



USE OF RENEWABLE ENERGY  
OUTSIDE ANNEX 1

# INNOVATION FUND

Deployment of net-zero and innovative technologies

**HyPush: Construction of a fuel cell pusher boat operating with two hydrogen fuel cells and a lithium battery designed for inland river navigation**

The Innovation Fund is 100% funded by the EU Emissions Trading System

## | Project Factsheet

HyPush aims to introduce hydrogen technology to inland waterways by creating an innovative pusher vessel to move heavy barges in the Paris area. Powered by green hydrogen, this will fully decarbonise bulk transport on the Seine axis and immediately improve air quality.

HyPush will also combine this innovative technology with a pioneering business model. The vessel will be supplied to an operator for ten years, remaining responsible for the technological components such as fuel cells and power electronics, and ensuring maintenance and monitoring. The project aims to achieve a 100% relative GHG emission avoidance during the first ten years of operation compared to the reference scenario.

HyPush is composed of a propulsion system, combining a powerful buffer battery, a fuel cell and

### COORDINATOR

N GREEN MOBILITY

### LOCATION

France

### CATEGORY

Renewable Energy (RES)

### SECTOR

Use of renewable energy outside Annex I

### AMOUNT OF INNOVATION FUND GRANT

EUR 3,066,840

### EXPECTED GHG EMISSIONS AVOIDANCE

12,294 tonnes CO2 equivalent

### STARTING DATE

01 June, 2023

### ENTRY INTO OPERATION DATE

01 July, 2025

### FINANCIAL CLOSE DATE

30 June, 2024

a newly developed energy management system. The pusher vessel will be subjected to high-intensity operations, performing double duty on most workdays, up to 17 hours continuously. During these days, the HyPush will alternate between river ports approximately 30 km apart, leaving reduced time for filling during operations.

In terms of absolute greenhouse gas emissions, a total of 12 294 tonnes CO<sub>2</sub>equivalent will be avoided in the first ten years of operation. This is equivalent to the average annual greenhouse gas emissions (GHG) produced by 2 197 inhabitants in the European Union( Carbon Dioxide Information Analysis Center), or to 15 146 direct flights from Paris to New York (5 836 km) in economy class (according to Adème, the Agency for Ecological Transition. Calculation made for an airplane with more than 220 seats.).

This project aims to demonstrate the relevance of hydrogen propulsion to decarbonise river navigation and the maritime sector. This vessel will serve as a pilot and will boost the green hydrogen mobility market in France, in particular through river navigation operations, which are key to reducing carbon emissions in this sector.

## | Participants

N GREEN MOBILITY

More generally, as the demand for green hydrogen in the Paris area increases, the price of hydrogen will come down. This will make the use of green hydrogen more competitive by reducing the cost of operation for all mobility usages, including logistics and public transportation.

The project will provide an important precedent and encourage operators and ship owners to initiate their decarbonisation path. Moreover, the hull and ancillary equipment of the vessel are identical to those of other conventional pusher vessels. This means that the HyPush energy system can be easily implemented on a standard platform, either by building new vessels of the same dimensions or by adapting existing vessels through a retrofit process.

The replication potential of this project therefore means that the hydrogen propulsion technology can be transposed to many existing vessels. This can provide a durable decarbonisation solution for the important EU pusher fleet of 2 727 vessels, with 1 358 pushers and tugs in the Rhine fleet alone.

France