



## Flow metering of renewable gases (biogas, biomethane, hydrogen, syngas and mixtures with natural gas)

# Newsletter 3 Progress after Month 27 (M27)

**Date:** 01-10-2021

This letter provides an update on the progress so far in the EMPIR project JRP 18NRM06 NEWGASMET.

Since the last newsletter we have been working on different activities in the project. Below some interesting activities has been summarised.

### Testing the effect of hydrogen-admixture on the accuracy of high-pressure gas flow measurement.

Project partner VSL has started the measurement campaign to test the effect of mixing hydrogen with natural gas on the accuracy of a high-pressure flow meter, as part of Work Package 3. The accuracy of a rotary flow meter will be determined using the best possible uncertainty, by calibration using VSL's Gas-Oil-Piston Prover, the primary standard for high pressure natural gas flow. The rotary flow meter will be calibrated using both natural gas and hydrogen enriched natural gas (15% hydrogen), at two different test pressures: 9 and 16 bar.

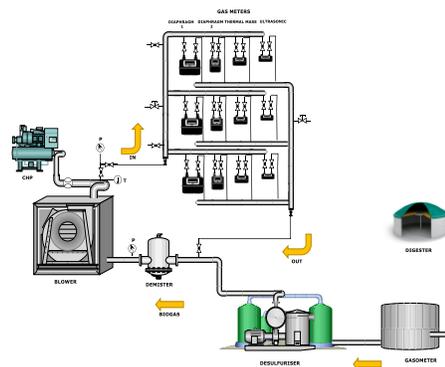
### The Biogas durability test.

Project partner ISSI is running the biogas durability test, this work started in September 2020. The test meters are mounted in a sewage sludge treatment plant near Milan. The sewage sludge treatment plant is producing treated biogas with a reduced concentration of H<sub>2</sub>S and moisture content. The flowing gas is analyzed on regularly basis.

Three different meter technologies are included in the test programme, with several meters of each type. The meters are periodically removed for metrological testing in order to track any shifts in performance over time.

We could witness the effects of this harsh environment on some meters already. And this is somehow expected because the test is done with gas compositions harsher than could be expected in the network with the scope to accelerate and identify the failure mechanisms and the material compatibility

An inspection of the meters will be made, and a final report will be issued when the test has finished.



### Tightness report.

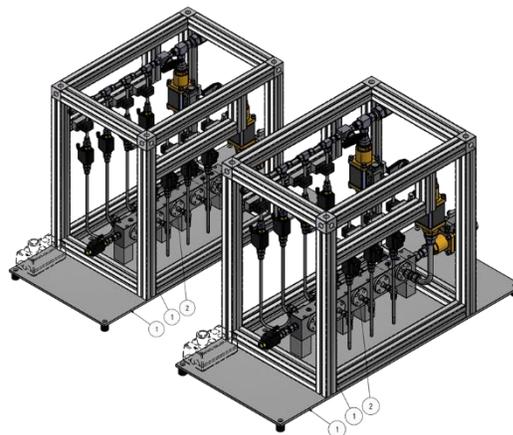
Project partner PTB has tested domestic gas meters for the gas tightness of hydrogen to assess its suitability for further testing with hydrogen. The meter is pressurized with hydrogen and then placed in a leak tight chamber filled with nitrogen. By measuring the pressure drop of the meter and inside the chamber, the leakage of the meter can be determined. The outcome of these test has been written in a report which will be available soon on the website [newgasmnet.eu](http://newgasmnet.eu).



### NEL-PTB test facilities.

The NEWGASMET project will assess the suitability of commercially available flow meters for use with renewable gases. A key consideration is the influence of hydrogen on flow meter accuracy, several countries in Europe and Worldwide are considering the introduction of hydrogen to gas distribution networks, either as a blend with natural gas or even as pure hydrogen.

To address this need, PTB and NEL have developed new hydrogen flow test facilities which use critical flow nozzles as the reference flow device. These new facilities are aimed at the domestic gas metering range, for calibration to the requirements of MID Accuracy class 1.5, with uncertainty targets of 1/5 MPE. Both facilities feature two reference metering sections, allowing the flow meter performance to be assessed with hydrogen, other pure gases and mixtures.



The development of these facilities is part of a wider study on the most appropriate calibration equipment and methods for renewable gases. Later this year, several domestic gas meters will be calibrated with hydrogen, the results of which will inform the development of new test procedures and revision of the CEN/TC 237 standards.

An intercomparison test programme is planned between the laboratories of PTB, NEL, CMI, VSL and MeterSit, which will provide evidence for the measurement uncertainty of the partner facilities and the suitability of several types of transfer standard for use with hydrogen and natural gas.

### Impact

NEWGASMET partners attended the CIM 2021 conference in Lyon at the 7-9 of Sept. to provide an overview of the project to the metrology community and industry stakeholders.

This provided an excellent opportunity to present the following aspects of the project:

- Conclusions of the bibliographic review and reports,
- Progress of the activities in technical work packages WP2 and WP3
- Development of tightness test methods
- Progress of reports to improve actual design standards for gas meters
- Progress of durability tests
- Design of tests benches and preparation of tests campaign
- Relation with standardization bodies and industry actors.

This has been a fruitful day to spread the knowledge about renewable gases flow metering.