



**Notes on an Expert Workshop on
"Underground storage of natural gas/hydrogen mixtures"
11th October 2011**

Attendees

J Lopez Zurita, Enagas (Chairman)
K Altfeld E.ON Ruhrgas AG
D Teichroeb, Enbridge, Canada
D Niu, DVGW
W Sloterdijk KEMA
M Hommes, KEMA
J Ivert Johansen, Energinet

J Höllwart, E.ON Storage
J-H Van Massenhove, Fluxys
L Nadau, GDF Suez
T Ihle, VNG
S Hatscher, Wintershall
S Schmitz, DBI
D Pinchbeck, GERG

The Meeting

The meeting began with welcome from the Chairman and a short introduction to GERG from Mr Pinchbeck.

Dr Altfeld introduced the natural gas system and the potential for inter-linkage with the electricity grid. He went on to explain the significant advantages that could be gained by using the gas grid as a storage option at times of over-production of renewable electricity and the effect this could have on load balancing.

Mr Teichroeb detailed the status quo in N America, including development of an electrolyser as a necessary pre-cursor to hydrogen storage in the NG system.

Dr Hatscher's presentation on "Hydrogen in Natural Gas Storages - Open Questions" provided a good introduction to underground natural gas storage in Germany and some of the anticipated problems. It was clear that, to date, work had not begun to determine the possible effects that H₂ may have on UG storage facilities.

Dr Hatscher went on to explain that the German gas storage owners and operators are organized in WEG KUGS (Wirtschaftsverband Erdöl- und Erdgasgewinnung e.V.) and, in 2009, they had founded a Work Group concentrating on potential effects due to change in gas supply sources for storages. In his view, it would be extremely difficult to perform tests on the existing storage facilities.

Mr Sloterdijk presented some results from the NATURALHY project which indicated that up to 30% hydrogen could be added to pipeline systems without any problems, although it was vital to assess each pipeline system before the addition of hydrogen. He felt also that there questions remained regarding tightness of cavern, salt and completion.

It was agreed that several important aspects needed investigation and that the consequences of changes in gas components have to be analyzed and limits and guideline have to be determined. There was strong agreement that the integrity and the performance of storage facilities must be maintained, because of the importance of its effects on security of supply.

It was agreed that a collaborative project should be set up between those present.