

## HydroMetha

Development of a stationary electricity storage system via high temperature co-electrolysis and catalytic methanation

<b>Programm / Ausschreibung</b>	Energieforschung (e!MISSION), Energieforschung, Energieforschung 3. Ausschreibung 2016	<b>Status</b>	abgeschlossen
<b>Projektstart</b>	01.01.2018	<b>Projektende</b>	28.02.2023
<b>Zeitraum</b>	2018 - 2023	<b>Projektlaufzeit</b>	62 Monate
<b>Keywords</b>	Power to Gas; Methanation; Co-SOEC; Electrolyser; CO2 sink		

### Projektbeschreibung

Conventional Power-to-Gas systems (storage of surplus electricity in CO<sub>2</sub> neutral gases) operate with electrolysis of water and optionally with subsequent methanation. With the flagship project HYDROMETHA a novel, fully integrated system of CO<sub>2</sub>+H<sub>2</sub>O high-temperature co-electrolysis (Co-SOEC) and catalytic methanation will be developed. The interconnection of these processes, as well as component and operational optimization will allow a significant increase in conversion efficiencies above 80%el. Due to system simplifications, increased lifetime and durability, as well as optimizations of the process chain, essential cost reductions and thus enhanced market potentials are expected. Additionally, operational strategies oriented on real energy market requirements, including part-load, stand-by and load-following operation will be developed, and the core system of high-temperature co-electrolysis with coupled methanation will be built up, characterized and tested in the form of a 10kWel function carrier. Due to the participation of five reputable industrial LOI partners, a strongly market oriented development can be achieved from a very early state of research.

### Abstract

Conventional Power-to-Gas systems (storage of surplus electricity in CO<sub>2</sub> neutral gases) operate with electrolysis of water and optionally with subsequent methanation. With the flagship project HYDROMETHA a novel, fully integrated system of CO<sub>2</sub>+H<sub>2</sub>O high-temperature co-electrolysis (Co-SOEC) and catalytic methanation will be developed. The interconnection of these processes, as well as component and operational optimization will allow a significant increase in conversion efficiencies above 80%el. Due to system simplifications, increased lifetime and durability, as well as optimizations of the process chain, essential cost reductions and thus enhanced market potentials are expected. Additionally, operational strategies oriented on real energy market requirements, including part-load, stand-by and load-following operation will be developed, and the core system of high-temperature co-electrolysis with coupled methanation will be built up, characterized and tested in the form of a 10kWel function carrier. Due to the participation of five reputable industrial LOI partners, a strongly market oriented development can be achieved from a very early state of research.

## **Projektkoordinator**

- AVL List GmbH

## **Projektpartner**

- Energieinstitut an der Johannes Kepler Universität Linz
- Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e.V.
- Prozess Optimal CAP GmbH
- Montanuniversität Leoben
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