

# OPHARM2

## Advanced analysis for offshore production of hydrogen from offshore wind

**DURATION: 36 months | LAUNCH: 2023 | BUDGET: €2,489K**

### CONTEXT

While the first industrial projects for hydrogen production coupled with offshore wind power have been announced in the North Sea, France's ambitions in this field have yet to be defined. Offshore energy spatial planning will have strong implications for the development of future grids, which needs to be anticipated. **Some major challenges must also be investigated and lifted before hydrogen from offshore wind becomes a reality: the electrolyser location scenarios, the performance of the proton exchange membrane electrolysis technology in an offshore environment and the social acceptance of the whole.**



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#### TECHNOLOGIES



#### STAGES OF THE VALUE CHAIN



Preparatory studies

Design

### OBJECTIVE

To address a series of complementary aspects of renewable hydrogen production from offshore wind farms to support its progress towards operational deployment, including energy networks integration, technology aspects and environmental impacts

### SCIENTIFIC CONTENT

#### Networks integration

- Basin scale study: Channel, Atlantic and Mediterranean sea basins
- Local scale study: Marseille-Fos harbour and industrial site

#### Technology specification and sizing

- Panorama of involved technologies
- Specification and sizing of wind turbine + electrolysis system and substation + electrolysis system

#### Impact of motion on proton exchange membrane electrolyser performance

- Cases definition for tests
- Simulation of movements for wind turbine and substation
- Testing electrolyser performance with simulated motion

#### Environmental integration

- Identification of the different pressure-receiver pairs: chronic risk, accidental risk, impacts on marine compartments
- Risk characterisation of brine discharges in offshore wind farms
- Characterization of both physicochemical and biological impact of brine

### EXPECTED RESULTS

- **Methodology** for local scale assessment of renewable hydrogen production-consumption scenarios for heavy industry decarbonisation
- **Hydrogen production systems** specification and performance target definition from desalination unit to offshore storage
- **Identification** of possible unwanted system resonance regarding the electrolyser exposed to motions of a floating platform
- **Recommendations** for environmental impact assessment of the hydrogen production in marine environment using transdisciplinary approach
- **Upgraded OPHARM** configuration assessment tool

### PARTNERS



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