REA response to Bright Blue Call for Evidence

The Renewable Energy Association (REA) is pleased to submit this response to the above consultation. The REA represents a wide variety of organisations, including generators, project developers, fuel and power suppliers, investors, equipment producers and service providers. Members range in size from major multinationals to sole traders. There are over 550 corporate members of the REA, making it the largest renewable energy trade association in the UK.

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Answers to Consultation Questions

Q. 4: Which technologies provide the greatest potential for decarbonisation of heat, and how can they be better supported?

In combination, biogas, biomethane, heat pumps, biomass boilers, geothermal, solar thermal, and reduced heat demand can decarbonise the UK heat supply. Their potential depends on the type of heat, the type of property, and consumer choices. It is important to recognise that all technologies have advantages and disadvantages and must be tailored to the heat use, building fabric, and consumer preference.

Biogas and biomethane

Underpinned by the introduction of the Renewable Heat Incentive, the UK biomethane market has been thriving in the period 2014-17 (discounting the hiatus caused by delay in introducing the new RHI tariffs) delivering significant benefits and helping Government meet the 2020 renewable energy targets and its own Carbon Budgets. Since 2011 the UK has become the fastest growing and most innovative biomethane market in Europe, with eighty-five sites currently accredited under the scheme, which so far have injected 5.1 TWh of biomethane to the grid.

Once all the UK biomethane plants operational and under development operate at full capacity, they will be injecting approximately 4 - 6 TWh of green gas per annum into the gas grid, enough to meet the heating needs of around 400,000 homes. This will represent around 240,000 tonnes of LNG that the country won't need to import from the Middle East or four 60,000-tonne LNG tankers not needing to dock at domestic ports.

Cost reductions have already been made to some extent (Gas grid Entry Unit costs have already been reduced by 50% in the last 7 years) but there is potential for further cost reductions, so long as the Government continues to provide a stable support mechanism at the right level for industry, to ensure the market continues to grow with confidence.

Biogas has also a role to play in decarbonising heat within the agricultural and food and beverage sector, as outlined below.

Agricultural sector
Within the agricultural sector specifically, most farms are off the gas grid in the UK, particularly small ones. In these situations, on-farm anaerobic digestion would enable replacing fossil fuel heat required for the farm buildings and the farmer's own household with renewable heat from biogas (as both, heating and hot water supply), whilst delivering numerous additional benefits. In addition to decarbonising off-grid heat, significant and cost-effective greenhouse gas mitigation could be achieved by the controlled/managed processing of slurry and fertiliser replacement through the use of renewable biofertiliser. More information is provided in our response to the next question.

Food and beverage sector
Similarly, on-site anaerobic digestion deployed on factories, especially in the food and beverage sector, could provide a source of renewable heat for the beverage or food manufacturing process, which would replace use of fossil fuel heat, especially within processes that have a significant heat requirement (distilleries, breweries etc.). Nestlé, Diageo, and First Milk are examples of companies using on-site AD to process biodegradable production residues to generate heat and power that could be used on the site to some extent.

<u>Heat pumps</u>

Heat pumps have proved very effective in new build properties where the heat demand is lower and the cost is lower to install larger radiators and/or underfloor heating as needed. It does require some space, but less than biomass fuel storage. It is very convenient for consumers that do not want to deal with fuel delivery and want a lower maintenance. As the power grid is decarbonised, the GHG emissions of heat pumps will decline and align with the Government's 2050 targets.

<u>Biomass</u>

Biomass boilers have been shown to be very effective in replacing oil boilers in existing buildings off the gas grid. Biomass boilers will still be needed in order to reach the 2050 targets, as many of our existing buildings with higher heat demand will exist in 2050, which other technologies may struggle to sufficiently heat. In addition, the use of biomass fuels supports the forest and woodland growth in the UK and abroad, and as the wider economy decarbonises, the GHG emissions of biomass will decline (e.g. emissions from transportation of biomass declining) and align with the Government's 2050 targets.

The thinnings used for biomass are essential to forest management, which ensures the growths of higher quality timber that can be used for furniture and buildings. The use of biomass leads to more productive forests, with higher carbon stock and higher tree stock. The use of biomass thereby supports the ongoing growth of forests and woodlands in the UK.

<u>Geothermal</u>

Geothermal has a great potential within the UK. It is still an emerging technology with no plants in operating to date, but after the first 50 plants in operation, the costs and risks will reduce significantly, which have been seen in many other European countries as the industry matures. Deep geothermal energy can provide heat for commercial, industrial and residential buildings. It is ideal for providing heat to district heating schemes, universities and hospitals. It can also be used in industrial processes, such as

cooling, or in aquaculture and horticulture. Deep geothermal energy is available 24 hours per day, 7 days a week, and produces large quantities of heat to be used in industrial processes, farming and district heating. It has a very small surface footprint and is a reliable, cost-effective form of energy. Once built, a deep geothermal plant can be expected to continue in production for fifty years or more.

Solar thermal

Solar thermal is a useful technology for reducing the amount of fuel consumed by consumers.

There is no single technology that can deliver all heat demand, as heat (and cooling) demand varies in terms of high-/low-grade heating, load factors, and delivery form. A Victorian house in the countryside will not be heated the same way as a new build house in a suburban area. Heat systems for space and water heating are not utilised to the same degree that heat systems for process heating are. Yet, although hot water in radiators can heat a room, it cannot provide the heating needed for industrial heat. There is no single answer to solve the decarbonisation of heat. At present, there is no consensus on what technology or policy is the best or most efficient to deliver low-carbon heating. From the industry's point of view, the Government need to create stable policies with clear direction and stop picking winners. But the industry needs to reduce costs to a lower gap between fossil fuels and renewables. But this won't happen without clear direction and many different policies that enable all low carbon technologies.

Q. 7: What policies should the Government reform or introduce to upgrade the gas network?

We appreciate the need to reinforce and upgrade parts of the gas network; however, this is likely to be unnecessary if we are to decarbonised heat without continuing to be reliant on fossil fuel. It is instead more likely that we will have to significantly reduce the reliance on the gas network for heating and cooling, and any major investments in the gas network will have to bear this in mind. The Cadent report on the potential for low-carbon green gas in 2050 suggests that there is a total renewable gas potential of around 108 TWh/annum in 2050 under their central scenario[1]. This represents 19.6% of the UK current demand for domestic and commercial space heating and hot water requirements. This would suggest a significant reduction in the use of gas for heating and cooling in the 2050 unless the demand dramatically reduced through energy efficiency measures. The alternative is repurposing the gas network for hydrogen, which would rely on the conversion of (fossil fuel) natural gas by steam methane reformation (SMR). This route has its own challenges such as the conversion of the gas network, roughly doubling the costs to the consumer for their heating, requiring mass conversion of all gas boilers to hydrogen boilers, let alone the wide-scale use of CCS to store the carbon from the SMR process[2].

When considering upgrading the gas grid, the long-term decline in the use of gas must be considered. The UK will have to use less gas in the future, if it intends to decarbonise its heat, as only part of the current gas consumption level can be covered by low-carbon green gas.

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[1] Cadent Gas (2017), Bioenergy Market Review, https://cadentgas.com/about-us/the-future-role-of-gas/renewable-gas-potential

[2] NEA (2017), Heat Decarbonisation, Potential impacts on social equity and fuel poverty, http://www.nea.org.uk/wp-content/uploads/2017/09/Heat-Decarbonisation-Report-September-2017.pdf