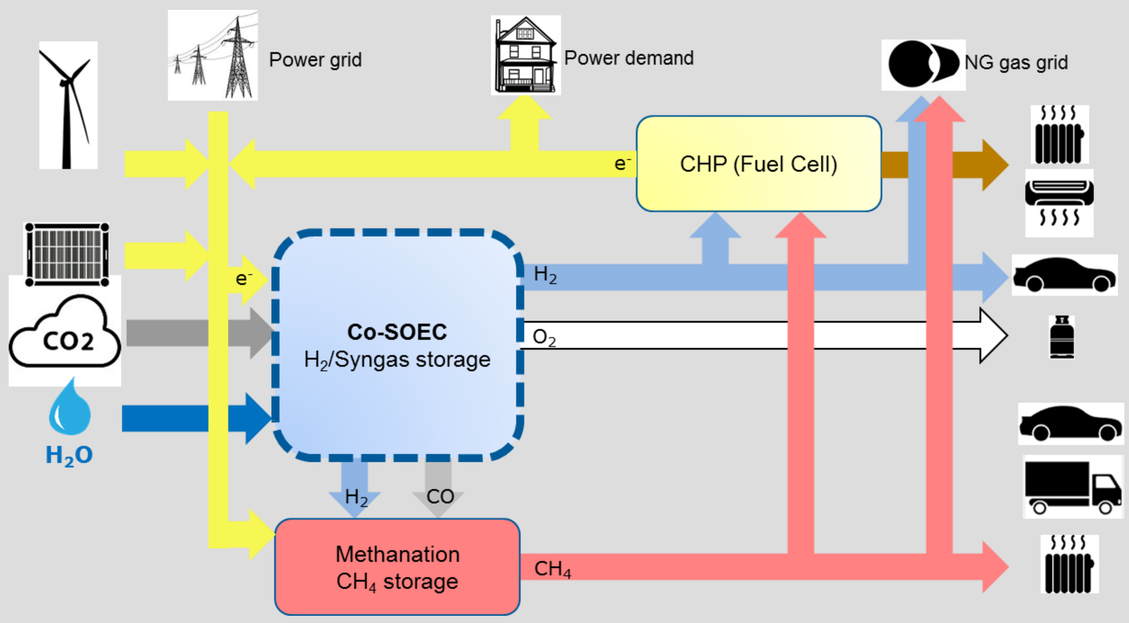
Development of a stationary electricity storage system via high temperature co-electrolysis and catalytic methanation

The flagship project HYDROMETHA combines high-temperature co-electrolysis of CO_2 and H_2O by solid oxide cells with catalytic methanation to enable storage of electrical energy from fluctuating renewable sources (Power-to-Gas technology).

Project partners
- AVL List GmbH
- Montanuniversitaet Leoben
  - Chair of Physical Chemistry
  - Chair for Process Technology and Industrial Environmental Protection
- Fraunhofer IKTS Dresden
- Energy Institute at Johannes Kepler University Linz
- Prozess Optimal CAP GmbH

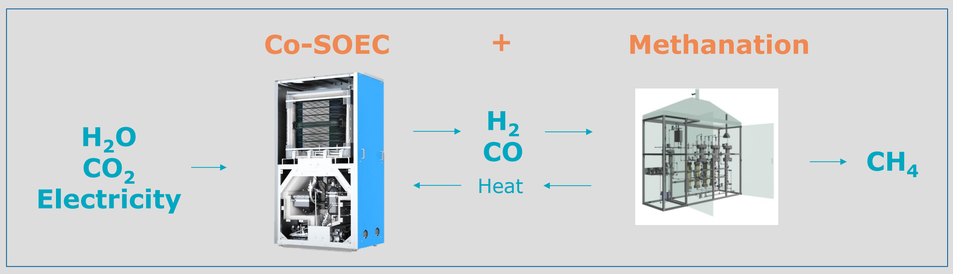
Associated partners
- OMV
- RAG
- EVN
- voestalpine
- K1-MET

Power-to-Gas: Future energy storage



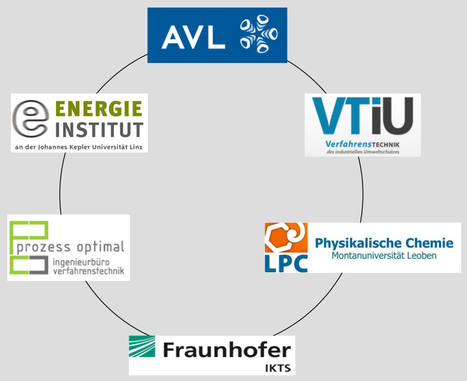
Project idea

Significant increase in conversion efficiencies above 80%$_{el}$



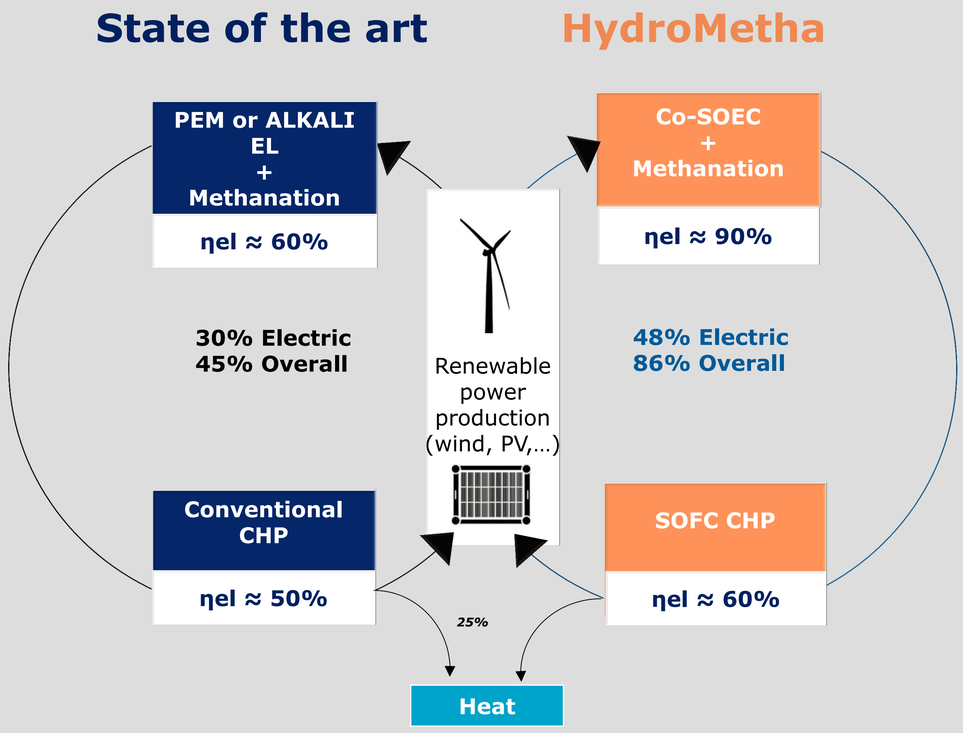
- ✓ 10kW$_{el}$ functional unit, including all essential components
- ✓ Increased lifetime and durability
- ✓ Optimizations of the process chain
- ✓ Essential investment cost reductions
- ✓ Significantly enhanced market potentials
- ✓ Analysis for large-scale implementation of the technology

Project consortium



The project deals with the **combination of two complex technologies**, covered by the consortium:

- ✓ Materials development
- ✓ Cell & Stack development
- ✓ Overall system development for the operation of the Co-SOEC and methanation technology
- ✓ Techno-Economical Analysis



Impact for Austria

ENVIRONMENT
- ✓ Significant contributions to the Austrian energy- and climate-related standards
- ✓ De-carbonization and highly efficient transformation of (volatile) renewables
- ✓ Integrating and expansion of renewable energies into the energy system
- ✓ Significant reduction of greenhouse gas emissions through CO_2 utilization

ECONOMY
- ✓ World-wide attention due to the development of a novel combined power-to-gas system
- ✓ Technology leadership: International competitiveness is strengthened in the field of Co-SOEC
- ✓ Numerous potential areas for the application of the developed technology (renewable energy sector, CO_2 intensive industry, …)
- ✓ International positioning of Austria as a producer of technology and as a systems and service provider

SOCIETY
- ✓ Securing and maintaining highly qualified job positions

Acknowledgment

Financial support by the Austrian Ministry for Transport, Innovation and Technology (bmvit) within the program Energieforschung (e!MISSION, 3rd call, project number 864578) is gratefully acknowledged.

Contact

Richard Schauperl, AVL List GmbH, Helmut-List-Platz 1
8020 Graz
Tel: +43 316 787 3316
E-mail : richard.schauperl@avl.com