Fuelling the future:
Prioritising the gas transition for Net Zero

THE ROLE OF GAS IN HEATING HOMES

Energy UK

Carbon Capture & Storage Association

Fuelling the Future: Progressing the gas transition for Net Zero

The role of gas in heating homes

This is the fourth in a series of briefings from Energy UK and the Carbon Capture and Storage Association (CCSA), exploring the role of gas in the transition to a net zero economy. This briefing discusses the role of gas in heating homes across the UK, and outlines the policies required to enable an equitable transition to a clean heating system.

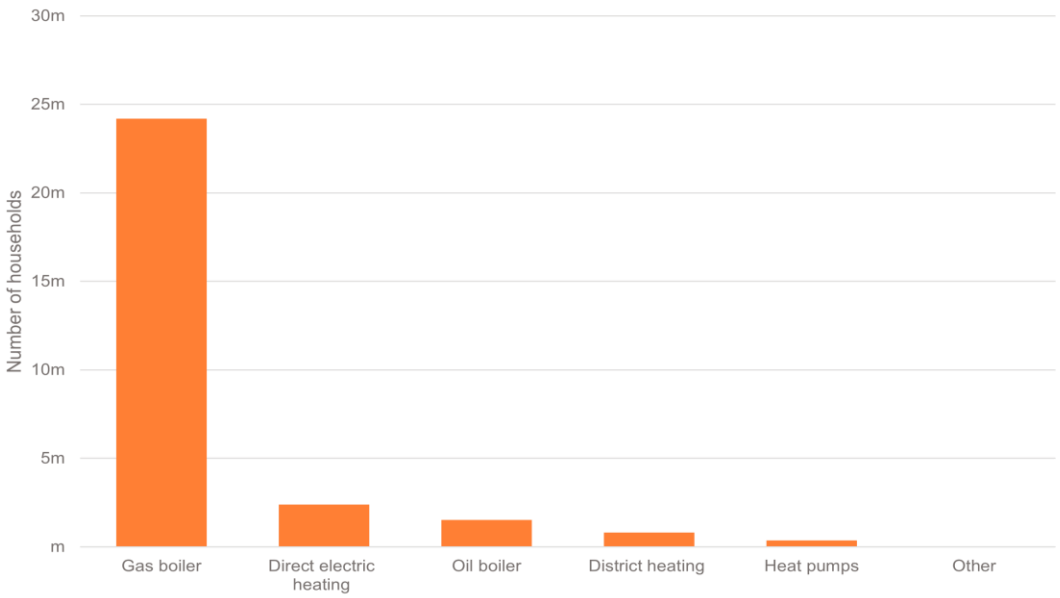
Visit the Fuelling the Future webpage to explore previous briefings in the series that look at the broad role of gas across the whole economy, in the power sector, and across the UK's industry.

Gas is central to how we heat our homes

There are roughly 30 million homes in the UK and 85% of them rely on natural gas for heating.[1] Homes accounted for more than a third of the natural gas burned in 2023, more than any other use including electricity generation and industry.[2] Homes also account for 20% of emissions.[3]

To reduce these emissions, transitioning to low-carbon heating systems is crucial, and the next decade will be critical for deciding how this takes place.

Figure 1: How homes are currently heated



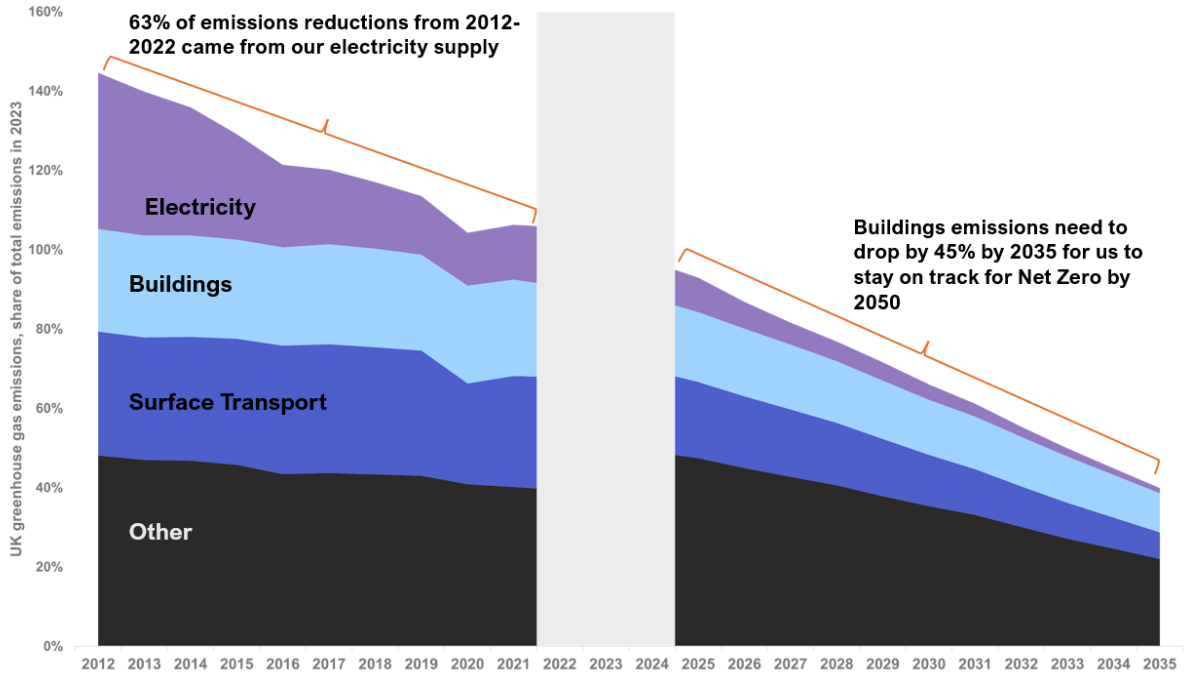
Source: NESO (2024): Future Energy Scenarios

[1] DESNZ (2024), Hydrogen heating: Overview
[2] DUKES (2024), Supply and consumption of natural gas and colliery methane (DUKES 4.2)
[3] House of Commons Library (2024), Housing and net zero

Tackling home heating is key to Net Zero

So far, decarbonisation has mostly been delivered by the power sector, primarily through the successful phase-out of coal and ramping up of renewables. This delivered 63% of emissions reductions from 2012-2022. We are now entering a new phase of the energy transition which needs to focus on more difficult parts of society to decarbonise, including buildings. According to the Climate Change Committee, emissions from buildings must fall 45% by 2035, as Figure 2 shows.

Figure 2: How building emissions must drop to stay on track for Net Zero by 2050



Source: Energy UK analysis of DESNZ and Climate Change Committee

We will need a range of technologies to decarbonise home heating

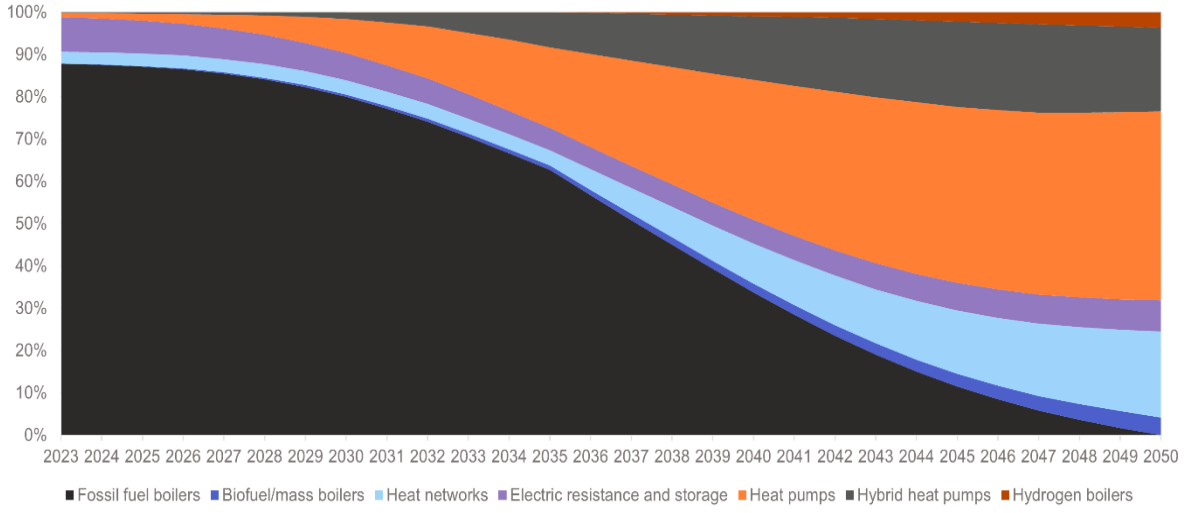
Eventually, all natural gas boilers will need to be replaced with low-carbon alternatives, and there is no single technology that can fully replace them all. There are a range of options available including:

- **Heat pumps:** one of the most efficient forms of heating that concentrates energy from an outside source (typically the air or the ground) using electricity. Hybrid heat pumps that use electricity and other fuels (like hydrogen, biomass or gas) may also be used.
- **Heat networks:** heat is shared between users in a building, community or larger areas, either from a central source (like a large boiler or heat pump) or by recycling heat from power stations, industrial facilities or data centres, and delivering this heat through a network of insulated pipes.

- **Biomass:** using wood and other plant materials, especially in more sophisticated biomass boilers, although this is likely to play a small role in decarbonising homes that are currently off the gas grid.
- **Hydrogen:** the UK will develop a clean hydrogen economy primarily to support industry and power generation. The Government will make a strategic decision on the role of hydrogen for heating in due course, however the Climate Change Committee estimates that there will be no role for hydrogen in home heating.[4]
- **Biomethane:** As overall gas demand declines, biomethane produced through anaerobic digestion (AD) can play a role in decarbonising the residual demand on the grid during the transition. This includes demand from hybrid heat pumps, which require gas for some heat consumption. The UK already has over 100 AD plants injecting biomethane into the grid, with substantial potential for further expansion. Additionally, integrating carbon capture and storage technologies at these sites could enable carbon removals, supporting the government's broader decarbonisation targets.
- **Emerging electric heating and thermal storage:** new technologies are being developed, including heat batteries that use electricity to make and store heat, helping to make the system more flexible.
- **Energy efficiency:** however we choose to heat our homes, it will be cheaper and easier if our houses are better insulated. This will involve both retrofitting older homes and building new homes to a high standard.

It is increasingly clear that electrification will be the primary way we decarbonise heat and that heat pumps will play a dominant role going forward, as can be seen in Figure 3 below.

Figure 3: How home heating might change out to 2050



Source: NESO (2024): Future Energy Scenarios, Holistic Transition[5]

[4] Climate Change Committee (2025), Seventh Carbon Budget

[5] *The Climate Change Committee's Seventh Carbon Budget projects that 6% of heat pumps installed by 2040 will be hybrid systems.

The challenge of decarbonising heat

Progress in switching to low-carbon heating has faced various challenges, including:

- **Infrastructure**: The UK's housing stock is generally old with poor energy efficiency. Around two-thirds of households suffer from damp, drafts or overheating – this wastes energy irrespective of the fuel type, but can be particularly problematic for low-temperature heating systems such as heat pumps.[6]
- **Financial barriers:** Low-carbon heating systems can have higher upfront costs than fossil systems such as gas boilers, and it can be difficult for households to afford these, either outright or by accessing financing. Rebalancing policy costs on energy bills is needed to ensure that the running costs of low-carbon heating are not higher than gas.
- **Policy inconsistency:** A boom-bust policy cycle for green home upgrades has limited investment by the supply chain, resulting in a lack of trained installers in low-carbon heating systems and specialist insulation measures. Long-term policymaking and funding are needed to drive confidence in the market, including in credible installer companies, and among customers accessing Government schemes.
- **Lack of awareness:** Unlike the decarbonisation of the power sector, which has largely taken place out of sight from the public, the decarbonisation of heat will be taking place within UK households, driven by millions of individual decisions, and with coordination by local authorities. This will require significant education and engagement of energy customers.

The UK has made some progress

Several policies have been implemented to support the transition to a clean heating system to date. This includes:

- Providing fully funded measures for low-income or vulnerable households, through the Energy Company Obligation (ECO), Warm Homes: Social Fund, Warm Homes: Local Fund and Home Upgrade Grant.
- Interventions in the market such as the Boiler Upgrade Scheme and the (now closed) Green Homes Grant Scheme.
- The Government has also taken steps to directly raise understanding among customers as to the clean heating options available to them, such as the online checker tools on gov.uk and the recently launched Warm and Fuzzy campaign.

[6] Energy Systems Catapult, A Guide to Decarbonisation of Heat in the UK

More ambition is needed: policies for heat decarbonisation

Decarbonising heat will require ambitious, coordinated policy across Government departments that works closely with households, industry and the public sector.

- **Frameworks and regulation for clean heat:** with the right market mechanisms, house builders and heating system manufacturers will play a central role in decarbonising heat. Requirements for new homes and buildings to be energy efficient and use low-carbon heating should be implemented through the Future Homes and Buildings Standards. The Clean Heat Market Mechanism obligates heating appliance manufacturers to meet targets for the proportion of heat pumps they sell each year, introduced by the Government in November 2024.
- **Policy clarity and certainty:** households and industry need to know what is likely to happen to make the right decisions about the technology they use and the investments they make. That is only possible with a clear direction and plan from Government. Making unambiguous decisions bolsters clarity and certainty. This is especially needed around the role of hydrogen in home heating, which is currently not expected until 2026.
- **Funding the shift:** some households need support to make their homes more energy efficient and replace their fossil fuel heating. This is delivered through schemes including Boiler Upgrade Scheme, Energy Company Obligation, Warm Homes: Social Fund and Warm Homes: Local Fund. Extending these programmes and increasing their funding is essential to decarbonising home heating.
- **Removing barriers:** the right planning system can positively shape investment – such as heat network zoning. The Government has taken some positive steps for particular technologies such as relaxing permitted development rights for air source heat pumps, but more action is needed to provide clarity for customers on the most appropriate heating technologies for their homes.
- **Streamlining the journey for households:** it must be easy for households to replace their gas heating, and to disconnect the gas supply, with high standards from the businesses and professional involved both in terms of the products and services they deliver.
- **Making the economics work for households:** the price of electricity relative to gas is a core factor in whether households save money by switching to electric heating, like heat pumps. This also impacts the investment proposition for new low-carbon heat networks. However, the UK has some of the most expensive electricity prices relative to gas in Europe. Electricity needs to be cheaper before there is a major shift away from gas heating. Policy costs to fund legacy renewables and some social schemes are part of the problem. Removing them (ideally into general taxation, but possibly part-funded by gas bills) would make a big difference.

Energy UK is the trade association for the energy industry, representing companies investing billions of pounds to secure our country's current and future energy needs.

From growing start-ups to major electricity generators, grid and infrastructure developers and energy suppliers, our members are driving change across power, heat, transport and flexibility.

We provide a collective voice for the sector working with governments, regulators, charities and other organisations to provide crucial insight that shapes policy, offers solutions and promotes best practice.

Our broad view across the whole system supports evidence-based positions which are not tied to particular technologies, and are focused on delivering strategic benefits for people, businesses and the economy.

We champion initiatives such as our Vulnerability Commitment, which pushes suppliers to go beyond regulation to support customers with additional needs, and TIDE, the industry's drive for greater inclusion and diversity. Through our Young Energy Professionals Forum, we support the development of future leaders.

We are equally committed to our team and are proud to be recognised as a 'Gold' Investors in People employer.

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The CCSA is the trade association promoting the commercial deployment of Carbon Capture, Utilisation and Storage (CCUS), an essential solution to deliver net zero emissions across the economy, predominantly in power, industrial and transport sectors.

It works with members, governments and other organisations to ensure CCUS is developed and deployed at the pace and scale necessary to meet net zero goals and deliver sustainable growth across regions and nations.

The CCSA has over 100 member companies who are active in exploring and developing different applications of carbon capture, CO2 transportation by pipeline, ship and rail, utilisation, geological storage, and other permanent storage solutions, both end-users of the technology and those in the supply chain, as well as members from management, legal and financial consulting sectors.

www.ccsassociation.org/

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To discuss this series of reports, please contact kisha.couchman@energy-uk.org.uk and louise.stott@energy-uk.org.uk.

This briefing is part of a series of reports from Energy UK and the Carbon Capture and Storage Association (CCSA) exploring the role of gas in the transition to a Net Zero economy.

Find out more here:
www.energy-uk.org.uk/fuelling-the-future/

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