



Making an impact on the clean energy transition

MARKET UPTAKE

HIGH-QUALITY HYDROGEN, COST EFFECTIVELY PRODUCED



Production purity with quality assurance

The composition of hydrogen depends on how it is sourced and produced. Feedstock, whether water, natural gas or biogas, and production methods, such as electrolysis, steam methane reforming or natural gas partial oxidation, can influence levels of pollutants.

However, ensuring hydrogen meets minimum quality standards and purity levels above 99.9 % for fuel cell and other applications entails higher production costs and additional quality assurance throughout the process.

The FCH JU is tackling these challenges with initiatives aimed at increasing purity, optimising standards and reducing costs. The HYCORA project conducted landmark research into maximum pollutant thresholds, reducing the cost of purification and contributing to updated international quality standards. Building on that achievement, HYDRAITE has set up the first three laboratories in Europe to test for all contaminants covered by the standards, and implemented a method for in-line continuous monitoring of fuel quality at hydrogen dispensers. Meanwhile, MEMPHYS focused on optimising an electrochemical hydrogen purification system, while the HYGRID project is scaling up and demonstrating a hybrid system for the direct and cost-effective separation of high-quality hydrogen from natural gas grids. The successes so far have led to two patent applications and the creation of a commercial spin-off.

From innovation to commercial adoption

The FCH JU is supporting ongoing research into cost-effective solutions, including innovative technologies capable of extracting and purifying hydrogen from hydrogen-natural gas blends and gas streams with different compositions and origin. With an expanding market for hydrogen technologies, especially fuel cells for transportation, purity and quality assurance will be fundamental factor in driving widespread commercial adoption.

High-quality, high-purity and cost-effective hydrogen is essential for the commercial take off of fuel cells and other applications. The FCH JU is addressing this cost-vs-quality challenge through innovative projects to advance hydrogen quality assurance and purification technologies.



FCH JU Success Stories

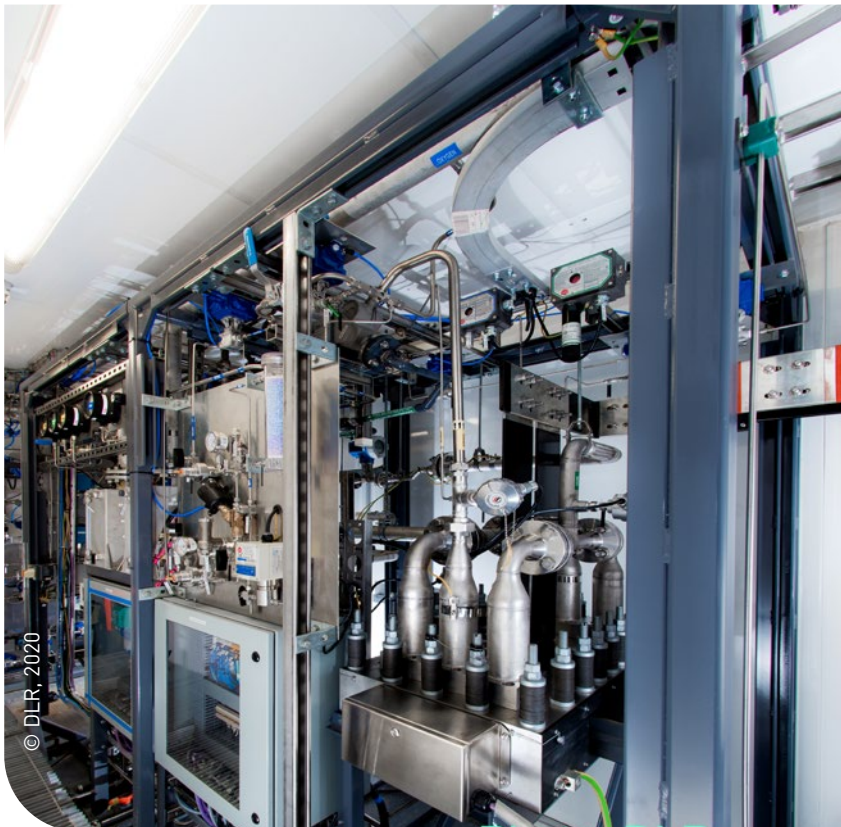


COST-EFFECTIVE SOLUTIONS TO MEET QUALITY AND PURITY STANDARDS

Hydrogen composition can vary depending on how it is produced, but complying with international standards on purity and quality for use in fuel cells and other applications must be achieved cost-effectively.

SETTING THE HYDROGEN QUALITY STANDARD

To address the challenge of meeting hydrogen quality and purity requirements cost-effectively, the FCH JU brought together leading hydrogen technology research institutions and companies across Europe. **The goal?** To contribute to the evolution of international standards, provide quality assurance solutions and support commercially viable high-purity hydrogen production. **Key results?** Optimised international standards on hydrogen quality, novel purification technologies and Europe’s first hydrogen testing facilities that are supporting the commercial deployment of hydrogen for transportation and other applications while boosting the competitiveness of the European hydrogen industry.



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KEY ACHIEVEMENTS

HYCORA

ISO14678

international standards optimised based on HYCORA research

2 500

individual measurements of hydrogen pollutants

41

days of continuous testing

7

partners from across Europe

HYDRAITE

3

European laboratories capable of measuring all contaminants according to ISO14687 standards

8

partners from across Europe

HYGRID

NEW

stable, high performance and long durability membranes for hydrogen recovery

12.5 kg/DAY

production of prototype hydrogen recovery system

LESS THAN EUR1.5/kg

target cost of recovered hydrogen

TWO

patent applications

IMPACT

ISO

recommendations for optimisation of hydrogen quality standards

1ST

hydrogen quality testing laboratories in Europe

99.97%

purity of hydrogen recovered from natural gas

FIND OUT MORE



www.fch.europa.eu/page/fch-ju-projects
<http://hycora.eu/>
<https://hydraite.eu/>
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