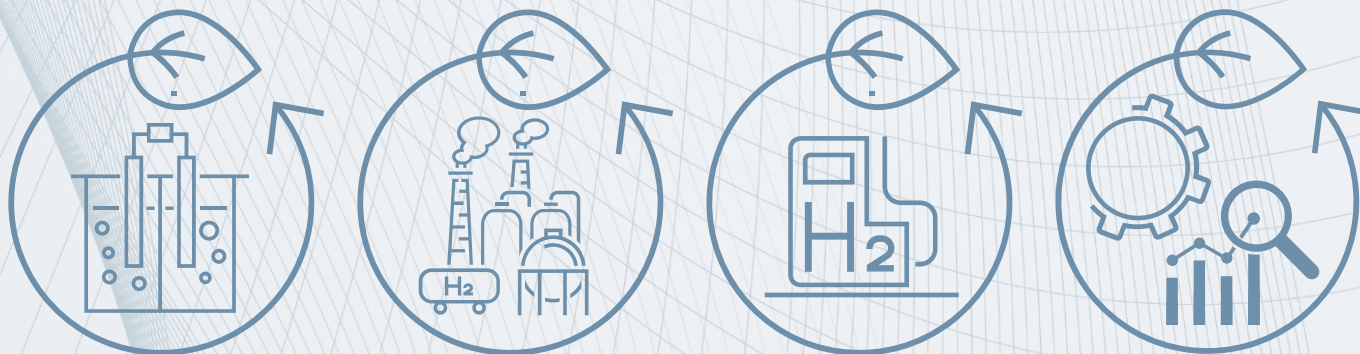




HyCentA Research GmbH

The Hydrogen Technology Research Center





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)





Projects Electrolysis & Power-to-X

One-stop-shop Electrolyser Development at HyCentA Research



Catalyst ink preparation



PEM Single Cell Test Bench



PEM Stack Test Bench



System Test Bench



Component Manufacturing

Single Cell Testing

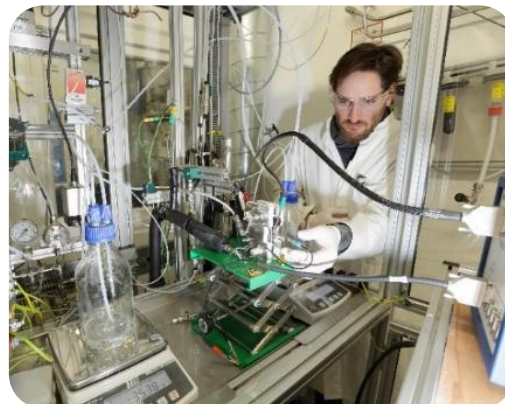
Stack Testing

System Testing

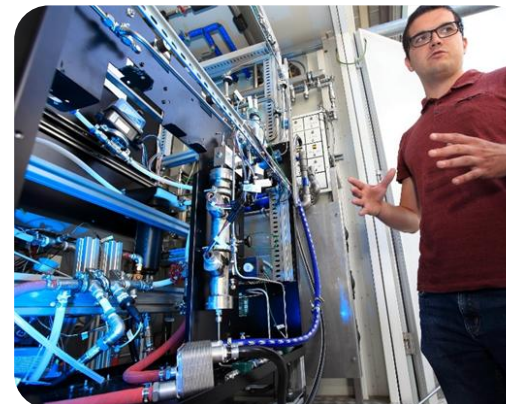
Electrode Manufacturing



AEM Single Cell Test Bench



AEM Stack Test Bench



Gas Analysis

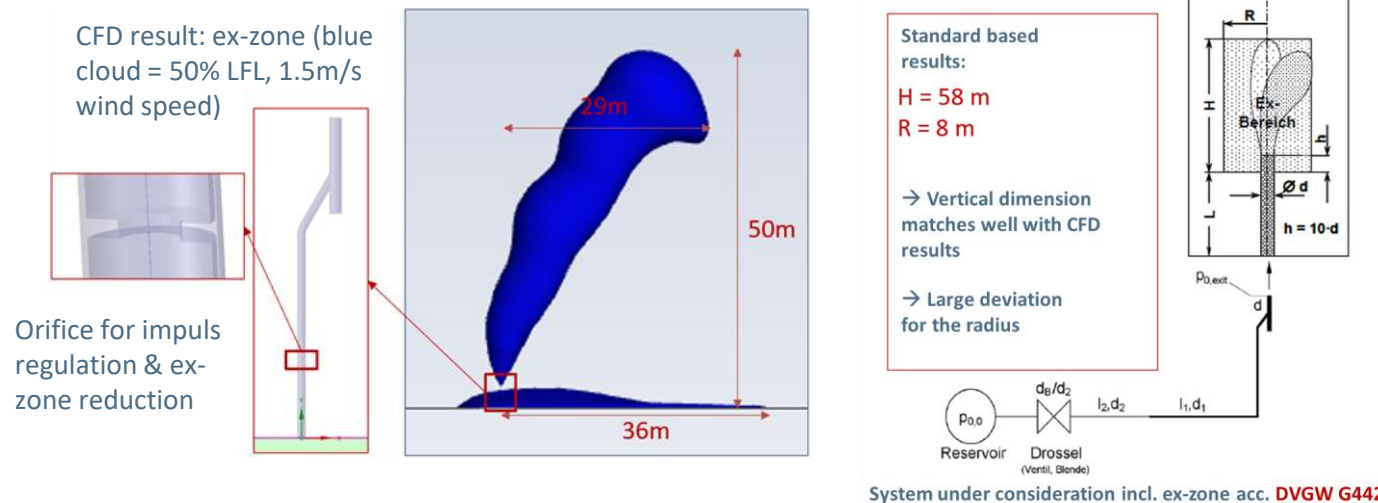




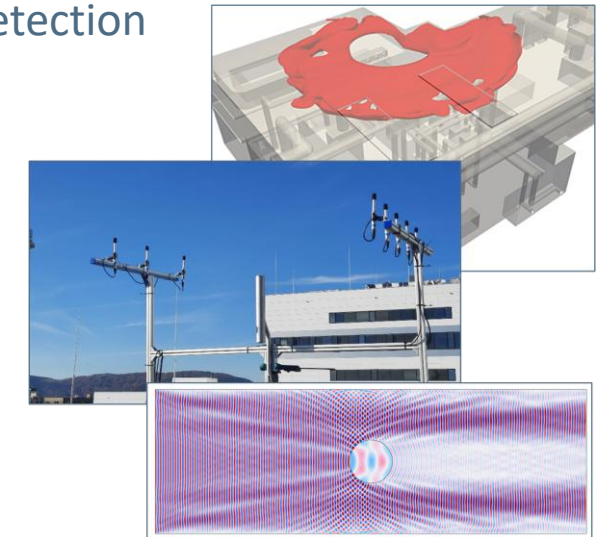
COMET H2 Safety & Detection

- Hazardous zones **simulation methods development & validation** by atmospheric measurements
- **H2 release behaviour**: leaks, cracks & diffusion
- **H2 flares** – effective, safe & low cost
- **H2 dispersion monitoring sensors** – new concepts
- **Smart Safety Concepts** – integrated method & tool chain for deployable safety concepts

Pipeline blow-off: H2 ex-zone CFD simulation vs. standard (DVGW G442)



Acoustic tomography for atmospheric H2 detection





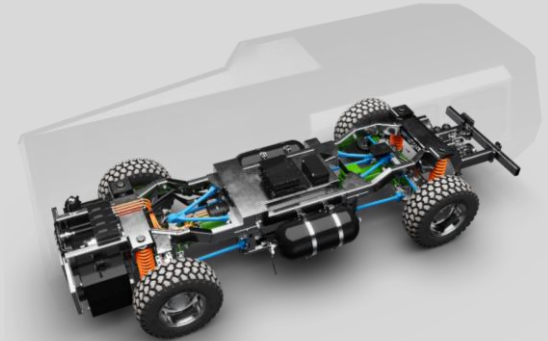
H2 Construction & Mining Machines

Design & test of a fuel cell hybrid machine for construction & mining applications

- Cathode poisoning
- Thermal management
- Water management
- Efficiency and lifetime optimized operation strategy



Hy.CoMM



Vehicle Data

- 6t curb weight
- 2t payload
- 30% climbing ability
- >100km driving range

Powertrain

- 60kW fuel cell
- 34kWh battery
- 6.5kg H2 storage
- 2 x 90kW E-Motors



Liquid Hydrogen Lab - LHL

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



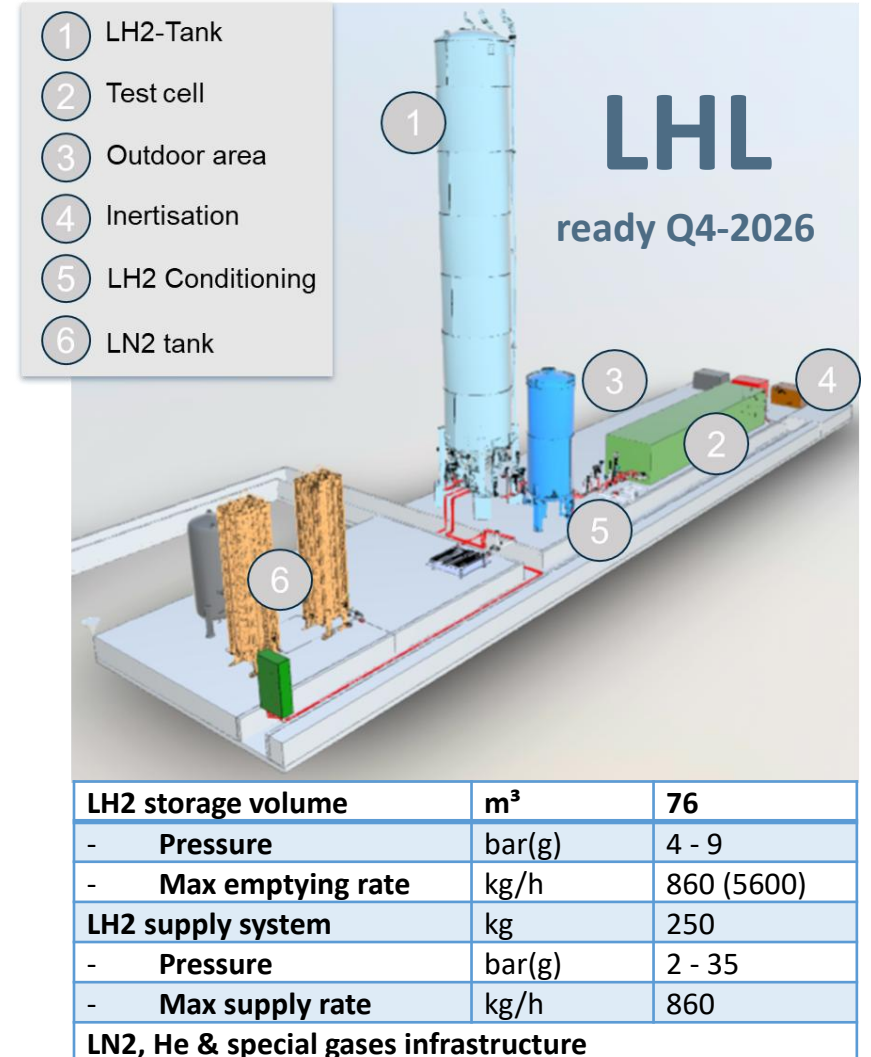
Source: Daimler Trucks, Mercedes-Benz Trucks provides outlook on hydrogen-based GenH2 Truck at IAA Transportation 2022 in Hannover



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**



Join us in shaping the future of hydrogen technology!

HyCentA Research GmbH

Inffeldgasse 15

A-8010 Graz

- Phone: +43 316 873 9500
- office@hycenta.at
- www.hycenta.at



 Bundesministerium
Innovation, Mobilität
und Infrastruktur

 Bundesministerium
Wirtschaft, Energie
und Tourismus

