



## BATMAX Press release

### The project:

BATMAX project will enhance the performance, safety, reliability, service life and cost-effectiveness of battery systems, and therefore to maximise the value created by the operation of the battery systems in various kinds of end use applications. This is approached by creating a framework for next generation of battery management based on large amounts of data; experimental, operational and synthetic, adaptable physics-based models, suitable reduced-order models for both physical BMS (Battery Management System) algorithms and real-time multi-scale digital twins. To concretise the pathways towards reaching the main objective, BATMAX partners are exploring emerging opportunities for optimised battery utilisation across the technical scope.

### The main objective:

The main objective of the project is to contribute to improving the battery system performance in terms of safety, reliability, service life and lifetime cost. BATMAX ambition is to rethink the field of BMS from hardware and software points by leveraging advanced models (physics and data-driven) and robust state functions to ensure reliable and safe operation of the battery system during all operating conditions and end use scenarios. BATMAX will make the latest advances in physics-based battery modelling accessible to BMS developers by reducing the cost by at least 20% of cell parameterisation, improving the computational efficiency to run on BMS hardware, and adapting the parameterisation in real-time to reflect the evolution in state of health of the cell during operation.

### An overview of the progress:

The project demonstrates a proactive commitment to ethical standards, to comply with Horizon Europe's ethics regulations and rules. Moreover, the project outlines a comprehensive approach to establishing a **multi-scale modelling framework** for coin cell parameterisation for the following parameters at beginning-of-life (BoL), as well as the formation of 30Ah LFP Pouches, with plans for cycling in early 2024. This modelling framework needs to be integrated into the BMS in order to deliver an accurate lifetime prediction tool.

**The battery modelling toolbox, BattMo**, is an electrochemical-thermal simulator, designed primarily for Li-ion batteries. Further steps involve the identification of safety limits and indicators for integration into

BMS algorithms, as well as the integration of the modelling framework for accurate life predictions, as mentioned earlier. Methods for reducing models, hybrid modelling and AI-supported model parametrisation will be developed.

The BATMAX project aims to establish a robust data infrastructure and advanced modelling techniques, to enhance the understanding and control over the performance of battery systems. Until now, significant progress has been made in defining the high-level layered digital twin architecture, while gathering data sheets for cell sensors, edge devices and BMS to shape the low-level architecture. Additionally, implementation efforts involving IOT-native communication interface and Azure cloud services are in progress.

In BATMAX project, the focus lies on four use case application areas for batteries, namely waterborne (maritime applications), non-road mobile machinery (off-road), heavy-duty vehicles and stationary storage. These offer a very versatile mixture of battery system and management requirements, which require a methodical approach applicable to all types of battery use. Until now, the requirements for the use cases and the duty cycles have been defined.

**Contact:**

To be able to follow the progress of the BATMAX project, please visit our website: <https://batmaxproject.eu/>. You can also follow us in [LinkedIn](#) and [X](#).

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