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**FACTSHEET:
DIGITAL BATTERY PASSPORT
FOR SECOND-LIFE BATTERIES**



Funded by
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DIGITAL BATTERY PASSPORT FOR SECOND-LIFE BATTERIES

Supporting circularity through trusted data

About REBELION

REBELION addresses the waste management challenges of lithium-ion batteries from electric mobility, promoting recycling as a sustainable solution to recover valuable raw materials and support circular battery value chains.

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Key insight

A single platform combining traceability, sustainability assessment, and secure data management for battery lifecycle.

BATTERY LABELLING SYSTEM

A centralised **QR-based digital passport system** for second-life batteries, enabling traceability across dismantling, sorting and recycling.

BATTERY ECO-RATING SYSTEM

Battery rating system based on eco-cost accounting and life-cycle assessment, supporting **informed sustainable choices**.

DATA SECURITY

Blockchain architecture ensures tamper-proof battery lifecycle records, enabling compliance with EU Battery Regulation (2023/1542) and ESPR.

LIFECYCLE TRACEABILITY

Tracks battery information of dismantling, testing, repurposing and recycling of battery history.

MANAGEMENT ACCESS

Accessible through **web and mobile**, allowing to retrieve battery information via QR code with role-based digital access.

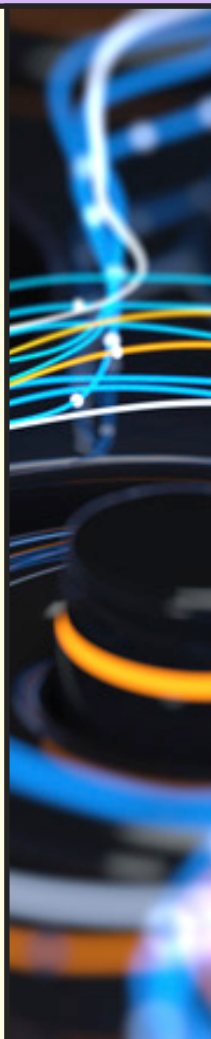
Why it matters

Growing numbers of electric vehicle and industrial batteries are reaching the end of life, creating both an **environmental challenge** and a valuable **recovery opportunity**. By 2030, an estimated 1.5 million tonnes of lithium-ion batteries will reach end-of-life annually worldwide. Current data systems are fragmented, so recyclers, refurbishers and regulators cannot easily access the **battery information** they need. This creates safety risks, inefficiencies and barriers to circular economy adoption..

REBELION's
DBP enables
safe,
efficient
reuse of
1.5Mt of
Li-ion
batteries
reaching
end-of-
life yearly
by 2030.

What are we developing

The ADMEC team at Nottingham Trent University is building a web-based, cross-platform **Digital Battery Passport (DBP)** system designed **for second-life batteries** within the REBELION project. Unlike existing DBP applications focused on new batteries, this system captures data across the full lifecycle, from manufacture through dismantling and diagnostics to recycling. The platform includes a mobile App, a structured data repository, a data upload module for operators, dynamic ecolabels with environmental impact rankings, and blockchain-integrated security. A dedicated tool automatically generates **customised ecolabels and QR codes for individual battery units**, linked to a centralised database that filters information by process stage.



How it works

The DBP platform links battery data, sustainability indicators, and traceability records.

1 BATTERY REGISTRATION: Each battery has a **unique QR code** linking to its digital record in central repository.

2 DATA COLLECTION: **Operators** (OEMs, recyclers, labs, refurbishers) collect & submit structured battery data.

3 DYNAMIC ECOLABEL: A **dynamic ecolabel** presents the PEF-based A-E ranking and a QR code to lifecycle data.

4 INFORMATION ACCESS: Operators scan QR to view **stage-specific data** (safety, diagnostics, sustainability).

5 BLOCKCHAIN SECURITY: **Blockchain records** ensure secure, transparent and tamper-resistant lifecycle tracking.

Key benefits

The REBELION DBP delivers environmental, economic, regulatory, and digital benefits via secure lifecycle traceability.

INDUSTRIAL

Standardised data exchange across the battery value chain enabling efficient dismantling, screening, testing, repair of second-life battery components.

ENVIRONMENTAL

Measurable lifecycle **environmental impact** via eco-accounting and PEF methods, supporting informed decisions on battery reuse, repurposing and recycling.

SAFETY

Real-time access to critical safety data (voltage levels, hazardous materials, recommended disassembly procedures), **reducing risks** for operators.

REGULATORY COMPLIANCE

Supports EU **Battery Regulation compliance** through accessible, structured and auditable battery lifecycle data.

DIGITALISATION

Accelerates **battery value chain digitalisation** through standardised and interoperable data services.

Key figures

Key characteristics and performance indicators of the REBELION Digital Battery Passport platform.



BATTERY TYPES



4 Battery types currently supported: Samsung, Volkswagen, Nissan LEAF, Mitsubishi



DATA CATEGORIES

8 standardised data categories covering the full battery lifecycle



LIFECYCLE ASSESSMENT

Tracks batteries from manufacturing to dismantling, diagnostics, repurposing and recycling.



STAKEHOLDERS

Recyclers, testing laboratories, refurbishers, second-life operators, and regulatory authorities.



ACCESS PLATFORMS

Available through a website, mobile app and QR code for **easy access**.



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Discover more at:

[> REBELLION-PROJECT.EU](https://rebellion-project.eu)



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