

## **BATTERY2LIFE General Presentation**



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### In a nutshell 1





**Project Name:** BATTERY Management system and System design for stationary energy storage with 2nd LIFE batteries

**Call identifier:** Cross-sectoral solutions for the climate transition (HORIZON-CL5-2023-D2-01)

Duration: 36 months (January 2024-December 2026)

**Business Cases:** Domestic storage in Austria and Industrial (grid-scale) storage in Greece

**Project Coordinator:** Dr Angelos Amditis, Institute of Communication and Computer Systems (ICCS)

Consortium: 11 Partners from 5 countries

Funding: ~4M€

Website: battery2life-project.eu

#### Social Media:

- @battery2life\_eu
- BATTERY2LIFE Project



In the near future the number of electric vehicle (EV) batteries, which are no longer appropriate for automotive use, will dramatically increase. It is estimated that over 5 million metric tons of EV batteries will be inappropriate for mobility purposes by 2030. The average EV battery capacity loss is estimated to around 2.3% per year, thus, at the end of the warranty, the expected EV battery nominal capacity varies between 70-80%. This residual capacity can be still exploitable for other non-EV storage applications aiming to facilitate the green energy transition and promote the Renewable Energy Source (RES) share in all electricity grids.

Lack of flexible and standardised packaging for efficient disassembly, assessment and reconfiguration method

Lack of standardised, reliable and efficient means to monitor status, assess suitability and appropriately match used modules for 2<sup>nd</sup> life applications

Transferring a BMS design from 1<sup>st</sup> life (automotive) to 2<sup>nd</sup> life (static storage) applications is a challenging task, since the requirements of the system, functions and safety are not the same



### Aim 🗸



BATTERY2LIFE aims to facilitate the smooth transition of batteries to 2<sup>nd</sup> life use and boost the innovation of the European Battery Industry by providing enablers to implement open adaptable smart Battery Management Systems (BMS) and improved system designs towards reliable reconfiguration of used batteries.





## Innovations ✓





Open interoperable hybrid BMS adaptable to chemistries, technologies, protocols, application requirements



 BMS with embedded Electrochemical
Impedance Spectroscopy (EIS) for State of Charge (SoC)



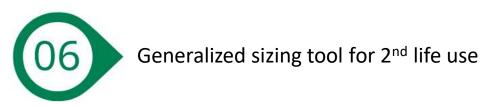
Improved/New system designs for easy reconfiguration of used modules



Advanced diagnostic tool for 2<sup>nd</sup> life batteries



Smart reliability and safety functionalities embedded in the BMS State of Warranty (SoW) – to enhance battery operational efficiency









- Enable the safe and efficient reconfiguration of the Battery Systems for 2<sup>nd</sup> life use: a) facilitate re-configuration on existing designs, b) propose new design frameworks for 1<sup>st</sup> & 2<sup>nd</sup> life batteries
- Design & develop an open cloud-based BMS, adaptable to battery technologies and communication protocols for 1<sup>st</sup> or 2<sup>nd</sup> life storage applications
- Embed smart monitoring and control functionalities in the BMS to ensure safety and reliability in 2<sup>nd</sup> life operation (SoX estimators, EIS, sensors, active balancing algorithms)
- Develop AI-based tools for the reliable and efficient assessment, sorting & recombination of modules according to their suitability and needs for 2<sup>nd</sup> life applications
- Demonstrate and assess the efficiency and the impact of the B2L solutions in domestic and utility-scale storage applications
- Propose sustainable business plans to boost the competitiveness of the European battery industry







- Battery pack & Battery Management System (BMS) design for single module operation or recombination (reconfiguration) of modules or battery packs for consolidated and new battery technologies.
- ✓ Safe, accessible and reliable operation of batteries and compatible with the battery passport concept.
- ✓ Battery System (BS) design to enable **disassembly and reconfiguration** for 2<sup>nd</sup> life.
- Development of fast and efficient qualification strategies and assessment of Electric Vehicle (EV) batteries for 2<sup>nd</sup> life applications and quantify it with respect to state of the art in terms of time and efficiency.
- Reduction of 30% of repurposing/refurbishment cost for adapting EV batteries to stationary applications in 2<sup>nd</sup> life.
- Environmental impact assessment, from both positive and negative aspects, for adapting EV batteries to 2<sup>nd</sup> life applications.
- Impact in the European economy by a growth of the market and employment, by facilitating the uptake of stationary Energy Storage System feasibility of operation in the batteries extended life domain (2<sup>nd</sup> life).







#### **Utility scale storage application**

*Efficient reconfiguration for 2<sup>nd</sup> life* 

#### **Domestic storage application**

New battery design principles









# Thank you! Any questions?



www.battery2life-project.eu



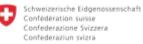
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