Energy in Action: Overcoming barriers to decarbonising homes

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Decarbonising the way we heat our homes is not only vital to improving our nation's health, it will also help ensure UK energy bills are stable and affordable in the long term. Energy UK members, AgilityEco, British Hydropower Association, EDF, the Kensa Group and Octopus Energy are just some of the companies working across industry to combat challenges facing home heating in the transition.

Replacing the UK's existing fossil fuel heating systems with low-carbon technologies is going to be a mammoth task. With the majority of UK homes currently heated with gas,[1] it will mean changes for many households across the country.

Whilst all properties are suitable for low-carbon alternatives such as heat pumps,[2] there are homes across the country that are more difficult to decarbonise due to higher costs and other challenges that can add difficulty and complexity.

These properties include a wide range of residential buildings such as high-rise blocks, homes with space constraints or those with heritage status.

Finding affordable solutions for all properties is not only crucial to meeting the UK's legally binding Net Zero target but also ensuring fairness so that everyone can benefit from the transition to a cleaner energy system.

Cutting the cost

With energy bills still significantly higher than what had previously been the norm, the case for long-term solutions and more efficient heating systems to reduce usage and cost is clear. But doing so requires initial investment and polling conducted by Public First, on behalf of Energy UK and One Home, found that over a third of people who didn't install energy efficiency measures in 2023 said it was because they couldn't afford the upfront costs.[3]

The Government has several schemes that can reduce the cost of energy-saving measures for households with low Energy Performance Certificate (EPC) ratings to improve energy efficiency and upgrade their heating systems. This includes a grant of up to £7,500 available for an air or ground source heat pump through the Boiler Upgrade Scheme and funds for wall, loft and underfloor insulation.

Energy UK members EDF, AgilityEco and Octopus Energy have been working with households, local authorities, other energy suppliers and installers to tackle the issue of funding clean heating systems.

AgilityEco runs the Local Energy Advice Partnership (LEAP), which has supported over 14,000 low income and vulnerable households this past year, and which receives referrals from hundreds of councils nationwide. Focusing on helping low income and vulnerable houses, LEAP offers a free energy advice service as well as assistance with applying for further schemes such as the Warm Home Discount and Priority Services Register.[4]

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[1] Nesta (2023) What does the latest census data reveal about how homes are heated in England and Wales?
[2] Energy Systems Catapult, All housing types are suitable for heat pumps, finds Electrification of Heat project
[3] Public First (2024) Public First Polling for Energy UK
[4] Local Energy Advice Partnership, How LEAP works

Alongside this, AgilityEco project manages the Warmer Homes programme on behalf of local authorities in the South and South-East of England. Working with suppliers and installers, AgilityEco provides energy efficiency home improvements including insulation, air source heat pumps and electric radiators. Customers have seen their energy consumption nearly halved, and their EPC ratings improve to a C from an E after having an air source heat pump fitted.

EDF works directly with households to improve energy efficiency and cut costs for consumers. One household qualified for the Energy Company Obligation 4 (ECO4) funding from EDF and had loft insulation, an air source heat pump and a solar PV system fitted for free by the supplier. These upgrades save the homeowner over £1,000 on their energy bills. EDF also supports the development of a Heat Pump Installers Network Academy which delivers free heat pump training to upskill engineers across the UK.

Grants provided by the Government offer a big help to those worried about funding low-carbon technology. However, even with these in place, the cost of installation can be challenging for low income or vulnerable households. **Octopus Energy** has worked to lower the cost of installing a heat pump for customers. Heat pump installation prices start at £500, which includes the £7,500 Boiler Upgrade Scheme grant, with 94% of Octopus installation quotes being less than the £6,082 national average.

Tackling physical constraints

While schemes like ECO4 and the Boiler Upgrade Scheme reduce the cost of adopting clean heating systems, many terraced houses in the UK face physical constraints like space or noise limits when installing technologies such as heat pumps.

Energy UK member, **British Hydropower Association** is working with Rossendale Valley Energy, a community benefit society on the 'Net Zero Terrace Street' project which aims to provide clean energy to heat homes facing these challenges at no cost to the householder. The campaign targets terraced streets that might find off-the-shelf solutions unsuitable and looks for alternatives through community-led and practical solutions. By working directly with local communities to create tailored solutions for them, British Hydropower Association has supported families in keeping energy bills affordable and homes warm.

Data from Energy Systems Catapult shows that heat pumps are three times more efficient than gas boilers, giving them a vital role in helping customers switch to cheaper and cleaner energy.[5] While a heat pump itself is small, it usually has to be positioned somewhere outside with unobstructed airflow which is clearly difficult for people living in flats or without outdoor space.

The **Kensa Group**, an Energy UK member, has developed an approach known as networked heat pumps (NHPs) that sees a small ground source heat pump (GSHP) in each home in the street or block of flats, all connected to a shared underground network drawing renewable heat from the ground.

As this type of heat pump can be installed indoors and with the network financed and installed in the street, NHPs remove barriers such as upfront investment and outdoor space constraints, meaning any home from a terrace to a tower block can have a heat pump. Kensa's heat pumps are small enough to fit in a cupboard and are 3-4 times more efficient than alternatives for space-constrained homes like electric heaters and

[5] Energy Systems Catapult (2022) Heat pumps shown to be three times more efficient than gas boilers

boilers.[6] The approach has allowed thousands of heat pumps to be installed in flats across the UK leading to lower bills for their residents.

Likewise, Smart Heat Batteries – such as the Zero Emission Boiler (ZEB) developed by tepeo – take electricity from the grid when it is cheap and plentiful and store it as heat in a device about the same size as a washing machine, made from non-toxic and low impact materials. ZEBs provide water at the same flow temperatures as existing boilers, minimising the need for retrofit and making them ideal for smaller properties that may be less suitable for a heat pump. Being able to store energy as heat shows the flexibility of ZEBs which not only cuts bills for the householder but reduces overall costs by helping reduce demand at peak times and making the most efficient use of renewable power.

Energy in action

Decarbonising heating systems in our homes is key to lowering people's energy bills long-term as well as combating climate change. While this may present challenges, achieving a fair and inclusive transition to low-carbon heating requires collaboration between government, industry, and communities. By addressing both financial and physical constraints, we must make sure no household is left behind in the journey.

Energy Matters, for people, power and prosperity. If you have a case study showcasing innovative work within the sector, please get in touch via press@energy-uk.org.uk.

[6] Kensa Heat Pumps (2024) 'Game-changing' Shoebox NX heat pump unlocks the NeXt generation of home heating