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Critical Minerals: India's Supply Chain Diplomacy and the China Dependency Problem

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INTERVIEW ANGLE

"How should India balance its clean energy ambitions with the geopolitical risks of critical mineral dependency? What is the role of mineral diplomacy in India's foreign policy?"

WHY IN NEWS

India's National Critical Mineral Mission, launched in 2025 with a Rs 34,300 crore corpus, is gaining operational momentum as KABIL secures lithium agreements in Argentina and the Geological Survey of India completes critical mineral exploration — exposing a central contradiction in India's clean energy transition: the green economy requires minerals whose supply chains are controlled by the very geopolitical rival India is trying to reduce dependence on.

THE CORE CONTRADICTION

There is a paradox at the heart of India's energy transition. To move away from fossil fuel dependency — oil mostly from the Middle East, coal from domestic production — India must rapidly scale up electric vehicles, solar capacity, and battery storage. Yet doing so requires lithium, cobalt, nickel, graphite, and rare earth elements, whose mining and refining are overwhelmingly concentrated in China and a handful of other countries that may not be reliable long-term partners.

India's 100% import dependence for 10 critical minerals is not a temporary gap — it reflects decades of underinvestment in domestic geological exploration and the absence of a strategic mineral procurement policy. While China was quietly acquiring cobalt mines in the Democratic Republic of Congo in the 2000s and building lithium refining capacity in the 2010s, India was neither exploring its own territory systematically nor building overseas acquisition pipelines.

The NCMM is the corrective attempt. But its success depends not just on money — Rs 34,300 crore is a meaningful corpus — but on resolving structural bottlenecks that no single mission has fully addressed.

WHAT NCMM GETS RIGHT

The mission's architecture is sound in several respects. First, the creation of KABIL as a dedicated overseas acquisition vehicle — analogous to Oil India's overseas arm for petroleum — signals that mineral procurement is now treated as a strategic function of the state, not merely a commercial one. KABIL's Argentina agreement for lithium brine in Catamarca province, while modest (Rs 200 crore for exploration rights), establishes a diplomatic and commercial foothold in the Lithium Triangle at a moment when competition from China, Japan, South Korea, and the United States for these assets is intensifying.

Second, the Mineral Security Partnership membership brings India into a 14-nation coordinating architecture. For India, which has historically been reluctant to join US-led economic coalitions (it stayed out of the Indo-Pacific Economic Framework's trade pillar), MSP membership represents a pragmatic calculation: the alternative — continued dependence on Chinese-controlled supply chains — is a greater strategic risk than the entanglement costs of multilateral coordination.

Third, NCMM's recognition that recycling is not merely an environmental good but a supply chain strategy is important. India generates approximately 3.2 million metric tonnes of e-waste annually — third highest globally — yet recovery rates for lithium, cobalt, and copper from this waste stream are negligible. The Rs 1,500 crore Recycling Incentive Scheme is a first step toward a circular economy that reduces import exposure.

THREE STRUCTURAL PROBLEMS THAT NCMM CANNOT SOLVE ALONE

The Refining Gap

Acquiring mineral assets abroad does not secure supply. The Argentine lithium blocks that KABIL is exploring will eventually yield lithium carbonate or hydroxide — but India currently has no domestic lithium refining capacity. The processed material would need to travel through Chinese refining infrastructure (which controls ~65% of global lithium processing) before it becomes battery-grade material usable by Indian manufacturers. This is the same problem Japan and South Korea faced — and are now investing billions to resolve through domestic refining plants and strategic partnerships with Australian and Canadian processors.

NCMM allocates resources for domestic refining capacity, but building a greenfield refinery from scratch takes 5–7 years even with full regulatory support. India must simultaneously pursue interim supply arrangements with countries that already have refining infrastructure — Australia (lithium), Canada (nickel and cobalt), and the EU (rare earth processing through France and Germany) — even if those arrangements involve paying premium prices.

The State-Centre Jurisdictional Tangle

The Mines and Minerals (Development and Regulation) Amendment Act, 2025, which granted the Central Government exclusive authority over 24 strategic minerals — overriding state government auction rights — was a necessary but politically fraught step. Mineral rights had historically been a state subject under the Seventh Schedule, and the centralisation of strategic minerals created friction with resource-rich states like Jharkhand, Odisha, and Rajasthan.

The underlying logic is defensible: allowing state governments to auction critical mineral blocks to the highest bidder — potentially including Chinese-linked entities operating through third-country intermediaries — would be strategically irresponsible. But the Centre must accompany the revenue loss to states with adequate compensation mechanisms, or risk undermining the cooperative federalism that effective mineral governance requires. A clear revenue-sharing formula, transparently structured, would reduce state resistance and speed up exploration clearances.

The China Hedge — How Far Can It Go?

China's 2023 export controls on gallium and germanium, and its 2024 graphite restrictions, demonstrated its willingness to weaponise mineral dominance. India's exposure is acute: China processes ~90% of global graphite, and India's EV and battery sector has no short-term alternative for anode material.

Yet India cannot simply decouple from Chinese mineral supply chains without severe economic cost. Chinese companies like CATL and BYD are among the most advanced battery manufacturers globally. Any Indian EV or battery storage manufacturer that requires cutting-edge technology will, for at least another decade, need to engage with the Chinese battery ecosystem in some form — whether through technology licensing, joint ventures, or equipment supply.

The realistic strategic goal for India is not decoupling but managed diversification: reducing the share of Chinese-controlled minerals in India's supply mix from near-100% to perhaps 30–40% within a decade, while building domestic refining capacity and recycling infrastructure to provide a buffer in the event of supply disruption. NCMM, at its best, achieves this — not the complete independence that the political rhetoric sometimes implies.

WHAT INDIA'S MINERAL DIPLOMACY NEEDS

A dedicated geological intelligence function: GSI's 368 exploration projects are valuable, but systematic multi-year geological mapping of India's critical mineral potential — particularly for rare earth elements in Andhra Pradesh and lithium in J&K — requires a sustained institutional commitment that survives political cycles.

Strategic equity stakes, not just exploration agreements: KABIL's Argentina deal involves exploration rights, not equity ownership. The next step must be equity stakes in producing mines — the model China used most effectively in the DRC for cobalt. Argentina, Zambia, and Australia offer politically viable entry points.

A Critical Minerals Bank: Analogous to the Strategic Petroleum Reserve, India needs a mechanism to stockpile processed critical minerals — lithium carbonate, cobalt sulfate — against supply disruption scenarios. Even a 90-day stockpile would significantly reduce India's vulnerability.

Refining as a diplomatic tool: India's bauxite and titanium processing capacity, and its growing aluminium sector, give it something to offer partner countries in exchange for preferential access to their lithium and cobalt. A minerals trade framework that exchanges Indian processing capacity for partner-country raw material supply would strengthen the bilateral dimension of India's mineral diplomacy.

📌 FACTS CORNER — KNOWLEDGEPEDIA

NCMM — KEY DATA:

Launch: 2025; Ministry of Mines; corpus Rs 34,300 crore (2025-2031)

India 100% import-dependent: lithium, cobalt, nickel (plus 7 others)

KABIL: JV of NALCO + HCL + MECL; Argentina deal Rs 200 crore (Catamarca province)

Recycling Incentive Scheme: Rs 1,500 crore; target 40 kT minerals/year from e-waste by 2030

GSI: 368 critical mineral exploration projects completed in 3 years

MINERAL SECURITY PARTNERSHIP (MSP):

Members: 14 nations — India, US, EU, UK, Japan, South Korea, Australia, Canada, France, Germany, Italy, Norway, Finland, Sweden

Launched: 2022; US initiative

MINES AMENDMENT ACT 2025:

Central Government authority over 24 strategic minerals

Overrides state government auction rights for these minerals

CHINA DOMINANCE IN REFINING:

Graphite: ~90%; Lithium: ~65%; Cobalt: ~70%; REE: ~60%; Gallium: ~80%

2023: export controls on gallium + germanium

2024: graphite export restrictions

DRC cobalt: Chinese companies control ~70% of production

LITHIUM TRIANGLE:

Countries: Argentina + Bolivia + Chile; ~65% of global lithium reserves

J&K lithium discovery (2023): 5.9 million tonnes (quality unconfirmed)

INDIA MINERAL STRENGTHS:

Aluminium/Bauxite: 2nd globally; Mica: ~25% global production; Iron ore: 3rd globally

Titanium (ilmenite/rutile): significant deposits (Tamil Nadu, Kerala, Odisha)

Thorium: ~30% of world reserves

INDIA-AUSTRALIA CRITICAL MINERALS PARTNERSHIP (2022):

5 lithium security projects identified; ECTA signed 2022

OTHER RELEVANT FACTS:

India e-waste: 3rd largest globally (~3.2 MT/year)

Strategic Petroleum Reserve: ~5.33 MMT (~9.5 days consumption) at Vishakhapatnam, Mangaluru, Padur

PLI for Advanced Chemistry Cells (ACC): under Ministry of Heavy Industries; incentivises domestic battery manufacturing

China-Plus-One strategy: Japanese, South Korean, US companies diversifying manufacturing out of China — opportunity for India

Sources: The Hindu, Ministry of Mines, PIB

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