

H₂MARINE

HYDROGEN PEM FUEL CELL STACK FOR MARINE APPLICATIONS



Project ID	101137965
PRR 2025	Pillar 3 - H ₂ End Uses - Transport
Call Topic	HORIZON-JTI-CLEANH ₂ -2023-03-02
Project Total Costs	7 499 171.50
Clean H ₂ JU Max. Contribution	7 499 171.50
Project Period	01-01-2024 - 30-06-2027
Coordinator Beneficiary	ETHNIKO KENTRO EREVNAS KAI TECHNOLOGIKIS ANAPTYXIS, EL
Beneficiaries	CLEOS IDIOTIKI KEFALAIOUCHIKI ETAIREIA, Beyond Gravity Schweiz AG, EH GROUP ENGINEERING SA, GREENERITY GMBH, TEKNOLOGIAN TUTKIMUSKESKUS VTT OY, CLUSTER VIOOIKONOMIAS KAI PERIVALLONTOS DYTIKIS MAKEDONIAS, THYSSENKRUPP MARINE SYSTEMS GMBH, Powercell Sweden AB, ZENTRUM FÜR SONNENENERGIE- UND WASSERSTOFF-FORSCHUNG BADEN-WÜRTTEMBERG, ALBERT-LUDWIGS-UNIVERSITÄT FREIBURG, REINZ-DICHTUNGS GMBH, ECOLE POLYTECHNIQUE FEDERALE DE LAUSANNE

<https://h2marineproject.eu/>

PROJECT TARGETS

Target source	Parameter	Unit	Target	Target achieved?
Project's own objectives	Module Rating	kW	250	
	Hours of test for each FC	hours	2 000	

PROJECT AND GENERAL OBJECTIVES

The overarching objective of the H₂MARINE project is to design, build, test and validate two PEM stacks generating 250 - 300 kW electrical power designed for marine applications. The H₂MARINE project takes a top-down approach, building on a proof of concept of two PEM stacks that are being developed in the EU and Switzerland. The H₂MARINE project will:

- Identify the requirements for the tests and conditions as well as load curves that the dual cell stacks will have to be tested against, using the combined knowledge of a major ship-building industry (Thyssen-Krupp Marine Systems) and ship owners (Cleos).
- Enable both the PowerCell and the EH Group stack manufacturers to benefit from a great consortium surrounding their development, testing and upscaling with unique testing facilities (Beyond Gravity, Zentrum für Sonnenenergie- und Wasserstoff-Forschung Baden-Württemberg, Greenerity, University of Freiburg), industrial partners such as DANA, the upscaling of stacks by Ethniko Kentro Erevnas kai Technologikis Anaptyxis and École polytechnique fédérale de Lausanne and novel diagnostics development by VTT, which will allow them to enhance the state-of-the-art of PEMFC stacks, and advance and scale up the system to reach ambitious targets set in the call which will be disseminated by CLUBE (a member of numerous fuel cell and hydrogen projects).

- Test the proposed solutions in a relevant environment/ecosystem, designed to represent actual marine conditions.
- Design the stack modules in an optimum manner for up-scaling up to 10 MW power train systems.
- Test several diagnostics for the integrity of the stack and overall system and for the health status of critical components.
- Assess the technology and economic feasibility of the solution, in order to determine its valuable end-use, which will allow the partners to research the potential market(s) and identify the best opportunities.

PROGRESS, MAIN ACHIEVEMENTS AND RESULTS

The project officially started on January 1, 2024 and the associated work is on-going.