

Green Hydrogen on the Move

HyCentA Research GmbH

Build'n Green, wko Austria, April 28-29, 2026

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- HyCentA in Brief
- H2 Valley – Green Hydrogen on the move
- DeCarb
- Energy Hub Graz
- LHL – Liquid Hydrogen Lab
- Summary & Outlook



HyCentA Research – Leading Hydrogen Innovation

- **120+ researchers** mechanical engineering, physics, chemistry, process engineering, electrical engineering
- **600+ projects** successfully completed
- **20+ years of R&D expertise**
- **State-of-the-art research**, testing and refueling infrastructure
- **International Cooperations**



Extra-university research organization at
Graz University of Technology (TUG)



Research Areas along the Entire Value Chain



Area 1

Area 2

Area 3

Area 4



**Electrolysis and
Power-to-X**



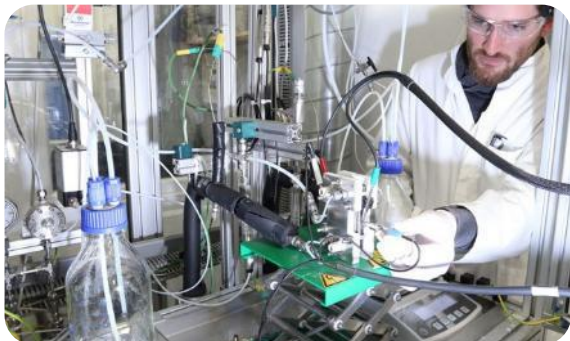
**Green Energy
and Industry**



Green Mobility



**Circularity and
Sys. Optimization**



Area 1: Electrolysis & Power-to-X

One-stop-shop Electrolyser Development at HyCentA Research



Catalyst ink preparation



PEM Single Cell Test Bench



20 kW Stack Test Bench



150 kW Stack Test Bench



Component Manufacturing

Single Cell Testing

Stack Testing

System Testing

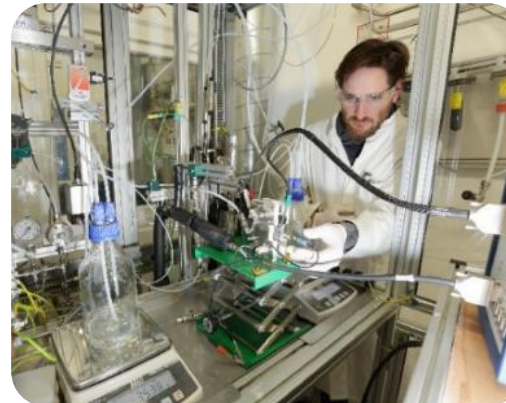
Electrode Manufacturing



PEC Single Cell Test Bench



AEM Single Cell Test Bench

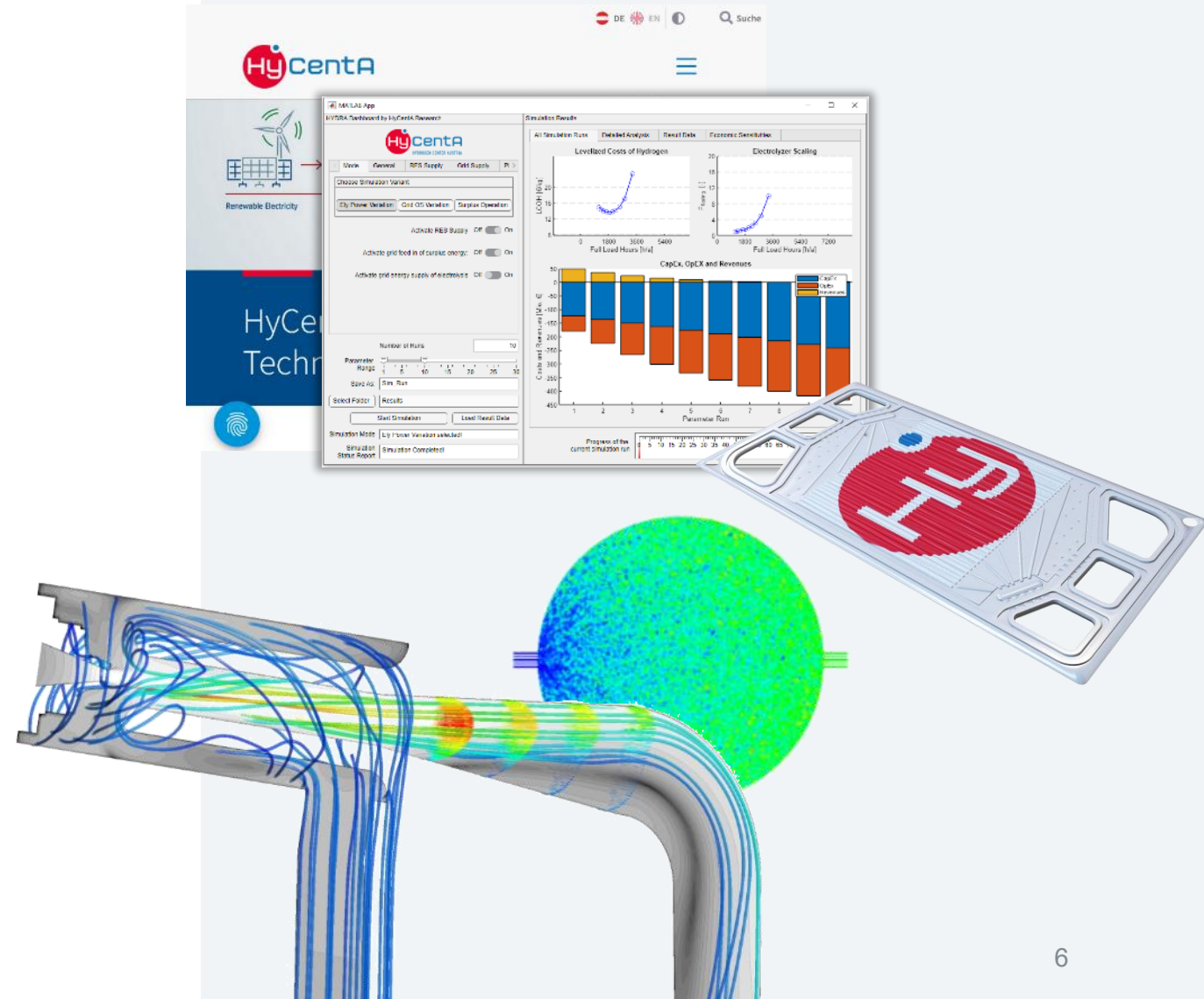


Gas Analysis



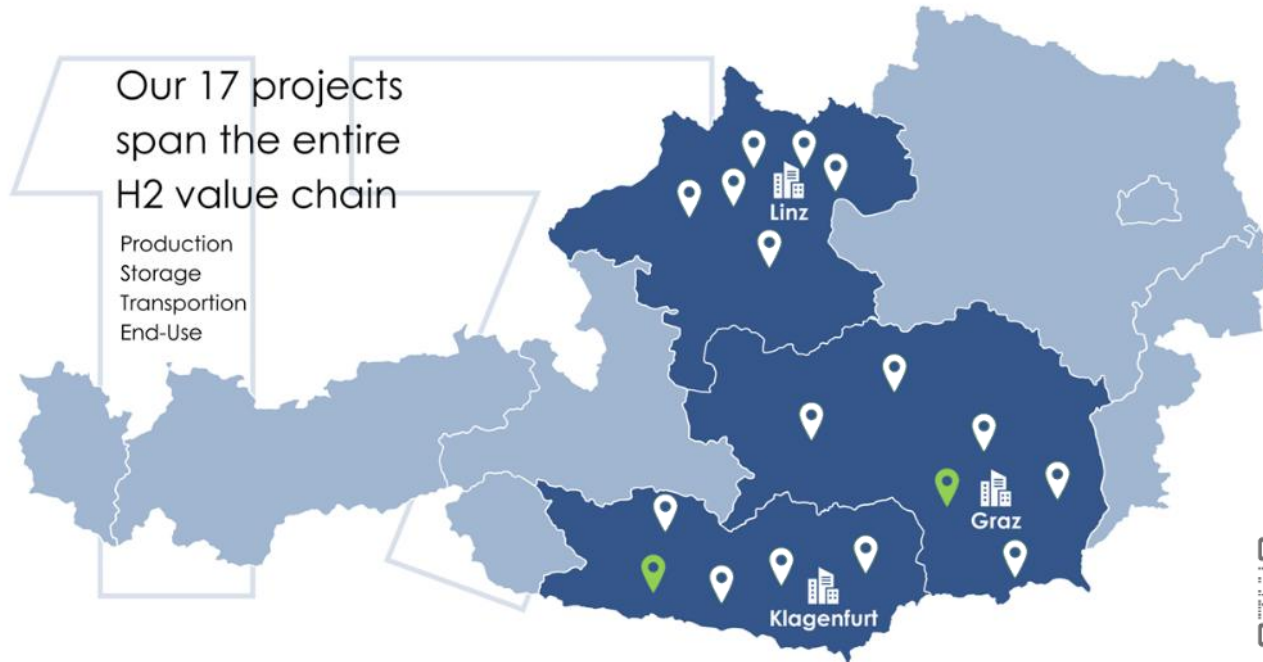
Accelerate the transition to a hydrogen-based economy!

- **HYDRA** - Hydrogen Infrastructure Simulation and Optimization Tool – Techno-economic optimization
- **CAD Design and FEM Simulation**
Stacks, components, systems ...
- **Multi-Phase Flow Simulation**
Stack layout, hydrogen storage system, injector/ejector, ...
- **Real Time Fuel Cell System Simulation and Control Design** Automotive PEM system ...
- **Vehicle Simulation and HiL**
Passenger cars, busses, trucks, trains, snowmobiles ...



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

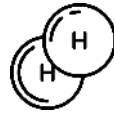
10,000

tonnes/year planned H2 production

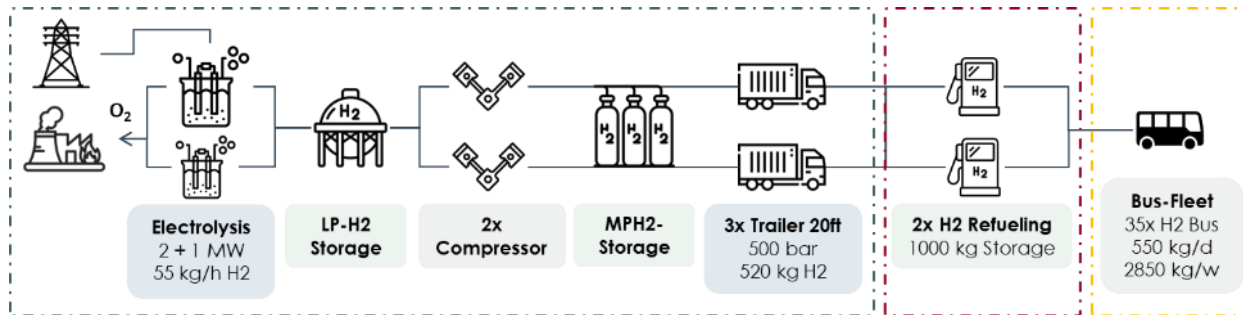
200,000

CO₂-equivalent saved by 2030

Project DeCarB



35 Buses 2,2 Mio. km/a 147 t/a RFNBO H₂ -1.340 t/a CO₂



kelag

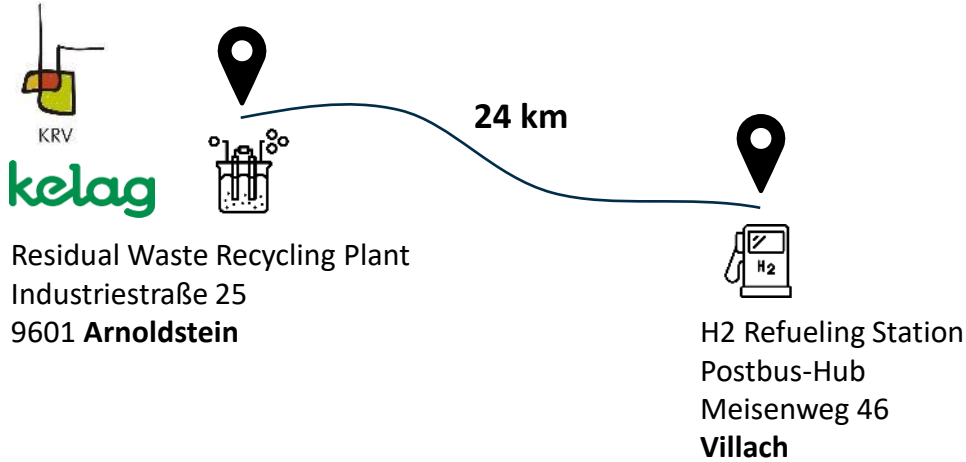
GUTMANN
WOLFTANK
GROUP

POSTBUS



- **Conceptual design H2 infrastructure**
 - System simulation: bus operation, refueling schedule, trailer logistics
- **Support basic & detail engineering**
 - P&ID, control strategy, layout
- **Support tendering process**
 - Supplier market research, requirements engineering
- **Scientific monitoring of implementation**
 - Gas quality verification (ISO 14687)

Project DeCarB – in Operation



H2 Bus



Manufacturer: MCV

Capacity: 43 seats, 36 standing places

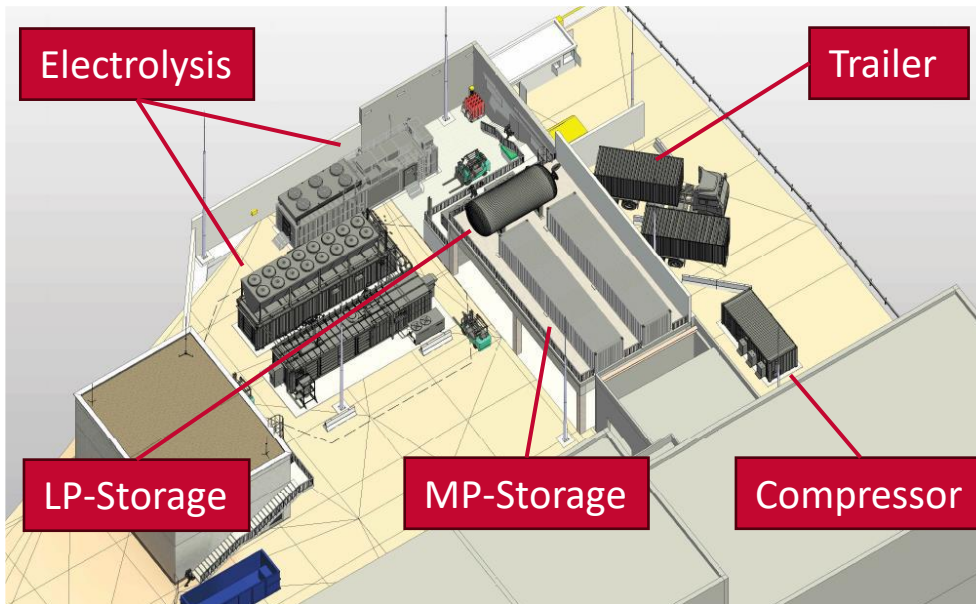
100 kW Fuel Cell system (Ballard)

117 kWh LFP battery

40 kg H2 storage, 350 bar

300 kW system power (cont.)

7.2 kg/100 km H2 consumption



Project Energiewerk Graz – FEED

ENERGIE GRAZ



Electrolysis

3MW
8000 h/a
450t/a

Compressor Station

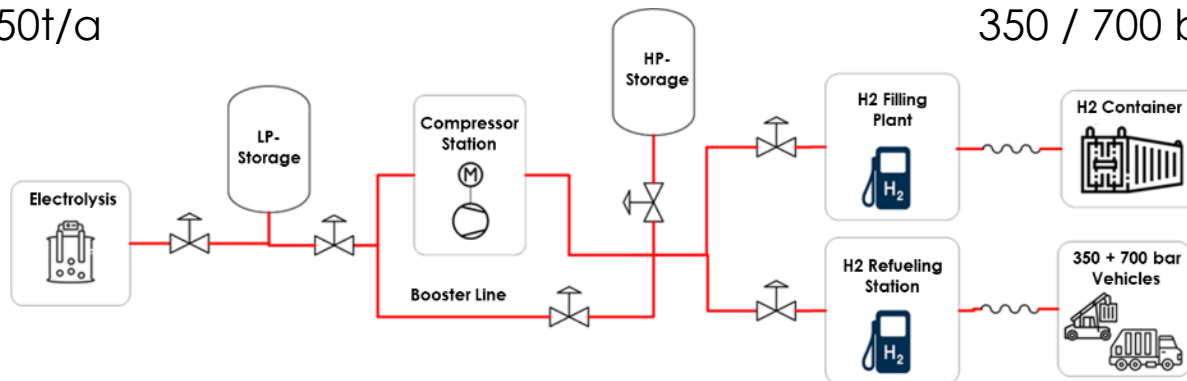
550 / 950bar

Trailer & Container filling

max 500 bar

Local Company HRS

350 / 700 bar



HyCentA Contribution

- **Conceptual design & feasibility study**
 - System simulation: H2 production & production profile, H2 container logistics
- **Support documentation for environmental impact assessment & authority approval**
 - P&ID, layout, safety assessment
- **Support tendering process**
 - Supplier market research, requirements engineering, tender documents, evaluation of tender offers
- **HI2 Valley coordination**
 - H2 trailer interface standardization

LHL – Liquid Hydrogen Lab

Source: 'MF Hydra': World's first liquid hydrogen-powered ferry gets operational (interestingengineering.com)



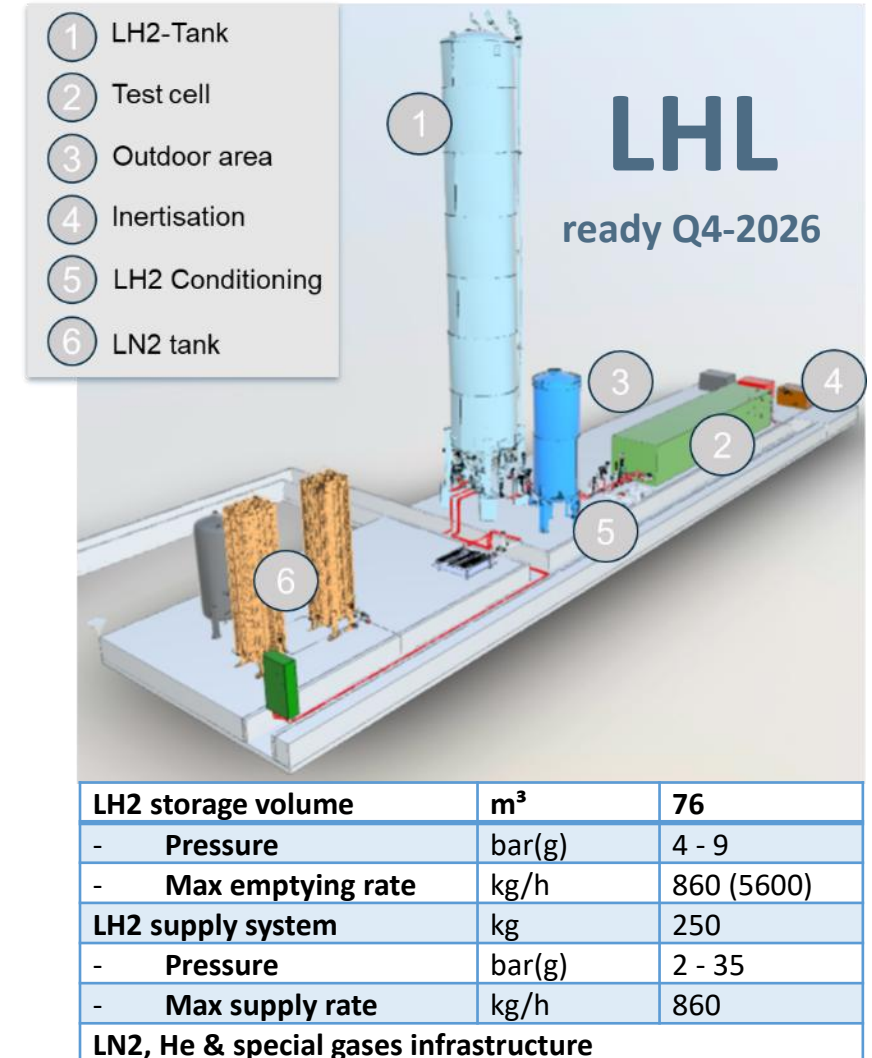
Source: Daimler Trucks, Mercedes-Benz Trucks provides outlook on hydrogen-based GenH2 Truck at IAA Transportation 2022 in Hannover



Source: Hydrogen-powered aviation A fact-based study of hydrogen technology, economics, and climate impact by 2050



- LH2 needed for **aviation, heavy-duty, rail & shipping**
- LHL infrastructure for liquid hydrogen (LH2) **materials, component, and system testing**
- **High LH2 flow rates up to 860 kg/h**
- Modern, highly **flexible test environment** for data acquisition and manual as well as partially and fully automated process control and regulation
- **HiL, SiL, EoL & scientific test concepts**
- Climate-controlled **container test cells & large outdoor test area**



- **Green hydrogen is key for improved resilience**
 - Energy security
 - Economic growth
 - Sustainable environment
- **Scaling for competitive cost remains challenging**
- **HyCentA Research is your competent & neutral partner** all along the hydrogen value chain!

Join us in shaping the future of hydrogen technology!

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