H_2 Learning by Doing

Trust
Quality
Progress

Re-purposing the gas grid to hydrogen

Where are we?

- 2014/15 Hyhouse. Understanding the way hydrogen moves around a Scottish Farm House
- 2015/16 NGN Leeds H21 study. Re-purposing feasible and cost effective <£10,000 per average meter point including SMR, transmission, storage and conversion.
- 2015/16. KPMG study. Hydrogen is very cost competitive with electricity Why?
  - It offers inter-seasonal storage
  - Typical <1/7th-1/20th per kW/km for transmission/distribution
  - Requires no DHW tank or heat pump.
  - Enables householders to keep their Combi's.
- 2018/to date Hy4Heat Gas boilers, fires, cookers, catering appliances etc
- 2018/to date H100 Underpinning safety work
- 2019/to date Several GDNO's investigate potential FOAK for demonstrating hydrogen.
- 2018/to date H21 looking at risks in the network.

GB should start progressing real projects.

THE UK did have (and still has?) a lead in hydrogen technology but a number of other countries are now seeing real potential eg the Netherlands, Germany and Japan.

GB will loose its lead in this sector unless it starts learning by doing.
Why?

1. Investor confidence
2. Developing the gas engineering skill base with knowledge of hydrogen
3. Strengthening the supply chain.
   - ❖ Appliances
   - ❖ Pipes
   - ❖ Fittings
4. Involving the gas retail/wholesale sector
5. Testing customer appetite, interest and acceptance of hydrogen applications through consented participation in the trial, helping to inform social acceptance of a hydrogen energy transition and the UK Gov heat policy decision (expected 2023/24).

GB should start progressing real projects.

As a result of COVID 19, appliance and other component manufacturers are even more in need of run-way of successful projects to show that the UK does have a way forward regarding re-purposing the gas grid and meeting its climate change commitments

GB should start progressing real projects.

The perfect project:

- Uses ‘Green’ hydrogen from a direct wire wind turbine BUT with full grid back-up
- Gives householders options ie they can choose between nat gas or hydrogen available at the same price.
- Can demonstrate all aspects of the hydrogen supply chain.
- Is at a scale that can be seen as politically realistic involving reasonable numbers of appliances ie 2003-300 and potentially up a 1000.
- Has the support of the local authority.
- Can be rolled out to a larger scale if/when successful including the real possibility of local geological storage and local supplies of ‘grey’ by-product hydrogen.
- Fits in with the countries larger scale ambitions.

GB should start progressing real projects.

The perfect project contd.

- Is of modest and appropriate budget and ideally cost competitive with electric heat pumps and the corresponding high levels of thermal insulation often required.
- Ready to proceed to provide a market for hydrogen appliances late 2021.
- Straightforward safety case.
- Provides stakeholder confidence
- The developer should have a proven record of successfully & safely delivering flammable gas across a whole country.

- Can provide the backbone to a new industry providing heat to the home, commerce, industry and transport.

- And could be commissioned before COP26.

Where can such a location be found? H100 Fife

GB should start progressing real projects.

Where can such a location be found?

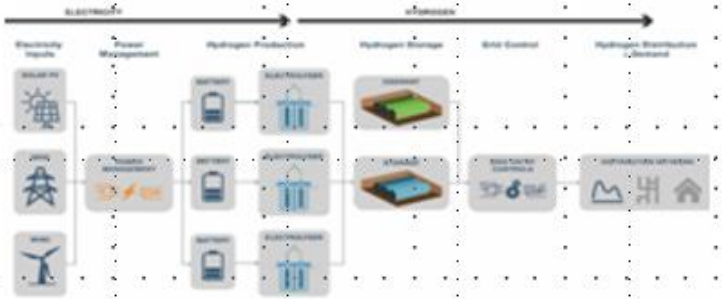
H100 Fife

H100 Fife . An ideal Learning by Doing site.

Levenmouth Innovation Zone

7MW turbine

Project Methilltoune



300 to 500 domestic connections, maybe up to 1000.
Uniquely parallel pipes will be used to investigate social aspects of conversion

Lessons to be learnt and/or confirmed.

- Close connection of wind turbine and electrolyser
- Operation of electrolyser
- Management of storage
- Operation of PRS/odorization
- Operation of network
- Conversion of consumers especially inconvenience & general ‘hassle’
- Psychology of conversion to hydrogen
- Extended operation of hydrogen appliances
- Proof of emergency procedures.
- Perspectives of householders on the pros and cons of hydrogen roll out.
- Interest from commercial/manufacturing sites.
- Views of local authority

- And many more in the technical, regulatory and psychological spaces.

Lessons to be learnt and/or confirmed.

BUT to LEARN all this the project has to undergo

- Final Design
- Build and
- Commission.
- Operate &

A missed heating season loses >3% of the time to 2050

The UK should undertake the DOING these projects now.