

HyCentA Research GmbH

Shaping the Sustainable Hydrogen Society

Project References Area 2: Green Energy in Industry
Graz, August 2026

Wasserstoff Region Ost-Österreich am Start!

Im Projekt **H2REAL** wird ein **Hydrogen Valley** als Schlüssel für die Wasserstofftechnologie und -anwendungen in der **Region Ost-Österreich** entwickelt. Ost-Österreich bietet alle Voraussetzungen für die Umsetzung und **Demonstration einer integrierten Wertschöpfungskette von Produktion, Speicherung, Verteilung und Verbrauch von Wasserstoff**. Die Projektpartner nach ihrer Kernkompetenz, Aktivität und Regionalität entsprechenden Clustern zugeordnet. Da jeder Cluster nur einen Bruchteil der Wertschöpfungskette für grünen Wasserstoff abdeckt, ist die Einbindung starker regionaler Schlüsselorganisationen aus dem gesamten Spektrum der Wertschöpfungskette erfolgsentscheidend.

HyCentA unterstützt mit Simulationsmethoden zu Produktion, Verteilung, Speicherung und Anwendung die verschiedenen Demonstratoren des Valleys. Darüber hinaus werden anhand der gewonnenen Daten Modelle verifiziert und weiter entwickelt.



AIT
AUTRIAN INSTITUTE
OF TECHNOLOGY

**GAS CONNECT
AUSTRIA**

**netz
BURGENLAND**

**TU
WIEN**
TECHNISCHE
UNIVERSITÄT
WIEN

**Burgenland
Energie**

HAFEN WIEN
ein Unternehmen der **WATERSTOFF**

WIEN ENERGIE

WIENER LINIEN

**ENERGIE
INSTITUT**
an der Johannes Kepler Universität Linz

**windkraft
SIMONSFEL**

WIENER NETZE

**WIENER
WASSERSTOFF**

Linde

**ENERGIE
NETZE
STIEHLMANN**
Ein Unternehmen der
ENERGIE STIEHLMANN

moving»power

WIVAP&G
Energy Model Region

**NÖ
Netze
EVN Gruppe**

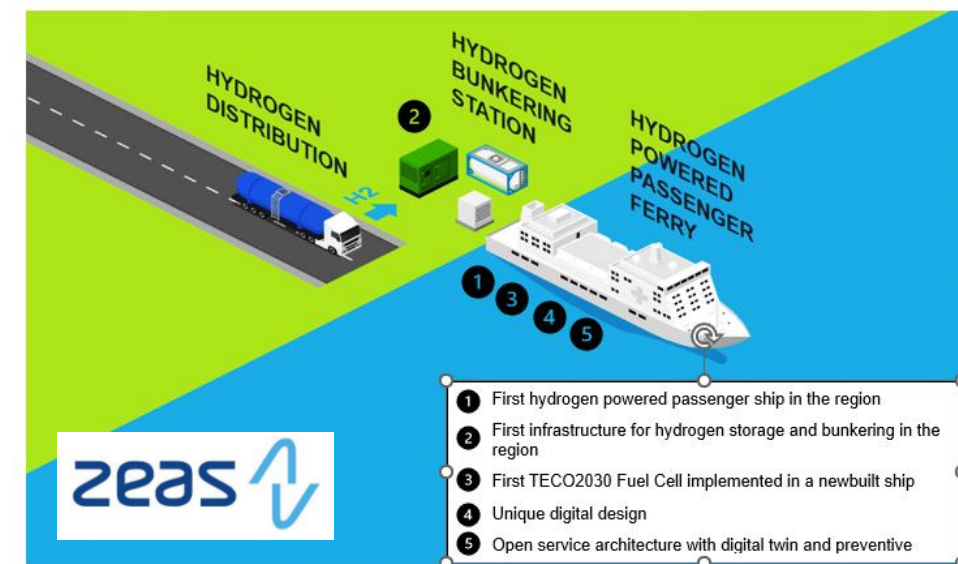
APC

Zero Emission Adriatic Vessel

The main aim of **ZEAS** project is to contribute to accelerating the shift to **safe use of sustainable climate neutral fuels in waterborne transport** through a full scale on board operational demonstration of a new system powered by hydrogen fuel cells with maritime applications.

An international consortium of top-notch entities covering the whole innovation value chain will develop, validate and demonstrate a new **zero emission passenger ship powered by hydrogen and the associated hydrogen distribution, storage and bunkering solution**. The ship will be specifically designed to operate in the Adriatic Sea, which is known for its pristine environment and sensitive marine eco-systems.

HyCentA is leading the hydrogen distribution, storage and bunkering solution development.



LÜRSSEN
DESIGN CENTER KVARNER

GITONE

MARITIME CENTER OF EXCELLENCE

JADROLINIJA

HyCentA
HYDROGEN CENTER AUSTRIA

ZENLAB



Sveučilište u Rijeci
POMORSKI FAKULTET
FACULTY OF MARITIME STUDIES
University of Rijeka

TECNOAMBIENTE
A TRADE COMPANY
Enabling sustainable progress

SCAN
projekt

DNV

UNIVERSITY OF TECHNOLOGY
IN THE EUROPEAN CAPITAL OF CULTURE
CHEMNITZ



TECO
2030



Co-funded by
the European Union

Alternative Storage of Hydrogen in Liquids

- Hydrogen Transport and Storage
 - Comprehensive study of liquid hydrogen carriers: properties, hydrogen content, potential
 - Conversion parameters of carrier production: efficiency, material and energy input
- Fuel Cell
 - Study of available low-temperature fuel cells using liquid hydrogen carriers as fuel
 - Design and development of a low-temperature fuel cells using liquid hydrogen carriers as fuel
 - Laboratory testing of fuel cell

HyLiquids



Scientific partners



Company partners



Verbund



OMV

BÖHLER

voestalpine

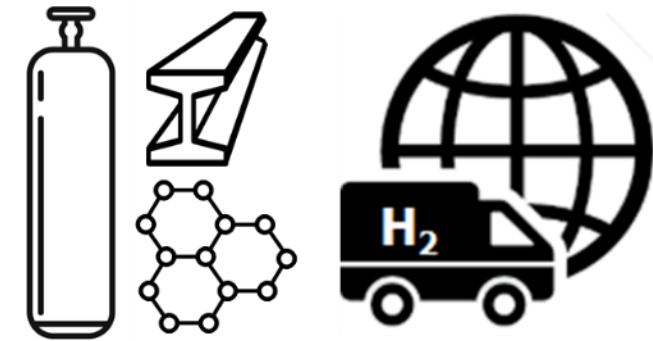
ONE STEP AHEAD.

Advanced CGH2 Storage Technologies and Distribution System

The HyDestiny project aims at optimization and footprint reduction of CGH2 storage and distribution systems. The project investigates the use of new hydrogen storage tank materials (steels, metal-fiber-composites, carbon fibers from biobased precursors) and their impact on the overall logistics system, both for road and pipeline transport.

Expected results:

- Potential of weight and carbon footprint reduction for CGH2 storage & transport
- Potential of carbon fiber precursors from renewable sources
- Qualification of novel materials for use with CGH2
- Modelling of hydrogen logistics for optimization and increasing efficiency



Scientific partners



Company partners



Third party



Project HyCO² Metal-hydride compressor up-scaling



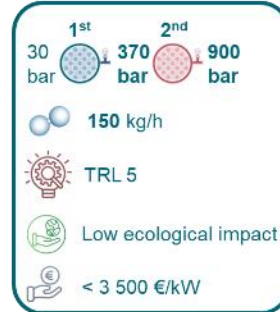
Goals



HyCO²



- Silent operation
- No moving parts
- Low maintenance effort
- High safety



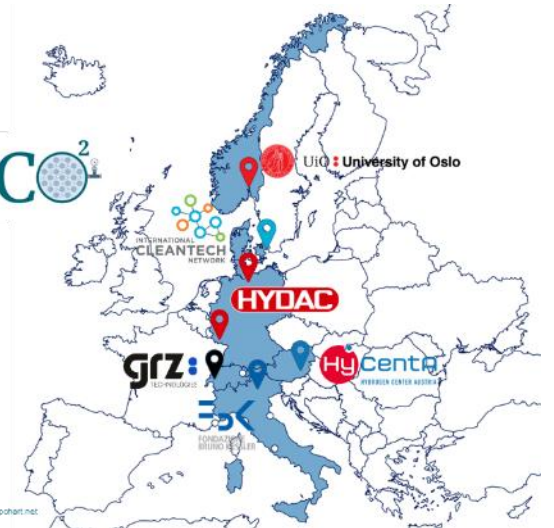
Consortium



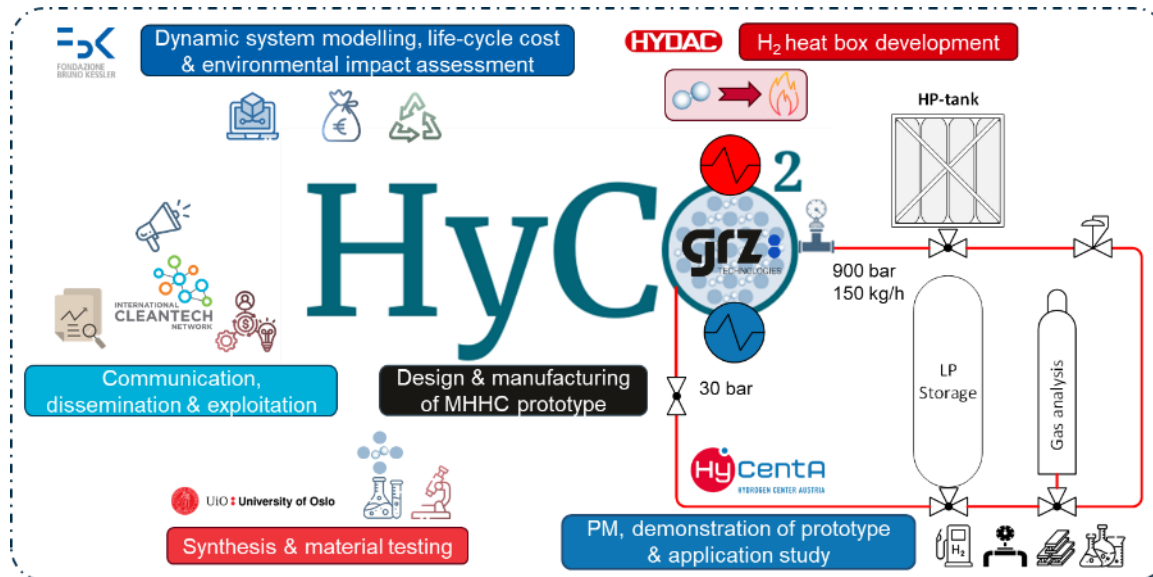
Industry committee



HyCO²



Project concept



3 years project



Total budget: 4.989 M€



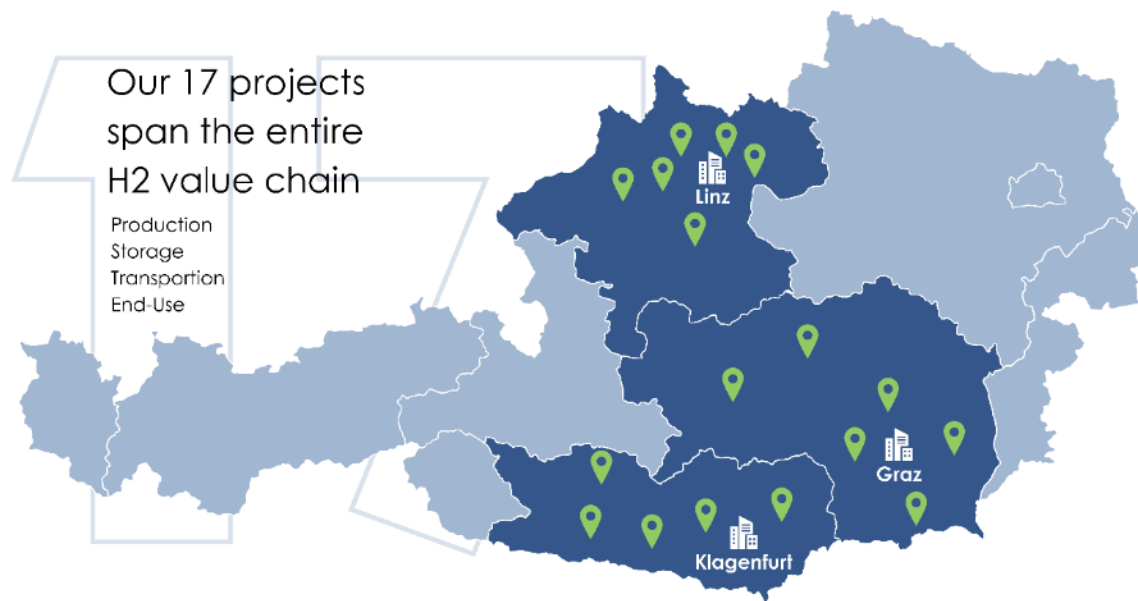
Main goal: Testing of demonstrator for 30 kg in 12 min at 900 bar at HyCentA Testfield



Proposals in HORIZON call: 10

Welcome to the Valley

Projects in Carinthia, Styria, and Upper Austria



www.hi2valley.com



linkedin.com/company/hi2valley/

€588 Mio

Total Project Volume*

€20 Mio

*of which are granted by the EU

44

Partners

2,000

Jobs

6

Year Timeframe

101

MW new electrolyzer

10,000

tonnes/year planned H2 production

200,000

CO₂-equivalent saved by 2030

II. Green Hydrogen Production - Fossilfree4Industry

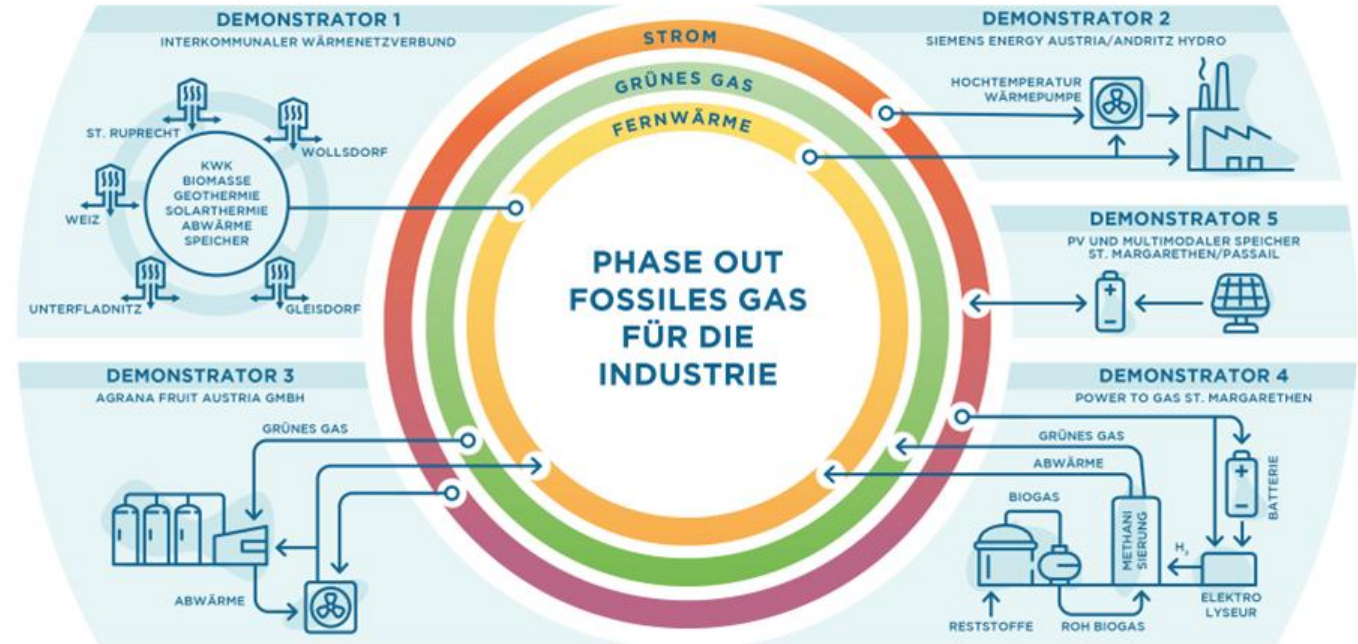
Location: Region Weiz/Styria

Project Volume: 5.8 million EUR

Funding Program: 100% ERNEUERBARE-ENERGIE-REALLABORE 2022

Duration: 01.11.2023 – 31.10.2027

The Fossilfree4Industry real-world laboratory comprises five interconnected demonstrators that collectively enable the phase-out of fossil natural gas for industrial applications in the Weiz region.



Project Partners:



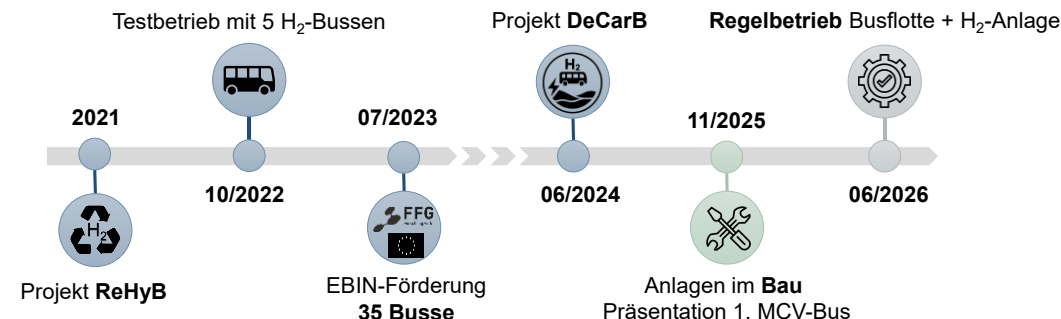
HyCentA Activities:

- Provision of technical support for Demonstrator 4 (Power-to-Gas facility, St. Margarethen)
 - Design and dimensioning of the conceptual system architecture of the hydrogen (H_2) process chain
 - Provision of technical and regulatory support throughout the permitting and approval procedures
 - Optimization of the concept based on operational experience and implementation feedback

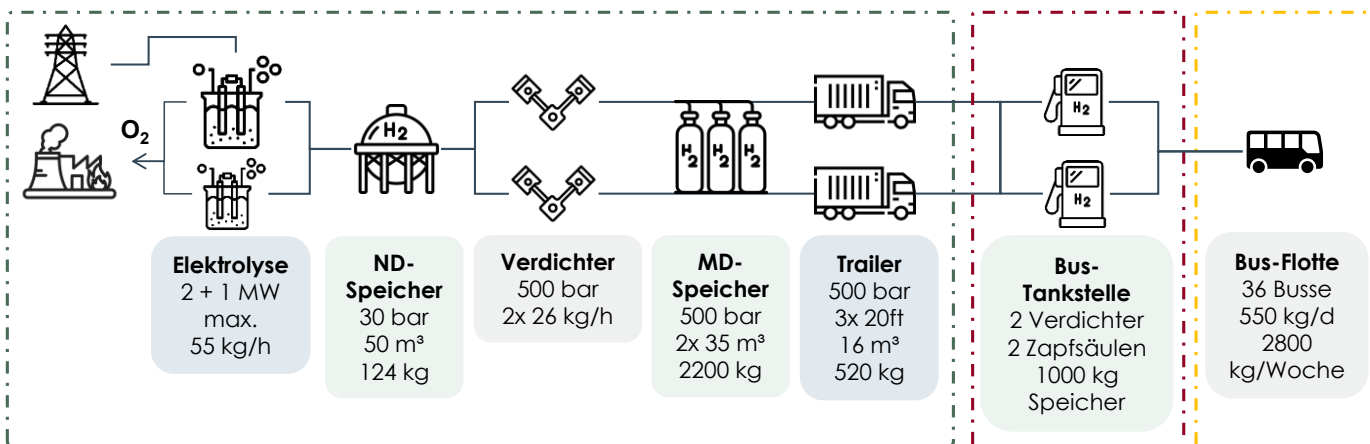
Project DeCarB 2024 - 2026



- 1. Conceptual design and dimensioning of the H₂ system path**
 - Simulation of refueling schedule, operation schemes + trailer logistics
- 2. Support Basic and Detail Engineering**
 - P&ID, Control strategy, Layout Plan, Redesign due to project changes
- 3. Support during the tendering process**
 - Market research, Specification sheets, Technical support
- 4. Scientific monitoring of implementation phase**
 - Gas quality verification acc. to ISO 14687



LAND KÄRNTEN



kelag

GUTMANN
WOLFTANK GROUP

POSTBUS

2,2 Mio. km

147 t
RFNBO H₂

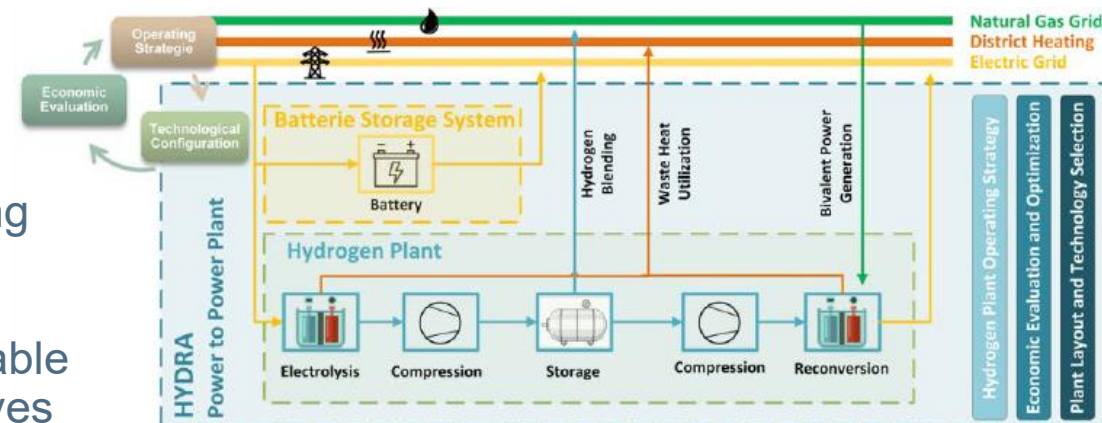
-1.340 t CO₂



Fast, Flexible, and Economical e-Methanol Production

Methanol is a versatile energy carrier with applications ranging from fuel in the mobility sector to a precursor for sustainable aviation fuel (SAF). The FlexMeOH project aims to advance flexible e-methanol production systems by integrating renewable hydrogen, CO₂, and dynamic electricity markets. Key objectives of the project include:

- Analysis and enhancement of system flexibility in the core subsystems electrolysis, gas and heat storage, methanol synthesis and electricity markets
- Development and simulation of innovative plant designs & optimal operational strategies for improved dynamic behavior & flexibility
- Comprehensive techno-economic evaluation in the context of European electricity markets

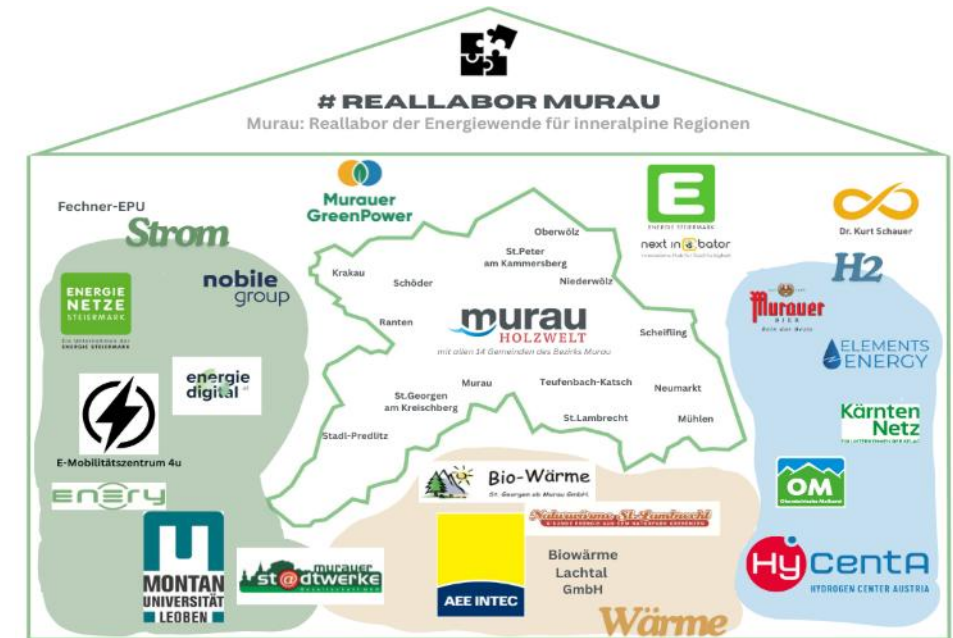
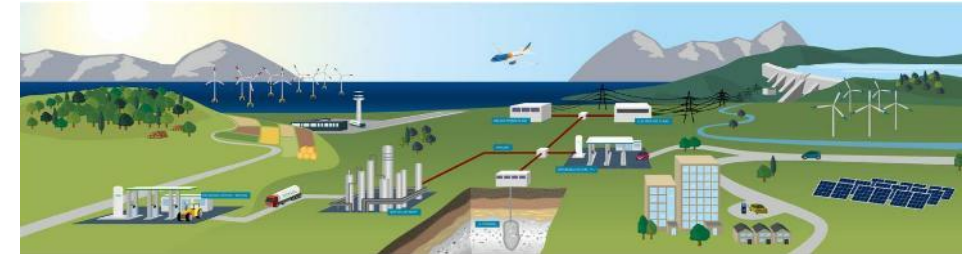


6 EU Partners:
DK (Co), IS, GR, AT

Optimierung des regionalen Energiesystems Murau durch Sektorkopplung

Projektziel ist die systematische Kopplung der Energiesysteme, um den massiven Überschuss an regional produzierter erneuerbarer Energie bestmöglich zu nutzen und einen weiteren Ausbau trotz begrenzter Exportkapazität zu ermöglichen.

- Konzeptionierung einer systemdienliche Großelektrolyse
- Entwicklung eines Abnehmer- und Transportkonzepts für H₂
- Machbarkeitsstudie für eine H₂-Pipeline
- Konzipierung einer Schwarmelektrolyse bestehend aus einzelnen Energiezellen „Johann“ der Firma EEG



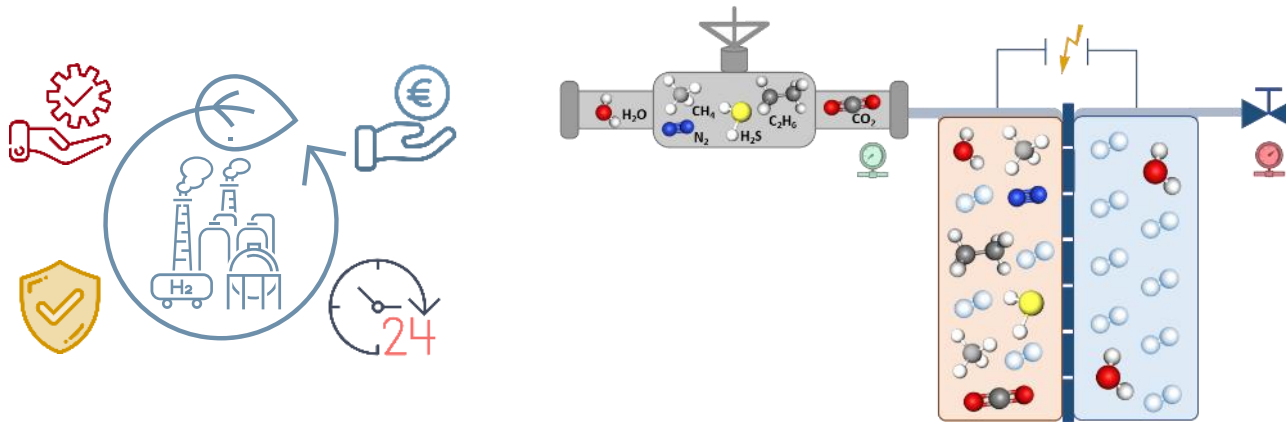
■ Re-Purposing of an existing natural gas pipeline for pure hydrogen



- Establishment of an H₂ pipeline test field and demonstrator to accelerate further developments
- Closing of all relevant scientific gaps regarding **H₂ quality and purification, inspection and maintenance** as well as **material compatibility**
- Derivation of a handbook to accelerate further re-purposing in Austria
- Platform for further developments and field tests
- Closing scientific gaps:
 - H₂ compatibility of the pipeline components and materials used
 - Inspection and cleaning of the pipelines
 - Quality of the transported hydrogen
 - Application-oriented purification

Project HyEmpire 2023 – 2026

Improve **efficiency, overall costs** and **reliability** of compression, purification and stationary power generation as well as **safety** of H₂-infrastructures



- Develop **system prototypes** for innovative electrochemical compression & purification
- Design of **future heat + power plant** with efficient base-load and highly dynamic peak load technologies (black-start capability)
- Investigate **data-driven and model-based approaches** to improve **overall reliability and safety**
- Conduct **comprehensive cost & life-cycle assessments** to enable a **broad & sustainable implementation** of technologies



Company partners



Scientific partners



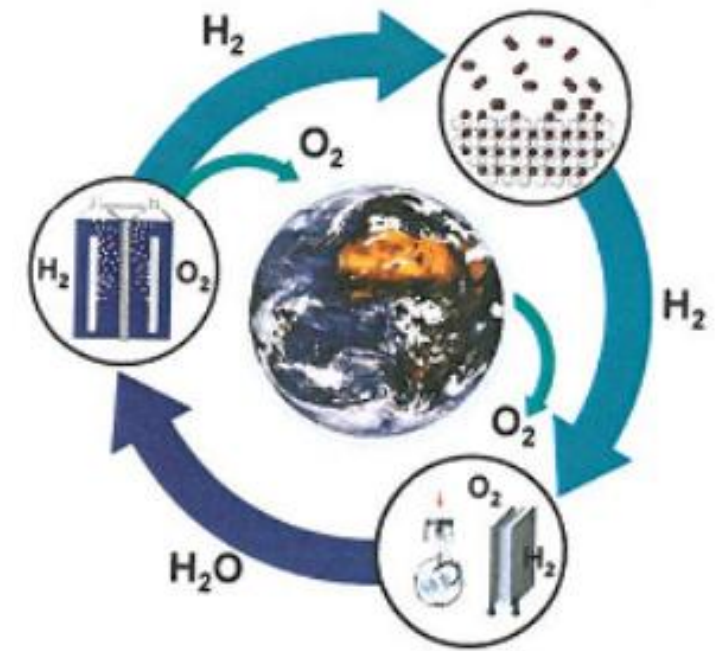
POLITECNICO
MILANO 1863



Third party



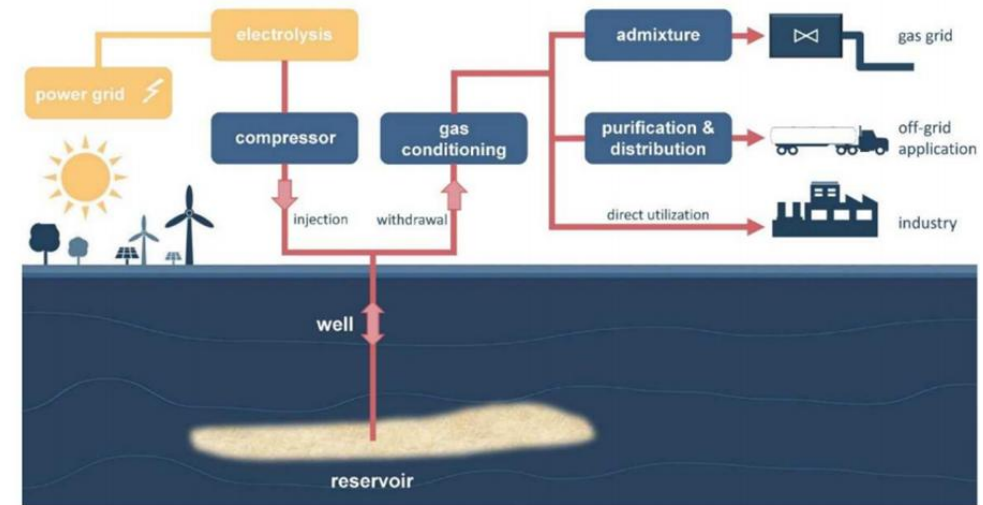
- Decentralised **E**nergy **S**torage units becoming economically and environmentally sound = **DESTORE**
- Large scale use of hydrogen peroxide (H_2O_2)
- Research basis: By using H_2O_2 , energy can be stored more efficiently (depending on the technology), than by using conventional hydrogen technology depending on the technology
- Exploration of interrelations and potential impacts on the Austrian energy system by detailed investigating H_2O_2 systems technically, ecologically and economically, for their suitability as cost-efficient storage, especially for renewable energies.



Underground Sun Storage 2030

- This project investigates the **large-scale seasonal storage of hydrogen** produced from renewable energy sources such as wind power and photovoltaics in depleted natural gas reservoirs.
- **Hydrogen is produced during periods of surplus power generation.** During periods of power undersupply, hydrogen is withdrawn and injected into the gas grid, distributed to end users, or used directly in industry.
- **HyCentA investigates not only technical and techno-economic aspects,** but also questions related to availability, safety, and optimal operation. For this purpose, a GIS (geographic information system) is being developed to **map stakeholders in the hydrogen sector at district level.**

UNDERGROUND SUN.STORAGE 2030



ENERGIE AG
Oberösterreich

EVN

Verbund voestalpine

axiom
AN DER UNIVERSITÄT SACHSEN-ANHALT



ENERGIE
INSTITUT
an der Johannes Kepler Universität Linz



KI MET
metallurgical competence center

WIVAP&G
Energy Model Region

The project is funded within the framework of the RTI initiative „Vorzeigeregion Energie“ of the Climate and Energy Fund, endowed with funds from the Ministry of Climate Protection (BMK).

Bundesministerium
Klimaschutz, Umwelt,
Energie, Mobilität,
Innovation und Technologie



Autonome regionale H2 Wirtschaft in Tirol

Ganzheitliche Betrachtung von Produktion, Lagerung und Anwendung von Wasserstoff aus regionaler erneuerbarer Energie Produktion. Technische und ökologische Analyse und Optimierung von Businessmodellen mit Hilfe von Simulationsmethoden in den Bereichen:

- Green Energy: Power2X, H2 Erzeugung durch TIWAG
- Green Mobility: Tourismus Zillertal und FC Trucks bei Mpreis
- Green Industry: betriebseigene H2 Produktion bei Mpreis

Die Ergebnisse stehen als Datenbank und virtuelle Wissens- und Prozessplattform zur Verfügung.



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Join us in shaping the future of hydrogen technology!

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und Tourismus

