

## Hydrogen-based naval propulsion and onboard energy systems

**Sector:** Marine infrastructures

### Short description of the needs:

*Challenge:* Maritime and port decarbonization requires efficient integration of hydrogen technologies, advanced energy management, and safe storage, all within a rapidly evolving technological, regulatory, and operational context.

*Objective:* Drive the development of fully integrated fuel cell-based power systems, including Balance of Plant optimization and management, by combining high-fidelity process modelling with data-driven methods. Deploy digital twins and intelligent control “agents” to improve monitoring, efficiency, safety, and reliability along the entire hydrogen value chain, from production and storage to distribution and end use. Consolidate capabilities in hydrogen use, including low-temperature hydrogen handling, sensor integration, and system-level optimization for naval propulsion, onboard energy systems, and naval services.

*Cooperation Opportunities:* Partner on hydrogen-based ship transformation and integration and on port-side energy infrastructures, providing system integration, energy optimization, and advanced digital solutions that support the transformation of ports into resilient, intelligent multi-energy hubs for modern ships.

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