SmartGasNet

Metrology for smart metering in gas networks

About SmartGasNet

Partial replacement of natural gas with renewable alternatives is essential to mitigate climate change. There is an urgent need to accelerate the clean transition by scaling up biomethane and hydrogen utilisation within the European infrastructure. However, the introduction of these renewable gases in gas grids gives rise to increasing fluctuations in gas flow rates and properties.

The main objective of SmartGasNet is to advance the processes for data collection, modelling, processing and prediction to foster the safe, efficient and economic operation of gas grids, supporting the introduction of low-carbon and renewable energy gases. Findings will foster the introduction of renewable energy gases such as hydrogen and biomethane in current gas grids, partially replacing natural gas. This project will provide the necessary methods, algorithms, datasets and good practice guides to enable gas grid operators to adapt their data processing for fiscal metering, custody transfer and billing.

Project Partners

VSL — National Metrology Institute

ČESKÝ METROLOGICKÝ INSTITUT

LITHUANIAN ENERGY INSTITUTE

PTB — Physikalisch-Technische Bundesanstalt Nationales Metrologieinstitut

DTU — Technical University of Denmark

ERIG

GERG — THE EUROPEAN GAS RESEARCH GROUP

NORCE

TNO innovation for life

UNIVERSITY OF LJUBLJANA — Faculty of Mechanical Engineering FS

Objectives

1 To create datasets for time-resolved gas flow measurements, including temperature, pressure and gas composition using state-of-the-art methods and techniques, mimicking changes in gas grid flow rate, pressure, temperature and gas composition typically seen in real-world scenarios to enable studying and modelling of time-correlation effects..

2 To develop methods for the evaluation of time correlations in gas metering data, as well as uncertainty evaluation for time averages of gas quantity and calorific value, and link these with models used to operate gas grids. The methods should apply to grids for hydrogen, natural gas and hydrogen-enriched natural gas (enriched to the most common level), and fully validated.

3 To assess the possibility of integrating machine learning (ML), as a type of artificial intelligence (AI), in smart metering and monitoring systems used in gas grids with respect to its applicability to produce measurement results that meet the requirements of ISO/IEC 17025, OIML R140 and ISO 15112, and ISO/IEC Guide 98.

4 To develop and validate an integrated package of methods for the evaluation of measurement data to support gas allocation and the fiscal metering of the most commonly used blends of natural gas with renewable gases (e.g., hydrogen and biomethane), as well as renewable hydrogen.

5 To facilitate the take-up of the technology and measurement infrastructure developed in the project by the measurement supply chain (GERG and MARCOGAZ), standards developing organisations (ISO/TC 193, ISO/TC 197, CEN/TC 234, EURAMET TC-F and TC-MC), legal metrology organisations (WELMEC, OIML) and end users (e.g., gas network operators).
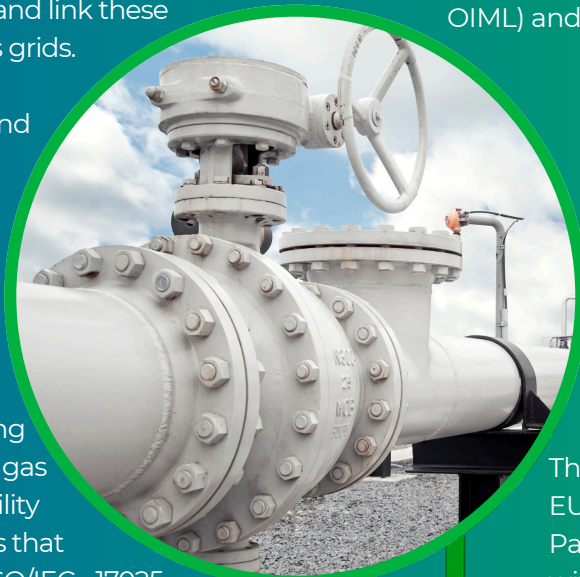
Funding

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Contact

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Social Media

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