



Conclusions

Christophe Brun
LNE



NewGasMet Training session 29-09-2022



NEWGASMET – Achievements and conclusions

WP1

This literature overview is the first ever.

Little amount of literature about metering renewable gases available 2 years ago.

For the different renewables gases studied, the literature & the users/operators feedbacks shows that they have all an impact on the existing gas meter. This impact depend on the quality/purity/contaminants/humidity of the renewable gases. It goes from impacting the uncertainty of the meter to the total broke of the measurement cell.

Therefore, none of the studied renewable gases except biomethane can be used with existing gas meter without prior study and experiments.



WP2

Recommendations to adapt normative standards

Proposal for renewable test gases to be used for metrological and durability tests

Durability tests with static H₂ and biogas flow

Current designs of domestic gas meters can not be used for measuring biogas flow with much confidence



WP2

EDX-SEM analyses of domestic gas meters

EDX-SEM analyses indicate that no severe degradation occurs of domestic gas meter internal components when exposed to H₂ in static conditions for a duration of 12 months.

Consequently, no severe degradation is expected for HENG applications when exposed to H₂ in static conditions for a duration of 12 months

Leak tightness tests of domestic gas meters

Leak flowrate is considerably larger with H₂ and it is therefore important to perform H₂ tightness tests

Durability tests on EVCDs with H₂

No significant effects observed on pressure transmitters



WP3

Bibliography about calibration test benches

Not many papers for renewable gas flow metering found in literature

Establishment of validated metrological test benches with exploitation for calibration of domestic gas meters with H₂, N₂, CH₄ was reached

Creation of generic measurement budget for suitable gas meter types

Purging of the facility must be performed properly to remove uncertainty contributions from the gas composition

Temperature effects (depressurization effect from gas cylinders bottles) needs to be handled carefully

Development of transfer packages (LFE and Nozzle/Rotary)

First tests with these packages were successful



WP3

Performance of inter-comparison tests with 4 laboratories took place
most results show satisfactory equivalence

Nozzles :

- agreement of discharge coefficient for air and hydrogen calibration inside uncertainty (conditions: input pressure up to 6 bar \square laminar regime and diameter larger 0.3 mm)
- nozzles are well suited as transfer standards (but re calibration not carried out yet for final judgement)

Rotary :

- small difference of error curves for methane vs air but same general behavior
- different behavior fo hydrogen vs air

Accuracy tests of domestic gas meters for conformity assessment of 2 types of diaphragm gas meters done by 2 metrological test benches (2 partners) using nitrogen and hydrogen have shown equivalent results



NEWGASMET

Important progress in knowledge about metering renewables gases

Development and/or adaptation of facilities to perform calibrations with renewable gases

For the future, more data about accuracy and durability tests is needed especially for tests with gas mixtures. Possible sources could be:

- data from manufacturers
- larger project with more tests to provide valuable statistics





Questions / Discussion

www.newgasmeter.eu

LinkedIn: Newgasmeter

