



Hydrogen Europe: European Hydrogen & Fuel cell Project Database

Project SOL2HY2

Solar To Hydrogen Hybrid Cycles

The FCH JU strategy has identified hydrogen production by water decomposition pathways powered by renewables such as solar energy to be a major component for sustainable and carbon-free hydrogen supply. Solar-powered thermo-chemical cycles are capable to directly transfer concentrated sunlight into chemical energy by a series of chemical and electrochemical reactions, and of these cycles, hybrid-sulphur (HyS) cycle was identified as the most promising one. The challenges in HyS remain mostly in dealing with materials (electrolyser, concentrator, acid decomposer/cracker and plant components) and with the whole process flowsheet optimization, tailored to specific solar input and plant site location. With recent technology level at large-scale hydrogen production concepts hydrogen costs are unlikely to go below 3.0-3.5 €/kg. For smaller scale plant, the costs of hydrogen might be substantially higher. The present proposal focuses on applied, bottle-necks solving, materials research and development and demonstration of the relevant-scale key components of the solar-powered, CO₂-free hybrid water splitting cycles, complemented by their advanced modeling and process simulation including conditions and site-specific technical-economical assessment optimization, quantification and benchmarking. For the short-term integration of solar-power sources with new Outotec Open Cycle will be performed. Simplified structure, extra revenues from acid sales and highly efficient co-use of the existing plants may drop hydrogen costs by about 50-75% vs. traditional process designs. Besides providing key materials and process solutions, for the first time the whole production chain and flowsheet will be connected with multi-objective design and optimization algorithms ultimately leading to hydrogen plants and technology “green concepts” commercialization. The consortium consists of key materials suppliers and process development SME and industry, RTD performers and a university.

Project Information

Type of project : Research

Timing : 01/06/2013 > 30/11/2016

Project website: <http://sol2hy2.eucoord.com>

Project Budget : 3.727.404 €

Funding

European Union through FCH JU: **Grant agreement 325320 - CORDIS link**

Project partners

Coordinator :

ENGINSOFT SPA

Partners :

[Aalto University \(former TKK - Helsinki University of Technology\)](#)

[DLR - German Aerospace Center](#)

[ENEA - Agenzia per le Nuove Tecnologie, l'Energia e lo sviluppo economico sostenibile](#)

[Woikoski](#)

[OUTOTEC \(FINLAND\) OY](#)

[Erbicol SA](#)

Sub project(s)

Sub project 1

Country: Italy

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Sub project categories

Research

Project Id: 1092

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