European Institute
for Energy Research
by EDF and KIT

ECo

Efficient Co-Electrolyser for Efficient Renewable Energy Storage

Key Facts

Funding Agency
EU FCH JU

Project Call
H2020-JTI-FCH-2015-1

Duration
05/2016 – 04/2019

Coordinator
DTU – Technical University of Denmark

Partners
- Commissariat à l'Énergie Atomique et aux Énergies Alternatives (CEA)
- École Politechnique Fédérale de Lausanne (EPFL)
- Catalonia Institute for Energy Research (IREC)
- HTceramix
- ENGIE
- Enagás
- VDZ gGmbH

Website
https://www.eco-soec-project.eu/

This project has received funding from the Fuel Cells and Hydrogen Joint Undertaking (JU) under grant agreement No 699892.

FUEL CELLS AND HYDROGEN JOINT UNDERTAKING

Project Objectives

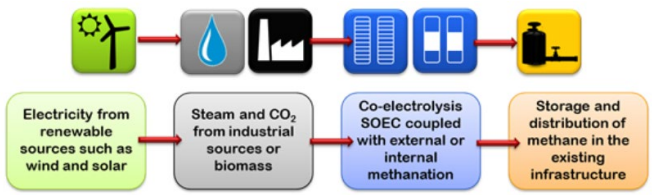
The overall goal of ECo is to develop and validate a highly efficient co-electrolysis process for the conversion of excess renewable electricity into distributable and storable hydrocarbons via simultaneous electrolysis of steam and CO_2 through SOEC (Solid Oxide Electrolysis Cells).
For this purpose, the efficiency of the direct production of syngas via Solid Oxide electrolysis shall be improved.

Technical objectives:

- Reduce the operating temperature to 700°C to enable direct synthesis of methane;
- Test the lifetime of stacks operated in the co-electrolysis configuration;
- Integrate cells in a medium sized stack.

Economic objectives:

- Analyse the economic added value of co-electrolysis in different applications;
- Analyse the environmental added value from recycling CO_2 emitted by industrial facilities.



Process scheme: Combined electrolysis of CO_2 & H_2O

EIFER's Contribution

EIFER tests cells and short stacks in the co-electrolysis mode.

Technical objectives of the experimental work:

- Electrical and electrochemical impedance spectroscopy measurements for performance and durability analysis;
- Influence of operation parameters (current, temperature, gas composition): analysis of output gases composition with gas chromatography;
- Long term tests under real-world operation conditions.

Analysis of techno-economic and regulatory framework:

- Evaluation of the overall cost of syngas production.

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