KEROGREEN – towards sustainable and green aviation fuel production

FUNDING

KEROGREEN has received funding from the European Union's Horizon 2020 Research and Innovation Programme under grant agreement No 763909.

Total funding: 4 951 959 € within 4 years (1.04.2018 - 31.03.2022)

Call Topic: H2020-LCE-06-2017 "Competitive low-carbon-energy - new knowledge and technologies", H2020 Work programme "Secure, Clean and Efficient Energy"

CONTACT / INFORMATION

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Production of sustainable aircraft grade kerosene from water and air powered by renewable electricity, through the splitting of CO_2, syngas formation and Fischer-Tropsch synthesis

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MISSION

KEROGREEN's main goal is to develop and test an innovative conversion route for the production of sustainable aircraft grade Kerosene from water and air powered by renewable electricity.

The KEROGREEN conversion route is based on plasma driven dissociation of air captured CO_2, solid oxide membrane oxygen separation and Fischer-Tropsch (F-T) kerosene synthesis.

KEROGREEN's new approach and process reduces overall CO_2 emission by creating a closed carbon fuel cycle and at the same time creates long-term large-scale energy storage capacity which will strengthen the EU energy security and allow creation of a sustainable transportation sector.

OBJECTIVES

- Achievement of an efficient, high yield plasma dissociation of CO_2 into CO and O_2
- Development of solid oxide electrolyte cells with perovskite electrodes for O_2 gas separation
- Kerosene synthesis via water gas shift (WGS) and advanced Fischer-Tropsch (FT)
- System and heat integration of the plasmolysis reactor, the oxygen separator and the WGS-FT-Hydrocracking kerosene synthesis units
- Demonstration of an integrated system for the first time
- Produce a container sized unit producing 0.1 kg/hr of kerosene
- CO production yield of 0.2 kg/kWh, OPEX 0.5 €/kg, lowered by thermal system integration and increased productivity
- Sustainability assessment comprising material flow based environmental and economic life cycle analyses and acceptability assessment
- Clarification of safety issues

PARTNERS

DIFFER – Dutch Institute for Fundamental Energy Research – NL

KIT – Karlsruhe Institute of Technology – DE

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