



## Rare Earth Elements Discovered in Sweden

**For Prelims:** Rare Earth Elements, Green Transition, Clean Energy, NASA's Space Shuttle Programme, Electric Vehicles, QUAD, Thorium.

**For Mains:** Significance of Rare Earth Elements, Monopoly of China over Rare-Earth, Rare-Earth Elements in India.

### Why in News?

Recently, Sweden's **state-owned mining company LKAB** has **discovered Europe's largest deposit of rare earth metals**.

### What is the Significance of the Discovery?

- The store, **situated in Kiruna** located in the **northern region of Sweden**, holds a stockpile of over **1 million metric tons of rare earth oxides**.
- This discovery bolsters **Europe's ambition to rely less on imported raw materials** needed for the **green transition**.
- Currently, **no rare earths are mined in Europe** and it mostly **imports** them from other regions.
  - According to a report in the BBC, **98% of rare earths** used by the **European Union** (EU) were sent by China.
- The discovery can also **prove to be a significant turning point not just for the EU but also for other western countries** as they have been trying to reduce their reliance on China for the import of these **rare earth elements**.

### What are Rare Earth Elements?

- **About:**
  - They are a set of **17 metallic elements**. These include the **15 lanthanides on the periodic table** in addition to **scandium and yttrium** that show similar physical and chemical properties to the lanthanides.
- **Significance:**
  - They are important in technologies of **consumer electronics, computers and networks, communications, clean energy**, advanced transportation, healthcare, environmental mitigation, and **national defence**, among others.
    - **Scandium** is used in **televisions** and fluorescent lamps
    - **Yttrium** is used in drugs to **treat rheumatoid arthritis** and **cancer**.
  - Rare earth elements are also used in **space shuttle components**, jet engine turbines, and drones.
    - **Cerium**, the most abundant rare earth element, is essential to **NASA's Space Shuttle Programme**.
  - Moreover, the push for switching from **internal combustion cars to electric vehicles** has also led to a rise in demand for rare earth.
- **Monopoly of China:**

- China has over time **acquired global domination of rare earths**, even at one point, it produced **90% of the rare earths the world needs**.
  - Today, however, it has **come down to 60%** and the remaining is produced by other countries, including the **Quad (Australia, India, Japan and United States)**.
- Since **2010**, when China **curbed shipments of Rare Earths to Japan**, the US, and Europe, production units have come up in **Australia**.
- Even so, the **dominant share** of processed Rare Earths **lies with China**.
- **Rare Earth Elements in India:**
  - India has **6% of the world's rare earth reserves**, it only produces **1% of global output**, and meets most of its requirements of such minerals from China.
  - **Indian Rare Earths Limited (IREL)** is majorly responsible for **mining and extraction of primary mineral** that contains **Rare Earth Elements: monazite** beach sand, found in many coastal states.
  - IREL's prime focus is to provide **thorium** — extracted from monazite — to the **Department of Atomic Energy**.

## UPSC Civil Services Examination, Previous Year Questions (PYQs)

**Q. Recently, there has been a concern over the short supply of a group of elements called 'rare earth metals. Why? (2012)**

1. China, which is the largest producer of these elements, has imposed some restrictions on their export.
2. Other than China, Australia, Canada and Chile, these elements are not found in any country.
3. Rare earth metals are essential for the manufacture of various kinds of electronic items and there is a growing demand for these elements.

**Which of the statements given above is/are correct?**

- (a) 1 only
- (b) 2 and 3 only
- (c) 1 and 3 only
- (d) 1, 2 and 3

**Ans: (c)**

**Source: IE**

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