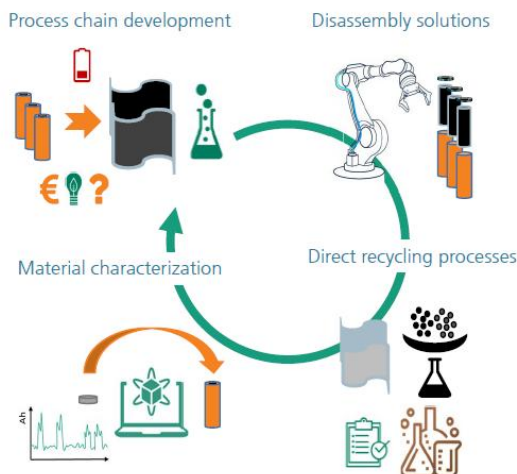


End-of-Life & Battery Recycling

Batteries are essential for the energy transition. Sustainable deployment requires a holistic lifecycle approach, including reduced use of critical raw materials, recycling-friendly design, second-life concepts, and efficient material recovery. Circular processes can significantly reduce CO₂ footprint and strengthen resource security.

The [Fraunhofer Battery Alliance](#) has extensive expertise in the evaluation of product and process technologies along the entire value chain, from raw material extraction to battery recycling. The focus is on the development of new battery technologies and the optimization of existing systems, considering the minimal use of critical raw materials, dismantling- and recycling-friendly design as well as efficient recycling.



We perform life cycle analyses, determine the remaining useful life, and develop second life models for batteries. In addition, innovative reconditioning processes are demonstrated under real market conditions to promote the sustainable use and recycling of batteries.

Recycling activities range from mechanical pretreatment to hydrometallurgical / electrochemical material recovery, black mass processing, and regeneration of active materials. The Alliance also develops automated disassembly and reassembly technologies and scalable factory & logistics concepts.

Pilot facilities offer shredding, centrifugation, extraction, leaching, electrochemical treatment and full analytical monitoring, enabling recovery of valuable metals and functional materials.



Robot based - Battery disassembly [\[YouTube-link\]](#)



Material mixture after EHF



Metal fraction after sieving and washing



Underscreen fraction: black mass

Hydro-mechanical process for the production of black mass – Water-based separation process

Our Offer:

- Evaluation of product and process technologies along the entire battery value chain
- Preparation of life cycle assessments (LCA)
- Determination of the remaining useful life of batteries (RUL forecasts)
- Demonstration of reconditioning processes of lithium-ion batteries under market condition
- Design for recycling- Customer-specific, recycling-friendly cell design
- Disassembly, re-assembly and recycling processes,
- Raw material recovery as well as re-use
- Analyses and testing, labelling, sensor systems, safety

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Kindly get in touch with us if you are interested in this technology or require further information.

Thanks and Regards,

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