



Rare Earth Elements Overview

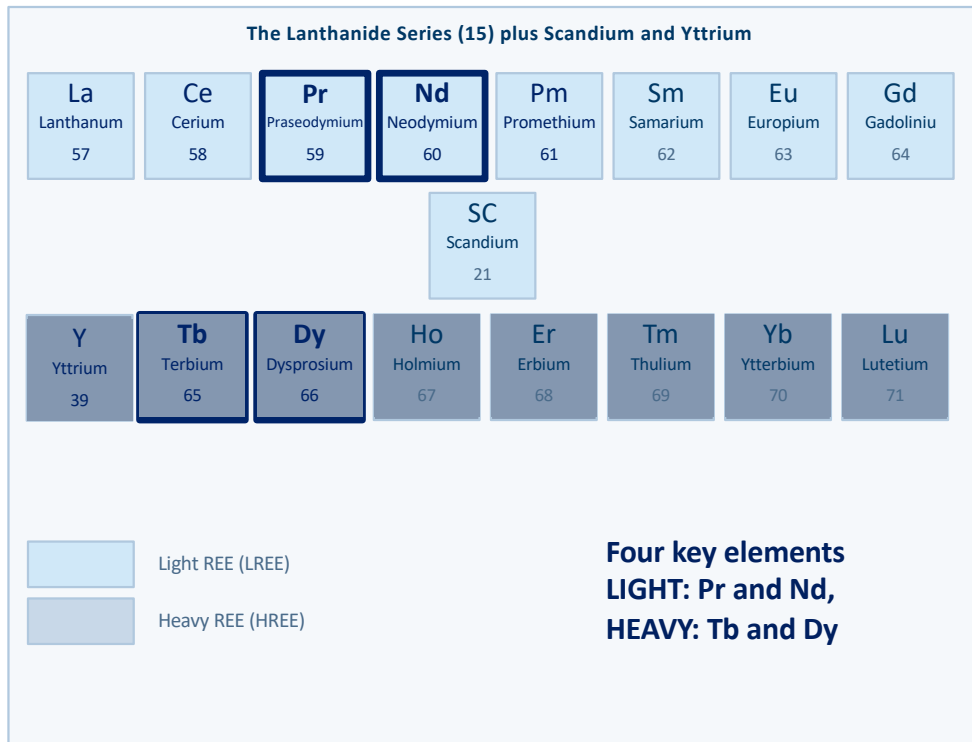
Asia Clean Energy Forum, 9 June 2026



Solving Complex
Challenges Together

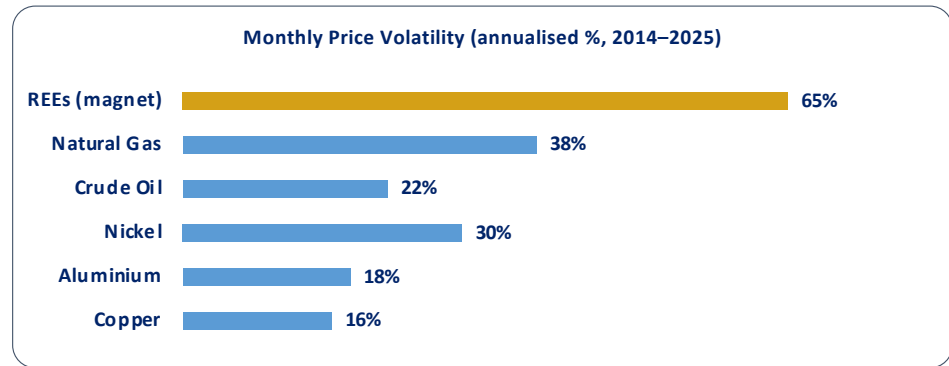
Rare earth elements : What are they? Why are they important?

What are Rare Earth Elements (REE)?



Points of interest

- 1 **Despite their name, they are not rare. However, finding in concentration and processing are key to economic viability**
- 2 **Individual separation is very difficult, and Intellectual Property is a competitive advantage**
- 3 **A small group of REEs (Nd, Pr, Dy, Tb) drive most of the value, primarily through permanent magnets**
- 4 **Prices are volatile compared with other commodities**



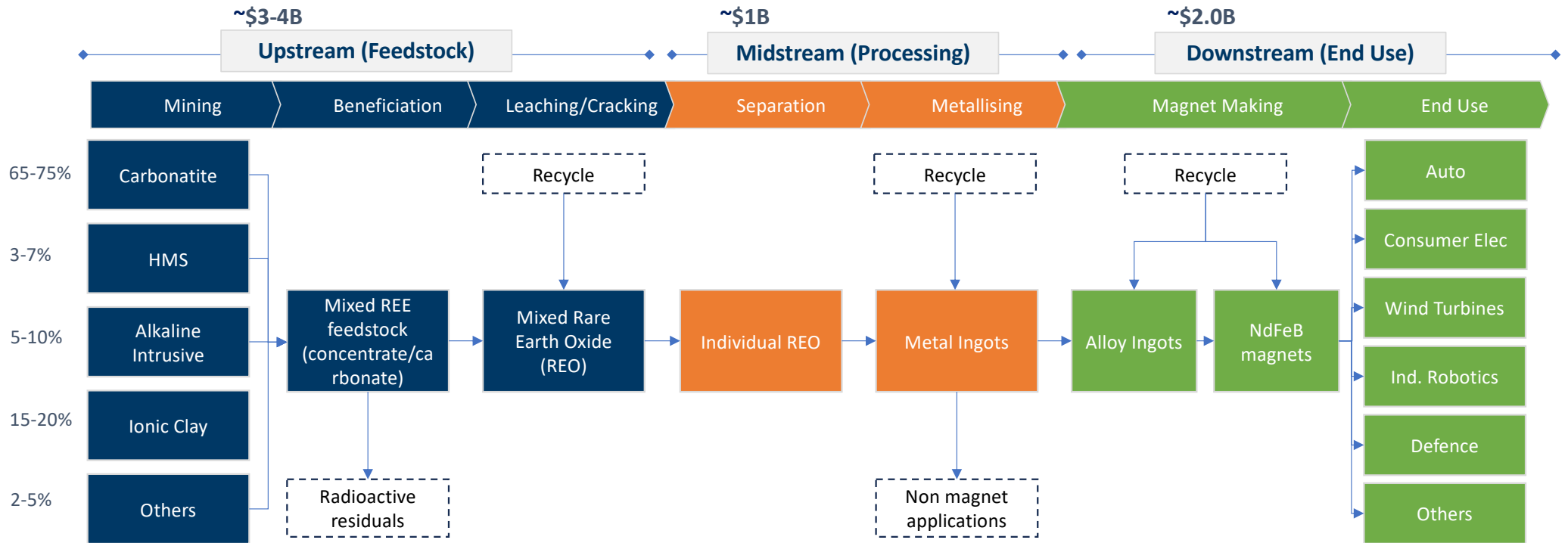
Source: USGS Fact Sheet 2002-0087 (Haxel, Boore & Mayfield); ADB Briefs No. 339 (April 2025); EC Critical Raw Materials Act (2023)

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REE to Magnet Value chain: Upstream – Midstream – Downstream

Key take aways

- 1 Permanent magnet value chain is a ~\$6-7 billion market.
- 2 Midstream 'Pinch point'
- 3 Multiple mining techniques with carbonatite key for Light REE source; and ionic clays for Heavy REE



Note: Figures shown in flow diagram relate to the Nd-based magnet value chain and are indicative only

Source: .

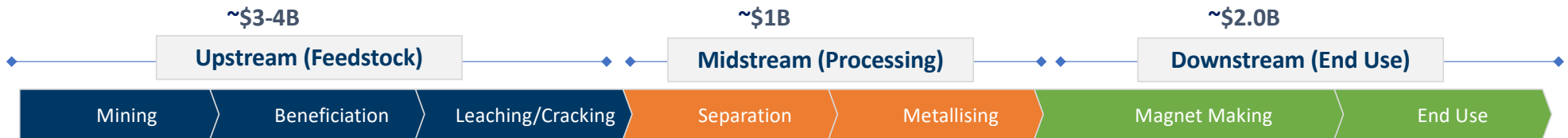
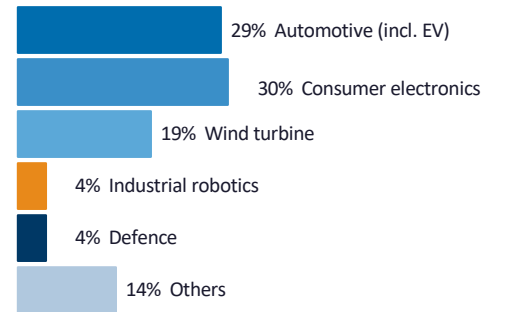
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Value chain concentration creates supply chain risks globally

Key take aways

- 1 >90% refining and magnet making in a single country
- 2 End use is varied; demand by region is global
- 3 Supply chain diversification is occurring at mining and beneficiation steps
- 4 Supply Chain diversification is developing slowly at other stages

Permanent magnet end-use demand (2024)



Feedstock Supply by Region	
PRC	60%
Myanmar	15%
Australia	10%
USA	9%
Others	6%

Refining Supply by Region	
PRC	91%
Others (Lynas, MP)	9%

Magnet Making Supply by Region	
PRC	94%
Japan (Shin-Etsu, TDK)	5%
Others	1%

Magnet Demand by Region	
PRC	50%
EU	15%
Japan	15%
USA	11%
S. Korea + Others	9%

Source: USGS Mineral Commodity Summaries 2025; IEA Critical Minerals Outlook 2024; PRC MIIT annual quota reports; Lynas FY2024; MP Materials FY2024

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