GrInHy2.0

GREEN INDUSTRIAL HYDROGEN VIA STEAM ELECTROLYSIS

Project ID:	826350
PRD 2023:	Panel 1 – H2 production
Call topic:	FCH-02-2-2018: Demonstration of large-scale steam electrolyser system in industrial market
Project total costs:	EUR 5 882 492.50
Clean H_2 JU max. contribution:	EUR 3 999 993.25
Project period:	1.1.2019–31.12.2022
Coordinator:	Salzgitter Mannesmann Forschung GmbH, Germany
Beneficiaries:	Paul Wurth SA, Sunfire GmbH, Salzgitter Flachstahl GmbH, Tenova SpA, Commissariat à l'énergie atomique et aux énergies alternatives

https://salcos.salzgitter-ag.com/de/grinhy-20.html

PROJECT AND OBJECTIVES

GrInHy2.0 is about implementing the world's biggest high-temperature electrolyser, with a capacity of 720 kW alternating current and electrical efficiency of 84 % lower heating value. During the assessment of the technology's carbon direct avoidance potential for the future European steel industry, the electrolyser will produce more than 100 t of green hydrogen based on steam from industrial waste heat produced over > 13 000 operational hours from steel production in Salzgitter.

PROGRESS AND MAIN ACHIEVEMENTS

- Electrolyser scale-up to 720 kWel and 200 Nm^3H_2/h was successful.
- The electrical efficiency target of 84 % lower heating value was reached.
- By the end of 2022, the system had been operating for more than 14 000 hours.
- Stack degradation at 15 $m\Omega cm^2.kh\text{-}1$ is below what was expected.
- Production of more than 100 t of climate-neutral hydrogen was achieved.
- Electrolyser investment costs were reduced to below 4 500 €/(kgH_2/d).

FUTURE STEPS AND PLANS

The project was successfully concluded, and no further steps are planned.

QUANTITATIVE TARGETS AND STATUS

Target source	Parameter	Unit	Target	Achieved to date by the project	Target achieved?	SoA result achieved to date (by others)	Year of SoA target
AWP 2018	Total production of green hydrogen	t	100	102	✓	N/A	2017
	Demonstration of hot start from min. to max. power	minutes	5	15	⚙	10	2018
	Hours of operation	hours	13 000	14 000	✓	10 000	2019
	Availability	%	95	85	⚙	66	
Project's own objectives	Hours of continuous stack testing	hours	20 000	10 000	⚙	8 700	2019

Clean Hydrogen Partnership
Co-funded by the European Union