Battery Recycling
A global perspective on regulations & policies

Used Electric Vehicles, Battery End-of-Life & Circularity
Africa Workshop
April 24 / 25, 2024

polash.das@un.org
Global Battery Demand Forecast & Recycling Feedstock

Demand for lithium batteries expected to increase 5-fold by 2033 at 15% CAGR

By 2040, battery recycling market in Europe will be up ten-fold vs. 2030 – driven by giga-factory scrap initially, EoL batteries to ramp up from 2030+

The surge in electrification and cell production is set to escalate demand for battery metals. In the short-term, recycling can help to meet a part of this demand, providing marginal security of supply for regions with low primary metal production.

As the first wave of EVs reach end of life in 2030, recycling market is expected to grow substantially

110GWh (≈ 5.5 million tonnes) of total battery scrap in 2023 and 480GWh (≈ 2.400 million tonnes) by 2033

Source: Annual Battery Report 2023 by Volta Foundation

- **Two Stage Approach – Development Promotion & Development Standardization**: Initial stage – power battery recycling and reuse concept proposed, moved gradually to reduce subsidies, strict technology and environment protection, clarify responsibility, establishing punishment mechanism.

- **Policy structure**: the policy system regarding power battery reuse in China consists of three parts: 1) top-down design from central level, 2) policies formulated by ministries, and 3) policies issued by local governments

- **Top down from Central level**: requiring manufacturers of vehicle power batteries to establish reused product recycling system in accordance with sold product quantity either by self-built or entrusting others. Recently the construction of collection system of reused power batteries

- **Ministry level policy**: Started in 2006, EV manufacturer were made responsible for collection and treatment of batteries that they sold. Till now 21 regulations and polices have been released – Technical policy for recovery of auto products, roadmap for New EVs, recycling and reusing batteries for EVs, implementation rules etc.

- **Target based guidelines**: Dismantling technology, Recycling rate of Ni, Co, Mn > 98.5% in 2020 to >99.5% by 2030, Li recycling rate from >60% in 2020 to >80% by 2030, Graphite recycling rate > 70% by 2030.

- **Responsibility – For Each Stage, By Each Stakeholder**: At Design Stage – safe & easy dismantling, At sale stage – Traceability of battery product code system, at Recovery Stage – effective recovery & collection system, At reuse & recycling stage- evaluate, inspect, classify and recycle
New European Union Battery Regulation – (2023/24)

- Impact the design, production and waste management of all types of batteries - manufacturing and Sale, due diligence of supply chain, access the social and environmental risks, new labeling – consumers are more informed.


- Applies to: All Manufacturer, producer, importer distributor, Applies to all type of batteries, Applies independently of the origin of the battery or raw material.

- Sustainability and Safety: Carbon Footprint and Restrictions on Hazardous Substances: All EV batteries a capacity of > 2 kWh must have a “clearly legible” carbon footprint declaration and label and the levels of recycled Co, Li and Ni used in production. Restrict use of Hg, Ca & Pb.

- Supply Chain Management: Due Diligence Requirements: Each stakeholder must implement due diligence policy address social and environmental risk inherent in sourcing, processing and trading raw material – acc. OECD Due Diligence Guidelines & UN Guiding principals on Business & Human Rights.

- Labelling and information: Battery passport – Info on battery model, use. Must have labels and QR codes – Capacity, performance, composition. CE marked. - Conform HSE protection guidelines

- Recycling & End of Life Management: Separate and high quality recycling.

- Targets – Portable Batteries - Collection rate 45% at 2023 to 73% by 2030, LMT 61% by 2031. No Landfilling, All waste battery collection for end user free of charge, compulsory minimum levels of recycled content for reuse in new industrial
South Korea Battery Recycling Regulation – (2010)

- **Resource Circulation System:** South Korea has established a resource circulation system for EV batteries, which includes a mandatory deposit system for battery manufacturers and importers. This system ensures that manufacturers and importers are responsible for collecting and recycling used batteries.

- **Recycling Targets:** The government has set recycling targets for EV batteries. By 2027, the target is to recycle 90% of the weight of the battery, and by 2031, the target is to recycle 95% of the weight of the battery.

- **Recycling Infrastructure:** The government has invested in building recycling infrastructure for EV batteries. In 2020, South Korea announced a plan to build a $1.1 billion EV battery recycling plant, which will be the world’s largest.

- **Research and Development:** The government has also invested in research and development for EV battery recycling technologies. In 2021, South Korea announced a plan to invest $130 million in developing EV battery recycling technologies.

- **Second-Life Applications:** South Korea has been promoting the use of second-life applications for EV batteries. The government has provided subsidies for companies that develop second-life applications for EV batteries, such as energy storage systems.

- **Penalties for Non-Compliance:** The government has imposed penalties for non-compliance with the EV battery recycling regulations. Manufacturers and importers that fail to meet the recycling targets can face fines and other penalties.
Thank you!