



# Solar Waste Management

## Why in News?

Recently, a report titled '**Enabling a Circular Economy in India's Solar Industry - Assessing the Solar Waste Quantum**' shed light on India's escalating [solar waste](#) crisis.

## Key Points

- The study was conducted by the **Ministry of New and Renewable Energy (MNRE)** in collaboration with experts from the [Council on Energy, Environment and Water](#) (a leading not-for-profit policy research institution in Asia).
- **Key Highlights** of the Report are:
  - The current solar capacity of India, as of FY23, has generated about **100 kilotonnes (kt)** of cumulative waste, which will increase to 340 kt by 2030.
  - Around 67% of the projected waste by 2030 is expected to be produced by five states: **Rajasthan, Gujarat, Karnataka, Tamil Nadu, and Andhra Pradesh.**
  - Discarded solar modules contain critical minerals essential for India's economic development and national security, including silicon, copper, tellurium, and cadmium.
- Rajasthan has the **highest solar power generation potential** of all states in the country.
  - As of August 2023, **Rajasthan's operational solar power projects** produced roughly **17.8 GW of solar energy.**

## Solar Waste

- It is any waste generated during the **manufacturing of solar modules, or discarded modules and scrap** from manufacturing processes.
  - Modules are discarded at the end of their functional life or due to damages from transportation, handling, and installation.
  - Improper handling and landfilling of solar waste should be avoided. Proper treatment is necessary to **reclaim valuable minerals and prevent the leaching** of toxic materials like lead and cadmium.
- According to the [International Renewable Energy Agency \(IRENA\)](#), approximately **80% of solar panel components, including glass and metal frames, are recyclable.**
  - Solar waste can be recycled to recover materials like glass, aluminium, copper, silicon and silver.
  - Recycling can be broadly categorised into **mechanical, thermal and chemical processes.**
    - Each process helps in the recovery of specific minerals of varying purity grades.