

DJEWELS

DELFIJL JOINT DEVELOPMENT OF GREEN WATER ELECTROLYSIS AT LARGE SCALE



Project ID	826089
PRR 2025	Pillar 1 - H ₂ Production
Call Topic	FCH-02-1-2018
Project Total Costs	41 967 250.00
Clean H ₂ JU Max. Contribution	10 999 999.00
Project Period	01-01-2020 - 31-12-2025
Coordinator Beneficiary	HYCC B.V., NL
Beneficiaries	MCPHY ENERGY ITALIA SOCIETA A RESPONSABILITA LIMITATA, BIOMETHANOL CHEMIE NEDERLAND B.V., MCPHY ENERGY DEUTSCHLAND GMBH, INDUSTRIE DE NORA SPA-IDN, HINICIO, MCPHY ENERGY, NOBIAN INDUSTRIAL CHEMICALS BV, NV NEDERLANDSE GASUNIE

<http://www.djewels.eu>

PROJECT AND GENERAL OBJECTIVES

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

NON-QUANTITATIVE OBJECTIVES

Project development phase:

- Perform the engineering activities for setting up the water electrolysis system.
- Ensure safety performance: (i) completed design; (ii) completed hazard and operability analysis.
- Establish a business case for hydrogen for producing green hydrogen and develop a business plan for large scale upscaling towards 2030.

Operations:

- 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.
- Demonstrate the reduced footprint of high-pressure alkaline electrolysis versus low pressure systems.

- Demonstrate feasibility of high-pressure alkaline electrolysis to undertake primary grid balancing services.
- Formulate and disseminate project results.

PROGRESS, MAIN ACHIEVEMENTS AND RESULTS

Technical:

- Finalisation of Djewels basic engineering.
- Technology demonstration of 1 MW stack completed.
- Testing of advanced high current density electrodes on 1 MW stack completed.

Permits:

- Irrevocable environmental permit issued.
- Irrevocable water permit issued.

Financing:

- Wadden fonds subsidy for project development stage approved.
- Tailormade subsidy of 80 M Euros approved by the Dutch state.

Project management:

- Project execution and engineering plan for execution activities has been completed.

FUTURE STEPS AND PLANS

- Finalisation of project contractual agreements in entire supply chain.
- Subsequent move to project execution.
- Start of operations; Q4 2027.

PROJECT TARGETS

Target source	Parameter	Unit	Target	Target achieved?
Project's own objectives	System nominal capacity	MW	20	
	Efficiency degradation @ rated power and considering 8 000 hours operations / year	% increase in energy consumption every year	1.5	
	Energy consumption	kWh/kg	< 52.8	
	CAPEX @ rated power including ancillary equipment and commissioning	M/(t/d)	5.5	
	Flexibility with a degradation <2% year	% of nominal power	3-110	
	Hot start from min to max power	%/secs	20 (ramp up) 100 (ramp down)	