DJEWELS

DELFZIJL JOINT DEVELOPMENT OF GREEN WATER ELECTROLYSIS AT LARGE SCALE

Project ID	826089
PRR 2024	Pillar 1 – Renewable hydrogen production
Call topic	FCH-02-1-2018: Demonstration of a large scale (min. 20 MW) electrolyser for converting renewable energy to hydrogen
Project total costs	EUR 41 967 250.00
Clean H_2 JU max. contribution	EUR 10 999 999.00
Project period	1.1.2020–31.12.2025
Coordinator	Hydrogen Chemical Company BV, Netherlands
Beneficiaries	BioMethanol Chemie Nederland BV, Hinicio, Industrie De Nora SpA, McPhy Energy, McPhy Energy Deutschland GmbH, McPhy Energy Italia SRL, Nobian Industrial Chemicals BV, NV Nederlandse Gasunie

https://djewels.eu

PROJECT AND GENERAL OBJECTIVES

Djewels demonstrates the operational readiness of a 20 MW electrolyser for the production of green fuels (green methanol) in real-life industrial and commercial conditions. It will bring the technology from technology readiness level 7 to 8 and lay the foundation for the next scale-up step: a 100 MW electrolyser on the same site. Djewels will enable the development of the next generation of pressurised alkaline electrolysers by developing more cost-efficient, better-performing, high-current-density electrodes, and is preparing for the serial manufacturing of the stack and scale-up of the balance-of-plant components.

NON-QUANTITATIVE OBJECTIVES

- Perform the engineering activities for setting up the water electrolysis system.
- Ensure safety performance (design has been finalised and hazard and operability analysis has been completed).
- Establish a business case for hydrogen for producing green methanol and develop a business plan for large-scale upscaling towards 2030.
- Evaluate technical and business model performance with regard to predictions through monitoring of system operation.
- Define the optimal operation conditions of the new high-density electrode package.

PROGRESS AND MAIN ACHIEVEMENTS

- Finalisation of the Djewels 1 design.
- Issuing of irrevocable permits.
- Completed testing of the 1 MW stack.

FUTURE STEPS AND PLANS

- Stack testing and optimisation is to be finished. This is delayed, and was expected to be completed in July 2022.
- The investment decision is expected to be made in quarter 3 of 2024.
- Ground breaking is expected to take place in quarter 4 of 2024.
- Construction is expected to be completed in 2026.

PROJECT TARGETS

Target source	Parameter	Unit	Target	Target achieved?
Project's own objectives	System nominal capacity	MW	25	
	Electrolysis CAPEX @ rated power, including ancillary equipment and commissioning	M €/(t/day)	5.5	
AWP 2018	Flexibility with degradation below 2 %/year	% of nominal power	3–110	
	Energy consumption	kWh/kg	< 52.8	
	Degradation	%/year	0.72	

Clean Hydrogen Partnership
Co-funded by the European Union