R3-MYDAS

Remanufacturing, Repurposing and Recycling Energy Goods through advanced Mechatronic and Digital technologies

E-Vehicle Batteries

Smarter End-of-Life Decisions

Using battery data, State-of-Health diagnostics and robotic disassembly to support safer, more efficient and circular battery value chains.

As electric vehicle adoption grows, managing batteries at the end of their first life is a challenge for the industry. When an electric vehicle battery is no longer suitable for its original use, stakeholders must decide whether it can be reused, repurposed, remanufactured or recycled.

THE CHALLENGE

These decisions depend on the battery's condition, especially its State of Health. However, battery lifecycle data is often fragmented, incomplete or difficult to verify.

Battery disassembly also presents major operational and safety challenges. Electric Vehicle battery packs are complex systems comprising housings, cooling structures, connectors, modules, and cells, often secured with dozens or even hundreds of screws.

The challenge is therefore twofold: understand the real condition of the battery through trustworthy diagnostics, and make disassembly safer, more efficient and more adaptable to different battery designs.

THE R3-MYDAS SOLUTION

R3-Mydas combines battery diagnostics, AI-based decision support and robotic disassembly to make end-of-life battery management safer, more reliable and easier to scale.

- State-of-Health diagnostics
- One-shot hybrid assessment
- AI-driven decision support
- Robotic battery disassembly
- Computer vision and precision screwdriving
- Human-robot collaboration

By connecting battery data, diagnostics and robotic disassembly, R3-Mydas helps close the loop between end-of-life assessment and practical circular battery processing.

KPIS ACHIEVED

R3-Mydas improves the way EV battery condition is assessed, combining data analytics, anomaly detection and automated disassembly to support safer and more reliable end-of-life decisions.

- **20%** — Improvement in the visualization of causal relationships
- **30%** — Improved detection of deviations from normal behaviour
- **50%** — Faster anomaly localisation
- **30%** — Increase in handled data-stream modalities
- **20%** — Faster data fusion process

SUSTAINABILITY

R3-Mydas helps turn EV battery end-of-life into a smarter decision-making process. Instead of treating used batteries as waste by default, the project supports safer and more informed choices on whether batteries, modules or cells can continue to generate value.

- Keeping battery value in use for longer
- Avoiding premature recycling
- Safer dismantling of complex battery packs
- Better use of critical materials
- Data-driven circular decisions

Aligned with Current ISO/CEN Standards

USE CASE LEAD

This use case is led by **AVL**, focused on mobility engineering, e-mobility, battery development, testing and data-driven vehicle technologies.

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MORE ABOUT THE CASE STUDY

r3-mydas.eu/rmydas-demo-cases-evehiclebatteries

Partners

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