

## Frequently asked questions about hydrogen

**Q: What are the benefits of running a boiler on pure hydrogen?**

A: For the end user the boiler performance is the same as a current natural gas appliance but there are no CO<sub>2</sub> or CO emissions therefore improving both the environmental performance and also safety.

**Q: Can current boilers run on a mix of natural gas and hydrogen?**

A: Yes, work is ongoing now at Keele University to prove that existing gas appliances can safely run on a blend of up to 20% hydrogen by volume. This project is expected to report back during 2020 and lead to a wider deployment of blends into local networks in coming years as a step towards a possible hydrogen future.

**Q: Why is Baxi well placed to get involved in the development of hydrogen boilers?**

A: We've been around for 150 years and we plan to be here for another 150; we have no intention of standing still and we will meet the changing expectation of our customers, employees and other stakeholders. Our legacy of providing market leading technologies here in the UK is one that we strive to build on. Our workers, our customers and our installers have always been part of our strategy and will continue to be as we transition to a low carbon economy.

**Q: What are the differences between an existing boiler that runs on natural gas and one that is fuelled by pure hydrogen?**

A: Pure hydrogen reacts differently when combusted therefore some internal components and flame control techniques are different to that of a natural gas boiler. The performance, size and appearance are comparable to our current natural gas offering.

**Q: When will Hydrogen boilers be available to buy?**

A: We are working to develop 'hydrogen ready' boilers now which can work on natural gas then be converted to run on hydrogen at the point of a local grid changeover. We will announce more details when we are ready to do so. With regard to the gas grid converting to hydrogen large scale projects could begin in 2027.

**Q: What, if any, changes will have to be made to the gas network to use it for hydrogen?**

A: Through the iron mains replacement programme, much of the current pipework infrastructure is suitable to transmit hydrogen safely. There will need to be investment in hydrogen generation plant (for either blue or green hydrogen) in order to produce hydrogen to inject in the first instance and a managed conversion at building level.

**Q: What changes will need to be made to existing heating systems so they can run on hydrogen?**

A: Our development is intended as a 'like for like' replacement for an existing combination or system boiler with no system changes needed to accommodate other than converting the gas supply.

## Frequently asked questions about 20% Hydrogen:

**Q: What is blended hydrogen?**

A: Hydrogen combustion produces no carbon dioxide (CO<sub>2</sub>) therefore can help to reduce emissions from heating. The HyDeploy project<sup>1</sup> is demonstrating the use of a 20% hydrogen / 80% natural gas blend (by volume) in heating applications using existing appliances to keep disruption to a minimum whilst reducing emissions.

**Q: How does blended hydrogen fit with other industry hydrogen projects?**

A: As an interim step a blend of 20% hydrogen by volume can be deployed simply and quickly. The UK Government are exploring the potential for hydrogen to form a key low carbon energy supply to help reach the 2050 net-zero emissions target. There are several projects based upon the use of pure hydrogen for heating applications, such as Hy4Heat, H100 and H21. Although not directly linked to 100% hydrogen delivery, blending does provide a practical, non-disruptive and necessary step to potentially lead to further CO<sub>2</sub> savings with hydrogen in the future.

**Q: Why are we certifying products for 20% hydrogen blends?**

A: Following success at Keele further industry projects, such as HyNet<sup>2</sup>, will see larger deployment of blended gas into regional networks, with the eventual aim of a national roll out. Whilst current appliances are already tested with a blend of hydrogen as part of the requirements of the Gas Appliance Directive, we have chosen to go the extra mile and attain third party certification that our boilers are approved for operation on blends of up to 20% hydrogen.

**Q: Why is the upper blend level set at 20% hydrogen?**

A: The topic of blending has been carefully considered across Europe in the last decade with projects demonstrating and exploring the topics of material compatibility, appliances and network delivery. This body of work, in conjunction with the HSE Research Report RR1047<sup>3</sup>, indicate that the addition of up to 20% hydrogen by volume is a practically deliverable approach without incurring undue disruption.

**Q: How will I know if my area is to receive blended hydrogen?**

A: This would be subject to plans of your local Gas Distribution Network.<sup>4</sup>

**Q: What about the other boilers in the range?**

A: The tests that are carried out already cover a mixture of hydrogen in the combustion process and they comply as well. The remainder of our residential boiler ranges will be covered by a written declaration to cover this compliance soon.

**2021 Baxi Heating**

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<sup>1</sup> <https://hydeploy.co.uk/>

<sup>2</sup> <https://hynet.co.uk/>

<sup>3</sup> <https://www.hse.gov.uk/research/rrhtm/rr1047.htm>

<sup>4</sup> <https://www.ofgem.gov.uk/key-term-explained/map-who-operates-gas-distribution-network>