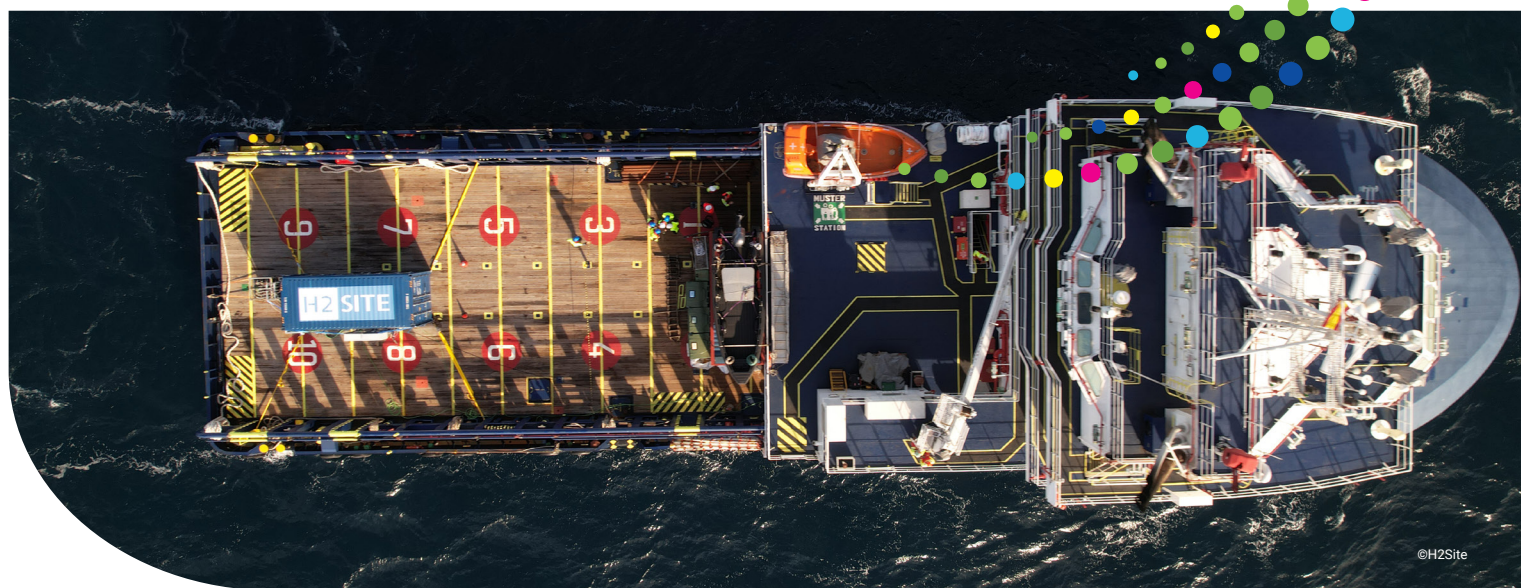


## Transforming EU-funded research into real-world solutions: H2SITE brings membrane reactor and separator technology to market



**Turning research into market-ready technology is a cornerstone of the EU's clean energy ambitions. H2SITE, a European deeptech start-up, exemplifies this journey. Drawing on breakthroughs from a series of Clean Hydrogen Partnership-funded research projects, H2SITE has successfully commercialised a membrane reactor technology that enables decentralised, energy-efficient production and separation of high-purity hydrogen from gases such as ammonia and methanol. By offering a compact, feedstock-flexible solution to obtain hydrogen where it is needed, H2SITE is opening up new pathways for clean hydrogen deployment in industrial, maritime mobility and energy storage sectors across Europe.**

### A Game-Changer for On-Site Hydrogen Purification

Hydrogen can be produced from a wide range of sources - biogas, methanol, ammonia - but traditional purification methods are energy-intensive, centralised, and costly. This creates a barrier to widespread hydrogen use in sectors that require high-purity hydrogen close to the point of need.

H2SITE addresses this challenge by combining hydrogen production and purification in a single step, using membrane reactor and separator systems. This breakthrough enables distributed purification, reducing transport and storage emissions, lowering overall

hydrogen supply costs, and increasing access to clean hydrogen in remote or decentralised settings.

### From EU-funded research to commercial reality

H2SITE is built on more than a decade of EU research investment. Its technology draws on breakthroughs developed across six key Clean Hydrogen Partnership-supported projects.

*"Building on over a decade of European research, H2SITE has transformed cutting-edge innovation into a market-ready solution, delivering clean and cost-competitive hydrogen exactly where it's needed efficiently, sustainably, and locally." H2SITE CEO Andrés Galnares*

**FLUIDCELL** demonstrated how small-scale, fuel-flexible fuel cell systems incorporating membrane technology could improve efficiency in small-scale hydrogen applications. **ReforCELL** advanced reforming technology for high-efficiency hydrogen recovery. **FERRET** scaled membrane reactors to industrial levels. **BIONICO** proved that high-purity hydrogen can be produced from biomass in a single reactor step. **HYGRID** combined membrane and non-membrane purification for increased energy efficiency. Finally, **HIGGS** assessed the impact of natural gas-hydrogen (NGH<sub>2</sub>) blends in the separation process and explored the impact of high levels of hydrogen on gas infrastructure.

The cumulative impact of these projects enabled H2SITE to bring its technology to market rapidly, offering solutions that are already being piloted across Europe and globally in key industrial sectors, such as hydrogen separation from natural gas at Mortara in Italy, in a pilot project with the Italian gas network operator, currently the world's largest of its kind using H2SITE membrane reactors technology.

More recent co-funded projects such as HERMES, APOLLO and HYIELD are extending this trajectory, advancing clean hydrogen solutions from waste valorisation to maritime transport and next-generation energy systems.

## Supporting hydrogen deployment where it matters

H2SITE's systems have already been tested and validated in various international projects across different application areas. These include refineries and chemical plants where high-purity hydrogen supports decarbonisation efforts, and hydrogen refuelling stations that benefit from decentralised purification without needing large-scale infrastructure. The technology also supports hydrogen-based energy storage, contributing to grid flexibility and resilience, in addition to on-board ammonia cracking for the decarbonisation of the maritime sector.

The company continues to attract investment and build partnerships with industry stakeholders, showing the commercial viability of clean hydrogen technologies rooted in public R&I funding.

**The goal** To make clean hydrogen more accessible by decentralising purification and reducing the cost and energy burden of hydrogen separation - helping to meet EU climate and energy targets across various sectors.

**Key results** H2SITE has demonstrated a scalable membrane reactor and separator solution capable of purifying hydrogen from diverse feedstocks at the point of use. Its journey from EU-funded innovation to industrial deployment shows how research can accelerate real-world energy transitions. Now operational in several industrial and mobility settings, H2SITE is proof that strategic public investment in research can drive real-world impact and unlock Europe's hydrogen economy.

## KEY ACHIEVEMENTS

### MEMBRANE REACTOR

technology developed for decentralised hydrogen purification

### ULTRA-HIGH PURITY

hydrogen achieved for industrial and mobility applications

### FEEDSTOCK FLEXIBILITY

including ammonia, methanol and biogas

### REAL-WORLD DEPLOYMENT

of systems across European sites

### 6 EU PROJECTS

provided the foundation for industrial-scale innovation

## IMPACTS

### DECARBONISATION

enabled in sectors such as chemicals, refining and transport

### ENERGY SAVINGS

achieved by reducing the number of purification steps

### TRANSPORT EMISSIONS

cut by avoiding the need to distribute compressed hydrogen

### INDUSTRIAL PARTNERSHIPS

formed to demonstrate and scale the solution

### EU INNOVATION

translated into a commercial clean-tech success story

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[www.h2site.eu](http://www.h2site.eu)

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<https://www.hygrid-h2.eu/>

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