

# Contact

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# CryoMet

## Metrology for reliable liquefied energy gases measurement



# Objectives

**1** To determine the measurement reliability and uncertainty of (bio-)LNG flow meters in-field, including (i) 2-phase flow, (ii) meter insulation type, (iii) reproducibility, and (iv) temperature cycles. In addition, to develop traceable (bio-)LNG and LH<sub>2</sub> meter diagnostics and demonstrate, using SI-traceable reference data sets, a target accuracy of 0.5 % for (bio-)LNG flow meters.

**2** To determine the reliability of (bio-)LNG composition measurements under in-field conditions, including sampling errors, and the achievable accuracy of LNG composition measurement equipment. Then, to demonstrate, using SI-traceable reference data sets, a target uncertainty of less than 0.3 % ( $k = 2$ ) for the online determination of LNG density.

**3** To determine the accuracy of (bio-)LNG in-field temperature measurements, including the impact of static and dynamic effects on the temperature measurement system. Then, to demonstrate, using SI-traceable reference data sets, a target uncertainty maximum of 0.5 °C ( $k = 2$ ), for in-field conditions and for cryogenic temperatures down to -253 °C, applicable for LH<sub>2</sub>.

**4** To perform SI-traceable flow and temperature measurements in LH<sub>2</sub> conditions and to develop SI-traceable calibration procedures for LH<sub>2</sub> flow, composition, and temperature measurement systems. In addition, to verify the performance of the (bio-)LNG and LH<sub>2</sub> metrological infrastructure developed, including through inter-comparisons of the SI-traceable calibration systems.

**5** To facilitate the take-up of the technology and measurement infrastructure developed in the project by the measurement supply chain (accredited laboratories, instrument measurement manufacturers), standards developing organisations (OIML TC 8, ISO/TC 28, CEN/TC 408, IEC/TC 65/SC 65B), the EMN for Energy Gases and end users (e.g. research institutes, plant operators, TSOs/DSOs).



# About CryoMet

The “Fit For 55” legislation package requires an increased use of liquefied energy gases to reach a 55% net greenhouse gas emissions reduction by 2030. However, reliable measurement methods for bio-liquefied natural gas (bio-)LNG and liquefied hydrogen (LH<sub>2</sub>) are not yet fully developed.

Traceable measurements for (bio-)LNG and LH<sub>2</sub> are urgently needed across the supply chain. To address this issue, CryoMet will develop reference data sets and technical evidence to support the acceptance of measurement methods for (bio-)LNG and LH<sub>2</sub>. This will include verification of the results and datasets under in-field conditions and by SI-traceable inter-comparisons. The outcomes should enable the European liquefied gas metrological framework to be expanded, and new SI-traceable calibration procedures to be developed.

CryoMet’s liquefied gas measurement methods and good practice guidance will be disseminated and promoted to standardisation bodies, the measurement supply chain, and end-users.

# Project Partners

