



Sustainable HYdrogen
powered Shipping

From land to sea: sHYpS completes the Staranzano on-land test campaign

A key project milestone

In July 2026, the sHYpS team successfully completed the full ground-test campaign on the prototype liquid-hydrogen (LH2) storage system at CENERGY's new dedicated facility in Staranzano (GO), near Trieste. The campaign marks a decisive step before installation aboard Viking Libra.

The project has now reached a key validation stage. The prototype storage system has been operated and assessed on land, under controlled conditions, before moving to the constraints of a ship. The Staranzano campaign combined commissioning, cryogenic operation, performance tests and system checks - creating a practical bridge between the prototype and the next phase at sea.

From first commissioning to liquid hydrogen operation

The test campaign was built up in careful stages, with each step used to verify the system before moving to the next level of operation.

01

Liquid nitrogen

The system was first commissioned with liquid nitrogen to confirm that equipment, valves and sensors were working correctly in a controlled, lower-risk environment.

02

Hydrogen preparation

The storage tank was conditioned with gaseous hydrogen and then filled with liquid hydrogen.

03

Performance testing

With LH2 on board, the team assessed the thermal insulation of the cryogenic storage tank and reproduced intended shipboard operation at scaled capacity while simulating Fuel Cell operation profiles.



Figure 1: Monitoring the system during testing



Figure 2: The cryogenic piping and storage system at the Staranzano site

Testing the system as it will operate on board

The purpose of the campaign was not simply to switch the system on. Staranzano allowed the team to reproduce intended operating conditions in a setting where components could be observed, adjusted and checked in detail - before the equipment reaches the ship.

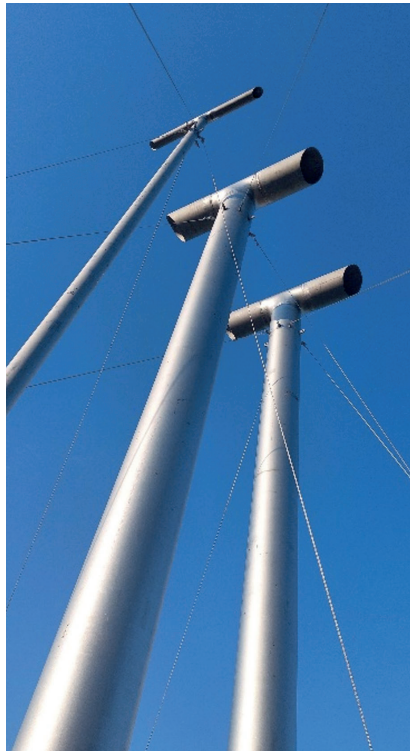
Land testing creates room to learn - before going to sea

For a complex prototype, testing on land is an opportunity to identify and address issues early, when the system remains accessible and the operational constraints of a vessel are absent. During the campaign, the team encountered challenges including sensor functioning and nitrogen leaks. Each was investigated and successfully mitigated, and the safety of the activity was not compromised.

LH2 storage system



Test-site infrastructure



WHY THIS MATTERS

A safer, more informed next step
On-land testing makes it possible to understand system behavior, learn from unexpected situations and resolve issues before installation and operation on board.

One milestone, many people

The campaign was carried out at CENERGY's new dedicated facility in Staranzano in close collaboration with the CHART VRV and CHART Ferox teams, under the supervision of Navalprogetti, the University of Trieste, Viking Ocean Cruises and Lloyd's Register.



Figure 3: The test campaign team on site at Staranzano

NEXT ON THE ROADMAP

From Staranzano to Viking Libra

With the ground-test campaign complete, the project moves into the next phase: completing the installation of the equipment aboard Viking Libra and preparing for the onboard test campaign over the coming months.



Figure 4: Installation work: the LH2 storage tank is lifted into position

A STEP CLOSER TO THE SEA

The Staranzano milestone brings sHYpS one significant step closer to demonstrating the project vision aboard a cruise ship, with the ambition of enabling the world's first hydrogen-powered cruise ship.

THE NEXT STEPS

- Complete the installation aboard Viking Libra.
- Carry out the onboard test campaign.
- Continue the path toward hydrogen-powered cruise operations.

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