

Projektsteckbrief

Freiberg, den 01.01.2017

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

Laufzeit: 01.01.2017 bis 30.06.2020

Projektträger / Fördermittelgeber: EU/Horizon2020

Förderkennzeichen: 736272

Kurzfassung/Abstract:

BioRoburplus builds upon the know-how developed in the ending FCH JU BioRobur project (focused on an innovative direct oxidative steam reformer of desulphurised biogas, < 1ppmw sulphur) to develop an entire fuel processor delivering 50 Nm³/h (i.e. >100 kg/d) of 99.9% hydrogen from biogas. The energy efficiency of biogas conversion into H₂ will be at least 81% on a HHV basis (reference biogas composition CH₄=60%; CO₂=40%, thereby exceeding by at least 1% the topic target. This ambitious efficiency target will be achieved by a highly integrated process scheme (Fig. 1) including an improved fast-dynamics version of the BioRobur oxidative reformer (tailored to the specific operating conditions of the processor) followed by a two-stage intercooled WGS reactor, an innovative combination of absorption/adsorption H₂ purification techniques minimising energy requirements and a recuperative burner recovering thermal energy from the low-enthalpy off-gases of such H₂ purification section. A peculiar feature of the BioRoburplus is that, beyond reaching unprecedented biogas-to-H₂ efficiency values, it will recover additional heat (an additional 4% of the biogas HHV) from the compressor unit of the PSA separation unit to the anaerobic digester generating the biogas itself. A dedicated TRL6 demo campaign (>4400 h) will be carried out in the last twelve months of the project integrating the processor in a real industrial site (ACEA).

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