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FUTURE TECHNOLOGY

prometeo

PROMETEO:
Hydrogen production by means of solar heat and power in high temperature solid oxide Electrolysers

Title

PROMETEO - Hydrogen production by means of solar heat and power in high temperature solid oxide Electrolysers

Project

Prometeo is a European Horizon 2020 project that aims to design, construct and test an innovative prototype to produce renewable hydrogen from solar power.

The Prometeo project aims to validate an innovative system prototype for the production of renewable hydrogen using solar fuels, moving the technology readiness level from TRL 3 to TRL 5.
By testing a large SOE stack in electrolysis mode Prometeo aspires to move a step forward in SOE performances to produce hydrogen from renewable energy sources. The Prometeo's prototype is based on high-temperature solid oxide electrolysis (SOE) coupled with an innovative heat storage system. The storage system will optimize the use of intermittent solar heat in hydrogen production.
The prototype will be designed to meet end-users' needs for renewable hydrogen in different industrial sectors: injection of hydrogen into the gas grid (SNAM, Italy), chemical storage of renewable electricity (Capital Energy, Spain) and use of hydrogen for ammonia and fertiliser production (Stamicarbon, the Netherlands).
The project will last three and a half-years and it is supported by funding of € 2.5 million from the European Fuel Cells and Hydrogen Joint Undertaking (FCH JU). The final goal of Prometeo is to move a step forward in the use of renewable hydrogen for industrial decarbonization by 2030.

The main challenge in Prometeo is to optimize the coupling of the Solid Oxide Electrolyser (SOE) with two intermittent renewable sources: electricity from renewables (PV, wind, or variable grid power) and high-temperature solar heat from Concentrating Solar (CS). The SOE system will be supported by a Thermal Energy Storage (TES) to balance solar heat supply in steam generation for high-temperature electrolysis. The integrated system aims to increase efficiency, flexibility and reliability of the electrolysis, while minimizing the production costs for hydrogen.

Info

Type of project: HORIZON 2020
Timing: 4 years

Funding

Coordinator
ENEA

Partner
CAPITAL ENERGY
FONDAZIONE BRUNO KESSLER
SOLIDPOWER
IMDEA ENERGY
SNAM
EPFL
NEXTCHEM SPA
STAMICARBON
GREEN CAPITAL POWER
ANGUITA FOTOVOLTAICO
QUANTUM HYDROGEN
ATENA

Country:
Italy