# HydroMetha

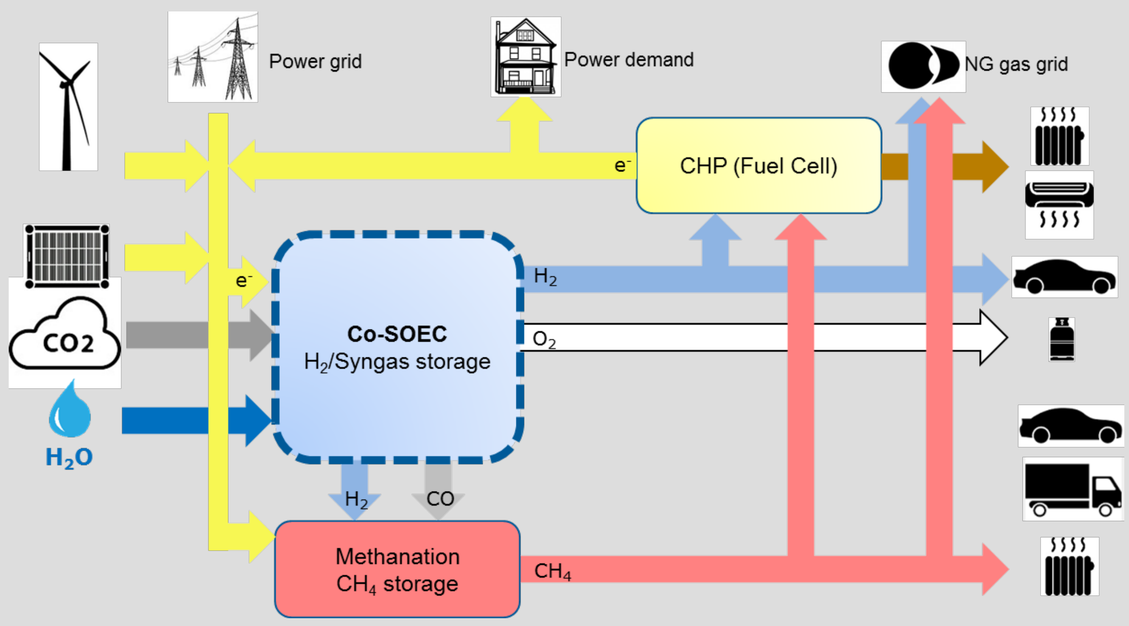
## Development of a stationary electricity storage system via high temperature co-electrolysis and catalytic methanation

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
- Montanuniversität 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

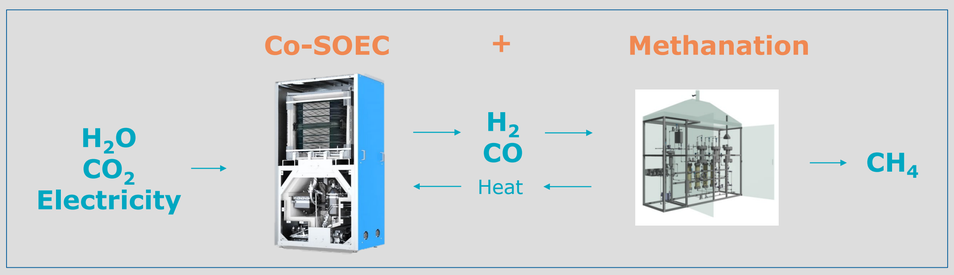
**Associated partners**
- OMV
- RAG
- EVN
- voestalpine
- K1-MET

## Power-to-Gas: Future energy storage



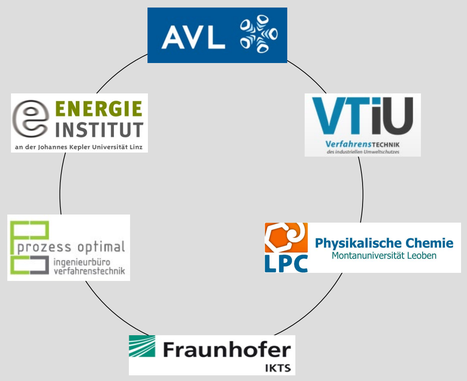

## Project idea

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



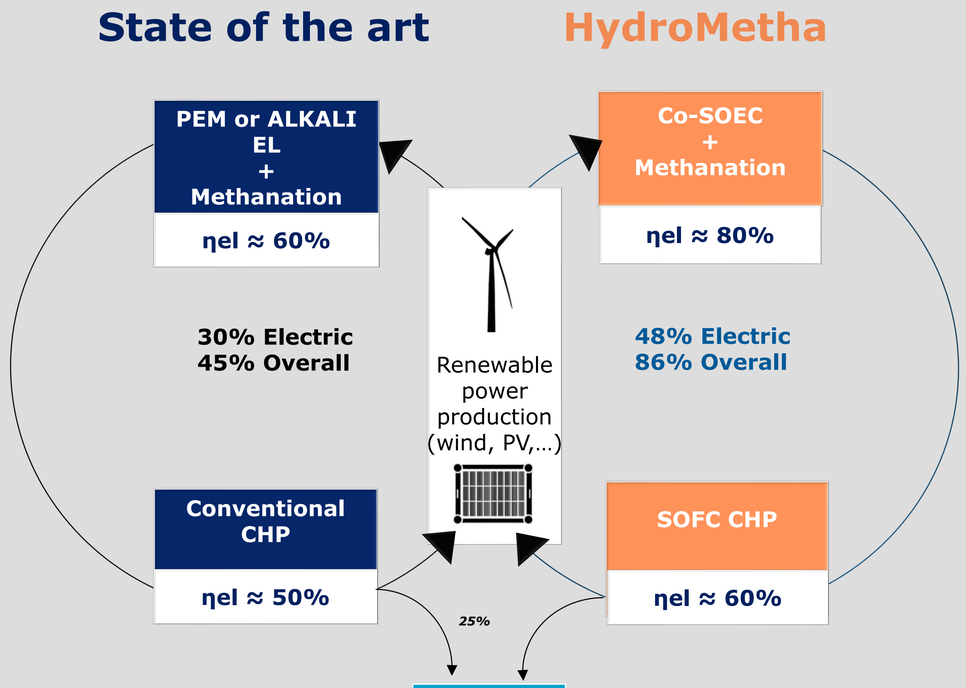

- ✓ **10kWel functional unit, including all essential components**
- ✓ **Increased lifetime and durability**
- ✓ **Optimizations of the process chain**
- ✓ **Essential investment cost reductions**
- ✓ **Significantly enhanced market potentials**
- ✓ **Analysis for large-scale implementation of the technology**

## 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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