

PARTNERS



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Sustainable HYdrogen
powered Shipping

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Co-funded by
the European Union

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THE PROJECT

The shipping industry is facing one of the most demanding challenges ever: to find the way to achieve zero-emission navigation. The time to achieve such goal is very short: the next big deadline imposed by the IMO is to reduce the total annual GHG emissions from international shipping by at least 50% by 2050.

Hydrogen is one of few zero-emission solutions that is very promising, but the technology necessary to use it on board is not completely ready. To combine the tight application times (50 % reduction by 2050 of GHG emissions from shipping) and the technological gap, sHYpS is centered around the idea of a swappable storage system for the liquid hydrogen, based on new c-type ISO containers. This solution can enable a full zero emission ship platform in the needed time.



DURATION
48
MONTHS

The project has received €8,621,612.45 funding, from the European Union's Horizon Europe research and innovation programme.

€14,295,314
PROJECT BUDGET



13
PARTNERS



6
EUROPEAN COUNTRIES

OBJECTIVES

To pursuit its goals, the Specific - Technical and Industrial - Objectives (SOs) of the SHYpS are described below:

- S01** — **Design, build and test a prototype of an intermodal ISO 40 LH2 container** and of its evaporator (by CHART). **Design and test of the tank connection space** (to safely connect the container to the ship's green power plant
- S02** — **Design the structural integration between the H2 fuel handling and the energy system** through the detailed design of a 6MW PEM fuel cell powertrain and **have the system ready to be reviewed by Lloyd's.**
- S03** — **Integrate the LH2 storage system, the fuel handling system and the electric connection to the ship backbone, onboard one Viking's newbuild cruise ship.**
- S04** — **Complete extended testing at components level** to have Lloyd's review and **test the full system onboard.**
- S05** — **Validate that an LH2 container supply chain is viable** (by PLP and PoB) and unlock a zero-emission operation model for large ships.
- S06** — **Demonstrate the scalability of the LH2 system and its logistics.**
- S07-S06** — **Develop a solution which is fully adoptable by many kinds of ship with a conceptual design** (by NAV and K17) for **5,000 DWT and 8,000 DWT / 700 TEU cargo and containers vessels.**
- S08** — **Increase knowledge and expertise on hydrogen-as-a-fuel pertinent rules for marine application.**

IMPACT

sHYpS will contribute to:

- Develop a preliminary design of a fully renewable ship by 2027 (passengers and freight), leaving no residual challenges to an up-scaled solution

1 Demonstration of the feasibility to store and use hydrogen-based fuels (generally in liquid form) on a medium and large scale in a realistic environment on-board

2 Demonstration of the use of hydrogen in high power applications with long autonomy

4 Development of pertinent technical rules

5 Contribution to the establishment by 2027 of at least two full scale demonstration projects using or potentially using 100% climate neutral fuels in a realistic shipping environment

- Demonstrate that the IMO roadmap is realistic and achievable using state of the art technologies.

Medium and longer-term objectives

Concrete contribution