THOTH2

NOVEL METHODS OF TESTING FOR MEASUREMENT OF NATURAL GAS AND HYDROGEN MIXTURES

Project ID	101101540
PRR 2025	Pillar 5 - Cross-cutting
Call Topic	HORIZON-JTI-CLEANH$_2$-2022-05-04
Project Total Costs	1 997 361.25
Clean H$_2$ JU Max. Contribution	1 997 360.50
Project Period	01-02-2023 - 31-07-2025
Coordinator Beneficiary	SNAM S.P.A., IT
Beneficiaries	CESAME-EXADEBIT SA, INRETE DISTRIBUZIONE ENERGIA S.P.A, GRTGAZ, ENAGAS TRANSPORTE SA, GERG LE GROUPE EUROPEEN DE RECHERCHES GAZIERES, OPERATOR GAZOCIAGOW PRZESYLOWYCH GAZ-SYSTEM SPOLKA AKCYJNA, EIDGENOSSISCHES INSTITUT FUR METROLOGIE METAS, INSTYTUT NAFTY I GAZU - PANSTWOWY INSTYTUT BADAWCZY, ISTITUTO NAZIONALE DI RICERCA METROLOGICA, COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANISATION, FONDAZIONE BRUNO KESSLER, AGENZIA NAZIONALE PER LE NUOVE TECNOLOGIE, L'ENERGIA E LO SVILUPPO ECONOMICO SOSTENIBILE, ALMA MATER STUDIORUM - UNIVERSITA DI BOLOGNA

https://thoth2.eu/

PROJECT AND GENERAL OBJECTIVES

THOTH2 aims to cover the normative and standards gaps related to methodologies and protocols for evaluating the performances and identifying the limits and tolerances of state-of-the-art (SOA) measuring devices in transmission and distribution systems when carrying mixtures of hydrogen and natural gas or pure hydrogen. THOTH2 will design dedicated methodologies to test different types of measuring devices (gas meters, gas volume conversion devices, pressure and temperature transducers, gas quality analysers, and gas leak detectors) under various operating conditions.

NON-QUANTITATIVE OBJECTIVES

THOTH2 will help the scientific and industrial communities understand the potential impact of different H_2/NG mixtures on the performances of SOA measuring devices installed in the transmission and distribution gas infrastructures. European transmission system operators (TSOs) and distribution system operators (DSOs) will benefit from the project results, as they will obtain important information about the limits and tolerances of the measuring instruments under various operating conditions. As THOTH2 is a pre-normative research project, recommendations will be sent to the normative bodies to support the development of new standards and the update of existing ones.

PROGRESS, MAIN ACHIEVEMENTS AND RESULTS

- Assessment of SOA, barriers and bias on metering devices for natural gas / hydrogen blends and pure hydrogen.
- Definition of the methodologies for testing the different measuring devices.
- Preparation of the test rigs and reporting procedure for experimental activities.
- Start of testing campaigns in December 2024, after the collection of the devices (gas meters, pressure transducers, water dew point analysers, leak detectors, flow computers) from manufacturers.
- Application of methodologies and testing protocols on selected devices to evaluate their performances under different operating conditions.

FUTURE STEPS AND PLANS

- Validation of the test methodologies to provide insights which will be included in recommendations, and subsequently be shared with relevant standardisation bodies and manufacturers through the THOTH2 Stakeholders Advisory Board.
- Development of a repurposing concept for an existing gas meters calibration facility for operation in the natural gas containing blended hydrogen.

PRR 2025 PILLAR
Cross-cutting

Clean Hydrogen Partnership
Co-funded by the European Union

PROJECT TA RGETS

Target source	Parameter	Unit	Target	Achieved to date by the project	Target achieved?
Project's own objectives	Papers submitted to open access peer-reviewed journals during the project.	Number	4	3	
	Presentation of the project at at least 5 professional workshops/ exhibitions.	Number	5	3	
	Organisation of a closing workshop presenting the project results to all interested stakeholders.	Number	1	-	
	Presentation in international and other relevant conferences identified during the project.	Number	7	3	✓
	Safety, PNR/ RCS Workshops.	Number	2	1	
	Validation of new or modified test protocols and methods.	Number	5	-	
	Definition of preliminary guidelines and recommendations for new standards.	Number	1	-	
	Concept of repurposing of an existing gas meters calibration facility for operation in the natural gas containing blended hydrogen.	Number	1	-	
	Definition of SoA of measuring devices installed in NG transmission and distribution networks.	Number	1	1	
	Definition of methodologies and testing protocols for assessing the performances of measuring devices with H_2NG mixtures.	Number	5	5	⚙
	Test rigs preparation and reporting procedure for experimental activities.	Number	1	1	
	Organisation of at least one Stakeholder Advisory Board workshop.	number	1	1	