



**HOUSE OF COMMONS BUSINESS, ENERGY AND  
INDUSTRIAL STRATEGY COMMITTEE:  
DECARBONISING HEAT IN HOMES**

WRITTEN EVIDENCE FROM THE HYDROGEN TASKFORCE  
DECEMBER 2020

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### Executive Summary

The Hydrogen Taskforce welcomes the opportunity to submit evidence to the Business, Energy and Industrial Strategy Committee's inquiry into decarbonising heat in homes. It is the Taskforce's view that:

- Decarbonising heat is one of the biggest challenges that the UK faces in meeting Net Zero and several solutions will be required;
- Hydrogen can play a valuable role in reducing the cost of decarbonising heat. Its high energy density enables it to be stored cost effectively at scale, providing system resilience;
- Hydrogen heating can be implemented at minimal disruption to the consumer;
- The UK holds world-class advantages in hydrogen production, distribution and application; and
- Other economies are moving ahead in the development of this sector and the UK must respond.

In March 2020, the Taskforce has defined a set of policy recommendations for Government, which are designed to ensure that hydrogen can scale to meet the future demands of a net zero energy system:

- Development of a cross departmental UK Hydrogen Strategy within UK Government;
- Commit £1bn of capex funding over the next spending review period to hydrogen production, storage and distribution projects;
- Develop a financial support scheme for the production of hydrogen in blending, industry, power and transport.
- Amend Gas Safety Management Regulations (GSMR) to enable hydrogen blending and take the next steps towards 100% hydrogen heating through supporting public trials and mandating 100% hydrogen-ready boilers by 2025; and
- Commit to the support of 100 Hydrogen Refuelling Stations (HRS) by 2025 to support the roll-out of hydrogen transport.

**Please note**, the above policy recommendations are currently in the process of being revised to take into account recent commitments from the Government and the Taskforce's analysis on how hydrogen can support the UK to decarbonise and reach the stated ambition of Net Zero by 2050.

The Taskforce would welcome the opportunity to brief the BEIS Select Committee on its enhanced policy recommendations to the Government, once these have been established.

### The Hydrogen Taskforce

1. The Taskforce is a coalition of the hydrogen industry's largest organisations that operate and innovate in and across this sector, including Arup, Baker McKenzie, Baxi, BOC, BNP Paribas and Arval, BP, Cadent, DBD, ITM Power, Johnson Matthey, Northern Gas Networks, Ørsted, SGN, Shell, Storengy and SSE.

2. The Taskforce aims to enable the UK to become a world leader in the international application and service of hydrogen, to deliver excellence throughout the supply chain and create a globally attractive export. It has elected to submit evidence to this inquiry as it has a significant interest in the development of policies to achieve decarbonisation in heat in the UK.

### **Responses to the questions asked by the Committee**

#### ***What has been the impact of past and current policies for low carbon heat, and what lessons can be learnt, including examples from devolved administrations and international comparators?***

3. Hydrogen is recognised as playing an essential role in the achievement of low carbon heat supply, and the UK Government has implemented several policies which have strengthened our understanding of this role.
4. The Government has helped to initiate a number of projects in recent years which have collectively demonstrated the technical and economic viability of hydrogen as a pathway to decarbonise domestic and commercial heat by decarbonising the gas grid, including supporting the development of appliances that use 100% hydrogen.
5. The Hy4Heat programme was launched in 2018 to establish if it is technically possible, safe and convenient to replace natural gas (methane) with hydrogen in residential and commercial buildings and gas appliances. Managed by Arup and several other partners, this programme has led work on the development of safety and certification standards, engaged industry on the development of applications of hydrogen in domestic, commercial and industrial heat and developed demonstration facilities.
6. ITM Power, Cadent and Northern Gas Networks are working on the HyDeploy project, in collaboration with Keele University, which aims to establish the potential for blending and distributing hydrogen into the normal gas supply. This project will help determine the level of hydrogen which can be safely used by customers' existing domestic appliances.
7. H21 project, led by Northern Gas Networks and several Taskforce members, will demonstrate the suitability of existing assets to transport 100% hydrogen. This project will provide key safety evidence that will support gas networks' future conversion to hydrogen.
8. SGN's H100 Fife project is looking to demonstrate the UK's first network to carry 100% hydrogen. This project will examine the regulatory, technical, physical and commercial feasibility of distributing 100% hydrogen to approximately 300 homes and businesses by the end of 2022.
9. The Taskforce welcomes Ofgem's awarding £18 million, alongside £6.9 million from the Scottish Government, to SGN's H100 Fife project. SGN shareholders and Cadent, Northern Gas Networks and Wales & West Utilities are also providing funding for this project. This demonstrates the collaborative relationship that this sector is building with Government and regulators on hydrogen heating and how this will support industry and investor confidence for the future.
10. Both the NetZero Carbon Teesside and HyNet projects, which are being led by Taskforce members and are supported by the Government's Hydrogen Supply Competition, are large-scale projects and, if driven to deployment, will be able to demonstrate low carbon heating at scale. Without these projects and others like them, it is the Taskforce's view that the UK will have significant

evidence to demonstrate the viability of hydrogen in heating and many of the building blocks in place to put this into action, but no hydrogen at scale to deploy.

11. All these projects have collectively generated sufficient evidence to demonstrate the technical and economic viability of hydrogen as a pathway to low carbon heat, as well as deepening understanding of some of the challenges involved.
12. Due to the current and anticipated success of these projects, the UK is now able to lead in the development of hydrogen for heating and the Taskforce considers the deployment of this end-use application to be a high priority for the UK, alongside the distribution, transmission and production of hydrogen.
13. However, the UK is at risk of being overtaken by other countries who have more ambitious and joined up approaches to hydrogen. For example, Germany's COVID-19 stimulus package earmarked €9bn for the expansion of hydrogen capacity, targeting 5GW by 2030 and a further 5GW by 2040. Japan established its hydrogen strategy in 2017, which has given industry the confidence to invest.
14. To date, the UK lacks the clear policy framework which exists in Japan, and Government investment has been, in order of magnitude, lower than in countries like Germany.
15. The Taskforce welcomes the recent pledges made by the Prime Minister to hydrogen and is committed to working with the Government to deliver a comprehensive UK Hydrogen Strategy that will support investment in key components of the entire hydrogen value chain, including heating.

***What key policies, priorities and timelines should be included in the Government's forthcoming 'Buildings and Heat Strategy' to ensure that the UK is on track to deliver Net Zero? What are the most urgent decisions and actions that need to be taken over the course of this Parliament (by 2024)?***

16. In March 2020, the Hydrogen Taskforce's report identified several immediate steps the Government should take to support the development of low carbon heat, either in the Buildings and Heat Strategy or in other forthcoming policy papers.<sup>1</sup>
17. The Government should support public trials of 100% hydrogen. The Taskforce welcomes the Government's backing for a large village hydrogen heating trial starting in 2025, and the ambition for a hydrogen town pilot by 2030. These timescales are realistic and deliverable, but the Taskforce believes there would be value in pursuing more than one of each successively larger trial, in order to strengthen the quality of evidence and data gained from these.
18. Furthermore, the Taskforce appreciates the Government allocating £81 million for hydrogen heating trials in the 2020 Spending Review but notes that mechanisms and regulations to support large-scale trials and innovation are needed.
19. Mandating that all new boilers must be hydrogen-ready by 2025 should also be a key priority. The installation of hydrogen-ready boilers is a necessary precondition for the wider rollout of

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<sup>1</sup> The Role of Hydrogen in Delivering Net Zero – [Hydrogen Taskforce](#)

hydrogen as a source of low carbon heat as it will dramatically reduce the cost of conversion. Hydrogen-ready boilers have been developed by industry over the past 3 years. By mandating that all boilers must be hydrogen-ready by 2025, the UK Government will enable the supply chain to prepare.

20. The Taskforce requests that the Government confirms this mandate for hydrogen-ready boilers as soon as possible or in its forthcoming Hydrogen Strategy and that this will be implemented by 2025.
21. Amending the Gas Safety Management Regulations (GSMR) to enable hydrogen blending into the UK Gas Grid will also be a precondition of a successful low carbon heat strategy. Blending into the gas grid would enable production to scale and could also reduce emissions immediately, helping accelerate the development of 100% hydrogen heating.

***Which technologies are the most viable to deliver the decarbonisation of heating, and what would be the most appropriate mix of technologies across the UK?***

22. The scale and demand profile of domestic, commercial and industrial heat means that, although other technologies such as heat pumps and district heating have a key role to play, decarbonisation at the scale needed to meet net zero targets will require hydrogen to make a significant contribution.
23. Various schemes, such as HyNet, H21, H100 and the HyDeploy programmes, are clearly demonstrating the applicability of hydrogen in the gas grid. Heating technologies can be deployed now, providing early markets for hydrogen, developing infrastructure and allowing the upstream supply chain to mature.
24. UK firms are also at the forefront of developing domestic hydrogen appliances that demonstrate the safe use of hydrogen as a fuel in producing domestic heating, hot water and cooking. Baxi Heating UK has developed a 'hydrogen ready boiler,' which can be initially installed to operate on natural gas then converted to hydrogen with a simple intervention. Once hydrogen is available on the gas network, these boilers can be easily converted without the need for a new heating system.

***What are the barriers to scaling up low carbon heating technologies? What is needed to overcome these barriers?***

25. To achieve high levels of output from across the hydrogen sector, the Hydrogen Taskforce's believes that Government and industry should now invest and collaborate to ensure that technology development and commercialisation takes place in tandem and at pace. The Taskforce's current policy recommendations outline the steps that the UK Government can take to drive hydrogen output, unlock investment from industry and lead in technology development. Please note, these recommendations are currently being revised to reflect the Government's recent commitments and new analysis undertaken by the Taskforce.
26. Currently, the ability of UK industry to scale up activities in both green and blue hydrogen production is limited by the lack of supportive policy frameworks and corresponding lack of secure market for hydrogen. The feasibility studies and demonstration projects mentioned elsewhere in this submission have demonstrated that these technologies are ready to be scaled but industry awaits the right market and policy frameworks to allow this.

27. As mentioned previously, the current Gas Safety Management Regulations (GSMR) need to be amended to enable hydrogen blending into the UK Gas Grid. Similarly, the Taskforce believes that regulation to support strong coordination between appliance developers, the network operators and hydrogen producers is needed to ensure that there is consistency in specification and standards.
28. Given hydrogen's cross sector application, there is value in a more joined up approach, which would ensure that hydrogen's role in the future energy system emerges in a strategically coordinated manner. These strategies give industry and investors confidence in the ambition and commitment of these countries to hydrogen and allows them to invest.
29. The Taskforce understands that a UK Hydrogen Strategy will be published in 2021 and appreciates the Prime Minister and Government's recent commitments to hydrogen. The Taskforce is committed to working with the Government to deliver a comprehensive UK Strategy that will support investment in key components of the entire hydrogen value chain, including heating.

***What incentives and regulatory measures should be employed to encourage and ensure households take up low carbon heat, and how will these need to vary for different household types?***

30. At this stage, mandating that all new boilers must be hydrogen-ready by 2025 should be the key priority for domestic deployment of low carbon heat. The later this policy is implemented, the greater the number of outmoded boilers will have to be replaced entirely to enable deployment of low carbon hydrogen for heating.
31. It is the Taskforce's view that replacing old boilers at point of need will be more impactful on consumers, who may not be able to plan for this. Creating a phase-in period in which old boilers which reach the end of their useful life and are then replaced by new hydrogen-ready boilers is far preferable.
32. The Taskforce is confident there will be a range of hydrogen-ready boilers on the market, if Government signals now that they will be mandatory from 2025.

***What action is required to ensure that households are engaged, informed, supported and protected during the transition to low carbon heat, including measures to minimise disruption in homes and to maintain consumer choice?***

33. The transition to low carbon heat has the potential to be significantly disruptive for people. Regarding the transition to hydrogen specifically, several communications challenges have been identified.
34. A 2019 study conducted by UKRI and Newcastle University, found that public understanding of hydrogen is low.<sup>2</sup> Once informed, willingness to use blended hydrogen in household appliances was moderately high. 70.6% of respondents believed that blended hydrogen would result in positive environmental impacts. However, both the perceived cost of hydrogen and the safety concerns surrounding its use remain.

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<sup>2</sup> Blended Hydrogen: The UK Public's Perspective – [UKRI and Newcastle University](#)

35. As part of the H21 project, Leeds Beckett University and Northern Gas Networks have produced a study that shows that consumers trust the gas industry to ensure the safe use of hydrogen and it provides key recommendations for educating and informing the public.<sup>3</sup> Participants in this study accepted that their gas price may rise, but were concerned about the cost of purchasing new appliances.
36. It should be noted that the cost of a hydrogen-ready boiler is now comparable with current natural gas boilers, which may allay concerns that the public will be unduly impacted. Therefore, these studies demonstrate that there is a need to communicate the cost-effective and safe benefits of hydrogen uptake and use to the public.
37. As mentioned previously, mandating that all new boilers must be hydrogen-ready by 2025 should be the key priority for domestic deployment of low carbon heat. The later this policy is implemented, the greater the number of outmoded boilers will have to be replaced entirely to enable deployment of low carbon hydrogen for heating and prove more disruptive for the public in the long-term.
38. The Taskforce believes that the UK Government already recognises the role of hydrogen as a pathway to decarbonisation but urges it to join with industry to communicate the value of this resource to the public.

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<sup>3</sup> H21: Public perceptions of converting the gas network to hydrogen – [Leeds Beckett University](#)

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