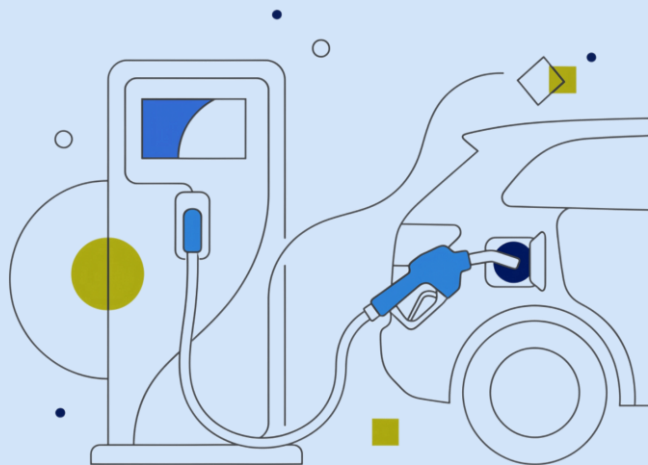




VeripHy: From Validated Prototype to Commercial HSTA

TRL 6 → TRL 9 | IH-MIE Open Call 2026

The Lean Hydrogen Company S.L. · Sevilla, Spain

Europe's HRS Deployment Challenge Demands Reliable SAT

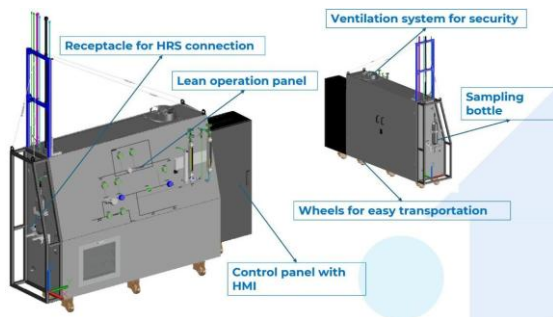
The Regulatory Driver

The **AFIR mandate** accelerates deployment of public hydrogen refuelling stations across the TEN-T network. Every station must be verified before opening to the public — making Site Acceptance Testing (SAT) a legal requirement, not an option.

The Gap in Practice

- SAT is often **skipped or performed with real vehicles**: no controlled fault injection, no repeatability
- A 2024 CARB study of 22 light-duty stations found **none fully complied** with SAE J2601
- Many stations lacked a data-acquisition system able to record fuelling data required by HGV 4.3
- Documentary review alone does not reproduce conditions governing a real dispensing event

 The scarcity of dedicated SAT apparatus means non-conformities go undetected: creating safety and compliance risk at every new HRS opening.



THE SOLUTION

What is VeripHy?

VeripHy is a mobile **Hydrogen Station Testing Apparatus (HSTA)**. It emulates a hydrogen vehicle's compressed storage system (CHSS) to perform fully controlled, traceable Site Acceptance Tests on any HRS.

- Designed following **ISO 19880-1**; protocols per **SAE J2601 & SAE J2799**
- Safety compliance: ATEX, R134, CGA 5.5 and harmonised CEP practice
- Developed by **The Lean Hydrogen Company S.L.**
- Includes all instrumentation and software required to test the station end-to-end



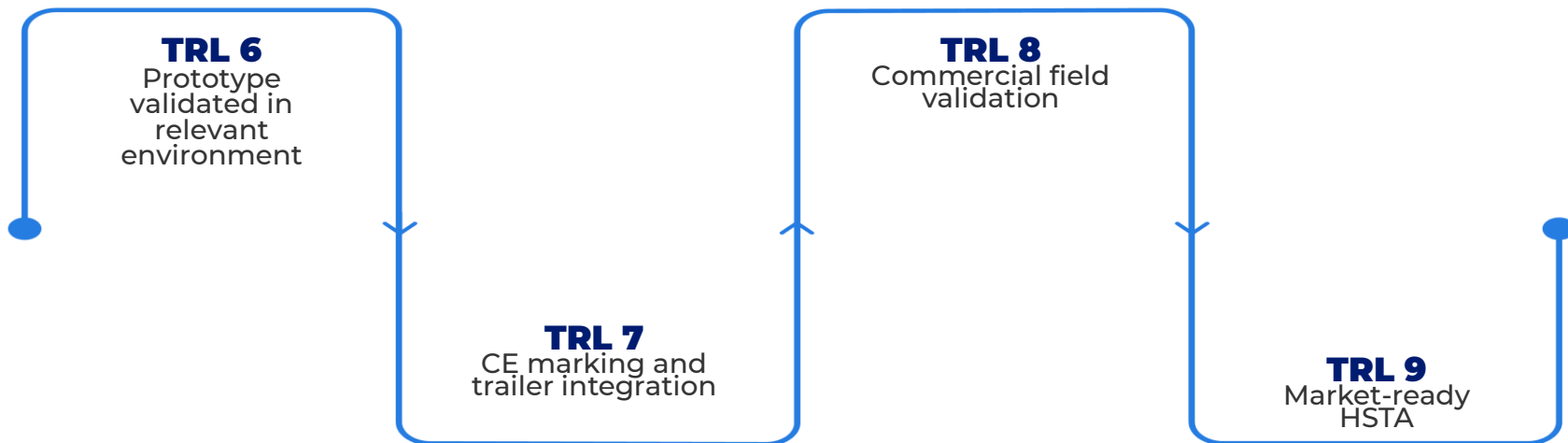
Current Status TRL 6 -Validated Prototype

Prototype Built Q4 2024

Type IV tank, 104 L, 70 MPa. Covers **SAE J2601 Category B** (light-duty HRS). Developed with NEOTEC / CDTI funding as the Minimum Viable Product.

Field-Validated on 2 Real Spanish HRS

Tested on commercial stations **H35-T40** and **H70-T40**. Confirmed nominal safety behaviour and detected real non-conformities in pressure-ramp control, pre-cooling and fault response.



What VeripHy Can Do Today



Fuelling Protocol Verification

Real-time pressure, temperature & flow measurement. Verifies both **Table-Based and MC Formula-Based protocols** with and without IR communication (ISO 19880-1). Signal forcing checks HRS safety system responses.



Hydrogen Purity Testing

On-site O₂ and H₂O measurement (pass/fail) plus sampling bottle for full laboratory certification per **SAE J2719**.

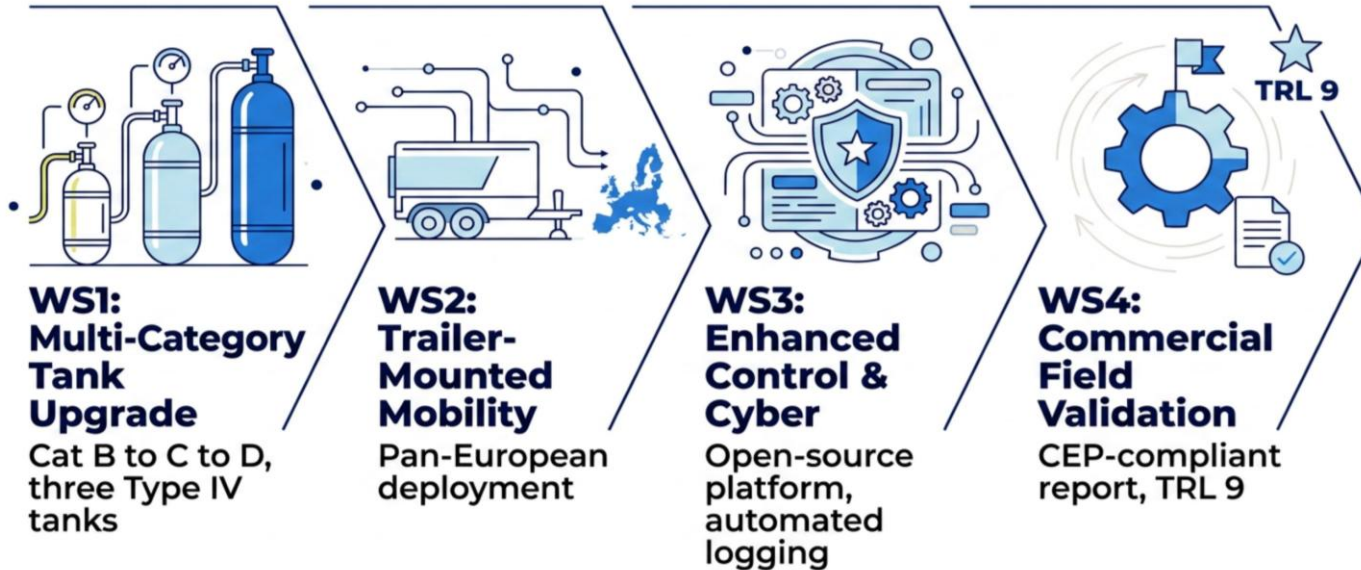


Station-Side Modbus Link

Provides a second independent data and safety layer plus a complete data acquisition interface for full traceability of each test event.

The Roadmap: TRL 6 → TRL 9

This IH-MIE Open Call 2026 project, submitted under **Challenge 2: Refuelling Infrastructure**, transforms the validated prototype into a **CE-marked, commercially deployable HSTA** covering all SAE J2601 categories.



WS1

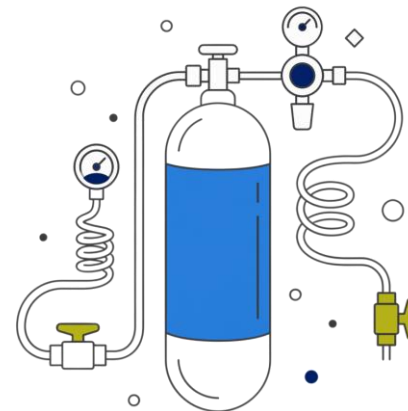
Multi-Category Tank Upgrade

Cat. B → Cat. C → Cat. D

The current prototype uses a single 104 L tank, limiting testing to light-duty stations only. WS1 replaces this with a **three-tank Type IV configuration**, unlocking the full SAE J2601 category range.

- Three Type IV tanks, **100–124 L each**, rated to 70 MPa
- Certified under **PED or TPED** → enabling CE/π marking of the complete equipment
- Expands addressable market from light-duty to **heavy-duty HRS testing** across Europe

📋 This is where **Type IV tank manufacturers** with PED/TPED certification become critical partners.



WS2 & WS3: Mobility and Enhanced Control



WS2

Trailer-Mounted for Pan-European Mobility

- Transfer the equipment to a **road trailer** deployable to any HRS across Europe without specialised logistics
- Directly addresses the key limitation identified in field validation: single-site prototype vs. scalable commercial service

WS3

Enhanced Control, Safety & Cybersecurity

- Migrate equipment control to an **open-source software platform** improving test granularity and repeatability
- Enhanced individual test control and **automated data logging** for full traceability
- Cybersecurity hardening aligned with current **EU regulatory requirements** for critical infrastructure

Commercial Validation at a Live HRS → TRL 9

The final workstream deploys the CE-marked, trailer-mounted VeripHy at a **partner HRS** to complete full commercial validation under real operating conditions.

- Generate a **CEP-compliant test report**: the industry-standard deliverable for HRS commissioning across Europe
- Successful validation achieves **TRL 9**: commercially available, field-proven HSTA ready for market entry

✓ TRL 9 = commercially available, field-proven equipment ready to serve the European HRS rollout.



Who We Are Looking For

We are seeking **two types of strategic collaborators** to join the IH-MIE project consortium:

HRS Operators / Station Owners

Willing to **host the commercial validation campaign** (WS4) using the CE-marked VeripHy trailer at your live station.

Type IV Tank Manufacturers

Supplying **PED/TPED-certified tanks** (100–124 L, 70 MPa) to co-develop the multi-category CHSS configuration in WS1.

Join Us: Build the Infrastructure That Certifies Hydrogen Infrastructure



Contact

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Open Call

IH-MIE Open Call 2026
Challenge 2: Refuelling
Infrastructure

Project Goal

CE-marked commercial HSTA
TRL 9 by project end