



# Hydrogen Europe: European Hydrogen & Fuel cell Project Database

## Project BIOROBURplus

Advanced direct biogas fuel processor for robust and cost-effective decentralised hydrogen production

BioROBURplus builds upon the closing FCH JU BioROBUR project (direct biogas oxidative steam reformer) to develop an entire pre-commercial fuel processor delivering 50 Nm<sup>3</sup>/h (i.e. 107 kg/d) of 99.9% hydrogen from different biogas types (landfill gas, anaerobic digestion of organic wastes, anaerobic digestion of wastewater-treatment sludges) in a cost-effective manner. The energy efficiency of biogas conversion into H<sub>2</sub> will exceed 80% on a HHV basis, due to the following main innovations: 1) increased internal heat recovery enabling minimisation of air feed to the reformer based on structured cellular ceramics coated with stable and easily recyclable noble metal catalysts with enhanced coking resistance; 2) a tailored pressure-temperature-swing adsorption (PTSA) capable of exploiting both pressure and low T heat recovery from the processor to drive H<sub>2</sub> separation from CO<sub>2</sub> and N<sub>2</sub>; 3) a recuperative burner based on cellular ceramics capable of exploiting the low enthalpy PTSA-off-gas to provide the heat needed at points 1 and 2 above. The complementary innovations already developed in BioROBUR (advanced modulating air-steam feed control system for coke growth control; catalytic trap hosting WGS functionality and allowing decomposition of incomplete reforming products; etc.) will allow to fully achieve the project objectives within the stringent budget and time constraints set by the call. Prof. Debora Fino, the coordinator of the former BioROBUR project, will manage, in an industrially-oriented perspective, the work of 11 partners with complementary expertise: 3 universities (POLITO, KIT, SUPSI), 3 research centres (IRCE, CPERI, DBI), 3 SMEs (ENGICER, HST, MET) and 2 large companies (ACEA, JM) from 7 different European Countries. A final test campaign is foreseen at TRL 6 to prove targets achievement, catching the unique opportunity offered by ACEA to exploit three different biogas types and heat integration with an anaerobic digester generating the biogas itself.

## Project Information

**Type of project :** Research

**Timing :** 01/01/2017 > 30/06/2020

**Project Budget :** 3.813.536 €

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## Funding

European Union through FCH JU: [Grant agreement 736272 - CORDIS link](#)

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## Project partners

**Coordinator :**[Politecnico di Torino](#)**Partners :**[KIT - Karlsruher Institut für Technologie](#)[CNRS - Centre National de la Recherche Scientifique](#)[CERTH \(National Centre for Research and Technology Hellas\) with CPERI](#)[HYSYTECH S.r.l.](#)[JOHNSON MATTHEY PLC](#)[SCUOLA UNIVERSITARIA PROFESSIONALE DELLA SVIZZERA ITALIANA](#)[DBI - GASTECHNOLOGISCHES INSTITUT GGMBH FREIBERG](#)[ENGICER SA](#)[UAB MODERNIOS E-TECNOLOGIJOS](#)[ACEA PINEROLESE INDUSTRIALE SPA](#)

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

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**Sub project categories**

Research

Project Id: 921

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