



# Hydrogen Europe: European Hydrogen & Fuel cell Project Database

## Project CoMETHy

Compact Multifuel-Energy To Hydrogen converter

Sustainable decentralized hydrogen production requires development of efficient fuel-flexible units adaptable to renewable sources. CoMETHy aims at developing a compact steam reformer to convert reformable fuels (methane, bioethanol, glycerol, etc.) to pure hydrogen, adaptable to several heat sources (solar, biomass, fossil, refuse derived fuels, etc.) depending on the locally available energy mix. The following systems and components will be developed:

- a structured open-celled catalyst for the low-temperature (< 550°C) steam reforming processes
- a membrane reactor to separate hydrogen from the gas mixture
- the use of an intermediate low-cost and environmentally friendly liquid heat transfer fluid (molten nitrates) to supply process heat from a multi fuel system. Reducing reforming temperatures below 550°C by itself will significantly reduce material costs. The process involves heat collection from several energy sources and its storage as sensible heat of a molten salts mixture at 550°C. This molten salt stream provides the process heat to the steam reformer, steam generator, and other units. The choice of molten salts as heat transfer fluid allows:
- improved compactness of the reformer;
- rapid and frequent start-up operations with minor material ageing concerns;
- improved heat recovery capability from different external sources;
- coupling with intermittent renewable sources like solar in the medium-long term, using efficient heat storage to provide the renewable heat when required.

Methane, either from desulfurized natural gas or biogas, will be considered as a reference feed material to be converted to hydrogen. The same system is flexible also in terms of the reformable feedstock: bioethanol and/or glycerol can be converted to hydrogen following the same reforming route. The project involves RTD activities on the single components, followed by proof-of-concept of the integrated system at the pilot scale (2 Nm<sup>3</sup>/h of hydrogen) and cost-benefit analysis.

## Project Information

**Type of project :** Research

**Timing :** 01/12/2011 > 31/12/2015

**Project website:** <http://www.comethy.enea.it/>

**Project Budget :** 4.933.250 €

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## Funding

European Union through FCH JU: Grant agreement 279075 - [CORDIS link](#)

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## Project partners

**Coordinator :**

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

**Partners :**

[Fraunhofer](#)

[University of Perugia](#)

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

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## Sub project(s)

### Sub project 1

**Country:** Italy

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**Sub project categories**

Research

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Project Id: 934

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