

Department for Energy Security and Net Zero
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21 March 2023

Sent by email to: domesticboilersconsultation@beis.gov.uk

Improving Boiler Standards and Efficiency - boiler efficiency, hydrogen-ready boilers, and the role of hybrid systems

Dear Department for Energy Security and Net Zero,

While Centrica is best known as the owner of British Gas, our Group brings together capabilities which support the UK and Ireland's energy security and will help the country reach net zero. We are proud to offer skilled, well-paid jobs for our 20,000 strong team - and we're growing, taking on a new apprentice for every day of this decade. Our customers benefit from zero carbon electricity supplied from our interest in the UK nuclear fleet, long-term power purchase agreements with renewable electricity generators, and £70bn worth of long-term gas supply contracts. Indeed, Centrica's wider strategy and capabilities centre on enabling a low carbon future. This includes solutions that allow large energy users, including the NHS and defence estate, to save money and reduce carbon emissions and new energy models that mean communities own and control their energy infrastructure.

We're the UK's leading installer of boilers, 50 years since we first started offering the service to our customers. British Gas engineers get some of the best training in the industry at our own OFSTED-rated academies.

Every boiler sold by British Gas is rated A for energy efficiency. Should the Government proceed with its hydrogen blend proposals, all of our boilers would be able to use the new mix with little disruption to consumers.

Executive summary:

- In our response to the Government's consultation, we outline that there is a significant opportunity to improve the efficiency of existing boilers through the Government's proposals to require all boilers meet Energy Labelling Class VI.
- We state that there won't be real world efficiency benefits without boiler controls. Realising the full benefits of increased minimum standards requires effective commissioning and system design for optimal performance.

- We support the Government's proposal to mandate hydrogen-ready boilers from 2026. Hydrogen can play a vital role in providing whole system flexibility, reducing net zero system costs, and provide consumers a choice in what best suits their heating needs.
- Currently, all of the boilers we sell today can take 20% hydrogen blend. Leading manufacturers such as Worcester Bosch and Vaillant have already developed hydrogen-ready boilers and have given assurances that the costs of these boilers won't be too dissimilar from a natural gas boiler.
- With regards to the proposed widespread deployment of hybrids, we support the Government's intention to include hybrid heating systems in its 600,000 heat pumps installations per year by 2028 target.
- Our view is that hybrids could provide a solution in decarbonising homes on and off the gas grid. Through the heat pump element of the hybrid heating system, emissions reductions can be realised in the short term. In the longer-term, hydrogen could replace the natural gas element of the system, making it a low-carbon option.

Chapter 1: Boiler Efficiency

Question 1: Do you agree that all gas boilers should be placed on the market with controls that meet Energy Labelling Class VI? Yes/No. Please expand on your views.

- Yes, we agree. There is a huge opportunity to improve the efficiency of the existing boiler stock with this change.
- We also note that not all homes will be suitable for a weather compensation which would reduce the effectiveness of this requirement.

Question 2: Do you think we should require all gas boiler controls to meet Energy Labelling Class VI, irrespective of whether they are placed on the market with a gas boiler?

- Yes, this makes sense to get the performance and efficiency.

Question 5: a) Should FGHR systems be required as an alternative or additional requirement to Class VI controls, for example, alongside larger combination boilers over 35kW? Yes/No. Please explain your answer.

b) If so, should this be limited to certain types of FGHR systems, for example, limited to inbuilt Passive FGHR systems with thermal storage? Yes/No.

- a) No, we are of the view that requiring FGHR systems as an alternative/additional requirement to Class VI controls is not practical as the technology is not compact enough, unless the system were to be built into future boilers.

Question 6: Do you agree that all domestic-scale gas combination boilers should be able to modulate to 10% of their maximum output without on/off cycling? Yes/No. Please expand on your views.

Question 7: Should minimum boiler outputs be capped, and, if so, at what level? Please expand on your views.

- Yes, we agree that all domestic-scale gas combination boilers should be able to modulate to 10% of their maximum output without on/off cycling. Should the Government mandate this change, then it wouldn't need to set a cap for minimum boiler outputs as discussed in question 7.
- Setting a cap at 0 would be the best case scenario as boiler installers could fit a 30kW boiler into any housing type and rate it based on what the heat demand is.

Question 8: Do you agree that we should extend the revised requirements to include system and regular boilers? Yes/No. Please expand on your views.

- Yes, as this is a small part of the market. 60%-65% of our boiler sales are combi-boilers. From our experience, customers tend to enter the buying journey wanting combi boilers, so the true demand is approx. 70%-75%.

Question 9: What additional installer training, if any, would be needed to support system and regular boiler inclusion in these requirements?

- Yes, additional training will be required. Considerations would need to be made around costs of the training and the time it'll take to do this. The Government would need to provide training subsidies for installers to help with these costs.

Question 11: What role, if any, can FGHR systems have with system and regular boilers?

- FGHR systems have a role to play, provided that the technology is advanced enough to reduce the costs and size. The ultimate goal should be that FGHR systems become a feature that is included in the boiler design.

Question 13: What real-world efficiency benefits might be realised by such an increase to minimum energy performance standards?

- You don't get the real world benefits without the controls. The standards could be set to 94% but it all comes down to controls, commissioning and system design, so that it's able to operate at its optimal level.

Question 15: Do you agree that the government should set a requirement for all cylinders to have a minimum efficiency rating of B? Yes/No. Please expand on your views.

- Yes, where practically possible. If it requires an insulated and vented cylinder, then it won't fit in some spaces.

Question 16: What additional measures may be required to ensure that cylinders are future-proofed for use alongside heat pumps?

- There would need to be assurances that the protocols and connectivity to the heat pumps are compatible. They would need to be heat pump ready.

Question 17: a) What additional information can be collected or recorded by installers to ensure full commissioning for boiler installations take place, for example, should heat loss calculations be recorded? b) What available technologies can be used to speed up this process, including more time-consuming practices like hydraulic balancing?

- a) Yes – as this would put in checks to ensure that the commissioning process is correct.

Chapter 2: Hydrogen-ready boilers

Question 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.

- In some cases, the transition to low-carbon heat will be disruptive for consumers. There are approximately 26 million existing homes and around 85% of these homes are connected to the gas grid. For many customers in these homes, retrofitting them could involve changes to appliances to meet their central hot water, cooking and central heating needs. This is in addition to potential energy efficiency upgrades that some will have to do.
- Hydrogen offers a major opportunity for the UK to lead on development of a new sector capable of unlocking thousands of jobs, billions in investment and new export opportunities. With the right choices, the UK is uniquely well placed to capitalise on this new sector.
- Hydrogen could provide decarbonised heat in buildings, either via hydrogen boilers or could be part of a combination with heat pumps as part of a hybrid system – mainly to meet peak demands during the winter months. Some manufacturers have developed hydrogen-ready boilers, which are designed for hydrogen use but optimised to run on natural gas and designed to be easily converted to hydrogen use once required. This would enable the UK to use its existing gas infrastructure, manufacturing and installation capabilities in deploying hydrogen boilers in homes.
- All of the boilers we sell today can take 20% hydrogen blend. Currently the industry view is that Hydrogen-ready means the boiler can be converted to a 100% hydrogen for less than £100 and in under 1 hour. The conversion is required as hydrogen burns differently than natural gas including different ignition method, different burn temperature.
- Domestic heating account for approx. 67.5 MtCO₂e p.a. While there are electric alternatives, heat decarbonisation will need a mixture of solutions, we should be guided by the pursuit of the lowest cost and least disruptive pathways for different building stock by geography.

Question 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.

- In [2021](#) Ideal, Baxi, Worcester Bosch and Vaillant agreed to sell 'hydrogen-ready' boilers at the same cost as their equivalent technologies that currently run-on natural gas.

Question 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.

- Yes, we expect a comparable installation time for a hydrogen-ready boiler given the design similarities to a current domestic gas boiler.

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

- It is difficult to be specific on costs at this stage. However, we would expect costs to have some correlation to the volume of manufacturing of components but would anticipate any premium to be relatively small and decline in the long run as hydrogen-ready boilers become established.

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

- Yes, we agree with this definition.

Question 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. This would likely support the planning around hydrogen gas network conversion.

Chapter 3: Hybrids

Question 48: Do you agree with our current understanding of risks and benefits of widespread deployment of hybrids from 2028? Yes/No. Please provide evidence and reasoning to support your answer.

- Hybrid Heating Systems provides one of the solutions which the Government could use in transitioning consumers on and off the gas grid from natural gas boilers. Hybrid Heating Systems can maintain comfort levels in all buildings, regardless of a buildings energy efficiency rating with a greater opportunity to decarbonise today. There's opportunity to get incrementally greater carbon reduction over time through improved energy efficiency measures such as better insulation. Hybrid Heating Systems can also be low-regret investments for consumers compared to full electrification.
- As a Hybrid Heating System is not currently a zero-carbon solution, it is important to see hybrids as a transitional technology acting as a bridge towards ultimately zero-carbon solutions such as hydrogen. In the longer-term, hydrogen would replace the natural gas element in a hybrid system and would offer customers who are unable or unwilling to transition to heat pumps alone, with an alternative that contributes towards reducing emissions in the built environment in the near term. Replacing natural gas with hydrogen would provide Hybrid Heating Systems with the potential to be a carbon-free option as we head towards net-zero.
- Hybrid Heating Systems maximise the integration of intermittent renewable electricity as over-production resulting from variable weather conditions can be managed by switching from green gas to green electricity, or vice versa, thus minimising the need for curtailment and avoiding over investment in low-carbon generation capacity. They can also take advantage of electricity generated at the point of use via solar PV and micro wind turbines maximising self-consumption.
- The consumer acceptability challenges of some low-carbon technologies have been well documented. Hybrids could provide better consumer acceptance, which will be critical as we transition to low-carbon heat. There's also an opportunity for Hybrid Heating Systems to be

installed in rural off-gas grid homes which aren't structurally or economically viable for a pure electrification solution.

- Hybrid heating systems have the advantage when it comes to distressed purchases. With a full heat pump solution often requiring new emitters and pipework, plus the potential for DNO or planning permission. The advantage a hybrid has is that the non-operational gas boiler can be replaced for a hybrid gas boiler to get the customer up and running as quickly as possible, the installer can complete the installation by adding the hybrid heat pump. Currently it is unlikely that consumers could switch to a heat pump if their boiler is non-operational due to the time scales involved.

Question 41: Do you think specific smart controls standards, that go beyond those for smart heat pumps, are needed for hybrid heating systems? Yes/No. Please expand on your views.

- Compatibility for DSR, ToU tariffs and PV optimisation would ensure that heat pump usage is maximised whilst ensuring maximum possible cost savings for the consumers.

Question 42: Do you think other measures are required to support low-carbon operation of hybrid heating systems? Please expand on your views.

- Yes, system design is still essential to maximise the proportion of the load that the heat pump can deliver. Although one of the advantages of a hybrid system, is the reduced disruption so rather than mandating system improvements such as pipe sizing and emitters, advice instead could be mandated so that the customer has a plan to maximise the systems suitability for the heat pump element over time. Similar to the way a medium term retrofit plan supports customers future decisions and planning in PAS2035.

Question 43: What further measures can the government and industry take to support consumer choices and ensure hybrids are installed where most appropriate?

- Customer education for this is key industry needs to promote the technology options available to consumers to transition towards net zero. Subsidies such as BUS and other schemes could also look to support hybrids offering a lower grant value for hybrid ensuring that full heat pump continues to attract the most subsidy but still encouraging hybrid uptake. If this were to be implemented this would potentially increase the volume of heat pumps achieved for the same investment.

Question 44: Do you agree that installers of hybrid heating systems should develop all of the skills required to install standalone heat pumps, to be considered competent to install hybrid systems (excluding when installing a compact hybrid)? Yes/No. Please expand on your views.

- Yes, as this will ensure the installers have appropriate skills to advise the customer on potential system improvements to maximise the use and efficiency of the heat pump in the hybrid system.