

# Hy4Heat – demonstrating hydrogen for heat

This quarterly newsletter gives an update on the progress of the various work packages that make up the Hy4Heat programme. The aim of Hy4Heat is to establish if it's technically possible safe and convenient to replace natural gas (methane) with hydrogen in residential and commercial buildings and gas appliances. This will enable to government to determine whether to proceed to a community trial.



## Hy4Heat at COP24

Hy4Heat was part of the BEIS exhibition at COP24 in Katowice. The United Nations climate change conference held in Poland in December 2018 ended with a deal on putting the Paris agreement into practice.



BEIS Head of Technical Energy Analysis Jon Saltmarsh (left) and Arup Director Mark Neller at COP24



## Hydrogen quality standards (WP2)

- IGEM, the Institution of Gas Engineers & Managers, is reviewing the relevant standards for hydrogen
- Purity and colourant are being considered by DNV GL in a separate stream of work

IGEM is currently reviewing all the relevant existing standards and bringing together a group of technical specialists to identify knowledge gaps, both in the UK and internationally. Three IGEM working groups will look at a range of areas including;

- DSEAR (dangerous substances and explosive atmospheres regulations)
- materials
- leakage rates and ventilation
- appliance location
- fluing, installation and air supply
- installation

Separately DNV GL work package is also conducting studies into the purity and colourant of hydrogen gas to inform the development of a range of hydrogen appliances and testing/certification capability as an integral part of the Hy4Heat programme, to de-risk the use of hydrogen for heat in UK homes and businesses. The work includes research, development and testing studies to provide an assessment of the options available for the purity and flame colourant for hydrogen.

DNV GL is undertaking a survey to gather information on the industry's opinions on colourant for hydrogen gas flames. If you receive the survey please do take a few minutes to help with this research.



## Appliance certification (WP3)

Hydrogen appliances to be certified under GAR (Gas Appliance Regulation). These regulations will be aimed at providing guidance on the testing and certification of hydrogen gas appliances for notified bodies and appliance manufacturers.

BSI is developing a new PAS 4444 to be used primarily on the Hy4Heat programme but the aim is that it can form the basis for wide-scale standardisation of hydrogen-fuelled appliances. It will be a guide to be followed by appliance manufacturers regarding functionality safety, installation, operating and servicing requirements for their hydrogen-fuelled and hydrogen/natural gas dual-fuelled or converted appliances, including: boilers; cookers; fires.



## Domestic hydrogen appliance development (WP4)

This work package is the development of domestic hydrogen appliances to demonstrate the safe use of hydrogen as a fuel in providing domestic heating, hot water and cooking requirements. It aims to provide critical evidence of end use application, safety, in-use emissions, and functionality.

The first phase of this work package is complete with 16 different projects submitting Phase 1 Reports outlining how they would approach the development of prototype appliances. The reports, received on 15 February and are being evaluated now.



**NEW**

## Meter development (WP10)

This is the most recent work package to be added to the Hy4Heat programme and is for the development of hydrogen smart meters. Any new meter will be compliant with the UK's move to smart electricity and gas metering. The chance to register interest is now, and we're hopeful that manufacturers will be applying to develop meters for use with hydrogen gas.



## Commercial appliances (WP5)

Environmental Resources Management (ERM) is currently investigating and researching the commercial market to understand the variety of commercial appliances and the issues to be addressed in their conversion or replacement with hydrogen appliances. ERM is conducting the research using a number of different methods, so please assist if you're asked. The commercial sector covers a diverse and wide range of products and you're welcome to get in touch with us if you'd like to discuss ideas for commercial appliances.



## Industrial Appliances (WP6)

Element Energy, along with Jacobs and Cardiff University is undertaking a market research study into the variety of industrial appliances and the issues to be addressed in their conversion or replacement with hydrogen appliances. An industry-wide questionnaire has been issued and achieved a good response rate. The findings are being collated and analysed. Site surveys and interviews are also being conducted and the final report will be complete in the spring.



## Safety assessment (WP7)

This is a key work package of the Hy4Heat programme. It will focus on assessing the safe use of hydrogen gas in domestic properties and buildings. This will include gas leakage accumulation and ventilation of gas releases in different enclosed spaces within a typical domestic property.

Experimental testing will be undertaken to support the safety assessment. Additionally information from GDNOs is being collated to support this work. This information will then feed into the quantitative risk assessment (QRA) and consequence model to support the safety assessment.



## Demonstration trails and planning for community trials (WP8 & WP9)

We will be demonstrating the prototype hydrogen appliances, for engagement purposes, in unoccupied locations. This will be from around April 2020 through to March 2021. If you have a hydrogen appliance, or provide ancillary equipment for use with hydrogen appliances (e.g pipes, valves, etc.), and would like to part of the showcase demonstration - please do get in touch.

Part of the Hy4Heat programme management team's work is planning and preparations for potential community trials. This will involve engagement with various organisations including HSE, local authorities and gas distribution network operators (GDNO).

## Come and hear us

We're going to be speaking at a number of conferences and events over this year and hope to see some of you at them. Ones coming up are:

- **Futurebuild** 5 – 7 March 2019, ExCel London register to attend <https://futurebuild19-visitor.reg.buzz/speaker-invite>
- **All Party Parliamentary Group on Hydrogen**, 11 March 2019 HoP, London email to register [appghydrogen@connectpa.co.uk](mailto:appghydrogen@connectpa.co.uk)
- **Scottish Renewables Conference** 12 – 15 March, Edinburgh register to attend <https://www.scottishrenewables.com/events/srac19/register/>

We're also aiming to hold a stakeholder event in the autumn where there will be presentations outlining how the various work packages are progressing.

## Get in touch

If you've received this quarterly newsletter you're on our database and will be receiving updates about Hy4Heat's progress. If you've been forwarded the newsletter by a colleague, just send us a note with your contact details and your organisation's name to **Hy4Heat@arup.com** or sign up on our website. We won't bombard you – and you can unsubscribe anytime.