaponised · an escalation ladder that cuts supply in weeks

Situation. For years the dependence was a latent risk, a card never played.

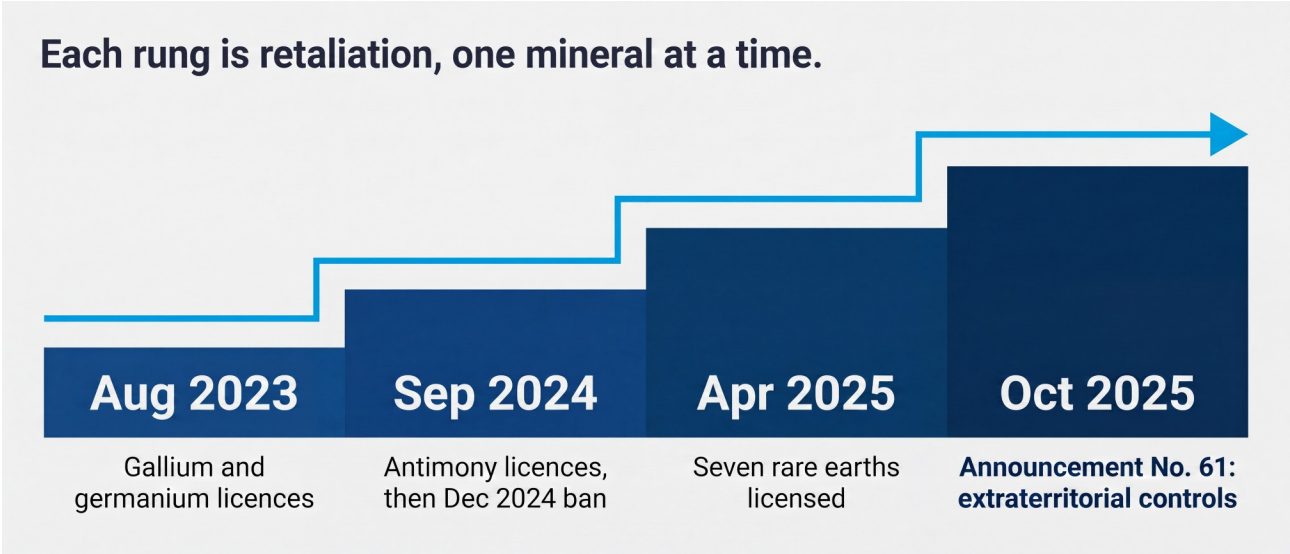
Complication. China rolled out export-licensing one mineral at a time · gallium and germanium, antimony, seven rare earths, then extraterritorial controls · so the latent risk became an active, escalating weapon.

Question. How fast does the weapon bite, and how precisely can it be aimed?

The escalation ladder: gallium and germanium, then antimony, then seven rare earths, then extraterritorial

Exhibit 7

A maturing toolkit Beijing can climb again · so the planning case is recurrence, not a single past event



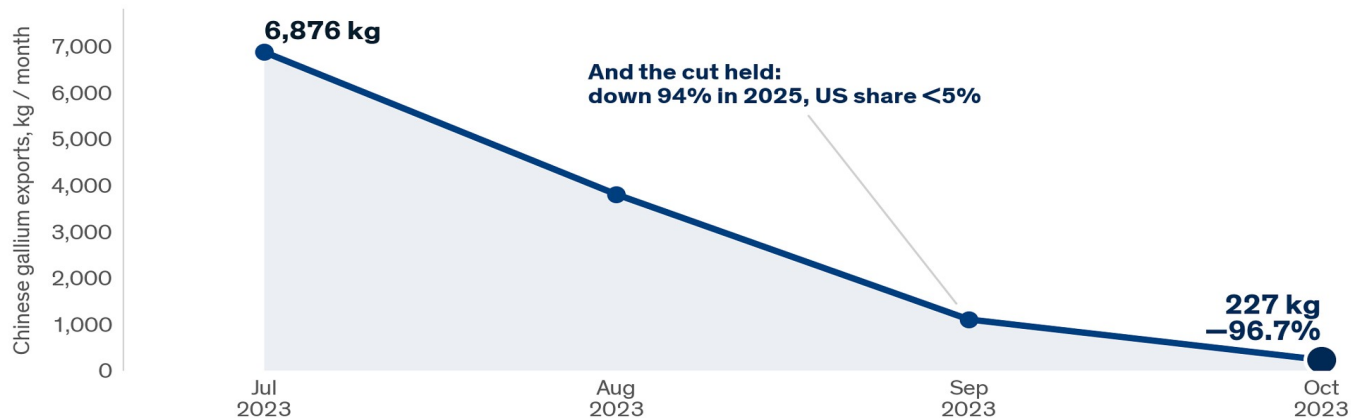
Source: IEA Policy DB · gallium and germanium controls; Global Trade Alert · antimony controls; CSET/Georgetown · MOFCOM Announcement No.61; CSIS · seven rare-earth restrictions, 2023–2025.

When the licence regime hits, exports collapse

90%+ within three months

Exhibit 8

So what. A qualified-supplier plan that takes quarters to stand up is too slow against a weapon that empties the cupboard in weeks.



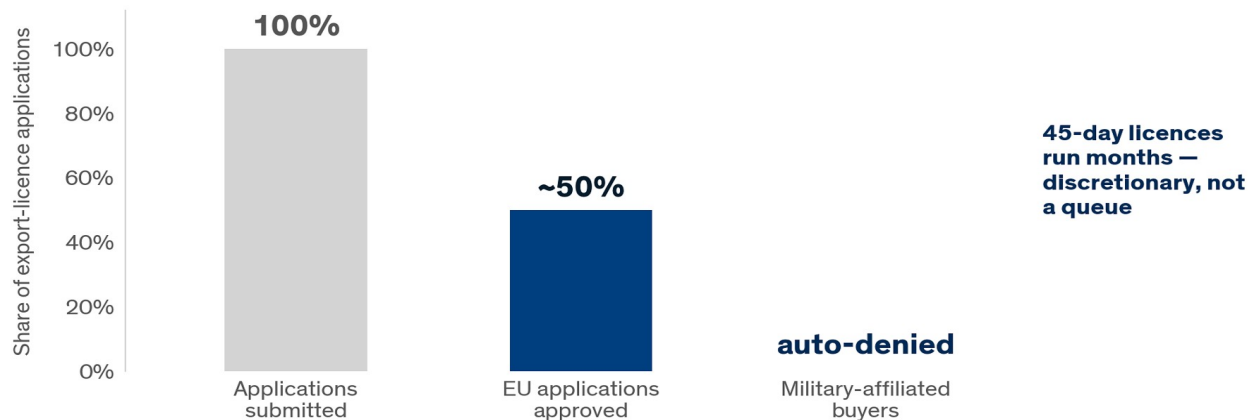
Source: CNN Business · gallium and germanium near-zero; CSIS · gallium truce not solved; Quest Metals · antimony export ban; OilPrice · antimony prices up 2,600%, 2023–2026.

¹ The gallium 6,876 → 227 kg collapse is corroborated across CNN customs, the USITC and CSIS; the 94%-in-2025 figure shows the cut held, not a one-month spike.

Even the rules ration supply • 45-day licences run months, ~50% EU approval, military buyers auto-denied

Exhibit 9

So what. Even 'open' trade is throttled at Beijing's discretion, so contracted volume is not assured volume.



Source: China Briefing • export-control impacts; White & Case • extraterritorial 50% rule; CSIS • restrictions threaten US defense, 2025.

¹ The ~50% approval rate is an EU-cited estimate; the 45-day window is the nominal processing time, which in practice runs months.

-93.3%

is how far China's magnet shipments to the US fell in a single month · the weapon, fired and aimed.

Western dependence is structural · and it is not uniform across the Atlantic

Situation. The West tends to assume its exposure is broadly similar and broadly manageable.

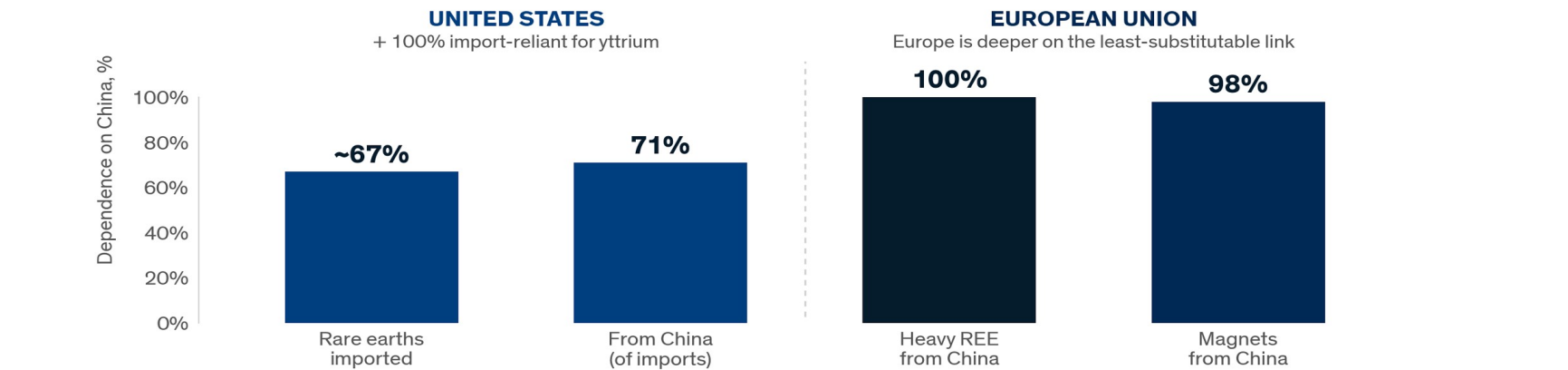
Complication. Dependence diverged by geography and by link · the US imports two-thirds of its rare earths while the EU takes 98% of its magnets from China · so the exposure is deeper and more uneven than a single headline implies.

Question. Exactly how exposed is each Western bloc, and what does the one precedent of escape tell us?

The US imports two-thirds of its rare earths, 71% from China; the EU is deeper on magnets

Exhibit 10

So what. A Western response has to be sequenced by where each bloc is most fragile, not run as one undifferentiated programme.



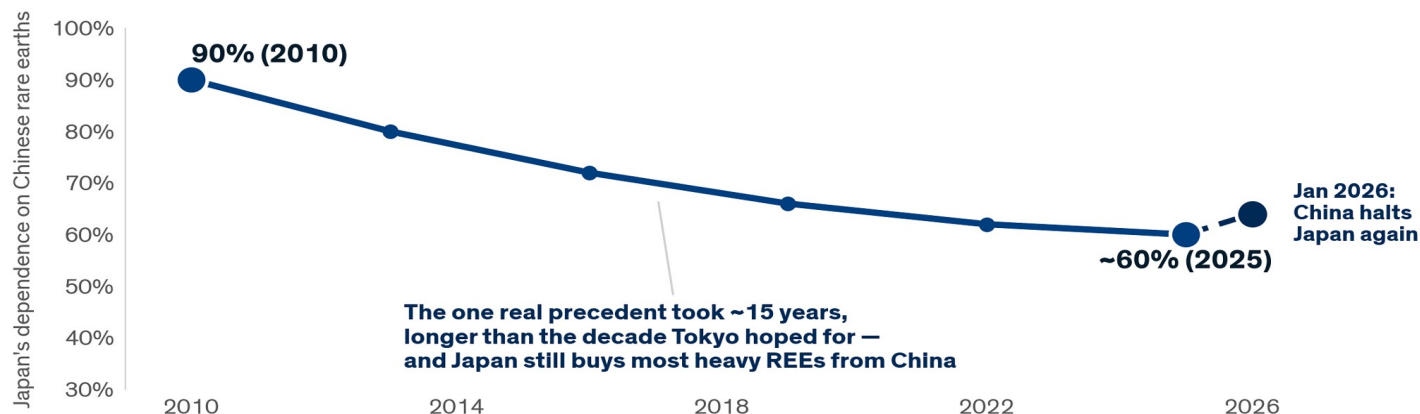
Source: CSIS · restrictions one year later; GAO · DoD critical materials; Statista · US rare-earth imports; European Parliament · EU export restrictions, 2024–2026.

¹ USGS' higher ~80%-in-2024 US import-reliance figure is cited but the PDF is binary-encoded and not re-verifiable; the deck leads on the CSIS ~67% / 71% read.

Japan cut its dependence from 90% to ~60% • but it took ~15 years, not a decade

Exhibit 11

So what. The realistic planning horizon for breaking dependence is a decade-plus, so the near-term task is bridging, not escaping.



Source: World Economic Forum · Japan rare-earth minerals; East Asia Forum · lessons from Japan's shock; Quest Metals · how Japan solved its dependency; FD
D · China blocks exports to Japan, 2023–2026.

¹ The best-case precedent is a ~15-year grind, not the decade Tokyo had hoped for; Japan still buys most heavy REEs from China.

Defense is the sharpest edge · months of supply against a 2027 deadline

Situation. Modern Western weapons systems were built on cheap, abundant Chinese rare-earth magnets nobody priced as a risk.

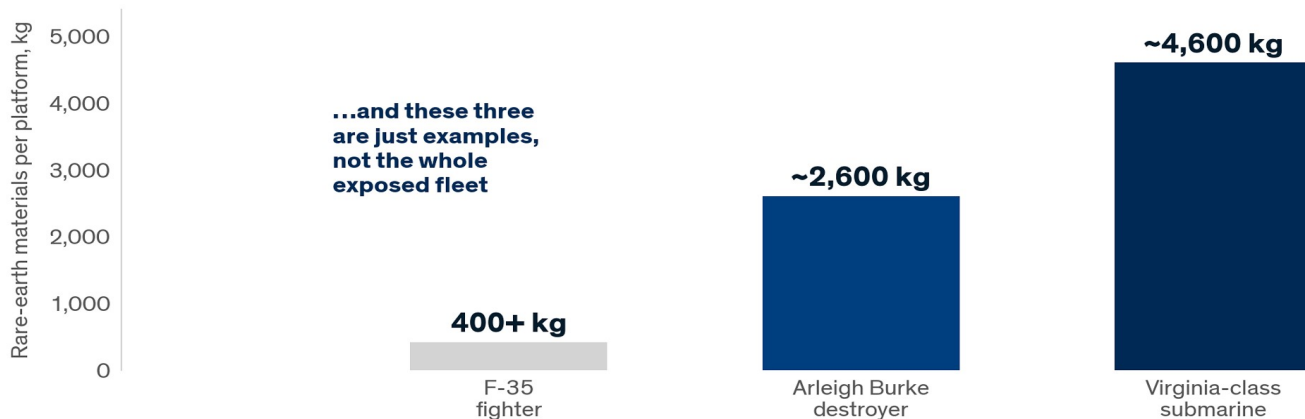
Complication. That dependence hardened into a vulnerability · 78% of DoD programs are exposed and the heavy-REE stockpile fell below one tonne · just as a 1 Jan 2027 statutory ban arrived, so the deadline now collides with the bottleneck.

Question. How exposed is defense, and what does the 2027 deadline run into?

Modern weapons are rare-earth-dense · an F-35 carries 400+ kg, and 78% of DoD programs are exposed

Exhibit 12

So what. This is not a niche problem; it touches most of the procurement base, which is why the stockpile gap matters.



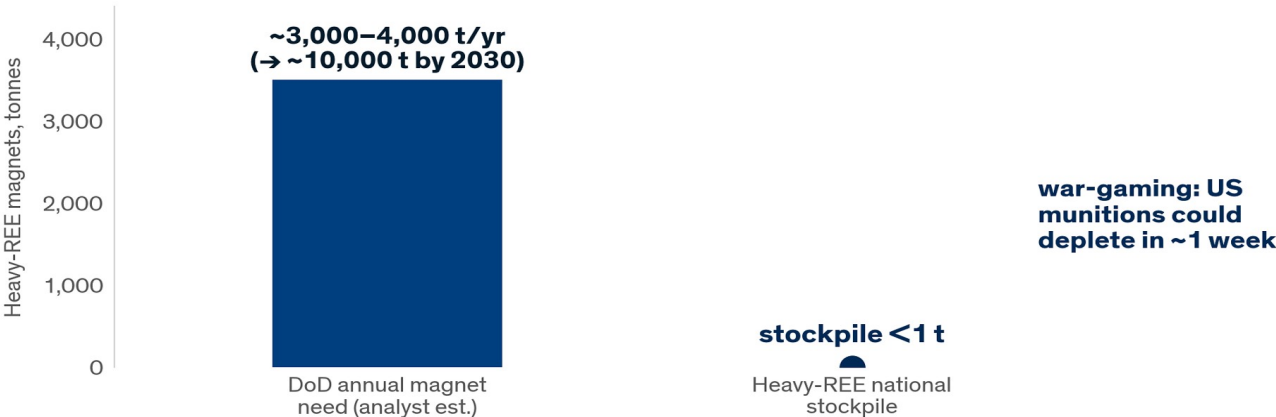
Source: Visual Capitalist · rare earths power US defense; Adamas Intelligence · rare earths in an F-35; Rare Earth Exchanges · REEs in defense technology, 2024–2025.

¹ Headline kg mixes magnets, alloys and coatings; pure elemental REE is far lower (~11–20 kg; ~23 kg SmCo), footnoted so the claim is not discredited on the well-known '920 lb' misquote.

The stockpile is under one tonne, and a 2027 ban collides with a decade-long build-time

Exhibit 13

So what. The deadline cannot be met on schedule, so the near-term answer is waivers, stockpiles and qualified suppliers, not a domestic build that arrives in time.



Source: Discovery Alert · US strategic defence rare earths; Transition Security · Mining for War; West Point MWI · minerals, magnets and military capability; Rare Earth Exchanges · Pentagon 2027 ban; Econofact · reducing import reliance, 2024–2026.

¹ The ~3,000–4,000 t/yr need and the stockpile split are analyst/inventory estimates not re-confirmable from primaries; the verified, load-bearing point is the unclassified ~1-week wartime-depletion war-game.

Scarcity has flipped the market

- the leverage now shows up in the price

Situation. Through 2024 rare earths were in a glut, with prices falling and the leverage latent.

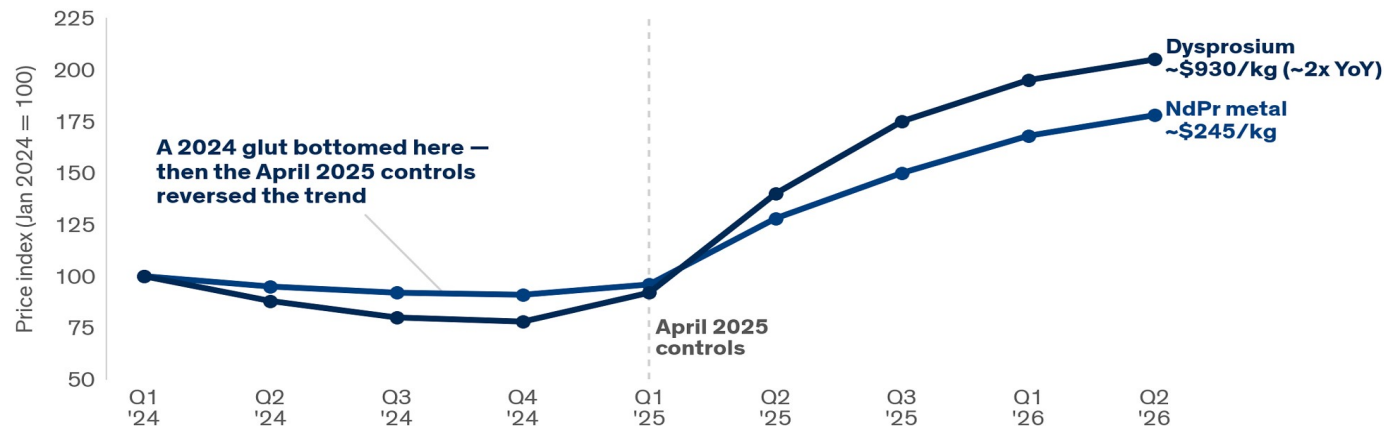
Complication. The April 2025 controls flipped the market · NdPr metal climbed to ~\$245/kg and dysprosium roughly doubled · so scarcity, not surplus, now sets the price.

Question. How far has the price moved, and how large is the macro stake behind it?

April 2025 flipped a glut into a spike • NdPr metal to ~\$245/kg, dysprosium roughly doubled

Exhibit 14

So what. The price is now a real-time gauge of the leverage, so it should be tracked as a risk signal, not background noise.



Source: Strategic Metals Invest · current prices (23 Jun 2026); Crux Investor · NdPr scarcity premium, 2024–2026.

¹ The ~\$245/kg is the Nd/Pr metal quote, distinct from the lower NdPr-oxide basis used for the 2024 baseline, so the move is read off a consistent basis.

Up to \$6.5T is exposed if fully implemented • but the realised hit so far is >\$1B/yr

Exhibit 15

So what. The leverage should be sized to the realised hit and a falling ceiling, not the headline \$6.5T, or the response will be mis-scaled.



Source: IEA • Rare Earth Elements executive summary; Mining.com • billion-dollar US GDP impact (Macquarie); Anderson Institute • export-control architecture, 2025–2026.

¹ Render \$6.5T greyed and tagged conditional; >\$1B/yr is the realised, load-bearing figure; the \$6.5T ceiling falls as alternatives scale.

The Western response is real and funded · and still years short of demand

Situation. Before 2025 the West had no funded answer to the dependence at all.

Complication. Capital and a working de-risking template arrived · ~\$7.3B committed and a \$110/kg MP Materials price floor · yet 2035 non-China capacity still covered only a fraction of demand, so funding rose but the gap stayed open.

Question. How much has been committed, and how far does it actually get the West by 2035?

Capital is flowing • ~\$7.3B committed • but the IEA says \$60B and a decade are needed

Exhibit 16

So what. The commitment is real but an order of magnitude short, so the near-term plan cannot rely on domestic capacity arriving in time.



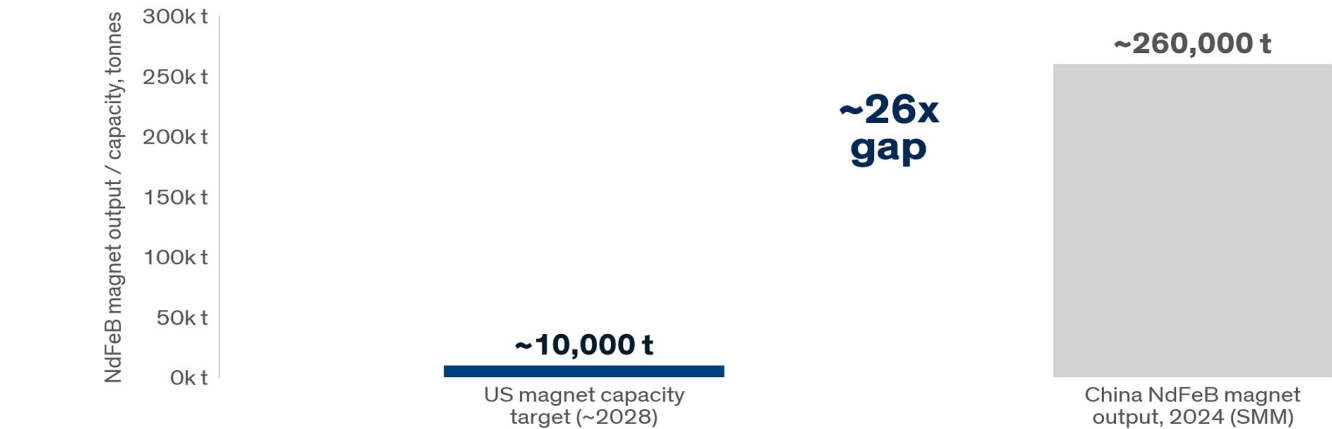
Source: CSIS · restrictions one year later; Brownstein (BHFS) · critical-minerals financing; IEA · projects and policies needed, 2025–2026.

¹ \$60B over 2025–2035 is an IEA estimate (refining ~half, magnets ~a third); the ~\$7.3B is committed US government capital across five agencies.

The de-risking template works: DoD took 15% of MP Materials with a \$110/kg floor and 7,000 t offtake

Exhibit 17

So what. The mechanism is sound and replicable, but even at its template best the West remains a fraction of Chinese magnet output this decade.



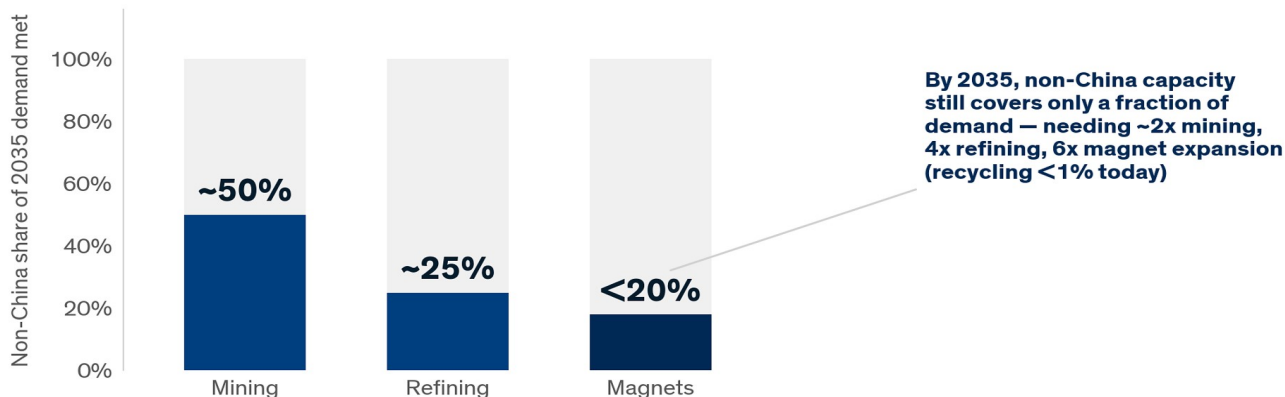
Source: MP Materials · DoD public-private partnership; Payne Institute · MP-DoD explainer; Fort Worth Report · \$1.25B magnet plant; CSIS · restrictions one year later; SMM · NdFeB production rising in 2024, 2025–2026.

¹ The China ~260,000 t is the documented SMM 2024 NdFeB output; the point is the ~26x order-of-magnitude gap, not a precise capacity number.

By 2035, non-China capacity covers only 50% of mining, 25% of refining, and under 20% of magnets

Exhibit 18

So what. The gap persists into the 2030s, so the response must be sized as a bridge, not a fix.



Source: Discovery Alert · supply-chain transformation 2026; Fluor · Iluka Eneabba refinery; Neo · heavy-REE separation in Europe; Tectonic Defense · Noveon \$215M Series C; IEA · Rare Earth Elements executive summary; Resource Recycling · US REE recycling scales up, 2025–2026.

¹ Non-China heavy-REE coverage is tighter still; the IEA does not publish a Dy/Tb-only figure. Recycling recovery is ~90%+ when achieved; the bottleneck is collection economics, not physics.

The lever has a sunset, not an off-switch · weaponising costs Beijing too

Situation. The natural conclusion from the gap is that the West is structurally stuck for the foreseeable future.

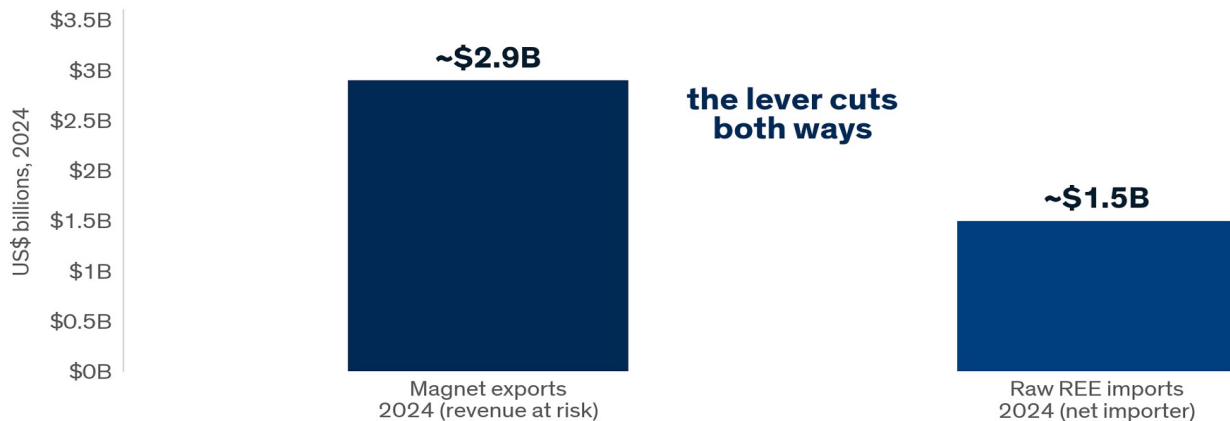
Complication. The leverage eroded from the other side · China became a net importer of raw rare earths, high prices spurred substitution, and the IEA's projection has its share diluting to ~51%/76% by 2030–35 · so the chokepoint's strength fell over time.

Question. How durable is the leverage, and what does that make the right response?

Beijing pays too · now a net importer of raw rare earths, forfeiting ~\$2.9B in magnets

Exhibit 19

So what. The truce is Beijing managing its own downside, so the leverage has a cost ceiling that limits how long it can be held.

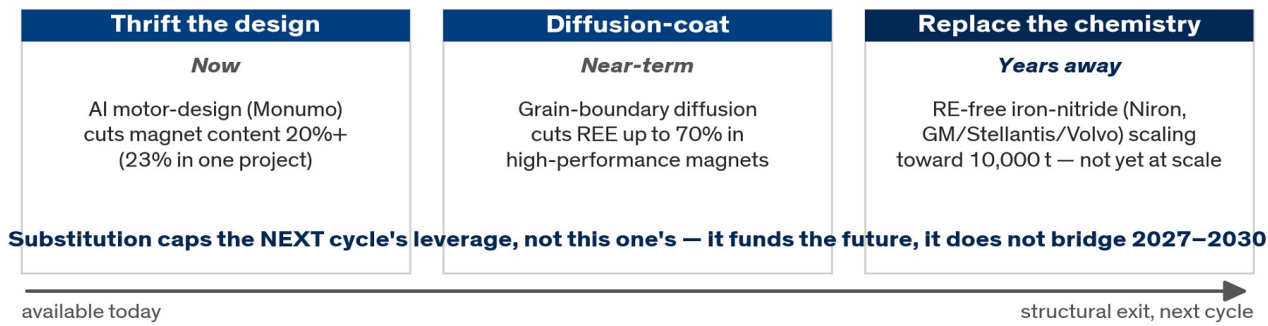


Source: RFF · Issue Brief 25–12, strategic game of rare earths; China Briefing · China's rare-earth dominance, 2024–2025.

Substitution is real but nascent · designs cut magnet content 20%+, diffusion up to 70%, RE-free years away

Exhibit 20

So what. Substitution is the structural exit but does not relieve the 2027–2030 window, so it funds the future rather than bridging the present.



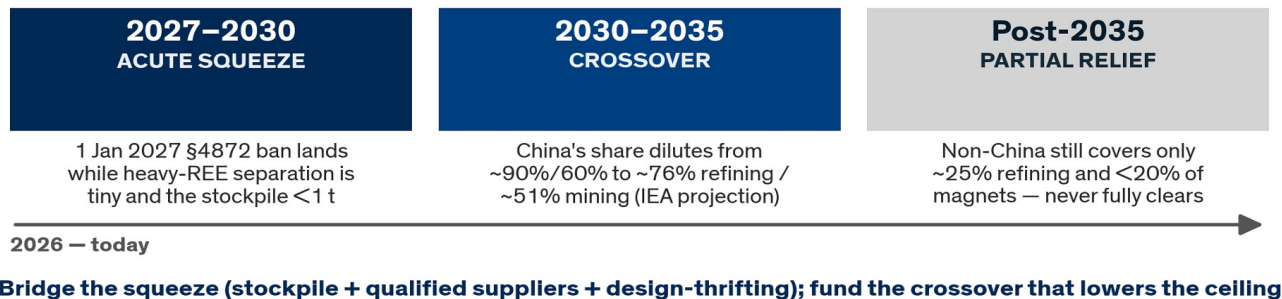
Source: Monumo · the magnet moment; Global Finance · breaking China's grip; New Atlas · GM-Niron clean-earth motor; IDTechEx · materials to replace rare earths, 2025–2026.

¹ Most pathways are pre-scale and timelines are forward estimates; IDTechEx's honest caveat is that substitute motors are 'years away,' so substitution caps the next cycle, not this one.

The decision is a timeline: an acute 2027–2030 squeeze, then a 2030–35 crossover to ~51%/76%

Exhibit 21

So what. This converts ‘how durable’ into ‘what to do, by when’ · tightest for ~3 years, easing partially through the early 2030s, never fully clearing this decade.



Source: IEA · Global Critical Minerals Outlook 2025; Global Finance · breaking China's grip; CSIS · gallium not solved by mid-2027, 2026.

¹ The 2030–35 shares are IEA projections; the chokepoint is tightest in the next ~3 years, eases partially through the early 2030s, and never fully clears this decade.

Bridge the 2027–2030 squeeze, fund the 2030s crossover, and size to the realised hit

China's near-monopoly on rare-earth processing and magnets is a real, weaponisable chokepoint with a sunset, not an off-switch, so bridge the acute 2027–2030 squeeze.

M o v e	O w n e r	W h e n	C o s t
Stockpile heavy REEs and qualified magnets for the 2027–2030 window, and qualify two-plus non-China suppliers per critical input	Supply-chain strategy lead	Before 1 Jan 2027	Stockpile + qualification spend
Fund design-thrifting and grain-boundary diffusion to cut magnet content 20–70%, and qualify a rare-earth-free backup chemistry	Engineering / R&D lead	2026–2029	R&D program budget
Co-invest in allied refining and magnet capacity under a price-floor mechanism (the \$110/kg MP template) for the 2030s crossover	Corporate-development lead	2026–2030	Capacity co-invest / offtake
Track NdPr and dysprosium prices, China's net-import trajectory and licence-approval rates each quarter as the leverage gauge	Market-intelligence analyst	Quarterly	Monitoring time

Bridge the acute 2027–2030 window and fund the 2030s crossover · the moves are sequenced, not competing.

THE ASK

*Size the leverage honestly: bridge a 2027–2030 squeeze, do not
assume a permanent stranglehold*
