

GOVERNMENT OF INDIA  
MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE

**RAJYA SABHA**  
**UNSTARRED QUESTION NO. 1339**  
TO BE ANSWERED ON 30.07.2026

**Expanding recycling infrastructure**

1339. SHRI S NIRANJAN REDDY:

Will the Minister of ENVIRONMENT, FOREST AND CLIMATE CHANGE be pleased to state:

- (a) whether Government has assessed India's preparedness to manage end-of-life solar photovoltaic modules and lithium-ion batteries as renewable energy deployment accelerates;
- (b) whether Government has taken note of the recommendations of NITI Aayog on strengthening the Extended Producer Responsibility (EPR) framework and expanding recycling infrastructure;
- (c) the number and capacity of authorised recycling facilities currently operational in the country; and
- (d) the steps taken to recover critical minerals and reduce import dependence through recycling?

**ANSWER**

MINISTER OF STATE IN THE MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE  
(SHRI KIRTI VARDHAN SINGH)

**(a) to (b):** The Government has taken note of the recommendations of NITI Aayog contained in the Action Plan for Circular Economy for the Electronics and Electrical Sector, Lithium-ion Batteries and Solar Panels, prepared during the period from November 2021 to March 2022, relating to strengthening the Extended Producer Responsibility (EPR) framework. The Government has notified sector-specific EPR regulations under the Environment (Protection) Act, 1986, including the Battery Waste Management Rules, 2022 and the E-Waste (Management) Rules, 2022.

Under Rule 12 of the E-Waste (Management) Rules, 2022, every manufacturer and producer of solar photo-voltaic modules or panels or cells have been mandated to obtain registration, maintain inventory of solar PV modules, store the waste generated from Solar PV modules/panels/cells up to the year 2034-35 as per the guidelines laid down under the rules, file annual returns, comply with Standard Operating Procedures, and process the waste other than solar PV modules as per the applicable rules or guidelines. Recycler of solar photo-voltaic modules or panels or cells has been mandated for recovery of material as laid down by the CPCB.

Further, Ministry has notified the Battery Waste Management Rules, 2022 in August 2022 under the Environment (Protection) Act, 1986, replacing the Batteries (Management and Handling) Rules, 2001. The Rules cover all categories and chemistries of batteries, including lithium-ion, lead-acid, nickel-cadmium and other batteries used in electric vehicles, portable devices, automotive and industrial applications, and place an EPR obligation on producers to ensure environmentally sound collection, recycling and refurbishment of waste batteries.

**(c) to (d):** As on 23<sup>rd</sup> July, 2026, 406 e-waste recyclers including end-of-life solar photovoltaic modules have been registered on CPCB's E-Waste EPR Portal having annual processing capacity of 40.14 Lakh Metric Tonnes (MT). Similarly, 57 recyclers of lithium-ion batteries are registered on CPCB's Battery Waste EPR Portal having annual processing capacity of 5.17 Lakh MT.

The Government has incorporated resource recovery as a key objective under both the Battery Waste Management Rules, 2022 and the E-Waste (Management) Rules, 2022. The Battery Waste Management Rules, 2022 mandate recyclers to recover minimum specified percentages of materials such as lithium, cobalt, nickel and lead from waste batteries, and require these recovered materials to be channelized back into new battery manufacture through mandatory minimum recycled-content norms (5% by 2027-28, rising to 20% by 2030-31). Similarly, the E-Waste (Management) Rules, 2022 prescribe EPR obligations along with phased recycling targets. The CPCB guidelines mandate recycler to recover aluminium, copper, iron and gold from e-waste. These measures are intended to improve resource efficiency, strengthen the circular economy, facilitate the recovery of critical minerals, and reduce the country's dependence on imports of virgin raw materials.

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