SBI Research

China's ban on Rare Earth and Permanent Magnets: Implications for India…However, Government of India has launched the National Critical Mineral Mission (NCMM) in 2025… Simultaneously active participation of state governments in encouraging rare earth exploration and processing can also contribute to regional economic development as in Odisha

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Executive Summary

- Critical minerals (including rare earth) form an important part of the modern production process because of their unique physical, chemical properties in reducing energy consumption, achieve miniaturization and thermal stability
- 30 minerals have been identified as critical for India's economic security by Government of India
- This analysis indicates that total imports of rare earth and compounds is around $33 million per year in the last four years. FY25 imports were at $31.9 million
    - Direct absorption of rare earth is concentrated in six sector. Sizable absorptions in basic metals and electrical and optical equipment. The direct absorption of magnets is concentrated in automotive, electrical and electronics and machinery
- The imports of rare earth magnets averaged $249 million in last four years. In FY25, magnet imports were $291 million was highest in last four years
- **Our analysis indicates sectors impacted by ban are – Transport Equipment, Basic Metals, Machinery, Construction and Electrical & Electronics. Both domestic production and exports will be impacted**
- Government of India has launched the National Critical Mineral Mission (NCMM) in 2025 to establish a robust framework for self-reliance in the critical mineral sector with total funds allocation of Rs 18000 crore for the period 2025-31
- **The active participation of state governments in encouraging rare earth exploration and processing can contribute to regional economic development and self sufficiency in critical mineral value chains**

Critical minerals are important for modern economic structures

- Critical minerals form an important part of the modern economic production process

- Criticality of a mineral is decided by many factors notably –
  - Current and emerging economic structure
  - Technology
  - Local availability and
  - Technologically feasible substitute

- Therefore, what is critical is depends on country under study

- **Economically critical minerals are characterized by following properties**
  - Small share in overall cost structure but extreme criticality in production
  - Concentrated supply sources resulting in sudden reduction in capacity utilization due to disruption
  - Nonavailability of substitutes and recycling technology
  - Opaque pricing, high price volatility and geopolitical risk

National policy on critical minerals and banks

- Finance Minister announced setting up of ‘Critical Mineral Mission’ in the Union Budget speech 2024-25 on 23.07.2024
- Government of India has launched the National Critical Mineral Mission (NCMM) in 2025 to establish a robust framework for self-reliance in the critical mineral sector
- India will invest in exploring and acquiring critical mineral assets in resource-rich countries
- PSUs and private firms will be supported through funding, guidelines, and inter-ministerial coordination
- Accordingly, critical minerals are an important business opportunity for banks that requires exclusive policy focus and strategic direction within banks

Funds allocation under Critical Mineral Mission

Mission Objectives	Finance Heads		Source of Allocation	Total Allocation (INR crore) (FY 2024-25 to 2030-31)
Securing Domestic and Foreign Sourcing	Domestic Critical Mineral Exploration		NMET	3000
			GSI	4000
	Risk Coverage for foreign sourcing		NMET	4000
	Support for exploration activities outside India		NMET	1600
	Recycling	Incentive scheme for Mineral Recy-cling	Budget	1500
		Pilot Projects-Mineral Recovery	NMET	100
Strengthening Value Chains	R&D and Human Resource Develop-ment		ANRF & other R & D schemes	500
	International R&D Support		ANRF & other R & D schemes	500
	Skill Development Centres		Budget	100
	Critical Minerals Processing Parks		Budget	500
	Stockpiling of Critical Minerals		Budget	500
Grand Total				16300

Expected Investments by @PSUs, etc.	18000
@ *PSUs-* *Khanij Bidesh India Limited (KABIL), Coal India Ltd. (CIL), National Mineral Development Corporation (NMDC), NTPC Mining Ltd, Neyveli Lignite Corporation India Ltd (NLCIL), Steel Authority of India (SAIL), Indian Rare Earth Ltd (IREL)., Oil India Ltd, ONGC Videsh Ltd (OVL). Other PSUs will also be encouraged to invest abroad in critical minerals.*	

30 critical minerals have been identified Ministry of Mines, Government of India

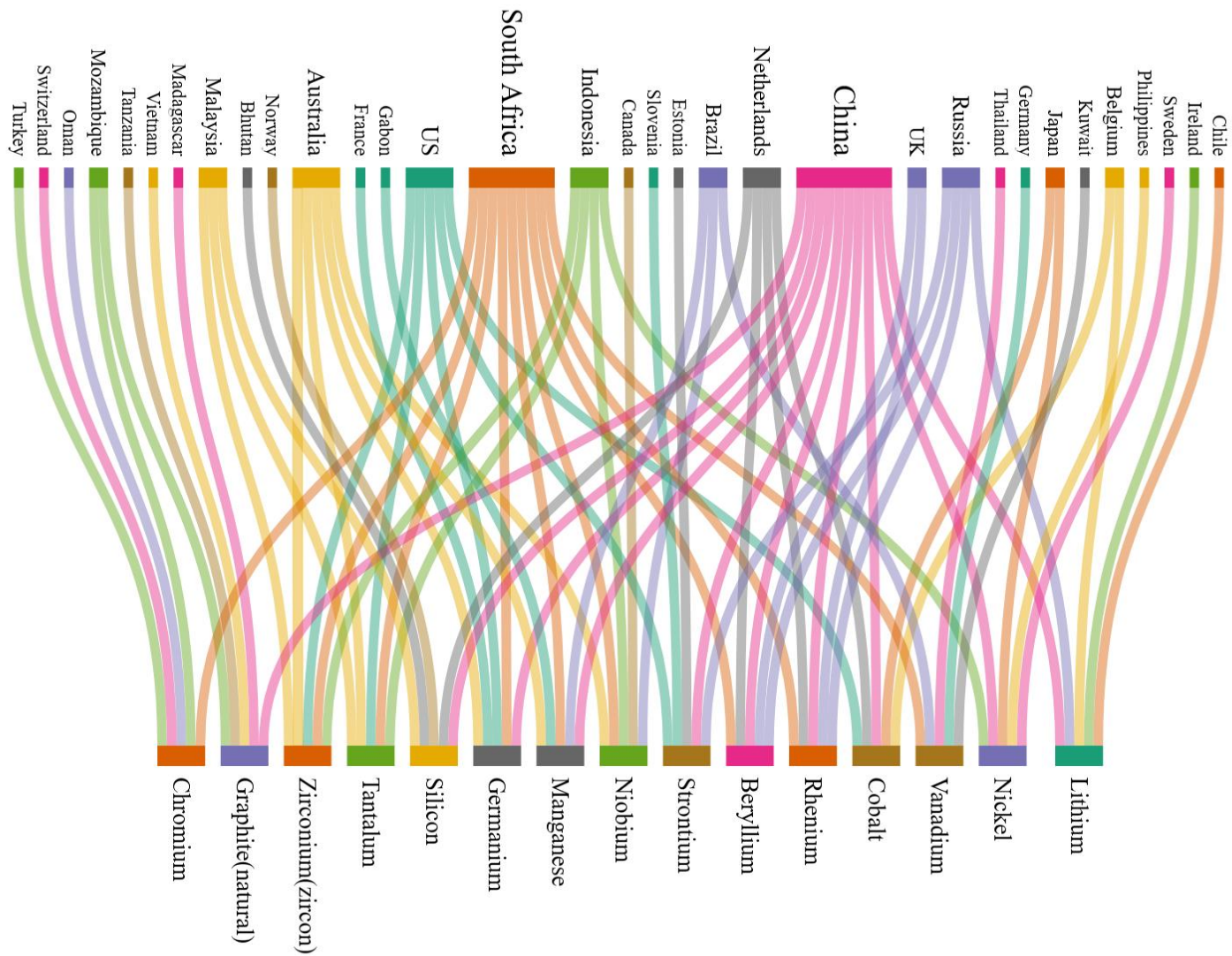
1 Hydrogen																2 Helium
3 Lithium	**4 Beryllium**										5 Boron	6 Carbon	7 Nitrogen	8 Oxygen	9 Fluorine	10 Neon
11 Sodium	12 Magnesium										13 Aluminum	**14 Silicon**	**15 Phosphorus**	16 Sulfur	17 Chlorine	18 Argon
19 Potassium	20 Calcium	***21 Scandium***	**22 Titanium**	**23 Vanadium**	24 Chromium	25 Manganese	26 Iron	**27 Cobalt**	**28 Nickel**	**29 Copper**	30 Zinc	**31 Gallium**	**32 Germanium**	33 Arsenic	**34 Selenium**	35 Bromine	36 Krypton
37 Rubidium	**38 Strontium**	***39 Yttrium***	**40 Zirconium**	**41 Niobium**	**42 Molybdenum**	43 Technetium	**44 Ruthenium**	**45 Rhodium**	**46 Palladium**	47 Silver	**48 Cadmium**	**49 Indium**	**50 Tin**	**51 Antimony**	**52 Tellurium**	53 Iodine	54 Xenon
55 Cesium	56 Barium		**72 Hafnium**	**73 Tantalum**	**74 Tungsten**	**75 Rhenium**	**76 Osmium**	**77 Iridium**	**78 Platinum**	79 Gold	80 Mercury	81 Thallium	82 Lead	**83 Bismuth**	84 Polonium	85 Astatine	86 Radon
87 Francium	88 Radium		104 Rutherfordium	105 Dubnium	106 Seaborgium	107 Bohrium	108 Hassium	109 Meitnerium	110 Darmstadtium	111 Roentgenium	112 Copernicium	113 Nihonium	114 Flerovium	115 Moscovium	116 Livermorium	117 Tennessine	118 Oganesson

Critical mineral		**57 Lanthanum**	**58 Cerium**	**59 Praseodymium**	**60 Neodymium**	**61 Promethium**	***62 Samarium***	**63 Europium**	***64 Gadolinium***	***65 Terbium***	***66 Dysprosium***	**67 Holmium**	**68 Erbium**	**69 Thulium**	**70 Ytterbium**	***71 Lutetium***
Included in analysis	***Rare earth baned by China***	89 Actinium	90 Thorium	91 Protactinium	92 Uranium	93 Neptunium	94 Plutonium	95 Americium	96 Curium	97 Berkelium	98 Californium	99 Einsteinium	100 Fermium	101 Mendelevium	102 Nobelium	103 Lawrencium

Source: *Report of the Committee on Identification of Critical Minerals, Ministry of Mines June 2023, Pg 32*

- Critical minerals include a wide range of minerals and compounds highlighted in pink
- **This analysis is based on rare earth which is a subset of larger critical mineral set and includes minerals banned by China**

Network topology for 15 Critical mineral for India with near 100% import dependency



Source: Report of the Committee on Identification of Critical Minerals, Ministry of Mines June 2023, Table 1

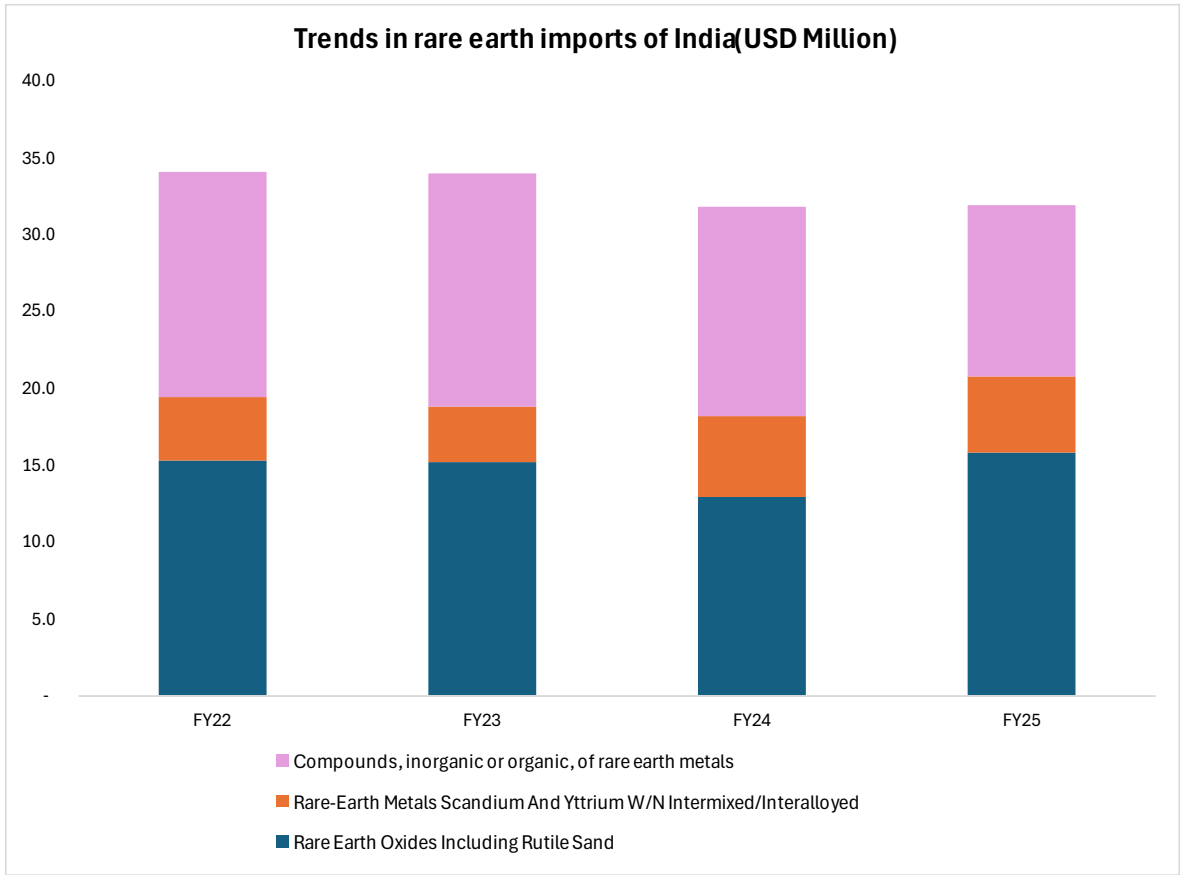
Economic importance of rare earth increasing due to digitization and green transition

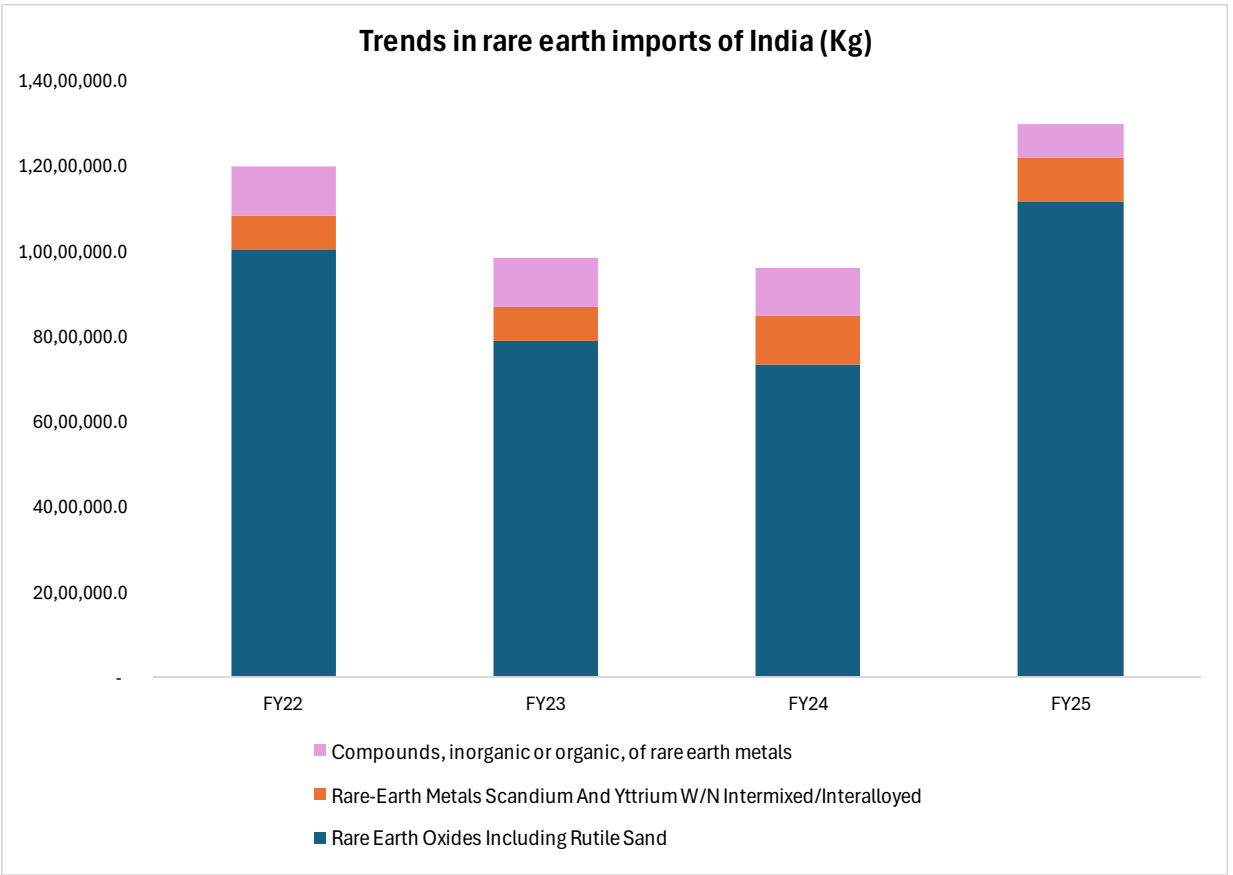
- Rare earth is a subset of critical mineral with wide application in many emerging technologies
- During the last three decades, there has been an explosion in the applications of rare earth and their alloys in several technology devices
- Because of their unique physical, chemical, magnetic, luminescent properties, these elements help to make many technological advantages such as reduced energy consumption, miniaturization, durability and thermal stability
- In recent years, demand for rare earth is particularly on rise in energy efficient gadgets (green technology) which are faster, lighter, smaller and more efficient

Area	Application
Electronics	Television screens, computers, cell phones, silicon chips, long-life rechargeable batteries, camera lenses, LED, CFL, marine propulsion systems
Manufacturing	High strength magnets, stress gauges, ceramic pigments, colorants in glassware, chemical oxidizing agent, automotive catalytic converters
Medical Science	Portable X-ray machines, MRI, contrast agents, nuclear medicine imaging, cancer treatment applications, and for genetic screening tests, medical and dental lasers
Renewable Energy	Hybrid automobiles, wind turbines, next generation rechargeable batteries, biofuel catalysts
Technology	Lasers, optical glass, fiber optics, masers, radar detection devices, nuclear fuel rods, mercury-vapor lamps, highly reflective glass, computer memory, nuclear batteries, high temperature superconductors

Source: Geoscience Frontiers 10 (2019) 1285e1303

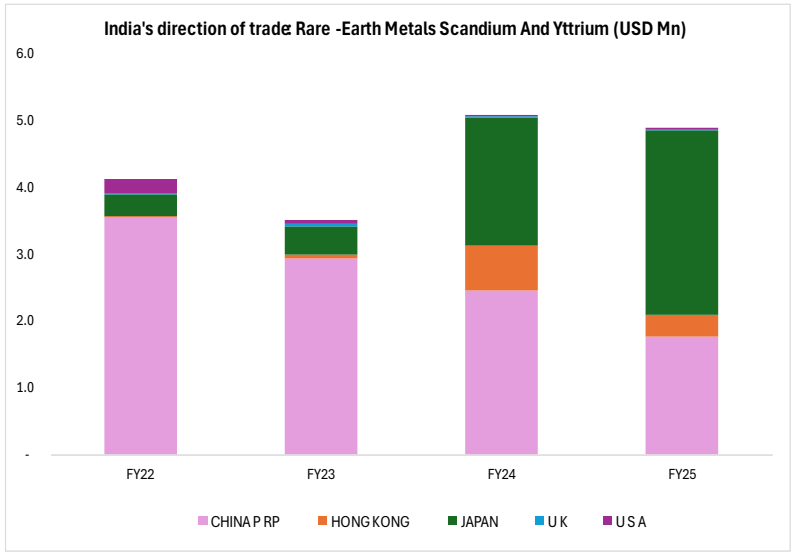
India’s consumption of rare earth minerals and compounds shows rising trend in volumes

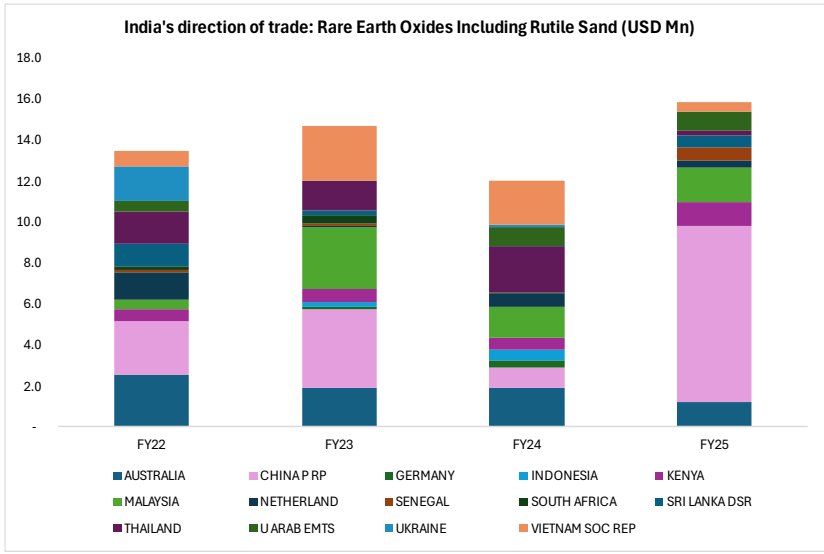


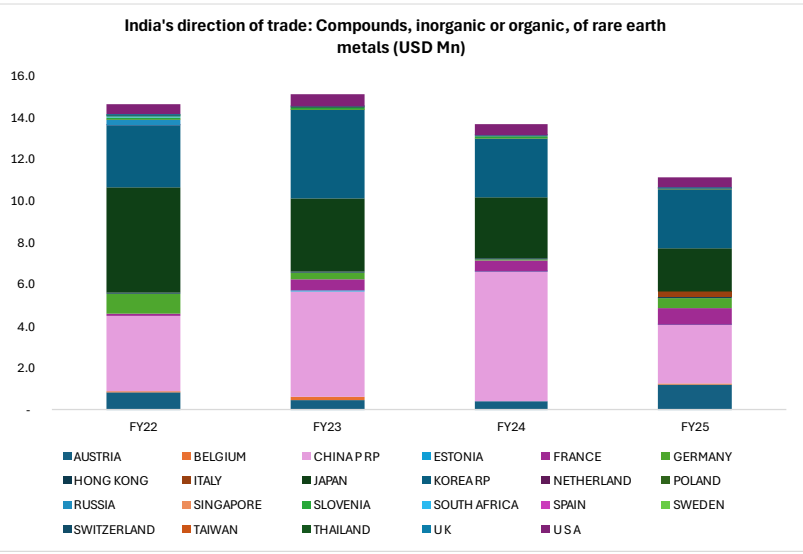


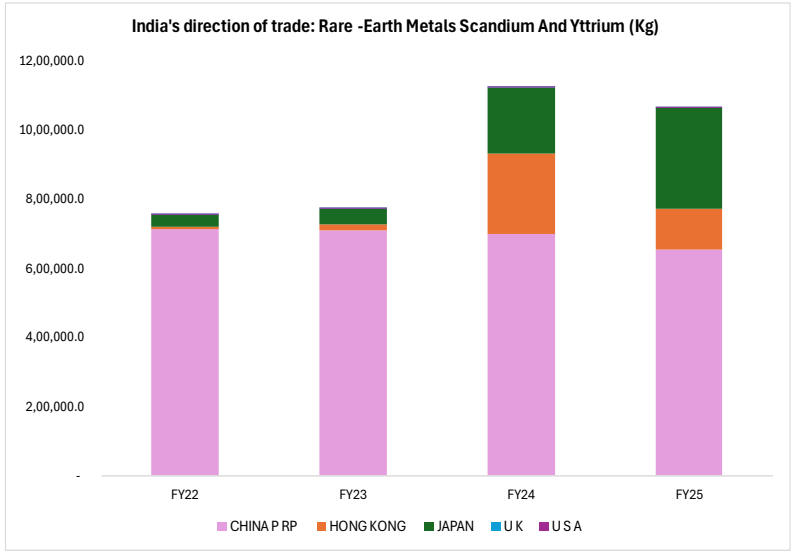
Source: Ministry of Commerce

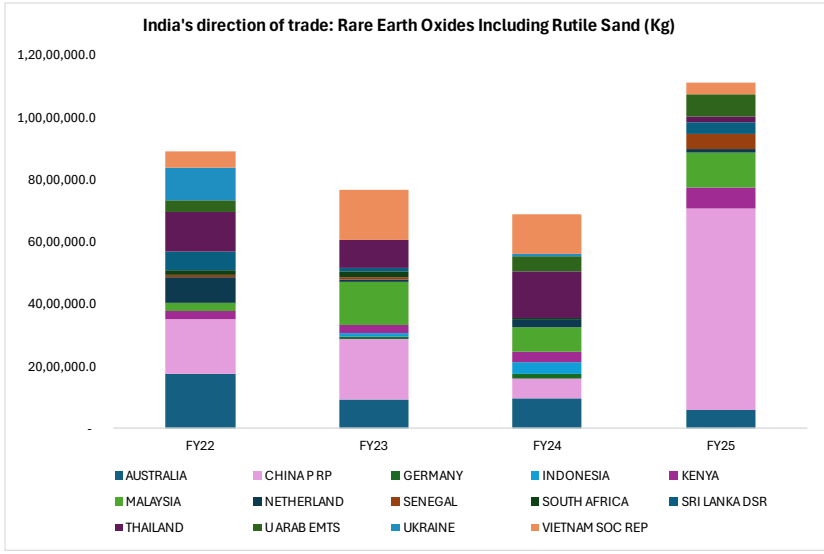
China dominates in India's direction of trade in rare earth minerals and compounds

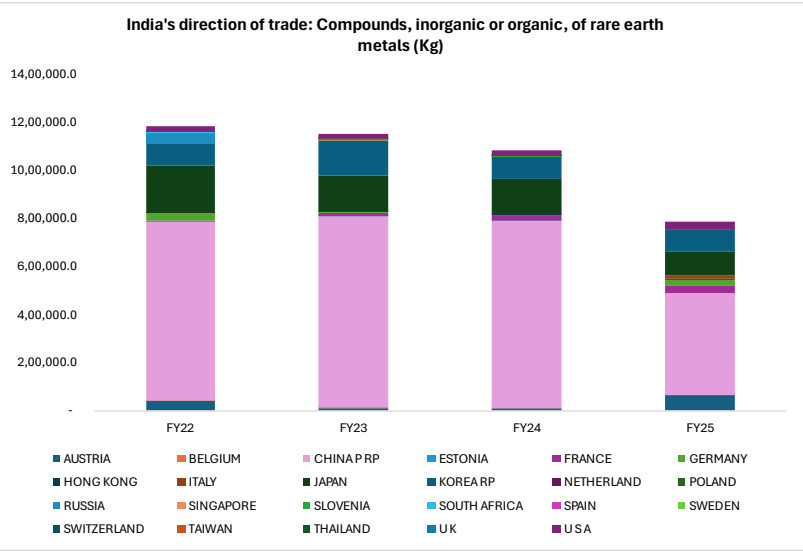






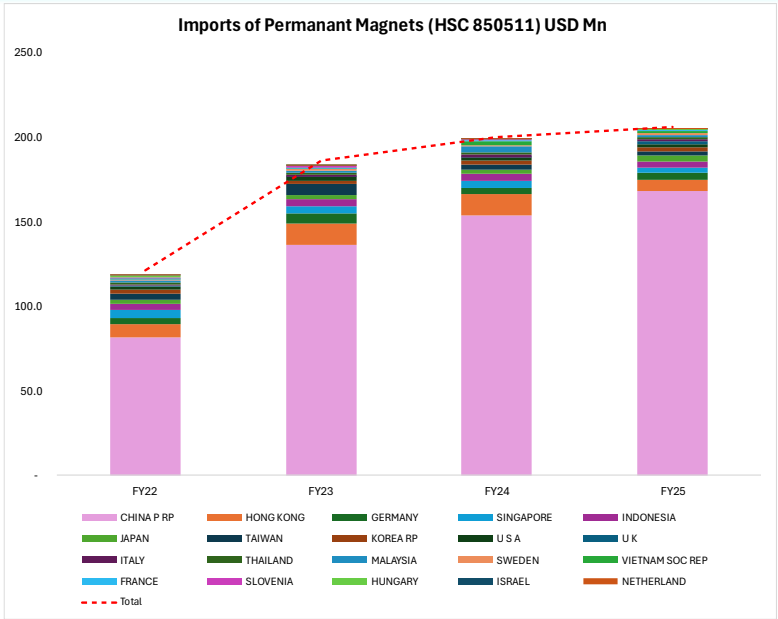


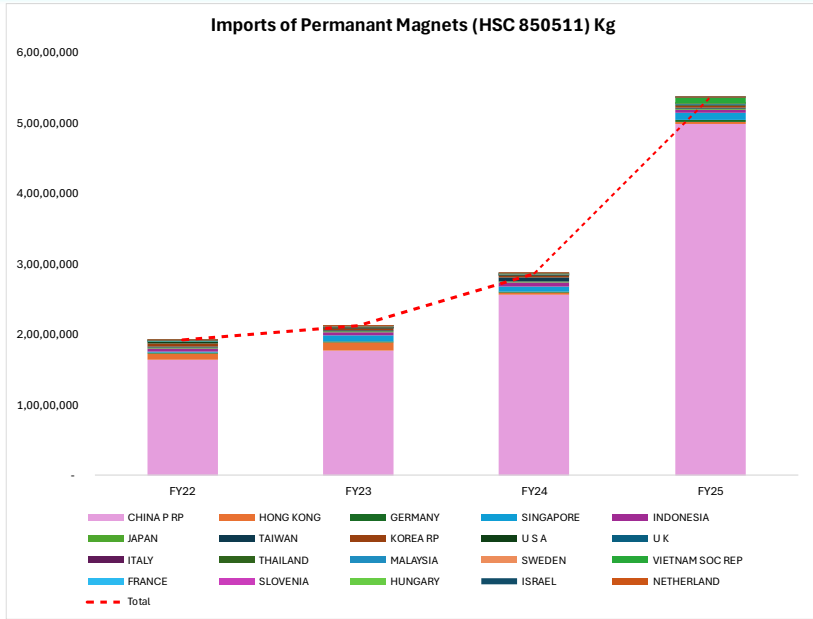


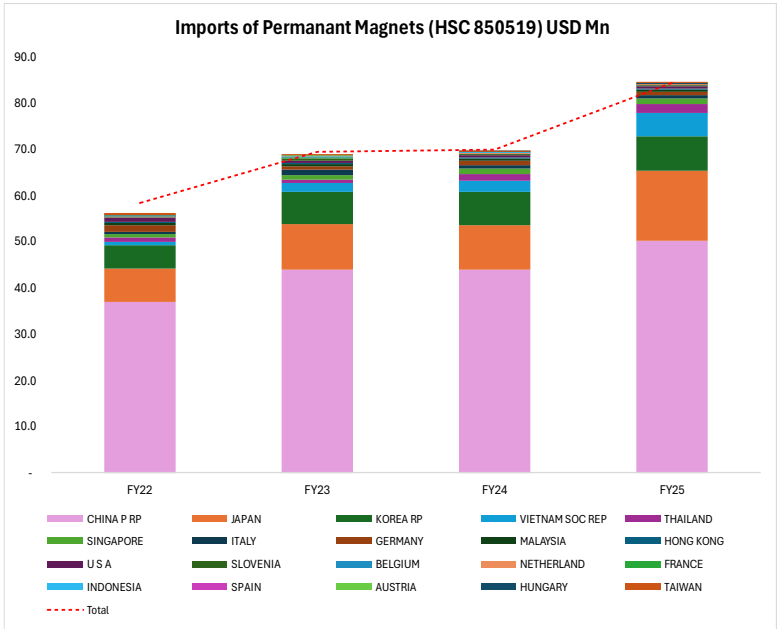


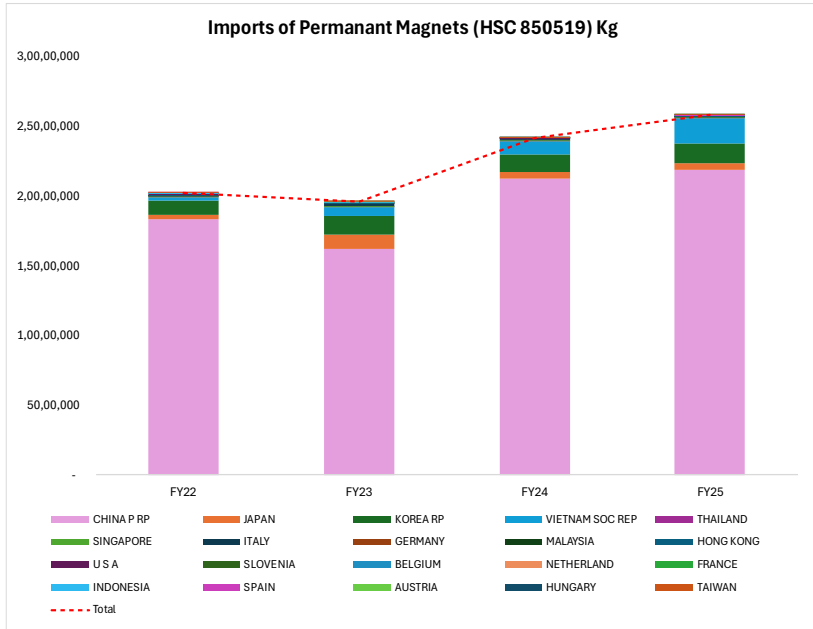
Source: Ministry of Commerce

Import of rare earth permanent magnets by India has increased sharply in FY25



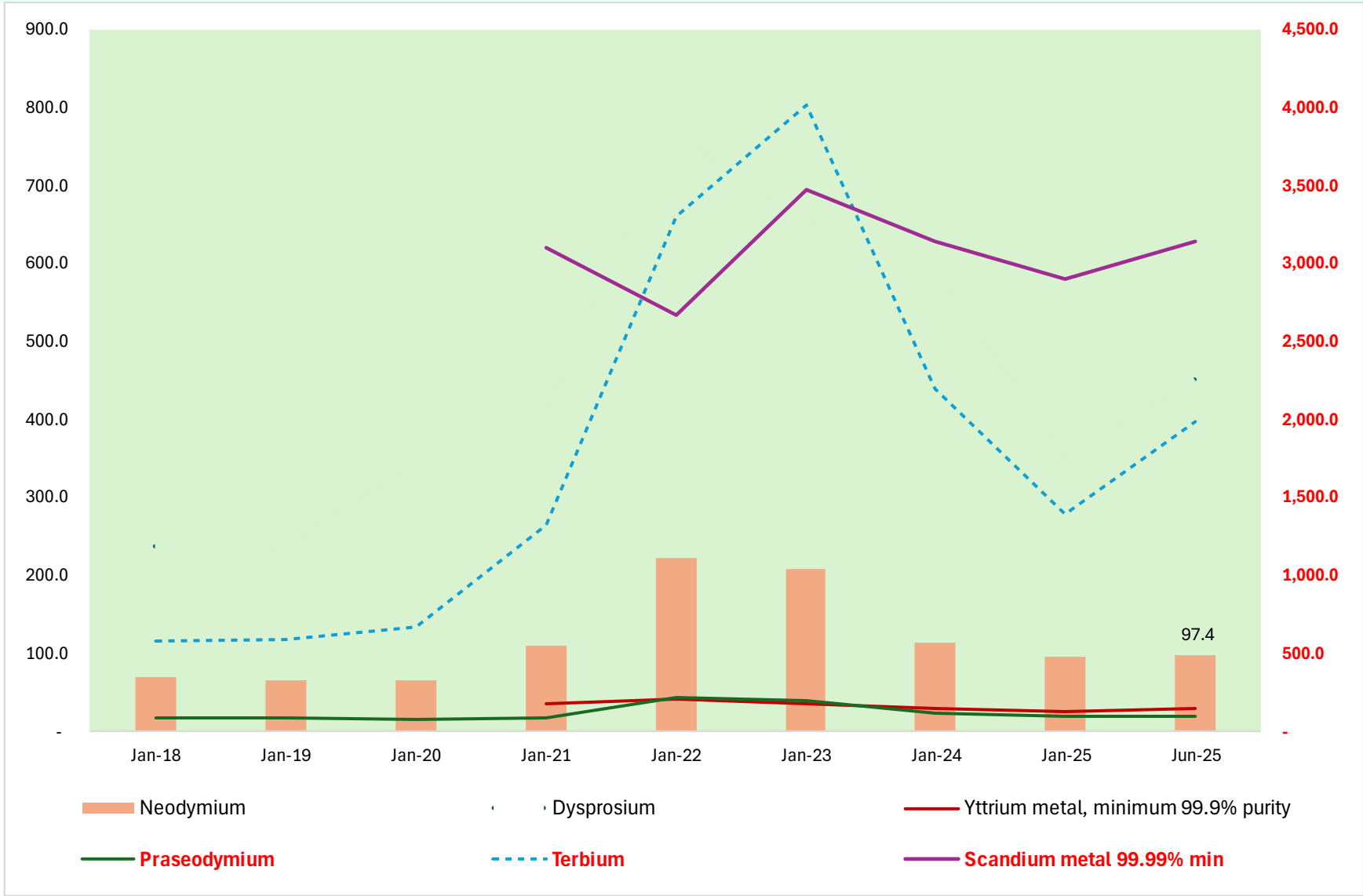






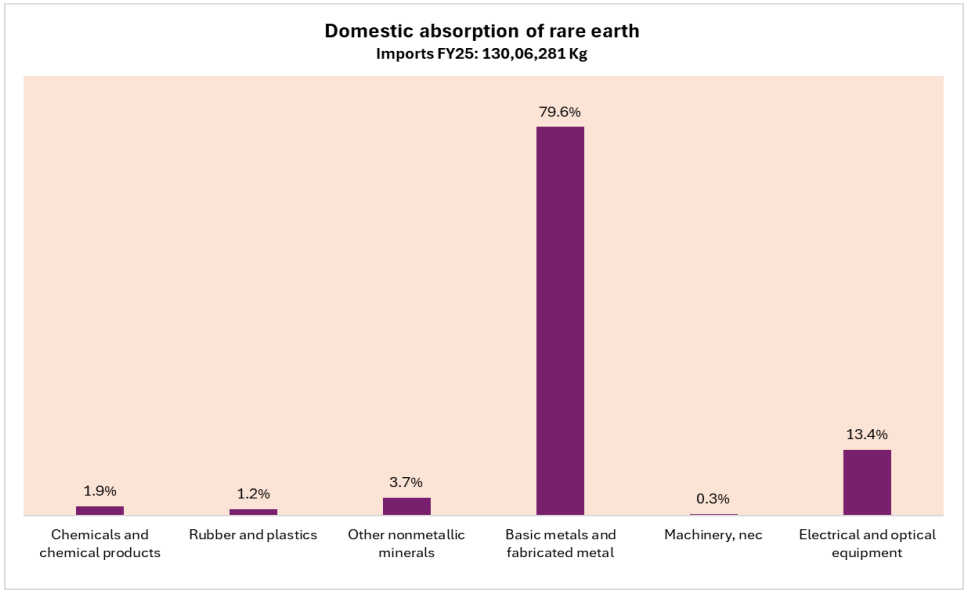
Source: Ministry of Commerce

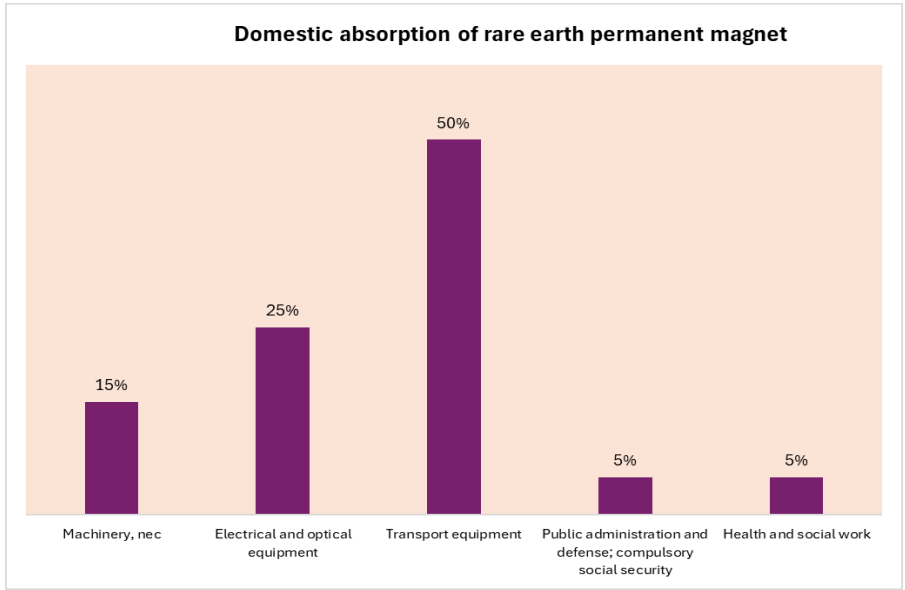
Trends in prices of select rare earth minerals (USD / kg) shows high volatility

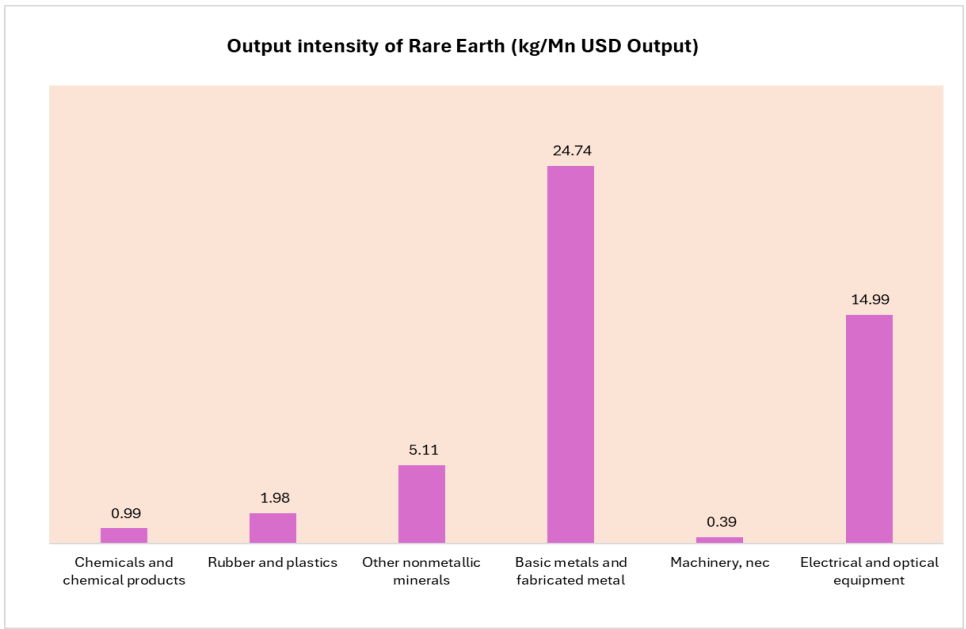


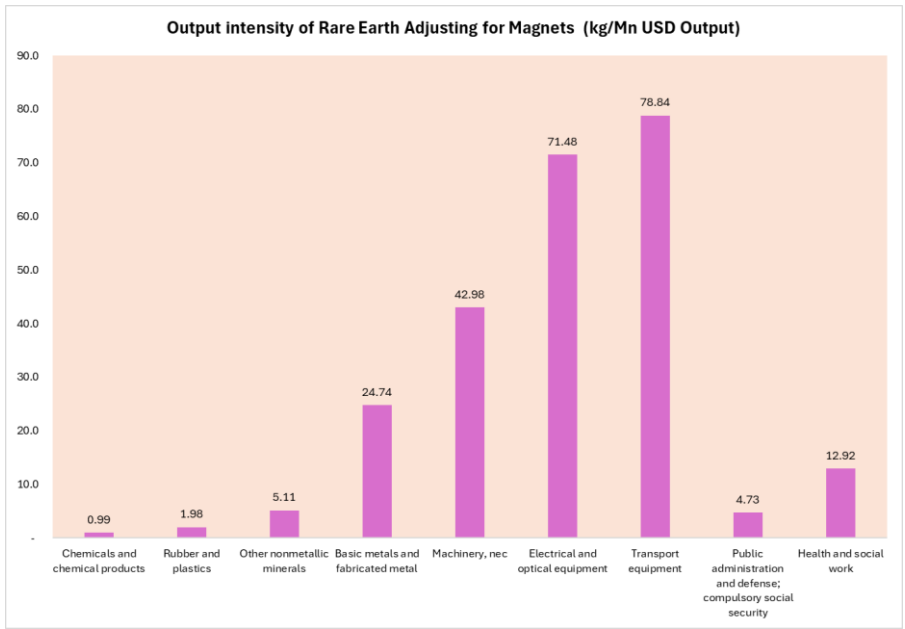
Source: Strategic Metals Invest

Granular analysis shows, absorption of rare earth and magnets concentrated in four sectors





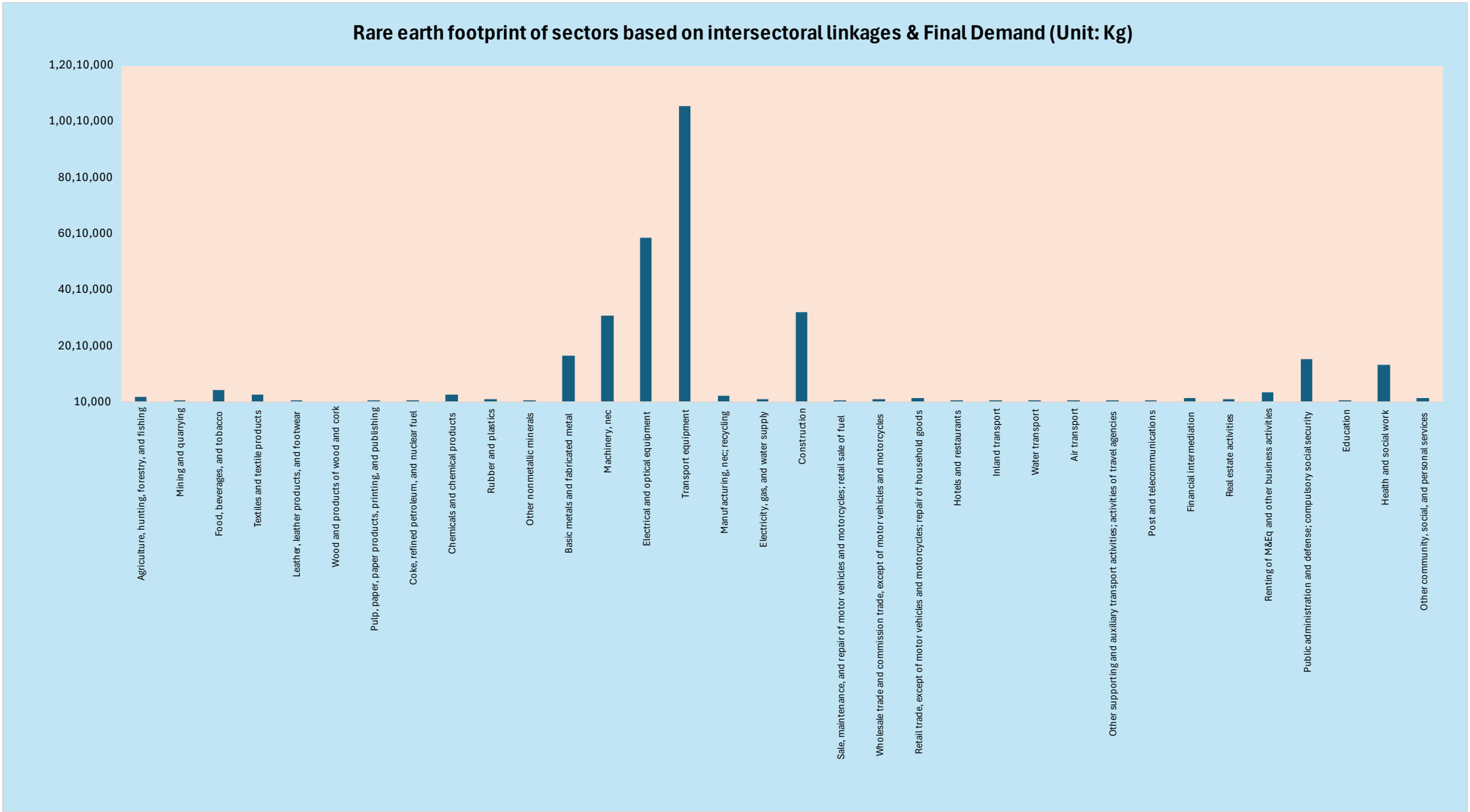




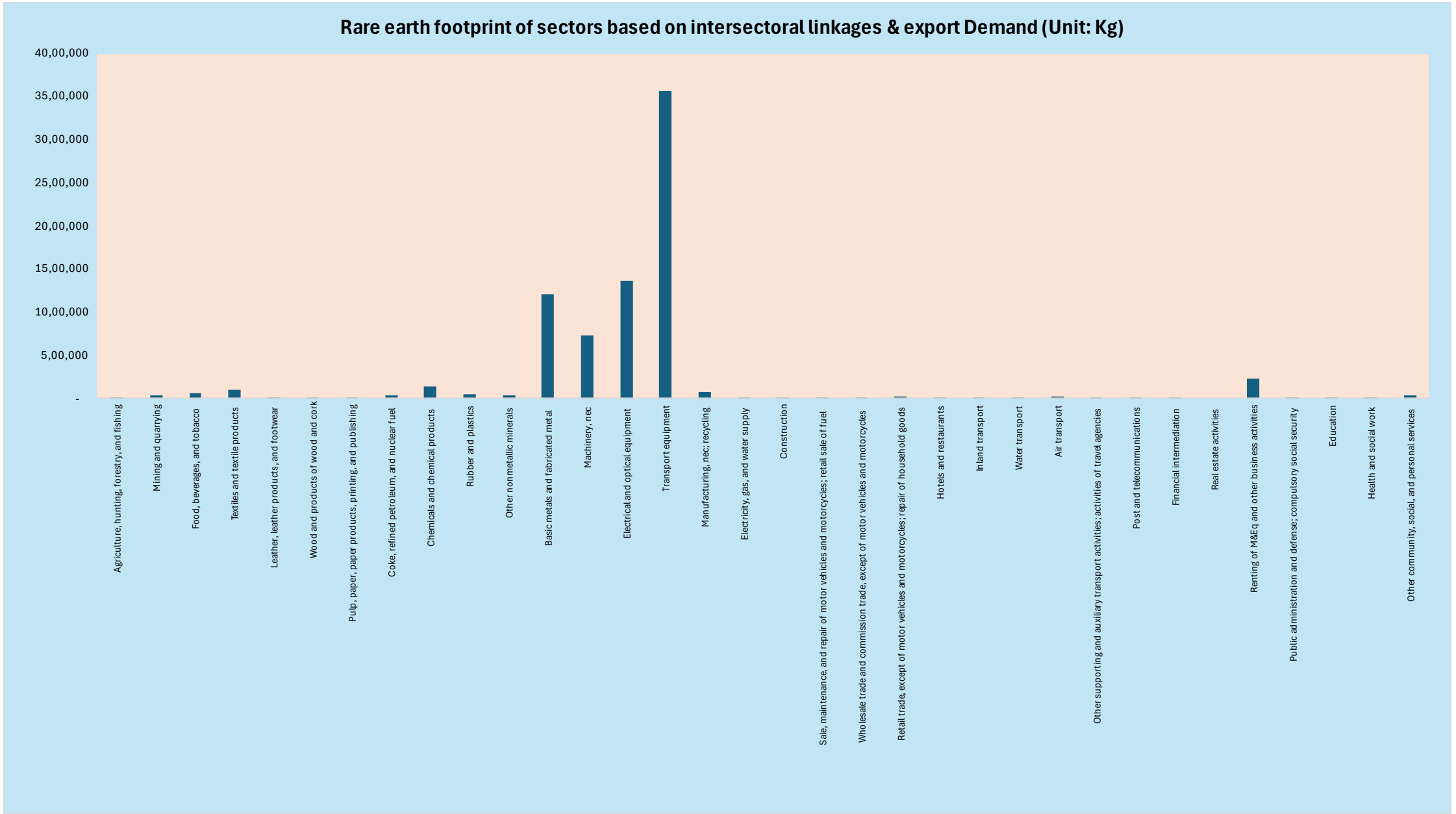
Economic importance of rare earth significant for transport, basic metals and electronics

- The analysis indicates that total imports of rare earth and compounds is around $33 million per year in the last four years. FY25 imports at $31.9 million
- The imports of magnets averaged $249 million in last four years. In FY25 magnet imports were $291 million
- The analysis indicates direct absorption of rare earth is concentrated in six sectors, with sizable absorption in basic metals and electrical and optical equipment
- The direct absorption of magnets is concentrated in automotive, electrical and electronics and machinery
- **The granular sector by sector analysis using the direct rare earth input and embodied rare earth in magnets (@ 33% of weight) was done using two perspective – final demand and export demand**
- The rare earth footprint (in kg) is an approximate indicator of the vulnerability of the sector output to disruption in supply of rare earth/rare earth value added
- The top sectors impacted by China's ban include – Transport equipment, basic metals, machinery, construction and electrical and electronics
- Both domestic production and exports will be impacted

Estimated rare earth footprint of Indian economy: Demand side perspective



Estimated rare earth footprint of Indian economy: Exports side perspective



Rare earth footprint: a banking perspective under aggravated scenario….

- Rare earth being a critical mineral, disruption in supply of rare earth can impact the financial exposure of banks to these sectors as also ancillary ones

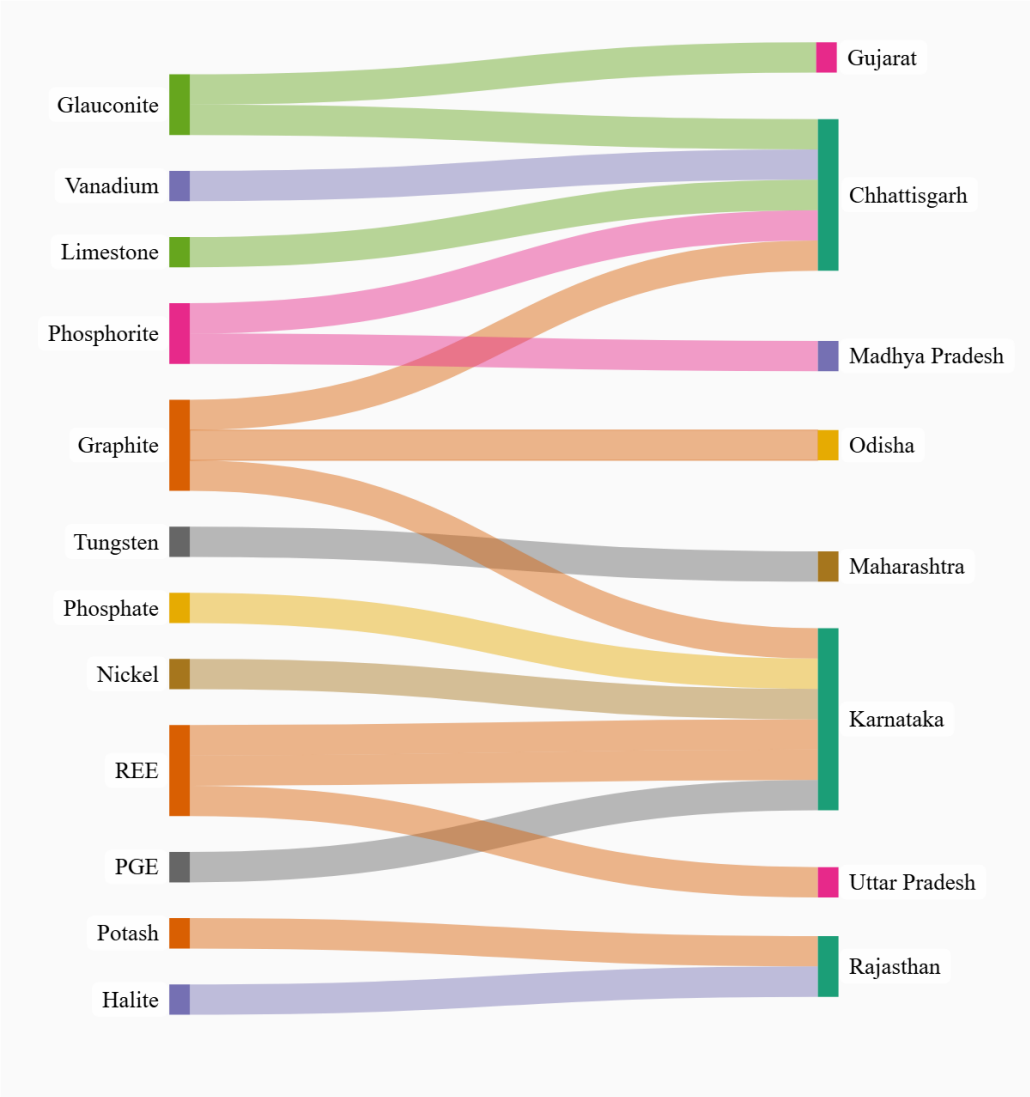
- However, it should be kept in mind vulnerability is also a function of available inventory of rare earth and disruption is not immediate uniformly across sectors

- The possible transmission mechanism to banks due to rare earth supply shock under aggravated scenario may include
  - Elongation of working capital cycle due to accumulation of semi-processed inventory, idle capacity etc.
  - Volatility in demand due to output inoperability
  - Likely emergence of stress in both upstream and downstream sectors
  - Interlinkages from NBFC sector to banking sector
  - Export / trade uncertainties for committed yet unfulfilled obligations; both funds as also non-funds based (due to sudden restrictions)

- The latest RBI FSR acknowledges that domestic financial system can be impacted by external spillovers and intensifying geopolitical hostilities

- Since geopolitical factors decide the criticality of a mineral, the above analysis is one of the many dimensions of impact of geopolitical factors on banking

State government participation in rare earth exploration and value-add manufacturing



- Domestic value-chain creation in critical minerals will require state government participation
- Many States have issued Notice Inviting Tenders (NIT) for the auction of Exploration License (EL)
  - Adjoining figures gives NIT & EL as per inviting states and critical mineral type
- The Industrial Policy Resolution 2022 of Odisha Government recognizes Rare Earth Minerals based value-added products as a priority sector under the policy
- Odisha Government has approved ₹8000 crore titanium facility in Ganjam to boost high-tech manufacturing
- Critical mineral value-chains can be source of regional economic development given the expanding digital and green economy

Source: Ministry of Mines, Ongoing NIT under National Critical Mineral Mission

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