Recycling Electric Vehicles

Why in news?

Electric Vehicles (EVs) are seen as key to decarbonise mobility, but there are challenges in recycling lithium-ion batteries from electric vehicles.

How the battery waste is managed in India?

Battery Waste Management Rules 2022	
Nodal agency	Ministry of Environment, Forest and Climate Change (MoEFCC)
Coverage	All types of batteries - EV batteries, automotive batteries, industrial batteries and portable batteries
Extended Producer Responsibility (EPR)	Producers (including importers) of batteries are mandated to collect and recycle/refurbish waste batteries
Online portal	Provides for exchange of EPR certificates between producers and recyclers/refurbishers
Recovery	Minimum percentage of recovery of materials from waste batteries is mandated
Polluter pay principle	Environmental compensation will be imposed for non-fulfilment of EPR targets and obligations set out in the rules

What are the concerns with the Battery Waste Management Rules?

- **Labelling requirements-** The labels on batteries in India does not carry an icon (a crossed bin) which indicates that the batteries cannot be disposed of in regular bins.
- **Design constraints**- There is an absence of eco-design during assembly for recycling to employ corrective methods.
- **Lack of traceability-** The rules do not provide tracking of material used in the batteries, which is critical to reduce the carbon and environmental footprint of the batteries.
- **Absence of harmonisation-** The rules do not establish regulatory standards for testing and classifying used batteries that have a second life.
- **Counterfeit documents-** - Recyclers or dismantlers are falsifying documents and moving the same shipments repeatedly to meet their targets.
- **Financial crunch**- Recycling plants are capital intensive and will be operating at low capacity as the volume of end-of-life batteries are still very low.
- The rules do not provide incentives for recycling capacity and facilities.

Global Climate Friendly Initiatives for Battery Recycling

• **Inflation Reduction Act, 2022-** It is a *US law* that allows recycled battery materials to qualify for significant tax credits.
• **End of Life Vehicles Directive**- It is a *European Union* initiative that mandates automakers to take back vehicle owners' end-of-life batteries.
• **Fit for 55**- It is a *European Union* package that requires the publication of battery carbon footprints by setting collection and recycling targets including minimum recycled content requirements for newly built batteries.
• **Battery passport**- It is a digital tool introduced by *European Commission* that seeks a carbon footprint declaration for batteries sold in Europe starting 2024.
• **China-** It's regulations encourage standardisation of battery design, production and verification to improve assembly and dismantling of used batteries.

Why there is a need for battery recycling and reuse?

- **Limited resource availability**- Recycling of batteries can generate a *source for rare metals.*
    - Using recycling technologies, 95% of metals can be recycled for use in manufacturing new batteries.
- **Environmental hazards**- If not handled well, it could reach in landfill thus contaminating soil and groundwater.
- The environmental impact of metal recycling from lithium ion batteries waste is significantly less than from metal extraction from the mines.
- **Import dependency**- It is important for India to establish recycling ecosystem to save forex.
    - India's major import is from *China* which holds 51% of global cell manufacturing capacity.
- **Supply chain disruption**- COVID 19 pandemic has exposed business risks as a result of disruptions in the global supply chain, resulting in a long lead time for raw material deliveries.
- Recent Russia-Ukraine war has also affected the supply chain of key battery metals like nickel and aluminium, along with crude oil.
- **Price discovery**- Creating a well-established recycle ecosystem can help discover the resale value of batteries for reuse/ recycle applications.

Telangana model*- Electric Vehicle Policy provides incentives to recycling businesses for ultra-processing.*

Punjab model*- Punjab is creating an e-marketplace to encourage resale of used batteries along with incentives to promote resale.*

What lies ahead?

- There is a need to *revamp the 2022 Rules* to make battery labelling mandatory and provide all the critical information needed on battery composition, performance etc., for efficient refurbishing and recycling.
- *Mandatory battery durability requirements* can incentivize the production of long-

lasting batteries and support second-life usage.

- *The Deposit Refund System* which is mentioned in the 2022 Rules to provide incentives to customers to return batteries must be popularised.
- *Disposal of batteries in landfill should be prohibited* and an effective mechanism must be developed for proper disposal of batteries.

References

1. Down To Earth- The future of transport is electric
2. Down To Earth- Revamp battery recycling rules
3. Down To Earth- EV battery recycling

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