Briefing | Decarbonising Heat

Energy UK

Key points

- **The forthcoming Heat and Buildings Strategy needs to set out a credible plan on how we deliver solutions to decarbonise our heating. The Government will not meet its legislated net zero target without tackling emissions from buildings.**
- **It is vital that we ensure that the transition to low carbon homes does not leave the most vulnerable customers out of pocket, and that new services come with appropriate consumer protections, financial support and practical advice.**
- **To decarbonise heat, we will need to largely electrify it, installing heat pumps over the coming decades. We will need other technologies too, including energy efficiency measures, hydrogen, other renewable heat, and heat networks.**
- **The decarbonisation of buildings does not require immediate change from most households. There will be a gradual shift away from fossil fuel boilers as households replace their appliances and are offered lower carbon, more efficient alternatives. The Government should communicate this point clearly.**
- **Through giving clear timelines and consistent market incentives in its policy, alongside regulatory measures, the Government will help stimulate a strong private market response, and drive competition, developing the supply chain for low-carbon heat technologies and bringing down costs for consumers.**
- **Energy efficiency is an enabler of heat decarbonisation, with additional public health and economic benefits. Following the end of the Green Homes Grant, the Government needs a long-term and funded energy efficiency retrofit programme. We can create mass employment across all regions of the UK by initiating an ambitious programme of domestic energy efficiency and low-carbon heat retrofit.**

If the UK is to meet its 2050 net zero target, and also meet the new UK Government target to reduce emissions by 78% by 2035, finding new ways to deliver low-carbon heating is essential. The scale of the challenge means it is perhaps the most significant challenge facing policy makers in reaching net zero, and in a similar way to the transition to zero emission vehicles, the transition depends on ordinary people being incentivised and supported to change to a lower carbon technology, and businesses changing their operations, supply chains, and service offering.

The forthcoming **Heat and Buildings Strategy**, to be published by the Department of Business, Energy and Industrial Strategy soon, will be the first time the UK Government has set out a framework for decarbonising heat. It is essential this document provides clear and ambitious targets, because with sufficient scale, the supply chain can gear up to create long-term employment, keep energy bills down, reduce NO_2 emissions and accelerate our understanding of the decarbonisation pathway for buildings.

As the UK Government's Ten Point Plan for a Green Industrial Revolution correctly sets out - *"making our buildings more energy efficient and moving away from fossil fuel boilers will help make people's homes warm and comfortable, whilst keeping bills low."* Delivering low-carbon heat

Energy UK
26 Finsbury Square
London EC2A 1DS

T 020 7930 9390
www.energy-uk.org.uk
t @EnergyUKcomms

GSHPA
39 Dryburgh Road
London SW15 1BN

T 0330 2234 302
www.gshp.org.uk
t @GSHPAssociation

also offers the opportunity of improving air quality and health outcomes, with the processes used for heating and hot water recognised as a leading cause of poor air quality within the home.

Investment, Jobs and Skills

It is estimated it will take a similar amount of investment to decarbonise our heating sector regardless of the technology mix[1]. **Government is not expected to fund this transition, it will be primarily delivered with private capital**. However, to attract private sector investment, the Government needs to provide clear policy signals now.

Jobs will be created in every part of the country with significant export potential, with installers, manufacturers, engineers, and administrators required. This is on top of the jobs that would result from a National Energy Efficiency Programme. The Government should ensure the skills (re)training required to deploy renewable heating systems at scale are a key plank of their forthcoming Green Jobs and Skills Action Plan.

Low-carbon heat technologies

In order to meet our legislated Net Zero target, it is necessary to scale up technologies we have available today over the next decade, whilst exploring the potential of technology not yet commercially available. An effective competitive market is the best way to deliver rapid carbon reductions and cost reductions for consumers.

Electrification and heat pumps

Heat pumps are an electric technology which "boosts" naturally occurring heat in the environment; there are ground-source, air-source and water-source heat pumps. Heat pumps are the primary available low carbon heat technology and are already in use around the world. Though the technology used in heat pumps is also used in refrigeration and air conditioning, heat pumps themselves remain unfamiliar to many in the UK. Ambitious targets for low-carbon electricity generation mean the power sector is confident that we will meet any heat pump energy demands with low-carbon electricity, whilst still achieving our net zero target.

In the Ten Point Plan, the UK Government announced an ambition of 600,000 heat pump installations per year by 2028[2], compared to ~36,000/year now; the independent adviser to the Government, the Climate Change Committee (CCC) are recommending over one million heat pumps be installed per year by 2030[3]. We need to see a plan to realise this ambition in the Heat and Buildings Strategy.

Scaling up the heat pump market

- A stop-start approach to subsidy has failed to deliver consistent growth in UK heat pump manufacturing and installation, most recently the discontinuation of the Green Homes Grant.
- Government intervention will be required to establish appropriate frameworks and provide direct support in the early stages to support the scaling up of markets.
- The Government should kick-start this transition and provide grants for large-scale low carbon heat pathfinder projects in homes and businesses across the UK.
- Recent media reports suggest Government is preparing to offer households a grant to incentivise them to install a heat pump[4]. This would be a welcome boost to the market.

[1] Climate Change Committee: https://www.theccc.org.uk/wp-content/uploads/2018/06/Imperial-College-2018-Analysis-of-Alternative-UK-Heat-Decarbonisation-Pathways.pdf

2 November 2020: The Ten Point Plan for a Green Industrial Revolution

[3] Climate Change Committee - The Sixth Carbon Budget: The UK's path to Net Zero

[4] The Sun, 28 May - Millions of Brits can soon afford to rip out boilers & install eco-heat pumps

Making the uptake of heat pumps cost-effective for consumers

- The cost of heat pumps is currently higher than that of a gas boiler, but Government can implement measures to help drive down costs in installation and operation.
- Changes to taxes on electricity bills could reduce energy bills for those using a heat pump. 23% of the electricity bill, compared to 2% of the gas bill, is currently made up of costs added to bills by the Government, including environmental and social policy costs.
- Addressing wider taxation imbalances and disincentives would contribute to a green recovery and allow time for supply chain efficiency to reduce costs. Gas boiler installation and maintenance is charged at 5% VAT, whereas the cost of a heat pump or energy efficient materials are subject to 20% VAT. Supporting the reduction of VAT to 5% for the purchase, installation and maintenance of low carbon heat would incentivise uptake.
- We expect that the current cost associated with heat pumps will reduce. Estimates state that the costs of heat pumps could come down by approximately 20-30% by 2030 and 30-40% by 2050[5], with these reductions delivered faster if the UK market grows at pace.
- Training more installers and requiring smart controls for all installations would also help to deliver efficiency and keep energy bills low.
- Targeted support for vulnerable and fuel poor consumers with energy efficiency and low carbon heat measures, alongside updated protections, should be introduced. Energy efficiency measures deliver immediate reductions to energy bills, but those consumers that would benefit most may not be able to afford the upfront cost, and as such cannot benefit from the longer-term benefits without support.
- The running cost of heat pumps varies depending on the energy efficiency and heating needs of a property, and energy efficiency is a critical part of decarbonising all buildings regardless of the type of heating they use in future.
- Social housing should be energy efficient with a low carbon heat appliance installed wherever possible, given the clear benefits to those customers from reduced energy bills. For the privately owned sector, organisations like mortgage providers are already looking to develop products that encourage or reward installing energy efficiency measures and low carbon heat, and should be supported by frameworks that encourage and, where appropriate, require improvements across all types of home and business.

Low Carbon Gas

- The UK has a significant gas infrastructure that has served millions of customers for many years, and some of this could continue to be used in future if we can replace the current gas with low carbon alternatives. Much of that infrastructure will need to be upgraded if we want to deliver low carbon gasses in place of the current natural gas.
- We can make carbon reductions now by using more bio-gas to replace natural gas in the short term; the technology to make that bio-gas is already in use in some places in the UK.
- Hydrogen-ready boilers, capable of being converted at a later date without replacing the whole boiler, are being developed by a number of UK-based companies. These companies are also exploring conversion of appliances including gas hobs.
- The future cost of hydrogen for heating is still unknown as we continue trials to determine technical, environmental, and commercial solutions, with hydrogen production the main factor expected to impact the cost to consumers.

[5] Element Energy - Development of trajectories for residential heat decarbonisation to inform the Sixth Carbon Budget, p. 99

- Hydrogen production using methane could be linked up to carbon capture and storage technologies already being developed. This is known as ‘blue hydrogen’ and is the main available source of hydrogen in the UK.
- The CCC focusses its net zero recommendations on developing the UK’s ability to produce hydrogen using renewable electricity to split water into hydrogen and oxygen through the process of electrolysis, to avoid any carbon emissions. This is known as ‘green hydrogen’.
- This hydrogen could be used to replace some uses of fossil fuel gas in the economy, particularly in industrial clusters, and could be used for some wider applications in heat. We need to continue trials to know more, and the Government has committed to delivering a hydrogen town trial by 2025 to test the costs and benefits of this approach.

Hybrid Systems

- Hybrid systems use electric heating solutions in conjunction with gas or other technologies. This may be useful for some customers, in terms of cost and convenience, as well as meeting the needs of the energy system. For example, in a hybrid system you might add an air source heat pump to a rural household currently using LPG or oil; for the customer this means delivering carbon reductions without requiring a potentially costly upgrade to their electricity network connection.

Heat Networks

- Heat networks are common internationally and the UK has a long history of using them. In a heat network, pipes connect multiple buildings to deliver heat rather than gas or electricity. Some of these use a single large source of heat that warms buildings across entire town centres, while others can connect the heat source within each building to share the heat demand of all buildings connected. Heat networks typically deliver efficiencies in operation, maintenance - and can reduce the cost - of heating those buildings.
- We can connect many customers to heat networks now and deliver immediate carbon savings through efficiency, and most of these could be upgraded at a later date with zero-carbon technologies without disrupting residents. These may be particularly appropriate for towns and cities or in industrial clusters.
- Customer protection and wider regulations surrounding heat networks need updating to be aligned with existing protections for gas and electricity customers, to ensure common positive outcomes for all consumers.

Other technologies

- A wide range of technologies exist, from solar-thermal and heat storage to biofuels created from processing waste. We need to keep our options open and allow a robust competitive market to define the winners. This will allow us to drive forward ambitiously in the 2020s using the whole range of technologies that currently exist. Continued hesitation will only result in higher costs for consumers later on.

About Energy UK

Energy UK is the trade association for the energy industry with over 100 members spanning every aspect of energy, from large scale renewables generators, major energy retailers, and SME providers of services like electric vehicle charge points. The UK energy sector has led the decarbonisation of the UK in the thirteen years since the Climate Change Act, with the power sector reducing its greenhouse gas emissions by 71%.

For further information please contact: **Brendon Marsh**, Public Affairs Officer, Energy UK
E: brendon.marsh@energy-uk.org.uk