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HORIZON EUROPE PROGRAMME – TOPIC: HORIZON-CL5-2022-D5-01-02

AENEAS

innovAtive ENErgy storage systems onboArd vesselS

Deliverable D 6.5

Roadmap towards full scale on-board demonstrators for two ESS solutions by 2027

Deliverable Type	Report
Dissemination Level	Sensitive
Due Date (Annex I)	31.01.2026
Pages	55
Document Version	Final
GA Number	101095902
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Public Summary

This Deliverable provides the technical roadmap towards full-scale on-board demonstrators for two AENEAS Energy Storage System (ESS) solutions by 2027. Building on the results of WP1–WP5 and the impact assessment activities in WP6, the document identifies the most suitable vessel segments and use-cases for the deployment of the AENEAS Advanced Electrical (AE) technologies, Solid-State Batteries (SSB), Semi-Solid-State Batteries (SSSB) and Supercapacitors (SC), and defines the sequence of technical, safety and integration steps required to the project. The roadmap is articulated into four main building blocks. First, it provides a comparative overview of the three AE technologies, summarising their maturity level, performance and operational constraints based on the cell-level characterisation (D3.1), electro-thermal modelling (D3.2) and module design and testing activities in WP4. Second, using the operational profiles and requirements derived in WP1, together with the fleet segmentation and feasibility analyses developed in WP6, the deliverable identifies vessel segments and use-cases that are most promising for full-scale deployment, producing a technology–segment matrix and a set of applicability sheets for priority segments. Third, the document defines a deployment pathway from TRL 5 to TRL 7–8, specifying the necessary steps in terms of upscaling, system integration, performance validation, safety qualification and compliance with EU/IMO decarbonisation indicators, in line with the objectives of Task 6.4 and the overall AENEAS concept. Finally, the roadmap clarifies the roles and responsibilities of the partners involved in Task 6.4, and outlines the main milestones and decision gates leading up to the installation of two on-board demonstrators by 2027, which will serve as a cornerstone for broader market deployment and will feed directly into Deliverable D6.6 and the Final Exploitation Plan (D6.4).