



Hydrogen Europe: European Hydrogen & Fuel cell Project Database

Project HYDROSOL-3D

Scale Up of Thermochemical HYDROgen Production in a SOLar Monolithic Reactor: a 3rd Generation Design Study

HYDROSOL-3D aims at the preparation of a demonstration of a CO₂-free hydrogen production and provision process and related technology, using two-step thermochemical water splitting cycles by concentrated solar radiation. This process has been developed in the frame of EU co-financed projects within FP5 and FP6. From the initial idea over the proof of principle and over several steps of improvement - that have awarded to project HYDROSOL the EU "2006 Descartes Prize for Collaborative Scientific Research" - the technology has recently reached the status of a pilot plant demonstration in a 100 kW scale showing that hydrogen production via thermochemical water splitting is possible on a solar tower under realistic conditions. The present project focuses on the next step towards commercialisation carrying out all activities necessary to prepare the erection of a 1 MW solar demonstration plant. HYDROSOL-3D concerns the pre-design and design of the whole plant including the solar hydrogen reactor and all necessary upstream and downstream units needed to feed in the reactants and separate and bottle the products. Two alternative options will be analyzed: adapting the hydrogen production plant to an already available solar facility or developing a new, completely optimised hydrogen production/solar plant. The most promising option will be analysed in detail, establishing the complete plant layout and defining and sizing all necessary components. Validation of pre-design components and process strategies by experiments (in laboratory, solar furnace, solar simulator and solar tower facilities) and a detailed techno-economic analysis covering market introduction will complement the project. The HYDROSOL-3D consortium has been built accordingly bringing together the experience and knowledge elaborated in all the R&D work carried out up to the current status of HYDROSOL projects, with industrial leaders and innovative SME's capable to bring the technology to maturity and to the market.

Project Information

Type of project : Research

Timing : 01/01/2010 > 31/12/2012

Project Budget : 1.729.084 €

Funding

European Union through FCH JU: [Grant agreement 245224 - CORDIS link](#)

Project partners

Coordinator :

[CERTH \(National Centre for Research and Technology Hellas\) with CPERI](#)

Partners :

[DLR - German Aerospace Center](#)

[CIEMAT - Centro De Investigaciones Energeticas, Medioambientales y Tecnologicas](#)

[HyGear B.V.](#)

[TOTAL S.A.](#)

[Sub project\(s\)](#)

Sub project 1

Country: Greece

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Sub project categories

Research

Project Id: 997

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