



NATURALHY: the first step in assessing the potential of the existing natural gas network for hydrogen delivery

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ABSTRACT

Hydrogen and hydrogen-containing gases are seen by many as important options in the transition towards a more sustainable energy society. Hydrogen can be produced from various sustainable sources, including electricity from wind turbines, and is an important component of so-called syngas produced by the gasification of biomass and coal (in that case with carbon capture and storage (CCS)).

The NATURALHY project aimed to provide the natural gas industry with the necessary information to accommodate hydrogen in the existing natural gas grid with acceptable consequences. The project focussed on the potential showstoppers being, the durability of pipeline material, the integrity management, safety aspects, life-cycle and socio-economic aspects and end-use aspects.

The project has been selected by the European Commission for financial support under the sixth Framework Programme. The project had 39 partners including Gasunie, BP Gas Marketing Limited, DGC, GDF SUEZ, STATOIL, IGDAS, National Grid and GERG. The project started in 2004 and has been completed in October 2009. The overall budget amounted to 17 Million Euro. Gasunie was responsible for the overall project coordination.

The project has proved that::

- depending on the steel from which high pressure pipelines are constructed, these pipelines could be used for gas mixtures that contain up to 50% of hydrogen;
- safety related to the transmission, distribution and use of natural gas is not significantly compromised compared to the current situation with natural gas if up to 20% of hydrogen is added to natural gas. Additions up to 50% might be feasible but must be assessed case by case;
- the maximum percentage of hydrogen that can be allowed to ensure proper end-use performance depends on appliance type and condition as well as on local natural gas distribution conditions. For domestic appliances, a method has been derived to address these questions on the level of a distribution region (country).