Innovate UK

Mind the Gap

Ensuring heat policy reaches space-constrained homes

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REGEN

Acknowledgements

About Net Zero Living

Net Zero Living (NZL) is a programme of work run by Innovate UK. The programme provides support to local authorities, their partners and communities to overcome non-technical systemic barriers to the scaling and adoption of net zero solutions.

Within the programme, there are 52 local authorities – the NZL participants – at various stages in the development and delivery of their local net zero plans.

Regen provides expert support on policy and regulation to the NZL programme, and this paper has been informed by these interactions.

About Regen

Regen provides independent, evidence-led insight and advice in support of our mission to transform the UK's energy system for a net zero future. We focus on analysing the systemic challenges of decarbonising power, heat and transport. We know that a transformation of this scale will require engaging the whole of society in a just transition.

Regen is a membership organisation with over 200 members who share our mission, including clean energy developers, businesses, local authorities, community energy groups and research organisations across the energy sector. We manage the Electricity Storage Network (ESN) – the industry group and voice of the grid-scale electricity storage industry in GB.

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Executive Summary

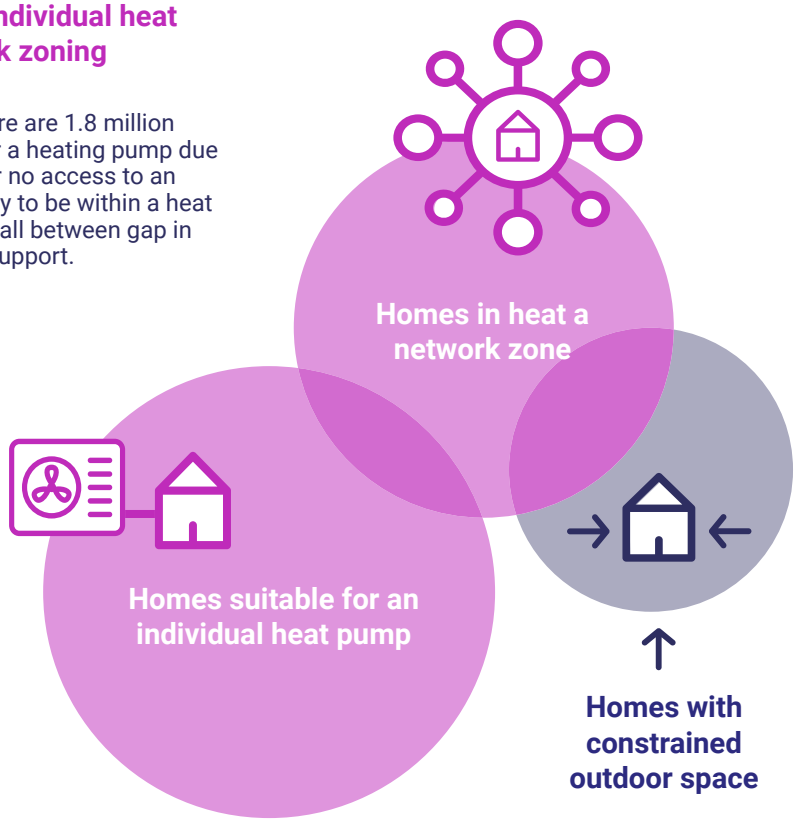
Around 1.8 million homes in the UK fall into the ‘heat gap’ between the major policy approaches to deploy low-carbon heating.

These are homes where individual heat pumps are very difficult to deploy due to severe space constraints, and a lack of nearby commercial anchor loads means that commercially led heat networks are unlikely to be developed.[1] Without a strategic approach from policymakers, these homes will likely be stranded with high-carbon heating.

UK and devolved government policies identify individual heat pumps as the dominant technology for decarbonising domestic heat.[2] The vast majority of UK homes are technically suitable for a heat pump though there are significant delivery challenges to overcome in order to reach the targeted uptake.[3] Heat pump installations are supported by a 0% VAT rate, as well as grants towards the capital cost of installing a heat pump through the Boiler Upgrade Scheme in England and Wales and the grant and loan scheme in Scotland.[4,5,6]

The heat gap between individual heat pumps and heat network zoning

Regen analysis estimates there are 1.8 million homes that ar not suitable for a heating pump due to having limited, restricted or no access to an outdoor space and are unlikely to be within a heat network zone. These homes fall between gap in heat decarbonisation policy support.



- Homes without policy support (The heat gap)
- Homes with policy support

Venn diagram not to scale

Low-carbon heat networks are also expected to play a significant role in heat decarbonisation, with the UK government aiming for them to meet 20% of heat demand by 2050.[7] In England, heat network zoning is the key mechanism for enabling this growth.[8] Heat network zones are expected to focus on areas where 'anchor loads' create commercially viable network opportunities – with only limited inclusion of domestic properties.

This paper identifies that there is a significant minority of homes that are falling through the gap between these two approaches and explores how government and regulators can unlock compelling opportunities to decarbonise these homes.

We offer the following recommendations:

1. **Deliver a methodology to identify homes in the heat gap**

- The Department for Energy Security and Net Zero (DESNZ) could formalise a definition for homes in the gap, building on their research on 'complex-to-decarbonise' homes and use this to reduce uncertainty and empower local delivery of low-carbon heat.[9]
- The framework would need to evolve as the transition accelerates, taking account of changes in technology, energy costs, consumer attitudes and delivery models.

2. **Commission research and innovation to clarify the best approach to decarbonise space-constrained households**

- Governments and innovation agencies could commission large-scale pilot studies to develop scalable, repeatable models for delivering low-carbon heat to space-constrained homes.

3. **Remove barriers to delivering low-carbon heat in space-constrained homes**

There are four immediate policy opportunities to close the gap:

- **Broaden the reach of existing policy to close the heat gap:** UK and devolved governments should ensure that heat network delivery and grants for low-carbon heating are made more inclusive to narrow the gap.
- **Reduce the 'spark gap':** the UK government could reform levies and restructure electricity markets in order to reduce electricity bills, alleviate fuel poverty and support the uptake of low-carbon heat through all electric technologies.
- **Capture the network value of clean heat deployment:** Ofgem could require distribution network operators (DNOs) to engage with low-carbon heat delivery in order to mitigate electricity network investment.
- **Unlock opportunities for communal heating in individual buildings through revised regulation:** the UK government could explore the legal and regulatory barriers to communal heat projects.

Introduction

The ‘gap’ between individual heat pumps and heat network zoning

There is a ‘heat gap’ for a small, but significant, number of severely space-constrained homes across the UK where individual heat pumps and commercially led heat networks are unlikely to provide the decarbonisation solution.

The heat gap is not well defined, which creates uncertainty around low-carbon heat that acts to slow down action to decarbonise homes more widely. This issue was regularly raised by local authorities engaged with the Net Zero Living programme. Starting to address this question will create momentum behind heat electrification by providing greater clarity as to where heat pumps, heat networks or other technologies will be the best heating solution.

This report aims to characterise homes within the gap and identify options for addressing it.

Heat pumps are a great solution but need space to work

Heat pumps provide heat from low-carbon electricity with much higher efficiency than other systems. For the majority of homes, individual air source heat pumps are considered the best way to decarbonise heating – for the energy system, the occupier and overall cost effectiveness.

Heat pumps use electricity to collect ambient heat from the air, water or ground and deliver it into the home. They are able to deliver several times more heat energy than the electricity they consume, thus achieving an efficiency of several hundred percent. The vast majority of heat pumps installed for individual buildings are air source, as these are not limited by access to land or water resources.[10] In-use studies have shown they offer a typical efficiency of 280% in the UK.[11] There was a wide spread of performance in this study, which may highlight opportunities for improving the average through better design and installation standards, though it also highlights how different housing archetypes, insulation standards and household behaviour can impact performance.[12]

There is consensus around the importance of heat pumps for providing low-carbon heat. They are recognised by the UK and devolved governments as critical to the delivery of net zero.[13] The National Energy System Operator (NESO) and the Climate Change Committee (CCC) also indicate that heat pumps will be the dominant heating system in a net zero future.[14,15]

Studies show that individual air source heat pumps are suitable for the full range of housing archetypes, but for some homes, severe space constraints mean that individual heat pumps are not suitable, and alternatives must be identified.[16,17]

Large-scale heat networks will be a solution in some areas – but not all.

One solution for severely space-constrained homes may be a heat network connection. Heat networks are expected to serve around 20% of the UK's heat demand by 2050.[18] In England, heat network zoning is being implemented, with the aim of supporting the development of large-scale strategic heat networks. The government's response to the 2023 heat network zoning consultation is pending, but the methodology and outputs of the pilot indicate that the focus will be on large urban areas that incorporate a significant volume of non-domestic heat demand as anchor loads.[19,20]

Zoning regulations will require certain buildings within zones to connect to the network, providing investors greater certainty of demand. These buildings include new developments, buildings with pre-existing communal heating systems and certain non-domestic buildings. The majority of existing domestic buildings are not included within this, though they should have the opportunity to connect.

The zoning methodology presented in the heat network pilot is based on a least cost approach comparing a heat network to an individual air source heat pump counterfactual.[21] It does not assess barriers to the air source heat pump counterfactual other than cost.[22] As a result, homes where air source heat pumps are difficult to install are excluded from the two major solutions for decarbonising homes.

The devolved nations are on a similar trajectory, though there is less certainty about how – and even if – heat network zoning will be implemented. The Welsh Heat Strategy commits to supporting the scale-up of low-carbon heat networks, stating that heat network zones will follow from Local Area Energy Plans (LAEPs) and commits to then 'assess whether the zoning powers in the Energy Act 2023 are required in Wales'.[23] Local Heat and Energy Efficiency Strategies (LHEES) are the 'principal mechanism' for delivering clean heat in Scotland.[24] Heat networks are a core part of these plans, but there is no detail yet on how they will be delivered. Northern Ireland's Department for the Economy is undertaking research into a 'spatial national heat study for district heating'.[25]

Our recommendations outline how all homes could be offered a compelling, low cost route to low carbon heat.

Characterising the heat gap

Recommendation 1

Deliver a methodology to identify homes in the heat gap

The first stage in addressing the heat gap is to clarify which homes fall into it. Understanding the number, location and level of deprivation of these homes is important to ensure effective national and local policy measures can be implemented to support their transition to low-carbon, affordable heat.

There are roughly 1.8 million homes in the heat gap

Our high-level, indicative analysis estimates that there are around 1.8 million homes in the UK where space represents a fundamental barrier to the adoption of individual heat pumps, and commercial heat networks are unlikely to be available.[26]

The Energy System Catapult's (ESC) 2022 electrification of heat demonstrator identified external space constraints as the most common barrier to installing an individual heat pump.[27] For some homes, recent changes to planning rules or greater acceptance of heat pumps may mitigate this barrier.[28] For others, such as back-to-back terraced houses, there is a fundamental shortage of space for an external unit. There would be a material impact on the community if individual heat pumps were adopted, which is unlikely to be acceptable. Another technology must be identified to decarbonise heat.

Identifying homes in the heat gap within wider spatial planning is the first step to addressing them with effective policy.

Comprehensive spatial analysis is required

Clear recognition and identification of homes in the heat gap is required to give confidence to local authorities and homeowners to be able to invest in appropriate low-carbon heating. This requires comprehensive spatial analysis, which should complement heat network zoning by accounting for the practicality of an individual heat pump, as well as the social need for effective low-carbon heat in every home.

Such a tool would identify areas with high concentrations of homes in the heat gap and support local authority and community-led activity to focus on area-based projects and programmes, including both heating solutions, renewables and fabric upgrades. Empowering local communities and local government to deliver home energy advice and upgrades offers stronger community buy-in, supply chain engagement and a better understanding of the need in each area. [29]

Addressing the heat gap is vital to tackle fuel poverty

Households in the heat gap need to be protected from high running costs for their heating. High running costs could result if these homes become stranded on high-carbon heating options or where low-carbon alternatives with high running costs are installed. Without efforts to identify and deliver cost-effective solutions for homes that fall into the heat gap, there is a risk of trapping residents with high-carbon and/or expensive-to-run heating systems.

Fuel poverty affects 6.1 million households in the UK.[30] Research shows that there are wide-ranging impacts of cold homes in terms of excess deaths, health and care costs, educational attainment and productivity.[31] Homes in the heat gap, and where the household is living in fuel poverty, need suitable support to install low-cost, affordable-to-run, low-carbon heating. The solutions are unlikely to be straightforward with a mix of tenures and housing stock combined with severe space constraints.

A social tariff would provide support for fuel-poor households more generally.[32] Providing efficient low-carbon heating for homes in the heat gap will not only support the UK's decarbonisation aims but will also reduce the number of homes living in fuel poverty and the cost of providing this support. There is a trade-off, and in some cases, particularly for homes with low energy demand, it may be more cost-effective for the government to make direct electric heating affordable through subsidies rather than investing in low-carbon heating with lower running costs.

Comprehensive spatial analysis would provide clarity for all buildings, reduce uncertainty and accelerate low carbon heat.

Solutions for addressing the heat gap

Recommendation 2

Commission research and innovation to clarify the best approach to decarbonise space-constrained households

There are a number of options to decarbonise heat in space-constrained households, including those explored in NZL (see case study: 'Net Zero Terrace Streets', page 13). Finding the best solution requires an assessment of the household, the building and the area.

Delivery models are just as important as the technology. Solutions must be compelling to consumers and provide clear benefits and protections with due consideration of energy network impacts and long-term governance and maintenance.

Assessing the household, the area and the building is vital to find the right approach to low carbon heat.

There is a wide range of potential low-carbon technologies

The range of low-carbon heating technologies breaks down across three categories: heat pumps, other electric heating and communal systems. The relative merits of these options are presented in the table below. Domestic biomass is not considered due to its negative impact on air quality, as well as high space requirements.[33]

Heat pumps offer advantages in terms of efficiency and, therefore, running costs, but space limitations may restrict their use for space-constrained homes. Air-to-air heat pumps may be more suitable for some of these homes, particularly open-plan flats.

Other electric heating technologies cannot exceed 100% efficiency, which results in higher running costs per unit of heat delivered. Costs can be reduced by using thermal storage in order to access time-of-use tariffs. In general, they tend to be relatively cheap to install and maintain, meaning that they are likely to be an optimal choice for homes with low heat demand.

Heat networks can effectively decarbonise heat in severely space-constrained homes on an area-wide scale, where there are suitably grouped buildings. They can connect multiple buildings to low-carbon heat, reducing space requirements in each home, as well as capturing ambient heat.

Summary— Technology options for low carbon heat in space constrained homes

Technology	Upfront costs	Running costs	Space	Usability
Heat pumps				
Hydronic air source heat pumps	£10,000 to £15,000[34] (less £7,500 grant)	Very high efficiency means lower running costs.[35,36]	External heat pump unit, plus thermal store for hot water	High – stable performance with a long lifespan
Ground source heat pumps	£19,000 to £38,000[30] (less £7,500 grant)		Internal heat pump unit, hot water store and trenches or boreholes	
Air to air heat pumps	£2,400 to £8,000[37] Not currently eligible for the Boiler Upgrade Scheme		Outdoor unit and wall-mounted indoor fan units	Moderate – rapid heating and cooling, no hot water.
Networks				
4th generation heat networks	Cost is dominated by infrastructure investment, which varies widely. Current schemes are mainly gas-fired and communal, making them poor predictors of cost for newer, low-carbon networks. High-density heat demand and waste heat sources can significantly reduce costs.		Compact heat interace unit	High – similar in operation to a combi boiler
Ambient loop heat networks			Internal heat pump unit, plus thermal store for hot water	High – stable performance with a long lifespan, and can provide cooling
Other electric				
Storage heaters	£150 to £600 per heat-er, plus significant re-wiring costs[38]	Higher than heat pumps, but using an off-peak tariff can reduce costs	Wall-mounted units in each room	Poor – less responsive, requires planning. Smart controls emerging.
Heat batteries	£8,000 for the direct replacement of a gas boiler[39]	Higher than heat pumps, but significant savings with flexible tariffs and solar	Compact boiler unit plus thermal store	Moderate – familiar system and controls, and quick boiler replacement, but requires a time-of-use tariff
Infrared heating panels	£350 to £600 per panel, multiple panels per room, plus rewiring[40]	No efficiency or flexibility advantage. Low energy use relies on maintaining comfort at lower air temperature.	Minimal – thin wall or ceiling-mounted panels in each room	High – instant localised heat, works for intermittent use

Key

- Good
- Moderate
- Poor

A framework is required to identify the optimal approach to decarbonising all homes, without creating or exacerbating fuel poverty. Such a framework would build on the approach of heat network zoning, but would be technology agnostic and focused on the need to decarbonise all homes affordably.[41]

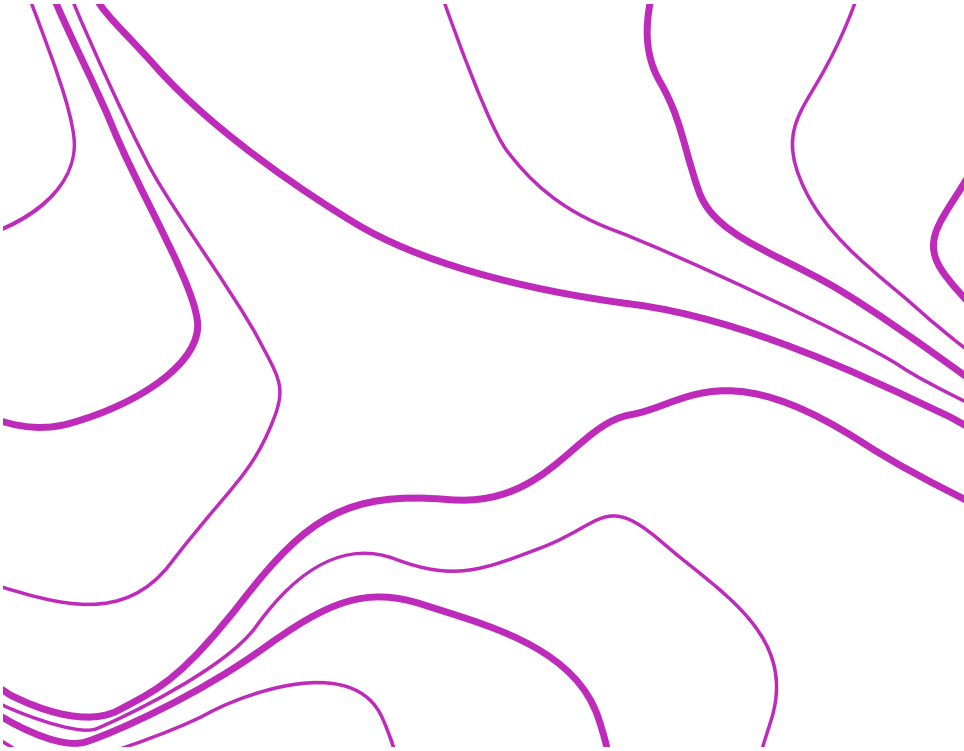
Effective delivery models are required for technology to work

Both the home and the household must be at the centre of the transition to low-carbon heating. This requires the right technical approach to be paired with an effective delivery model.

At present, area-wide case studies for tackling heat decarbonisation in homes in the heat gap are relatively limited. There are a handful of examples, such as Net Zero Terrace Streets (see case study, below), which are attempting to address the issue, but these face enormous challenges in communicating, financing and delivering the work. Most of these challenges are common across retrofit delivery schemes, but tackling space-constrained homes reduces the flexibility of delivering the work, as well as being linked to higher levels of deprivation, which can compound many of the other challenges.

Concerted support is now required to scale up meaningful pilot projects to demonstrate how the heat gap can be addressed in practice.

We need to develop compelling offers that provide low-carbon heat, affordable bills and effective community engagement.



Case study

Net Zero Terrace Streets

Net Zero Terrace Streets (NZTS) is an Innovate UK-funded project developing a replicable, place-based model for decarbonising mixed-tenure terraced housing in Rossendale, led by Rossendale Valley Energy and Rossendale Borough Council.

The aim is to create healthy, warm homes with no upfront cost to residents, delivered through affordable, low-carbon energy. Dense terraced streets were identified as a particularly challenging typology to decarbonise. With little or no outdoor space, external air source heat pumps are rarely viable, and a lack of commercial anchor loads makes a heat network unlikely. This leaves electric boilers as the default low-carbon option, which would result in much higher running costs than fossil fuel heating. Given the high levels of fuel poverty and deprivation in these communities, this is not an acceptable solution.

Through detailed technical modelling, the team identified networked ground source heat pumps, packaged with whole-house fabric upgrades and shared solar, as a scalable pathway. This can be financed through an affordable standing charge model with no upfront cost, tested against real household energy bills to ensure it reduces, rather than increases, costs.

Alongside the physical measures, NZTS has developed a robust retrofit methodology that builds on a three-home pilot. These properties were deliberately selected to represent diverse terrace archetypes and site conditions, allowing the team to trial sequencing logic, airtightness strategies and resident support processes.

Community engagement is central to delivery. Local Energy Champions ensure households are co-designing retrofit journeys, while the Centre for Energy Equality's Fairer Warmth platform provides trusted advice and ongoing support.[42] Local supply chains are being mapped and engaged, with training needs identified to build a place-based workforce for future rollouts.

Governance and replication are embedded through the creation of Looped Energy Communities CIC, a vehicle designed to support other areas to adopt the NZTS model with confidence. Knowledge from the pilot is being captured through live monitoring logs, risk registers and learning frameworks, all of which will feed into a comprehensive deployment pack for future clusters.

Ultimately, the project not only delivers immediate improvements for participating households, but also addresses systemic barriers of finance, governance, supply chain capacity and resident engagement, offering a route to decarbonisation for people who are otherwise likely to be left behind in the energy transition. In order to test and fully realise the benefits of place-based, local delivery of networked heating, a large-scale demonstrator is required.

Opportunities to close the gap

Recommendation 3

Remove barriers to delivering low-carbon heat in space-constrained homes.

All households should have an affordable route to low-carbon heat, and clarifying the approaches for different homes will reduce uncertainty. The previous section outlines areas where more research and innovation are required, but there are known barriers that could be more immediately addressed to support the installation of low-carbon heat in the heat gap.

The technology exists. If policy can reduce uncertainty and lower costs then the heat gap could be narrowed.

Broaden the reach of existing policy to close the heat gap

The government has proposed expanding the Boiler Upgrade Scheme to include low-carbon heating technologies beyond hydronic heat pumps.[43] This would broaden the opportunity to install low-carbon heating in space-constrained homes, though it should also ensure it does not over-incentivise less efficient technologies or undermine the growing demand for heat pumps.

Heat network zoning could also be modified to narrow the heat gap. The proposed methodology assumes an individual air source heat pump 'counterfactual' to measure where heat networks are likely to offer the lowest cost, low-carbon heating technology.[44] This could be amended to account for homes that are unlikely to be suitable for an individual hydronic heat pump. This would then extend the benefit of low-carbon heat networks to homes where they represent the lowest cost, practical route to low-carbon heat.

Expanding heat networks to include such buildings would have an impact on the financial proposition for the network. Heat network connection costs are high, and these costs are likely to be hard to recover for space-constrained homes, where the heat demand will be relatively low. This approach may, therefore, require additional support from the government – recognising the wider social value of decarbonising these homes, lowering bills and improving air quality.

Case study

Sutton Dwellings

Sutton dwellings are four blocks of social housing flats in Kensington, owned by Clarion Housing Group who recently decarbonised them through a shared ground loop ground source heat pump system.

These homes are over 100 years old and are incredibly space constrained. The density and size of the flats means there is not sufficient space for individual air source heat pumps. Nor is there shared space available to the estate to install an energy centre providing heat to a 4th generation heat network. The heritage aspect of the buildings poses further limitations, making a shared air source system difficult to install onto the roof, as it would be difficult to conceal.

The approach taken was to use a shared ground loop, where each home is heated by an individual heat pump that is installed internally and accesses heat from the ground through pipes. Clarion worked with Kensa to install an ambient ground loop of 27 boreholes, drilled in the central courtyard, and 81 ground source heat pumps providing heat and hot water to each flat.

Beyond the space constraints, this system has the advantage of high familiarity and low running costs. Heat is provided through radiators and residents have independent control over their energy use. The high efficiency of a heat pump system will lower the energy required to keep bills low. This is particularly important for social housing.

The challenge of this system is the installation process. In this case the installation was part of a wider regeneration of the blocks in which there were no residents living on site. This makes drilling boreholes, fitting pipework and installing heating distribution much simpler and results in cost savings through combining with other refurbishment.[45]

Reduce the 'spark gap'

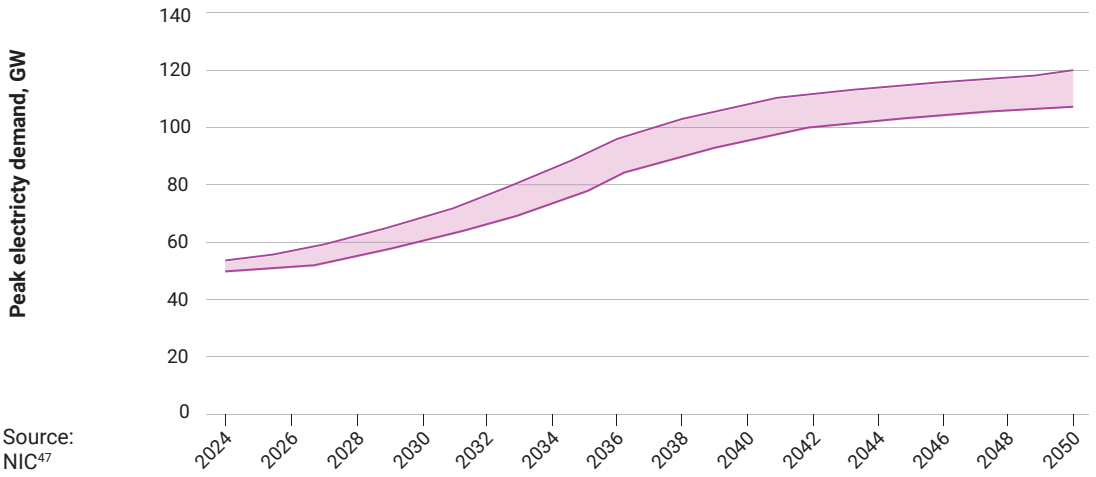
Electrification is expected to be the primary mechanism to decarbonise heat for all buildings. The high cost of electricity relative to fossil gas – also known as the 'spark gap' – undermines the economic argument to decarbonise heat across all technologies. Reducing the spark gap will not only accelerate the adoption of heat pumps and strengthen the business case for low-carbon heat networks, but it will also allow other electric heating technologies to become competitive.

As well as incentivising electrification, reducing electricity costs will immediately reduce fuel poverty among the 8% of households who use electric heating. The fuel poverty rate among this group is almost twice as high as for households with gas heating, and the lack of an existing hydronic distribution system acts as an additional barrier to heat pump uptake.[46] The forthcoming Warm Homes Plan would benefit from including policies to reduce the spark gap.

Capture the network value of clean heat deployment

The electricity network is critical to decarbonising our homes, and significant infrastructure investment is required to deliver net zero. Peak demand is forecast to double by 2050, with the electrification of heat accounting for 40-47 GW of this demand, as shown in the graph below.[47] The choice of how we electrify heat will impact the investment required.

Peak electricity demand from 2024 to 2050.



Source: NIC[47]

Currently, households and communities have few incentives to choose heating systems with the electricity network in mind. A Regen study for the National Infrastructure Commission (NIC) found that the required annual investment in the distribution network could range between £1.4bn and £1.8bn to support the electrification of heat and transport, as well as connecting low-carbon generation and storage.[48] This would be a significant increase compared to the current annual budgets for load-related expenditure of £640m.[49] Identifying approaches that reduce the network impacts of heat decarbonisation will reduce the required investment into electricity generation, distribution and balancing, lowering costs for all consumers.

Mechanisms to incentivise thermal storage and communal heating where they offer a network saving could be developed to address this. This process is challenging as it must account for the spatial variation of electricity networks as well as wider electrification requirements, such as electric vehicle charging. Incentivising heat networks to incorporate greater degrees of thermal storage is a sensible first step, and this could be incorporated into heat network regulation.

Empowering DNOs to facilitate heat decarbonisation projects that allow them to reduce network investment would be another approach. Ofgem's decision for DNOs to play a greater role in energy efficiency delivery during the next price control period should be a positive move in this direction.[50]

Unlock opportunities for communal heating in individual buildings through revised regulation

Communal heat networks serve multiple units within a single building or very small development. These have the potential to fill the heat gap for homes where space constraints restrict individual air source heat pumps, most obviously in blocks of flats. Compared to district heat networks, they are not dependent on wide-scale heat density and do not require pipework to be laid under the streets, which significantly lowers up-front investment.

Census data for Great Britain shows that only 3% of flats are heated solely by a heat network, whereas 59% are heated by individual fossil fuel systems.[51] Communal heating systems offer an opportunity to decarbonise a significant volume of these homes, but there is little incentive for residents or landlords to overcome the practical and legal barriers to deploying these solutions. The Boiler Upgrade Scheme can be redeemed against shared ground loop systems, but the latest data shows only 29 redemptions have been made out of a total of almost 60,000.[52]

At the micro-scale, for example, households within a former house divided into flats could, in theory, develop a communal heating approach sharing the use of a single ground or air source heat pump. This approach requires an organisation to act as a heat supplier, and the current proposed heat network regulations would apply.

From January 2026, Ofgem will have new regulatory powers to protect consumers on heat networks.[53] This is welcome, as currently people who use a heat network to heat their home have had lower levels of support and protection than gas and electricity customers.

However, it also means that new communal heating systems in buildings will have a much higher regulatory burden. Regulation could be developed in order to incentivise the provision of small-scale communal heating systems. This should create an opportunity for the provision of small-scale, communal heating systems whilst providing adequate consumer protection.

Broadening the reach of existing policy and taking a whole systems approach to low carbon heat could close the heat gap.

Conclusions

Having identified the challenge of the heat gap, we have made a number of recommendations to address it. Here we describe each one, who could take it forward and how it might be enacted.

1. Deliver a methodology to identify homes in the heat gap

Challenge

The heat gap represents homes falling through the cracks between the dominant policy approaches. Identifying these homes and defining them more clearly is the first step to closing the gap, as well as reducing uncertainty, which is holding back the transition more widely.

Reponsibility

DESNZ is well placed to manage this process. They could build on their research on complex-to-decarbonise homes by formalising a definition of homes in the gap.[54] Using this definition in policy would give greater clarity to households and local government, empowering them to identify and deliver the right solutions for low-carbon heat.

Enact

The framework should evolve as the transition accelerates, taking account of changes in technology, energy costs, consumer attitudes and delivery models. This presents a challenge in policy design and communication, which can be addressed through transparency. Areas of uncertainty and the framework for decision making should be clearly defined, enabling delivery to focus on the low-regret options and effectively manage risk.

2. Commission research and innovation to clarify the best approach to decarbonise space-constrained households

Challenge
All homes need an affordable, low-carbon heating option. It is not acceptable for homes to be left behind, and a just transition requires low-income households to be supported in installing and using an effective solution.

Reponsibility
Research now needs to focus on delivery at scale. There is a wide range of technological options, but households need to be supported and listened to by trusted groups to deliver the right technology into each home in the right way.

Enact
Community energy groups have several tools and networks to begin this work. The government and UKRI could work to identify how to fund and incentivise this work in a way that kickstarts a fairer transition.

3. Remove barriers to delivering low-carbon heat in space-constrained homes

We have identified four tangible policy opportunities to close the gap.

Enact

Broaden the reach of existing policy to close the heat gap

The heat gap is defined by the two major policy approaches to low-carbon heat: individual heat pumps and heat networks. Reconsidering how these policies are defined could help narrow or close the gap.

For the UK government, heat network zoning could employ a more nuanced counterfactual for assessing heat network viability that allows for dense areas of housing where individual heat pumps are not a practical consideration. Funding may be required to support the extension of heat networks to less financially viable areas of housing. This would need to be assessed against the advantages of bringing affordable low-carbon heat to these homes in bulk, and the wider impact on deprivation, air quality and emissions. Devolved governments could make the same considerations in deciding how and where they will deliver low-carbon heat networks.

For heat pumps, the Boiler Upgrade Scheme is the principal policy support for households to install heat pumps.[55] The recent consultation on expanding the scheme to other technologies is one approach to narrowing the gap.[56] This is not without risks, however, as it may undermine the messaging that heat pumps are several times more efficient than other technologies. A more strategic approach to supporting all households to find the best low-carbon heating technology could be explored.

Enact

Reduce the 'spark gap'

The price of electricity relative to gas (the spark gap) is the highest in Europe.[57] This is most often talked about in terms of individual heat pumps, but this also holds back other forms of low-carbon heat, which use electricity and are competing on prices set by gas or oil-burning boilers. The UK government could work with Ofgem to reform levies and restructure electricity markets in order to reduce electricity bills, alleviate fuel poverty and support the uptake of low-carbon heat through all electric technologies.

Enact

Capture the network value of clean heat deployment

Efficiency and flexibility are vital tools in managing the network investment required to deliver clean heat. Ofgem have announced that energy efficiency will play a greater role in DNOs' operations in the next price control period.[58] Ofgem might also look to ensure that the electrification of heat and transport is embedded in decision making, ensuring that the best value approach for consumers is approached from a whole system view.

Enact

Unlock opportunities for communal heating in individual buildings through revised regulation

Space constraints can sometimes be overcome by using a shared, communal heating approach. The UK government could explore the legal and regulatory barriers to communal heat projects, in order to ensure that regulation supports the provision of small-scale communal heating systems. This would need to balance the opportunity for the provision of small-scale, communal heating systems whilst providing adequate consumer protection.

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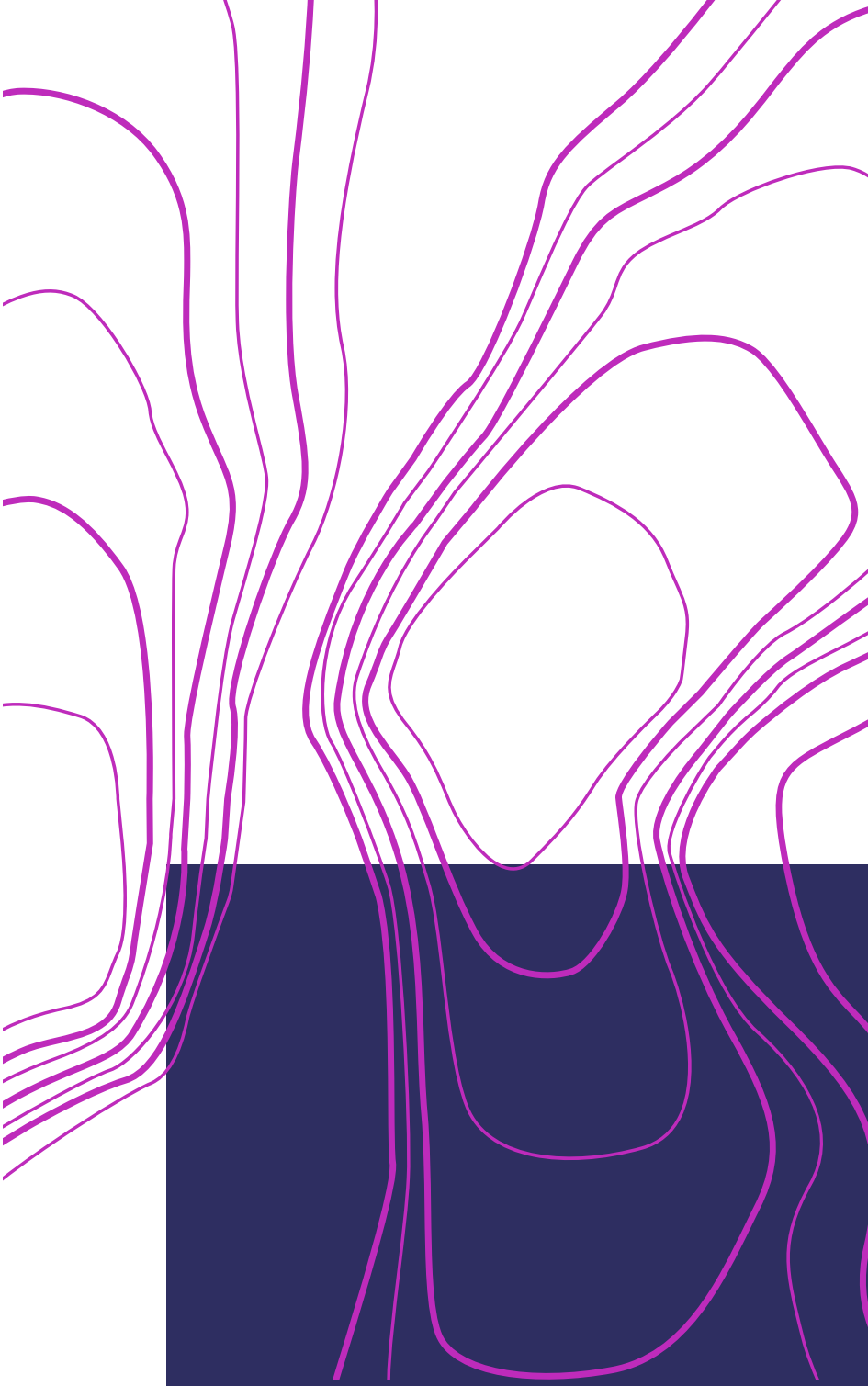

Mind the Gap

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