



Safer, smarter Li-ion battery recovery

Pretreatment and State-of-Health upstream: the missing link for circular battery economy

SAFETY MANAGEMENT &
REGULATORY COMPLIANCE



OPTIMISED EVALUATION
AND ROUTING FOR
SECOND LIFE APPLICATIONS



STANDARDISED AND SCALABLE
END-TO-END PRETREATMENT
PROCEDURES

Duration:
2025-2026

Budget:
€1.28M

Project Number:
24613

Supported by



RawMaterials
Connecting matters



Co-funded by the
European Union

Who benefits from RISBAT?

- ▶ Large battery recycling companies in Europe
- ▶ PROs without pretreatment capacity
- ▶ Recyclers lacking sorting and state-of-health assessment

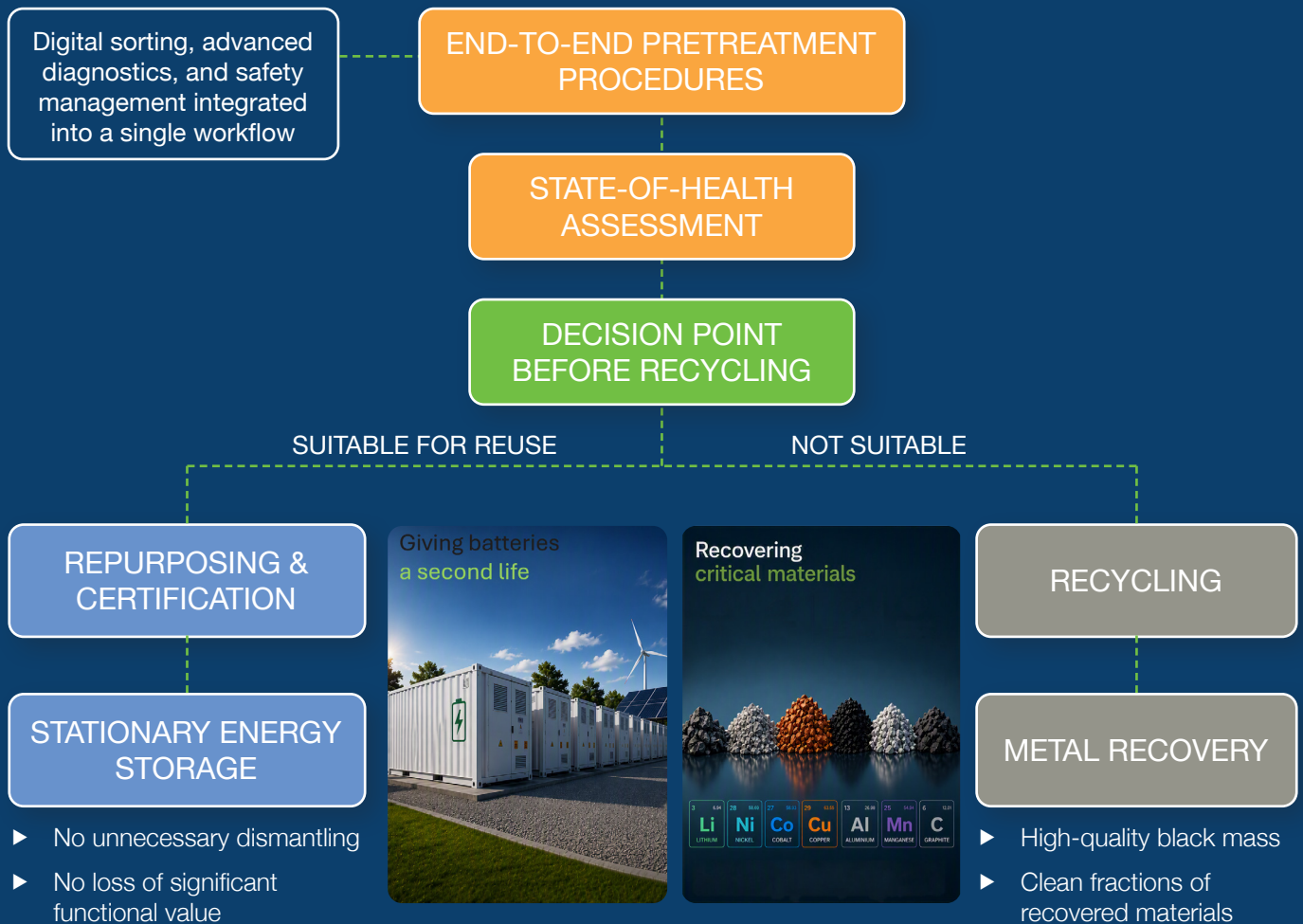
Growing end-of-life battery challenge

- ▶ No dismantling / discharge infrastructure for large-format batteries
- ▶ No chemistry identification and unsafe storage facilities
- ▶ Full export dependency

Batteries are exported before value is assessed

Value Recovery from the RISBAT Framework

Value is created before recycling



RISBAT Impact



**Up to
+40% Reuse
Enabled**



**Compliant
with Regulation
(EU) 2023/1542**



**Up to 50% of
Critical Raw
Materials Preserved**



**+2000 tons/year
Battery Handling**



**Lower Handling
and Management
Costs**

RISBAT FRAMEWORK

Standardised end-to-end pretreatment of end-of-life Li-ion batteries

Battery intake & registration

Category-specific pretreatment

Classification, segregation & storage

Digital sorting & traceability

Dismantling & component separation

Reuse, repurpose & recycling

4 Lithium-ion Battery Categories

Industrial batteries

LMT batteries

EV batteries

Portable batteries

Scalable and adapted to market and operational reality of each country

Safety Management & Pretreatment Protocols



- ✓ Operational risk mitigation
- ✓ Business continuity
- ✓ Regulatory compliance

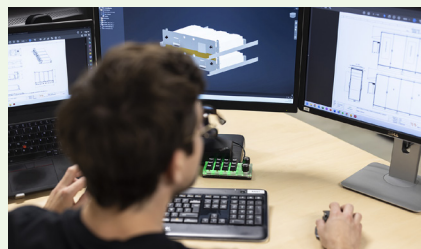
ADR-compliant packaging, storage & monitoring



Controlled discharge



Digital Sorting & Traceability



- ✓ 98% chemistry identification accuracy for NMC and LFP batteries
- ✓ Digital documentation from reception to reuse and recycling



Label-based identification



Visual recognition & pack family



Operator assisted classification



Data traceability & Digital record

Dismantling and Routing to Reuse and Recycling



- ✓ Certification of state-of-health assessment
- ✓ Advanced evaluation for second life applications



State-of-Health Assessment



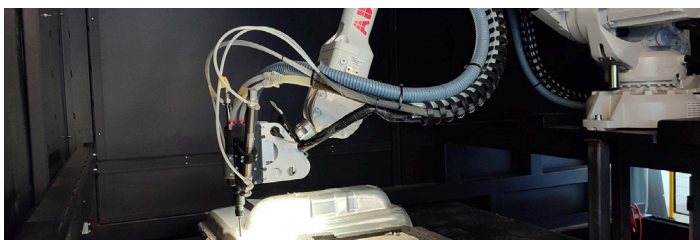
Dismantling and component separation

Preparation of packs or modules for downstream processing



Implementation of robotic disassembly of EV battery cases

HIRO MAIA Robotic Station Validated at TRL 5



Detects & classifies



Adapts to geometries



Unscrews fasteners



Improved repeatability

95%

Case removal rate

98%

Unscrewing accuracy

99.8%

Vision system accuracy

0

Safety events

1m15s

per battery pack

94%

System Uptime

Validation in real operational environments

The RISBAT framework and the robotic disassembly were demonstrated at three national test lines operated by Re-Battery (Coordinator, Greece), SNRB (Romania), and Electrão (Portugal).

3 Countries – 3 PROs



Re-Battery
Greece



SNRB Association
Romania



Electrão
Portugal

- ▶ Gradual integration allows adaptability to different regulatory environments, battery streams, and infrastructure levels
- ▶ Standardised protocols ensure safety of operations
- ▶ Robotic dismantling minimises manual operations and risks
- ▶ The economic feasibility will increase once the battery streams rise, starting from 2030
- ▶ Digital traceability during all stages increases trust in second-life battery markets.

RISBAT Joint venture

The project moves to commercial deployment through RISBAT spin-off company set up to build a safe, robust and transparent Li-ion battery supply chain.

The company will exploit the battery-reusability evaluation protocol, and will bring RISBAT to market.

Matchmaking platform

RISBAT Matchmaking platform is an open platform designed to:

- ▶ Connect supply & demand
- ▶ Identify battery streams
- ▶ Enable reuse & recycling partnerships

Consortium

7 partners across
6 countries combining
PRO, industrial and
research expertise



Contact

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RISBAT project



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