Synthesis of methanol from captured carbon dioxide using surplus electricity

Fact Sheet

Project Information

MefCO2
Grant agreement ID: 637016

Funded under H2020-EU.2.1.5.3.

Project website

Overall budget € 11 068 323,75

Status Closed project

EU contribution € 8 622 292,60

Start date 1 December 2014

End date 30 June 2019

Coordinated by I-DEALS INNOVATION & TECHNOLOGY VENTURING SERVICES SL

Spain

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Objective
Methanol represents one of the most common and widespread platform chemicals and precursors for further synthesis, and is traditionally produced from synthesis gas, obtained by the reforming of natural gas. This methanol synthesis process operates in a stable, high-throughput manner and demands low carbon dioxide/carbon monoxide ratios in feed. The current project, nonetheless, is to encompass flexible (in operation and feed) methanol synthesis with high carbon dioxide concentration-streams as an input, the latter originating from thermal power stations using fossil fuels. The demonstrational technology may alternatively be intended for the application of existing biomass combustion and gasification system streams, operating for the production of electric/thermal energy, as opposed to chemical synthesis. The other synthesis reactant, hydrogen, is to originate from water hydrolysis using surplus energy, which would be conversely difficult to return to the grid. The three main benefits of the process would thus be as follows; the mitigation of exhaust carbon dioxide and reduction of greenhouse gas emissions (1), stabilisation of electric grid by the consumption of the electric energy at its peaks (2), and the production of methanol as a versatile chemical for further conversion (3). Implications of such technology would have a strong connection to the pending exploration of alternative energy carriers and their synthesis as opposed to conventional resources of fuels and chemicals. The principal technological challenge to be overcome is anticipated to be the development of a suitable catalyst and process, which would allow for high-CO2-content feeds, relatively transient operation (save for an upstream buffering technology is developed), and economically viable operating conditions. The primary advantages of this technology are to be its flexibility, medium-scale operation (deployed “at exhaust location”), and facile integration capacities.

Field of science

/engineering and technology/environmental engineering/energy and fuels/fossil energy/gas
/natural sciences/chemical sciences/inorganic chemistry/inorganic compounds
/engineering and technology/environmental engineering/energy and fuels/electric energy
/engineering and technology/environmental engineering/energy and fuels/renewable energy
/engineering and technology/environmental engineering/energy and fuels

Programme(s)

Topic(s)

Call for proposal

H2020-SPIRE-2014
Funding Scheme

IA - Innovation action

Coordinator

I-DEALS INNOVATION & TECHNOLOGY VENTURING SERVICES SL

Address
Av. Manoteras 52
28050 Madrid
Spain

Activity type
Private for-profit entities (excluding Higher or Secondary Education Establishments)

EU contribution
€ 1 042 332,70

Contact the organisation

Participants (8)

KEMIJSKI INSTITUT

Estonia
EU contribution
€ 1 195 300

Address
Hajdrihova 19
1000 Ljubljana

Activity type
Research Organisations

Website
Contact the organisation

MITSUBISHI POWER EUROPE GMBH

Germany
EU contribution
€ 1 017 625

Address
Schifferstrasse 80
47059 Duisburg

Activity type
Private for-profit entities (excluding Higher or Secondary Education Establishments)

Contact the organisation
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<td>CRI EHF</td>
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<td>UNIVERSITA DEGLI STUDI DI GENOVA</td>
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