

GOVERNMENT OF INDIA
DEPARTMENT OF ATOMIC ENERGY
RAJYA SABHA
UNSTARRED QUESTION NO. 803
TO BE ANSWERED ON 27.07.2023.

Geopolitical significance of rare earth minerals

803 Shri Ayodhya Rami Reddy Alla:

Will the PRIME MINISTER be pleased to state:

- (a) the manner in which rare earth minerals are linked to transition towards a clean energy economy, if so, the role they play in development of electric vehicles, wind turbines, solar panels, and other renewable energy technologies;
- (b) whether there are any initiatives or efforts to promote recycling and circular economy for rare earth minerals, if so, the manner in which Government and industries are working together to minimize dependence on primary sources and enhance resource efficiency; and
- (c) geopolitical significance of rare earth minerals, the manner in which they influence global trade, technology development and national security considerations?

ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES AND PENSIONS AND PRIME MINISTER'S OFFICE (DR. JITENDRA SINGH):

- (a) Rare earth minerals play a crucial role in the transition towards a clean energy economy in India and globally. India, like many other countries, relies on rare earth minerals for the development of electric vehicles, wind turbines, solar panels, and other renewable energy technologies due to their indispensable characteristics. Here's how rare earth minerals are linked to the clean energy transition in India and their role in specific technologies:

Electric Vehicles (EVs): Production of permanent magnets. Permanent magnets (neodymium, praseodymium, and dysprosium)

Wind Turbines: Neodymium and Dysprosium, are crucial for the development of wind turbines.

Solar Panels: Thin-film solar cells and concentrating solar power systems, utilize rare earth minerals for their manufacturing processes.

- (b) The Government has taken a number of steps to formalise the e-waste recycling sector of the country. The E-Waste (Management) Rules, 2016 provide for compulsory authorisation of the dismantling and recycling units from the concerned State Pollution Control Boards (SPCBs)/ Pollution Control Committees (PCCs). CPCB has issued guidelines/SOP for processing of e-

waste. Ministry of Environment, Forest and Climate Change (MoEFCC) has notified the E-Waste (Management) Rules, 2022 on 2nd November, 2022. Bhabha Atomic Research Center (BARC), a Constituent Unit under Department of Atomic Energy has developed various scalable technologies to recycle rare earth values present in various rare earth bearing scraps such as Compact Fluorescent Lamps (CFL) and rare earth based permanent magnets found in hard disk drives, wind turbines, MRI machines, mobile phones, Brushless Direct Current motors. Six Lab scale technologies for recycling of various rare earth bearing scraps are developed and transferred to IREL for scaling up and deployment. IREL (India) Limited, a Public Sector Undertaking under Department of Atomic Energy, has taken up a pilot project towards demonstration of technology in Rare Earth Elements (REE) recycling established by BARC on Lab scale.

- (c) Rare Earth Elements (REEs) are present in almost everything we use - from processors to advanced alloys to electric vehicles to consumer electronics and industrial machinery. They are also crucial to many strategic applications including missile navigation and sensor systems. The significance of rare earths makes it important to diversify their supply chains to avoid over-dependence on a single supplier.
