



## SEP PAC

### PROPULSION SYSTEM BASED ON FUEL-CELL POWER

The sea and river port and transport sector is resolutely committed to controlling its environmental impact. The strong commitment of those responsible for managing river vessel fleets in Paris and their counterparts in maritime ports is indicative of a willingness to sign up fully to the 'clean ports' objective. Today the fleet of ships with fuel-cell propulsion is continually growing and becoming a priority for some ports.

A fuel cell is an electrochemical energy [generator](#) that is capable of transforming the chemical energy of a [combustible](#) into electrical energy without passing through the thermal energy stage. Hydrogen is the simplest [combustible](#) to use and results in a high-density current. Its combustion produces nothing but water, in either liquid or vapour form. This system offers the twofold advantage of not using a fossil resource and producing no waste other than water. It does however take up a lot of space. Fuel-cell research is therefore concentrated on hydrogen storage tanks with the aim of making them safer, lighter and more compact.

The SEP PAC project will produce an electricity generator, known as a hydrogen Fuel Cell Power System (FCPS), rated at several hundred kW of power for use in the maritime and fluvial domain. It will incorporate new DC-to-DC converters that will allow technological advances by using silicon carbide (SiC) components to optimise outputs.

A study will also be carried out as part of the project into supplying "clean" hydrogen in order to develop hydrogen filling stations for sea and river vessels.

**The SEP PAC project is also recognised by the Pôle EMC2 cluster.**

#### Partners

##### Companies

ECA EN, Couëron [Project Developer]  
Bureau d'études Mauric, Nantes  
Naval Group, La Montagne

##### Research center

Université de Nantes, Nantes

#### Funder

Ademe

#### Labelisation

23/09/2016

#### Overall budget

14 M€