

# H<sub>2</sub>MARINE: Hydrogen PEM fuel cell stacks for marine applications

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## Abstract

The scope of the project H<sub>2</sub>MARINE is to pave the way for the development of marine-ready and reliable FC stacks and systems. The H<sub>2</sub>MARINE project includes among others improvements in the design, diagnostics, testing protocols, cost competitiveness, as well as the overall system performance. The H<sub>2</sub>MARINE targets are:

- To enhance the state of the art of PEMFC stacks designing two modules that can be upscaled to 10 MW powertrain systems using superstacks formed by connecting up to four stacks of 250 kW each.
- To test the proposed solutions in marine conditions (humidity, vibration, tilting, salinity). H<sub>2</sub>MARINE will target testing stack durability for 40000 h.
- To study several diagnostics for both the stack and the overall system integrity, as well as for the prognosis of the health status of critical components, achieving online diagnostic and prognostic tools by smart and functional use of commercial sensors.
- To assess the technology and economic feasibility of the solution, define its end-use value and integration into the broader H<sub>2</sub> ecosystem. The project aims to optimize the scale-up and manufacturing costs with a target of 1000 €/kW by 2030 through a “Design for assembly” approach.

The project consortium is comprised of 10 EU partners from 4 countries and 3 partners from Switzerland, covering all aspects of the marine H<sub>2</sub> value chain. The H<sub>2</sub>MARINE project has received funding from the European Union’s Horizon Europe research and innovation program and the Clean Hydrogen Joint Undertaking under Grant Agreement:101137965 and the Swiss State Secretariat for Education Research and Innovation (SERI).