

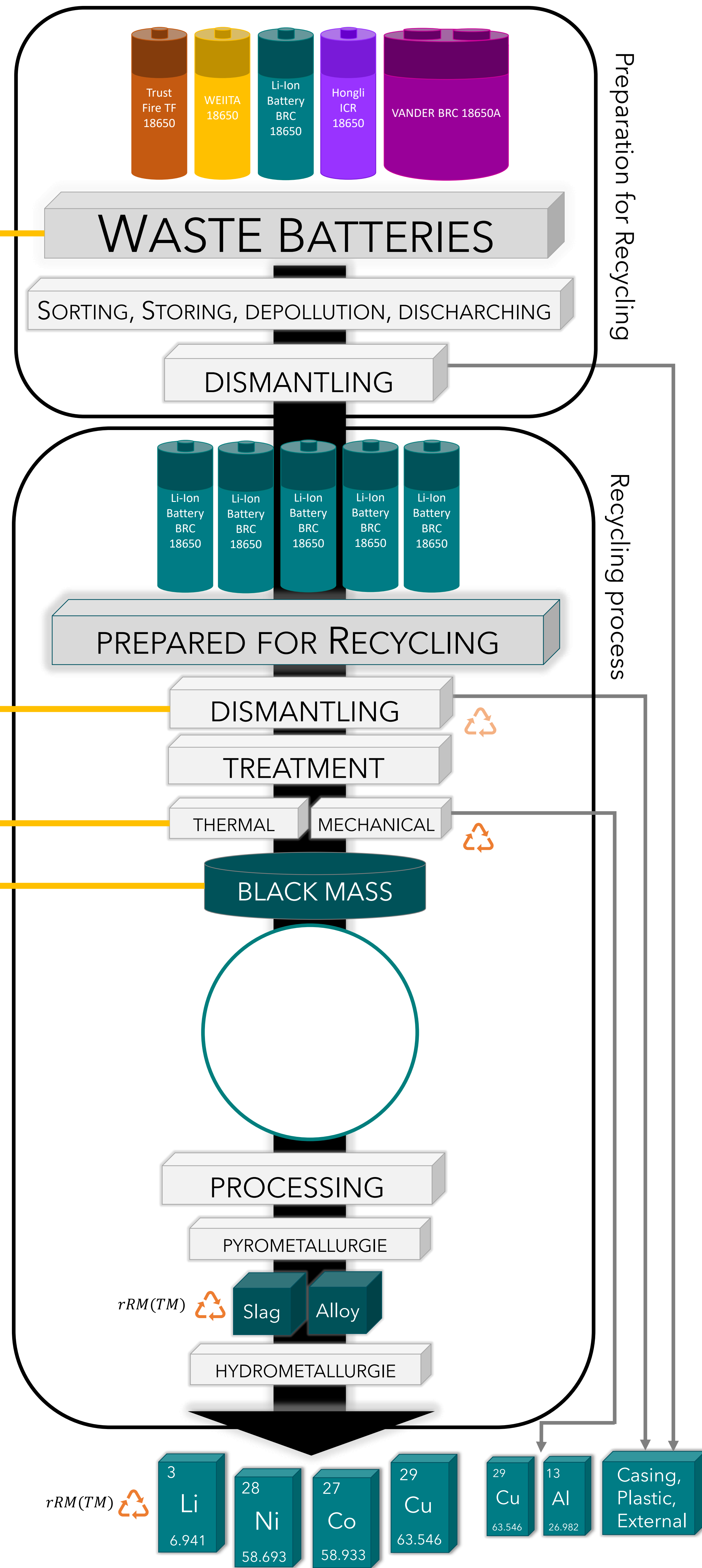
INITIAL SITUATION

The industry is keenly anticipating the release of the **new guidelines for calculating recycling efficiency** under the EU Battery Regulation. From mobility transition. The introduction of key figures and mandatory an EU standpoint, implementing element-based recycling quotas aligns quotas is pushing the industry to optimize its processes accordingly. with the critical raw materials strategy of the European Commission and

CHALLENGES

NEW EUROPEAN BATTERY REGULATION

- Different LIB Types
 - Different average composition
 - Handling residues
- Allocation problem of dismantling
 - Preparation for recycling vs. recycling
 - Pure materials vs. compounds
 - Dismantling = 100 % recycling
- Dealing with emissions?
 - Exhaust gas (Li)
 - Losses (dust)
- Choosing chemical analysis method
 - XRD, XRF, ICP, etc.
 - Sampling frequency
 - By-products
 - Fe, Al, Mn, C
- Recalculating input composition from the endpoint
 - LFP, primary batteries
 - Loosing information
 - Required level of data quality, completeness, accuracy & consistency
 - Securing representative sampling from an unknown heterogeneity of the bulk
- Establishing robust verification processes by independent third parties
- How to find answers?
Scientific Field Research



Recycling ≠ Recycling

According EEA^[2]:
'Recycling' = resource recovery method involving: (1) **collection**, (2) treatment for use as raw material

According New EBR:
'Recycling' = resource recovery method involving: (1) **collection**, (2) treatment for use as raw material

Calculation points

- Calculating **recovery of material**
- targeted materials Co, Cu, Pb, Li, Ni (in Annex XII, Part C, Regulation (EU) 2023/1542)
- Recovered in materials, substances and products that can substituting primary materials, substances and products

Recycling efficiency rate

$$rRE = \frac{\sum m_{output}}{m_{input}} * 100; [mass \%]$$

Recovery rate of materials

$$rRM(TM) = \frac{\sum m_{TM, output - point}}{m_{TM, input}} * 100; [mass \%]$$

"First recycler" is obligated to report

- Recycler who carries out recycling in the permitted facility where the recycling process commences
- If the same battery waste stream goes through more than one facility consecutively
- A waste management operator who only conducts **preparation for recycling, including the storage, handling and dismantling of battery packs or the separation of fractions** that are not part of the waste battery itself, **cannot be the first recycler**

EXPLORE our Projects

MoLIBity: DI Rutkowski C., MUL
LITB recycling process from mobility applications

FuLIBatter: DI Rutrecht B., K1-MET
LIB Recycling for Recovery of Critical Raw Materials

DISCUSS with US at the RDT

Limits of the rRE calculation
16:00 Uhr 13.11.24
HS Kupelwieser (1.OG)

Innovation through Cooperation
12:00 Uhr 14.11.24
Seminarraum D (EG)

Let's collaborate

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