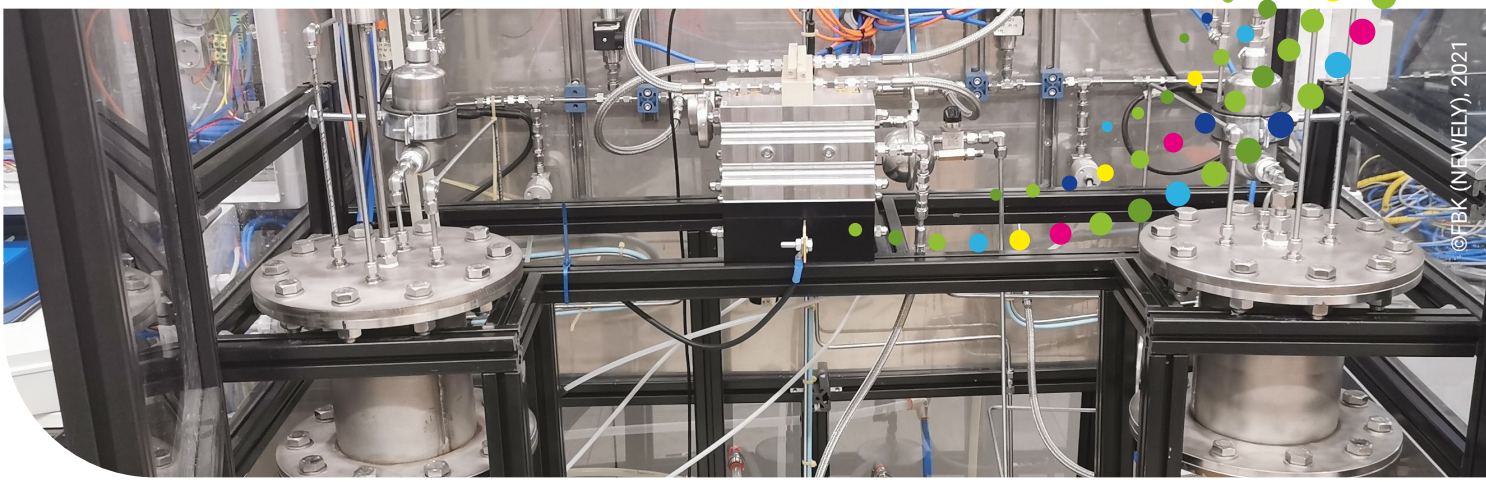
Clean Hydrogen Partnership

Hydrogen Production

New electrolysers to generate cheap, clean hydrogen



Three Clean Hydrogen Partnership-funded projects have expanded the knowledge base related to development of anion exchange membrane electrolysers (AEMELs) for hydrogen production in Europe, testing small power stacks with a capacity of 2 kilowatts (kW). The projects have also jointly defined AEMEL testing protocols and established AEM-HUB, an information-sharing cluster.

Combining advantages, eliminating drawbacks

AEMELs are at the early research and development stage, whereas high-capacity proton exchange membrane (PEMELs) and alkaline (AELs) electrolysers are commercially available. However, PEMELs require expensive catalysts and AELs operate at low current densities, reducing efficiency.

AEMELs have the potential to combine the advantages and eliminate the drawbacks of AELs and PEMELs as regards cost, effectiveness and sustainability of hydrogen generation. Three complementary projects – ANIONE, CHANNEL and NEWELY – have increased knowledge of hydrogen production catalysts and AEMEL components, including reinforced composite membranes and low-cost, durable electrodes. The components were assembled into stacks and tested for around 2 000 hours.

Upscaling and marketing

The materials and stacks developed by ANIONE, CHANNEL and NEWELY have achieved efficiency levels close to those of PEMELs, but at lower cost. The membranes show enhanced mechanical behaviour and the catalysts demonstrate higher performance and stability than their state-of-the-art equivalents.

All three projects have now concluded, and consortia members are looking to scale up the stacks to reach capacities of up to 100 kW within new Clean Hydrogen Partnership-funded projects like HERAQCLES and HYSCALE. SME partners subsequently plan to commercialise elements such as the membranes, electrodes and stacks.

COST-EFFICIENT, SUSTAINABLE, AVAILABLE

Anion exchange membrane electrolysers (AEMELs) offer the possibility of being energy efficient for a lower cost than current commercial electrolysers, but more work is needed before they are ready for market.

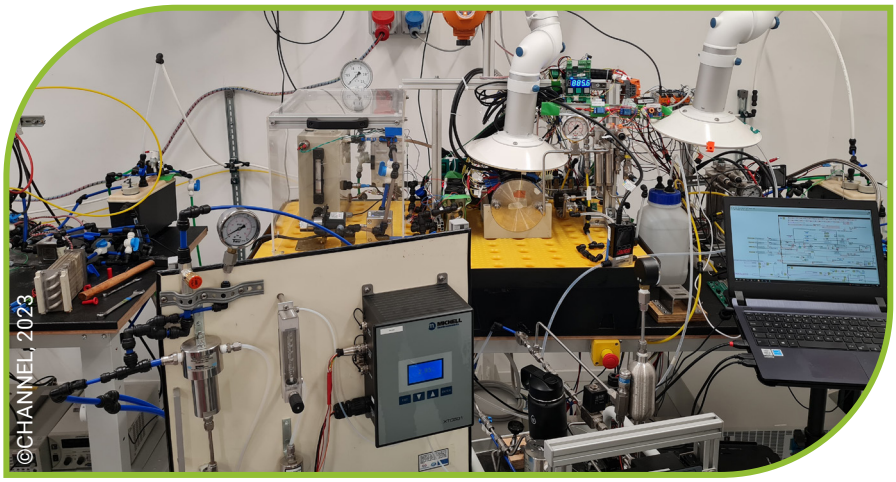
COLLABORATION IS KEY

As anion exchange membrane electrolysers can make hydrogen production cheaper, more effective and more sustainable, Clean Hydrogen Partnership projects are paving the way for wider implementation of this technology.

Given their complementary objectives, ANIONE, CHANNEL and NEWELY tackled AEMEL development in a collaborative way, exchanging information to formulate the testing protocols and create the hub. Testing provided relevant results for upscaling and optimisation.

The goal? Future projects should create high-capacity AEMELs that can produce cost-efficient, clean hydrogen at large scale for use in applications such as grid balancing, energy storage, industry and transport.

Key results? The projects increased knowledge of AEMEL catalysts, reinforced membranes and low cost and durable electrodes for AEMEL. The composite membranes developed by the project and the setting up of the AEM-HUB provides a basis for further AEMEL development. The projects also jointly came up with testing protocols for AEMEL in collaboration with the European Commission's Joint Research Centre.



FIND OUT MORE

www.clean-hydrogen.europa.eu/projects-dashboard
https://anione.eu
https://newely.eu
www.sintef.no/projectweb/channel-fch
www.hyscale.eu
www.innovation.monolithos.gr/projects/heracqles
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KEY ACHIEVEMENTS

NEW MATERIALS AND COMPONENTS
for AEMEL electrolysers were validated in 2 kW AEM electrolyser stacks with 5 to 10 cells each

58% EFFICIENCY
achieved by stacks

ENERGY CONSUMPTION
was below 57 kWh/kg H2

UP TO 40 % LOWER COSTS
than PEMELs

NO CRITICAL RAW MATERIALS
used, unlike in PEMELs

1.8 VOLTS
generated per cell – close to PEMEL performance levels

ZERO VOLTAGE DEGRADATION
in 2 000 hours of operation

IMPACT

Other projects such as HERAQCLES and HYSCALE **HAVE SCALED UP TO STACKS** of a few tens of kW and developed large-size cells.

Some of the SME partners plan to **COMMERCIALISE THE MATERIALS** developed in the projects after upscaling.

The AEM-HUB was established to **SHARE INFORMATION** on AEMELs.

TESTING PROTOCOLS
were shared with the EU's Joint Research Centre.

Clean Hydrogen Partnership

Co-funded by the European Union

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Clean Hydrogen Partnership

Hydrogen Storage and Distribution

Hydrogen economy's success lies in underground storage

Hydrogen storage is important for a secure renewable energy supply as it can help to balance fluctuations in electricity produced by wind and sun. The Clean Hydrogen Partnership is funding R&I projects that are studying how best to store large volumes of 'green' hydrogen underground, understand the challenges, map potential sites and prepare demonstrators.

Greater renewable energy demand

Hydrogen storage in salt caverns has been done since the 1970s in Europe, but not in porous reservoirs like depleted gas fields or aquifers. HYSTORIES and HyUSPRe projects have identified suitable porous reservoir sites for hydrogen storage and studied the economic, environmental and technical requirements needed to exploit them.

HYSTORIES has produced a database of hydrogen storage sites in the EU's 27 Member States countries and four neighbouring countries. Meanwhile, HyUSPRe developed an interactive map of potential storage sites in depleted gas fields and aquifers and a roadmap for the deployment of underground storage up to 2050. EUH2STARS has started work on the first demonstration site located in Austria.

Preparing demonstration sites

Laboratory experiments and computer modelling have allowed for better understanding of the technical feasibility and risks of underground hydrogen storage. Costs estimates were done, taking into account the sites' proximity to renewable energy infrastructure. HyUSPRe's roadmap to 2050 shows how underground storage can contribute to a zero-emission energy system in the EU.

EUH2STARS, which began in January this year, will aim to demonstrate competitive hydrogen storage in depleted natural gas reservoirs at technical readiness level 8 – a complete and qualified system – by the end of the decade.

REGULATIONS, MICROBES AND PUBLIC ACCEPTANCE

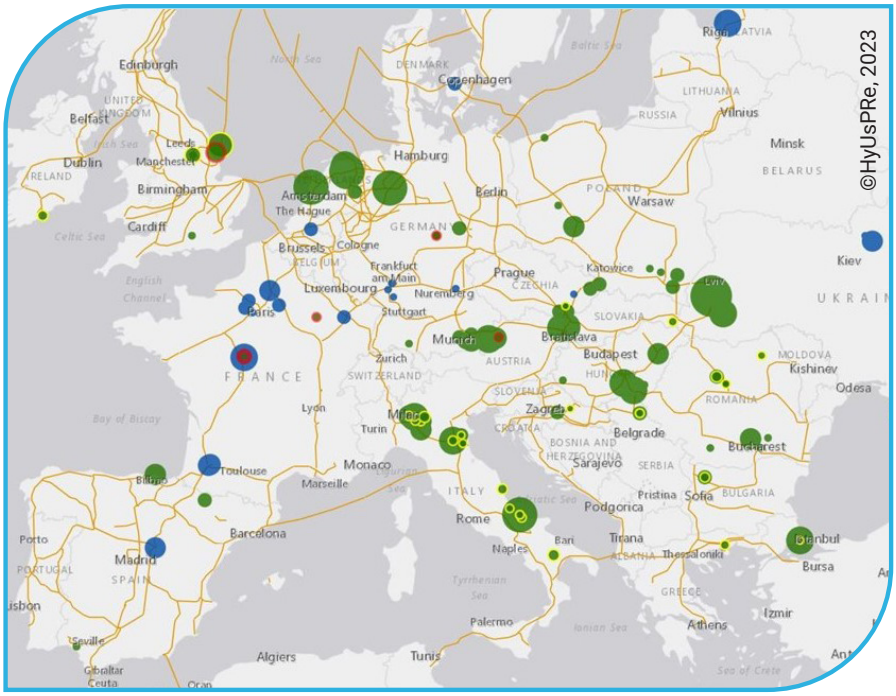
In addition to developing regulations and ensuring public acceptance, more work is needed to understand the geochemical, microbiological, flow and transport behaviour of hydrogen in porous reservoirs.

INSIGHTS FOR DECISION-MAKERS

HYSTORIES and HyUSPRe have laid the foundation for commercial-scale underground storage. EUH2STARS' demonstrator sites in the European regions will show how the technology can be replicated.

The goal? Pilot projects will help build storage capacity in line with the development of a trans-European hydrogen transport infrastructure. Use of underground storage will reduce the need for transport infrastructure between countries and enable stronger integration of renewables into the European energy system.

Key results? Technical and socio-economic studies and mapping have provided insights about cost, storage capacity and suitability to help government and industry decide which sites to exploit and how.



KEY ACHIEVEMENTS

GEOLOGICAL DATA was gathered from **23** European countries.

A CAPACITY ESTIMATION for over 800 porous reservoirs in 27 EU countries and 4 neighbouring countries was developed. For instance, 26 on- and offshore storage sites were identified in Italy.

6 OF 17 EU COUNTRIES studied by HYSTORIES have regulations or regulations under development for underground hydrogen storage.

140 EXISTING AND PLANNED underground gas storage sites in porous reservoirs, suitable for hydrogen storage, are contained in HyUSPRe's database.

415 TERRAWATT HOURS of storage capacity was identified by HyUSPRe in Europe.

IMPACTS

A ROADMAP for underground hydrogen storage until 2050 was developed by HyUSPRe.

A STORY MAP about the potential for underground hydrogen storage in European depleted gas fields and aquifers was developed by HyUSPRe.

A better understanding of the **GEOCHEMICAL, GEO-MECHANICAL AND MICROBIAL** effects of underground hydrogen storage is due to HYSTORIES and HyUSPRe.

EUH2STARS will **DEMONSTRATE UNDERGROUND STORAGE** in Austria and prepare three replicator sites in Hungary, Spain and the Netherlands.

FIND OUT MORE

https://www.clean-hydrogen.europa.eu/index_en
https://www.euh2stars.eu/en/project/project-description.html
https://www.hyuspre.eu/
https://hystories.eu/
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Clean Hydrogen Partnership

Clean Hydrogen Partnership

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PDF ISBN 978-92-9246-444-8 · doi:10.2843/6203265 · EG-01-24-000-EN-N

Clean Hydrogen Partnership

Hydrogen Storage and Distribution

A blueprint to transport hydrogen via Europe's gas grid

Development of a pan-European hydrogen transmission network by 2030 is critical for meeting Europe's energy transition goals, including ensuring a secure, affordable and independent energy supply. The Clean Hydrogen Partnership funds projects that perform research aimed at repurposing Europe's gas grid to enable it to transport large quantities of hydrogen.

Competitive, clean energy

An integrated hydrogen transmission infrastructure will boost Europe's renewable energy supply and keep it competitive through the energy transition. By supporting the development of a transmission infrastructure, the Clean Hydrogen Partnership aims to speed up the deployment of hydrogen energy.

For example, project SHIMMER aims to improve hydrogen injection management in gas networks. Two other projects are testing the compatibility of gas infrastructure with hydrogen: PILGRHYM is focused on steel and CANDHY on non-steel infrastructure. OPTHYCS is developing technology to detect leaks and make hydrogen transmission safer.

Exploring viability aspects

This ongoing research is based on the extensive knowledge developed by the HIGGS project, which investigated the technical and legal barriers to the transmission of hydrogen through gas pipelines. HIGGS also made an inventory of materials used in gas transmission infrastructure and identified the parts of the grid most susceptible to problems when integrating hydrogen.

The project also established a state-of-the-art experimental test facility, where it has studied the impact of hydrogen on various grid materials and components.

An investigation of the financial and technical aspects of hydrogen integration and the potential impacts on consumers has led HIGGS to conclude that repurposing is technically and economically viable. Another element is a regulatory review to support the formulation of standard approval procedures for grid expansion.

GETTING EUROPE'S GRID HYDROGEN-READY

Repurposing Europe's existing gas pipeline grid is a cost-effective way of transporting large amounts of hydrogen and requires an increased knowledge of materials, technologies and procedures along with guidelines and standards to address safety concerns.

A DEDICATED HYDROGEN NETWORK

The projects and complementary activities such as the European Hydrogen Backbone have advanced the approach of using the gas grid to transport hydrogen across Europe. HIGGS, SHIMMER, PILGRHYM, CANDHY and OPTHYCS fill in the gaps in research on the materials, technologies, procedures and safety standards needed for an integrated hydrogen network. The research also supports the development of the European Hydrogen Backbone – a European energy infrastructure operators' initiative to develop a cross-border, connected hydrogen transmission network based on repurposed gas pipelines.

The goal? A natural gas grid could be repurposed as a shortcut to creating a Europe-wide, connected infrastructure for hydrogen transport and opening the way for its large-scale deployment.

Key results? HIGGS created an extensive inventory of materials used in current pipelines and transport facilities and conducted an extensive testing programme on a range of critical components at experimental testing facility it developed. The project also mapped the technical, legal and regulatory framework needed for a high-pressure gas grid, established a testing platform and evaluated materials, technologies and procedures for affordability and safety. HIGGS has led to research on several fronts being conducted by projects such as SHIMMER, PILGRHYM, CANDHY and OPTHYCS.

FIND OUT MORE

www.clean-hydrogen.europa.eu/projects-dashboard
https://higgsproject.eu
https://shimmerproject.eu
https://pilgrhym.eu
https://candhy.eu
https://opthycs.eu
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KEY ACHIEVEMENTS

INVENTORY OF MATERIALS
used by current gas pipelines

3 000 HOURS
of pilot-scale replication of a high-pressure gas grid

IDENTIFICATION
of grid segments most susceptible to problems

ANALYSIS
of repurposing impact on consumers

IDENTIFICATION
of regulatory standards

TEST FACILITY
to study hydrogen's impacts on the gas grid

TECHNICAL AND ECONOMIC CASE
for further exploration of hydrogen use in the gas grid

IMPACTS

4 RESEARCH PROJECTS
support the development of hydrogen gas grids.

TECHNOLOGIES AND MATERIALS
identified for transforming gas networks.

LEAK DETECTION TOOLS
identified for secure transport.

STANDARDISED PROTOCOLS
developed for integration of hydrogen into the gas grid.

HIGHER COST-EFFECTIVENESS CASE made for repurposing gas pipelines for hydrogen compared with building new infrastructure.

Clean Hydrogen Partnership

Co-funded by the European Union

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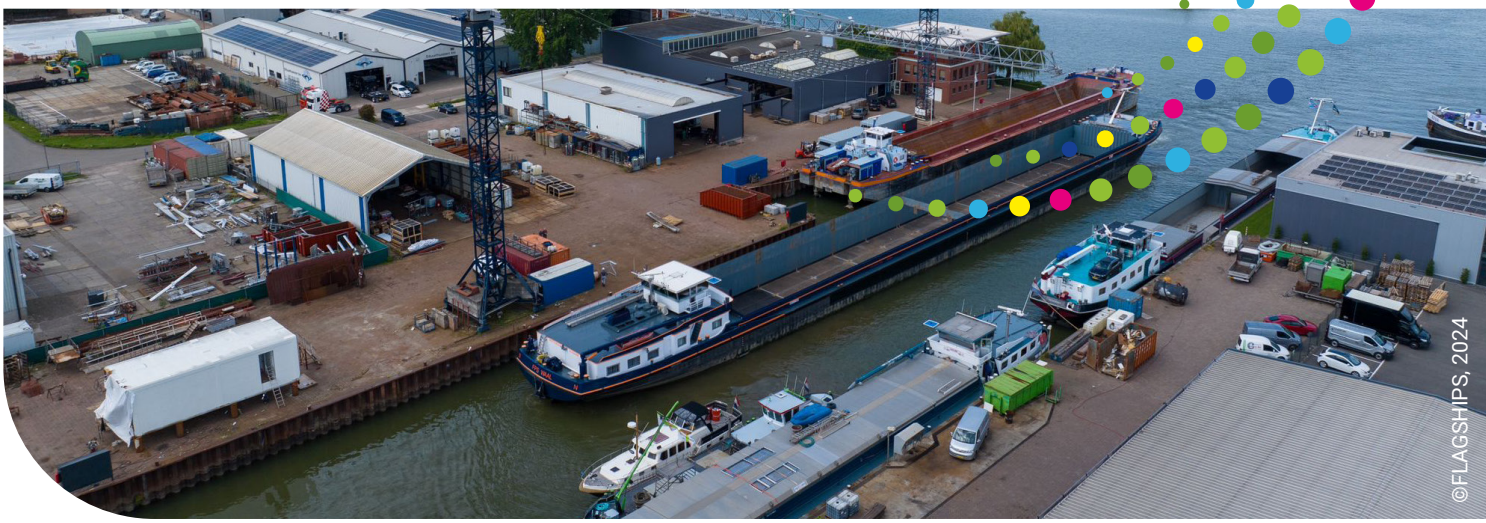
Clean Hydrogen Partnership

Transport End-uses

Setting sail for zero emission shipping on Europe's waterways



Transferring freight transport from road to water results in significant emission reductions. However, use of ageing vessels on inland waterways still produces high levels of pollution. Clean Hydrogen Partnership-funded projects are demonstrating how fuel cell technology can decarbonise Europe's inland waterway transport, safely and in a commercially sustainable way.

Accelerating emission-free shipping

The EU's inland waterways are cost-effective and safe transport corridors used by about 12 700 cargo vessels and 2 300 tugs and push boats. Projects FLAGSHIPS and RH2IWER are building new hydrogen fuel-cell-powered vessels, retrofitting older diesel-powered models and working to standardise the technology, to accelerate the uptake of emission-free inland shipping.

RH2IWER will demonstrate one dry cargo, two tanker and three container vessels powered by hydrogen on waterways linking the Netherlands, Germany and Belgium by 2025. Meanwhile FLAGSHIPS has retrofitted and launched the H2 Barge 2 for container transport on the Rhine between Rotterdam and Duisburg. It will start to demonstrate the Zulu 6, a new cargo barge, on the Seine in Paris.

In addition, five partners of the HEAVENN hydrogen valley in the Northern Netherlands are working on the WEVA project to build a hydrogen-powered barge, the Antonie, which will transport salt between Rotterdam and Delfzijl, replacing 120 trucks per trip, before the end of the year.

To support these initiatives, the RH2INE network is working on establishing cross-border hydrogen infrastructure in the Rhine-Alpine region.

From demos to commercial operation

The RH2IWER vessels represent roughly 80 % of inland waterway fleet used on the Rhine and Danube. Lessons learned during their construction, retrofitting and approval can easily be applied to the other vessels. The FLAGSHIPS' vessels will be kept in normal commercial operation after the project's 18-month demonstration period.

The aim is to increase the number of product designs that have regulatory, technical and safety approval from 15 in 2024 to 40 in 2030, and to increase the lifespan of fuel cell systems from 40 000 hours in 2024 to 80 000 hours by 2030.

REGULATIONS AND STANDARDISATION

Capital expenditure needs to be reduced, fuel cell systems have to be standardised and certification processes, regulations, codes and standards developed and streamlined to ensure faster approval to get hydrogen-powered fluvial vessels sailing.

NEW BUILDS AND RETROFITS

Inland vessels last for over 40 years and there is a low production of new ones. This makes new vessels and retrofitting the existing fleet vital to reaching emission reduction targets and ensuring rapid market uptake.

The goal? The Clean Hydrogen Partnership supports projects to bring together manufacturers, operators and public authorities to share expertise and make the leap from demonstrating the technical feasibility of fuel cells on inland vessels to deploying fleets of vessels and hydrogen infrastructure.

Key results? RH2IWER, FLAGSHIPS and other projects are showing the feasibility of using fuel cells and hydrogen onboard inland waterway vessels.

KEY ACHIEVEMENTS

THE 'GREEN'-HYDROGEN powered Antonie salt barge will replace 120 trucks.

FLAGSHIPS, RH2IWER AND HEAVENN to demonstrate **NINE** hydrogen vessels.

THE SIX RH2IWER VESSELS represent roughly 80 % of inland waterway fleet used on the Rhine and Danube.

12 PARTNERS, INCLUDING SHIP OWNERS, maritime engineers and research organisations, are involved in FLAGSHIPS.

FLAGSHIPS' THE H2 BARGE 2 will be able to carry 200 20 feet (6.10 m)-long shipping containers.

IMPACTS

The Central Commission for the Navigation of the Rhine **APPROVED FLAGSHIPS' H2 BARGE 2** for sailing on hydrogen in March 2023.

H2 BARGE 2 LAUNCHED on 8 February 2024.

FLAGSHIPS' ZULU 6 is the first hydrogen-powered barge to sail on a French waterway.

RH2IWER BRINGS TOGETHER five shipowners and two fuel cell manufacturers.

RH2IWER ALLOWS FOR SYNERGIES with three ongoing hydrogen projects: MAGPIE, PIONEERS and RH2INE.

FIND OUT MORE

https://www.clean-hydrogen.europa.eu/index_en
https://rh2iwer.eu/
https://flagships.eu/
https://heavenn.org/news/follow-the-developments-of-antonie/
https://www.wevaproject.nl/en/
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Clean Hydrogen Partnership

Clean Heat and Power End-uses

Portable generators to power a range of activities

The EVERYWH2ERE project has integrated proton exchange membrane fuel cell stacks with lightweight, safe, pressurised hydrogen technologies to create an easy-to-install, transportable generator. They offer a reliable, low-noise, low-emission power supply that can be used in environments such as construction sites, ports, and social and cultural events.

Preparation for market

Around 20 % of Europeans are exposed to unhealthy levels of noise. Reduction of noise and air pollution, including from temporary events and construction sites, have become priorities for public authorities. Moreover, the increase in construction work and events like markets and festivals stimulates demand for portable power sources.

EVERYWH2ERE has developed and tested six 'plug-and-play' fuel-cell generators (gensets) and investigated the legal framework to ensure their conformity with regulations. Environmental and logistical analyses have been performed, and hydrogen supply points in the EU have been mapped. In addition, contractual and business models have been defined, along with a replication strategy.

Demonstrations around Europe

EVERYWH2ERE, funded by the Clean Hydrogen Partnership, was a 'demonstration-to-market' project that aimed to prove the reliability of fuel-cell gensets via an EU-wide campaign. The gensets were demonstrated at events such as music festivals, on construction sites and at the Port of Tenerife, where one genset powered a rescue vessel. The stacks had already been trialled before their integration into the gensets.

The demonstrations were backed by strong communication and dissemination activities, including regular updating of the website and participation in public events. EVERYWH2ERE won awards for its outreach work.

CLEAN, RELIABLE ENERGY

Environments like construction sites, ports or festivals need a clean, reliable, low-noise power supply, and EVERYWH2ERE has developed transportable hydrogen-based generator sets that can meet this need.

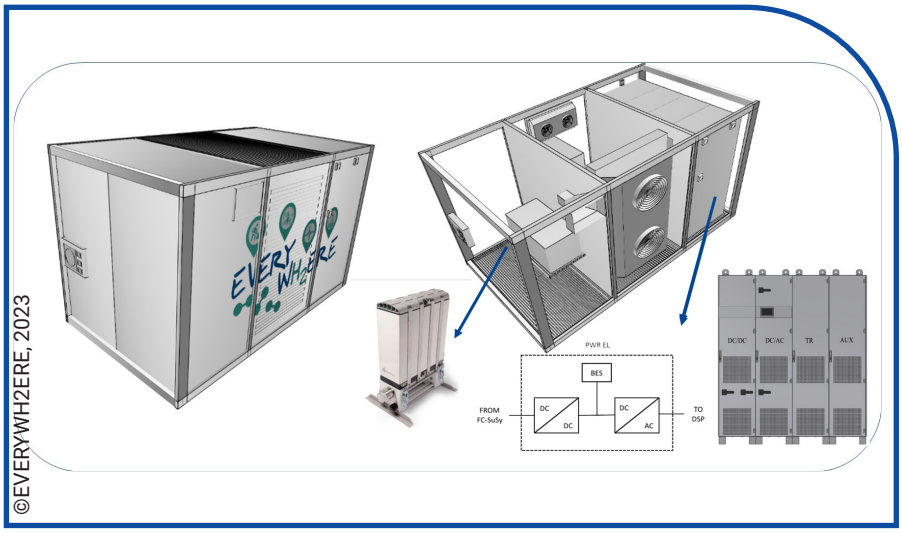
EXPLORING NEW USES

EVERYWH2ERE used cities as living labs to demonstrate its technology, starting with niche, but every day, applications.

External stakeholders are now interested in replicating the gensets for use at sea, and project partners are exploring further deployment and research. EVERYWH2ERE should also feed into the demand for powering critical infrastructure with portable fuel cells during natural disasters.

The goal? EVERYWH2ERE aims to make hydrogen gensets sufficiently affordable to enable them to replace diesel models across Europe.

Key results? The project has helped to increase acceptance of fuel cell and hydrogen technologies.



FIND OUT MORE

www.clean-hydrogen.europa.eu/projects-dashboard
www.everywh2ere.eu
@CleanHydrogenEU
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KEY ACHIEVEMENTS

6 GENSETS DEVELOPED – 25 kilowatts (kW) and 100 kW

50 % STACK efficiency achieved.

NOISE EMISSIONS reduced by 60 decibels.

6 HOURS installation time

UP TO 20 000 hours lifetime

-20 °C MINIMUM TEMPERATURE for use of gensets

DEMONSTRATORS TESTED at construction sites, events and a port

100 KW GENSET conforms with regulations

IMPACTS

EUR 2 400/kW manufacturing capital expenditure estimated for the 100 kW genset, EUR 5 500/kW for the 25 kW genset

Costs are estimated at **10 % LOWER** compared to solutions on the market

OVER 2 500 KG emissions reductions achieved compared with fossil fuel-based gensets.

ENVIRONMENTAL ANALYSIS of the gensets demonstrated better performance than diesel-fuelled models.

HYDROGEN SUPPLY POINTS were mapped and a logistical analysis performed.

SHORT-TERM RENTAL identified as most promising market for the gensets.

BUSINESS MODELS and a replication strategy were defined.

Clean Hydrogen Partnership

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Clean Hydrogen Partnership

Cross cutting

A sustainable, circular European hydrogen economy

Guidelines and tools like life-cycle assessments, eco-design guidelines, recycling and dismantling strategies and certification schemes for fuel cell and hydrogen (FCH) technologies have been developed by projects supported by the Clean Hydrogen Partnership. This boosts the circularity and sustainability of Europe's hydrogen sector and helps to achieve EU and global environmental goals.

Measuring environmental footprints

As well as possessing qualities like high performance and reliability, FCH technologies must be sustainable and circular, creating economic and societal value while minimising the environmental impacts. Clean Hydrogen Partnership-funded projects have developed sustainable approaches along the hydrogen value chain, ensuring that the sector is in line with good environmental principles.

Sustainability relates to economic, environment, social aspects while circularity encompasses reduction, recyclability and reuse of products, components and materials.

To determine the ecological footprint of FCH technologies, FC-HYGUIDE has provided guidance, training materials and courses on life-cycle assessments, case studies and datasets. SH2E has expanded the scope of the FC-HYGUIDE guidelines to encompass economic and social aspects through life-cycle sustainability assessments (LCSAs) and life-cycle costing.

Design, recycling and certification

To promote environmentally friendly design, eGHOST has formulated eco-design guidelines for FCH technologies, and HYPEF has devised product environmental footprint category rules. HYTECHCYCLING, BEST4HY and SUSTAINCELL have researched recycling, dismantling and reuse strategies for FCH technologies and their components. For hydrogen sourcing, CERTIFHY has created the first EU-wide Guarantee of Origin certification scheme.

In addition partnership-funded projects work closely with the European Commission's Joint Research Centre (JRC) on sustainability and circularity. The JRC also compiles an annual inventory of life-cycle assessments by the projects and develops a checklist for performing and reporting on these assessments.

ADDRESSING SUSTAINABILITY AND CIRCULARITY

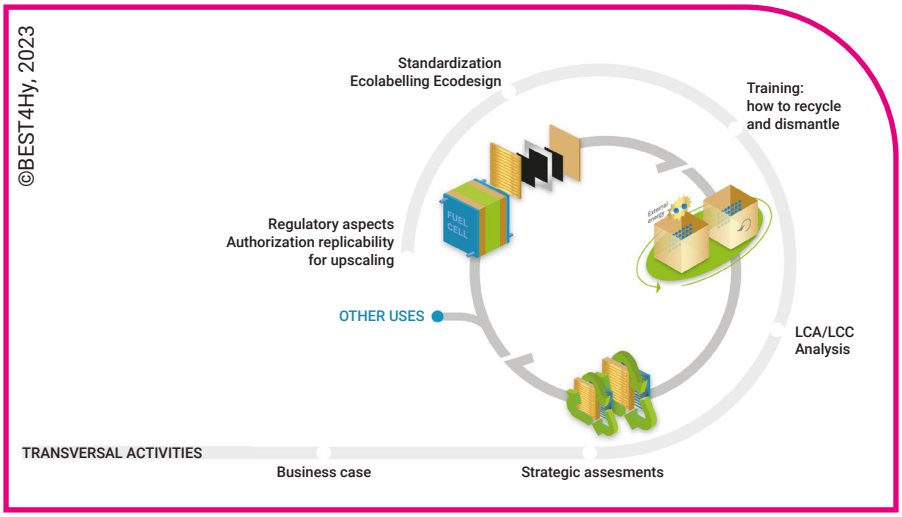
The hydrogen sector needs to be a sustainable and circular in line with the EU's strategy and rules on energy system integration and also contribute towards the achievement of the UN's Sustainable Development Goals (SDGs) and the objectives of the Paris Agreement.

DRAWING ON EXPERTISE

The partnership organises various activities to get experts' views on increasing sustainability and circularity. In 2024, it launched the European Hydrogen Sustainability and Circularity Panel and it also runs workshops. These have led to the development of new projects, such as HYDRA and NHYRA, which began in 2023 and 2024 respectively to focus on climate impacts.

The goal? The environmental impact of the hydrogen economy must be minimal, and resource reduction, recyclability and reuse must be maximised.

Key results? The projects are changing mindsets in the hydrogen industry and fostering a commitment to developing sustainable, circular technologies.



FIND OUT MORE

www.fch.europa.eu/page/fch-ju-projects
fc-hyguide.eu
sh2e.eu
eghost.eu
www.hypef.eu
hytechcycling.eu
best4hy-project.eu
sustaincell.eu
www.certifhy.eu
nhyra.eu

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KEY ACHIEVEMENTS

SYSTEMS THINKING TOOLS
on technology life cycles

ECO-DESIGN GUIDELINES
for FCH technologies

ENVIRONMENTAL FOOTPRINT RULES

RECYCLING AND DISMANTLING
research

GUARANTEE OF ORIGIN
scheme a first-of-its-kind for clean hydrogen

2 NEW PROJECTS –
NHYRA and HYDRA, which focus on the hydrogen sector's climate impacts

IMPACTS

ENVIRONMENTAL FOOTPRINTS
were measured for FCH technologies.

RECYCLING AND DISMANTLING
actions were demonstrated.

GREATER COOPERATION
will lead to informed decision-making.

GREATER REDUCTION, RECYCLING AND REUSE
strategies adopted by the hydrogen sector.

A path toward
LIFE-CYCLE SUSTAINABILITY ASSESSMENTS, RECYCLING AND ECO-DESIGN
has been charted by the projects.

Progress has been made by the sector towards achieving
EU AND GLOBAL SUSTAINABILITY GOALS.

Clean Hydrogen Partnership

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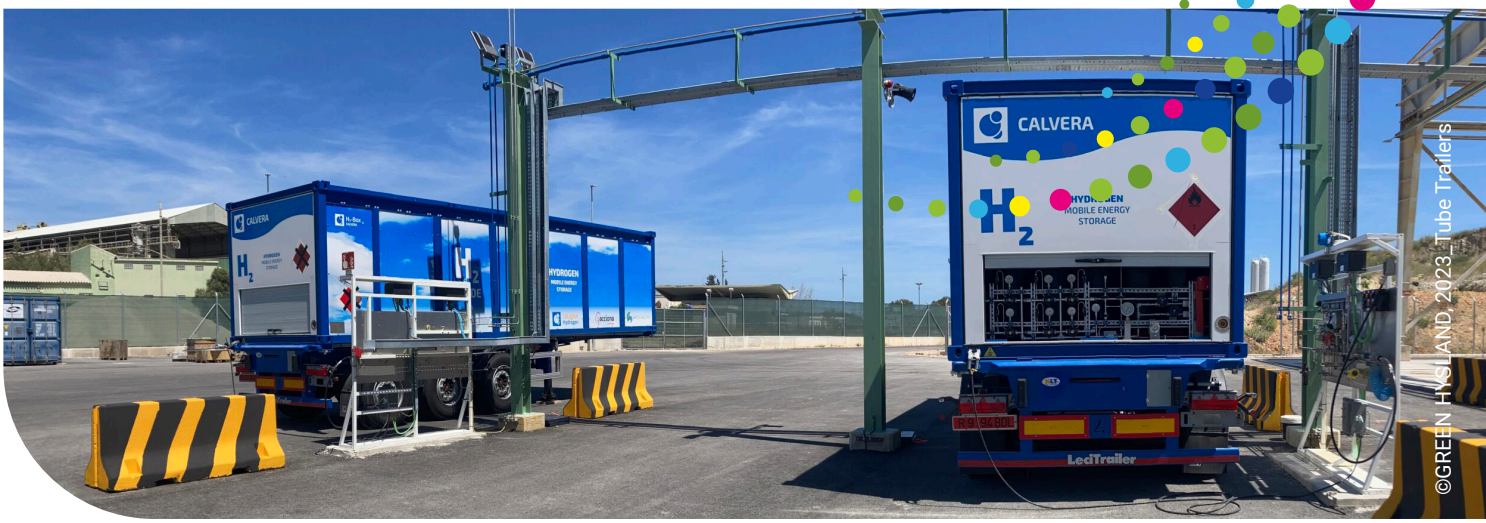
Clean Hydrogen Partnership

H_2 valleys

Helping Europe's regions grow their hydrogen economies



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Since 2017, the Clean Hydrogen Partnership has been working with European regions to develop their hydrogen economies. This support takes various forms. It includes the promotion and funding of hydrogen valleys, the establishment of a project development assistance facility and synergies with regional managing authorities.

Several support mechanisms

Hydrogen is key to shaping the green transition. The Clean Hydrogen Partnership has been awarding grants to hydrogen valleys across Europe, a contribution to the EU's REPowerEU plan.

The European Commission allocated to the Clean Hydrogen Partnership an additional EUR 200 million through REPowerEU to double the number of Hydrogen Valleys in Europe by 2025. The aim is to scale up green hydrogen production to meet the growing demand.

In addition, funding for the Hydrogen Valley Platform supports the Clean Hydrogen Mission, which aims to reduce hydrogen costs by facilitating the delivery of 100 large-scale hydrogen valleys worldwide by 2030. The platform provides information on existing valleys to inspire the creation of new ones.

Meanwhile, the project development assistance facility (PDA) is helping regions with limited hydrogen deployment to formulate project plans. Furthermore, the partnership has signed agreements to develop structured and tailored cooperation plans with regional authorities.

Building on past work

Clean Hydrogen Partnership's grants have been building on support provided under the FCH-Regions initiative and the European Hydrogen Valleys Partnership, which led to the development of flagship projects like HEAVENN and Green Hysland.

The pilot phase (2019 to 2021) of the PDA mainly targeted central and eastern Europe. The second phase was aimed at islands, outermost regions and regions receiving cohesion policy assistance. A planned Hydrogen Valleys Facility will accelerate the creation of hydrogen valleys through continued PDA support.

At the same time, cooperation with regional authorities will focus on research and innovation, capacity building, knowledge transfer and funding.

TOWARDS DECARBONISATION

Hydrogen is a vital element in the green transition, and the Clean Hydrogen Partnership helps European regions develop their hydrogen economies and reach decarbonisation and growth goals.

DE-RISKING HYDROGEN PROJECTS

Clean Hydrogen Partnership support enables regions to put their project ideas into practice. This boosts the hydrogen economy by helping to integrate sectors consuming energy with the energy production industry within a regional set-up, reducing the risk inherent in launching projects.

The goal? It is essential to accelerate the green transition at regional level by replacing natural gas, coal and oil with renewable hydrogen in various sectors.

Key results? The partnership has helped to expand hydrogen valleys and foster global partnerships, leading to clean, sustainable energy.

FIND OUT MORE

www.clean-hydrogen.europa.eu/projects-dashboard
www.clean-hydrogen.europa.eu/get-involved/working-regions_en
h2v.eu

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KEY ACHIEVEMENTS

16 HYDROGEN VALLEYS
supported in 15 European countries

EUR 1 BILLION TOTAL INVESTMENT
in the 16 valleys

13 NEW HYDROGEN VALLEYS
allocated grants in 2022 and 2023

11 REGIONS
supported under the pilot PDA

14 REGIONS
in 9 countries supported under PDA 2

10 MEMORANDA OF COOPERATION
with managing authorities to foster synergies

OVER 60 EUROPEAN HYDROGEN VALLEYS
listed on the Hydrogen Valley Platform

IMPACTS

ENTIRE VALUE CHAIN
is covered from production to distribution.

TRANSPORT, INDUSTRY AND HEATING
are among the targeted sectors.

OVER 200 MW
of electrolyser capacity is planned.

EUR 45.6 MILLION
is to be directed to 67 SMEs.

ADDITIONAL FUNDING
is available for valleys via national calls.

900 MW
of energy capacity is to be developed via PDA 2.

Clean Hydrogen Partnership

Co-funded by the European Union

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