

Hydrogen Appliances Report for BEIS Case Study



Kiwa Gastec collaborated with E4tech in this DECC-sponsored desk study on the development of a hydrogen-fired appliance supply chain.

There is a strong movement to convert the UK's existing natural gas grid to hydrogen, driven by ambitious carbon reduction targets. Widespread conversion from natural gas to hydrogen would make a huge contribution to achieving Britain's emissions target of an 80 per cent cut in emissions (on 1990 levels) by 2050. Assessing the modifications required to domestic properties to receive a change in gas supply is a vital part of understanding the resources required to decarbonise the UK's domestic heating and cooking energy supply.

The technical expertise provided in this project is sought by utilities and innovators, often in government-backed initiatives.

What is the hydrogen-fired appliance supply chain study?

The study was commissioned to assess the technical challenges and the costs associated with developing gas appliances to operate on 100% hydrogen.

Gas appliances are designed and built to operate on a certain gas specification. To use gas outside of this specification can bring problems such as poor quality combustion, damage to the appliance and unsafe operation. So far, manufacturers have generally been reluctant to invest in research and development of hydrogen appliances, given the immaturity of the market.

The study considered the possible barriers to a roll out of hydrogen city by city. It then examined the possible responses to overcome these barriers. The final report was a synthesis of views from a wide range of stakeholders – appliance manufacturers, trade associations, and government – and developed a way forward for the appliance industry to respond to the challenges and opportunities which would come from a hydrogen economy.

Study outcome

- There is an appetite for manufacturing domestic hydrogen appliances and the technical challenges can be easily overcome
- Clear policy direction and a concrete plan for hydrogen roll-out are necessary to provide the impetus for research and development into hydrogen-ready appliances

Kiwa N.V.

info@kiwa.nl

+31 (0)88 998 44 00

- Appliances suitable for hydrogen are not that different to those for natural gas. However, the burning characteristics of hydrogen mean that some design aspects will need to be modified , for example to accommodate an invisible flame, flame burning at higher temperature, etc. Specific standards are needed to guide the design approach;
- Appliances designed to burn hydrogen should be independently tested to standards extended for hydrogen, to ensure that they function safely and effectively
- The study identified a need for gas standards to be extended to provide guidance on the hydrogen purity supplied;
- Training for gas installers needs to be facilitated, defined by standards extended to consider hydrogen

The role of Kiwa Gastec

- Lead authors of the report
- Provided technical and project management lead throughout
- Facilitated meetings with stakeholders to gather views, develop an understanding of barriers, and formulate responses

The official report can be read [here](#).