

# Battery Recycling

A global perspective on regulations & policies

Used Electric Vehicles,  
Battery End-of-Life & Circularity  
Africa Workshop

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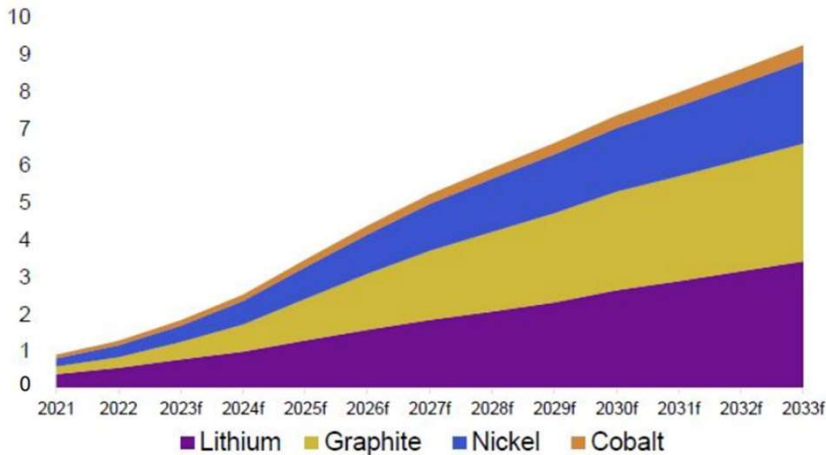


# Global Battery Demand Forecast & Recycling Feedstock



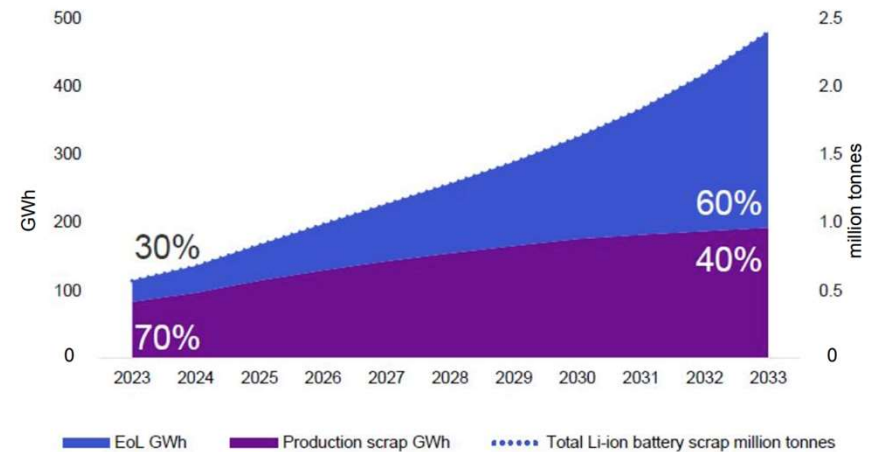
Demand for lithium batteries expected to increase 5-fold by 2033 at 15% CAGR

**Lithium-ion battery metal demand**  
Million tonnes



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.

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+



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

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

Source: Annual Battery Report 2023 by Volta Foundation

# China – EV Battery Recycling Regulation (2006-2017)

- **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.
- Integral part of the European Commissions plan - EU Green Deal, Circular Economy Action Plan, New Industrial Strategy.
- **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!

