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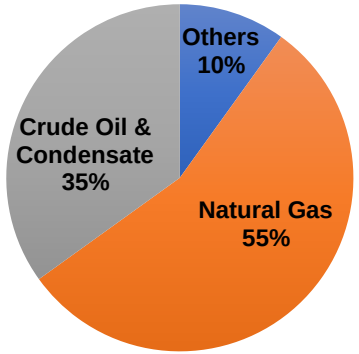
20 MAY 2025

Revitalising Malaysia's Mining Sector: Strategic Pivot Toward Rare Earths

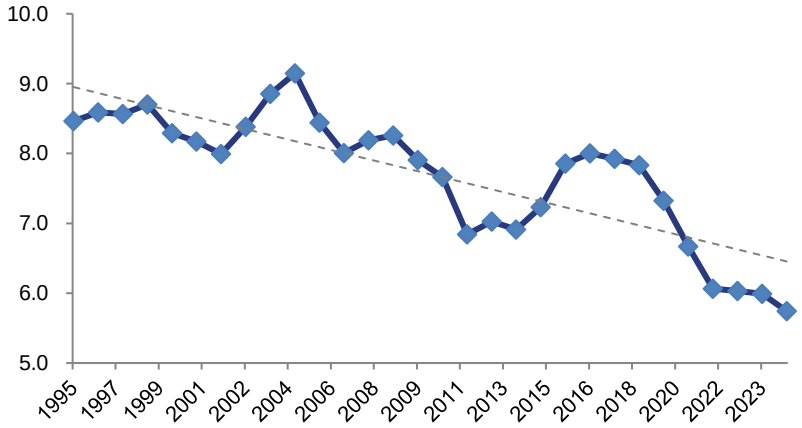
A Sector in Transition: Declining Hydrocarbons to Untapped Potential

Malaysia's **mining sector has long been anchored by oil and gas** — together accounting for over 90% of total output in 1Q2025, with gas at 55.1% and oil at 34.9%. This structural reliance, however, is facing clear headwinds. Crude oil and condensate output fell for the third consecutive quarter (-4.6% y-o-y), while gas production contracted by 2.2%. Official estimates suggest domestic gas reserves may be exhausted within 10–20 years, threatening Malaysia's position as a net energy exporter. These trends expose a strategic vulnerability: Malaysia's mining output is concentrated in a finite, declining resource base. Meanwhile, **non-hydrocarbon minerals — such as rare earth elements,** gold, tin, and bauxite — **remain underexploited**, despite growing global demand. As the world shifts toward green energy and critical mineral security, Malaysia has an opportunity to reposition its resource strategy. Responsibly unlocking its mineral wealth — especially rare earths — offers a path to sustainable, inclusive growth.

% Share of Mining Output



Crude oil production (Million barrel/day)



Sources: DOSM, CEIC, BMMB Economics

REE: Strategic and Commercial Rationale

Against the backdrop of declining hydrocarbon output and the urgent need to diversify Malaysia's resource base, **rare earth elements (REEs)** stand out as a critical frontier. Their importance extends well beyond mining — REEs are fundamental to the green economy, high-tech innovation, and national strategic resilience. REEs are indispensable to the production of:

- ✓ **Permanent magnets** used in electric vehicle (EV) motors, wind turbines, and industrial robotics;
- ✓ **Electronic components** such as semiconductors, displays, and sensors;
- ✓ **Strategic defense systems** including guidance, radar, and secure communications.

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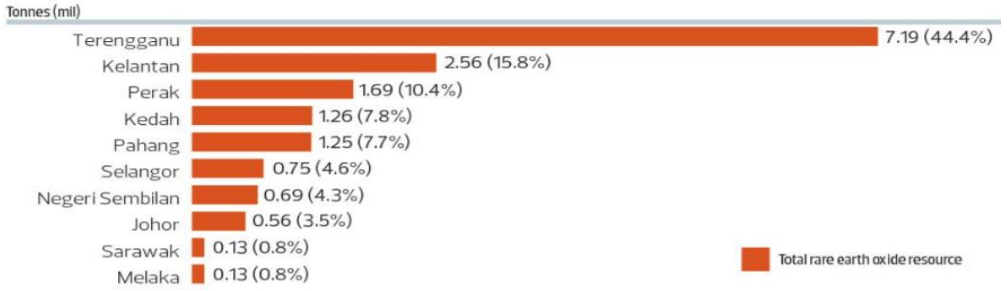
Malaysia's Strategic Advantage in the Global REE Landscape

Value Chain Activities for Developing NR-REE

Upstream	Mid-stream	Down-stream
• Mining REE	• Separation and processing • Malaysia is at this stage, e.g. Lynas	• Manufacturing for advanced materials • Targeted goal for Malaysia

Source: Malaysia's Return to Mining: Redeveloping Rare Earth Elements (REE), ISEAS

Distribution of Malaysia's REE Resources by State



Sources: Ion-Adsorption Clay Rare Earths Industry in Malaysia, NRES; The edge Malaysia

Global demand for REEs is projected to grow at a **5.4% CAGR, reaching USD 9.38 billion by 2028***, driven by the accelerating shift toward clean energy and digital technologies. Supply security is increasingly under scrutiny, as over 80% of global REE supply is currently controlled by China — exposing other economies to geopolitical risk and supply disruptions. Malaysia holds a unique position in the global REE value chain:

- It **hosts the only rare earth separation plant outside China**, operated by Lynas in Gebeng, Pahang — a critical midstream capability.
- It **possesses untapped ionic clay rare earth deposits** — found in states such as Kedah, Kelantan, Perak, and Pahang — that are geologically similar to southern China's, which dominate global supply.
- Its **political stability, regulatory clarity, and proximity to regional electronics hubs** (e.g., Penang, Singapore, and Taiwan) position it as an ideal location for downstream integration.

From a geological perspective, **Malaysia's ionic clay deposits offer several advantages**: they are lower in radioactive content, easier to extract, and more environmentally manageable than hard rock sources — making them highly attractive for sustainable development. Recognising this, the government has designated REEs a **"strategic mineral"** under the National Mineral Industry Transformation Plan (2021–2030) and reinforced its industrial importance in NIMP 2030. A **rare earth export ban on raw materials**, announced in 2023, further signals intent to develop a full value chain, from upstream extraction to downstream manufacturing (e.g. magnet production).

*Source: Rare Earth, An Invaluable Element for Malaysia, MIDA

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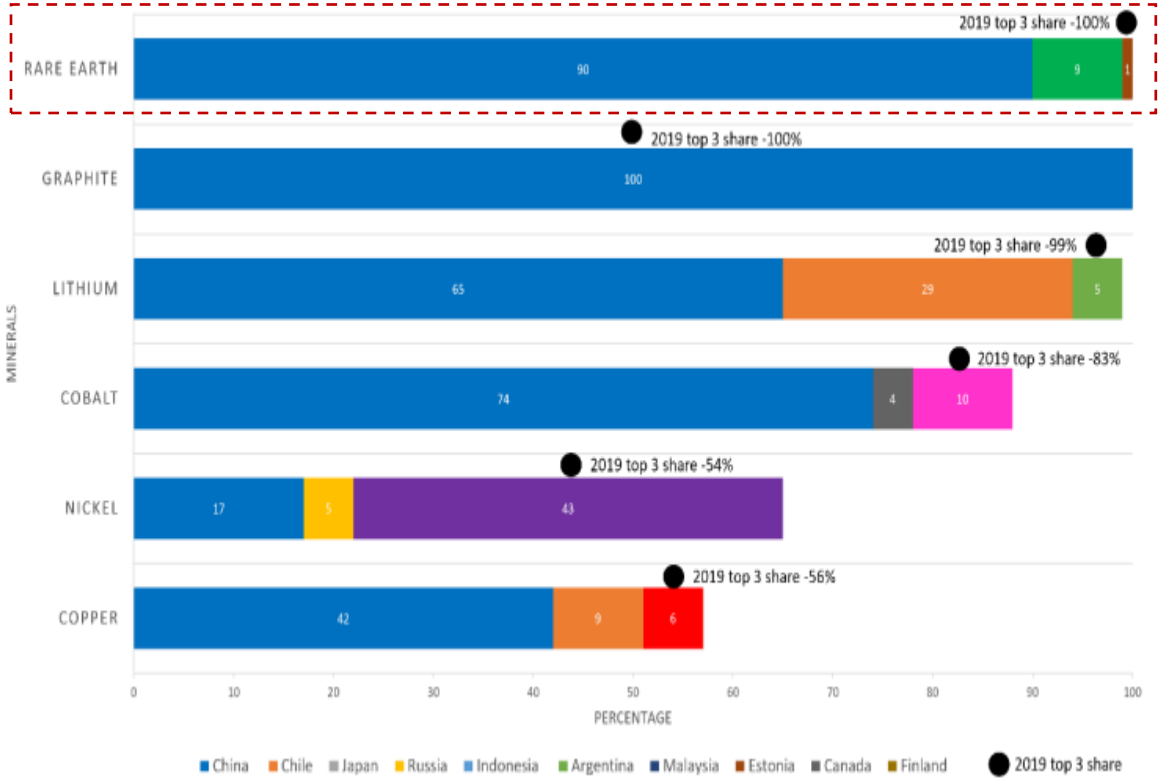
Moving beyond a midstream transit role is key for Malaysia to maximise value creation at home

Value Chain Positioning: Midstream Strength, Upstream Potential, Downstream Ambition

- Malaysia's current rare earth value chain is heavily **midstream-centric** - Lynas Malaysia operates the world's only large-scale separation plant outside China in Gebeng, Pahang. The facility imports REE concentrate from Australia, processes it via cracking and leaching, and exports separated oxides (e.g. NdPr, lanthanum, cerium) to global buyers, mainly in Japan and South Korea.
- **Upstream** mining remains nascent, despite promising ion-adsorption clay (IAC) deposits in Kedah, Perak, Kelantan, Pahang, and Terengganu — similar to southern China's geology. These clays are prized for: (i) hosting medium to heavy rare earths (e.g. dysprosium, terbium); (ii) low radioactive content, which eases environmental concerns; (iii) simple extraction methods via leaching, reducing capital and environmental costs.
- **Downstream, Malaysia lacks manufacturing capacity** for high-value REE-based products such as permanent magnets for EVs and turbines, catalysts and polishing powders for electronics, and alloy materials for defense and aerospace applications.

In essence, while global demand is booming, Malaysia **must move beyond a midstream transit role to capture more value domestically.**

Share of top three producing countries in processing of selected minerals (Last updated 11 Jul 2023)



Sources: Malaysia's Return to Mining: Redeveloping Rare Earth Elements (REE), ISEAS

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Enabling Environment and Forward Prospects

Malaysia's rare earth development agenda is **supported by regulatory ecosystem** that prioritizes strategic value creation, sustainability, and national interest. The NIMP 2021–2030 designates non-radioactive rare earths as "strategic minerals," with targets set for value chain development, investment attraction, and enhanced GDP contribution.

To ensure responsible development, the government has introduced a federal-level standard operating procedure (SOP) for rare earth exploration and mining. Regulatory oversight is anchored by:

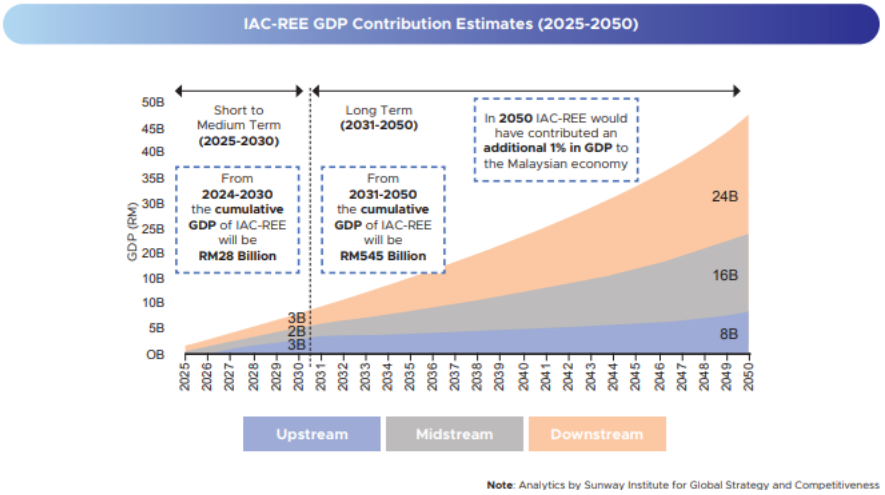
- **The Atomic Energy Licensing Board (AELB)** for radiation risk and licensing compliance;
- **The Department of Environment (DOE)** for leaching operations and waste management;
- **Mandatory Environmental Impact Assessments (EIA)** and **radiation baseline studies** for project approvals.

Malaysia's rare earth framework signals strong investor readiness — favouring responsible projects that support industrial growth, supply chain integration, and inclusive development.

For the financial sector, **Malaysia's rare earth push opens meaningful opportunities** — from **financing upstream and midstream activities to supporting joint ventures and state-linked initiatives**. There is scope to develop ESG-aligned, Shariah-compliant solutions tailored to mining SMEs, while offering strategic structuring and advisory support. As the country repositions its mining sector, rare earths offer a rare blend of national priority and long-term commercial potential.

REE Industry: GDP Contribution

By 2030, the industry would have the potential to generate **24,800 jobs and contribute RM8 billion to the national GDP in 2030**, with a **cumulative GDP value of RM28 billion from 2025 to 2030.** It is envisaged that with the establishment of the REE ecosystem, it can contribute close to RM48 billion to GDP in 2050. The sustained development of the ecosystem between 2025 and 2050 is expected to contribute approximately **RM573 billion t**o the Malaysian economy.



Sources: Ion-Adsorption Clay Rare Earths Industry in Malaysia, NRES

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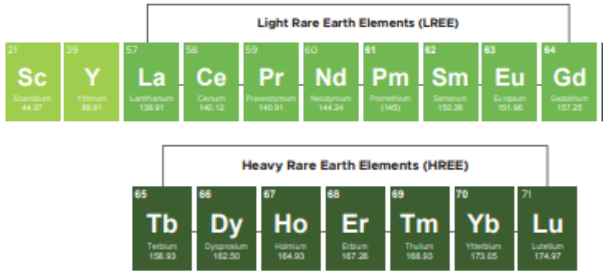
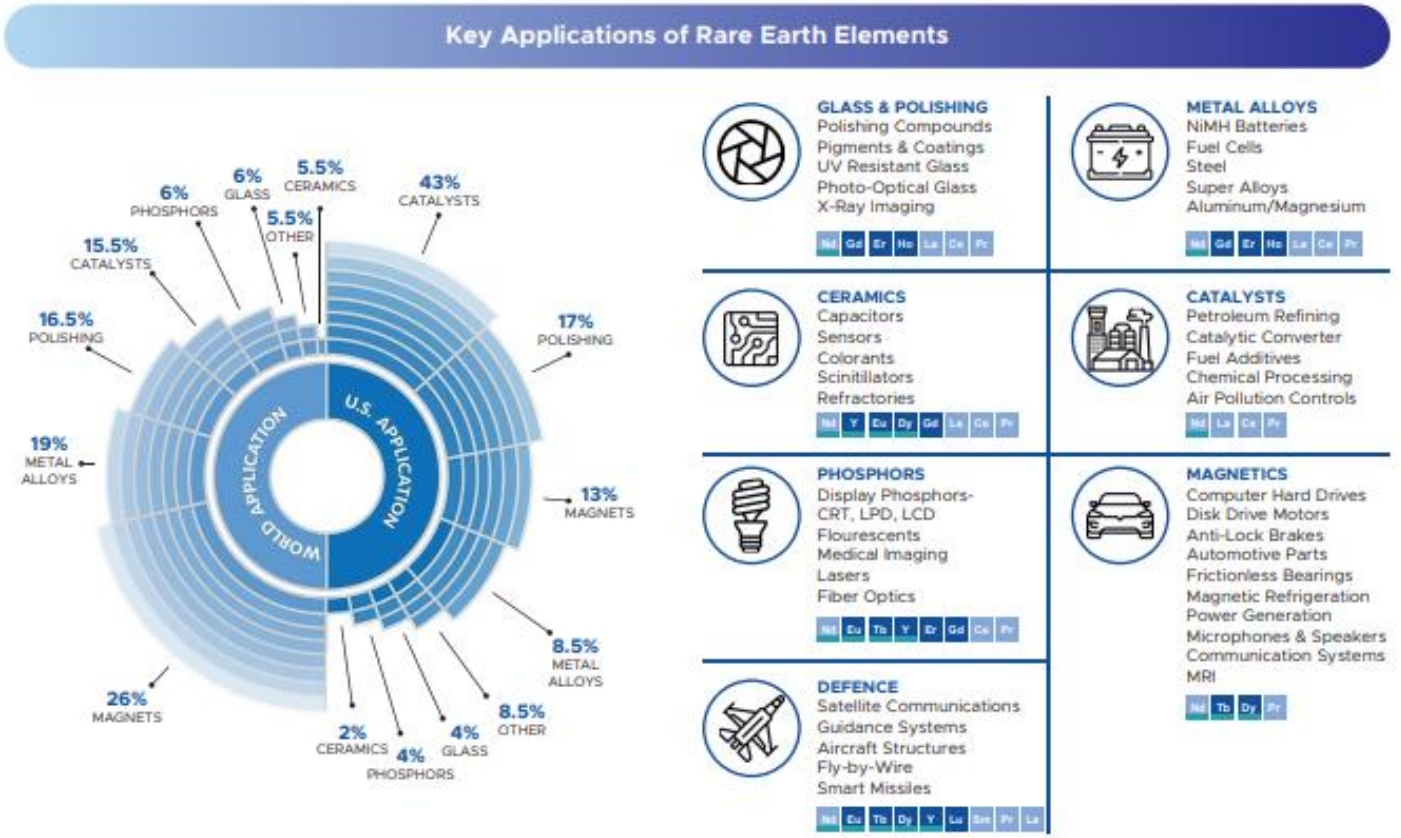
Appendix: REE at a glance

Rare Earths refer to a group of 15 elements (REE) that belong to the Lanthanide series. Upon including Scandium and Yttrium, Rare Earths comprise of 17 critical elements.

Described as technology metals, Rare Earths are among the most resource-critical raw materials. Despite their highest economic importance, Rare Earths feature a high supply risk with the supply chain being currently dominated by China for the production of super-magnets used in electric vehicles (EV), wind turbines, consumer electronics, and most military hardware.





Sources: Ion-Adsorption Clay Rare Earths Industry in Malaysia, NRES

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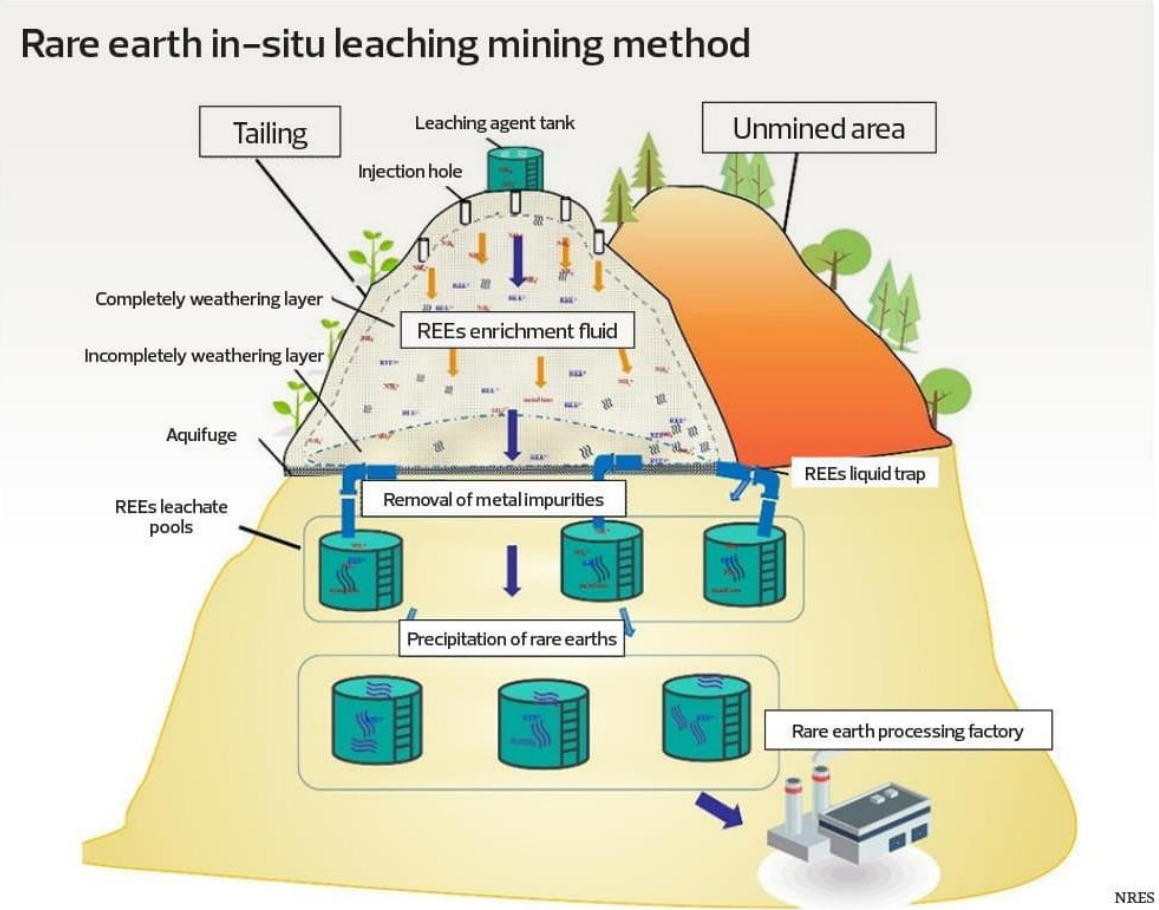
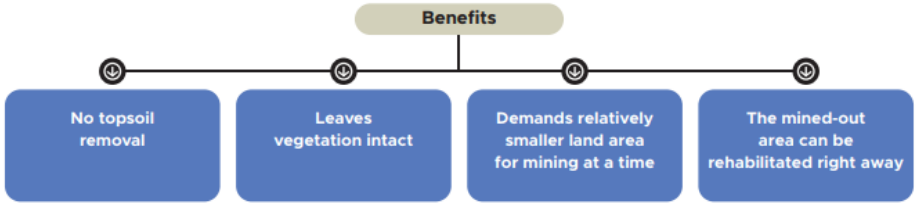
Appendix: Extraction of REE

REE leaching refers to the **process of extracting rare earth elements (REE) from ore using a chemical solution**. This is a key part of rare earth processing, especially for ion-adsorption clay deposits, which are commonly found in countries like China and potentially in Malaysia.



In-situ Leaching (ISL) is a process of injecting leaching solution directly into the clay deposit underground. The REEs are dissolved in place and then pumped out.



Sources: Ion-Adsorption Clay Rare Earths Industry in Malaysia, NRES

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Appendix: Key players & stakeholders* in Malaysia's REE Sector

Agency / Ministry	Role
Ministry of Natural Resources and Environmental Sustainability (NRES)	Leads REE policy, licensing, and environmental oversight. Formerly known as KeTSA.
Department of Minerals and Geoscience Malaysia (JMG)	Key agency for geological surveys, mineral mapping, and licensing of mining exploration.
Department of Environment (DOE)	Evaluates Environmental Impact Assessments (EIAs) and monitors compliance with environmental regulations.
Malaysian Investment Development Authority (MIDA)	Promotes FDI in REE downstream industries, including magnet manufacturing and green tech.
Malaysian Nuclear Agency (MNA)	Ensures compliance with radioactive material standards (for deposits with thorium traces).
State Governments (e.g. Perak, Kelantan, Terengganu)	Grant land-use approvals and monitor compliance at the local level. Each state has authority over land and mineral resources.
Ministry of Investment, Trade and Industry (MITI)	Coordinates strategic development under the NIMP 2030 framework.

Company / Entity	Role
MCRE Resources Sdn Bhd	A local firm piloting non-radioactive REE extraction in Perak (Kenering) with state backing.
Aras Kuasa Sdn Bhd	A Pahang-based mining company involved in rare earth exploration and extraction.
Ansarcomp Global Synergy Sdn. Bhd.	A company with deep technical expertise in sustainable rare earth mining.
LYNAS Malaysia Sdn Bhd	While focused on processing of LREEs in Gebeng (imported from Australia), Lynas remains a major REE player in Malaysia.
Malaysian Rare Earth Corporation (MREC) (proposed)	A potential government-linked entity under study to oversee strategic REE development.

Note: non-exhaustive list and extracted from various websites

Sources: Various news and websites, BMMB Economics