

Turning down the heat

Easing the pathway to
low-carbon home heating



Executive Summary

UK heat policy is at a cliff edge, putting net zero at risk.

To date, most consumers have not chosen to install heat pumps. This study finds that forcing consumers to do so is likely to increase costs for everyone and spark backlash against climate policy. We set out the parameters for a more flexible pathway, which supports technologies, including hybrid heat pumps, based on emissions and cost savings. We find that, by allowing consumers to transition more gradually to newer technologies, this approach offers a lower-cost and more voter-friendly pathway to net zero.

In their 2024 Manifesto, the Labour Party pledged to “save families hundreds of pounds, reduce fuel poverty, and guide Britain back on track to meet our climate targets”.¹ Once elected, the new Government enacted this by extending support for, and reducing barriers to installing, heat pumps.² More recently, the Warm Homes Plan committed to 450,000 installations per year, by 2030 (down from 600,000 per year, by 2028).³ In theory, this is a sensible policy approach. Heat pumps can improve energy efficiency, reduce consumer exposure to volatile energy prices, and cut emissions from home heating. However, in practice, heat pumps are still significantly more costly than traditional gas heating, and uptake has been slow. More aggressive policy to force faster adoption faces a real risk of political deadlock, by

increasing costs and removing consumer choice – putting both decarbonisation and household budgets at risk.

In this study we explore how focusing on a high-cost, high-change pathway has delayed consumer uptake and created political risks for net zero. We compare this trajectory against a more flexible route, in which low-carbon heating technologies are offered equivalent support to heat pumps – dependent on their gas reduction potential. Such technologies include hybrid heat pumps, which combine a small heat pump with a new or existing boiler.

Through our research we find that most consumers do not currently consider heat pumps an attractive solution. This is unlikely to change until bill costs fall dramatically – beyond what Government announced in its last budget. While Government has committed to this, this will take time, and waiting will further delay our progress on home heat decarbonisation. Hybrids, on the other hand, can be an attractive solution to householders today. Higher hybrid uptake, combined with greater biomethane injections into the grid, would quickly unlock emissions savings. Compared to the current trajectory, this could save up to 5 million tonnes of additional CO₂ per annum in 2030⁴ – the equivalent of removing around 2.4 million homes from the gas grid.⁵

This is also a political risk. Our January 2026 national polling shows that voters, especially those most likely to swing between Labour and Reform, are resistant to policies they feel force high-cost change. They support a gradual reduction in gas usage only if bills remain stable, and strongly oppose bans and mandates implemented in the near term. Measures framed as accelerating electrification or forcing households off gas therefore risk becoming a salient “cost of living” grievance, creating space

for political opponents to weaponise the issue as unfair and out of touch. By contrast, a hybrid (or “flexible”) pathway sits in the politically safer ground: it signals progress on emissions while protecting household budgets and preserving consumer choice - reducing the likelihood of backlash that could stall delivery and undermine wider net zero support.

A new pathway also offers Government fiscal savings. By subsidising lower-cost solutions like hybrids, Government could save £1 billion by 2030, and £3 billion by 2035.⁶ Additional savings could be made on network reinforcement. The National Infrastructure Commission has estimated this cost* could reach £37-50 billion by 2050.⁷ A greater role for hybrids could reduce some of this cost and save an average household around £300 per year on their bills by 2050.⁸

We therefore recommend four key changes to unlock this potential:

01 Reward for gas reduction, not technology:

Rather than a narrow focus on heat pump technology types, Government incentives should be recalibrated to reward actual emissions reductions. This can be achieved by updating the Clean Heat Market Mechanism (CHMM), Boiler Upgrade Scheme (BUS), and Home Energy Scotland (HES), to recognise hybrid systems based on their operational performance and gas savings.

02 Incorporate hybrids into energy and climate modelling: The National Energy System Operator (NESO) models 563,000 to 580,000 heat pump installations annually by 2028⁹, a near 600% increase from 2024 figures.¹⁰ Preparations are currently underway to support the electricity grid for this. Missing this rate would leave consumers covering sunk costs for unnecessary electricity grid reinforcement, and rapid gas grid depreciation would force higher costs onto gas customers without yielding carbon

savings. Current government plans overlook these risks, lacking scenarios for hybrid uptake. NESO and the Climate Change Committee (CCC) should model these scenarios to adjust policies to real demand, reducing sunk cost risks.

03 Reduce Bill Costs: Government has various avenues through which to reduce the cost of operating a heat pump. To date, Government has focused on taxation as an avenue through which to reduce some of this cost. This does not, however, address future policy costs. In light of Clean Power 2030, which de facto bans new gas generation, Government should re-consider how gas-fired generation continues to set marginal prices and explore alternatives which could bring down this cost. We set some options for this out in Section 5.

04 Biomethane as a Strategic Complement: Expanding biomethane use, through coherent and cross-departmental policy alignment, has the potential to further diversify the UK’s decarbonisation resources. This should occur alongside the continuation of the Green Gas Support Scheme post-2030, and the extension of the UK ETS to support biomethane injections into the gas grid. Unlocking the full potential of biomethane can bridge existing policy gaps, offering a scalable solution while existing infrastructure transitions progress.

By unlocking access to more consumer-friendly options and reducing subsidy cost, these changes can substantially reduce the political and fiscal risks of the home heating transition.

* For electric vehicles and heat pumps.

Alternate low-carbon heating technologies

The age, size, location, existing plumbing and type of house can all affect the suitability and potential efficiency of a heat pump. Depending on these factors, other low-carbon heating systems might offer lower costs. Below, we set out average costs for different low-carbon technologies. For reference, the average gas boiler system installation costs £3,000.¹¹

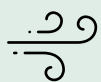
Heat networks

The average connection cost for one home is £25,000. This is socialised among network users, and consumers do not usually pay upfront.¹² Over an asset's (40 year) lifetime, this would cost about £300/kW.*

These systems are often better suited for new, high-density, developments than existing individual homes.¹³

Standalone heat pumps

To date, policy has generally supported heat pumps which heat the house through water (known as Air-to-Water, Ground-to-Water, or hydronic heat pumps), via a hot water cylinder and radiators. Another, cheaper, smaller, system transfers the heat into the room via air (Air-to-Air pumps) – like an air conditioner. This is more suitable for homes without an existing radiator system. Government has recently extended the BUS to these technologies.¹⁴ The CHMM, which is geared towards replacing gas boilers in water-heated homes, does not apply to Air-to-Air heat pumps.¹⁵



£7,000

Average Air-to-Air Heat Pump installation cost¹⁶



£12,000

Average Air-to-Water Heat Pump installation cost¹⁷

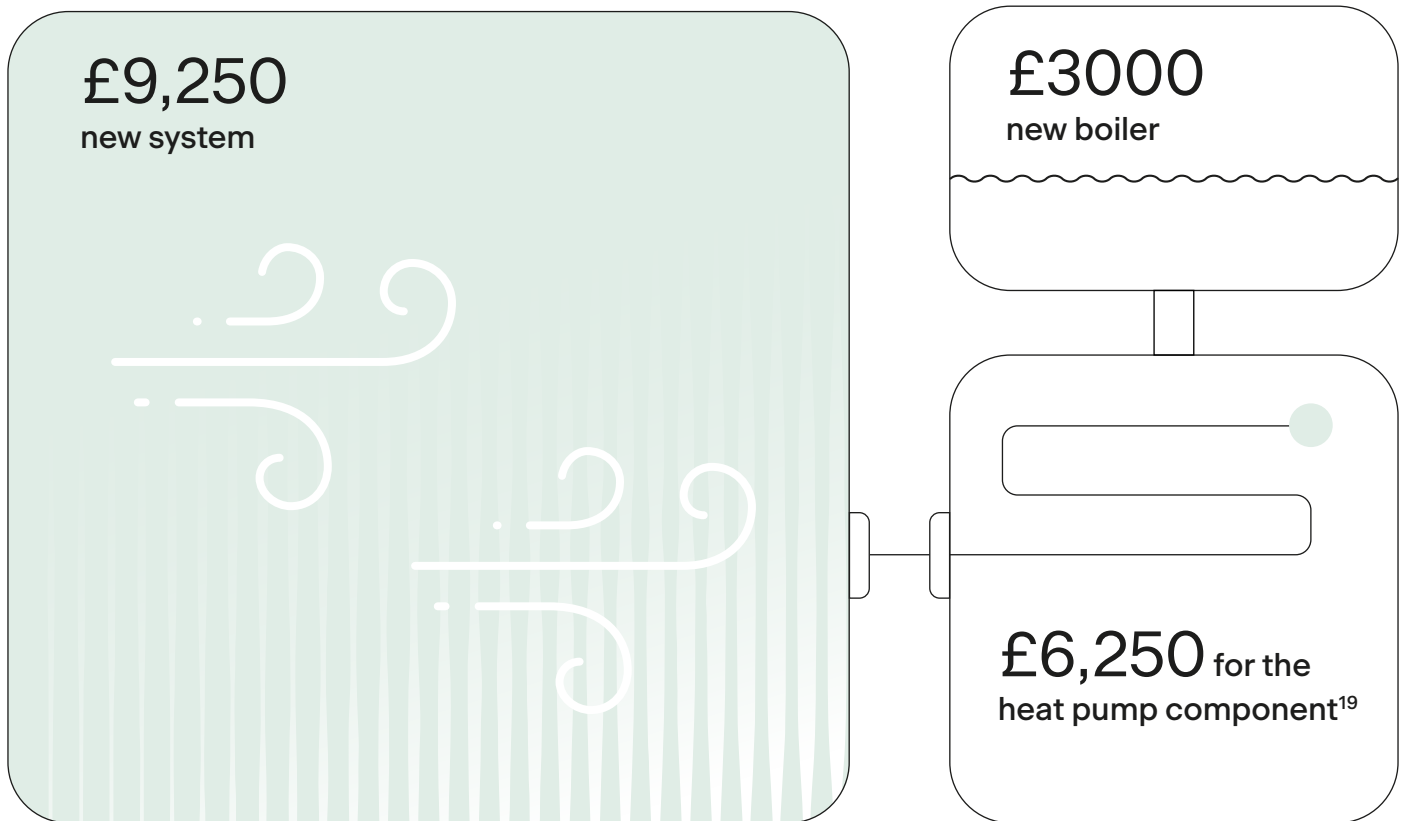


£30,250

Average Ground-Source Heat Pump installation cost¹⁸

* This assumes a 5–6 kW connected load, with no discounting.

Hybrid heat pumps



Hybrid heat pumps combine a new or existing gas boiler with a smaller heat pump unit. Because the gas boiler remains, and temperature can be adjusted quickly, they reduce the need for home upgrades. The control system is designed so that the heat pump takes on most of the load. The boiler can step in to offer more comfort (by heating up the home quickly), and balance high grid demand (when prices are high, or on particularly cold days). As a result, these systems also reduce dependency on electricity during peak periods, reducing the strain on the grid. They also offer consumers access to both gas and electricity tariffs, reducing running costs when the spark gap is higher.* We find that consumers are attracted to this dual-fuel option, which reduces reliance on one input (see Section 3). The CHMM currently offers hybrids half a credit,²⁰ while the BUS²¹ and HES²² provide no support.

*The conclusions in this report are based on the latest figures as at February 2026.

* The 'spark gap' is the ratio of average electricity to gas prices. See page seven for further discussion.

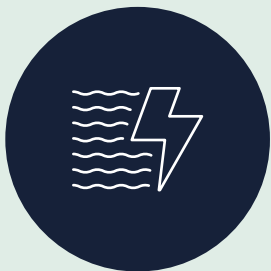
02

Why did Government choose heat pumps?

Government has a long track record of subsidising heat pumps.

Since 2003, those installing Ground Source Heat Pumps (GSHP) have received grants.²³ This was extended to Air Source Heat Pumps (ASHP) in 2014.²⁴ The Climate Change Committee has consistently modelled heat pumps as a major driver for decarbonisation in home heating.²⁵

On one hand, heat pumps can provide lower-carbon, higher efficiency heating – potentially delivering emissions and bill savings.



On the other, they can also be more costly to install than other heating systems, and lead to higher bills when electricity is more expensive than gas. In most cases, the latter is currently true.

Our analysis of 1,500 voters (see Section 3) finds that consumers are highly resistant to these costs, helping to explain low consumer appetite and uptake despite substantial government subsidies.²⁶

Heat pumps can work more efficiently

Heat pumps are not a new technology. They work by extracting heat from the air (air source) or the ground (ground source). This heat is then transferred into a gas, compressed, and used in the home – either through the air or central heating systems. Essentially, this process is the reverse of refrigeration.

Heat pumps offer two key benefits compared to traditional heating systems. Firstly, they use electricity – removing the need for fossil fuels in the home. Secondly, they can operate more efficiently than other heat systems, including gas boilers and electric radiators, potentially reducing fuel costs.²⁷

These benefits are only achievable if three conditions are met during the heat pump installation:



01 The home is fit-for-purpose. Unlike a gas boiler which is designed to rapidly change temperature by combusting fuel, a heat pump operates most efficiently when changing temperature gradually. This is why installing a heat pump will often take place alongside home upgrades, such as adding insulation, a hot water tank and increasing the size of radiators. Without this upfront investment, operating a heat pump may be less efficient and more costly. In addition to expense, consumers may find this investment inconvenient – which can create a deterrent to uptake. We explore this in Section 3.

02 There is adequate space. Many heat pump models can take up more external space, and require larger radiators to operate efficiently than traditional heating systems. For consumers switching from a combi gas boiler, they will also need to install an extra indoor hot water tank. Our analysis finds that consumers are reticent to adopt systems with major space demands.

03 The spark gap is low. In the UK, one kWh of energy from electricity costs four to five times the equivalent energy from gas.²⁸ This ratio is known as the ‘spark gap’. A spark gap this high can outweigh the efficiency savings of a heat pump and make it more expensive to run than a gas boiler. This is particularly relevant, as we find consumers highly sensitive to bill increases.

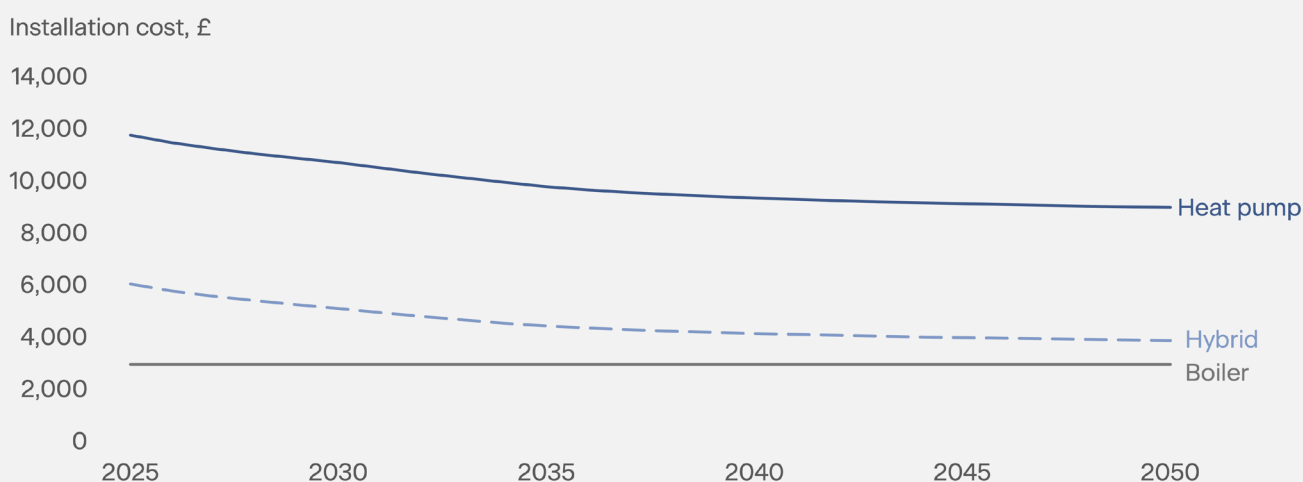
Heat pumps are not always low cost

In most cases, heat pumps are currently more expensive to install and operate than traditional gas boilers. This creates a barrier to uptake and helps to explain the UK's below-average rollout. Below, we explore what these costs are, and what is needed to overcome these.

Upfront costs

Despite Government ambition,²⁹ the total cost of installing a heat pump has not reduced substantially in the last ten years.³⁰ Today, an ASHP costs £12,000 on average, compared to £3,000 for a gas boiler.³¹ This is unlikely to come down substantially between now and 2030. The University of Edinburgh found that: "learning rates beyond 5% p.a. are unlikely."³² We model this below in Figure 1, which illustrates how the heat pump / gas boiler cost gap will remain well beyond 2030.

Figure 1. Unsubsidised installation cost of a boiler, heat pump and hybrid heat pump system³³



Source: Green Match, July 2025
Based on applying a 5% learning rate to heat pump deployment consistent with Seventh Carbon Budget

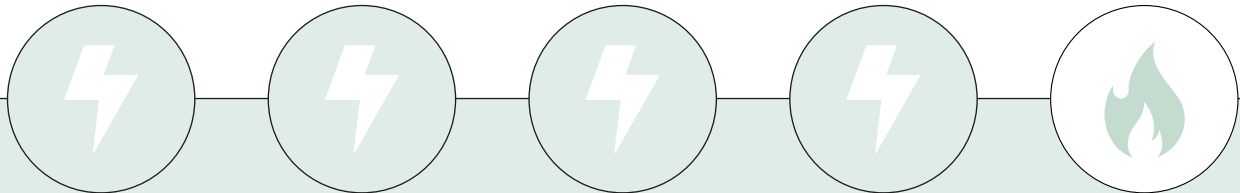


ASHP costs
£12,000 on average

Running costs

Not only does it cost more to install a heat pump, but it costs more to run one.

At an average ratio of 4:1,³⁴ the UK has one of the highest spark gaps between electricity and gas prices in Europe.



This high ratio correlates directly to heat pump installations and helps explain lower rollout rates in Britain.³⁵

This is not a new problem. The CCC first cited rebalancing electricity and gas costs in 2020, in the context of unlocking home heat electrification.³⁶ Later that year, the Government's Energy White Paper referenced the impact of electricity policy costs on consumer adoption of low carbon technologies.³⁷ Five years on, little has changed. The latest progress report to Parliament, published in June 2025, continues to explore options for rebalancing, but offers no clear recommendation.³⁸ The November 2025 budget looked to address some of this cost by removing 75% of Renewable Obligation funding from bills. This, however, does not address the incoming bill for large-scale grid and future renewable and nuclear build-out - which could likely offset any bill reduction effect. Given this, we assume a similar spark gap will persist in the near term. We model a ratio of 4:1, which assumes heat pump customers are accessing Time of Use tariffs, which allow them to benefit from cheaper electricity at off-peak times.

Our modelling finds that consumers using heat pumps in 2030 could still face annual bills up to £100 higher than those using boilers (Figure 2, 'realistic scenario'). A second scenario, 'stretch goal', models a spark of 2.8:1, at which point running a heat pump becomes comparable to a boiler. Unless this ratio is met, heat pumps will remain more expensive to run than gas boilers.³⁹ This is a major problem for uptake, given consumers will react negatively to bill increases of as little as £10 per month (see section 3).

Figure 2 compares annual costs for a boiler and heat pumps in a neighbourhood where consumers are switching to heat pumps. This is based on the following scenarios which assumes heat pumps operate with:

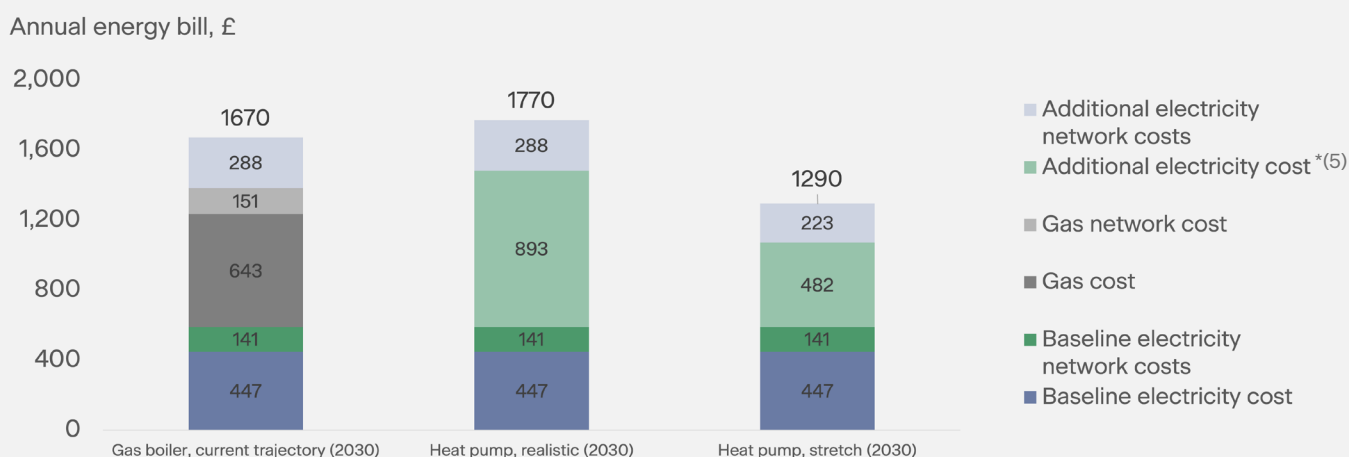
A ‘realistic’ scenario based on current price projections. It assumes:

- A Seasonal Performance Factor (SPF) of 2.6;^{*(1)} and
- A ‘spark gap’ of 4:1;^{*(2)}

A ‘stretch’ scenario based on lower electricity prices. It assumes:

- An SPF of 2.6; and
- A ‘spark gap’ of 2.8:1^{*(3)}.

Figure 2. Modelled average household energy bill with heat pumps, 2030 (2023 pricing)^{*(3)}



Source: Stonehaven modelling



^{*(1)} Average SPF from heat pumps between 7 kw and 8.5 kw in Energy System Catapult’s Electrification of Heat Demonstration Project (2025) <https://es.catapult.org.uk/project/electrification-of-heat-demonstration-project/>

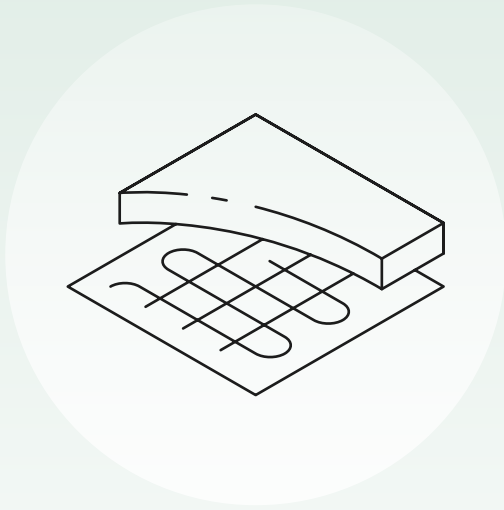
^{*(2)} Applies 14% saving from Cosy Octopus to the 2030 electricity-gas price ratio of 4 from DESNZ (2023) retail energy price series (tables 4 and 5)

^{*(3)} The model compares delivered heat costs, i.e. electricity price divided by heat pump SPF versus gas price divided by boiler efficiency (Pe/SPF vs Pg/ηg). Relative fuel price changes are represented indirectly by increasing assumed SPF (e.g. to 3.8) and/or applying an electricity tariff discount (e.g. the 14.3% Octopus Cosy reduction). Mathematically, a 14.3% electricity discount (multiplying Pe by 0.857) is equivalent to increasing effective SPF by around 16–17%, since both reduce Pe/SPF. Break-even

occurs when Pe/SPF equals Pg/ηg, implying a break-even electricity-to-gas price ratio of SPF/ηg; the reported spark gap of ~2.8 reflects this efficiency-adjusted threshold under the stated assumptions. Any apparent reduction in electricity network costs simply reflects the applied tariff discount.

^{*(4)} This does not include the cost of disconnecting properties from, nor decommissioning, the gas network. See page 25 for discussion of these costs.

^{*(5)} The smaller network cost under the 2.6 SPF / 2.8 spark gap arises because the model reduces the overall electricity unit price to achieve the lower electricity-to-gas ratio, and network charges are embedded within that retail price. As a result, the network component falls proportionally with the assumed tariff reduction, rather than reflecting any structural change in network costs or system efficiency.



2024 saw a 56% increase in installation of heat pumps

Government action

An average ASHP costs £9,000 more to install than a gas boiler. Both the UK and Scottish Governments recognise this and offer grants to consumers of up to £7,500, including the Boiler Upgrade Scheme (BUS) and Home Energy Scotland (HES).

The BUS and HES have been instrumental in heat pump uptake. An increase from £5,000 to £7,500 in late 2023 had a substantial effect on scheme uptake, and in 2024 we saw a 56% increase in installations.⁴⁰ This brings the average cost down to £4,500, which we find is £500 greater than the average consumers' cost tolerance for a new heating system. The future of this scheme is, however, uncertain beyond 2030. The CCC recognises that this creates real risks for heat pump installations.⁴¹ This, in turn, disincentivises heating engineers from training to provide and service heat pumps.

Additional policy, in the form of the Clean Heat Market Mechanism (CHMM), could reduce costs further. Since April 2025, the CHMM obligates UK boiler manufacturers selling over 20,000 gas boilers or 1,000 oil boilers to install low-carbon heating systems. They receive one credit per heat pump installed.

If they fail to accrue credits equivalent to 6% of sales, they must pay a penalty of £500 per credit. In practise, this incentivises manufacturers to discount heat pumps by up to £500, to avoid the penalty. As a standalone measure, this is not currently enough to bring down heat pump costs in line with consumers' cost tolerance. Combined with the BUS, this does bring upfront cost in line with cost tolerance, but does not solve for bill costs. Additionally, this still leaves an ASHP £1,000 greater than a gas boiler.

A final policy option would be to mandate heat pump uptake, by banning installation of gas boilers. While the CCC continues to model a phase-out date for fossil boilers into its carbon budget advice, Government stepped back from a proposed 2035 'boiler ban', following political pressure.⁴² Given consumers are not attracted to standalone heat pump systems (see Section 3), renewed discussion of such a ban is likely to stir major backlash. For its part, Government has confirmed that "no one's going to be forced to rip out their boiler" before 2030.⁴³ Without this tactic in its arsenal, Government must rely on price signals to reduce consumer demand for gas heating.

A high-cost pathway with limited exits

Above, we show that – even with existing subsidies – the average consumer must pay more for a heat pump than a gas boiler, and that once purchased, a heat pump will cost more to run. In Section 3 we find a deep unwillingness amongst voters to install a heat pump under these conditions. This is the fundamental policy problem: Government is asking consumers to pay more for something that will not save them money.

Additionally, the cost impact will affect everyone. In Figure 2 we modelled the cost of local network upgrades, which would be required to support wide-scale heat pump uptake. We find that this could add around £300 – regardless of whether they buy a heat pump.* Given consumers' sensitivity to small bill increases (see Section 3), this is likely to generate voter dissatisfaction.

Going forward, the cost impact of heat pump policy on boiler customers could increase even further. Our analysis finds that, if customers do not choose heat pumps, boiler manufacturers will incur a significant cost in CHMM penalties, which they are likely to pass onto consumers. Under the current penalty, this would be about £10–20. In future, this could rise to £170 – if the obligation is raised to 9%, and the penalty to £3,000 – as envisaged in the original scheme.⁴⁴ Such an increase would be necessary if the BUS is discontinued.

Up to 80% of consumers replace their boiler in an emergency⁴⁵ – when they will be unlikely to have time to consider alternatives or plan for a new system. This equated to about 1.2 million

boilers in 2024. Increasing this cost is unlikely to receive political support. This is evidenced by how media have already branded the CHMM a 'boiler tax'.⁴⁶

This leaves Government in a difficult position. One option would be to extend the BUS indefinitely. At £7,500 per heat pump, this would cost over £3 billion in 2030 alone, if Government's most recent target of 450,000 installations per year⁴⁷ is met. This is equivalent to 33 times the average expected annual Government spending on the Warm Home Discount. Not only is this fiscally unfeasible, but without major changes to the spark gap, it is still likely to be ineffective at achieving targeted uptake rates.

Another option is to drastically cut the spark gap. To do this, Government could shift electricity policy costs onto gas bills, to reduce the ratio to 2:1.⁴⁸ A spark gap of this size would be comparable to countries with substantial heat pump rollout.⁴⁹ This would, however, substantially increase energy bills for those unable or unwilling to make the switch. Alternatively, all current and future costs could be shifted onto taxation. This would create a significant political risk, given existing fiscal pressures, and the Government's promise not to increase income tax. A combination of taxation and rebalancing would minimise but not eliminate these pressures. Below, we explore how voters are likely to view these costs.

* DNOs will be required to upgrade local substations to cope with growing peak electricity demand. This will be funded through all electricity consumer's bills, regardless of whether they use electric heat or not.

What do voters want?

This is the fundamental problem in heat decarbonisation: heat pumps do not save most consumers money.

In this section, we investigate how voters relate to political decisions on home heating. We analysed the political landscape by comparing the general population with Labour's "Hero Voters". This term was coined by party strategists in the run up to the 2024 General Election and describes voters who returned to, or for the first time voted for, Labour in 2024. Decisionmakers value these voters highly, given their potential to switch, and their importance for Labour's electoral success. Our comparison revealed minimal variation in heat preferences between these voters and the general population. This key insight warns decision-makers that poor home heating policies could provoke widespread backlash, in both pivotal and broader constituencies.

Our findings indicate that a more hybrid-friendly policy approach is likely to receive greater popular acceptance. Conversely, we show that aggressively pursuing heat pumps poses significant political risks.

Consumer preferences on heat

We conducted a conjoint analysis with 1,500 UK respondents to uncover what they value in heating systems. Conjoint analysis is a statistical method used to understand consumer preferences by evaluating how different features influence decision-making. In this case, we examined factors like cost, environmental impact, energy efficiency, and system type. This approach allowed us to quantify the importance of each feature and identify the trade-offs consumers are willing to make. As a result, we can determine the most appealing combinations of features to drive adoption.

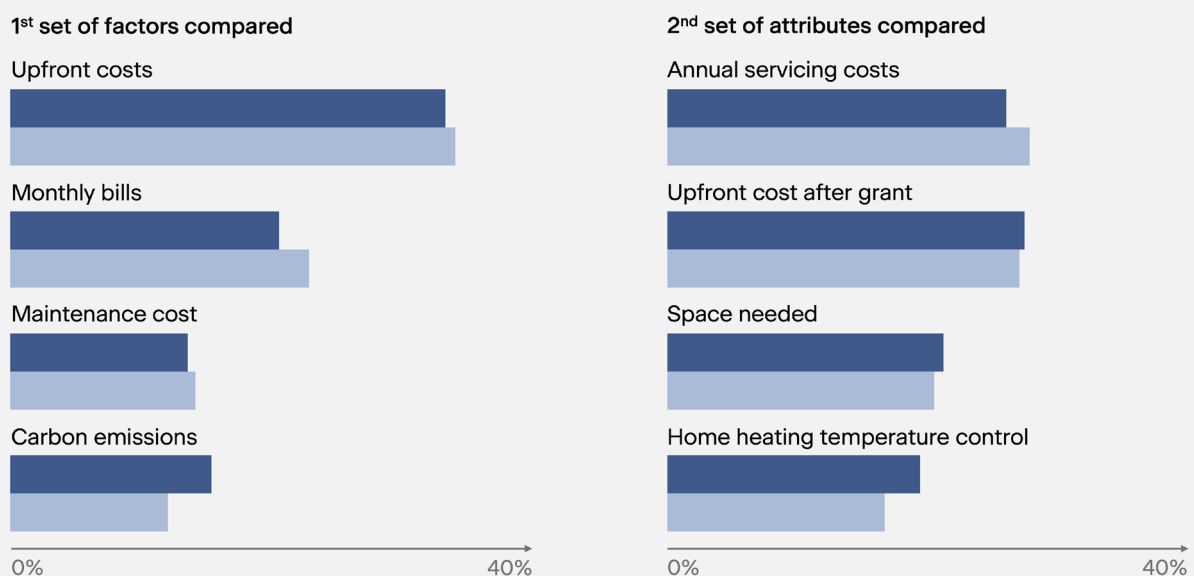
Key Findings

For the purposes of our analysis, we grouped features into three buckets. We found that voters valued these features:

- 01** Most important: Cost – including upfront, bill, and servicing costs, as well as any discounts
- 02** Less important: Convenience & control – space needed, installation time, and control over the system
- 03** Least important: Climate & energy – CO₂ reductions and preferences over energy source (electric or gas)

Figure 3. Most influential features when deciding on home heating systems

UK population vs. Hero Voter group preferences when comparing different heating system options



Source: Stonehaven analysis based on conjoint analysis with 1,500 UK respondents

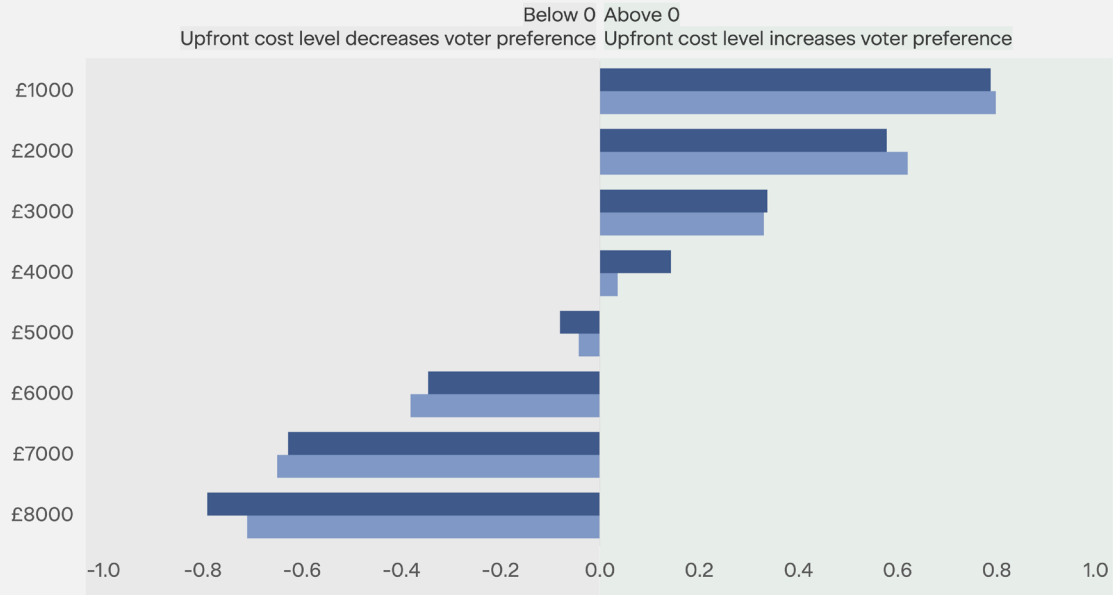
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Upfront cost is most important

Our analysis shows that voters take upfront cost into account the most when deciding on home heating. This is particularly relevant during emergency decision making, when a consumer may have less time to take other factors into account. Upfront cost has a major impact on heating system choice. The average voter is unwilling to spend more than £4,000 at most upfront to install a new heating system.

Figure 4. Impact of upfront costs when voters decide on home heating

Uk Population vs. Hero Voter group

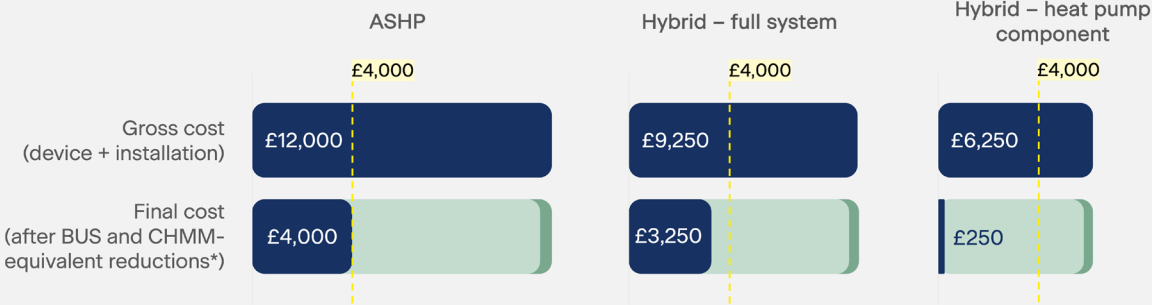


Source: Stonehaven analysis based on conjoint analysis with 1,500 UK respondents



Policy impact

Bars show gross and final upfront costs after BUS grant and CHMM-equivalent reductions*. Final costs are shown relative to the average consumer willingness to pay.



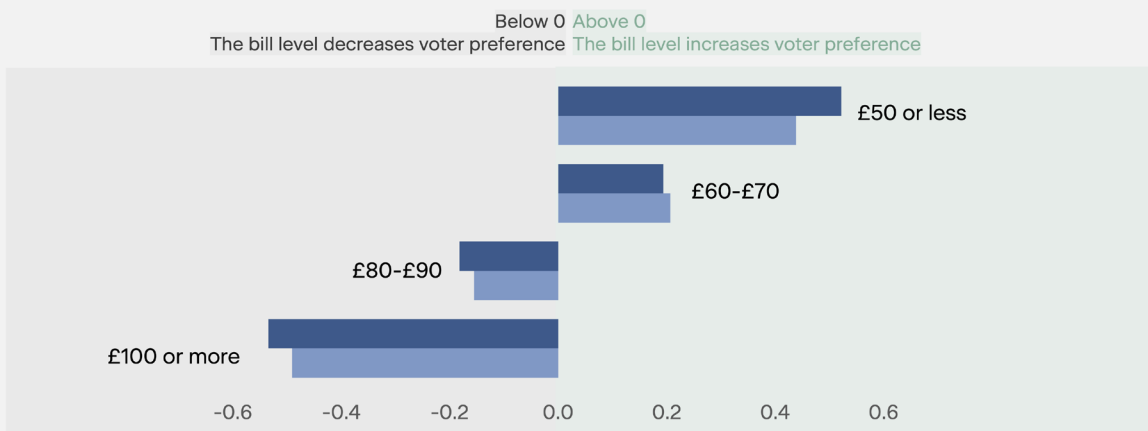
*after recommended policy changes, see Section 5

Running cost is also key

Even if upfront cost is accounted for, consumers are unwilling to incur monthly bills more than £80 (Figure 5) for home heating. A £10 increase in monthly heating bills makes people 20.8% less likely to choose a particular heating package (see Figure 5).

Figure 5. Impact of bill cost on voter preferences

The horizontal axis shows how much each option affects voter choices among the **UK population** vs. the **Hero Voter group**



Source: Stonehaven modelling

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Policy impact

Consumers are highly sensitive to bill cost fluctuations. Current heat policy could expose all consumers to bill increases of around £300 p.a. to subsidise the network (see Figure 2, additional electricity network costs). It also creates a potential £100 p.a. bill uplift for those choosing to switch from a gas boiler (see Figure 2). These costs would deter uptake and exceed consumer tolerance for bill increases, creating voter dissatisfaction.

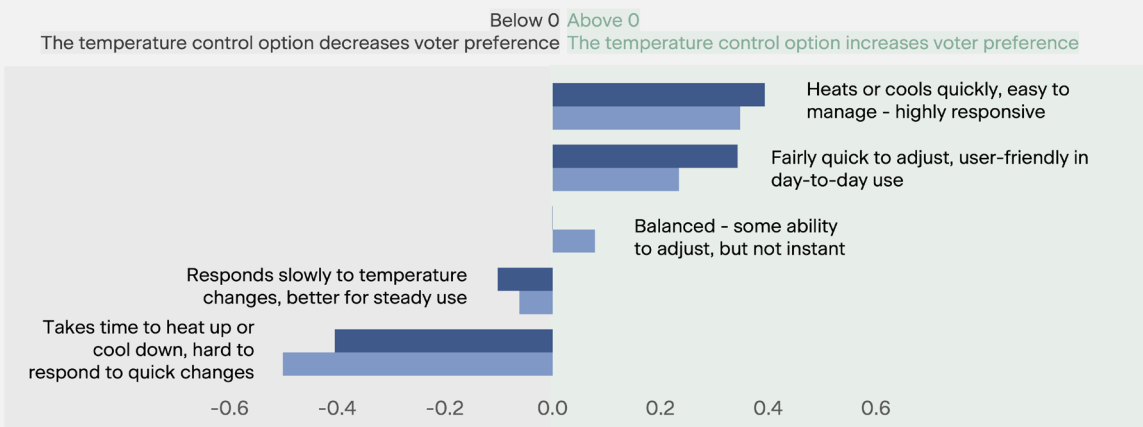
Consumers want control

Beyond cost considerations, factors related to convenience and control play a crucial role in consumer decision-making. Our research confirmed a significant preference for:

- Systems with quicker installation times. When this exceeds eight days consumers may be unwilling to switch, even if cost is no longer a factor.
- Systems using less space. Consumers would demand a £5,000 decrease in upfront costs, after accounting for grants, to find a large heating system as attractive as a smaller one.
- Systems offering quicker temperature adjustments. We find that lower levels of control create a significant deterrent effect for consumers.

Figure 6. Impact of temperature control on voter preferences

The horizontal axis shows how much each option affects voter choices among the **UK population** vs. the **Hero Voter group**



Source: Stonehaven modelling

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Policy impact

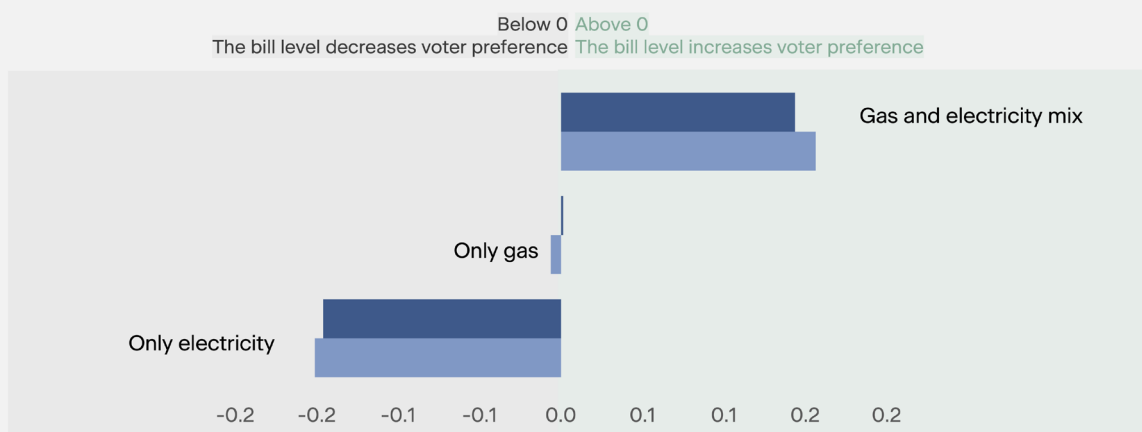
Even when cost is accounted for, consumers place a high value on temperature control. Additionally, convenience of installation and space requirements also influence preferences. A policy approach that offers limited control over these factors, by restricting the technologies consumers can adopt, would likely meet with less voter acceptance than one with more choices.

Voters care about what fuel they use

On one hand, climate and energy concerns are less significant than those regarding cost and convenience (Figure 3). On the other, when considering a switch, consumers show a strong preference for hybrid systems that combine electricity and gas, rather than systems that rely solely on electricity (Figure 7). This shows that, if required to move away from their standalone boilers, consumers are much more likely to favour a hybrid system.

Figure 7. Impact of energy source on voter preferences

The horizontal axis shows how much each option affects voter choices among the UK population vs. the Hero Voter group



Source: Stonehaven modelling

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Policy impact

Concern about climate or a desire to switch to an electric-only system are not enough to attract the average consumer to a heat pump. Voters are also cautious about 100% electricity dependence.⁵⁰ Conversely, consumers may be drawn to systems that use hybrid energy sources – and may even be willing to pay a small green premium for these. Under our policy recommendations (see Section 5), adding a hybrid to a heat pump could cost as little as £250 – something we find that voters could be willing to pay.

Impact on policy

Above, we identify four key implications for existing heat policy:

- 01 Current heat pump costs exceed what voters are willing to pay.
- 02 Voters will be sensitive to the bill increases required to reinforce the network for heat pumps.
- 03 Consumers are likely to be dissatisfied with the level of temperature control offered by heat pumps.
- 04 Consumers may find the prospect of a dual-energy system appealing.

In summary, under current energy prices, voters will be drawn to hybrids, as they offer lower costs, more convenience, and familiarity with an existing system. They may reject heat pumps for their higher costs, longer installation times, lower control, and reliance on electricity. Below, we explore the political implications of these preferences, by comparing two case studies from the Netherlands and Germany.

The politics of heat

Across Europe, technologically agnostic heat decarbonisation policy has offered significant political flexibility and resilience. Since 2013, Germany has achieved a 28% reduction in emissions from heating and air conditioning. The Netherlands, on the other hand, has surpassed this achievement with a 54% reduction in the same timeframe.⁵¹ This is particularly significant given the Netherlands' significant reliance on gas as an energy source, which makes up 41% of its energy consumption⁵² (similar to the United Kingdom).

Flexibility unlocks success

The Netherlands' success is largely attributed to proactive policies, including subsidies that align with hybrids' gas reduction potential, and acknowledge their lower impact on grid capacity.⁵³ By incorporating hybrids and offering consumers flexibility and lower costs, the Netherlands successfully mandated a standalone boiler phaseout date.⁵⁴ Political support for this extended into far-right political factions.⁵⁵

Technological selection locks in costs

Conversely, Germany provides an insight into the political consequences of pushing a single technology. To overcome uptake barriers, Germany implemented revisions to its Buildings Act in 2023. This mandated that newly installed heating systems must be powered by more than 65% renewable energy.⁵⁶ The revisions, which were leaked to the German press, were widely criticised for perceived unfairness, particularly due to their financial implications. Germany faced higher installation costs for heating systems compared to the UK,⁵⁷ and similar spark gap.⁵⁸ It did not subsidise hybrids.⁵⁹

Following the legislative change in September 2023, heat pump sales plummeted.⁶⁰ Protests broke out nationwide, and political opponents weaponised the issue to gain support against incumbents.⁶¹ Many left-leaning voters shifted their allegiance to right-wing or far-right parties due to the perceived negative impact of decarbonisation policies, with the heat policy emblematic of these grievances.⁶² Not only did this compromise the decarbonisation trajectory, but it generated uncertainty for businesses operating in the sector. This resulted in hundreds of job losses.⁶³

Similarly, the recent reversal of Scotland's policy to phase out gas boilers highlights the political challenge of implementing environmental measures that are seen as burdensome. The Scottish National Party (SNP) faced backlash over plans requiring homeowners to replace gas boilers with alternatives like heat pumps, amid concerns about the financial strain on individuals and potential fuel poverty exacerbation.⁶⁴

Three core lessons can be drawn from these case studies:

- 01** Perceived fairness is crucial; voters desire a sense of choice, particularly when they feel compelled to make costly decisions.
- 02** Decarbonisation efforts that affect household budgets and lifestyles are particularly contentious. These factors can easily be manipulated or weaponised by political opponents.
- 03** Political instability, or even the threat thereof, compromises market conditions, limiting opportunities for scaling up sustainable solutions.

Technological flexibility is the key

The Government's current strategy for heat decarbonisation is expensive, with little indication that this will alter soon. Essentially, this implies that the government is encouraging consumers to take on the risk of upfront costs, and to bear the burden of higher bills should no cost reductions be realised.

We find that consumers are unwilling to take on higher costs, and – unless these are eliminated immediately – are not particularly attracted to heat pumps as a technology.

Within this landscape, our policy recommendations offer a route to higher consumer uptake of low-carbon heat, with less risk of political compromise. They unlock this by affording consumers access to more flexible tariffs until the spark gap is addressed, and allowing them to retain familiar technology as they transition to lower-carbon solutions. This phased approach aligns more closely with consumer preferences, and reduces the risk of significant backlash, as seen in Germany.



What is the alternative approach?

Fundamentally, Government faces a challenge to decarbonising home heat because it has chosen to focus all of its resources on a technology which incurs higher upfront and running costs.

Voters, on the other hand, are unwilling to incur these costs, and do not currently see heat pumps as an attractive option.

There are no guarantees that either upfront or operational costs will come down. It is now time to reassess this strategy. In this section we explore how increasing policy support for hybrids, which are more attractive to consumers, could lower costs, unlock uptake, and speed decarbonisation.

Hybrids are compatible with net zero

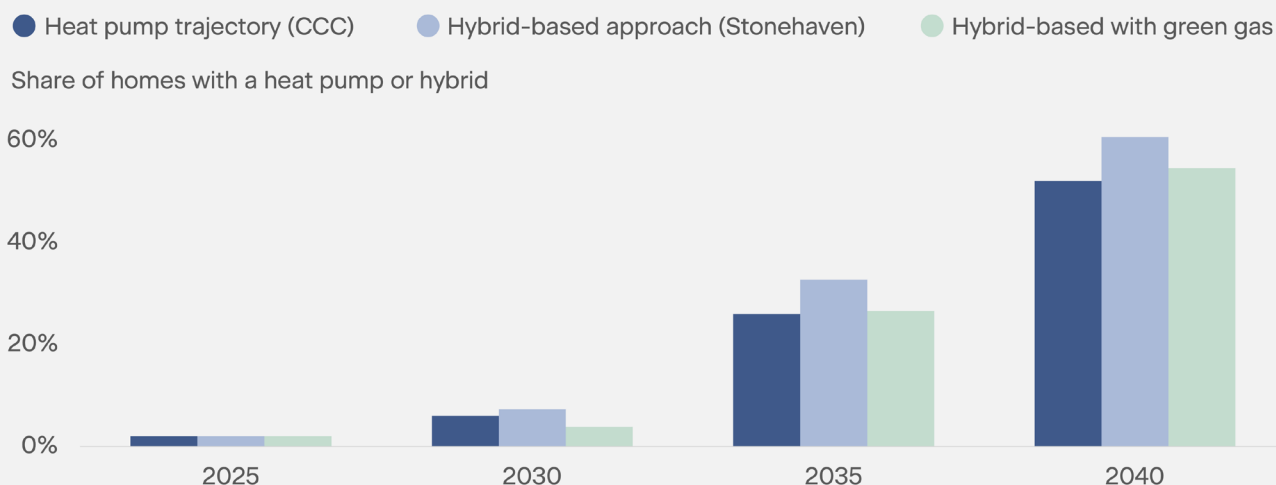
Hybrids' gas reduction depends on the extent to which the heat pump component is used. Some studies suggest that hybrids can cut gas consumption by at least 75%⁶⁵, compared to a heat pump (which results in 100% gas reduction).

Below, we show how hybrids can be compatible with net zero objectives, if the spark gap is improved* (Figure 8). The 'Heat pump trajectory' shows the percentage of homes with heat pumps in the CCC's balanced plan. The 'Hybrid-based approach' indicates how many hybrid heat pumps are needed to hit the CCC's carbon reduction targets. We find that installing 1.9 million hybrids in 2030 would save 2 million tonnes of CO₂ per annum – equivalent to decarbonising almost a million homes on the gas grid.

Biomethane injections, of 50 TWh total in 2030 and 120 TWh in 2050, could boost these savings, and add flexibility if the spark gap is not improved. This capacity is based on analysis about the future potential of green gas production in the UK.⁶⁶ We find that injecting biomethane would save a further 3 million tonnes of CO₂ per annum – equivalent to decarbonising a further 1.5 million homes on the gas grid. Additional emissions savings, which can be made through carbon capture and storage during biogas production, are not modelled here.

This is significant, as it demonstrates that there is an alternate route to the Government's current approach to net zero in home heating.

Figure 8. Hybrid heat pump deployment required to meet CB7 trajectory (2023 Prices)



Source: Stonehaven calculations based on the CCC's Seventh Carbon Budget, 2025

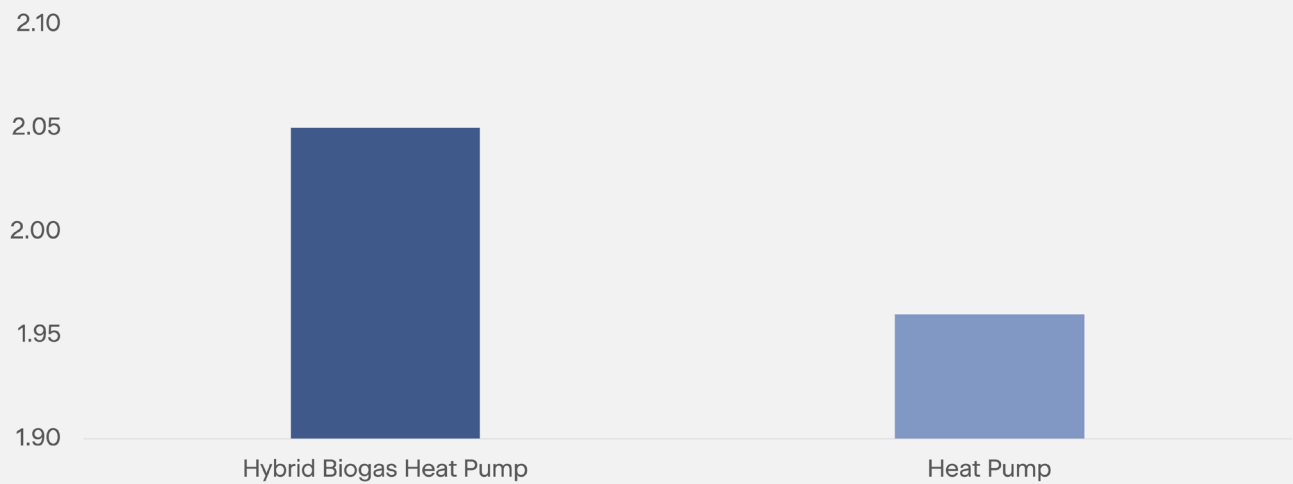
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* This is contingent on the 'spark gap' reaching the 'stretch' target. If it does not, emissions savings could still be higher than the counterfactual, in which heat pump uptake is well below target.

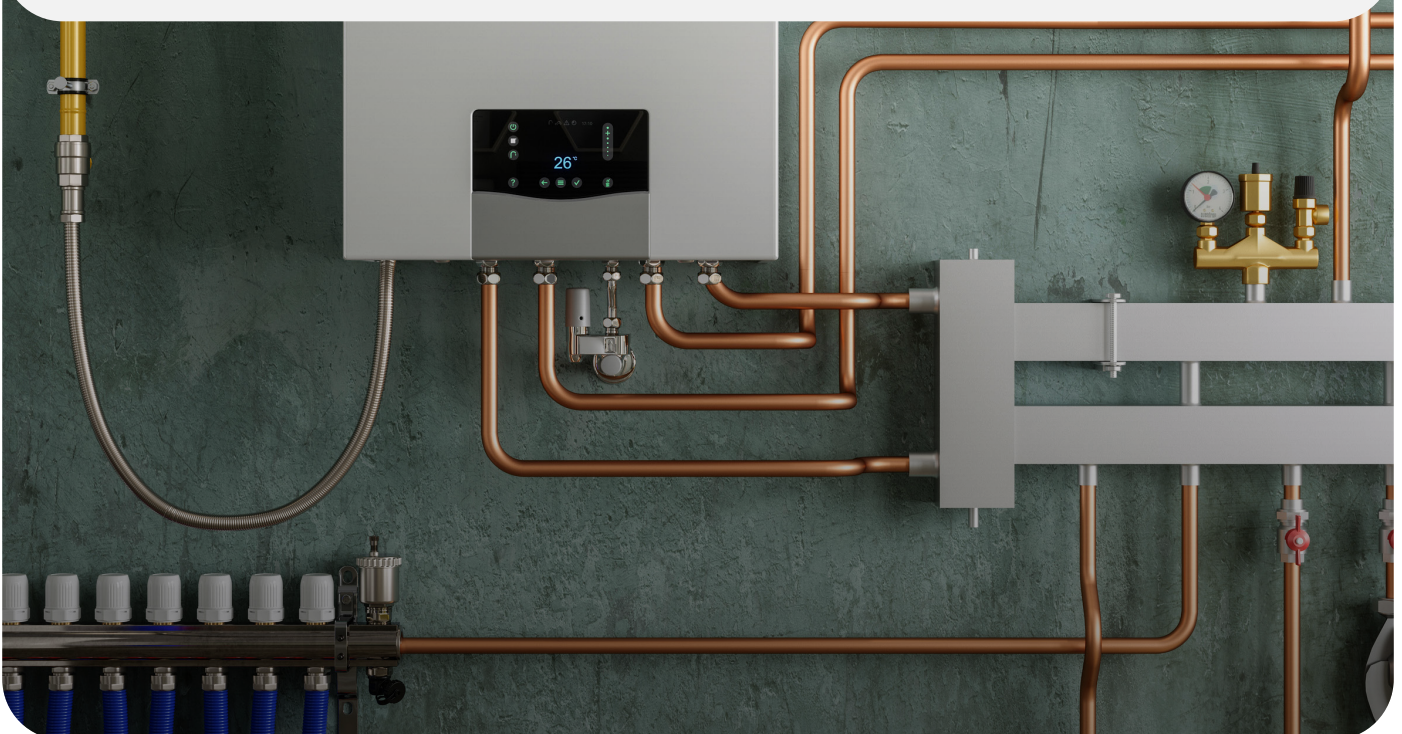
Not only can biomethane offer flexibility to heat decarbonisation, but it can do so cost-effectively. We find that each pound spent on biomethane-powered hybrid heat pumps,⁶⁷ offers similar carbon savings to electricity-powered heat pumps, while adding flexibility to the system. We estimate that every pound spent on hybrid systems fed with biomethane could offer an additional 100 kg of carbon savings compared to the same investment in standalone heat pumps. This does not include further savings to network reinforcement. This is set out in Figure 9.

Figure 9. Carbon saved per £ for Hybrid Biogas vs Heat Pump (2023 Prices)⁶⁸

Carbon Saved per £ (kg CO₂e/£) The y-axis is truncated above zero to emphasize small differences between scenarios.



Source: Stonehaven modelling



Biomethane injections

Low-carbon gas can be added into the grid in the form of hydrogen or biomethane. While Government continues to consider a role for hydrogen in home heating,⁶⁹ major bodies, including the Climate Change Committee (CCC), have ruled out its use.⁷⁰ Biomethane, which is a renewable gas produced from organic matter such as food and farming waste, receives relatively more policy support. The Green Gas Levy places an obligation on fossil gas suppliers to pay a levy, which is used to support new biomethane plants.⁷¹ The UK ETS, however, does not yet reward biomethane injection into the gas grid.⁷²

Despite the levy, supply of biomethane is still restricted, particularly due to investors' insecurity in the future of gas demand.⁷³ On one hand, NESO's latest Future Energy Scenarios predict growth in biomethane use until 2050.⁷⁴ On the other, the same scenarios predict a rapid drop in overall gas demand – compromising investment in green gas. The Future Homes Standard, which should enter into force next year, is expected to prevent new gas grid connections for homes in England, mirroring Scotland where fossil gas connections to new builds are now prohibited.⁷⁵ High heat pump adoption is also baked into modelling, implying existing homes will also disconnect from the gas grid and their existing heating system. Similarly, Ofgem forecasts potential "systematic" disconnections post-2030 due to evolving policy decisions.⁷⁶ It is not clear, however, if or how this will be met – and if not, what the implications for lower-carbon gas demand will be. Responses to a Call for Evidence⁷⁷ published by the previous government have not yet been published, and the CCC models a decline in biomethane grid injections from 2035.⁷⁸ Meanwhile, the existing support scheme is due to come offline in 2030. The result is an uncertain future for biomethane policy.

Hybrids offer lower costs to consumers

Hybrids systems can offer lower upfront and running costs than heat pumps alone in the average, existing UK home. This can improve their attractiveness to consumers.

Lower upfront costs

A new hybrid system costs £9,250 on average.⁷⁹ For customers with an existing boiler, who would like to add a heat pump component, this would reduce to £6,250. The BUS does not currently apply to hybrids, but the CHMM does offer half a credit. This would mean boiler manufacturers may offer up to a £250 discount on hybrids, bringing the cost to £9,000 for a new system, or £6,000 for an existing system.

Existing incentives do not, however, necessarily reflect the extent to which hybrids can cut gas consumption. In part, these exclusions result from the CCC excluding hybrids from its modelling on home decarbonisation.*

* CCC scenarios exclude hybrids.

Government could consider offering BUS subsidies and CHMM credits to reflect gas reduction. For example, if hybrids offer a gas usage reduction of 75%,⁸⁰ an equivalent BUS subsidy (£5,625) and CHMM credit (£375), would almost fully compensate for the heat pump component of a hybrid. This would make it almost free for consumers to decarbonise, while reducing the cost to Government and the potential pass-on of CHMM penalties to boiler customers by 25%. Additionally, we find consumers value non-financial aspects of hybrids more than standalone heat pumps – including shorter installation times, lower space requirements, and dual fuel operation. Combined with low upfront costs, this offers a more attractive solution to decarbonisation.

Figure 10 shows a similar scenario to Figure 2, but with widespread hybrid heat pump deployment, instead of standalone heat pump deployment, in the neighbourhood.

The hybrid heat pump uses the cheapest fuel at each half hour period. This is based on the same scenarios in Figure 2⁽¹⁾, which assumes heat pumps operate with:

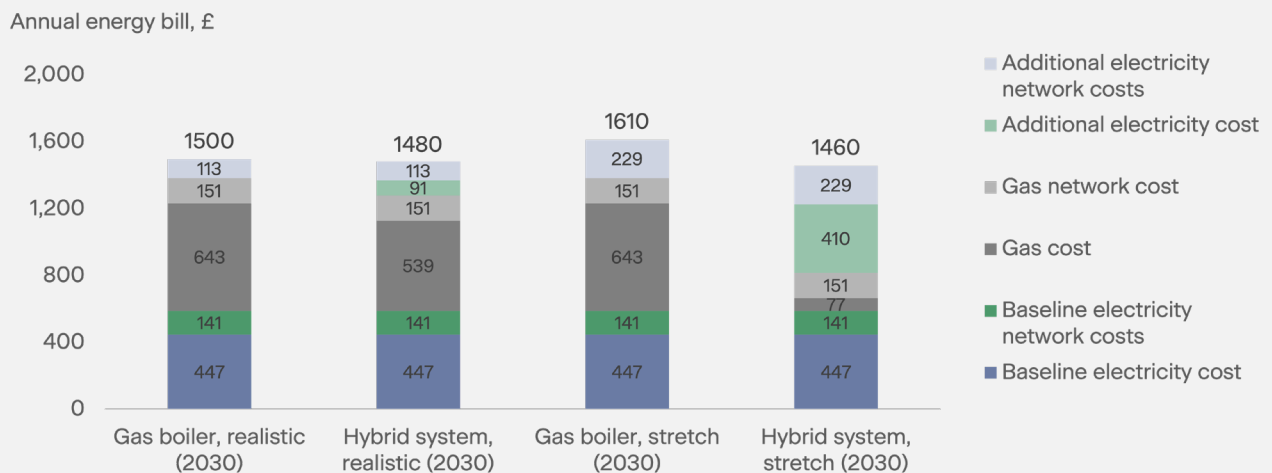
A ‘realistic’ scenario based on current price projections. It assumes:

- A Seasonal Performance Factor (SPF) of 2.6; and
- A ‘spark gap’ of 4:1

A ‘stretch’ scenario based on lower electricity prices. It assumes:

- An SPF of 2.6; and
- A ‘spark gap’ of 2.8:1

Figure 10. Modelled average household energy bill with hybrid systems, 2030 (2023 prices)^{*(2)}



Source: Stonehaven modelling



^{*(1)} See Figure 2 for assumptions

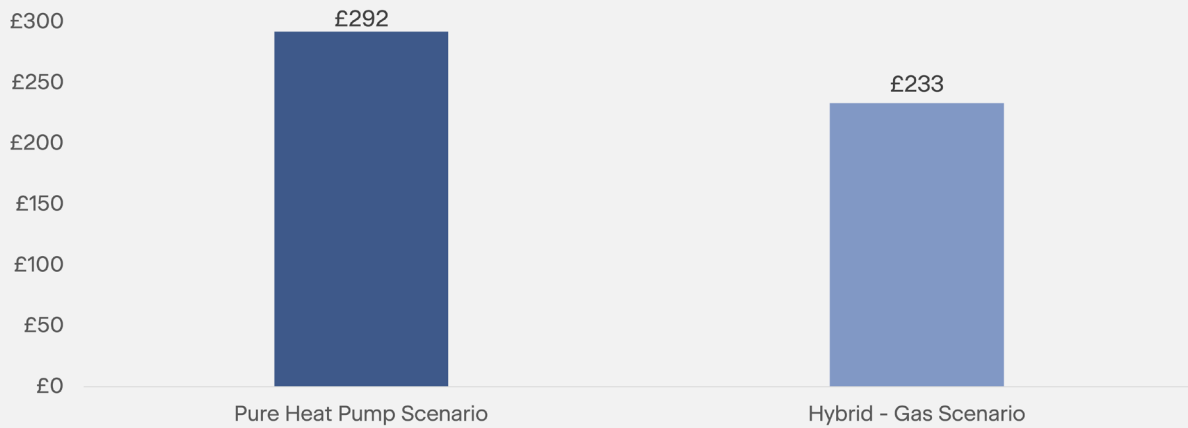
^{*(2)} The model estimates more efficient heat pumps within a hybrid system to require greater network investment. This is because the heat pump component is expected to meet a greater portion of heat demand.

Lower network costs

If hybrids are deployed at scale, they will also put less pressure on the grid than standalone heat pumps. This is because they can use gas in periods of peak demand. By reducing pressure on the grid, this could lower consumer contributions to network reinforcement by £60 per year.⁸¹

Figure 11. Energy Bill Impact from Network Costs, 2030* (2023 Prices)

Electricity network costs



Source: Stonehaven modelling

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* The model estimates more efficient heat pumps within a hybrid system to require greater network investment. This is because the heat pump component is expected to meet a greater portion of heat demand.

Unlocking lower prices for consumers

To summarise:

- 01** Heat pumps are more costly to install and run than gas boilers.
- 02** This is unlikely to change in the near-term.
- 03** Hybrids are cheaper to install and run than heat pumps.
- 04** Hybrids can offer immediate decarbonisation and support the pathway to net zero.
- 05** If the spark gap does come down, hybrids can still offer carbon and network cost savings.

We identify two core, and two supportive, policy changes needed to unlock hybrids' potential:

- 01 Core:** update the Boiler Upgrade Scheme (BUS), Home Energy Scotland (HES), and Clean Heat Market Mechanism (CHMM) to reflect the emissions reduction potential of hybrids.
- 02 Core:** update Future Energy Scenario and Carbon Budget modelling to consider the emissions reduction potential of hybrids in decarbonising home heating.
- 03 Supportive:** provide certainty over future policy support for biomethane production and injections, including inclusion in UK Emissions Trading Scheme (ETS).
- 04 Supportive:** accelerate plans to reduce the impact of electricity levies on bills, without penalising those remaining on the gas grid.

Below, we outline these changes in more detail.

Where to from here?

The Government's current plan to decarbonise home heat is desperately underperforming. This puts at risk our carbon budgets and consumer confidence. **Four key policy changes** are necessary to reduce costs and improve consumer uptake. With these in place, Government can get the heat transition back on track.

01 Reward for gas reduction, not technology type

Hybrids offer a more feasible pathway to rapid heat pump deployment, gas reduction, and decarbonisation. However current policy discourages hybrid deployment. The CHMM should be updated to reward actual performance of low-carbon heating technologies. To do this, manufacturers would monitor and report performance, receiving top-up credits should their hybrid heat pump reduce gas use by over 50%, relative to a gas boiler only system.

There are three parts to this policy:

- 01 Monitoring:** Hybrid heat pump manufacturers can monitor heat pump and boiler performance via their control systems. This data would allow manufacturers to estimate the effective gas savings, adjusted for weather, from using the heat pump component relative to a gas boiler only counterfactual. We understand this to be feasible even when a small heat pump is added to an existing boiler system.
- 02 Reporting:** Manufacturers would submit performance reports once a hybrid heat pump has operated for a full scheme year. These reports would require third-party validation.
- 03 Rewarding:** Manufacturers receive the standard 0.5 credits when selling a hybrid heat pump. After submitting their performance report, a manufacturer would be granted additional credit fractions to account for actual fall in gas use.

The reward could also penalise underperformance. Whilst this would better incentivise manufacturers to properly train installers, it could discourage deployment and again fail to stimulate the heat pump market. Whilst we recommend the government consult to better understand the risks, we recommend retaining the 0.5 floor initially before introducing the penalty for underperformance after a few years.

Government should also apply a similar methodology to the BUS and HES, to offer upfront grants until such time as a mandate is effectuated.

02 Incorporate hybrids and biomethane into energy and climate modelling

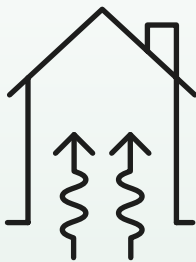
NESO is currently preparing the energy system for exponential growth in heat pumps. Current scenarios model 563,000 to 580,000 heat pump installations per year by 2028.⁸² This would require growth over five times 2024 installation figures.⁸³ If this is not met, consumers may have to cover the sunk cost of over-reinforcing the system. Simultaneously, the gas grid could be depreciated too quickly – forcing additional costs onto boiler customers without achieving carbon savings. This is a substantial risk, and not one for which Government is currently accounting. There are currently limited energy scenarios which model for hybrid uptake.

NESO's 2025 Future Energy Scenarios does add hybrids into its model, but at almost half a percent of total heat pump deployment in 2030.⁸⁴ Under this scenario, less than 1% of all heat pumps would be hybrids in 2030. This would offer a 0.01GW reduction to peak demand from heat.⁸⁵ A much greater role from hybrids can be both net zero compliant and increase this figure. For example, by increasing the share of hybrids to 75% (from around 1%), Government could reduce peak demand from heat by around a further 1.5GW – with substantial implications for network reinforcement.

In Figure 8 we show how, even under 100% hybrid deployment, net zero is still possible. Both NESO and the CCC should mitigate the risk of underdelivery on standalone heat pumps, by modelling alternative scenarios which account for hybrid uptake and biomethane expansion. This would allow policy, including grid reinforcement, to be adjusted to reflect real demand – reducing the risk of sunk costs.

Heat pump installations

must grow over **5x by 2028**
to meet NESO's current plans.



03 Reduce bill costs for heat pumps

Reducing the spark gap is key to improving low-carbon heat uptake – whether through standalone heat pumps or hybrids. Simultaneously, we find high voter sensitivity to any bill increases – suggesting a strong opposition to policy cost rebalancing. Government must take decisive action at pace to reduce the impact of policy costs on electricity bills, without pushing up bills for gas consumers. Options to do this include:

- 01 Remove gas-fired electricity generation from the electricity market and place these assets on a Regulated Asset Base. NESO would dispatch these assets when required. This would remove volatile gas prices from setting electricity prices, or;
- 02 Remove policy costs, including UK ETS from gas powered generation. If new gas generation assets are de facto prohibited under Clean Power 2030, this price incentive is no longer needed. Removing this cost would reduce the marginal price of electricity, or;
- 03 Consider pledging ETS funds from gas generation to subsidise the cost of expanding the electricity network and additional clean generation.

04 Unlock biomethane supply

Biomethane can offer additional flexibility to heat decarbonisation. Additionally, a large share of under-delivery on green gas can be attributed to policy incoherence. To unlock the flexibility offered by biomethane, Government should:

- 01 Set up a cross departmental team to align policy development and delivery. This would involve DEFRA, DFT, and DESNZ biogas experts and may require central coordination.
- 02 The above should be tasked with fast-tracking implementation of the Common Sustainability Framework - currently being consulted on, as of February 2026.⁸⁶ This should allow the same feedstocks to be allocated to where there is demand, rather than where specific policy allows and align waste and biogas policy.
- 03 Similarly, the above should align feedstock requirements across biogas support schemes to prevent inter-scheme competition.
- 04 Government should offer certainty over the future of the Green Gas Support Scheme, post-2030. This is likely to have a minimal impact on bills, given that the levy cost is yet to exceed £3 per meter, per annum.⁸⁷
- 05 While biomethane is currently zero-rated under the UK ETS, the Scheme does not yet incentivise production. This is different to the EU ETS, under which biomethane may be used to meet allowances. A 2024 consultation looked to resolve this, but the results have not yet been published.⁸⁸ Government should progress this at pace.

Conclusion

In the UK, heat pump uptake has consistently lagged behind Europe.

This is because Government has continually asked consumers to pay more for something that will not save them money, and for which they see limited non-financial benefit. Now, more than ever, failing to scrutinise the cost of climate policy threatens the entire trajectory of net zero. Government must look beyond technical feasibility, and factor cost and voter perceptions into its decision making – or risk losing electoral support. Germany offers a real example of this risk – where mandating standalone heat pump uptake derailed heat decarbonisation.

In this paper, we set out a more flexible approach, following the example of countries with high gas permeation. By opening heat policy to more technologies, including hybrids, we find that Government can offer lower-cost options, while smoothing the cost impact of network upgrades, and reducing the risk of sunk costs. This pathway also allows consumers to retain their existing boiler, as they familiarise themselves with heat pumps.

Our policy recommendations reduce cost risk and align more closely to consumer preferences on heat – creating a more viable pathway to net zero.

07 Annex

- Red = Technologically selective / off-track
- Yellow = Some technological preference / sub-par progress
- Green = technologically enabling / on track

Factor	Dates	Department	Administration	Geography	Technologies selected / hybrids excluded	Scope	Target	Progress
Heat pump – uptake drivers								
Subsidy / Grant	2022 – 2030	Boiler Upgrade Scheme	DESNZ	UK Government	England & Wales	Yes - extended to Air-to-Air heat pumps in Warm Homes Plan	£5000 – extended to £7500 in May 2024.	22,700 installations in 2024, 14,664 in the first half of 2025 ⁸⁹ Significantly less than Government target ⁹⁰ of 450,000 heat pumps per year.
Supplier obligation	April 2025 onwards	Clean Heat Market Mechanism	DESNZ	UK Government	UK	0.5 credits for HHP	Suppliers of <20,000 gas, or <1,000 oil boilers need to meet a LC heat target of 6% qualifying sales. This is met through HP or HHP installations.	TBC TBC
Business obligation	2022 – December 2026. To be replaced by grants and loans from Warm Homes Plan	Energy Company Obligation 4	DESNZ	UK Government	UK	No, dependent on SAP.	ASHP/gas boiler is considered 'renewable heating'. ⁹¹ Methodology (RdSAP) accounts for this.	Total £224.3 million cost reduction over period. 63.26% of reduction achieved. ⁹²
Tax relief	2022 – April 2027	Zero rated VAT on heat pumps	HMRC	UK Government	UK	Yes – only ASHP & GSHP. ⁹³	Groundworks + installation for residential + charitable buildings.	N/A N/A

(Targeted) Subsidy / grant	April 2023 – March 2025	Home Upgrade Grant (Phase 2)	DESNZ	UK Government	England	Yes (as only for non-gas grid properties)	Low income, non-gas grid – energy efficiency & low-carbon heating upgrades.	£630 million made available. ⁹⁴	2,118 homes in 2024, 1,342 homes in first half of 2025. ⁹⁵ Replaced with Warm Homes: Local Grant. Annual bill savings of £1,165,000 across scheme. ⁹⁶
(Targeted) Subsidy / grant	September 2023 – March 2025	Green Homes Grant Local Area Delivery (Phase 3)			England	No	Low income on gas grid – energy efficiency & low-carbon heating upgrades.	£287 million made available. ⁹⁷	126 ASHPs and 181 Hybrid Heat Pumps installed over scheme. Annual bill savings of £1,922,000 across scheme. ⁹⁸
(Targeted) Subsidy / grant	April 2023 – November 2024.	Social Housing Decarbonisation Fund (SHDF)			England	No, but funding could not be used to replace boiler component. Standalone heat pumps encouraged as a preference. ⁹⁹	Social housing - Funding for LAs and social housing landlords to improve energy performance.	£80 million made available.	265 ASHP and 89 electric storage heating systems.
(Targeted) Subsidy / grant	2025 – 2028	Warm: Social Housing Fund (Wave 3) [replacement for SHDF]			England			60,000 homes by 2028. ¹⁰⁰	TBC
(Targeted) Subsidy / grant	2025 – 2028	Warm: Local Grant [replacement for HUG and LAD]			England	No – but retrofit and packaged hybrids only allowed. Integrated hybrids not allowed. Heat pump must provide at least 55% of load, and meet MCS standards, Boiler must have A rating. ¹⁰¹	Low income on or off gas grid – energy efficiency & low-carbon heating upgrades.	9,000 homes by 2028. ¹⁰²	TBC

(Targeted) Subsidy / grant	2022 – 2025	Optimised Retrofit Programme	Welsh Government Local authorities		Wales	No, but criteria unclear. No mention in heat strategy. ¹⁰³	Social housing decarbonisation.	Not available.	Not available.
Subsidy / grant	2022 – present	Home Energy Scotland Grant and Loan Scheme	Scottish Government		Scotland	No ¹⁰⁴	Grant of up to £7,500, with interest free loan of up to £7,500 – for efficiency and clean heating.	170,000 heat pumps installations in 2030 [latest figures show approx. 36,000 MCS heat pumps operational]. ¹⁰⁵	2,306 zero direct emissions heating systems (incl. HPs) installed in 2023/24. ¹⁰⁶
(Targeted) Subsidy / grant	2023 – present	Various schemes (see list ¹⁰⁷).				No ¹⁰⁸	Home decarbonisation funding for benefit recipients, social housing, private rentals, and fuel poor.		(Currently 914 zero direct emissions heating systems (incl. HPs) installed by schemes in 2023/24. ¹⁰⁹
Labour market support	July 2023 – July 2025	Heat Training Grant	DESNZ	UK Government	England	N/A	£500 towards training for heat pump installation.	41,000 heat pump installers by 2028. ^{110 111}	166% increase in first year, ¹¹² but still insufficient. About 8,000 in 2024. ¹¹³ Long-term demand pipeline remains a barrier. ¹¹⁴

Low-carbon heat – strategy & policy

Regulation / consumer obligation	Under development	Future Home Standard	MHCLG	UK Government	England	Yes - "Fossil fuel heating will not meet this standard (including...hybrid boilers)" ¹¹⁵	Minimum standards for new homes.	TBC – could be aligned to carbon savings >75%. ¹¹⁶	N/A
Strategy	2021 – present	Heat and Buildings Strategy	DESNZ	UK Government	UK	Open to hybrids, but installation target is for pure HP. ¹¹⁷	Primary target for heat decarbonisation is HP installations.	600,000 hydronic HP p.a. by 2028. Heat pump costs on par with hybrids by 2030.	42,654 in 2024. ¹¹⁸ No significant cost reduction since strategy launched. ¹¹⁹
Standard	2022 – present	Standard Assessment Procedure 10	DESNZ (former BEIS)	UK Government - developed by BRE	UK	Methodology available to calculate hybrids - subject to criteria. Fuel and network costs are not automatically (are pre-defined). ¹²⁰ Will be replaced by Home Energy Model - consultation for which did not mention hybrids. ¹²¹	Methodology for homes' energy efficiency - both new and existing. Being reviewed – will allow more dynamic analysis of energy pricing.	N/A	N/A
Policy Strategy	January 2026 Onwards	Warm Homes Plan ¹²²	DESNZ	UK Government	Dependent on policy, primarily England & Wales	Yes - see Boiler Upgrade Scheme	Grants, homes and standards	Too soon to evaluate	TBC

Strategy	2021 – present	Heat in Buildings Strategy	Energy and Climate Change Directorate	Scottish Government	Scotland	Yes – prioritises HPs and heat networks, while keeping hybrids ‘under review’. ¹²³	Primary strategy to decarbonise Scottish buildings – including targets on heating and insulation. Commitment to phasing out fossil boilers from 2025 (for off-gas properties), and 2030 (for on-gas). Since	68% reduction in buildings emissions, and a million homes decarbonised by 2030. At least 124,000 LC heating systems annually between 2021 and 2026. ¹²⁴	Million homes target not possible, and fossil boiler phase-out delayed. ¹²⁵ 23,000 ASHPs installed in 2024. ¹²⁶
Strategy	2024	Heat Strategy for Wales	Welsh Government		Wales	Hybrids not included in targets.	Main target for heat decarbonisation and HP installation.	5.5GW HP capacity / 580,000 HPs installed by 2035 (target set in 2023) – would equal approx. 47,080 p.a. ¹²⁷	5,853 installed in 2023. ¹²⁸

Energy decarbonisation

Factor	Dates	Scheme	Administrator	Government	Applicability	Technologies selected / hybrids excluded	Scope	Changes	Impact
Market incentive	2021	UK Emissions Trading scheme	UK ETS Authority	UK and devolved Governments	UK	No – based on emissions alone.	Does not currently cover heating but does externalise some electricity emissions through Carbon Price Support.	Extension to Energy from Waste from 2028.	Will impact price of biomethane / low-carbon gas - dependent on CCS deployment and LCA methodology.

								Not currently planned to extend to home heating – but some calls for this.	Could incentivise switch to LC alternatives (including hybrids).
Strategy	Outstanding	Land Use Framework for England	DEFRA	UK Government	England	N/A	Affects supply of feedstocks for decarbonisation, including biomethane.	Delayed – consultation ongoing. ¹²⁹	
Strategy	August 2023 – present	UK Biomass Strategy	DESNZ	UK Government	UK	Considers importance of biomethane in offering grid flexibility. Maps potential of GG – 50TWh by 2050. This is not, however, modelled into scenarios.	Affects modelling around FS demand / supply.	Peak of 8TWh biomethane injection p.a. by 2030 predicted.	Could impact availability of green gas FS.
Strategy	2038-2042	Carbon Budget 7 – Advice for Government	Climate Change Committee	UK Government	UK	Emphasis on HP deployment and electrification, with HHPs not modelled. Limited role for biomethane in post-2035 decarbonisation.	Modelling on UK economy-wide decarbonisation.	Assumes limited role for biomethane in gas grid post-2035, with use prioritised elsewhere.	Could restrict modelling RE bioresource allocation.
Target	2025 – 2030	Clean Power 2030 Action Plan	DESNZ	UK Government	UK	Yes – emphasis on HPs to decarbonise buildings.	Plan to reach 5% unabated gas by 2030.	Minute role for HHP in offering flexibility.	Could restrict modelling RE gas demand.
Green Gas Support Scheme	2021 – March 2028	Green Gas Support Scheme	DESNZ	UK Government	UK	Phase-out post 2028	Subsidy to incentivise gas production with no more than 86.4 g CO2 equivalent per kWh.	Not confirmed post 2028.	Biogas injected into grid represented ~1% total heat demand in 2023.

08

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