

Dear Chairman,

Thank you for your time on Tuesday 16th February. I wanted to follow up on points raised to provide a fuller explanation as to ours and wider industry thinking, on the subject of decarbonising heat

A balanced energy system

We believe that hydrogen, heat pumps and district heating will all be required to get to net zero. Taking away options before they have been demonstrated at scale may well limit our potential to reach net zero in the timescale the government envisages.

Multiple studies have concluded that a balanced energy system incorporating hydrogen has the lowest whole system cost and therefore lower overall costs to consumers. For example, Navigant's 2019 'Pathways to Net Zero'¹ study concluded that whole system costs would be £13 billion cheaper per annum for a balanced scenario versus full electrification. This is due to the fact that the peak energy demand for heat in the winter in the UK is difficult to deliver reliably in an electrified system due to the intermittency of renewables. As a result, there would need to be a substantial additional build of renewable capacity which would be redundant much of the year and the electricity network would need to be re-enforced to approximately 5 times what it is today. In addition, many homes in the UK may not be able to benefit from an effective heat pump retrofit which would not be cost-effective for a large swathe of the UK's housing stock and may seek an alternative heating system. It is therefore vitally important that the whole system costs of options are considered.

Costs

We agree that the cost of hydrogen is important. Hydrogen is not yet delivered at any scale in the UK, and all estimates of production costs are just estimates until we can get production going at scale. The recently supported industrial clusters has created a great opportunity to demonstrate hydrogen production at scale and enable a learning curve (similar to wind turbines) that will bring down costs and enable more realistic estimates.

The costs of hydrogen quoted in the meeting at 9p/kWh are based on the data used by the Climate Change Committee (CCC). We have completed further work which I've attached that shows that costs could be significantly less than this once scaled.



The capital costs of heating systems to consumers was also discussed in the session. Whilst optimistic things have been stated around the future costs of heat pumps, the costs today range between £10k and £20k per property and there is little evidence that they are falling at anything like the rates implied.

I'd also like to reiterate that the actual cost of the gas network is approximately 23% of consumer's bills. Our estimate of the costs of hydrogen conversion on the network will require some investment but is likely to result in broadly similar costs to consumers. As the iron mains replacement programme ceases in 2032 it will then be replaced with conversion investment. The aim of conversion is to utilise as much of the existing assets as possible.

Consumer attitudes towards low-carbon heat

A good deal of research has already been conducted into consumer attitudes towards both heating in general and low-carbon heating specifically. Research has also looked at the extent to which consumers are engaged with climate change and aware of the contribution made by domestic heating.

From our review of existing research into consumer attitudes towards heating, we have identified three key themes:

- **Disruption:** Challenges faced by the Eco scheme (which provided grants to homeowners to install loft insulation and other energy efficiency measures) and the smart meter roll-out give a real sense of how much homeowners dislike disruption. In both cases, homeowners were essentially offered free upgrades to their homes with demonstrable energy- and cost-saving benefits, and yet uptake was low, even following extensive marketing campaigns and outreach. In the case of smart meters, the full-scale roll out began in 2016 and was originally due to complete in 2020, but the deadline has since been extended to 2021. Current predictions are that only 75% of properties will have smart meters by the new deadline. This aversion to disruption could potentially have a significant bearing on consumers' preferred low-carbon heating solutions. A recent Citizen's Assembly report concluded that 'it was clear that anything that could be done to minimise disruption and stress for people during retrofits would be welcome'.
- **User experience:** Most consumers place significant value on heating solutions that provide good quality, on-demand heat and that are operated in a way they are familiar with. In our Bright Blue research, 86% of consumers said it was very important or quite important to be able to heat up their home whenever they like; 84% said it was very important or quite important to be able to heat up their home quickly; and 77% said it was very important or quite important to have a heating system that is familiar to them. Recent customer research conducted National Grid concluded there is no appetite among consumers to see a reversal in their heating experiences to the past when heating was not on-demand. This attitude was particularly prevalent in older demographics.
- **Cost:** Unsurprisingly, studies have consistently concluded that minimising cost is high on consumers' list of heating priorities. While consumers want to both minimise the up-front cost of new heating solutions and reduce ongoing heating bills, they tend to place far greater emphasis on minimising up-front costs, even if this means higher lifetime costs.



Underpinning these three themes is a clear desire for consumers to have **choice** over which low-carbon heating solution they switch to. It's also essential that the needs of **all customers** are fully considered, especially those in vulnerable situations, including customers living in or close to fuel poverty. Without explicit consideration for their specific needs, there is a real risk that these groups will be 'left behind' by the transition to low-carbon heating and potentially made worse off than they are now.

Kickstarting the hydrogen economy

To reiterate, we believe that hydrogen has a role to play in the decarbonisation of heat. There are some early opportunities which would help to create momentum. These are:

- Mandating the installation of hydrogen-ready boilers from 2025
- Blending up to 20% hydrogen (by volume) into the existing natural gas grid, a low-regrets way to create significant baseload demand that would effectively underpin investment in hydrogen production.
- Support the production of hydrogen through the creation of a CfD financial mechanism and enable the industrial clusters to scale hydrogen production quickly

Next steps

I would be delighted to provide further information on any of the points raised and look forward to working with the committee in the future.

Yours sincerely

Dr Angie Needle

Director of Strategy

Cadent Gas Ltd

¹(<https://www.energynetworks.org/assets/images/Resource%20library/ENA%20Gas%20decarbonisation%20Pathways%202050%20FINAL.pdf>)