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

/engineering and technology/environmental engineering/waste management/energy efficiency

/natural sciences/chemical sciences/organic chemistry/aldehydes

/natural sciences/physical sciences/theoretical physics/particles

Programme(s)

FP7-JTI - Specific Programme "Cooperation": Joint Technology Initiatives

Topic(s)

SP1-JTI-FCH.2012.2.3 - Biogas reforming

Call for proposal

FCH-JU-2012-1

See other projects for this call

Funding Scheme

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

Coordinator

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Activity type

Higher or Secondary Education Establishments

EU Contribution

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Website

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<th>Organisation</th>
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<td>TECHNISCHE UNIVERSITAET BERGAKADEMIE FREIBERG</td>
<td>€ 639 182</td>
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**Website**

**Contact the organisation**

Administrative Contact

Danguole Draguniene (Mrs.)

Ion Popescu (Mr.)

Permalink: https://cordis.europa.eu/project/id/325383/en

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