



WAVE 2 THE FUTURE



Funded by
the European Union
NextGenerationEU



Ministero delle Imprese
e del Made in Italy



IPCEI
HYDROGEN



Italia domani
PILLOLE NAZIONALI
DI FIDUCIA E SOSTEGNO



WAVE 2 THE FUTURE

Wave 2 the Future is Fincantieri's strategic initiative within the **IPCEI Hy2Tech** program, focused on developing and adopting **hydrogen technologies** for the maritime sector. The project supports the decarbonization of naval transport and contributes to building a sustainable hydrogen value chain.

Wave 2 the Future is dedicated to the development, validation, and integration of hydrogen-based technologies tailored for cruise ships. The project aims to deliver innovative, efficient, and safe onboard solutions, from on-board production and storage systems to port infrastructure, that meet ships' operational requirements in terms of volumetric efficiency, safety, installability and economic sustainability. It represents a key step toward introducing hydrogen as a viable fuel for maritime decarbonization.



The project embraces a **multi-technology approach**, recognizing that no single green solution currently meets all maritime requirements. It focuses on validating complementary **green fuel and technology combinations** that ensure volumetric efficiency, operational readiness, and onboard integration. To be viable, green fuels must also be economically sustainable and readily available in ports.

Hydrogen stands out as a promising alternative, offering zero pollutant emissions and significant potential for cruise ship applications and broader maritime decarbonization.

Wave 2 the Future is funded by the European Union through NextGenerationEU and financially supported by the Italian Ministero delle Imprese e del Made in Italy, as part of the National Recovery and Resilience Plan (PNRR) initiative.



Wave 2 the Future is divided into three integrated initiatives (**Work Packages**), that involve the mobility sectors and the hydrogen system stakeholder value chain.

IPCEI HY2TECH TF2 FUEL CELLS TECHNOLOGY	WP1 HYBRID GREEN POWER GENERATION SYSTEM
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Developed by our subsidiary, **Isotta Fraschini Motori**, WP1's goal is to create an integrated solution combining an internal combustion engine and a fuel cell system, both powered **100% by hydrogen**, with batteries and potentially PV panels. The purpose is to create green power generation systems applicable to the widest range of ships. The final outcome will be the definition and testing of the first prototype of this new combined power generation system, called the **Hybrid Green Power Generation System (HGPGS)**.

IPCEI HY2TECH TF4 END USER TECHNOLOGY	WP2 GREEN COMBINED CYCLE GAS TURBINE FUELLED BY H2
	WP3 H2 TECHNOLOGIES DEMONSTRATED IN OPERATIONAL CONDITIONS

WP2 aims to develop a **combined cycle gas turbine (G-CCGT)** system for maritime applications, composed by gas and steam turbines. The objective of WP2, is to validate the onboard applicability of a combined cycle powered by up to 100% hydrogen. This system requires the development of the overall technical solution, as well as the construction and testing of its critical components.

WP3 involves design, construction, and operational demonstration of **two prototypes for maritime power generation technologies**:

- A power generation system consisting of a hybrid plant that combines **engines** and **Solid Oxide Fuel Cells (SOFCs)**.
- A power generation system comprising a hybrid plant that combines **traditional engines** and **Proton Exchange Membrane (PEM) fuel cells** powered by hydrogen.



A FUTURE ALREADY ON BOARD

Wave 2 The Future is tangible proof that for Fincantieri, sustainability is not just a statement of intent, but a commitment expressed through an industrial path that is already underway. The project brings to the sea a technology whose application, until just a few years ago, seemed distant: hydrogen as an energy source for navigation. In other words, transforming ships into true laboratories of innovation, capable of combining performance, safety, and environmental respect.



ENVIRONMENTAL Clean hydrogen propulsion

On an environmental level, hydrogen drastically reduces emissions and makes the ship a clean model: not only less CO₂, but also fewer nitrogen oxides, sulfur oxides, and particulate matter. The benefits extend not only to the oceans, but also to port cities and their ecosystems, which can enjoy cleaner air and live in quieter, more livable spaces.



SOCIAL
Jobs, skills and local value

On a social level, sustainability becomes a generator of value. Wave 2 The Future stimulates the creation of a European hydrogen supply chain, creates new engineering skills and opportunities for young people, attracts investments to local areas, and improves the quality of life for coastal communities.



GOVERNANCE Transparent, scalable public-private model

In terms of governance, the project embodies a public-private collaboration model based on transparency and the sharing of results. The knowledge and infrastructure developed become a common, replicable, and scalable asset, helping to strengthen the entire European hydrogen value chain.