

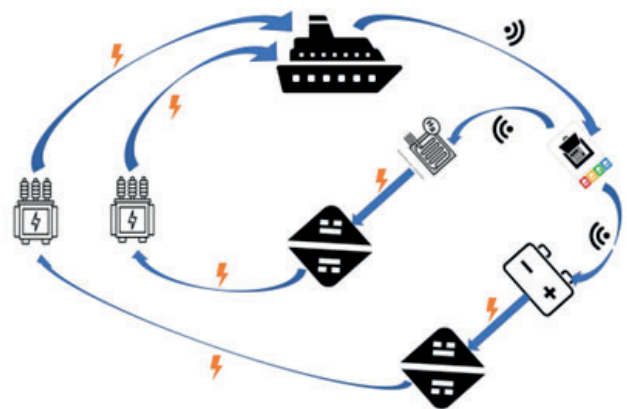


Sustainable HYdrogen  
powered Shipping

## sustainable HYdrogen powered Shipping Research and Innovation Action

Acting towards a cornerstone in the Decarbonisation of the Maritime Industry

sHYpS project Kick off took place in June 2022, and in close coordination with involved stakeholders, Jeumont Electric develop an overall power electronic design and control automation system architecture with the main goal to allow every electrical ship energy generator of sHYpS project to work efficiently and safely as a whole system and feed the ship with the “on demand” power needed for electrical power propulsion and hotel load.



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## When Imagination becomes Reality... Battery Energy Storage System (BESS) and BESS converters design

From the above architecture, and in close collaboration with the ship owner, Jeumont Electric defined the BESS (Battery Energy Storage System) basic design.

The Ship owner will be able to choose a BESS supplier compliant to the power needed for hybridization.

BESS system will provide stable power and will be able to absorb a dynamic transient power on demand, for a limited time.

In coordination with battery supplier and ship owner, Jeumont electric performed the basic design of the BESS converters allowing the power produced by the battery to be injected on the ship network to answer to the ship's need and ensure network stability in full electric mode.



## Fuel Cells (FC) converters design

In close coordination with FC (Fuel Cells) container designer, Jeumont Electric performed the basic design of the FC converters.

These converters will be able to interface with FC stacks and will allow the power produced by the FC modules to be injected on the ship network on demand.

Integrating the FC technology parameters (functioning, safety, limitations, ...) was a quite challenging task but has been successful thanks to a very close communication through weekly calls, face to face design meetings (which will keep going on till the end of this fantastic journey) with all involved parties.



## Step Up transformers design



To allow the power supplied by the batteries and the FC modules to be injected on the network, Jeumont Electric also performed the basic design of the step-up transformers which will be the final link between the power produced from the BESS and the FC cells modules to the ship network.

## When Imagination is under Control... Automation and Controls design

After having defined the basic design of BESS, converters, transformers, and other electrical systems components, Jeumont Electric also performed the basic control architecture of this system.

This control architecture has been performed in deep coordination with involved stakeholders. Jeumont Electric delivered the basic design of the control and automation of the system by defining the communication protocols, making sure that every component was fitted with proper instruments, measures at the proper place to allow a safe functioning of the complete system.

We integrated every need of each component, defined the safety loop controls, ensured a secured communication between components to allow a safe operation on the ship.

## Roadmap's next step Detailed design

With all these steps being done, journey is just starting. Close coordination and communication between stakeholders will be needed to go beyond and enter in the detailed design phase of the overall electrical system including control automation system which will make the link between this hybrid electric system and the ship power management system. There is still a lot to do, but this exciting journey is on a good shape to meet the targets.

# PARTNERS



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