Recycling Facility for Li-ion Batteries and E-Waste in Uttarakhand | Uttarakhand | 03 Apr 2024

Why in News?

Recently, the **Technology Development Board (TDB)** entered into an agreement with **M/s Remine India Private Limited**, for setting up a commercial plant for **recycling of Li Battery and** E-Waste **using Indigenous Technology** in Sitarganj (District Udham Singh Nagar), Uttarakhand.

Key Points

- Through the agreement, TDB has pledged a financial assistance of ₹ 7.5 crores out of the total project cost of ₹ 15 crores, marking a significant stride towards **sustainable development** and environmental stewardship.
    - The efficient recycling of **Li-ion batteries** serves as a vital source of secondary raw materials for cell manufacturing within the country.
    - The escalating imports of e-waste stemming from the disposal of spent **Lithium-ion Batteries (LIBs)** are driven by their growing utilization in portable electronics, electric vehicles, and global renewable energy storage systems.
    - The disposal of LIBs through landfilling and incineration poses environmental and safety concerns, highlighting the need for recycling initiatives.
    - The potential for value creation through the retrieval of metals from spent LIBs has spurred interest in recycling e-waste generated by these batteries.
- The lithium-ion battery recycling market size is projected to reach **USD 14.89 billion by 2030**, with a **Compound Annual Growth Rate (CAGR) of 21.6%**, up from USD 3.79 billion in 2021.
    - Despite this, a significant **95% of Li-ion batteries currently end up in landfills**, while **only 5% undergo recycling and reuse.**
- The dominance of the informal sector in the e-waste scenario has adverse environmental and economic implications.
- Efficient and environmentally friendly recycling methods are imperative to address the escalating issue of battery waste, mitigate migrant supply side risks related to critical elements, and reduce **carbon footprints.**
- India is 3rd in the world in terms of e-waste generation and significant efforts are required to curb the issue.

Li-ion Batteries

- A lithium-ion battery or Li-ion battery is a type of **rechargeable battery.**
- Li-ion batteries use an **intercalated** (Intercalation is the reversible inclusion or insertion of a molecule into materials with layered structures) lithium compound as one electrode material, compared to the metallic lithium used in a non-rechargeable lithium battery.
- The battery consists of electrolyte, which allows for ionic movement, and the two electrodes are the constituent components of a lithium-ion battery cell.
- Lithium ions move from the **negative electrode** to the **positive electrode during discharge and back when charging.**

E-Waste

- It is short for Electronic-Waste and the term is **used to describe old, end-of-life or discarded**

electronic appliances. It includes their components, consumables, parts and spares.

- Laws to manage e-waste have been in place in India since 2011, mandating that only authorised dismantlers and recyclers collect e-waste. **E-waste (Management) Rules, 2016** was enacted in 2017.
- India’s first e-waste clinic for segregating, processing and disposal of waste from household and commercial units has been set-up in **Bhopal, Madhya Pradesh.**

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