COLLABAT Cluster Introduction

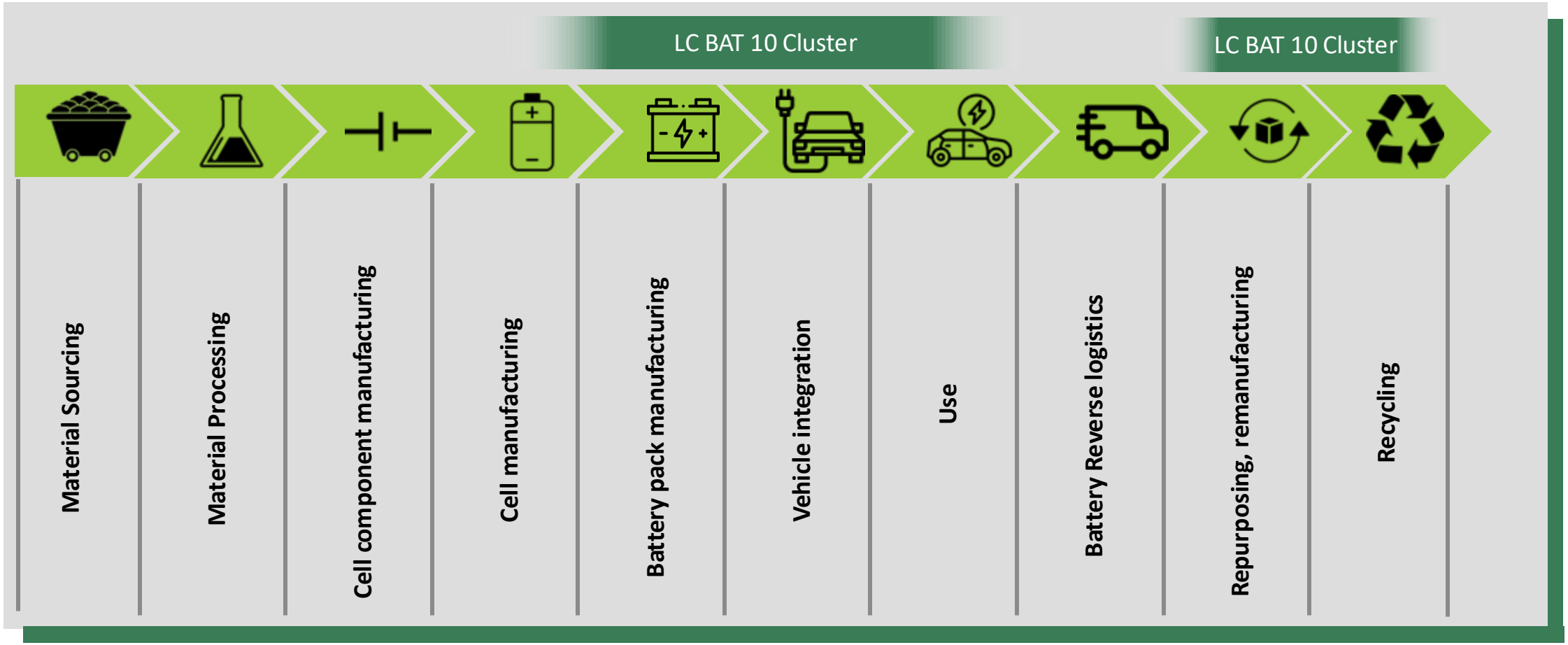
26th Nov 2024

Workshop Barcelona

COLLABAT

ALBATROSS HELIOS LIBERTY MARBEL

COLLABAT Battery Value Chain



LC-BAT-10-2020 Main goals

- Accelerate the mass market take-up of battery electric vehicles (BEV) and plug-in hybrids (PHEV), by means of:
  - Increasing the energy density of battery packs.
  - Shorter charging times for BEVs through high-power charging

- Expected Impact:
  - Reduced battery system weight by 20%.
  - Extended useful battery life to 300 000 km in real driving.
  - A minimum 20% Life Cycle Analysis improvement compared to existing products.
  - Improved knowledge on module and pack sensorisation and thermal management.

Projects details

HELIOS

High-performance modular battery packs for sustainable urban electromobility services

Some Key-Innovations:

- Hybrid combination of High Energy with High Power cells in one pack
- Modular & scalable design combining different battery modules & DC/DC
- Advanced BMS and Multi-Sensor-Unit using wireless communication
- Digital Twin, IoT Cloud based solutions, Fleet management software
- Ultrafast-charging at 360 kW
- Validation on a) small city EV car and b) full-size Bozankaya E-Bus

MARBEL

Manufacturing and Assembly of modular and Reusable EV Battery for Environment-friendly and Lightweight mobility

Some Key-Innovations:

- > 20% weight reduction
- > 25% charging time reduction
- > 40% LCA improvement by using modularity
- Useful Battery life up to 300,000 km
- Easy & Safe (dis-)assembly automatization
- Reparability and 2nd life transition
- Adaptable to all cells and vehicles

COLLABAT

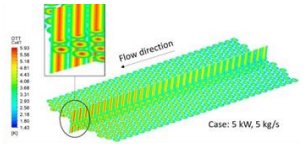
Projects details

ALBATROSS

Advanced Light-weight BATteRy systems Optimized for fast charging, Safety, and Second-life applications

Some Key-Innovations:

- Weight reduction by 20%
- Recharging time, 25% shorter
- Useful battery life enhancement
- Life Cycle Analysis – LCA improvement by 20%
- Sensorisation and thermal management knowledge
- Operational battery pack
- Validation on a BMW i3.



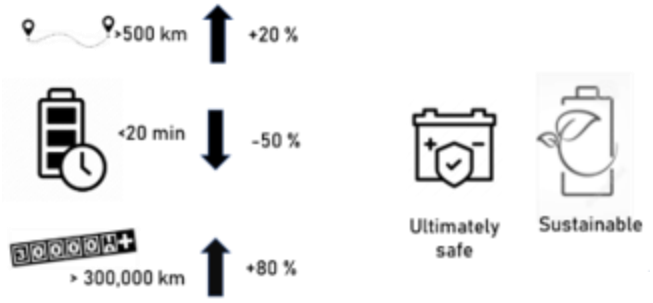
LIBERTY

LIGHTWEIGHT BATTERY SYSTEM
FOR EXTENDED RANGE AT IMPROVED SAFETY

Lightweight Battery System For Extended Range at Improved Safety

Some Key-Innovations:

- Cell-to-Pack solution.
- Immersion cooling.
- Enhanced Safety System
- Advanced BMS and SOX algorithms.
- Validation on a Mercedes EQC.



New Projects Members

iBattMan

Smart, Connected and Secure Battery Management System Enhanced by Next-Generation Edge- and Cloud-Computing, Sensors and Interoperable Architecture

Some Key-Innovations:

- innovative modular BMS platform to enhance battery performance and reduce TCO
- incorporate novel sensors and methodologies for monitoring the SoH of the cells during operation and in charging,
- cutting-edge technologies and tools for V2X and second-life applications
- use advanced physics- and data-based models implemented on-board and on-cloud

InnoBMS

Situationally aware innovative battery management system for next generation vehicles

Some Key-Innovations:

- integrated system, highly connected and self-testing, for balanced decisions
- predictive SoX diagnostics
- use of advanced models and secure real-time battery management to reduce margins
- collecting and managing data for accurate second life classification, and interfacing to Vehicle-to-everything applications (V2X)

COLLABAT In detail

- 3 main subclusters defined – already launched:
  - Sub – A: Sustainability
  - Sub – B: Testing & Validation
  - Sub – C: BMS

- The main purpose is to engage on technical topics of discussion and identify potential synergies among projects.
- We expect to provide specific outcomes valuable to upcoming EU projects, academia, industry etc.
- Our advances will be showcased on dissemination events.
- Potentially generating specific publications (whitepapers, guidelines, journal papers, etc.)

Projects contact Info

www.albatross-h2020.eu
Aysel Pilav: aysel.pilav@yesilova.com.tr & Rafael Afonso: rafonso@ewf.be

www.libertyproject.eu
Iñigo Gandiaga : igandiaga@ikerlan.es & Eduardo Miguel: emiguel@ikelan.es

www.helios-h2020project.eu
Corneliu Barbu: coba@ece.au.dk & Tomas Jezdinsky: tomas.jezdinsky@internationalcopper.org

www.marbel-project.eu
Eduard Piqueras: eduard.piqueras@eurecat.org & Marina Presas: marina.presas@eurecat.org

www.ibattman.eu
Corneliu Barbu: coba@ece.au.dk & Sofia Rosas: sofia.rosas@inova.business

www.innobms.eu
Omar Hegazy: omar.hegazy@vub.be & Arjo Roersch van der Hoogte: a.rvdh@uniresearch.com


Thank you !

HELIOS Project Overview

prepared for Collabat Cluster Workshop, 26th Nov 2024 in Barcelona

by Tomas Jezdinsky, ICA-Europe

This project has received funding
from the European Union's Horizon 2020
research and innovation programme
under grant agreement No 963646

Helios Project Overview

High-performance modular battery packs for sustainable urban electromobility services

- Funded under EU Horizon2020
  total EC grant approx. 10 Mio €
- Runtime Jan 2021 to Aug 2025 (extended)
- 18 consortium partners from 8 countries
- Website: www.helios-h2020project.eu
- Project Coordinator:

Prof. Corneliu Barbu
Aarhus Univ.
coba@ece.au.dk

Consortium partners per country:

DK: Aarhus University, Danish Technological Institute

FI: Aalto University

BE: European Copper Institute

FR: RDI'UP Innovative Research

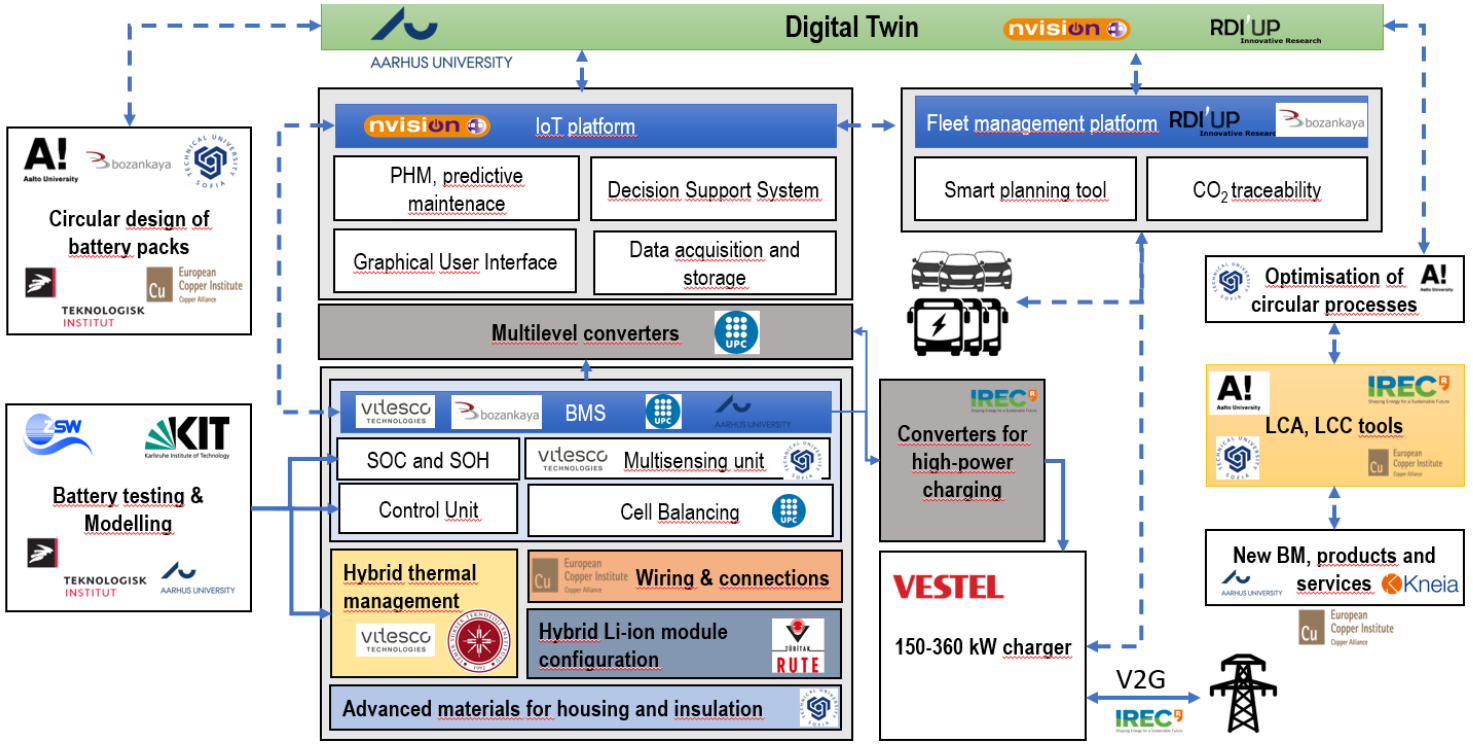
DE: vitesco Technologies, KIT Karlsruher Institut für Technologie, ZSW

ES: Universitat Politècnica de Catalunya BarcelonaTech, IREC Shaping Energy for a Sustainable Future, nvision, Kneia, idneo

BG: Technical University of Sofia We succeed!

TR: bozankaya, TÜBİTAK RUTE, VESTEL, Izmir Institute of Technology

Helios Project Tasks



- Cell selection for a hybrid high-power – high energy module
- Cell testing and evaluation
- Mechanical & electrical design of the battery modules
- Thermal management
- BMS and multi-sensor integration
- Power electronics & control strategy
- Digital twins and IoT fleet management SW platform
- Battery pack for 2nd life stationary storage solutions
- LCA and LCC analysis, assessing the recycling impact after EoL
- Integration & Testing of the battery pack demonstrator on demo vehicles, using 360kW super-fast charging

Helios General Objectives

- aims at developing and integrating innovative materials, designs, technologies and processes
- new concept of smart, modular and scalable battery pack for a wide range of electric vehicles:
  - 2 use cases for prototypes: small city car and fullsize electric bus
- improved performance, energy density, safety, lifetime and LCoS (Levelized Cost of Storage)
- optimised EV charge (incl super-fast charging) and discharge procedures and predictive maintenance schedules
- creating new designs and processes for ease of battery reuse in 2nd-life and recycling at EoL, contributing to circular economy

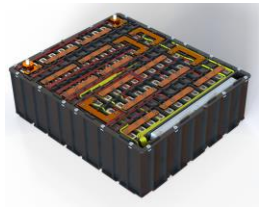
Project specifc goals

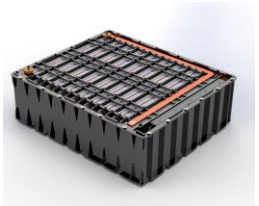
- 30% reduction of weight and 20% reduction in volume for both EV and e-bus application, corresponding to energy densities of 240 Wh/kg (500 Wh/L) and 500 W/kg (1000W/L) , which represents a 50% improvement compared to current energy density levels provided by TESLA (Model 3)
- Charging of a small EV (~80% SoC) in approx. 6 minutes with superfast-charging at 360kW
- Extend lifetime of Helios battery pack up to 300,000km or 20 years
- Improve circular economy processes within manufacturing, assembling, disassembling and recycling to min 20% Life Cycle Analysis improvement

➢ 2 Prototypes as demonstrators in Mitsubishi city car and Bozankaya E-Bus

Helios Value Proposition

- Hybrid approach combining mixed chemistry EV pack:
  a) High-Energy cells in one modules with
  b) High-Power cells in another modules





- High Energy = longer range and High Power = faster charging
- Modules have same shape & size, configurable to adapt for different use cases & customize for different driver styles (e.g. few # of HE modules but many HP modules… or vice-versa… or almost equal # of both…any configuration possible)
- Multilevel DC/DC for clever control strategies and balancing
- Monitoring of SoX in the cloud to optimize usage and lifetime of pack based on fleet data
- Scalable with same basic design from small EV to full-size E-bus (2 Helios demonstrators)
- Wireless BMS with benefits for dismantling, maintenance, repurpose and 2nd life usage in storage (no harness from modules CSC to BMS to disconnect & no need for new wiring)

Helios Project Developments

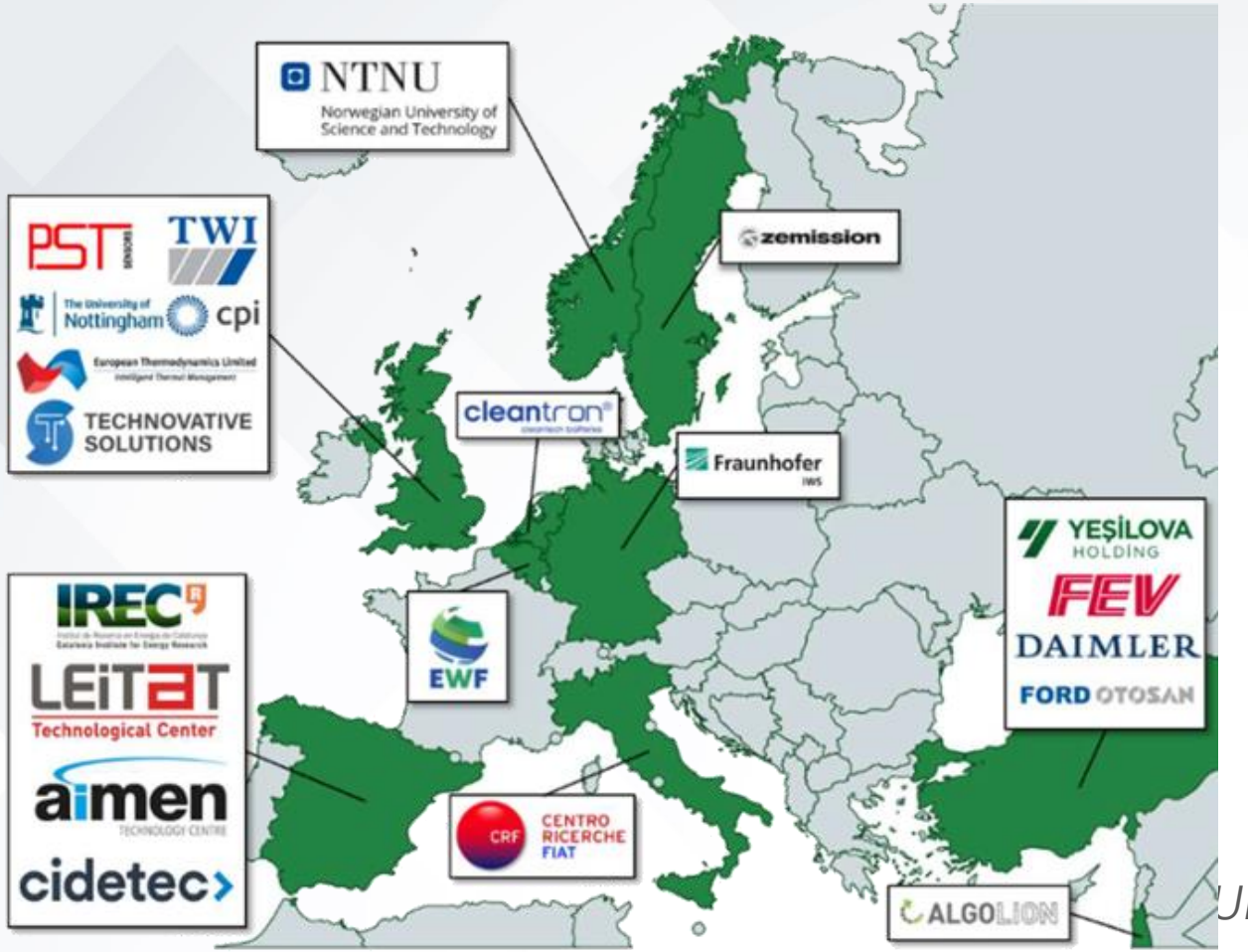
Technologies involved in HELIOS	Technology Readiness Level M0	M48
Hybrid module configuration battery packs, integrating LFP and NMC cells	4	7
Advanced polymers and composite material for structural components, housing and insulation	5	7
Hybrid thermal management system integrating tab and surface cooling with PCMs	4	7
Multilevel converters for the efficient management of energy and power	5	7
Multilevel converters for modularity, scalability and adaptability to the powertrain	4	6
In-vehicle AC-DC converters for ultra-fast charge	5	7
Improved charging protocols and communications	4	7
Improved state estimation methodologies, SOC and SOH	4	6
Improved control and health management strategies	4	6
Development of BMS with enhanced functionalities for state estimation and connectivity	5	7
DC-DC converter for cell balancing	4	7
AI algorithms for improved PHM embedded in the datAssistTM IoT software platform	4	6
Digital twins for performance and process circularity optimisation	4	6
LCCA tool for circular economy of Li-ion battery packs	5	7
V2G communication protocols for 1st and 2nd life battery pack utilisation	5	7
Big data analysis and IoTs applied to the management of performance and carbon footprint of EV fleets	4	6
Multisensing units integrated in the BMS for measurement of multiple parameters	5	7
Gas sensors for early detection of CO, VOCs, etc	3	5

THANK YOU!

General Overview of the ALBATROSS Project

Aysel PİLAV
YEŞİLOVA HOLDİNG

Advanced Light-weight BATteRy systems Optimized for fast charging, Safety, and Second-life applications



Grant agreement ID: 963580

Topic: *H2020-LC-BAT-10-2020 – Next generation and realisation of battery packs for BEV and PHEV*

Timing: *01.01.21 – 30.06.2025 (48 months+ 6 months extended)*

EU contribution: *~10 mil. €*

Coordinator: *Yeşilova Holding A.Ş.*

21 Partners from 10 Countries
Association: 1, Large: 3, RTO: 8, SME: 7, Uni:2

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 963580

Developments focused on:

TMS & Sensing

European Thermodynamics Limited – Intelligent Thermal Management

Loop heat pipes for non local cooling

The University of Nottingham – 2 Phase immersion for localised cooling

zemission – Catalytic heating

cpi / PST SENSORS – Direct electric heating & sensing

BMS

Cloud Big Data

FEV – AI enabled: Temperature control, fast charging & usage

ALGOLiON – Fast charging safety & preconditioning. Sensor free detection & predictive monitoring

Battery Modules

cleantron® cleantech batteries

Joining & Welding

TWI / Fraunhofer IWS

OEMs

CRF Centro Ricerche Fiat

Daimler

Ford

Lightweight Battery Trays

aimen Technology Centre / YEŞİLOVA

Eco Design

Technovative Solutions

Dismantling

LEITAT managing technologies

Battery Secondary Usage & Recyling

IREC – Shaping Energy for a Sustainable Future

NTNU

- *Battery module and packaging,*
- *Battery management system,*
- *Thermal management and sensing,*
- *Material and process development,*
- *Distmantling, second life usage, reuse, recycle,*
- *Life cycle analysis and sustainability*

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No

General Objectives of Albatross

Obj. 1. Weight reduction *of the battery system*

Obj. 2. *Sustainable* dismantling/recycling *of battery pack /modules*

Obj. 3. Flexible advanced BMS *capable of being used on different types of packs and mid-sized vehicles*

Obj. 4. Advanced BMS *for control, remote maintenance, safety, modularity, and lifecycle sustainability*

Obj. 5. *Systems compatible with* high-power ultra-fast charging

Obj. 6. Future performance-related test procedures *of developed functionalities*

Obj. 7. *To validate* battery performance functionalities at full scale *and* pack integration *into an existing vehicle*

Obj. 8. *To develop* Future safety-related test procedures *e.g., venting/management of gases, battery failure warning signals.*

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No

ALBATROSS is based on the further development of a BMW i3 EV.

Achieve a 20% weight reduction of the battery system

Increased driving range up to 480 km (285-310 km currently)

OEM/Model	Storage (KWh)	Total Weight (kg)	Battery Weight (kg)	Peak Energy Density3 (Wh/kg)	Range (km)	Charging time @150kW
BMW i3	42	278	204	152	285	40 min
Target	Up to 55	222	164	>200	480	30 min
Values/range achieved	57	326	259	210	486	30 min

15-20% improvement over the full lifecycle

-Closed loop battery cathode recycling
Recovering >80% battery pack using semi-automated dismantling
-SOH, SOS algorithm development

25% charging time reduction down to 30 minutes

300000 km battery lifespan

Innovative sensors and advanced BMS combined with cloud-based AI techniques

Very fast safety detection and prevention technology development

Chassis integration for light commercial & heavy-duty vehicles (virtual)

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No

www.albatross-h2020.eu

Albatross Project H2020

Albatross Project H2020

H2020 Albatross Project

Albatross Project

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No

LIBERTY Project

Eduardo Miguel - Researcher and Project Manager (Ikerlan)

emiguel@ikerlan.es

Lightweight Battery System for Extended Range at Improved Safety

LIBERTY has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 963522.
The document reflects only the author's view, the Agency is not responsible for any use that may be made of the information it contains.

Presentation Outline

LIBERTY Project Intro

EU perspective

Facts & Figures

Goals

Some of our key innovations

Immersion Cooling

Active Safety System

BMS

SOX algorithms

Battery Passport

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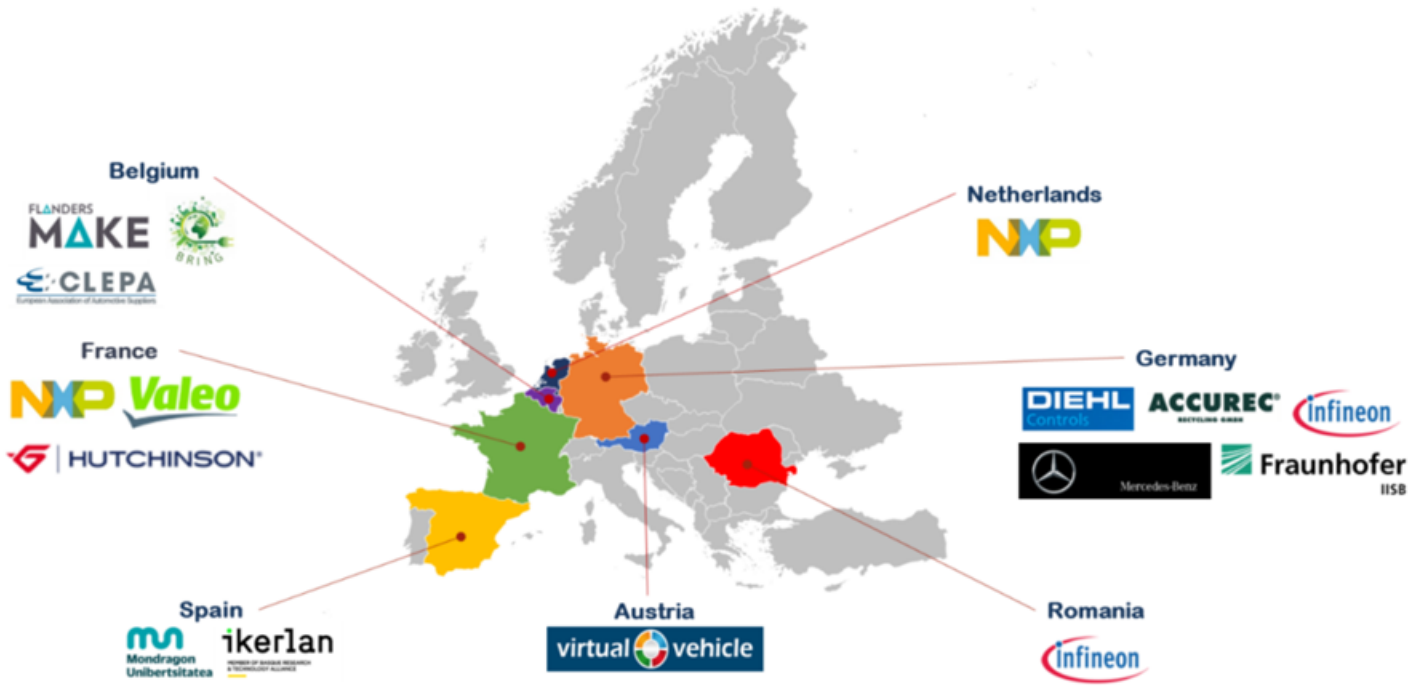
EU perspective – Horizon 2020 Framework

- LC-BAT-10-2020
  - Design of advanced battery packs
    - Lightweighting
    - Crashworthiness
    - Electrical and thermal requirements
  - Sustainable dismantling and recycling of battery pack/modules
  - Flexible advanced battery management systems
  - Remote maintenance and troubleshooting
  - High voltage systems compatible with high-power ultra-fast charging
  - Future performance-related test procedures
  - Development and qualification of future safety related test procedures
  - Integration into an existing vehicle

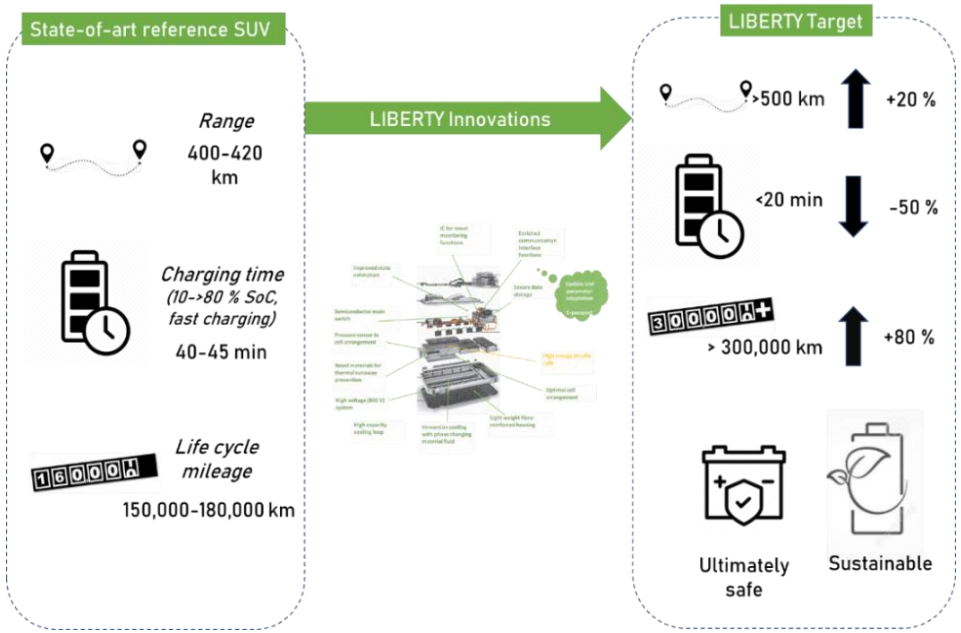
Facts & Figures



- 16 Partners from 7 countries
- Coordinator: IKERLAN
- Start date: January 2021
- Duration: 42 months
- Budget: 10M

LIBERTY – Project Overview

- O1: To achieve a range of 500 km on a fully charged battery pack
- O2: To achieve a short charging time
- O3: To achieve an ultimately safe battery system
- O4: To achieve a long battery lifetime
- O5: To achieve sustainability over the battery pack entire life cycle



LIBERTY – Project Goals

LIBERTY project will develop a new battery system through smart combinations and implementation of innovations including:

- A compact and safe battery pack based on high energy density cells and lightweight materials housing which is crash resistant
- A versatile battery management system resulting in optimal performance and safety over the system's total lifetime (first and second life)
- High accuracy state estimators allowing fast charging, enhancing range and lifetime, and guaranteeing ultimate safety and diagnostics
- An innovative thermal management system ensuring safety and preventing battery degradation during fast charging
- Design a (semi) automated battery dismantling procedure thereby reducing costs for recycling and reuse
- Development of future-proof testing protocols for standardised EV safety as well as performance testing.

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Some of our key innovations

Immersion Cooling

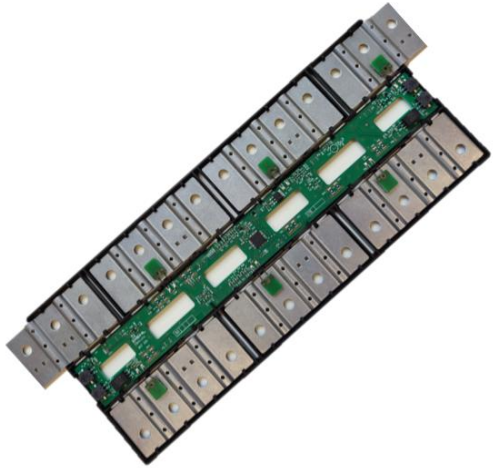
Active Safety System

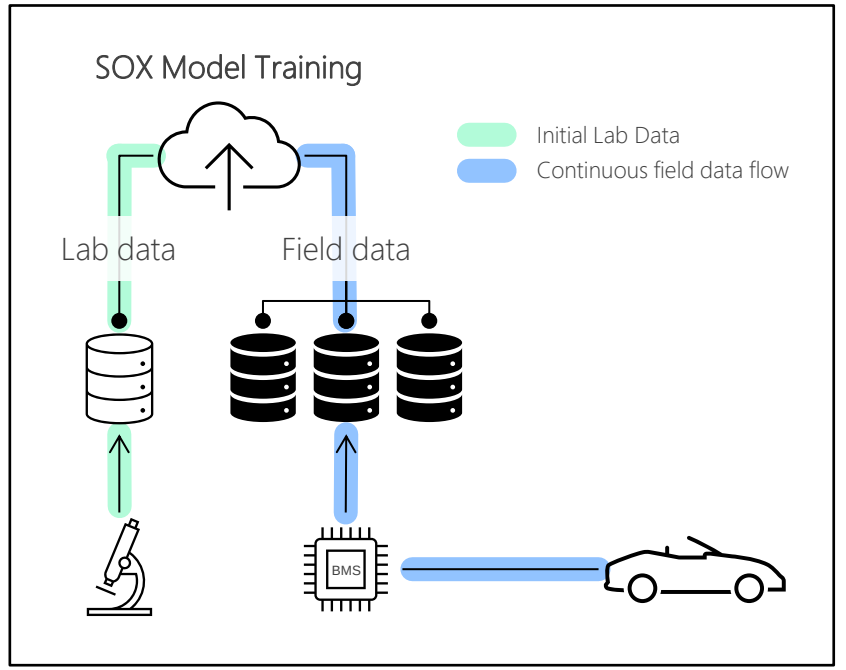
BMS

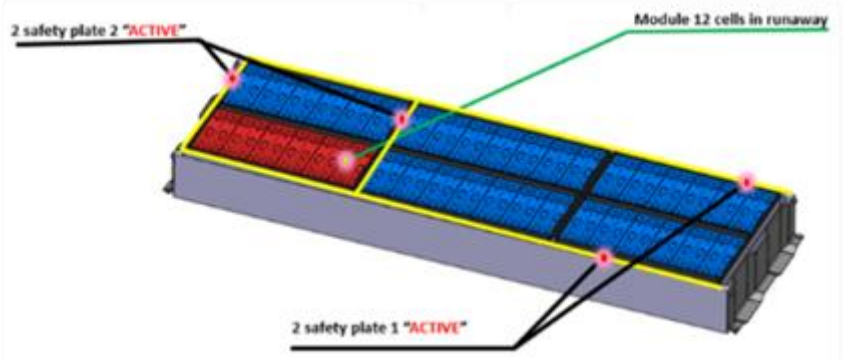
SOX algorithms

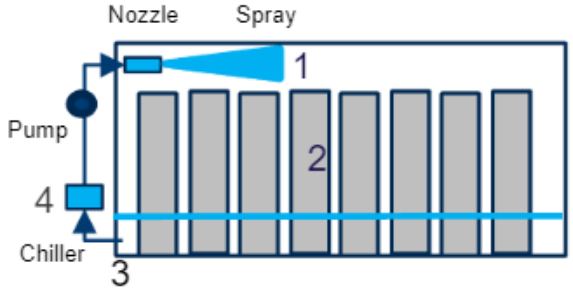
Battery Passport

Immersion Cooling based TMS









LIBERTY final event

LIBERTY
LIGHTWEIGHT BATTERY SYSTEM

KEY INNOVATIONS

O1. To achieve a range of 500 km on a fully charged battery pack.
O2. To achieve a short charging time.
O3. To achieve an ultimately safe battery system.
O4. To achieve a long battery lifetime.
O5. To achieve sustainability over the battery pack's entire life cycle.

PROJECT GOALS

LIBERTY will develop a new battery system through smart combinations and implemen-tation of innovations including.

- A compact and safe battery pack based on high energy density cells and light-weight materials housing which is crash resistant.
- A versatile battery management system resulting in optimal performance and safety over the system's total lifetime (first and second life).
- High accuracy state estimators allowing fast charging, enhancing range and lifetime, and guaranteeing ultimate safety diagnostics.
- An innovative thermal management system ensuring safety and preventing battery degradation during fast charging.
- Design a (semi) automated battery dis-mantling procedure thereby reducing costs for recycling and reuse.
- Developing of future-proof testing protocols for standardised EV safety as well as performance testing.

PROJECT PARTNERS

Liberty Battery Pack presentation, Design and Innovation.

MEETING INFORMATION

LOCATION: Mercedes Headquarters II Stutgart, Germany.

DATA / TIME: 2024-12-06, 9:30 - 16:00.

AGENDA

Description	Start/Duration
Welcome	9:30 - 10:00
Project technical overview	10:00 - 11:00
Coffee break	11:00 - 11:15
LIBERTY battery display	11:15 - 11:45
Roundtable discussion & Q&A	11:45 - 12:35
Showroom & lunch	12:35 - 14:00
Visit to Mercedes museum	14:30 - 16:00

REGISTER HERE

www.libertyproject.eu

Thank you!

Lightweight Battery System for Extended Range at Improved Safety

LIBERTY has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 963522.
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MARBEL

Manufacturing and assembly of modular and reusable EV battery for environment-friendly and lightweight mobility

MARBEL: tackling current and future challenges in mass market take up of electric vehicle

EDUARD PIQUERAS JOVER, MscEng
Project Coordinator | EURECAT Technology Center
eduard.piqueras@eurecat.org
26th November 2024

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2 CHALLENGES

3 OBJECTIVES & IMPACT

4 CURRENT STATUS

5 ACTUAL ACHIVEMENTS

6 NEXT EVENTS

CONSORTIUM:

16 partners from 7 European countries

6 Research centres

eurecat · Technische Hochschule Ingolstadt · CARISSMA Institute of Electric, Connected and Secure Mobility · SINTEF · IREC Shaping Energy for a Sustainable Future · ICCS · Fraunhofer IWU

5 TIER 1&2

ASAŞ · AVL · AGRATI World Fastener Solutions · FICOSA

1 Automotive engineering

Applus+ IDIADA

1 OEM

STELLANTIS | CRF

1 Battery Recycling

TES

2 SMEs

Technologic Development OTCEngineering Connected Mobility Technologies & Solutions

PowerTech systems

Topic **H2020-*LC-BAT-10-2020*** – *Next generation and realisation of battery packs for BEV and PHEV*

4,5 years duration, from 1/01/2021 to 30/11/2024

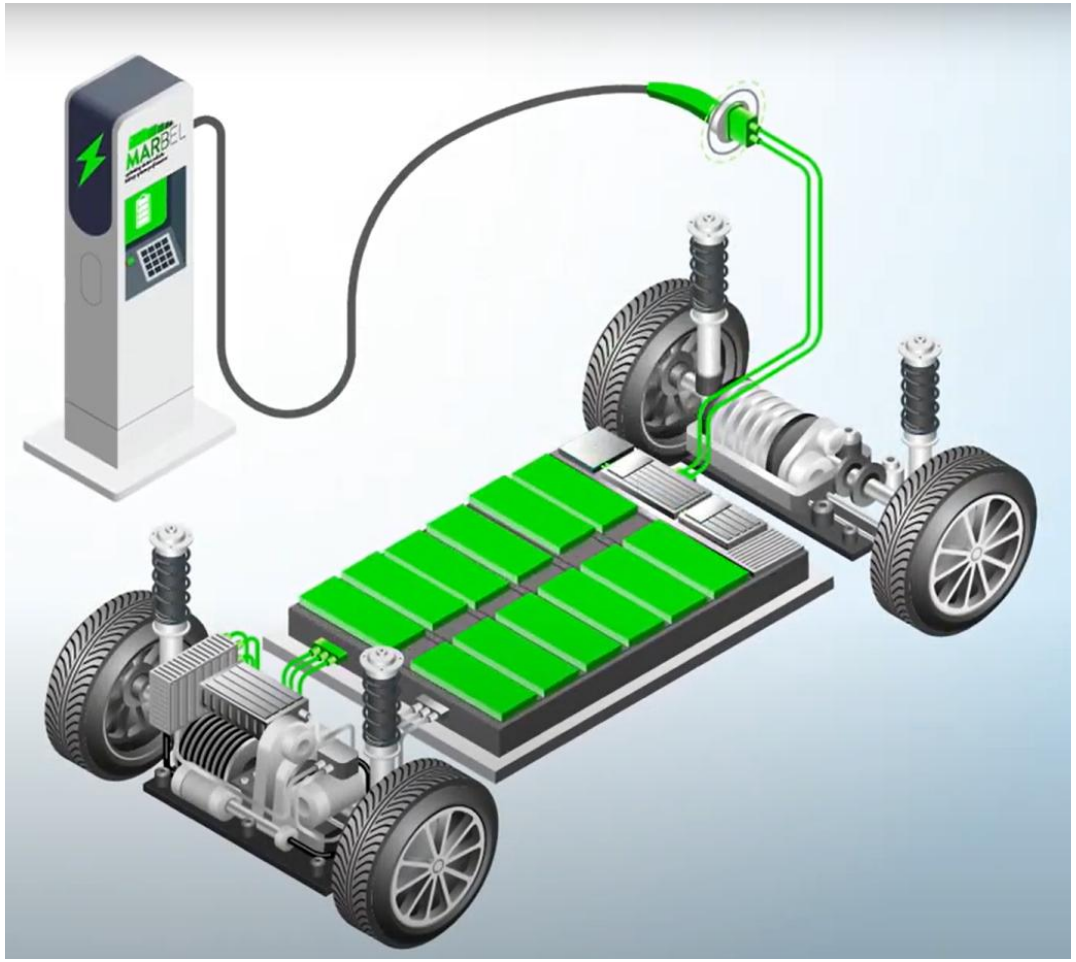
Budget: **11,7M€**, of which 9,8M€ funded by the EC

Coordinated by **Eurecat,** RTO eurecat

Grant agreement ID: 963540

GOALS:

- ✓ **To accelerate the mass market take-up of BEV & PHEV.**
- ✓ **More sustainable and efficient Electric Vehicles.**
- ✓ **Contribute to EU Policies and meet target GHG EU emissions target of 55% by 2030.**

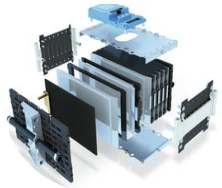


HOW?

- ✓ Increase **Energy Density** / Reduce Space & **Weight**.
- ✓ Optimize EV **Battery systems performance**.
- ✓ Increase **Battery Range**.
- ✓ Reduce **Charging Time**.
- ✓ Increase **Battery Lifespan** (tackling degradation).
- ✓ Reducing **time and cost** for **manufacturing** and **mainteinance**.
- ✓ Repurpose for **2nd life applications**.
- ✓ Reduce **environmental impact**.

OBJECTIVES & IMPACTS

DESIGN for CIRCULARITY



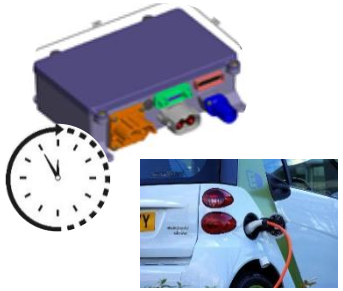
Modular & Lightweight

Recycled alloys

Weldless modules

Wireless communications

PERFORMANCE IMPROVEMENT



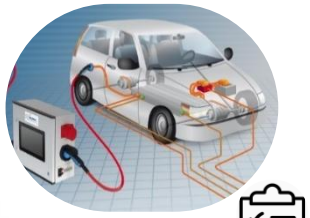
Thermal Management

Ultra Fast Charging

Advanced BMS

Wireless communications

TESTING VALIDATION DISSAMANTLING



Test procedures (AI)

Validation in eVIL

Safe dismantling

- ✓ >20% system weight reduction.
- ✓ Useful Battery life up to 300,000 km.
- ✓ >25% Charging Time Reduction.
- ✓ >40% LCA improvement.
- ✓ Time & Cost reduction in Assembly, Maintenance and Testing.

DESIGNED for:

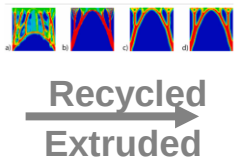
- ✓ Easy & Safe (dis)assembly
- ✓ Reparability and 2nd life transition.
- ✓ Adaptable to different cells & vehicles.

ACTUAL ACHIEVEMENTS

DESIGN for CIRCULARITY

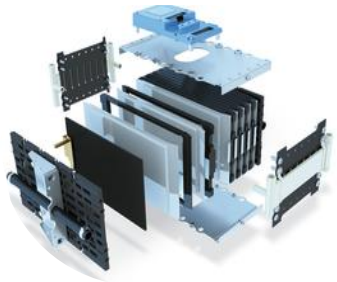
Lightweight and sustainable Battery Housing

- ✓ Recycled Aluminium Alloys,
- ✓ Optimized Aluminium extruded profiles,
- ✓ Modular design,



Modular design for an easy & safe (dis-)assembly

- ✓ Solutions and processes for a sustainable dismantling and 2nd life.

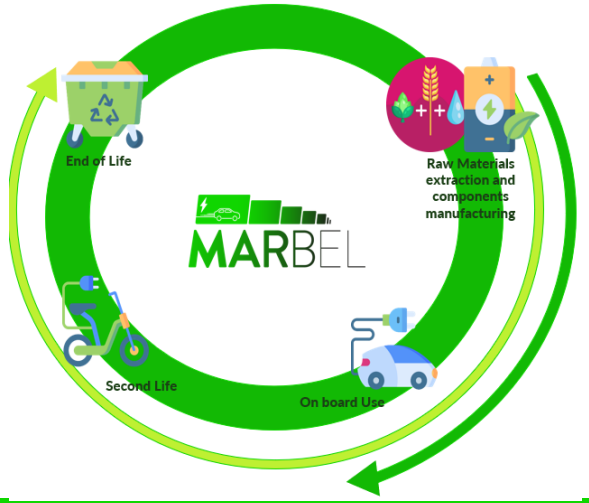


New Weldless Busbar for cell-to-cell connection

- ✓ Flexible weldless busbar facilitates an easy dismantling.

Methodology for Eco-Design

- ✓ Unified approach of the LCA & LCC for EVs Li-Ion batteries on a circular economy perspective.
- ✓ Focusing on hot spots, involving stakeholders from all life cycle stages (design, manufacturing, use, end-of-life).
- ✓ Defining actions (eco-design strategies) aligned to decrease environmental carriers in each of life cycle stages.



ACTUAL/FORESEEN ACHIEVEMENTS

BATTERY PERFORMANCE

Ultra-fast charging strategies and enhanced thermal management

- ✓ **UFC control algorithm**.
- ✓ **Charging station** prepared for high power charging.
- ✓ **JBOX battery switching 400/800V** ensuring the proper energy driving through the different busbar subsystems.

Enhanced thermal management

- ✓ Highly **efficient cooling panels:** Top and bottom cooling channels with cooled busbar.
- ✓ **Functional Aluminium profiles:** mechanical and thermal.
- ✓ **Aluminium Foam** as heat transfer enhancer element.

Battery management system (adaptable to 2nd Life applications)

- ✓ **Flexible & modular BMS** adaptable to large variety of batteries and applications.
- ✓ **Smart Cell Manager** and **wireless communication** reducing wiring complexity.
- ✓ **AI-based expert system** providing **predictive early failure detection** (maintenance) and identification of **2nd life applications**.
- ✓ **Data transmission to the cloud** with a secure communication channel permitting more complex functionalities.

- ✓ **>25% Charging Time Reduction**
- ✓ **Useful Battery life up to 300,000 km**

ACTUAL/FORESEEN ACHIEVEMENTS

TESTING
VALIDATION
DISSMANTLING

EV Battery Pack Test Bench Platform (eVIL)

- ✓ **Flexible and versatile test bench adaptable to different platforms**, which eliminates the necessity and the constraints of a given vehicle to test the developed systems.
- ✓ **Reducing time-consumption and costs for testing**, while **increasing** the overall system **safety.**
- ✓ **Demonstration of a complete battery pack**.

Set of Future Procedures for characterisation and validation of future performance and safety

- ✓ **Optimized end-of-line tests**, simplifying regular inspections 2nd life tests and car assessments.
- ✓ **AI data processing to reduce necessary tests** (expected time-saving factor 20%).
- ✓ **Mechanical test procedures for miniaturized housing**.

Safe and Efficient process for dissmantling

- ✓ **Increase safety during dismantling packs** without any energy vectors (saw, mechanical cutting laser or others) .

CURRENT STATUS

1. Setup the requirements for safety, modularity, 2nd use, performance and ecodesign
2. Design of a modular, weight-optimised and high-performance battery pack including housing, thermal management system, connections, charging station and BMS.
3. Module and battery pack assembly, integration in the electric vehicle-in-the-loop and dismantling operations
4. Development and definition of innovative performance and safety related test procedures, 2nd life applications addressed and demonstrated

MARBEL ADVISORY BOARD

Send your expresion of interest to:
Info@marbel-Project.eu

Until December 2024:

- Recruiting experts to take part of MARBEL's Advisory Board.

February/March 2025:

- Dedicated (online) Workshop to present MARBEL results and gather feedback.

April 2025:

- Invitation to MARBEL final event in Dresden (Germany).

COMITMENTS:

- ✓ Attend the two workshops.
- ✓ Assess MARBEL results and provide advice concerning potential exploitation of MARBEL results.

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MARBEL

Manufacturing and assembly of modular and reusable EV battery for environment-friendly and lightweight mobility

THANK YOU!

EDUARD PIQUERAS JOVER, MscEng
Project Coordinator | EURECAT Technology Center
eduard.piqueras@eurecat.org
13th June 2024

A project coordinated by:
eurecat

IBATTMAN PROJECT OVERVIEW

COLLABAT Next-Gen EV-Battery Solutions Showcase
Nov 26, Barcelona

iBattMan

Smart, Connected and Secure Battery Management System Enhanced by Next-Generation Edge- and Cloud-Computing, Sensors and Interoperable Architecture

Introduction

Title: Smart, Connected and Secure Battery Management System Enhanced by Next-Generation Edge and Cloud-Computing, Sensors and Interoperable Architecture

Start Date: 01 January 2024

End Date: 30 June 2027

Project ID: 101138856

Coordinator: Corneliu Barbu, Aarhus University

Topic: HORIZON-CL5-2023-D5-01-02 – Innovative battery management systems for next generation vehicles (2ZERO & Batt4EU Partnership)

Call: Clean and competitive solutions for all transport modes

Programme: Horizon Europe

Challenges

Battery Innovation Challenges

Performance | Safety | Cost-efficiency | Sustainability

Project Vision

Revolutionise EV battery performance and cost-efficiency in 1st life and 2nd life applications through a secure, connected, and reliable architecture powered by advanced sensors and edge-cloud computing.

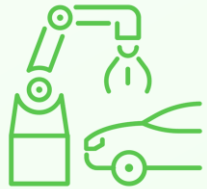
Project Aim

iBattMan will deliver effective and innovative solutions for a wide range of vehicles from small passenger cars to e-busses and electric trucks

- **DURABILITY**: Increased battery lifespan and durability, while optimizing driving range, for electric vehicles
- **ACCURACY**: Precise battery status monitoring, diagnostics and management functionalities;
- **CONNECTIVITY**: High connectivity and data storage to optimize the life and improve general use of the EV;
- **SAFETY**: Safe utilisation during all modes of operation;
- **CIRCULARITY**: Accurate classification for a second life and strategies for its practical implementation;
- **AFFORDABILITY**: More affordable and cost-efficient battery packs.

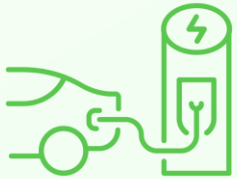
Project Objectives

Security & Optimisation
Provide a safe, optimal, reliable, and secure operation through an innovative BMS platform.



Integration Boost
Boost end-user acceptance and strengthen a competitive Pan-European supply chain in automotive and renewables.

Data Standardisation
Establish standardised protocols to extract valuable system data, creating databases for the scientific community and industry.



Collaborative Innovation
Promote collaboration between academia, industry and SMEs to rapidly develop new BMS applications.

Battery Breakthroughs
Develop new IP, patents, products, and services in BMS technologies for the EU Battery Industry.

Project Workplan

WP1 – Project Management & Coordination | Aarhus Universitet

WP2 – System Requirements | Manifattura Automobili Torino

WP3 – BMS Platform development | Fico Triad

WP4 – BMS Platform development | Virtual Vehicle Research

WP5 – Applications and Connectivity | Aarhus Universitet

WP6 – System Integration and Testing | AVL

WP7 – Dissemination, Standardisation & Exploitation | INOVA +

Thank you!

iBattMan

Corneliu Barbu

coba@ece.au.dk

Coordinator

AARHUS UNIVERSITY

Participants

Technische Hochschule Ingolstadt

FICOSA

virtual vehicle

IREC

Shaping Energy for a Sustainable Future

nvision

eurecat

AVL

INOVA+

FORD OTOSAN

MANIFATTURA AUTOMOBILI TORINO