

HERMES Project Launches to Deliver Next-Generation Hydrogen Purification Solutions for Europe's Green Transition

A European consortium has launched **HERMES** (Hydrogen Efficient Purification Using Membranes in Industrial Gas Streams), a four-year Horizon Europe initiative supported by the Clean Hydrogen Partnership. The project brings together seven organisations from four countries — including major industrial players, research centres, and academia — to deliver innovative hydrogen purification technologies that can accelerate Europe's decarbonisation goals.

Coordinated by **H2SITE** (Spain), HERMES will develop and demonstrate two advanced membrane-based reactor prototypes at **Technology Readiness Level 7** in operational industrial environments. These prototypes, based on palladium (Pd) and carbon molecular sieve (CMS) membranes, will each be capable of producing 100 kg/day of high-purity hydrogen.

The systems will be tested on **real industrial gas streams with variable hydrogen content and complex compositions** — from hydrogen-rich gas sources (up to 97% H₂) to challenging mixed hydrocarbon streams in refinery desulphurisation units (as low as 5% H₂), as well as syngas from methanation and biomass gasification. This broad operating range makes HERMES one of the most comprehensive hydrogen purification demonstrations in Europe.

Through this work, **HERMES aims to prove the technical and economic viability of flexible, scalable hydrogen purification systems, open new opportunities for integrating renewable hydrogen into industrial processes, and contribute to a more resilient and sustainable energy system in Europe.** The project also integrates full life-cycle, cost, and safety assessments to ensure that the solutions are sustainable, economically viable, and safe for large-scale adoption.

With **TÜPRAŞ** (Türkiye's largest industrial enterprise) validating Prototype 1 and **SNAM** (Italy's leading gas infrastructure company) validating Prototype 2 at fuel-cell grade hydrogen purity, HERMES will strengthen Europe's technological leadership in clean hydrogen and support the REPowerEU and Green Deal objectives. The knowledge generated will help pave the way for replication in other sectors such as refineries, chemical plants, and renewable hydrogen hubs.

The consortium also includes **TECNALIA** (Spain), **TU/e** (Netherlands), **Fondazione Bruno Kessler** (Italy) and **INTRACT** (Türkiye), bringing together complementary expertise in hydrogen technology development, system integration, industrial operation, and market uptake.

To follow HERMES' progress and discover its contribution to Europe's hydrogen economy:

-  Website: hermes-h2.eu
-  LinkedIn: linkedin.com/company/hermes-h2-project
-  YouTube: youtube.com/@hermes-h2-project
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