

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

#### Legal framework in India for battery recycling

E-Waste (Management and Handling) Rules 2011

E-Waste (Management and Handling) Rules 2016

E-Waste (Management) Amendment Rules 2018

## 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?

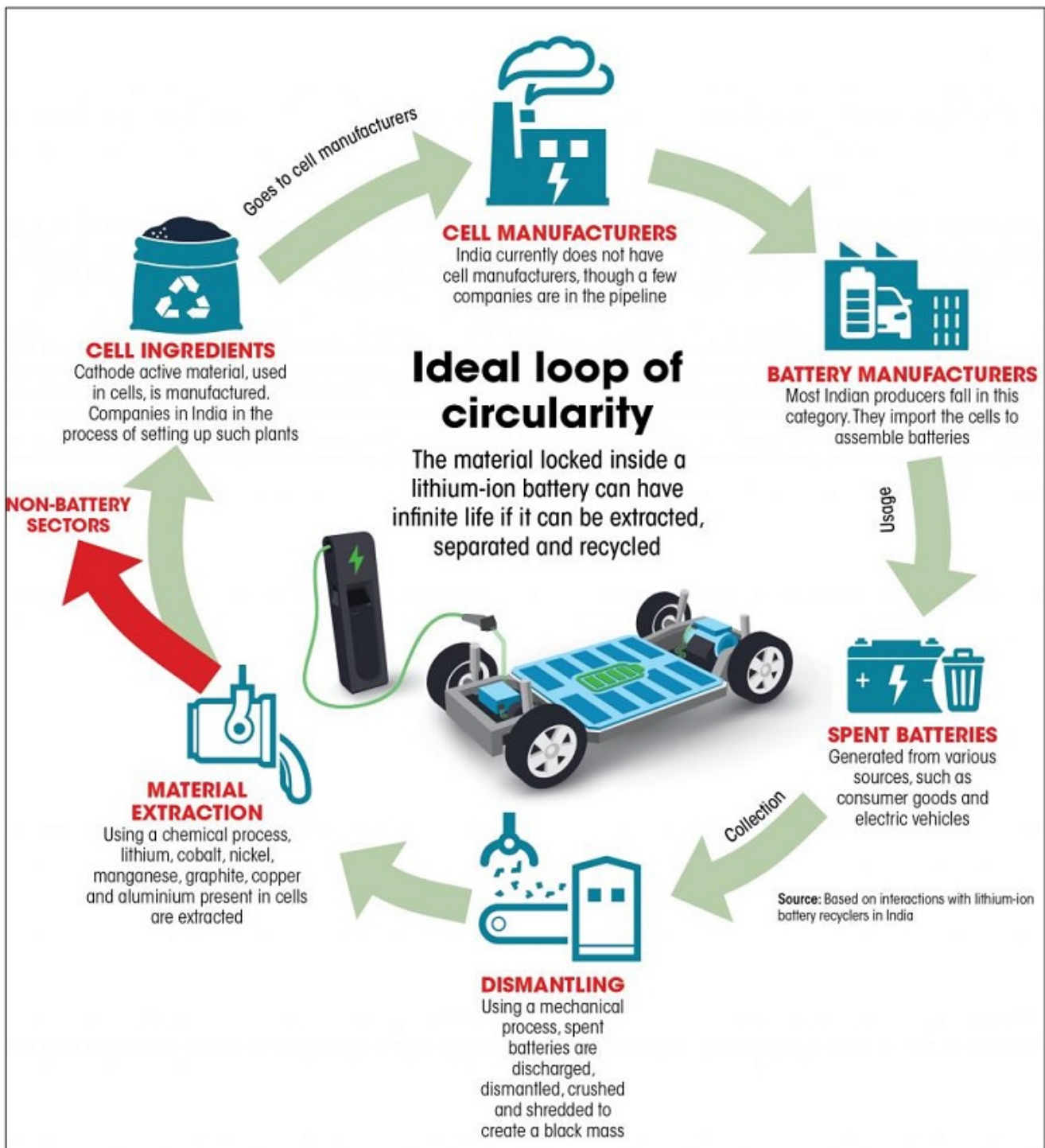
- **Limited resource availability-** Recycling of batteries can generate a *source for rare metals*.
  - Using recycling technologies, 95% of metals can be recycled for use in manufacturing new batteries.
- **Environmental hazards-** If not handled well, it could reach in landfill thus contaminating 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](#)

