

# CHALLENGES IN BATTERY RECYCLING AND SECOND-LIFE APPLICATIONS

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# LEGISLATION RELATED TO RECYCLING

Regulation (eu) 2023/1542 of 12 july 2023

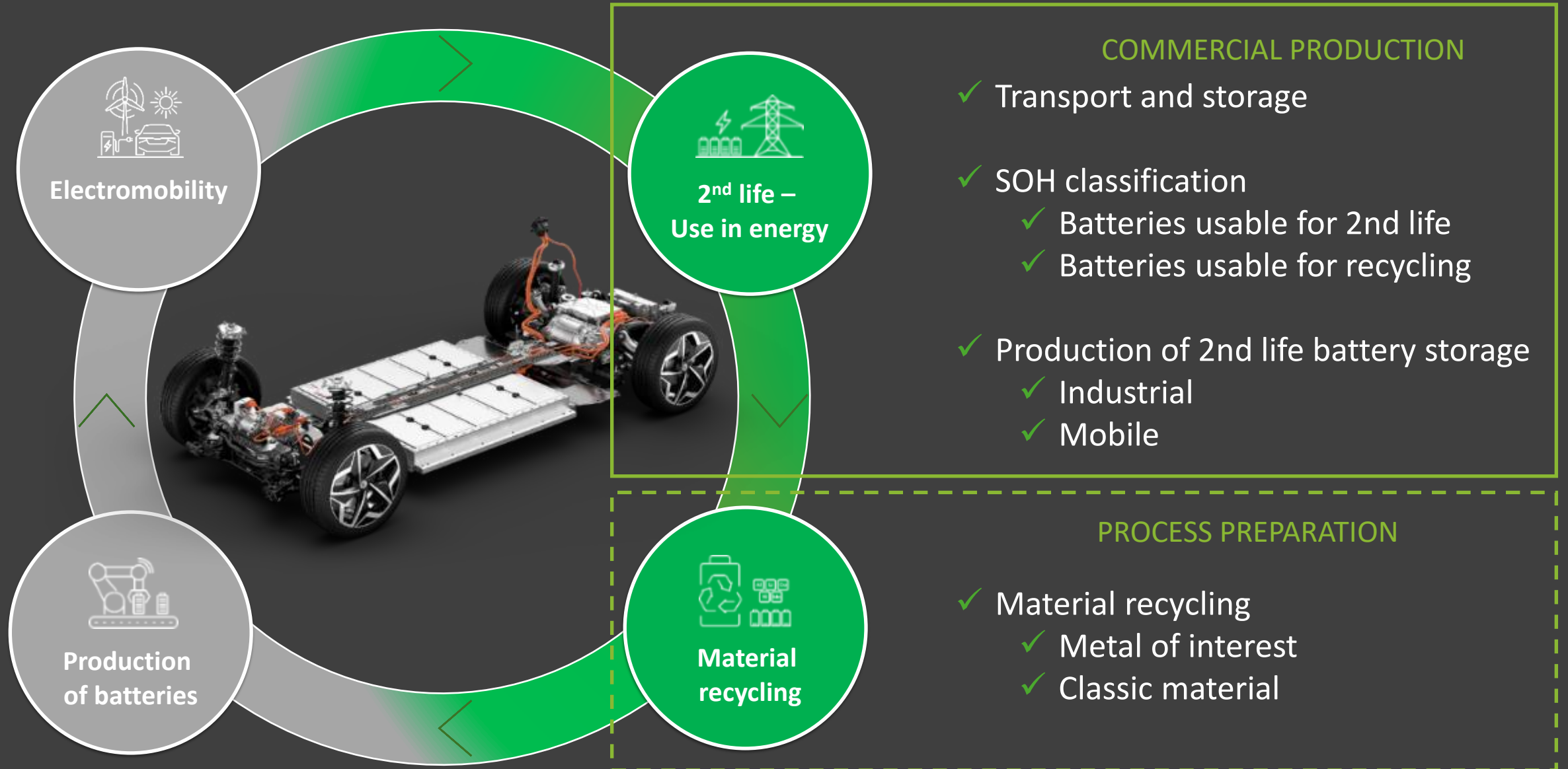
## RECYCLING EFFICIENCY TARGETS

- ✓ recycling 65% of the average weight of lithium batteries by 31 December 2025
- ✓ by 31.12.2030 recycling 70 % of the average weight of lithium batteries

## MATERIAL RECOVERY TARGET

	31. 12. 2027	31. 12. 2031
Co	90%	95%
Cu	90%	95%
Pb	90%	95%
Li	50%	80%
Ni	90%	95%

# LI-ION BATTERY CIRCULARITY - AREAS OF INTEREST



# EXTENDING THE LIFE OF LI-ION BATTERIES

2<sup>ND</sup> LIFE BATTERY STORAGE

# BASIC PRODUCTION PROCESS for 2nd LIFE BESS

## SUPPLY OF BATTERIES

- ✓ Collection of batteries
- ✓ Battery sorting by state and capacity
- ✓ Storage of batteries according to capacity classification

## PRODUCTION 2nd LIFE BESS

- ✓ Assembling BESS
- ✓ FAT tests
- ✓ Installation at the customer's site

# EXTENDING THE LIFE OF LI-ION TRACTION BATTERIES IN PRACTICE



IES Solution by IBG Česko

Support of charging infrastructure for e-mobility | PV energy storage | Stabilization of power peaks

# WHAT BESS 2nd LIFE PRODUCTION BRINGS

What happens when the batteries of 200 electric cars get a second life?

- ✓ In our case, 40 battery storage IES will be created - and with them, clearly measurable benefit

We will save 3,250 tonnes of CO<sub>2</sub> per year

- ✓ equivalent to 700 car emissions, 36 million km driven or 54,000 trees planted

By reusing battery modules, we significantly reduce the need to mine raw materials

- ✓ lithium, cobalt, nickel and more

We produce less waste.

- ✓ Batteries that would otherwise go straight to recycling can continue to work reliably for another 5 to 10 years thanks to our Battery Storage

# HOWEVER

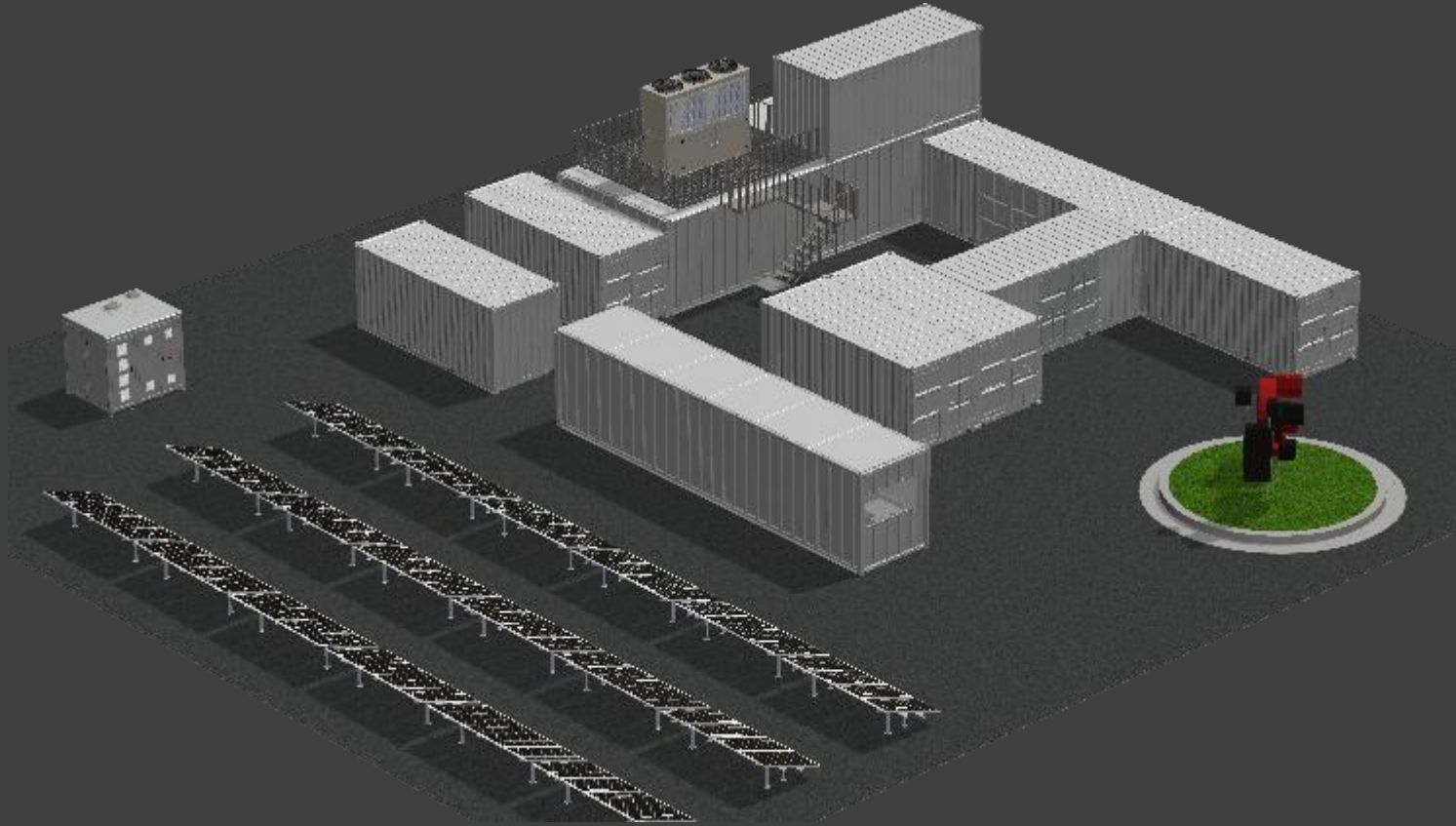
- x Automotive batteries do not have certifications for use in stationary applications
- x Used NMC batteries present significant fire hazard
- x Small scale battery sorting and assessment is expensive and time consuming
- x Significant drop of LFP batteries price almost kills the business case for second life
- x Issue of extreme innovation and improvement level of mass produced energy storages
- ✓ There is abundancy of automotive batteries discarded from production line



# LI-ION BATTERY RECYCLING

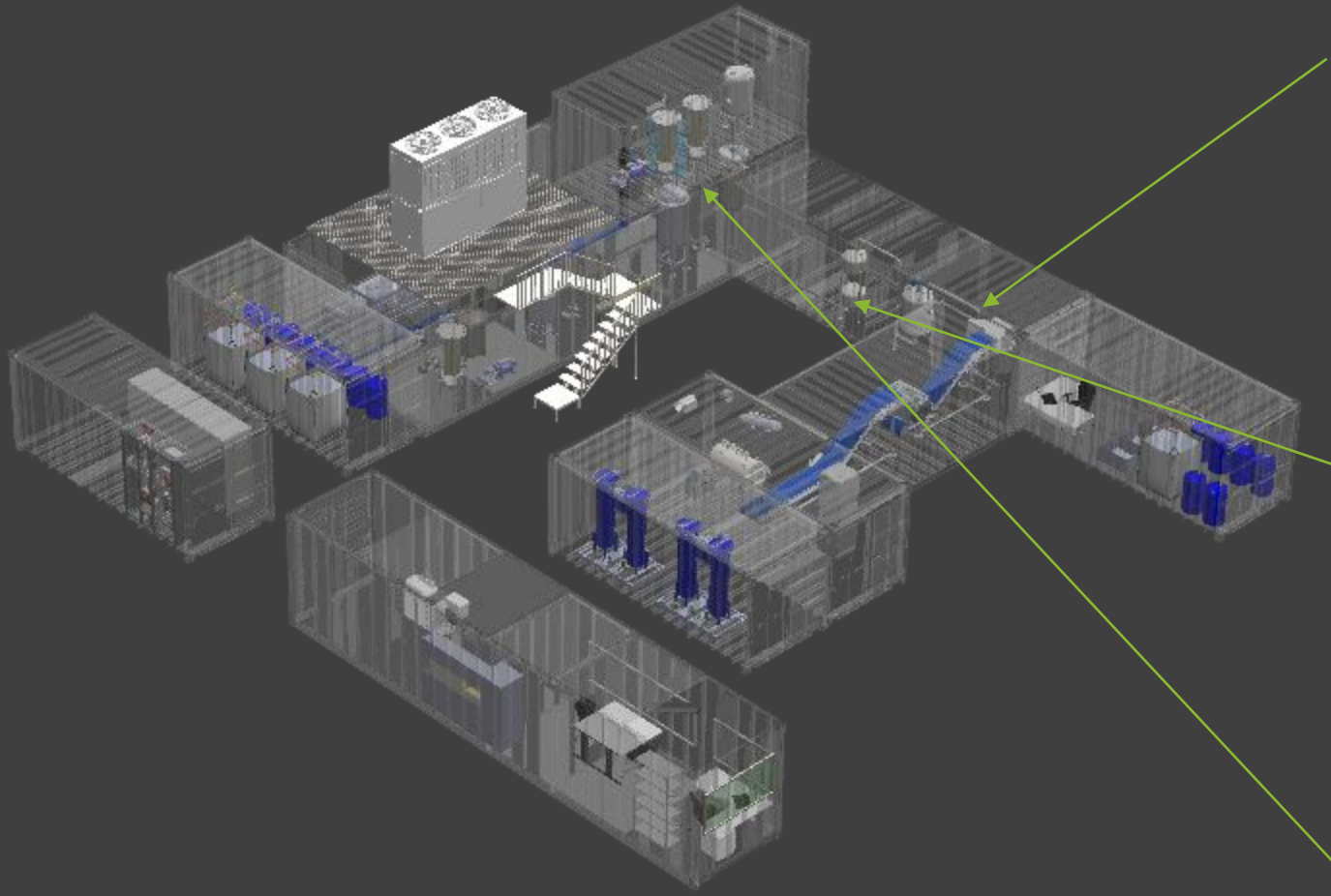
MODULAR RECYCLING LINE

# NEW RECYCLING LINE CONCEPT



- ✓ Space saving
- ✓ Modular system
- ✓ The use of green energy
- ✓ Energy sources
  - ✓ Water
  - ✓ Power

# THE OVERALL CONCEPT OF RECYCLING PROCESSES



✓ Shredding

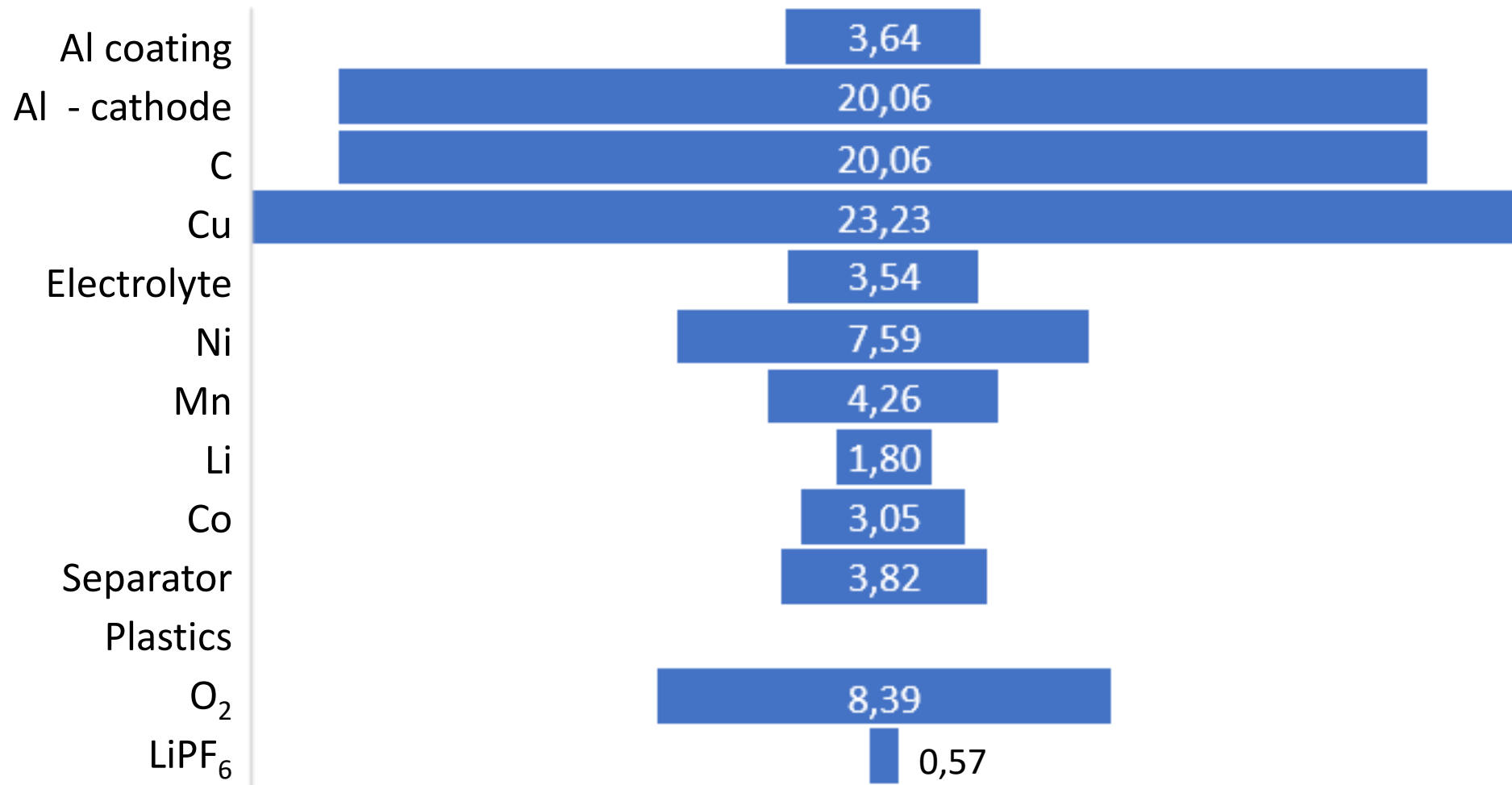


✓ Leaching



✓ Separation process

## BEV NMC material distribution



# THANK YOU FOR YOUR ATTENTION



IN COOPERATION WITH



Recyklační klastr

VŠB TECHNICKÁ  
UNIVERZITA  
OSTRAVA