



*This project has received funding from the European Union's Horizon Europe research and innovation programme under grant number No. 101104022.*



# STREAMS

SUSTAINABLE TECHNOLOGIES  
FOR REDUCING EUROPE'S BATTERY  
RAW MATERIALS DEPENDANCE



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BATTERY  
2030+

# The STREAMS consortium



# Objectives

- **Develop, evaluate and successfully demonstrate a comprehensive portfolio of flexible and scalable technologies and solutions for the sustainable production of battery-grade precursors and their respective anode and cathode active materials.**
- **Promote and evaluate the utilization of different streams of primary and secondary sources together with recycled battery mass.**
- **Develop circular models, manufacture battery cells at pilot scale and test them according to established standards.**

## Primary sources

- Spodumene (Li-source)
- Natural graphite

## Secondary sources

- Mining tailings (Co, Ni, and Mn)
- Bayer liquor (Li)
- Photovoltaic waste (Si)
- Biochar (conductive additive)

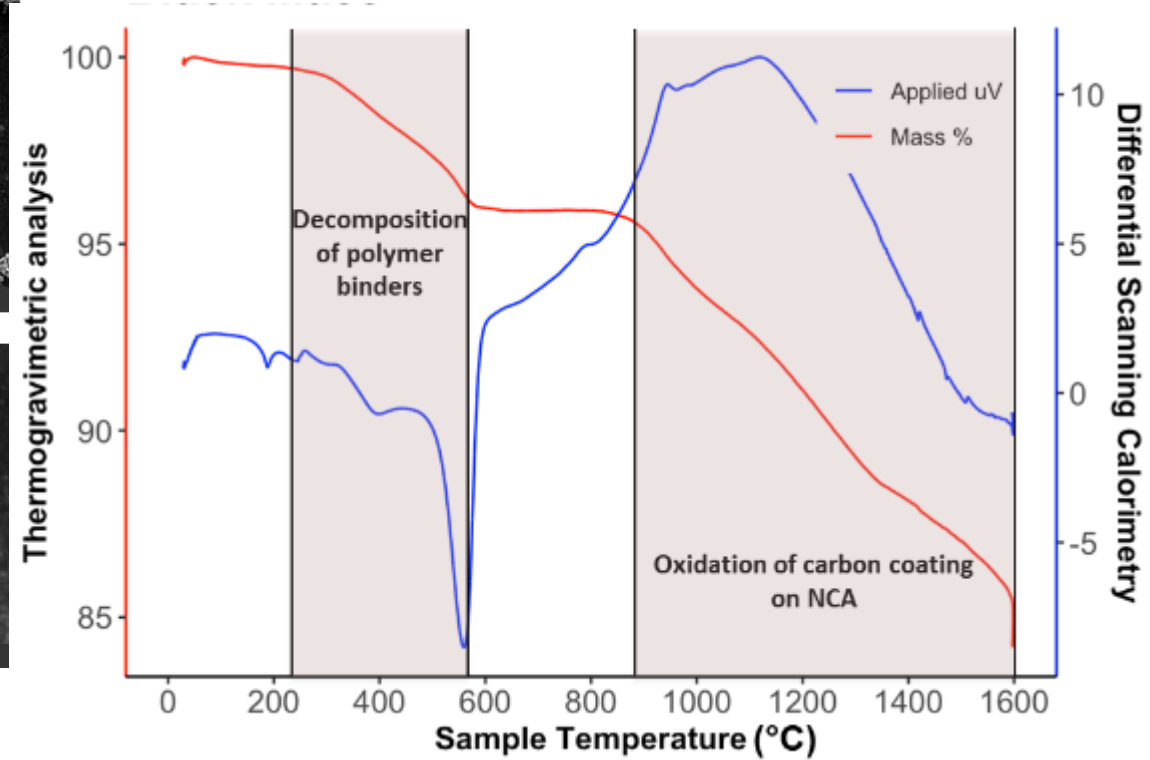
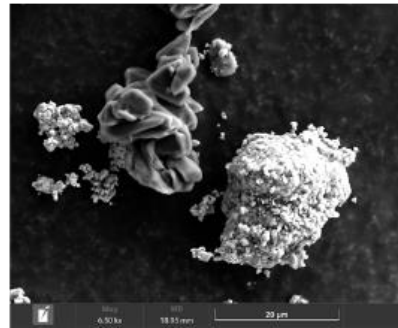
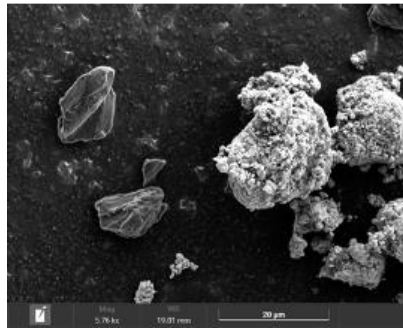
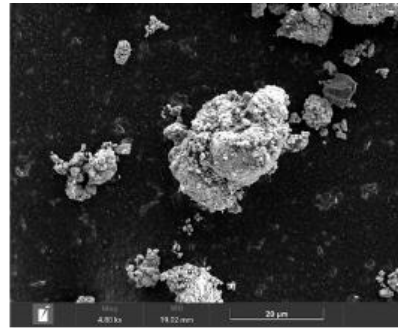
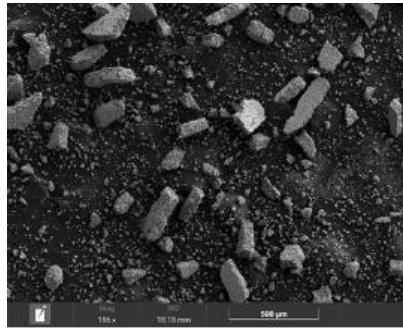
## Other sources

- Black mass (NMC, LFP and graphite)



# First results

## Characterization of a cathode rich black mass sample

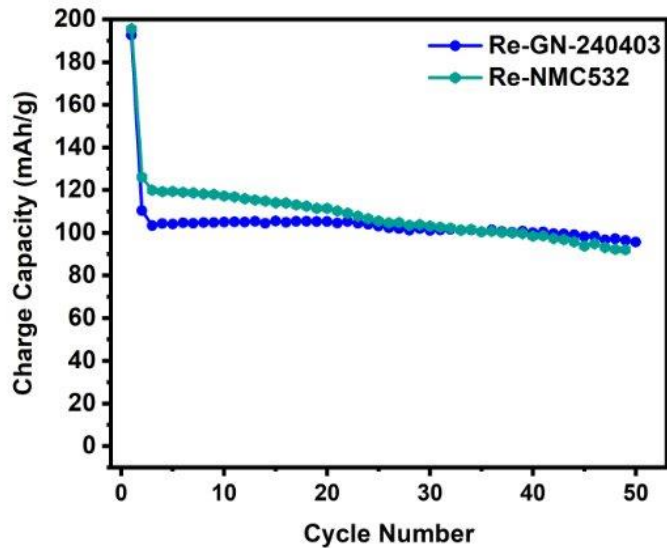
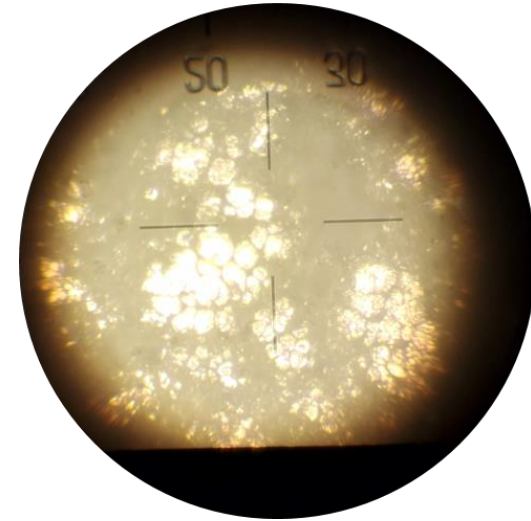


# First results



**Electrodeposition of Ni-Co alloys on Ti-cathodes after recovery from black mass**

**Li-particles at the surface of a stainless-steel electrode, obtained via electrodeposition**



**Electrochemical performance of cathode active materials that were directly regenerated via solid-state heat treatment**





# Roadmap goals

- 1) Which objectives of my project could be added to the roadmap goals?**
  - Sustainable integration of materials from primary and secondary sources into the battery materials development value chain
  
- 2) What are the expectations of my project from the future roadmap?**
  - Advancement of electrodeposition techniques for the recovery of lithium and transition metals in metallic form
  - Rehabilitation of the graphitic anode

