



# Hydrogen Europe: European Hydrogen & Fuel cell Project Database

## Project ReforCELL

Advanced Multi-Fuel Reformer for Fuel Cell CHP Systems

Distributed power generation via Micro Combined Heat and Power (m-CHP) systems, has been proven to overcome disadvantages of centralized plant since it can give savings in terms of Primary Energy consumption and energy costs. The main advantage is that m-CHP systems are able to recover and use the heat that in centralized systems is often lost. Wide exploitation of these systems is still hindered by high costs and low reliability due to the complexity of the system. REforCELL aims at developing a high efficient heat and power cogeneration system based on: i) design, construction and testing of an advanced reformer for pure hydrogen production with optimization of all the components of the reformer (catalyst, membranes, heat management etc) and ii) the design and optimization of all the components for the connection of the membrane reformer to the fuel cell stack. The main idea of REforCELL is to develop a novel more efficient and cheaper multi-fuel membrane reformer for pure hydrogen production in order to intensify the process of hydrogen production through the integration of reforming and purification in one single unit. To increase the efficiency and lifetime of the reformer, novel stable catalysts and high permeable and more stable membranes will be developed. Afterwards, suitable reactor designs for increasing the mass and heat transfer will be realized and tested at laboratory scale. The most suitable reactor design will be scaled up at prototype scale (5 Nm<sup>3</sup>/h of pure hydrogen) and tested in a CHP system. The connection of the novel reformer within the CHP will be optimized by designing heat exchangers and auxiliaries required in order to decrease the energy losses in the system. The project aims to increase the electric efficiency of the system above 45% and the overall efficiency above 90%. A complete lifecycle analysis of the system will be carried out and cost analysis and business plan for reformer manufacturing and CHP system will be supplied.

## Project Information

**Type of project :** Research

**Timing :** 01/02/2012 > 31/12/2015

**Project website:** <http://www.reforcell.eu/>

**Project Budget :** 5.546.195 €

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## Funding

European Union through FCH JU: Grant agreement 278997 - [CORDIS link](#)

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## Project partners

**Coordinator :**[TECNALIA](#)**Partners :**[CEA - Commissariat à l'énergie atomique et aux énergies alternatives](#)[Polimi - Politecnico Milano](#)[SINTEF AS](#)[HyGear B.V.](#)

TECHNISCHE UNIVERSITEIT EINDHOVEN

ICI CALDAIE SPA

SOPRANO INDUSTRY

HYBRID CATALYSIS BV

QUANTIS

JRC - JOINT RESEARCH CENTRE - EUROPEAN COMMISSION

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**Sub project(s)****Sub project 1****Country:** Spain**Address:**

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**Sub project categories**

Research

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Project Id: 1076

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