CH2P

COGENERATIONOFHYDROGENANDPOWERUSING SOLID OXIDE BASED SYSTEM FED BY METHANE RICH GAS



Project ID:	735692				
PRD 2023:	Panel 4 – H2 end uses – stationary applications				
Call topic:	FCH-02-4-2016: Co-generation of hydrogen and electricity with high- temperature fuel cells (> 50 kW)				
Project total costs:	EUR 7 239 100.08				
Clean H ₂ JU max. contribution:	EUR 3 999 896.00				
Project period:	1.2.2017-30.4.2022				
Coordinator:	Fondazione Bruno Kessler, Italy				
Beneficiaries:	Deutsches Zentrum für Luft- und Raumfahrt EV, École Polytechnique Fédérale de Lausanne, HyGear BV, HyGear Fuel Cell Systems BV, HyGear Operations BV, HyGear Technology and Services BV, Shell Global Solutions International BV, SolydEra SA, SolydEra SpA, Vertech Group				

https://ch2p.eu/

PROJECT AND OBJECTIVES

CH2P is designing, constructing and partially validating an innovative system prototype for hydrogen production. The system co-generates hydrogen, heat and electricity using solid oxide cell technology fuelled by carbon-lean natural gas or biomethane. The CH2P system operates in five modes, enabling flexibility in hydrogen and electricity supply. The prototype is placed in two 40-foot containers, and it is modular to support future upscaling. CH2P has been designed as a transition technology for application at hydrogen refuelling stations and has the ambition of producing hydrogen at < €4/kg.

Hot Bala

NON-QUANTITATIVE OBJECTIVES

- CH2P targets six use cases.
- The project aims to co-generate hydrogen and electricity for hydrogen refuelling stations. With a single technology, CH2P will deliver natural gas, hydrogen and power – the fuels of the EU directive on alternative fuels infrastructure.

PROGRESS AND MAIN ACHIEVEMENTS

- The CH2P project designed, simulated, constructed and validated a novel system prototype for hydrogen production.
- The system produces 20 kg/day of hydrogen and 25 kW of electric power.
- The system operates in five modes and delivers hydrogen at 7 bar with a purity level of 5.0 N of hydrogen.



QUANTITATIVE TARGETS AND STATUS

Т	arget source	Parameter	Unit	Target	Achieved to date by the project	Target achieved?
AWP 2016		System size	kgH ₂ /day	20	25	
		Flexible co-generation of H_2 and POWER	%	50 + 50	30 + 30	
		System efficiency	%	65	66	
	AWP 2016	Fuel utilisation and steam conversion rate at large stack module level	%	> 80 %	90	
		Stack voltage deviation	%		< 1 %	
	G	Gas purification unit producing 5 N of hydrogen	-	5N Purity CO < 200 ppb	5N Purity CO < 200 ppb	
		1 000 hours of testing in a real environment	hours	1 000	1 000	



PRD 2023 PANEL H2 End Uses – Stationary