

## **EU & India Electrical Vehicle Battery Recycling Technologies Exchange 2024**

### **Policy Context and Background Information on EU and Indian Battery Sector**

#### **1. Policy Context**

##### **About the EU-India Trade and Technology Council**

The EU-India Trade and Technology Council (TTC), established on 6 February 2023, aims at deepening the strategic engagement on trade and technology between both partners. The TTC consists of three Working Groups:

- 1) Working Group 1 on Strategic Technologies, Digital Governance and Digital Connectivity.
- 2) Working Group 2 on Green and Clean Energy Technologies; and
- 3) Working Group 3 on Trade, Investment and Resilient Value Chains.

WG 2 on green & clean energy technologies focuses on green technologies, including investment and standards, with emphasis on research and innovation. It will also foster cooperation between SMEs and start-ups from the EU and India.

The **Electric Vehicle Battery Recycling Technologies Exchange 2024** is an action under working group 2 and aims at speeding up finding solutions to the area of recycling of batteries for Electric Vehicles by involving start-ups and SMEs.

##### **About the Parties organising the Action**

Directorate General for Research and Innovation, European Commission, Brussels, in its capacity of Co-Chair of the TTC promotes cooperation with India in line with the Global Approach Strategy on International cooperation in R&I, by which it committed to step up cooperation with India on the green transition and with innovators/start-ups.

This Action is being implemented with the support of the Delegation of the European Union to India

The Delegation of the European Union in New Delhi, India was established in 1983 and is the diplomatic mission representing the European Union (EU) to India together with the 27 Member States of the European Union. It performs a variety of tasks aimed at enhancing relations between the EU and India.

##### **About the Principal Scientific Advisor Office (O/o PSA)**

The Government of India established the Office of the O/o PSA in November 1999. The O/o PSA aims to provide pragmatic and objective advice to the Prime Minister and the cabinet in matters of Science and Technology.

#### **2. Overview of EV Industry & Battery Recycling in India and the EU**

##### **India**

India's EV battery recycling market is expected to expand to 128 GWh by 2030 from a mere 2 GWh in 2023, which is a 6400% increase<sup>1</sup>. Modern batteries are a complex mix of materials and will require specialist policies and infrastructure for India to fully realize its recycling targets. Between 2022 and 2030, electric vehicle batteries are expected to majorly contribute to the recycling market, with 75% of the overall recycling market led by public transport<sup>2</sup>. The need to recycle EV batteries is four-fold: firstly, it helps to reduce the environmental impact of batteries, which can contain toxic chemicals that can harm the environment if not disposed of properly. Secondly, recycling batteries can help insulate against supply issues, as it can help recover valuable materials that can be used to manufacture new batteries. Thirdly, recycling batteries can help optimize second-life applications, such as using them for energy storage in

<sup>1</sup> <https://cleanmobilityshift.com/ecosystem/ev-battery-recycling-in-india-opportunities-and-challenges/>

<sup>2</sup> <https://wri-india.org/sites/default/files/Conference%20Proceeding-Battery-revised%2028%20july-final.pdf>

homes and businesses. Finally, recycling batteries can help to reduce carbon emissions, as it is estimated to lower their production cycles' carbon emissions by up to 90%.

In India, the estimated cumulative stock of Lithium Ion-Batteries in 2021 was about 22.4 GWh. It is estimated that the cumulative potential of lithium-ion batteries in India from 2022-30 across all segments will be around 600 GWh (base case) and the recycling volume coming from the deployment of these batteries will be 128 GWh by 2030. Out of which almost 59 GWh will be from electric vehicles segment alone. Presently in India, either the cells are imported and are assembled into battery packs or the entire battery packs are imported. The Indian Ministry of Heavy Industries has come up with a new Production-Linked Incentive (PLI) scheme to encourage domestic manufacturing of ACCs, which includes LIBs. Through this scheme, the Government of India (GoI) envisages reducing the dependency on imports for LIB cells.

Raw material sourcing for the cell manufacturing is not well established, with limited resources in the country. As such, India is expected to continue depending on imports for the raw materials required for LIB cell manufacturing. Recycling of used batteries could close the gap and help make a circular economy for LIBs possible.

The Government of India has issued draft guidelines on battery waste handling to curb the inappropriate handling and treatment of LIBs. These guidelines propose to mandate extended producer responsibility (EPR), forcing producers to take responsibility for the handling and treatment (collection, storage, transport, recycling, and disposal) of used batteries. The government also proposes some financial incentives to promote investments in LiB recycling.

For more details, kindly read the below links.

[https://www.niti.gov.in/sites/default/files/2022-07/ACC-battery-reuse-and-recycling-market-in-India\\_Niti-Aayog\\_UK.pdf](https://www.niti.gov.in/sites/default/files/2022-07/ACC-battery-reuse-and-recycling-market-in-India_Niti-Aayog_UK.pdf)

<https://pib.gov.in/PressReleasePage.aspx?PRID=1854433>

[https://www.orfonline.org/wp-content/uploads/2023/06/T20\\_PolicyBrief\\_TF4\\_EV-Battery-Chain.pdf](https://www.orfonline.org/wp-content/uploads/2023/06/T20_PolicyBrief_TF4_EV-Battery-Chain.pdf)

## **European Union**

The Electric Vehicle (EV) battery recycling industry in the European Union (EU) presents a compelling opportunity for start-ups and scaleups, fuelled by a rapidly expanding market. The EU's commitment to sustainability has propelled the EV market's growth, with the battery recycling sector expected to witness substantial expansion. The current European Electric Vehicle Lithium-Ion Battery Recycling market is growing at a CAGR of 21.3% and expected to reach EUR 255 million by 2029<sup>3</sup>, and experts predict further robust growth in the coming years as EV adoption accelerates.

In terms of battery types, lithium-ion batteries dominate the EV landscape, powering a wide range of vehicles from compact cars to heavy-duty electric trucks. These batteries, commonly found in electric cars and plug-in hybrids, contain valuable materials like lithium, cobalt, and nickel, making them prime candidates for recycling.

However, variations exist among Member States in terms of EV adoption rates and, consequently, the composition of discarded batteries. Several EU member states lead in EV penetration, resulting in a higher prevalence of used batteries. Others are catching up, creating a dynamic landscape for technology providers to tailor their solutions to specific regional needs.

The diversity in member states also introduces regulatory nuances and logistical challenges, emphasizing the need for adaptable and scalable recycling solutions. Companies keen on participating in the challenge should consider tailoring their strategies to accommodate these regional differences, ensuring seamless and efficient integration into the diverse EV battery recycling ecosystem across the EU. Now is the time for

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<sup>3</sup> <https://www.databridgemarketresearch.com/reports/europe-electric-vehicle-lithium-ion-battery-recycling-market#:~:text=Europe%20electric%20vehicle%20lithium%20battery%20recycling%20market%20is%20expected,USD%20276%2C835.03%20thousand%20by%202029.>

scaleups and innovative companies to capitalize on the burgeoning market, contribute to sustainability goals, and shape the future of EV battery recycling in the EU.

In July 2023, the European Union adopted a new Regulation on Batteries and Waste Batteries including imported ones. The new Regulation aims to create a circular economy for the batteries sector by targeting all stages of the life cycle of batteries, from design to waste treatment. This initiative is of major importance, particularly in view of the massive deployment of electric vehicles, for which the demand is projected to grow by more than 10-fold by 2030.

The Batteries Regulation lays down several targets, including for material recovery and recycling efficiency. For the recovery of lithium, the targets are as follows:

- 50% lithium recovery from waste batteries by end of 2027.
- 80% lithium recovery from waste batteries by end of 2031 (amendable based on market/technological factors).

The following recycling efficiency targets are being mentioned in the Regulation:

- 80% recycling efficiency for nickel-cadmium batteries by end of 2025.
- 50% recycling efficiency for other waste batteries by end of 2025.

The Battery regulation also provides mandatory minimum levels of recycled content for industrial, SLI batteries and EV batteries. The initial Minimum Recycled Content levels for industrial and EV batteries are 16% for cobalt, 85% for lead, 6% for lithium and 6% for nickel. The regulation further introduces an electronic “battery passport”, which allows for the digital storage of labelling and other required information on the battery’s components and recycled content.

For more details, kindly read EU’s Strategic Research and Innovation Agenda [Strategic Research and Innovation Agenda – BATT4EU \(bepassociation.eu\)](https://batt4eu.eu/)

A factsheet on battery activity in India [https://batterieseurope.eu/wp-content/uploads/2024/02/Battery-Innovation-INDIA .pdf](https://batterieseurope.eu/wp-content/uploads/2024/02/Battery-Innovation-INDIA.pdf)