Biogas robust processing with combined catalytic reformer and trap

Fact Sheet

Project Information

**BIOROBUR**

<table>
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<tr>
<th>Grant agreement ID: 325383</th>
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**Funded under**

FP7-JTI

**Overall budget**

€ 3 843 868,40

**EU contribution**

€ 2 486 180

**Project website**

[link]

**Status**

Closed project

**Start date**

1 May 2013

**End date**

31 August 2016

**Coordinated by**

POLITECNICO DI TORINO

[flag] Italy

Objective

In the BioROBUR project a robust and efficient fuel processor for the direct reforming of biogas will be developed and tested at a scale equivalent to 50 Nm3/h production of PEM-grade hydrogen to demonstrate the achievement of all the call mandates. The system energy efficiency of biogas conversion into hydrogen will be 65%, for a reference biogas composition of 60%vol CH4 and 40%vol CO2.

Key innovations of the BioROBUR approach are:

- The choice of an autothermal reforming route, based on easily-recoverable noble-metal catalysts supported on high-heat-conductivity cellular materials, which shows intrinsic advantages compared to steam reforming: catalysts less prone to coking, easier adaptability to biogas changing composition, more compact design, efficient handling of heat, lower materials costs, fast start-up/shut-down, easier process control, etc.

- The adoption of a multifunctional catalytic wall-flow trap based on transition metal catalysts, close coupled to the ATR reformer, which could entail effective filtration and conversion of soot particles eventually generated in the inlet part of the reformer.
during steady or transient operation, the decomposition of traces of incomplete reforming products (i.e. aldehydes, ethylene,...), the promotion of the WGS reaction to a significant extent so as to lower the size of the WGS unit, etc.
- The adoption of a coke growth control strategy based on periodic pulses of air/steam or on momentary depletion of the biogas feed so as to create adequate conditions in the ATR reactor for an on-stream regeneration of the catalysts, thereby prolonging the operating lifetime of the catalysts with no need of reactor shut-down.
Under the experienced coordination of Prof. Debora Fino, the project will integrate, in an industrially oriented exploitation perspective, the contribution of 9 partners (3 universities, 2 research centres, 3 SMEs and 1 large company from 7 different European Countries) with complementary expertise.

Field of science

/natural sciences/physical sciences/theoretical physics/particles
/natural sciences/chemical sciences/organic chemistry/aldehydes
/engineering and technology/environmental engineering/waste management/energy efficiency

Programme(s)

Topic(s)

Call for proposal

FCH-JU-2012-1

Funding Scheme

JTI-CP-FCH - Joint Technology Initiatives - Collaborative Project (FCH)

Coordinator

POLITECNICO DI TORINO

Address
Corso Duca Degli Abruzzi 24
10129 Torino
Italy

Activity type
Higher or Secondary Education Establishments

EU contribution
€ 424 913

Website

Contact the organisation
Participants (8)

TECHNISCHE UNIVERSITAET BERGAKADEMIE FREIBERG
- Germany
- EU contribution: € 639 182
- Address: Akademiestrasse 6, 09599 Freiberg
- Activity type: Higher or Secondary Education Establishments
- Website: 
- Administrative Contact: Dimosthenis Trimis (Prof.)

SCUOLA UNIVERSITARIA PROFESSIONALE DELLA SVIZZERA ITALIANA
- Switzerland
- EU contribution: € 128 073
- Address: Stabile Le Gerre, 6928 Manno
- Activity type: Higher or Secondary Education Establishments
- Website: 
- Administrative Contact: Alberto Ortona (Prof.)

CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE CNRS
- France
- EU contribution: € 288 196
- Address: Rue Michel Ange 3, 75794 Paris
- Activity type: Research Organisations
- Website: 
- Administrative Contact: Pascaline Toutois (Dr.)
<table>
<thead>
<tr>
<th>Organisation</th>
<th>Country</th>
<th>EU contribution</th>
<th>Address</th>
<th>Activity type</th>
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<tbody>
<tr>
<td>ETHNIKO KENTRO EREVNAS KAI TECHNOLOGIKIS ANAPTYXIS</td>
<td>Greece</td>
<td>€ 198 200</td>
<td>Charilaou Thermi Road 6 Km 57001 Thermi Thessaloniki</td>
<td>Research Organisations</td>
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<td>Erbcicol SA</td>
<td>Switzerland</td>
<td>€ 167 120</td>
<td>Viale Pereda 22 6828 Balerna</td>
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<td>HYSYTECH SRL</td>
<td>Italy</td>
<td>€ 334 356</td>
<td>Strada Del Drosso 33 18 10135 Torino</td>
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<tr>
<td>UAB MODERNIOS E-TECHNOLOGIJOS</td>
<td>Lithuania</td>
<td>€302 340</td>
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</table>
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Vismaliuku G 34
10423 Vilnius

Activity type
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Website

Administrative Contact
Danguole Draguniene (Mrs.)