17/03/23

REA Response:
Improving boiler standards and efficiency

The Association for Renewable Energy & Clean Technologies (REA) is pleased to submit this response to the above call for evidence. The REA represents industry stakeholders from across the whole heat sector and includes dedicated member forums focused on green gas & hydrogen, biomass heat, biomass power, renewable transport fuels, thermal storage and energy from waste (including advanced conversion technologies). Our members include generators, project developers, heat suppliers, investors, equipment producers and service providers. Members range in size from major multinationals to sole traders. There are over 500 corporate members of the REA, making it the largest renewable energy trade association in the UK. Given the scope of the consultation, we will be confining our comments to those specifically related to hydrogen-ready boilers.

26. What opportunities and challenges would requiring all newly installed domestic-scale natural gas boilers to be hydrogen-ready from 2026 present? Please provide evidence and reasoning to support your answer.

These requirements would give hydrogen the opportunity to play a role to decarbonise domestic heat. Given the scale of the decarbonisation challenge, it is clear that a combination of technologies will be needed and the REA supports a truly multi-technology approach. We also believe that there could be a strong role for hybrid systems, which use a heat pump most of the time, but then switch to hydrogen during stress periods. This would allow hydrogen to function as both energy storage and domestic heat supplier.

Hydrogen ready boilers could provide consumers with an option for renewable heating that is generally less disruptive than an entirely new technology such as a heat pump, but do not necessarily prevent consumers from pursuing other low carbon options should they choose to do so. This gives opportunity for heat decarbonisation in buildings where neither a heat pump, or alternative technology like a biomass boiler would be appropriate.

Adoption of Hydrogen ready boilers present a particular opportunity for those in hydrogen clusters and the development of hydrogen zones. REA supports introducing a “hydrogen zoning approach” similar to that being adopted for heat networks. This could for example enable zones to be identified and designated by a relevant authority in conjunction with the relevant local stakeholders (gas networks, developers etc) where the likelihood of hydrogen delivery is high and hydrogen is the only cost effective and technically feasible solution (e.g. delivering the greatest Green House Gas (GHG) savings at the lowest costs to consumers). A similar approach was also recently recommended in the report ‘Pathways for local heat delivery’ published by the University of Birmingham in partnership with the Energy Research Accelerator.

In terms of challenges, the main challenge will be consumer perception and protection. Since 100% hydrogen blend is very unlikely in the near future for most gas boilers, there is a risk hydrogen-ready boilers could lull consumers into a false sense of decarbonisation. See our response to question 29 of this consultation for more detailed information on this issue. The availability of Hydrogen ready boilers should not prevent consumers from investing into other renewable heating systems and should instead be one part of a larger toolbox.

We must ensure that such boilers do not prolong the life of fossil gas in the UK, that all decarbonisation options remain on the table for heating homes and that consumers are well educated around the different decarbonisation of heat pathways and support schemes – which should assist them to make the best decision based on their home/needs.

27. If made mandatory, can hydrogen-ready boilers match the cost of current natural gas boilers? Yes/No. Please provide evidence and reasoning to support your answer.

We understand that the components in hydrogen-ready boilers are very similar to those in fossil gas boilers, and cost will depend on volume as economies of scale are significant. If the market were to change rapidly in response to legislation (as it did in 2005 with the introduction of condensing systems) then we think appliances would achieve equivalent costs at equivalent volume from day one.

As with any new technology, the cost of hydrogen-ready boilers is likely to decrease as the technology becomes more widespread and production processes become more efficient.. This would depend on a variety of factors, such as the availability and cost of hydrogen fuel, the efficiency of production processes, and the development of new technologies.

Baxi, Worcester Bosch and Vaillant have agreed to sell 'hydrogen-ready' boilers at the same cost as their equivalent technologies that currently run-on natural gas.

28. Do you anticipate the installation of a hydrogen-ready boiler to take the same time as a natural gas boiler replacement? Yes/No. Please expand on your views.

In general, the installation of a hydrogen-ready boiler is likely to take a similar amount of time as the installation of a traditional natural gas boiler. Both types of boilers require similar installation processes, such as connecting the boiler to a fuel source and installing ventilation and controls.

There may be some additional steps involved in installing a hydrogen-ready boiler. For example, the installer may need to ensure that the hydrogen fuel supply system is properly connected and that the boiler is properly calibrated for hydrogen fuel. These additional steps could potentially add time to the installation process.

29.

a. For early adopters of hydrogen-ready boilers, in advance of a government mandate,can consumers expect to pay more for hydrogen-ready boilers? Yes/No. Please expand on your views.

No, we understand that consumers should not expect to pay more for hydrogen-ready boilers as compared to natural gas boilers. Please see question 27 for more information

b. What protection can be put in place to support consumers?

Labelling and information on gas boilers should not be misleading and should be transparent on the timeframes for hydrogen delivery via the gas grid. It should not lead consumers to make unnecessary purchases or delay the adoption of low carbon solutions where these can deliver substantial GHG emission savings cost effectively.

It is also important there is support for consumers to thoroughly research and compare different hydrogen-ready boilers before purchasing one. This could help them make an informed decision and choose a high-quality, reliable product.

30. Do you agree with the proposed basis for a definition for hydrogen-ready boilers? Yes/No. Please expand on your views.

Yes. Defining a hydrogen-ready boiler as one that is able to operate on 100% hydrogen is a sensible decision. Similarly, we agree that boilers that can only use hydrogen at a lower blend (such as up to 20%) should not be advertised or sold as 'hydrogen-ready' as these are functionally fossil fuel boilers and should not be unduly encouraged as a long term renewable heating solution.

The assessment of efficiency requirements that would follow from this consultation should take into account the planned decision later in 2023 on whether to support hydrogen blending into the gas network. The assessment work for that is considering blends of hydrogen up to 20%. This is important as it will ensure that the boilers are able to work efficiently with the planned hydrogen blends and not just 100% hydrogen. This will also avoid confusion for consumers and ensure that the term 'hydrogen-ready' is used only for boilers that are capable of relatively quick and affordable conversion to run on 100% hydrogen, should this be required in future.

31.

a. Do you agree that domestic-scale hydrogen-ready boilers should continue to meet 92% ErP efficiency? Yes/No. Please expand on your views.

It is possible that hydrogen-ready boilers could meet or exceed this standard. Hydrogen-ready boilers are a relatively new technology, and it is possible that future developments and improvements in technology could increase their efficiency even further. For example, advances in combustion technology or the use of waste heat could potentially increase the efficiency of hydrogen-ready boilers.

It is reasonable to expect that domestic-scale hydrogen-ready boilers should continue to meet or exceed the minimum efficiency standard of 92% set by the ErP Directive. This would help ensure that these boilers are as energy-efficient as possible and help reduce carbon emissions.

b. If ErP efficiency standards for gas boilers were raised to 93% or 94%, as set out in question 12, could hydrogen ready boilers meet this increased standard, when operating using both natural gas and hydrogen? Yes/No. Please expand on your views.

32. Could hydrogen-ready boilers meet lower nitrogen oxide emission limits, when running on hydrogen gas? Yes/No. Please provide evidence and reasoning to support your answer.

Hydrogen is a clean-burning fuel that produces very low levels of nitrogen oxide emissions when burned. In fact, the combustion of hydrogen produces only trace amounts of nitrogen oxide, making it an attractive fuel for reducing air pollution.

33. Do you agree that any requirement for domestic gas boilers to be hydrogen-ready in 2026 should be made through an update to UK Ecodesign legislation? Yes/No. Please expand on your views.

Yes. An update to Ecodesign legislation seems to be the simplest way to mandate hydrogen ready boilers by 2026.

34. Would you support increasing the scope of the hydrogen-ready mandate to include gas boilers with capacity of up to 70kW in 2026 or at a later date? Yes/No. Please expand on your views.

Yes. Hydrogen can be particularly effective as a low carbon energy source for larger boilers, so it makes sense for 70kW boilers to also be included in this legislation. Buildings large enough to require 70kW boilers are exactly the type of property that will require complex alternative solutions for their decarbonisation and so hydrogen should be an option for consumers. The 2026 date is reasonable for 70kW boilers.

35. Do you agree that hydrogen-ready boiler conversion kits should only be supplied when a hydrogen grid conversion of an area has been confirmed? Yes/No. Please expand on your views.

Yes. The main risk of these proposals is exacerbating consumer confusion, which could delay the decarbonisation of domestic British heat. Conversion kits should only be supplied when conversion of an area has been confirmed. This will also help to prevent wastage by not manufacturing, supplying and storing kits when they may not be needed.

36. Do you agree that information regarding the location and model of the hydrogen-ready boiler needs to be collected in an easily accessible format for manufacturers and networks to ensure a smooth future hydrogen conversion and roll out? Yes/No. Please expand on your views.

Yes. If the Government adopts its preferred approach there must be an accessible database. maintained by a competent body, to ensure details of those in need of conversion kits are available.

Collection of information could help manufacturers and networks plan for the future deployment of hydrogen fuel. Information about the location and model of hydrogen-ready boilers, manufacturers and networks could get a better sense of the demand for hydrogen fuel and plan accordingly. This could help ensure a smooth roll-out of hydrogen fuel and reduce disruptions to the supply chain.

BEIS should support an industry body such as Gas Safe to manage this database. But BEIS should ensure the body has enough recourse to maintain this database whilst complying with data protection and privacy law.

37. Building on question 18, we welcome views as to whether the change to hydrogen-ready boilers is likely to mean the government should look to strengthen the amount of regular maintenance required on boilers throughout their life span, given the need to ensure their fitness for hydrogen conversion can be preserved? Please expand on your views.

38. Do you agree that installers should be required to complete a module in hydrogen training prior to being permitted to fit hydrogen-ready boilers? Yes/No. Please expand on your views.

Yes. It is reasonable to expect installers to demonstrate competency in fitting hydrogen-ready boilers. Hydrogen is a new and relatively complex technology, and it is essential that installers are properly trained in order to ensure that hydrogen-ready boilers are installed safely and effectively. The Government must ensure these modules are available at an affordable price and do not put undue strain onto installer companies. This includes training being made available at a variety of UK sites and at a variety of times.

Learning lessons from similar issues in the biomass heat space through the HETAS Approved Biomass Maintenance Scheme (HABMS), the government should also ensure that multiple companies are qualified to deliver this training module in order to avoid a monopoly on what could be a valuable hydrogen training industry. BEIS should work with boiler manufacturers both in the UK and abroad to ensure these modules are relevant, affordable and effective.