phoenix

Building more reliable and performing batteries by embedding sensors and self-healing functionalities to detect degradation and repair damage via advanced Battery Management Systems

Project in a nutshell

The PHOENIX project aims to explore various possibilities for integrating self-healing, sensing, and triggering functionalities into batteries, to develop cells capable of living longer, detecting and preventing any kind of degradation, being more sustainable and less expensive.

Thanks to the integration of an advanced Battery Management System (BMS) to these functionalities, detecting any degradation in performance and evaluate the battery's overall quality will be possible: batteries lifetime will improve up to +100%.

Methodology

- Develop self-healing battery materials and sensing devices.

- Validate the triggering mechanisms and degradation detection.

- Assess the manufacturing, recycling, and sustainability process and develop the Battery Management System.

Objectives

Develop materials providing self-healing capabilities

Create and develop various types of sensors

Develop triggering devices that can activate the self-healing process

Creating a self-contained solution

Detect and address critical battery degradation

Assess the sustainability of the developed battery technology

Implement an adaptable approach to mass production processes of battery cells

Contribute to the growth of a sustainable battery manufacturing industry in EU

ACCUREC RECYCLING GMBH

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deepblue

DLR Deutsches Zentrum für Luft- und Raumfahrt German Aerospace Center

enwair FULL OF ENERGY

Fraunhofer ISC

Leclanché Energy Storage Solutions

cidetec energy storage

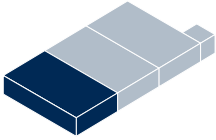VUB BATTERY INNOVATION CENTRE

Project funded by

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss confederation

Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

Sensors

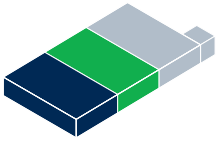- Ultrasound sensors
- Thermal sensors
- Gas sensors
- Dielectric elastomer and pressure sensors
- Reference electrode for half-cell potential sensing

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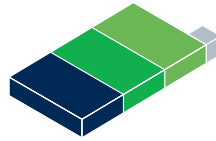# Trigger devices

- Triggering by pressure
- Triggering by magnetic field
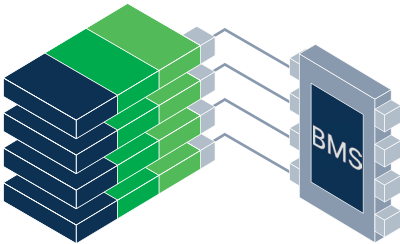- Triggering by temperature

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Self-healing functionalities
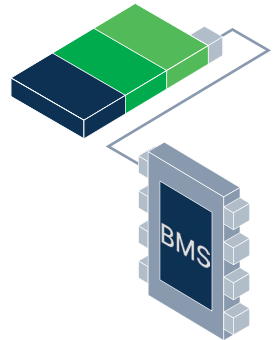
4 Four different self-healing approaches

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More sustainable batteries

Lower production costs

Longer batteries lifetime

BMS

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BMS

Contacts

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X @PhoenixSmartBat