Hydrogen Pilot Network FEED

Funded by the Gas Innovation fund

Project Objectives:

- Assessment of 12 candidate sites for selection of the area on the existing network to base the study.
- Research of other ongoing EU Hydrogen Projects.
- Development of a Front-End Engineering Design (FEED) study for the transport of hydrogen at pilot scale to both industrial and domestic end users.
- Base FEED on a supply of 100% hydrogen to the industrial users and a 20% by volume hydrogen / natural gas blend within the distribution network.

Materials selection
Acceptable Materials as per ASME B31.12: • Aluminium and Aluminium Alloys • Austenitic Stainless Steels with greater than 7% Nickel (e.g., 304, 304L, 308, 316, 321, 347) • Carbon Steels • Copper and Copper Alloys (e.g., Brass, Bronze, and Copper – Nickel) • Low-Alloy Steels • Titanium and Titanium Alloys
PE is resistant to the effects of hydrogen up to a temperature of 60°C and so it is likely that PE systems will not require any modification prior to accepting hydrogen blends
The susceptibility of a material to experiencing hydrogen embrittlement is influenced by both increased pressures and increased material strength.
Grades higher than X70 shall not be used unless the pipe and weld material is qualified for hydrogen service. The highest grade currently used on the network is X65 meaning the current material grades in use are deemed suitable for hydrogen service (IGEM/TD/1 H2 Supplement)

Key Findings:

- The Candidate Site Selection evaluated 12 candidate sites based on their existing natural gas consumption, connectivity to the existing network, proximity to a distribution network as well as proximity to potential sources of green hydrogen.
- The Ringaskiddy industrial area was selected due to having close proximity to a port for hydrogen supply as well as the additional advantage of being at the end of the transmission network – good opportunity to have a 100% hydrogen pilot scale network in the area as it does not extend to any further users.
- In terms of pipe size, the majority of the existing transmission network studied is suitable for accommodating the required volumes of hydrogen.
- AGIs would require the addition of a hydrogen pressure reduction unit and a grid entry unit to accommodate hydrogen blending within the distribution network.
- An estimated total material cost for upgrading the AGIs to allow for hydrogen to be implemented within this pilot scale network is €1.2 - €1.5M. This does not include the cost associated with the hydrogen pipeline.