

H₂ PORTS

IMPLEMENTING FUEL CELLS AND HYDROGEN TECHNOLOGIES IN PORTS



Project ID	826339
PRR 2024	Pillar 3 – H ₂ end uses: transport
Call topic	FCH-03-1-2018: Developing fuel cell applications for port/harbour ecosystems
Project total costs	EUR 4 117 197.50
FCH JU max. contribution	EUR 3 999 947.50
Project start - end	1.1.2019–31.12.2024
Coordinator	Fundación de la Comunidad Valenciana para la Investigación, Promoción y Estudios Comerciales de Valenciaport, Spain
Beneficiaries	Agenzia nazionale per le nuove tecnologie, l'energia e lo sviluppo economico sostenibile; Atena Scarl – Distretto Alta Tecnologia Energia Ambiente; Autoridad Portuaria de Valencia; Ballard Power Systems Europe AS; Cantieri Del Mediterraneo SpA; Centro Nacional de Experimentación de Tecnologías de Hidrógeno y Pilas de Combustible Consorcio; Enagas SA; Grimaldi Euromed SpA; Hyster-Yale Nederland BV; Mediterranean Shipping Company Terminal Valencia SA; Sociedad Española de Carburros Metálicos SA; Università degli Studi di Napoli Parthenope; Università degli Studi di Salerno; Valencia Terminal Europa SA

<https://h2ports.eu/about/>



PROJECT AND GENERAL OBJECTIVES

The H₂Ports project will demonstrate and validate two innovative solutions based on fuel cell technologies. A reach stacker and a terminal tractor will be tested on a daily basis during real operational activities at the Port of Valencia. The required hydrogen will be provided through a mobile hydrogen refuelling station (HRS) designed and built during the project. All three elements are currently in advanced stages of building, and the piloting period is planned to start in 2024.

NON-QUANTITATIVE OBJECTIVES

- The project aims to disseminate H₂ technologies to the port and maritime sector. This goal will be accomplished through the organisation of a stakeholder advisory group.

- H₂Ports will gather information on the use of H₂ in port environments.
- It will also gather information on the use of H₂ as fuel for vessels.

PROGRESS AND MAIN ACHIEVEMENTS

Both the reach stacker and the yard tractor have been commissioned, and their demonstration could start in the first half of 2024.

FUTURE STEPS AND PLANS

It is envisaged that the two applications (reach stacker and 4 × 4 terminal tractor) will undergo 2 years of piloting under normal operative conditions. The piloting period is expected to start in 2024.

PROJECT TARGETS

Target Source	Parameter	Unit	Target	Target Achieved?	
Project's own objectives, MAWP addendum (2018–2020) and AWP 2018	Amount of H ₂ dispensed	kg/day	60		
	MTBF	days	-		
	Tank-to-wheel efficiency	%	50		
	Hydrogen consumption	kg/h	RS: 3.33; YT: 2.34		
	Hydrogen storage cost	€/kg	650		
	HRS daily capacity	kg/day	60		
	Reach stacker vehicle power	kW	90		
	Vehicle power	kW	70		
	Noise level	dBA	< 60		
	HRS MBTF	days	50		
	Availability	%	90		
	HRS availability	%	> 98		
	Project's own objectives	Specific maintenance cost	€/output	TBD	
		Hydrogen refuelling time	minutes	< 30	
Vehicles over cost (target percentage over CNG and diesel port trucks)		%	100		
Cost of fuel cell system		€/kW	3 500		
Duration of the testing period		h-years	5 000–2		
Total installed power of fuel cell system	kW	175–205 (225–285)			
HRS-specific maintenance cost	€/kg	1			
HRS CAPEX	€	575 000			

