



# Hydrogen Europe: European Hydrogen & Fuel cell Project Database

## Project Hy2Seps-2

Hybrid Membrane - Pressure Swing Adsorption (PSA) Hydrogen Purification Systems

The main goal of the proposed work is the design and testing of hybrid separation schemes that combine membrane and Pressure Swing Adsorption (PSA) technology for the purification of H<sub>2</sub> from a reformat stream that also contains CO<sub>2</sub>, CO, CH<sub>4</sub>, and N<sub>2</sub>. The general objectives comply with SP1-JTI-FCH.2010.2.3: "Development of gas purification technologies", which is part of the application area SP1-JTI-FCH.2: "Hydrogen production & distribution". A hybrid process should combine the very high throughput and purity of a PSA process with a membrane separation process which has lower operating costs. As a result a hybrid process is expected to increase the overall H<sub>2</sub> recovery without sacrificing its purity. Furthermore, it provides the means for co-producing CO<sub>2</sub> stream ready for capture and sequestration. In order to achieve this goal the following scientific and technological objectives have been identified the proposed two year project:

- Optimization of the carbon membrane synthesis procedure and scale-up of their production.
- Detailed characterization & generation of transport & adsorption data for the adsorbent and membrane materials
- Investigate the benefits of using layered adsorbents on the PSA performance.
- Simultaneous design, control and optimization of a hybrid PSA membrane separation system.
- Evaluation of membrane material performance under real operating conditions.
- Assembly and testing of a hybrid membrane - PSA separation system.
- Investigation of the potential of generating a CO<sub>2</sub> rich stream ready for capture.

## Project Information

**Type of project :** Research

**Timing :** 01/11/2011 > 31/10/2013

**Project website:** <http://hy2seps2.iceht.forth.gr/>

**Project Budget :** 1.606.279 €

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## Funding

European Union through FCH JU: [Grant agreement 278538 - CORDIS link](#)

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## Project partners

**Coordinator :**

[FORTH/ICEHT - Foundation for Research and Technology - Hellas/ Institute of Chemical Engineering Sciences](#)

**Partners :**

[HyGear B.V.](#)

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PROCESS SYSTEMS ENTERPRISE LIMITED

CERAMIQUES TECHNIQUES ET INDUSTRIELLES SA

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

**Sub project 1**

**Country:** Greece

**Address:**

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**Sub project categories**

Research

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Project Id: 989

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