

SHIMMER

SAFE HYDROGEN INJECTION MODELLING AND MANAGEMENT FOR EUROPEAN GAS NETWORK RESILIENCE



Project ID	101111888
PRD 2023	Pillar 5 – Cross-cutting
Call topic	HORIZON-JTI-CLEANH2-2022-05-03: Safe hydrogen injection management at network-wide level: towards European gas sector transition
Project total costs	EUR 3 037 265.00
Clean H₂ JU max. contribution	EUR 2 999 156.25
Project period	1.9.2023–31.8.2026
Coordinator	SINTEF AS, Norway
Beneficiaries	Bundesanstalt für Materialforschung und -prüfung, Enagás Transporte SA, Fundacion Tecnalia Research and Innovation, Gassco AS, Groupe Européen de Recherches Gazières, INRETE Distribuzione Energia SpA, Instytut Nafty i Gazu – Państwowy Instytut Badawczy, Nederlandse Organisatie voor toegepast natuurwetenschappelijk onderzoek, Operator Gazociągów Przesyłowych GAZ-SYSTEM S.A., Politecnico di Torino, Redexis Gas Servicios SL, Redexis SA, Snam SpA

PROJECT AND GENERAL OBJECTIVES

To accelerate the transition to a low-carbon economy while exploiting existing infrastructure, hydrogen can be injected into the natural gas network. However, there are many technical and regulatory gaps that should be closed and adaptations and investments that should be made to ensure that multigas networks across Europe will be able to operate in a reliable and safe way while providing gas of highly controllable quality and meeting energy demand. Recently, the European Committee for Standardization concluded that it was impossible to set a common limiting value for hydrogen injected into the European gas infrastructure, instead recommending a case-by-case analysis. In addition to this, there are still uncertainties related to the material integrity of pipelines and network components with regard to their reduced lifetimes in the presence of hydrogen.

Results from previous and ongoing projects on the hydrogen readiness of grid components should be summarised in a systematic manner together with the assessment of the existent transmission and distribution (T & D) infrastructure components at the European level to provide stakeholders with decision support and risk reduction information to drive future investments and the development of regulations and standards.

The Shimmer project aims to enable higher levels of hydrogen integration and safer hydrogen injection management in multigas networks by contributing to the knowledge and better understanding of hydrogen projects and their risks and opportunities.

NON-QUANTITATIVE OBJECTIVES

- To map and address the European gas T & D infrastructure in relation to materials, components and technologies and their readiness for hydrogen blends.

- To define methods, tools and technologies for multigas network management and quality tracking – including simulation, prediction and safe management of transients – with a view to widespread hydrogen injection across Europe.
- To propose best-practice guidelines for safely handling hydrogen in the natural gas infrastructure and managing the risks.

PROGRESS AND MAIN ACHIEVEMENTS

The technical work during the first month has started in two work packages.

WP3 - Integrity Management and Safety

- Gathering information about materials and components in natural gas grids of participating TSOs and DSOs.
- Identifying critical material properties and component factors.
- Reviewing existing in-line inspection methods and involving technology providers in test campaigns.
- Gathering information on common leakage detection methods among operators.

WP4 - Flow Assurance

- Defines network models and case studies.
- Several workshops were held with TSOs and DSOs.
- A realistic case requirement document of needed components and data was achieved.
- Next phase focuses on collecting input data and finalizing case and model definitions.

<https://shimmerproject.eu/>

PROJECT TARGETS

Target source	Parameter	Unit	Target	Target achieved?
	Capability to control hydrogen presence over a served area	km ²	TSOs: > 100 DSOs: > 5	
Project's own objectives	Trained professionals	number	Tier 1: 120 000 Tier 2: 40 000 Tier 3: 20 000	
	Capability to track hydrogen spreading through the network structure	$\Delta\%H_2/h$ $\Delta\%H_2/km^2$	< 1 % < 2 %	
SRIA (2021–2027)	Total capital investment	M€/km	0.8	
	Operational expenditure pipeline	€/kg	0.01	
	Projects with proactive safety management	number	100	
	H ₂ leakage	%	0	
	Safety, PNR/RCS workshops	number/year	4	
AWP 2018	Impact on standards at scope	number/project	1	