Whose energy transition is it anyway?

The case of clean heat

Niamh O Regan
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SMF Social Market Foundation

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FOREWORD

In the face of the climate emergency, charting a course to Net Zero is one of the greatest challenges the UK has ever faced. The Labour government has set its sights on practically all of the country's electricity being zero carbon within the next five years – a hugely ambitious target that builds on historical success in decarbonising the grid.

But the race to Net Zero will involve far more than infrastructure changes or decarbonising energy generation. It will also involve the public and the decisions we will make within our homes. It will also involve bringing the public with us as we make the transition, as without society buy-in we will continue to struggle to make the necessary changes.

This report shows that, worryingly, almost half of people think that net zero is something being done to them rather than something they are taking an active role in, and a similar number feel governments of all persuasions have so far not done enough to engage the public on the transition.

This lack of a sense of agency among the public is particularly apparent when it comes to low carbon heating. As much as 17% of the UK's total carbon emissions comes from heating our homes. The only way to reduce that carbon pollution is through the electrification of heat, whether by installing heat pumps at a mass scale, or connecting homes to low-carbon heat networks.

Heat pumps have been around for decades, with the first in the UK having been installed in the 1940s. In countries such as Norway, the majority of heating is provided by heat pumps. Yet here they are too often seen as a new and untested technology: as this report shows, there is a public information vacuum, leading to a proliferation of myths that is holding back their adoption.

Combatting misinformation, addressing fears, and supporting the transition to clean, cheap, reliable low-carbon heating will require trust, in Net Zero and in heat pumps. This report should spur renewed and increased efforts from policymakers to build trust, for example with public information campaigns, actively countering heat pump myths, and publicising the use of heat pumps in public buildings. Combined with policies to reduce the cost of electricity, and ensure heat pumps are always cheaper to run than gas boilers, such steps are essential to removing barriers to heat pumps, Net Zero, and the clean energy transition.

By Luke Murphy MP

EXECUTIVE SUMMARY

The British public support net zero, but so far this has translated only to modest behaviour change

- The government has ambitious net zero targets, which require not just public support, but also public action – for example, adopting low carbon home heating and electric vehicles.
- Awareness of the overall target is high, at 89%, and the vast majority of the public support the ambition of the transition, despite a growing political divide.
- However, these favourable attitudes have not yet been matched by high levels of behaviour change.

Understanding public attitudes to the transition is essential to avoid the "greenlash" that has mired the transition in other countries

- The government lacks a public engagement strategy on net zero, and we do not know enough about how people feel about the actions required of them.
- Ensuring public trust and buy in to the processes to achieve net zero is essential for it to succeed, as other countries show.
    - Farmers' protests in Poland, France and the Netherlands in early 2024, and the resistance to a proposed change in heating law in Germany in 2023 demonstrate the strength of public feeling when people do not feel heard.
- In this report we seek to better understand how people feel about the transition, whether they feel a part of it, and what support they require to play their role – with a particular focus on decarbonising home heat.

There has been a failure to make people feel included in the net zero transition, jeopardising its success

Despite their support for net zero, people question its practicality and feasibility

- Almost half (48%) of people think net zero should be a top priority for government, but 63% of people think it will be too difficult to achieve by 2050.
- There is also scepticism that governments' commitment to net zero is genuine, rather than political posturing.

People feel the transition is happening around and to them, rather than feeling part of it

- Almost half think the government have done a bad job at engaging the public on net zero and even more (48%) feel the transition is happening to them, not with them. Over a third felt they could not engage or be involved with the transition.

There is a serious trust deficit in heat pumps, feeding fear and paranoia

Low carbon heating options like heat pumps are well known, but people do not understand why they should adopt them

- Heat pumps are seen as a technology which is new, unfamiliar and untested. People are wary of the upfront cost, uncertain over the long term pay off, and sceptical of claims about efficiency.
    - In reality, heat pumps are a long established and well tested technology and are used in different climates all over the world.
- The government's decision to back heat pumps as a technology of the future has not been adequately justified to the public.
- Our survey revealed that while almost half the public are open to, or already are, installing a heat pump, a quarter would not want a heat pump in their house.

Independent information, advice and guidance on low carbon heating is seen as absent, with the public being left to figure it out for themselves

- Hesitancy around heat pump technology is further hampered by a lack of trustworthy, reliable and detailed information sources. The information that exists arouses suspicion for being biased or oversimplified.
- The lack of a single trusted source means that the messaging on heat pumps is getting confused, with conflicting information on heat pump suitability, effectiveness during cold spells and so on, adding further distrust and uncertainty.
- 50% of people think there is too much conflicting information about heat pumps.

This informational vacuum is being filled by rumour and suspicion – making the topic vulnerable to politicisation

- Some worry that a transition to low carbon heat could come with harsh implementation and have little consideration of the costs involved. Those on lower incomes are especially likely to worry, particularly that they will have limited choice over product options, despite being more likely to be eligible for financial support.
- The myth that households will be forced to remove a working boiler to replace it with a low carbon heating system continues to perpetuate.
- Failure to clarify future direction leaves the public vulnerable to mis- and dis-information on net zero and low carbon heating, and the policy uncertainty that plagues industry is affecting households too. Just over a third think heat pumps will not be a long-term solution to home heating, with this belief preventing them from installing a new system.

Establishing trust will take significant effort from policymakers, but is essential to achieving net zero

Policy recommendations

Government needs to build trust in net zero

1. **Government should urgently design and deliver a net zero public engagement strategy, in which heat pumps should be a central focus.** Without public buy-in to the net zero mission and process, achieving its goals will be much harder, and more likely to be met with resistance.

Government needs to build trust in heat pump technology

2. **Government needs to actively work to combat heat pump misinformation.** Preventing myths about heat pumps and correcting misperceptions is necessary for improving their uptake
3. **Government should role model the installation and use of heat pumps** by publicising their use in public buildings, like GP surgeries, schools and libraries to build trust in the effectiveness of the technology.
4. **Government should use existing trusted messengers and information sources to build trust in heat pumps.** Given low trust in government as a messenger, government needs to work with sources that are trusted to spread information and provide advice about low carbon heating

Government needs to make sure heat pumps are a financially viable option

5. **Government should strengthen the economic case for heat pumps** by rebalancing electricity costs, increasing domestic energy production and completing the review of electricity market arrangements (REMA). Together this could make lower carbon heating systems cheaper to run, helping to persuade people that a heat pump is a financially viable option
6. **Government should continue to provide financial support for heat pumps through the Boiler Upgrade Scheme.** The government should commit to providing additional investment for the scheme, and extend the deadline of the scheme to provide long term certainty of support.

CHAPTER ONE – INTRODUCTION

As net zero has become a more prominent topic in policy discussions, there is a growing weight of evidence outlining the steps required to hit net zero emissions by 2050, and who needs to take them. Reports, including those published by the SMF, have covered the barriers to change encountered by the general public and, in the case of home improvements, tradespeople.

What is less explored and less understood however is how people feel about taking those steps. Do they have trust in the march towards net zero? Do they feel that they actually *are* part of the transition, or it is just something that is happening to them and around them?

Events in continental Europe across 2023 and 2024, like farmers protests in response to changes to agricultural policy, and right-wing populist parties capitalising on concerns around climate policies, highlight the risk of the government failing to take the public with them. Building a sense of individual agency, personal involvement and connection to the transition appears to be crucial. Opposition (or 'greenlash') to net zero policies has caused some key net zero policies to be put on hold or delayed, with EU notably diluting some of its climate policies, such as halving use of chemical pesticides, in responses to farmers protests.[1] The UK cannot afford to be in the same situation, given the ambitious net zero and decarbonisation targets. In this report we seek to understand the British public's level of trust in the net zero transition, how engaged they feel in the process and by policymakers.

Additionally, while behaviour change will be required across multiple facets of peoples' lives, how they feel about this behaviour change may vary. Given both its contribution to greenhouse gas emissions, and the level of backlash generated in Germany in reaction to planned fossil fuel phase outs, in this report we place a particular focus on levels of trust in low carbon heating. The UK overwhelmingly heats its homes using fossil fuels, be it gas or oil. Electricity by contrast only fuels around 11% of central heating systems, and only a fraction are heat pumps. Converting more British home heating systems to low carbon sources will be a monumental task, perhaps even more so because the switch needs to come from homeowners, and there is currently no mechanism which requires them to change their heating systems. Evidence from other countries has shown us that stimulating this change can be a real challenge, even if there is support in theory, translating this to action is more daunting. For the UK the case may be more difficult still, with the dates of key net zero policies, such as the cessation of combustion vehicle sales or the phase out of fossil fuel heating systems, vulnerable to change.

Methods

To understand the existing issues and public acceptance of the net zero transition, as well as what could be learned from other countries we conducted a review of the existing literature.

To understand public feeling, we conducted both quantitative and qualitative population research. Across late August and early September 2024, we ran four 90-

minute focus groups with a total of 35 people. Groups were split by income (above and below median income) and by location (urban and rural). We split the groups in this way to see if there were differences in trust level or attitude between those of different incomes. We split the groups by urban rural as rural homes are more likely to have an oil boiler and the mooted phase out date for these homes has been earlier than for gas boilers.

Using some of the insights from the focus groups we conducted a nationally representative survey of 1,500 people. In both cases we focused our research on homeowners, as they are more likely than other tenure groups to make decisions on the heating systems in their homes (tenants both in the private rented and the social rented sectors are much less likely to take decisions over how their home is heated). As a result, the total sample is older, whiter and more Conservative than the national average.

This report is structured as follows:

- **Chapter Two** investigates the extent of public involvement and engagement with the net zero transition in the UK up to now.
- **Chapter Three** explores in detail how the British public feel toward climate change, the net zero mission and how involved the government has made them feel in the transition.
- **Chapter Four** looks at how involved the public feel about the move to decarbonise home heat and what has held them back from switching to low carbon heating.
- **Chapter Five** suggests a number of ways policy makers can address issues of hesitancy towards the transition and reluctance to install heat pumps.

CHAPTER TWO – THE IMPORTANCE OF INDIVIDUAL AGENCY

Emissions reduction has been successful up to now but there is now need for greater public involvement

Through the Climate Change Act in 2008, the British government committed to significantly reducing greenhouse gas emissions by 2050. In 2019, this commitment was upgraded to a legally binding commitment to a policy of achieving net zero emissions by 2050.[2]

By 2017, emissions had reduced 43% compared to 1990 levels, and by 2023 had reduced a further six and half percentage points to 49.5%.[3] Reductions have largely come from changes to power, through the decarbonisation of electricity, as well as falls in emissions from waste and industry.[4] These changes, however, have largely taken place behind the scenes, with little need for public involvement.[5] While reductions will continue to come from these sectors, further emissions reduction will be difficult without substantial public behaviour change.

We know the public is concerned about climate change and supportive of the net zero aim...but this concern has not been translating into action

In May 2024 the Climate Change Committee (CCC) reported that the UK has done well at reducing emissions so far, meeting its first three carbon budgets. The rate of emissions reduction in 2023 was a significant increase on previous years, and will help the UK to achieve its target of 68% emissions reduction by 2030.[6] However to do so, this pace needs to be maintained over the next six years, and needs to expand to more sectors. Of all sectors where reductions are needed, only electricity has seen sufficient and sustained emissions reductions over multiple years.[7] Over the next six years, electricity and fuel supply emissions need to fall 23%, transport 24% and buildings 18%.[8] Key to achieving these is the accelerated roll out and uptake of low carbon technologies, such as electric vehicles and heat pumps.

In the government's favour is that the public are both concerned about climate change, and aware of the concept of net zero. The most recent polling from the Department of Energy Security and Net Zero Public Attitudes Tracker (PAT) indicates concern around climate change remains high (80% in Spring 2024), although this has declined since 2021 (85% in Autumn 2021).[9] Awareness of net zero is also high, and seemingly growing. In Spring 2024, 91% of the UK public said they were aware of the concept of net zero, with 53% saying they knew a lot or fair amount about it.[10] This is among the highest awareness since the tracker started in Autumn 2021. While awareness is higher among people over 45 (93-95% across all groups), those under 45 are close behind, with awareness of the concept between 87% and 89%.[11]

There is also awareness of the need for some major behaviour change to help meet climate goals. A 2022 survey by The Young Foundation found that only 3% of people were uninterested in lowering their carbon footprint.[12] According to the PAT, 86% of people are aware of the need to change the way we heat our homes, to reach net

zero targets[i].[13] Installing a low carbon heating system was the most commonly selected behaviour that the public thought would have the biggest impact reducing emissions, at 42%.[ii][14] In winter 2023, a little over a quarter (27%) also said that they would be likely to install a heat pump the next time they need to change their heating system.[15]

These high levels of support and awareness have not, however, translated into substantial behaviour change. When it comes to home heating systems, gas heating remains dominant in the UK, heating around 80% of homes. Only around 5% have a low carbon heating system.[16] In 2023, there was a little over 60,000 heat pump installations, with just under 40,000 installations certified by the standards organisation, MCS. This was a record number of heat pump installations but was still dwarfed by the estimated 1.75 million gas boilers installed in 2021.[17] Heat pump installations are evidently falling well short of the government's target of 600,000 a year by 2028.

Dramatically changing the numbers of annual heat pump installations will be necessary if there is any hope of reaching net zero by 2050. Some of the increase can come from new homes being built, but much of it will still need to come from the public, with changes made to existing homes necessary.

There have been questions raised over the process of the transition

The move to low carbon heating has not been a sudden shift in government policy. In 2014 the government launched the domestic Renewable Heat Incentive (commonly referred to as RHI), in what was "the world's first long term financial support programme for renewable heat".[18] In 2020 the government announced that the RHI would come to an end and be replaced by a scheme specifically focused on heat pumps.[19] Rumblings of discontent began with the launch of the (delayed) Heat and Buildings strategy which announced the intention to phase out gas boilers in existing homes from 2035.[20]

As time has gone on, home heating has become a particular political sticking point and raised other questions over public agency in the transition. In September 2023, then Prime Minister Rishi Sunak announced the rolling back or postponing of some key green policies (including on heating), declaring the need for a new approach with more public debate.[21] Part of his justification was that the UK's path to net zero was imposing great costs on people's lives at a time when money was short and that continuing to do so would risk losing the consent of the British people for the net zero agenda.[22] More recently Reform UK's 2024 general election manifesto committed to scrapping net zero altogether.[23] Additionally, the new government has

[i] We note however, that this is one of the lowest levels of awareness the tracker has recorded. The highest level of awareness recorded by the tracker was in Winter 2021, at 91%

[ii] Question asked participants to select the top three behaviours they thought would have the biggest impact on tackling climate change in the UK if everyone did it

not yet confirmed whether it will recommit to the 2035 phase out date for gas boilers, or if it will push it back.

While Sunak's move was widely criticised, both outside and inside his party, his argument has some merit.[24] There may still be broad public support for net zero, but the depth and nature of people's commitment is not well understood.

Public engagement on policy, particularly policy change as significant as what is required with net zero, is important for building the legitimacy of the transition.[25] It helps to strengthen accountability and transparency and can improve levels of trust too.[26] Polling from Nesta in 2023 found that almost three-quarters of respondents (72%) felt it was important that they were given a say in how to reduce the UK's carbon emissions.[27] The CCC has called on the government to have a national conversation on net zero, and the need for public engagement has been further underlined by the National Audit Office in their review of the government's progress on decarbonising home heat.[28] Despite these calls, and the government's commitment at COP26 to create one, the UK government still has no public engagement strategy for net zero.

This current transition bears some resemblance to previous heating transitions in the UK. In the late 19th and early 20th century, the UK experienced some significant heating transitions. The first of these was a transition away from coal fires and toward gas-based central heating.[29] Initially (at the end of the 1800s and start of the 1900s) the transition was market-led and slow but picked up as gas central heating became more socially legitimate. The increased standard of living after the second World War, the awareness of negative impacts of fuels like coal and the subsequent ban on their use in urban areas both helped gas heating to gain traction. The explicit role of government was also important, introducing specified indoor heating standards, and the extent of advertising and marketing campaigns by the gas council helped bring the public on board. The next transition, from "town gas" toward the natural gas systems used in many homes today, was led and coordinated by government from the start. Over the span of ten years, 40 million heating systems were replaced. Successfully doing so relied on strong leadership from local authorities, compelling public information campaigns and use of effective and trusted messengers.[30] The current transition is a mix between the two previous ones. While the government has set a target for heat pump installations, implementation is quasi-market led. It relies on individual household desire for heat pumps to drive up demand. At the same time government is softly encouraging heat pump adoption and providing financial support to help achieve that.

The experience of other countries suggests public buy-in and participation to the transition is essential to avoid "greenlash"

The importance of public buy-in to net zero is has been underlined over the past year or so where we have seen growing frustration and backlash to climate policies in many parts of Europe.

In recent years, there has been a shift in tone and attitude toward climate change policies. In the UK, the number of people concerned about climate change has

steadily dropped from 85% in 2021, to 80% in 2024. The proportion of people who think the media somewhat exaggerates the potential impact of climate change has increased from 30% to 33%.[31] This should be concerning for the government. If people don't believe in the transition, they will not be willing to engage in the necessary behaviour change or be more resistant to it.

Similar attitude changes have occurred in other countries too. As in the UK, climate change is seen as a major problem in much of continental Europe, and many do not see their own countries as doing enough to tackle it.[32] Again, as with the UK there is broad support for climate action and policies that help to reduce emissions, as the European Council on Foreign Relations has highlighted. However, over the past five years this has waned, posing a risk to new climate change policies and inhibiting policy implementation.[33] Additionally, as the Tony Blair Institute has pointed out, there is a gap between theoretical support for climate policies and the actual support when policies are put into practice. When they are implemented and start to affect people, there is often greater resistance to them.[34]

This so called "greenlash" can be seen across the EU. Farmers protests in the Netherlands, France, Germany, Brussels, Spain and Poland, in early 2024 have been some of the most visible illustrations of pushback.

In the Netherlands, activist group, the Farmers Defence Force, began protesting against certain climate policies in 2019.[35] The trigger for the first protests was a policy that would reduce nitrogen emissions through actions which included closing farms and culling livestock.[36] Protests continued through to 2023 in response to subsequent policy proposals which are seen by the protestors as anti-farmer, who had already reduced nitrogen emissions by almost two-thirds.[37] Many were frustrated by what they see as unfair targeting by the government, particularly when other, larger global emitters go unpunished. As in Germany, populist climate sceptic parties have latched on to the issue and have made political headway. The Farmer-Citizen Movement made big gains in the Dutch parliamentary elections in 2023 with the Guardian reporting a quote from the party's leader *"The Netherlands has clearly shown we're fed up with these policies. It's not just about nitrogen, it's about citizens who are not seen, not heard, not taken seriously."*.[38]

Inspired by the Dutch, similar farmers protests took place in many other European countries in the first half of 2024. Climate change policies were not the core issue for all farmers protests, but the protests themselves fuelled climate mis- and disinformation.[39]

One of the most notable cases of backlash against climate policies, however, has been the heating transition in Germany.

As with many other European countries, in recent years Germany has increased the number of heat pumps sold, in efforts to decarbonise domestic heating systems.[40] Following the 2021 election, the new coalition government agreed in principle to implement a policy requiring all replacement heating systems to be powered by at least 65% renewable energy. Originally, the shift away from fossil fuel boilers was to come into effect from 2025, but new legislation aimed to bring this forward to 2024,

prompted by the invasion of Ukraine, which highlighted Germany's reliance on Russian gas.[41] In February 2023 a draft of the proposed amendment was leaked and was met with considerable public and political backlash.[42] The newspaper which had originally published the leaked legislation (Bild) ran determinedly against it, popularising the term "*heizhammer*" (heating hammer) in reference to the policy.[43] Across the summer of 2023 public protests against the proposed changes took place across the country.

Picture: 2023, Protesters opposing amendments to Germany's Building Energy Act, which would require heating systems to use a minimum of 65% renewable energy

Source: Uwe Lein/picture alliance via Getty Images, via Foreign Policy

The issue was seized by far-right party Alternative für Deutschland (AfD), which used the heating law to capitalise on concerns around the costs of climate change and the net zero transition.[44] However, opposition also came from even within the coalition itself, with the free market FDP expressing their dissatisfaction with the bill. The legislation did pass in September 2023 when it was brought before parliament, but causing significant damage to public support and the government en route.[45]

The government's popularity fell to record lows as a result of opposition to the home heat move, and pushback against other green policies.[46] The Green Party and its Vice Chancellor Robert Habeck, seen as the face of the bill, was particularly burned. Over the course of a year, the approval rating of the Green Party had taken a hit, falling from 23% the previous Summer to just 14%.[47] In the recent elections for the European Parliament, the Green Party lost nine seats, while AfD gained four.[48]

Analysis from the Centre for Climate Change and Social Transformations has highlighted widespread concerns about the fairness and affordability of the proposals. Given the high costs of electricity, the switch to electrically powered heat

pumps was seen by some in Germany as an elitist move.[49] The other dominant issues however were a perceived lack of choice, and the absence of a "proactive and trusted public engagement communications strategy".[50] One politician interviewed said they felt that the failure to have a communications strategy wrecked the heating transition and severely damaged public opinion on the matter.[51]

In France, by contrast the move to decarbonised heating systems has been received much more positively, without the same level of pushback in neighbouring Germany. France is now the largest heat pump market in Europe, selling in the region of 720,000 heat pumps in 2023.[52]

With the success of the French case, we should bear in mind that firstly, electricity in France is relatively cheap. 40% of the country's total energy supply comes from domestically produced nuclear power, making an electricity dependent system like heat pumps an economical option.[53] Secondly, the heat pumps installed in France end to be air-to-air systems. These are cheaper than the air-to-water heat pumps which are more commonly found in Germany and the UK.

Even with these caveats however, there are key differences in how the policy to accelerate heat pump take up was laid out to compared to what happened in Germany. Firstly, France has had long-term, income tiered funding. This means that those on lower incomes receive more support, which helps address concerns around the justness or fairness of the transition.[54] Home decarbonisation and greater home energy efficiency also been a consistent focus of government for many years. The long-term signalling and consistent messaging has meant the change to low carbon heating has not been seen as not seen as sudden.[55]

As the UK ramps up its own policy of decarbonising home heat, the cases of Germany and France provide strong warning signs of what Westminster needs to avoid and what it should work towards. People cannot feel that they are given no option, or that the change in heating policy has been suddenly sprung upon them. At the same time, people need to be aware that they *will* have to make some changes, and that those changes come with timelines. At COP29 in November 2024, the prime minister asserted "*what we are not going to do is start telling people how to live their lives*". As we have established, agency and choice is vitally important, but it is also necessary for government to provide leadership and direction, and clarity that some aspects of the way we live our lives will have to change.[56] Failure to do so means resistance could grow not only to the decarbonisation of heating, but the wider net zero goal.

CHAPTER THREE – UNDERSTANDING THE PUBLIC POSITION ON THE NET ZERO TRANSITION

Britain has, so far, largely avoided net zero becoming the divisive issue that it has in the US, or some other parts of the West. Climate scepticism is lower in Britain than in many of our peers. For a long time, there has been cross-party support for tackling climate change. There was a cross-party consensus around the 2050 target, when it was amended from an 80% reduction in emissions to full net zero, in 2019.[57] Although the actions of the Conservative government did not always align with that ambition – "cutting the green crap", dropping the Zero Carbon Homes Plan and the effective ban on on-shore wind did not help to accelerate progress towards the net zero goal.

The agreement across the parties on the environment is however starting to break. The rhetoric of the new Conservative leader, and the Reform Party's calls for a 'referendum on net zero' herald widening divides on the issue. They argue that environmental policies are costly and being imposed upon the public without consent – arguments that have resonated overseas, as we have explored in the previous chapter. The new Labour government meanwhile, have committed to an at least 81% reduction in greenhouse gas emissions by 2035, and clean power by 2030.[58]

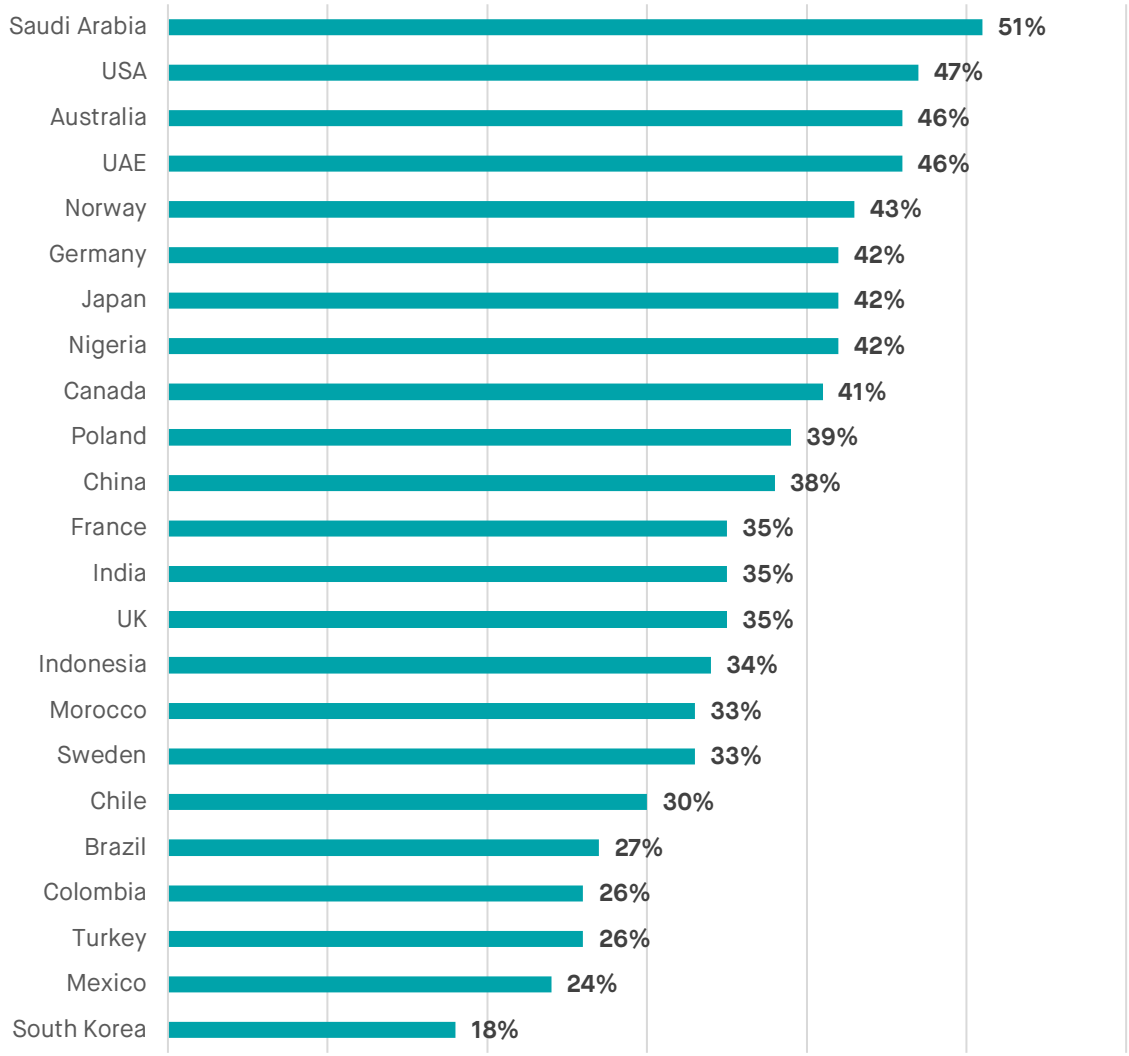
This chapter explores the British public's views on climate change, the net zero mission and how involved the government has made them feel in the transition. Using data gathered both from four groups of homeowners and our 1,500-person survey, it gives key insights into how people feel about the transition. As we will see, although a majority support the goal of net zero, most of the public feel dislocated from the process of it, suggesting a real risk that consensus on these goals could begin to break down.

Brits are in favour of net zero, but worry about its cost and whether it is realistic within the government's proposed timeframe

Despite their support for net zero, people question its practicality and feasibility

Our results chime with other studies showing that most Brits believe in climate change, and that it is being caused predominantly by human activity. 15% of homeowners in our survey felt that there was "no point" to pursuing net zero as they "don't think climate change is caused by human activity". This view was held by 45% of homeowning 2024 Reform voters, 16% of Tories and just 8% of Labour voters. This 'climate denial', is rarer in the UK than it is in many Western countries such as Germany, Japan, Norway, Poland and the US according to research by IPSOS for EDF in 2023.[59]

Figure 1: Level of climate scepticism among 16+ population across different countries, 2023iii



Source: Obs'COP 24: World opinion in the face of climate change, EDF and Ipsos

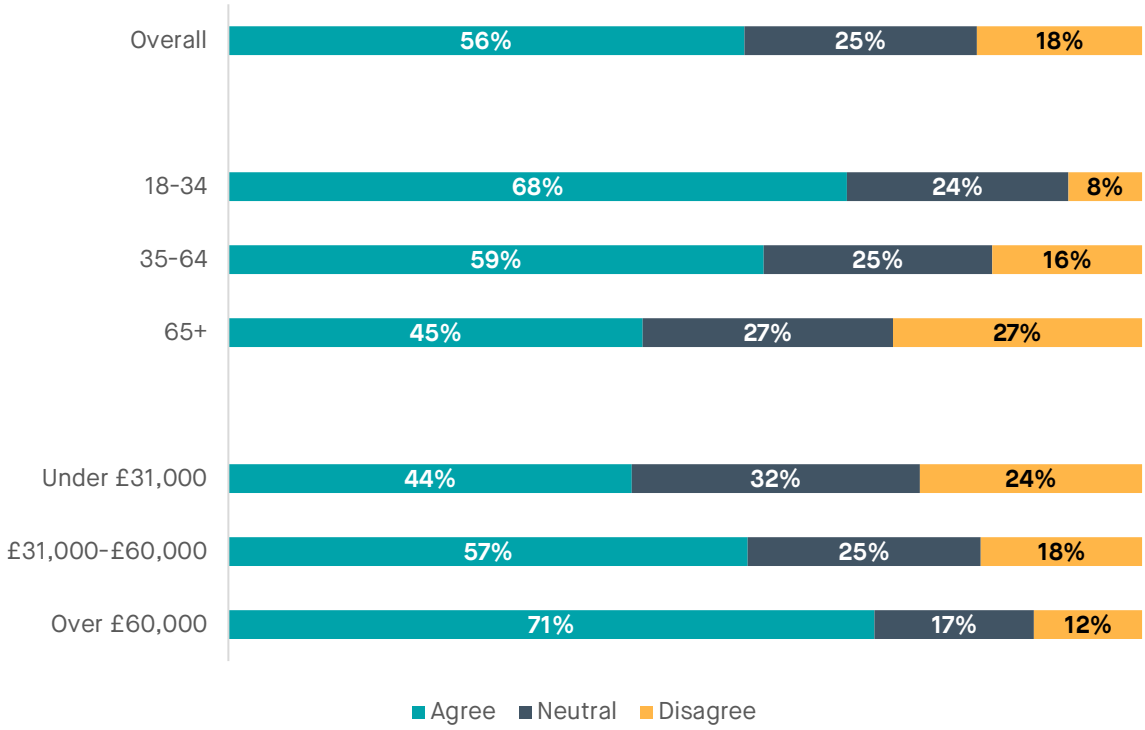
Support for the goal of net zero is also widespread, as Figure 2 shows, with 56% of respondents supporting the 2050 goal compared to 18% who oppose it. The chart also shows two of the recurring trends in the data on attitudes to net zero and to heat pumps – older people and those on lower incomes are less supportive of the net zero transition and the interventions it entails.

Nearly half of homeowners (48%) feel that net zero should be one of the government's top priorities. A quarter (25%) disagree.

The support for net zero across the political spectrum that we found aligns with what has been found by others. In the run up to the 2024 general election, the Energy and Climate Intelligence Unit, together with More in Common found in their survey that there was majority support for net zero across voters for all main parties.

[iii] Defined by the survey as either believing that climate change is mainly due to natural phenomenon or that there is no climate change

Figure 2: Extent to which homeowners support the aim of reaching net zero by 2050



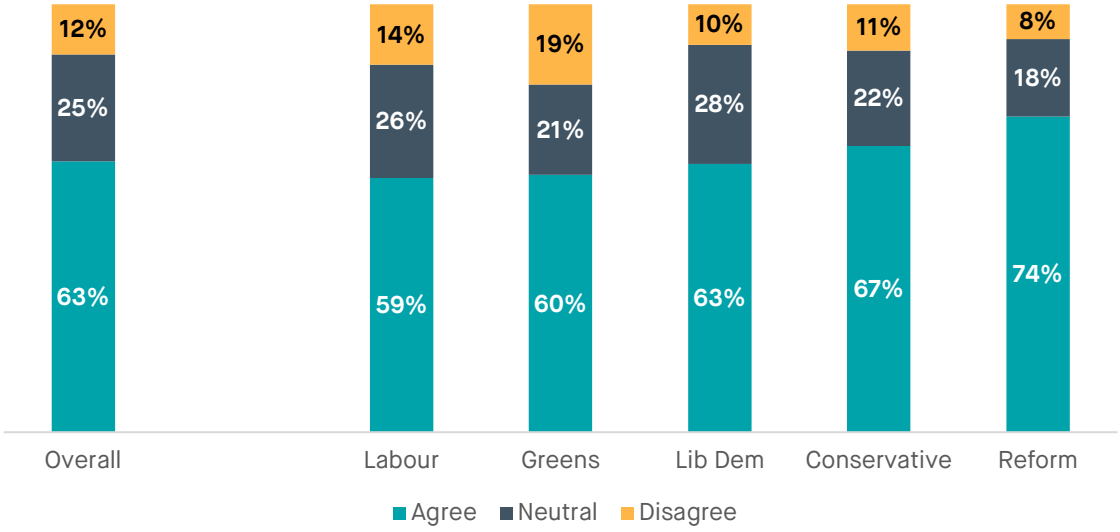
Source: Analysis of SMF net zero and heat pumps survey 2024

Although a majority of homeowners support the ambition of net zero, they are less confident that it is achievable. One focus group participant felt that "the target date for what it's got to be done by changes constantly" with "everyone talk[ing] the talk" but not being "actually willing to commit and start doing stuff". This sense that the government kept moving the goalposts was shared by others, noting "blurred lines" in whether governments were sticking to their plans made them sceptical about net zero. Another reflected on net zero seeming unrealistic in its speed:

> *"net zero has always struck me as a five-minute solution to 150-year problem." (rural, low income)*

The survey found that 63% of homeowners thought that the 2050 net zero target would be "too difficult to achieve". This was overwhelmingly a majority opinion, irrespective of whether people voted for the Greens or for Reform, as Figure 3 below highlights. This matches with what similar studies have found. The PAT Summer 2024 survey found that more than two-thirds (69%) of respondents were not confident that the UK is on track to meet the net zero 2050 target.

Figure 3: I think reaching net zero by 2050 is a nice idea but it will be too difficult to achieve



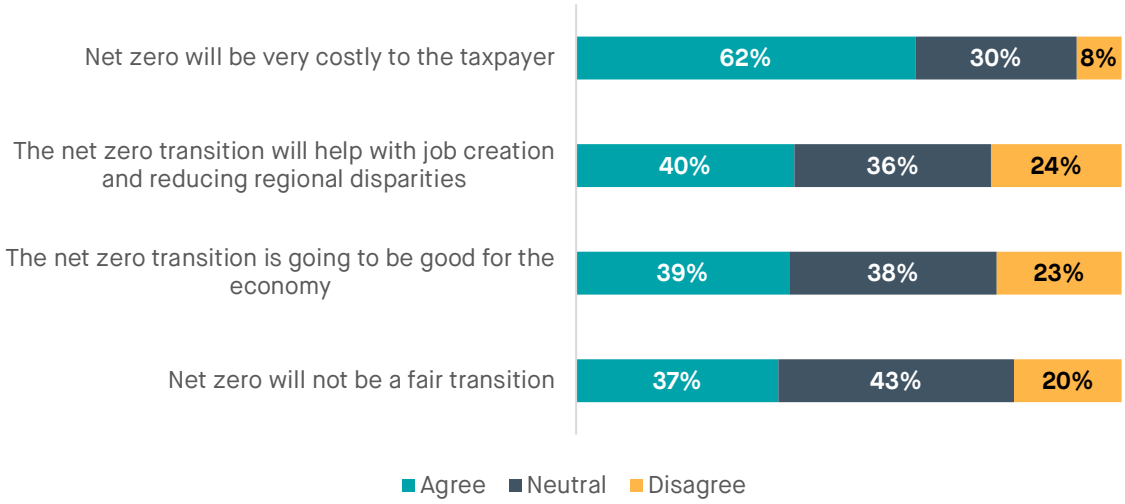
Source: Analysis of SMF net zero and heat pumps survey 2024

The public thinks that net zero will be good for the economy and inequality, but will be a drain on the public purse

Despite this scepticism, we found evidence that some positive narratives about the net zero transition are gaining traction. More homeowners think that measures to enable net zero will be good for the economy than think it will be bad (39% vs 23%), as can be seen in Figure 4. Also, a plurality feel that net zero will help to create jobs and reduce regional inequality (40% vs 24%). On both of these questions, though, well over a third of respondents did not have an opinion, and the positive case is yet to win over a majority of the public.

Respondents were much clearer in the view that net zero will be costly to the taxpayer. 62% believed this, compared to only 8% who disagreed.

Figure 4: Degree to which homeowners agreed with statements on net zero



Source: Analysis of SMF net zero and heat pumps survey 2024

Younger and wealthier people are more likely to think that net zero was going to be economically beneficial. Nearly two-thirds (63%) of 18-34 year old homeowners saw the transition as something that would be positive for the economy, against 29% of those over 65. Higher earning property owners are more likely to see economic upsides too, with 52% of those households earning over £60,000 seeing the transition as positive, compared to 30% of lower earners on under £31,000 a year.

Richer households were also less likely to expect net zero policies to be expensive for the exchequer. A little over half (56%) of households earning over £65,000 a year thought it would be expensive, compared to almost two thirds (65%) of those on less than £31,000. 47% of under 35s shared this concern, whilst 71% of over 65s did.

There is a concern that the government is not taking people with them on net zero, and that people don't know what or why changes are happening

People feel that the transition is happening around them and to them rather than feeling part of it

There was a widespread sense of dislocation from the net zero process in the focus groups that we held – that the transition had been thrust upon them. Participants felt that they knew little about what the transition consists of and that there is very little engagement about what is being done to achieve it, on both a local or national level.

> *"Local authorities and government make the decisions, and they stick the lead on us and expect us to follow. So, I don't feel as if I've had any involvement whatsoever, other than [that] I will attempt to make savings myself, which I hope will reduce emissions" (urban, low income)*

> *"I think it's been decided, hasn't it, what's going to happen... I generally approve of it, but we're not really consulted on it" (urban, low income)*

> *"I feel as well, it's been dealt with on a macro level, but not micro. So, it's totally policies that are churned out, "these are the targets" and stuff... I think we need to do it, but ... I wish it was more focused on individuals and what we can do." (urban, high income)*

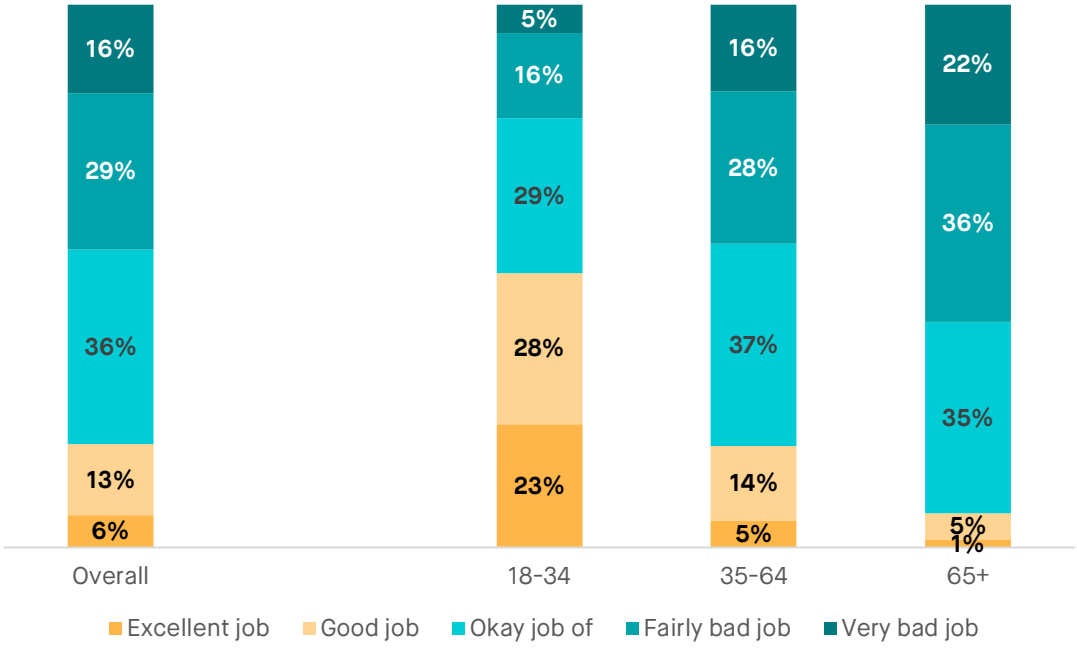
This came through in the survey as well. Nearly half of homeowners surveyed (48%) felt that the transition is happening to them, not with them, with the view shared irrespective of who they voted for in 2024 (ranging from 39% for Green voters to 61% of reform voters). Only 15% of respondents did not feel that way. Less than one in three (31%) felt that they are "part of and can engage with the transition", with a third (33%) neutral and 37% disagreeing. Strikingly more people than not (41% vs 28%) feel like you need to have a high income in order to be involved in the transition – a challenging situation given the changes that the transition requires will need to be made across all incomes.

Focus group participants commented on the effort required in order to take part in the net zero transition. One argued that "it...feels like you have to be really proactive in every aspect and on every part of it in order to benefit in any way, shape or form" from the changes.

The homeowners were unimpressed with UK governments' efforts to engage with the public on net zero over recent years. Less than one in five (19%) thought that they had done a good or an excellent job, with 45% rating them as very or fairly bad. Younger people were more positive about the government's efforts, with 51% saying that they had done a good or an excellent job, compared to just 6% of those aged over 65. Nesta similarly found that while 72% of people felt it was important they had a say in reducing emissions and the net zero transition, only 12% felt the government had done a good job in involving citizens, and 46% thought they had done a bad job. Without the opportunity to be heard, they lose confidence in the process.[60]

This does not seem to be a partisan point. Our survey found that Labour voting homeowners were somewhat more likely to say the government had engaged well (26%), with Tory voters on 20% and Lib Dems on 16%. Voters for those parties which are more critical of Conservative and Labour approaches to net zero – with Green voters saying it is too slow, and Reform voters that it is too quick or unnecessary – is reflected in a worse rating for the government's engagement (11% rating good or excellent for Green, 10% for Reform).

Figure 5: How well homeowners believe the government has engaged the public on the topic of the net zero transition so far, by age group



Source: Analysis of SMF net zero and heat pumps survey 2024

This poor engagement by government now is shaping the extent to which people feel like they will have control in the future. Only 12% of respondents felt that they will have "full control" over decisions to change their behaviour to reduce their carbon footprint, as Table 1 shows.

Table 1: How much say do you think you will have over future behaviour changes relating to net zero?

Statement	% respondents
I think I will have full control over my decision to make or not make changes to my behaviour	12%
I think I will have a good deal of control over my decision to make or not make changes to most of my behaviours, but will not have control over all decisions	31%
I think most behaviour changes will be decided for me, but there are some where I will make the decision	39%
I think all behaviour changes will be decided for me	18%

Source: Analysis of SMF net zero and heat pumps survey 2024

A better effort to educate the public and explain the rationale behind changes would help to build families' trust in net zero

A lack of information is a big driver of feeling cut off from the transition, especially among older and less well-off people

What is driving the public's sense of remove from the net zero transition? One focus group participant told us that they:

> *"don't think there's enough awareness out there within the public to make informed choices about the decisions that have been made for us, or the paths that we've been asked to go down." (urban, low income)*

From the survey, around 4 in 10 homeowners (39%) feel like they are able to make well informed decisions relating to the transition, with big differences by age group – 61% of 18-34 year olds can make informed decisions versus 29% of 65+ respondents. White people are less likely to feel informed enough to make decisions than those from ethnic minority backgrounds by 36% to 57%.

There are also disparities in the extent to which homeowners know where to find reliable information about the transition. Whilst 37% of all respondents feel they know where to go for information, this rises to half for those earning above £65,000, compared to just 27% where their household is bringing in less than £31,000 a year. There is an age split here as well, with 54% of the younger cohort being comfortable with where to find out more against 28% of the older group.

The public want to hear more from the government on their rationale for policies as well as role modelling these behaviours themselves

Our survey went deeper into what kind of information homeowners wanted on net zero, and who they wanted to hear it from. The most popular request was for the government to better explain the rationale for the changes being made, chosen by 4 in 10 (41%) respondents, as Figure 6, below, shows. This was also a common feeling in focus groups:

> *"it's all very confused and very vague". (urban, low income)*

Better government engagement on what changes they are making, *why* they are making them as well as the government role modelling the behaviours that it is requesting of households and businesses were similarly popular.

There was a desire for the government to be more direct and clearer in what it wants from the public that came through in focus groups:

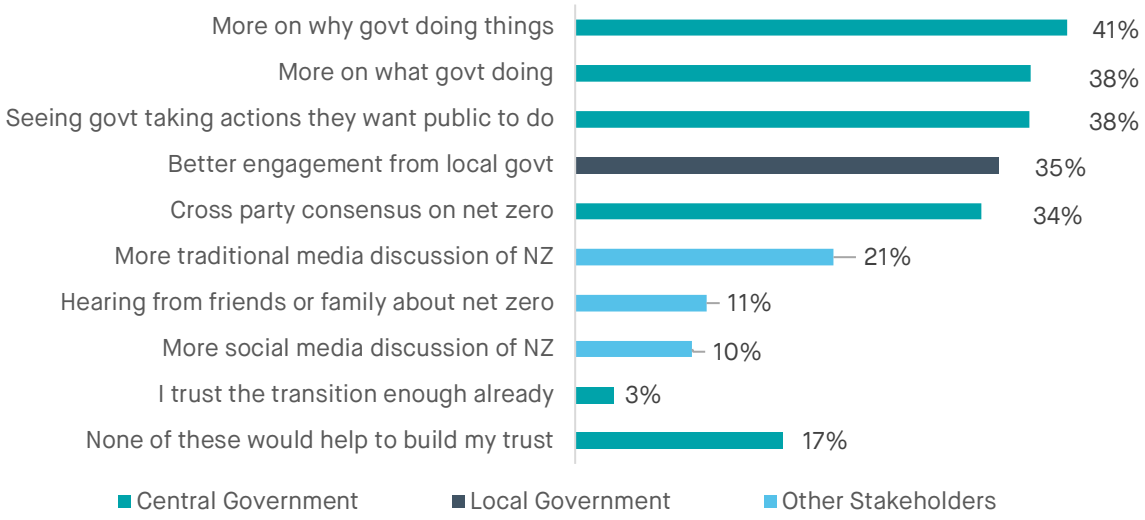
> *"It's their lack of maybe, you know, maybe they're doing a lot of things and I'm not aware of it, so maybe there's a problem of communication. But I think their lack of proactivity in terms of helping us and guiding us is restricting me... by them kind of taking the back seat. Or it feels like they really took the back seat. So, I feel really bad saying it, but it's restricted [me], because I'm just like, I don't know what to do. (urban, high income)*

A desire for local information sharing did not come out strongly in the polling – local government engagement was the fourth most popular option – but it was commented on in the focus groups. One participant "wonder[ed] if some of this information was sort of devolved down to local government, to local councils, whether that would be more helpful and more on the ground." This approach might be especially impactful for the younger generation, for whom local government engagement was the most popular selection. In past SMF research on barriers to insulation uptake, we also found that local government would be well placed, to help overcome issues of trust and information barriers.[61] However, Nesta research has also found that while local institutions are well-placed, they cannot always bridge the gap, not due to a lack of desire to do so, but as a result of a lack of funding, and bureaucracy.[62]

Older voters place more value in seeing cross-party consensus on issues. 40% of 65+ respondents were keen to see a more united vision for net zero between the major parties, ranking it joint top, whilst only 26% of 18-34 year olds selected this option.

Meanwhile, the public say that hearing more from their peers, and from the media on these topics would do less to boost their trust in the transition. Although younger respondents were more likely to feel that social media content would increase their level of trust, only 18% selected this option, ranking it second last above hearing from friends and family.

Figure 6: Popularity of methods to build trust in the net zero transition?



Source: Analysis of SMF net zero and heat pumps survey 2024

Homeowners are willing to make changes, but low carbon heating systems are less popular than other interventions

We asked homeowners what changes they would be willing to make to help with the net zero transition. The majority, 62%, were willing to actively make some of the changes suggested, even without being legally required to do so.

However, a quarter of respondents (24%) said that they would only make changes if legislation forced them to, with 15% suggesting that even then they may not. This chimes with a focus group participant commenting that "the only things I do…that are sort of energy efficient have been forced upon me, like recycling at home, or doing the green bin and stuff like that."

Table 2: Which actions would you be willing to take to contribute to the net zero transition[iv]

		%
	I would be willing for a **solar/wind farm or pylons** to be built near where I live	38%
	I would use **more public transport** and/or walk/cycle more instead of driving	37%
	I would **install renewable energy** technologies in **my house**	36%
	I would switch my heating to a low carbon heating system like a **heat pump**	28%
	I would buy an **electric car**	27%
	I would **change my diet** to lower emissions foods	21%
	I would **pay more for things** that create more emissions	12%
	I **would only make changes** that actively contribute to net zero **if legislation makes me** (e.g. a ban on petrol and diesel cars)	24%
	None of these	15%

Source: Analysis of SMF net zero and heat pumps survey 2024

There were three options that people proved most willing to consider, garnering between 36% and 38% support, the first of which provides some challenge to the perception of 'NIMBYism' in the public. Perhaps surprisingly, homeowners were more willing to have solar farms, wind farms or pylons built near where they live than any of the other options. This view was more popular among city dwellers, so it may reflect some 'cheap talk' from people that know they won't be required to make the change. However, a third of those in villages (33%) and in rural areas (36%) were also open to this. Even 29% of Reform voters chose this option. However, we note that even the most popular measures still only had support from less than two-fifths of those surveyed. Resistance to such measures, however, could still be high, underlining the need for the public to be involved in decisions that may result in actions like these being taken.

[iv] Note that respondents could select "I would only make changes that actively contribute to net zero if legislation makes me" as well as one of the pink options, so some of the 77% who selected at least one pink option

More use of public and active transport was the next most popular change that homeowners would be willing to make. This was more common in urban (39%) than rural (25%) environments, and especially popular with those aged 65+ (39%) or 35-64 (38% vs 28% for 18-34s).

Interestingly, homeowners were more willing to have renewable energy technologies in their house (selected by 36%), such as solar panels, than switch to heat pumps (28%). Views on heat pumps will be explored in detail in the next chapter, but younger people were more open to getting a low carbon heating system (35% of 18-34s vs 21% of 65+), and those in households earning over £65,000 were twice as likely to be interested than those bringing in under £31,000 (40% vs 20%). The pattern was similar in relation to renewable energy technologies. This may be reflective of earlier concerns around the cost of the net zero transition, and the relatively high upfront costs of installing a low carbon heating system.

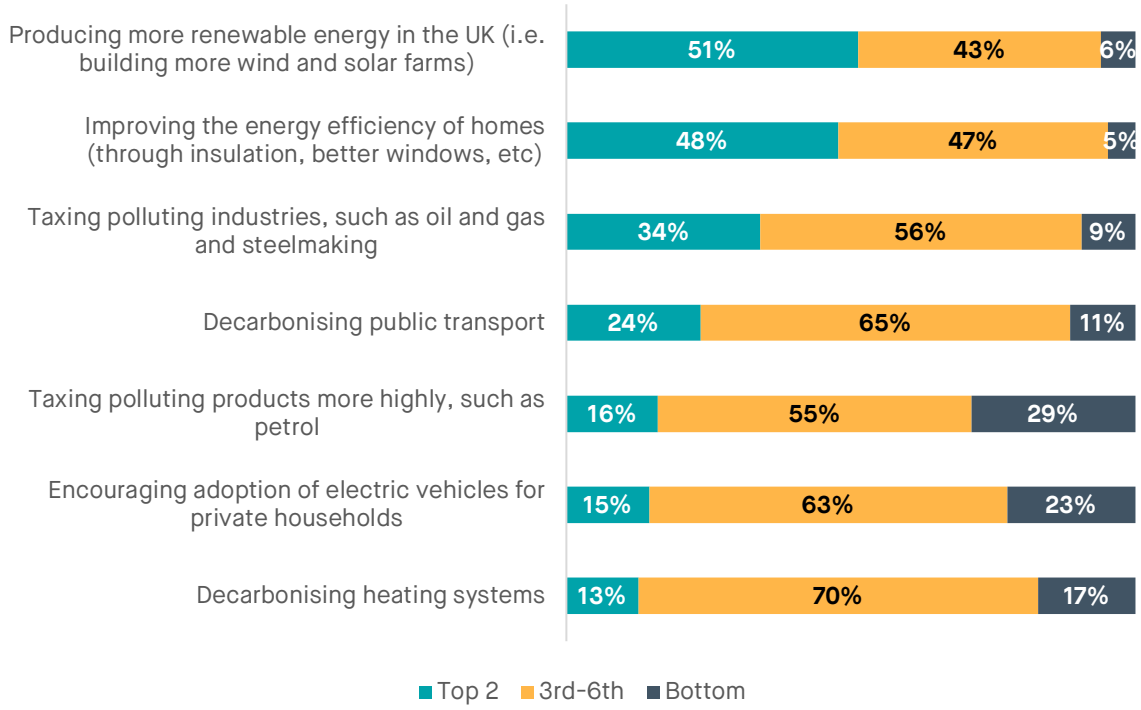
The public was less receptive to willingly paying more for things that pollute (12% selected), such as vehicles with combustion engines or fossil fuel heating systems. The new chancellor seems aware of this, choosing to follow Conservative chancellors in freezing rates of fuel duty rather than make the case for internalising externalities – i.e. making users pay more for things that cause societal damage.[63]

The survey also asked respondents to rank a range of government interventions which could be used to achieve net zero. Figure 7 shows how each option was ranked by homeowners. Over half of homeowners (51%) said that renewable energy generation should be a top two priority for the government. Just below this, 48% ranked improving the energy efficiency of homes, like focusing on things like improving insulation and windows, in their top two.

Transport policies seem to be especially divisive. Whilst 16% said taxing polluting products like petrol should be a top two priority, 29% ranked this as their lowest priority. Boosting electric vehicle adoption was a key priority for 15% and the lowest for 23%. We have seen that while these types of policies have a tendency to generate a significant amount of opposition when first proposed, the idea then becomes normalised and opposition to the policy fades.

Decarbonising heating systems was least likely to be ranked in the top two – just 13% did so. Although sparking less negativity than the transport policies, heat pumps are clearly not surrounded by enthusiasm relative to other net zero interventions. Given the significance of home heating in the UK's emissions, the comparative reluctance to focus on decarbonising home heat should give the government cause for concern. The next chapter will delve into the public's perceptions of heat pumps, their concerns, and what it would take to boost take-up.

Figure 7: How homeowners feel the government should prioritise energy transition policies?



Source: Analysis of SMF net zero and heat pumps survey 2024

CHAPTER FOUR – THE PUBLIC AND LOW CARBON HEATING

That only 15% of homeowners in our survey think decarbonising heating should be a top net zero priority for government raises some concerns over how well the public will react to policies with the decarbonisation of home heat as their focus. As we have highlighted in the case of Germany, belief in the need to address climate change did not translate into acceptance of policies to do just that.

This chapter uses our focus group and survey data to dig into feelings towards the low carbon heating transition. It finds that trust and uncertainty are significant issues, both in relation to heat pumps themselves and in the availability of information about them. The distrust has been further fuelled by government inaction to dispel concerns, risking the success of the switch to low carbon heating.

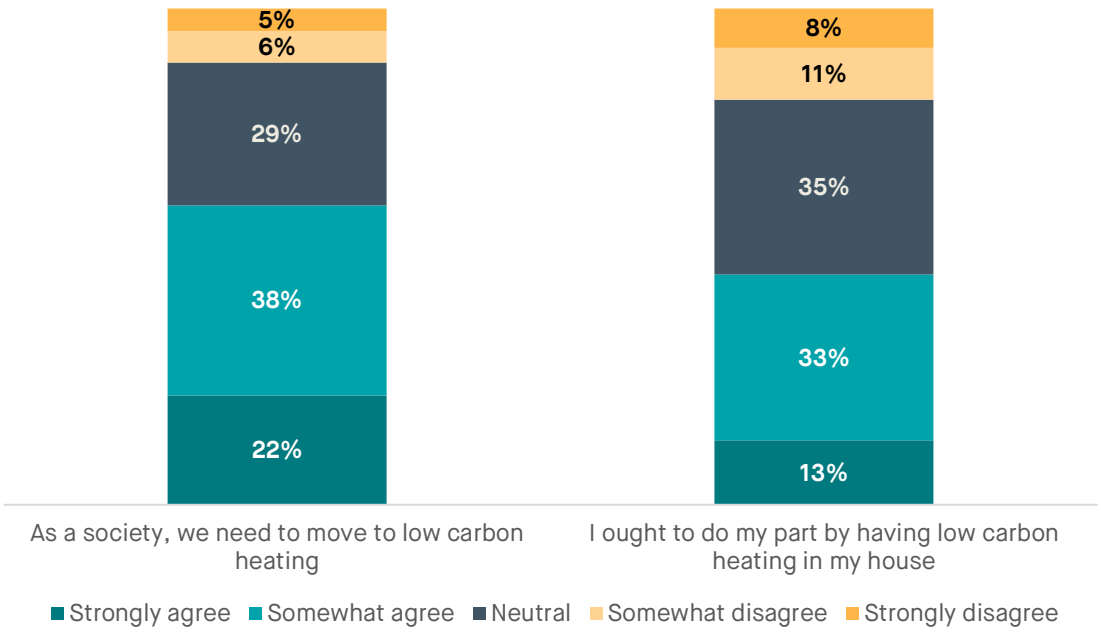
There is support for low carbon heating but heat pumps are seen as a relatively new untested and untrusted technology

The public are aware of heat pumps but knowledge and understanding remains surface level

Since the UK committed to net zero by 2050, awareness of heat pumps has certainly grown. In 2019 the BEIS public attitudes tracker found that only 57% of people were aware of renewable heating systems, and awareness of heat pumps specifically stood at 31% for source and 36% for ground source. By Summer 2024 the DESNZ public attitudes tracker found that 88% of people were aware of low carbon heating systems.[64] Our survey found a slightly higher levels of awareness of heat pumps. Only 5% of respondents have not heard of heat pumps, although we believe this higher level of awareness is reflective of our survey being limited to homeowners.

Our survey also showed that there was widespread acknowledgement of the need to decarbonise heating systems. As shown in Figure 8, 60% agree that as a society we need to move to low carbon heating. Support for such a move was higher among younger, wealthier and more left leaning voters, but remained at over half for almost all groups. Even among Reform voters, a third think the UK needs to move to low carbon heating.

Figure 8: The extent to which survey respondents agreed or disagreed with statements on low carbon heating



Source: Analysis of SMF net zero and heat pumps survey 2024

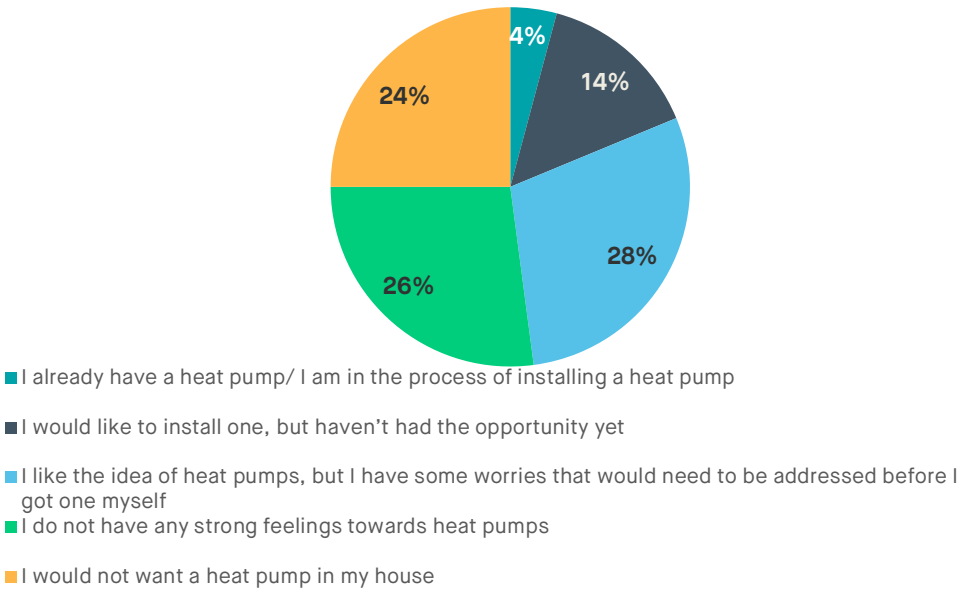
Taking responsibility for making that change to their own homes was less popular. Less than half (46%) agreed that they ought to contribute by fitting low carbon heating in their own home and almost a fifth (19%) thinking they should not.

Poor understanding of heat pumps is paired with low trust in the technology, with consequences for take up

This reluctance to act is further reflected in the level of support for personal heat pump adoption. As shown in Figure 9, almost half of the population are open to the idea of having a heat pump in their home, but a quarter are actively opposed to having a heat pump.

However, when the level of interest is examined more closely, support for heat pumps becomes more tenuous. 14% would like to install a heat pump, but haven't yet had the opportunity to do so, whereas a substantial 28% like the idea of heat pumps but have some outstanding concerns which would need to be addressed first.

Figure 9: How homeowners would describe their position on heat pumps

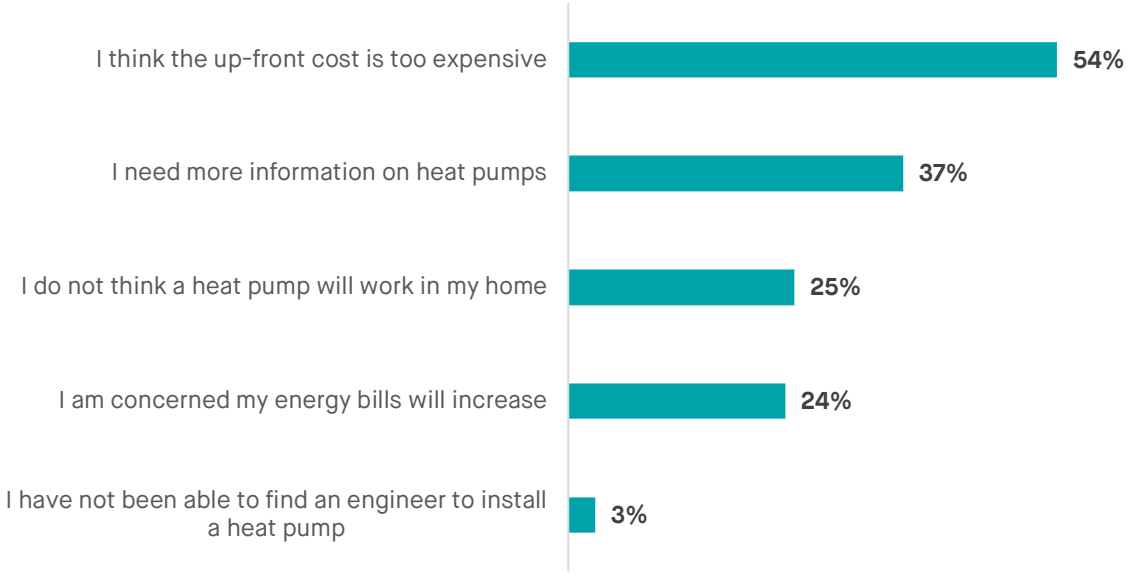


Source: Analysis of SMF net zero and heat pumps survey 2024

This reflects discussions from our focus groups. While there was a definite interest in low carbon heating and potentially adopting it, for many there were outstanding concerns that stopped them from taking the plunge.

Cost was unsurprisingly by far the greatest barrier to adoption in our survey, at 54%. As well as the upfront costs of paying for the heat pump unit and its installation, focus group participants also worried about the costs of maintenance and servicing, unsure about how it would compare to their current heating system.

Figure 10: Factors that have held back homeowners from installing a heat pump



Source: Analysis of SMF net zero and heat pumps survey 2024

After cost however, needing more information and doubting heat pump suitability were the next most common reasons that homeowners had decided not to install a heat pump. Similarly in our focus groups, discussions began with hesitancy over the cost but quickly uncovered wariness, uncertainty and even distrust of the heat pump technology itself.

Participants had practical concerns over the reliability of heat pumps. Some were concerned that heat pumps were new and untested, did not come with sufficient warranties and so were a big risk for consumers. This extended to concerns over the regulation of the industry, with several participants feeling there would be no recourse if things went wrong, or that the market was vulnerable to rip offs.

> *"You want to make sure that they do work efficiently. I'm sure they will work efficiently. Obviously, there's been a lot of testing going on, but that would be my main concern" (urban, low income)*

> *"If it is an unregulated market, it's going to open itself up to enormous pitfalls for people. I'm sure some people will be horribly ripped off" (urban, high income)*

> *"How trustworthy is the product? Is the payback going to be there, and what happens if it goes wrong?" (urban high income)*

There were also doubts over the credentials of the technology. Some participants were concerned that the raw materials needed for heat pumps or manufacturing may have a great negative environmental impact, which would negate the environmental good they do when heating homes instead of fossil fuels. Others questioned whether they would have an impact at all, or if homeowners would need to make big changes to their homes and their lives, but that it would not translate into tangible environmental impact.

> *"One point I would like to add on, is also regarding how they advertise it as environmentally friendly, and, of course, reducing carbon emissions and everything. But does it actually?" (urban, low income)*

> *"I think we need to see sort of a bigger picture, like if they, if the pumps are, you know, made in China and shipped across the world, you know, all those sorts of things from source. Where do all the parts come from? You need to sort of put all that together to sort of like get a true idea of what good these pumps are making (urban, low income)*

The distrust toward heat pumps have been magnified by what many felt was the government's failure to justify their decision on heat pumps as a technology of the future to the public. Participants in this group felt that the government had not clearly set out the case for heat pumps or explained how they had come to the decision on heat pumps being the heating technology of the future. Some questioned the government's motivations, concerned that they may have been lobbied into choosing heat pumps, rather than having a decision that was backed by science.

> *"One thing with the government, I would question is, are heat pumps the best thing that's available, or did heat pump companies lobby the government, and at some point, they decide to go along with heat pumps? Was it*

completely independent? Was some influence put on the government?" (urban, low income)

"Why have they chosen this certain way? Are they profiting from it in some way?" (urban, high income)

"When people want to win votes, they talk about crime because they want to scare the public. Then, you know, they talk about, you know, heat pumps because they want to turn around and appeal to those people that are conscientious about the environment. It's just, it's, that's what we're talking about, political it's just another tool to win over the masses in order to get where they want to be." (rural, high income)

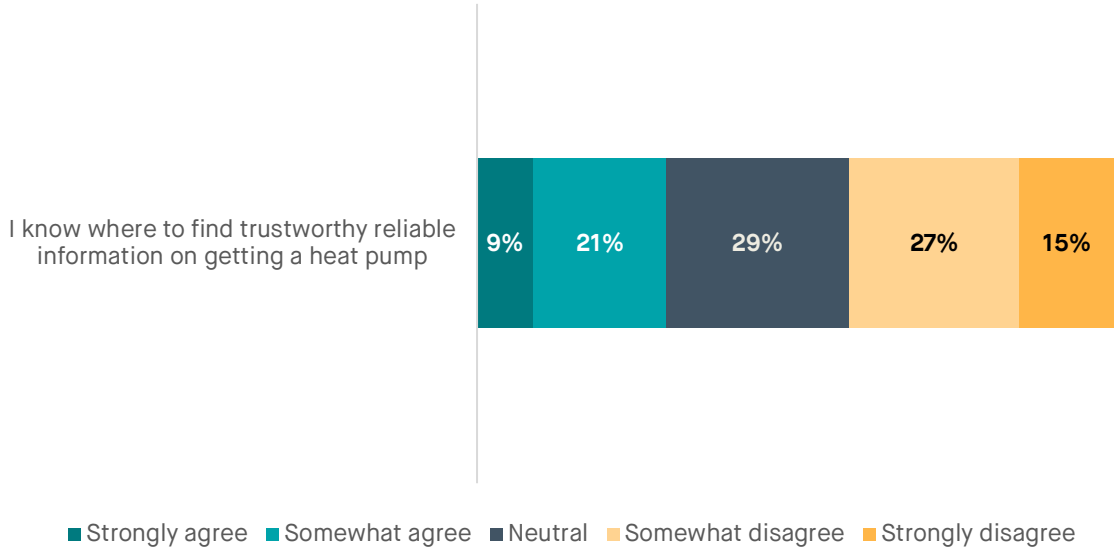
These feelings are reflective of the broader decline of trust in politics and politicians in recent years. The latest British Social Attitudes report found in summer 2024 that Britons trust and confidence in Britain's system of government was at a record low.[65] As noted in an SMF paper on falling levels of trust last year, trust in institutions of government is at 27%, while trust in individual politicians and ministers is incredibly low, at under 10%.[66]

Independent information, advice and guidance on low carbon heating is seen as absent, with the public being left to figure it out for themselves

People are wary of the information that is available, doubting it is trustworthy or reliable

Scepticism toward heat pumps themselves is further exacerbated by a perceived lack of trustworthy and independent information. Less than a third of survey respondents (30%) felt they knew where to go for reliable information, versus more than two fifths (42%) who don't.

Figure 11: Extent to which homeowners agreed they knew where to find information on low carbon heating



Source: Analysis of SMF net zero and heat pumps survey 2024

Search engines were the most common starting point for trying to find information on heat pumps, but people say they approach the search results with caution. There was a clear line drawn on what sort of information or sources definitely could not be trusted. Anything that appeared to be an advertisement or that was obviously trying to sell something was discounted. People were much less clear on websites and resources actually *can* be trusted.

> *"I personally just use any, search engine and just ask questions. I'll just put a question into a search engine heat pump, sufficient. What's the cost of a heat pump? And I'll just, I'll look at what media gets thrown back at me" (urban, low income)*

> *"I do something similar to [name removed] with Google. But I'm also sort of aware that the top results tend to be paid for. So sometimes something looks like maybe a government organisation or, you know, independent and they're actually selling you the product. So, you have to be a little bit wary of what you're looking at" (urban, low income)*

> *"as soon as a new incentive is brought out, all of a sudden, what everybody jumps on the bandwagon, and you're just bombarded with companies ringing you up or online and saying, you know they they're offering you this, that and the other. So, you just don't know where to turn." (rural, low income)*

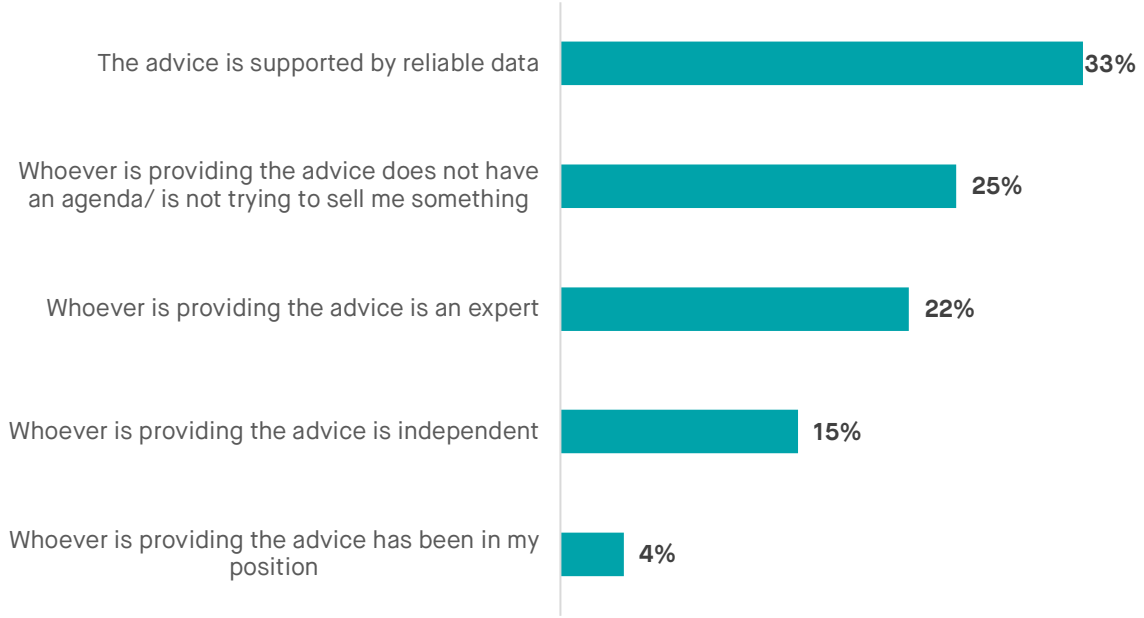
Most participants felt that there was no trusted source of information about heat pumps. Most easily accessible sources were viewed as likely to be a scam, or have some sort of vested interest, whether in getting them to fit a heat pump or dissuading them from it. As referenced earlier in the chapter, this also included sources from government.

> *"For me, there doesn't seem to be any kind of unbiased source of information that is going to give me what I need and want to know" (rural, high income)*

People have a good idea of what and who they would trust information from

People's vigilance against vested interests came through in the survey, with a quarter of respondents selecting "not having an agenda" as the most important factor when seeking trustworthy information on heat pumps. As detailed in Figure 12 the most important factor overall, however, was that the advice and information given was supported by reliable data.

Figure 12 : Factors important when seeking trustworthy information on heat pumps



Source: Analysis of SMF net zero and heat pumps survey 2024

For focus group attendees, the most trusted sources were those with lived experience of a heat pump. These sources were viewed as the most honest and would be able to reflect on the positives and negatives of having a low carbon heating system. However, hardly anyone knew someone with a heat pump who they could talk to about it.

> *"I want to know from those people who live with those heat pumps. What is it like? What are your basic how much maintenance is it? If you have real people who have really lived and experienced these items, then you're gonna trust it a bit more, because they've actually used it as you would use it." (urban, low income)*

> *"I wouldn't want to be, personally, the first of my friends doing it. I think I would want to know somebody that had done it and spoke to them about their experiences first" (urban, high income)*

> *"I haven't spoken to any individuals who have a heat pump, so I don't have any personal experience" (urban, high income)*

Consumer websites such as *Which?* and *Money Saving Expert* also proved popular. Participants felt that these sources were reliable, truly independent and had the consumer in mind above anything else. They had no interest in pushing a particular policy position, or in trying to sell a particular product.

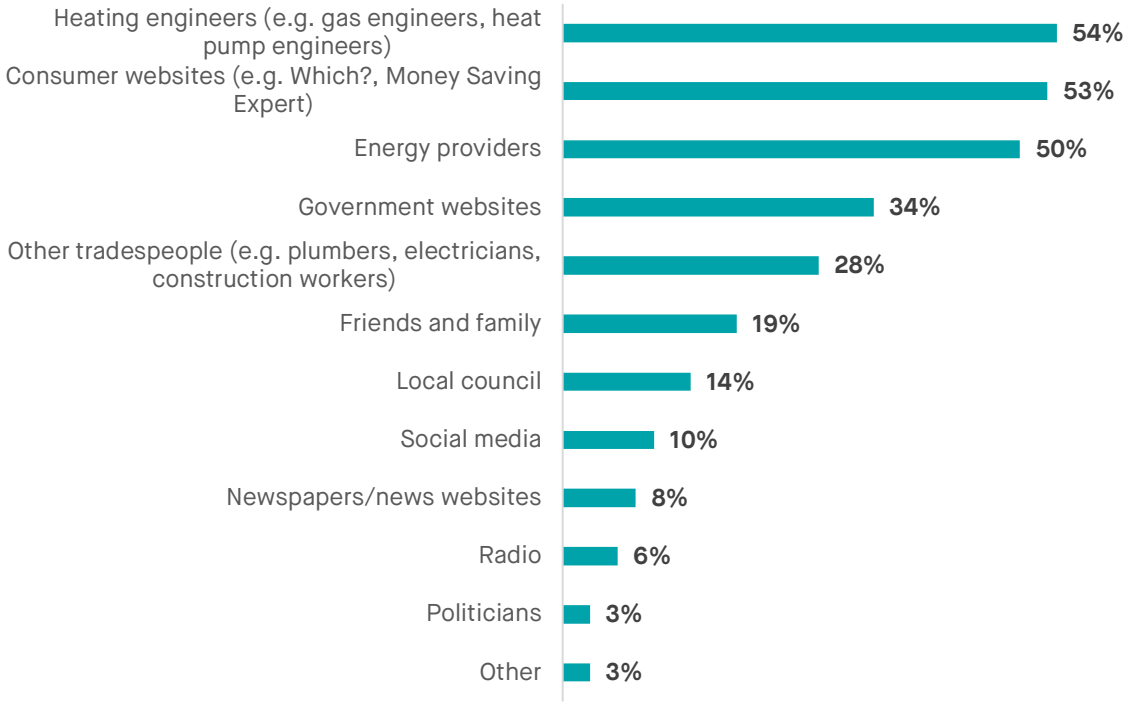
> *"only ones I would one hundred percent trust, I think, would be Which?, the consumer association, I think they're the only ones I would give my full trust in" (urban, low income)*

> *"Money Saving Expert is the only place to go to, in my opinion, because you don't have to pay for any of the information. Like they've had years and years*

of unbiased information. I feel like they're totally unbiased. They compare absolutely everything. They make it really easy, because they put calculators for you, and again, they're just not trying to sell anything" (rural, high income)

This view was not limited to our focus groups. Consumer websites were the second most selected source for information on moving to low carbon heating by our survey participants (Figure 13, below). The most popular source, however, was heating engineers, with more than half looking to them for information on heat pumps.

Figure 13: Where homeowners would go for information if they were exploring moving to a low carbon heating system, like a heat pump



Source: Analysis of SMF net zero and heat pumps survey 2024

But even trusted sources are used cautiously

Tradespeople, and heating engineers in particular were also popular in the focus groups. With their experience in the industry, heating engineers are seen as experts, and likely to have a good understanding of different heating technologies and how well they perform. Some focus group participants spoke about having an established relationship with their plumber, and trust in their reputation and their opinion. With that said, some participants remained acutely aware that heating engineers themselves could have vested interests, and this may prejudice their opinion, either in favour or against heat pumps.

"I actually spoke to my plumber about heat pumps, because my boiler is probably coming to the end of its life...And he completely pooh poohed them. And he said to me, if you have a heat pump put in, you'll have to have your garden dug up to lay all piping and stuff ...and he just was totally against it himself. And he's a plumber that I've dealt with for decades, and obviously I trust his opinion. And so even having the information down on the ground for

> *the trades people, if they're concerned about them, then it's not going to fill me with confidence" (urban, low income)*

> *"I've got a company. They're very local.... They service the boiler once a year. They've been around for 30, 40, years. They're a very well-known company in the area. And of course, they're a profit driven company. They're making a living. But I would call them in because this is also a company that's built its whole thing on a good reputation.... So, I would listen to what they've got to say. I wouldn't necessarily solely judge what my decision on what they have to say, but I'd hear it at least." (urban, high income)*

> *"certainly, wouldn't take any advice from a company that was selling the product, because, as [name removed] said, they'd be biased. You know, they're interested in selling you another product and making money. So, a more generalist, maybe I take advice from" (rural, high income)*

A previous SMF report, *Installing for time,* argued that owing to their trusted position, heating installers could be a means for spreading awareness of and arguments for low carbon heating. In order to do so, they need to be equipped with the right information and training on low carbon technologies.[67] Without this sort of training, they themselves could be at risk of providing inaccurate or misleading information too.

However, our research also found that installers are only likely to have this level of information and have taken part in the training if they actually see an opportunity to install them.[68] At the time of the research, a perceived absence of consumer demand, uncertainty on the role of hydrogen for heating and changing dates on the phase out of gas boilers meant many felt that taking on the training would be a waste of time and resources, as they would not get to put the training into practice soon enough.[69]

The information that is available is seen as insufficient and in absence of a trusted source, people are trying to fill in the gaps themselves

Even information from trusted sources falls short of the mark, according to focus group attendees. Participants commented that most information or support services they had found had been very superficial and did not provide adequate detail.

> *"I think they need to do it on different levels. Like, if you're searching the information, and you're happy to go about and look it up on a website, then having an independent website where you can access that information, and like, say, have chat bots and get more information and be more specific about your circumstances, would be brilliant" (urban, low income)*

> *"It may be a bit extreme, but I, I went to, I went to the point of reading the technical specs on different manufacturers for the heat pumps." (rural, low income)*

With the uncertainty around where to look for and find trustworthy reliable information, focus group attendees were confused by what they had seen and heard. For some, this has actively deterred them from installing a heat pump.

> *""If I felt it was reliable, I mean, the perfect position where I could have actually gone ahead and done it, but I've chose not to. So, I don't think there is any reliable, joined up information out there." (urban, low income)*

> *"I've had a little bit of a look in but I still find there's a lot of very, very contradictory information out there with regards to the grants that are available, the costs of the units, whether you do or don't need to change radiators," (urban, low income)*

> *"The information that I've had, it's quite from different sources. It's been quite contradictory... that's the reason why it took me so long. I mean, I've done it over a period of year. I'm still not anywhere near decided, you know, whether or not I'm going to go for it. So, it's that's the reason why I think the government needs to step in and regulate a bit more and just turn around" (rural, high income)*

With so much conflicting information and the absence of trusted information, it is hard for people to challenge or question the advice they had been given. One focus group participant, for instance, had been old they could not have a heat pump fitted due to the age of their property. Though they were given no justification for this, they had no resource they could use to challenge the claim, and felt they had to accept it. Another participant had been led to believe that heat pumps wouldn't work in the UK, given a lack of geothermal energy, despite this not being a requirement for heat pump systems.

> *"I was never given a reason why I was just told by lots of different trades people that these cannot be installed in properties older than 1995 you know. And again, they never gave me a reason why they just said it physically cannot be installed." (rural, low income)*

> *"I did look into it, but it was going to take up too much space, probably be too noisy, and also it wasn't really relevant to our country. I was led to believe we don't initiate enough heat underground to use it, especially in the winter. So that's why I didn't go for a heat pump" (rural, low income)*

The susceptibility to mixed messaging is also evident in our polling which found that 50% think there is too much conflicting information about heat pumps.

People feel that the government has forgotten about them, despite needing them on board for the transition

With inadequate information, people felt that they had been somewhat abandoned by government on heat pumps, being left to figure it out for themselves. Given what they saw as a strong desire for and push towards heat pumps from government, being left out in the cold this way was particularly confusing. Some felt what they saw as a lack of action by government, was a hindrance to them making the changes that government itself wanted them to make.

> *"I think the government needs to take a much stronger lead and push themselves forward. And I don't know, almost throw a comfort blanket over us that, you know, these decisions that we're being asked to make are the right ones, because it's backed by government (urban, low income)*

> *"Maybe they're doing a lot of things and I'm not aware of it, so maybe there's a problem of communication. But I think their lack of proactivity in terms of helping us and guiding us is restricting me...it feels like they really took the back seat. So, I feel really bad saying it, but, um, it's restricted [me], because I'm just like, I don't know what to do." (urban, high income)*

This informational vacuum is being filled by rumour and suspicion – particularly that people will be compelled to act and will receive no assistance to help them do so

Without clarifying the future for heat pumps, there is a risk of the issue becoming politicised, making the adoption and transition to low carbon heating harder. People are filling in the blanks themselves and coming up with their own assumptions and expectations of what is going to happen over the coming years. With a perceived lack of clarity and action from government and the absence of a single information source, people are vulnerable to miscommunication, and misunderstandings, as well as more directed and active disinformation.

People are concerned that their choices over home heating in the future could be quite limited

When it came to future actions, most focus group participants believed that in the short term, they will retain control over their heating system, such as decisions over what to do when their boiler breaks down. However, they fear this control will not always be secure. There is a belief in the need to decarbonise the heating systems, but there remain concerns over how government will go about doing this, and the extent to which the public will be supported in their journey.

None of our focus group participants thought that the government would forcefully install low carbon heating systems into people's homes. Many thought, however, that policy will develop in such a way that low carbon heating will become an inevitability. This in and of itself was not an issue, but there was concern over how it would be achieved.

Some participants expressed concern over how the change would be implemented what the timeframe for change was and crucially how change would be enforced. Issues like the fairness of the transition and concerns around workforce shortages were apparent.

> *"it's going to have to be phased because we can't all just get a copy of a heat pump on a certain date, because the hundreds of thousands of homes in the UK, there's not going to be enough people to fit like that is there? It's got to be the infrastructure there, and it's got to be done in a slowly, slowly, gradual process sort of way, or otherwise it's, yeah, it'll just be madness" (urban, low income).*

> *"they need to ensure that it's feasible....it's just all well for government to say, okay, that's the deadline, but they need to really nurture the sector and make sure that as individual, I can go and there are instillers there at a reasonable price" (urban, high income)*

Participants were more open to a gradual phase out of fossil fuel heating systems, or stopping the production of gas boilers. One participant reflected on the move to electric vehicles and foresaw the same pattern in home heating.

> *"there'll be decision made within government, where it'll say, after this point there will be no more gas boilers produced. Therefore, at the moment, it seems to me, the only other option that we've got is to go with heat pumps (urban, low income)*

> *"What they'll probably do is make it so you can't get it when you actually need to replace it, like with diesel and electric cars. Once, they won't force you to stop using the existing car you've got. It's just you won't be able to get another one when you need to replace it, either second hand or brand new" (rural, low income)*

> *"I'm not sure about the time scale, but I know there are, there is already legislation about banning gas boilers, for example. So, my guess is it'll be one of these cases where doesn't matter what the consumer thinks the government knows best, and it'll tell you, you've got no choice. Is how I understand it" (rural, high income)*

Others thought that the government might stimulate demand through gradually and subtly making gas more expensive, to the point where the only viable alternative would be heat pumps.

> *"I subscribe to the idea that they will force you to change by raising things like standing charges or gas. [until] it becomes too expensive" (rural, low income)*

There were mixed feelings on both of these methods. Some felt that such action from government would be covert and sneaky, whereas others pointed out that a tipping point needs to come from somewhere. In the same conversation, however, it was acknowledged that more forceful action is necessary if the government is genuinely serious about reaching net zero by 2050.

> *"I think also that there might be an element that you do have to get to some sort of tipping point, and something does have to happen, and things will have to be forced upon people if we truly are going to try and hit net zero by 2050, or whatever it is this week, because it's got to start somewhere... And the only power that they will have is to stop allowing us to have what we normally have." (urban, low income)*

> *"I think they have to put a point saying okay, by this time you have to place a boiler to a heat pump or something. There should be some persuasion and some and some incentive both needs to go hand by hand to convince people to move to that. Otherwise, it will never happen." (urban, high income)*

As some of these concerns raised by participants, like gradual the phase out of gas boilers, and signalling through energy prices are actual proposals in government policy, government effort to inform the public and provide information to support their decision will be crucial. They need make it clear and explicit that there is a change to heating systems happening, and the role the public has in that transition,

so that people don't feel it has been snuck up or suddenly imposed on them without discussion.

And the concern around high cost mixed with a lack of product choice was a particular concern for low income groups

More broadly there was a concern over the perceived narrowness of the heat pump market. Alongside the apprehension that heat pumps were relatively untested and new, participants were worried that they would have limited choice in over types, brands or cost of heat pump. Some believed that were only a small number of few heat pump brands or manufacturers to choose from. Participants were concerned that the implementation of low carbon heating systems would not be matched with sufficient government support, putting unfair pressure on households.

> *"I do agree we should be we have to force people to make change, but that should be government and company led, taking the majority cost... It's that upfront cost, no matter the saving at the end of it. I think that does have to be shouldered by the government and companies' combined and then clawed back over. A long period of time" (urban, high income)*

> *"You've got to consider the fact that by the time the legislation comes into effect, and they do ban gas boilers, you need to hope that the price has come down, that everything is a lot more advanced, so it's easier to install and less costly, and that" (rural, high income)*

This concern was held by focus groups participants on lower incomes in particular. This group's reliance on government support to switch to a low carbon heating system, left them worried they would have little choice. Many felt that the high cost of alternative heating systems would mean they would have to put up with what they are given, rather having true choice over what was fitted.

> *"My experience has been, if you're on a scheme where you're getting it for free, you get what you're given. You don't get choice in the type of, sort of boiler. When I got my boiler installed, thankfully, they were quite reasonable and put one in that's the right size, but I didn't have a choice of that. It was that's the one you're getting" (rural, low income)*

Government needs to make it clear that there still will be choice available to households. Firstly, that there is a wide variety heat pump brands, just as there is with boilers. Secondly, while heat pumps are largely expected to replace gas boilers, they are not the only low carbon heating option. Households who would prefer not to have a heat pump do have other low carbon options available. The expansion of the BUS to apply to other low carbon heating options like electric boilers should help to show there are a range of low carbon heating choices available to households, but this will need to be publicised.

The public are vulnerable to continued misinformation on heat pumps

Failure to clarify future direction leaves the public vulnerable to mis and dis-information on net zero and low carbon heating, and the policy uncertainty that plagues industry is affecting households too. A recurrent theme in our focus groups was a doubt over whether opting for a heat pumps would be a future proofing

decision. Several participants felt that heat pumps were more likely to be a passing fad for and that the government was not committed to them for the long term. A few expressed the sentiment that a new and better technology could come along in a few years' time and the government would change their mind. People were wary of spending so much on a heat pump only to be told that they would soon need to adopt another new technology.

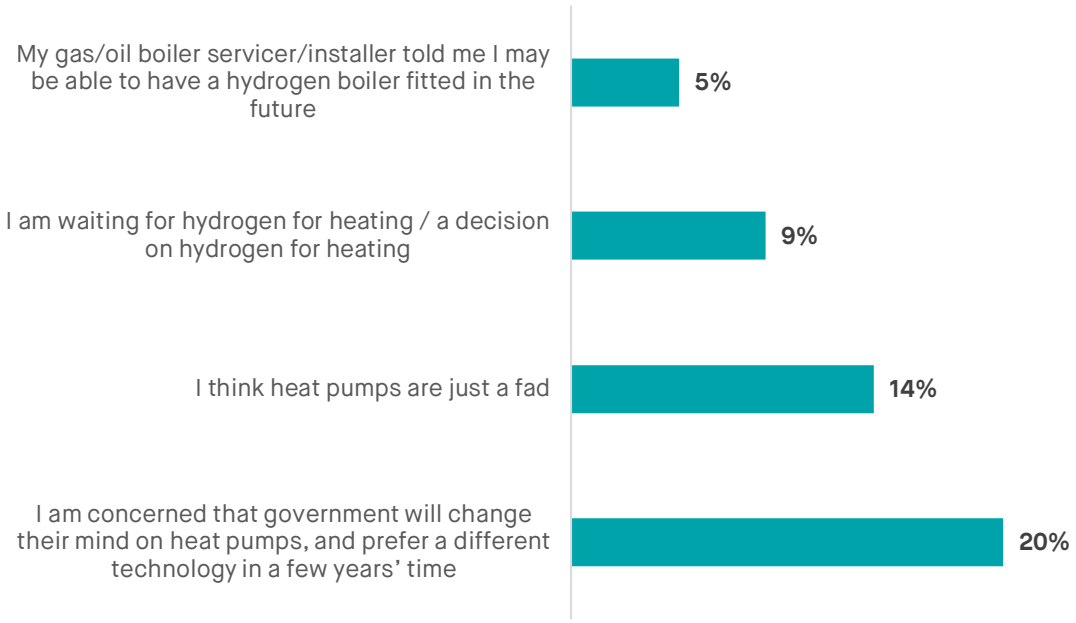
> *"Are they going to, in five years time, come up with something? Because 10 years ago, I didn't know, had never heard of heat pumps before. So, is it going to be new tech coming out, and they will be completely redundant?" (urban, high income)*

> *"If they [government] do make you get them, then you get them. And then what happens if they change it again? And then it's another cost in it, another change and another what we're going to do" (urban, low income)*

> *"This is the best thing ever until the next one comes out. This is the greatest thing ever that they want you to buy until 10 years from now," (rural, low income)*

This also came through in our survey. Even for those who were interested in installing a heat pump, doubts lingered due to uncertainty over the future of policy. Just over a third think heat pumps will not be a long-term solution to home heating, either doubting the government's commitment to it, or seeing heat pumps as more of a fad.

Figure 14: Factors which have stopped homeowners from getting a heat pump installed



Source: Analysis of SMF net zero and heat pumps survey 2024

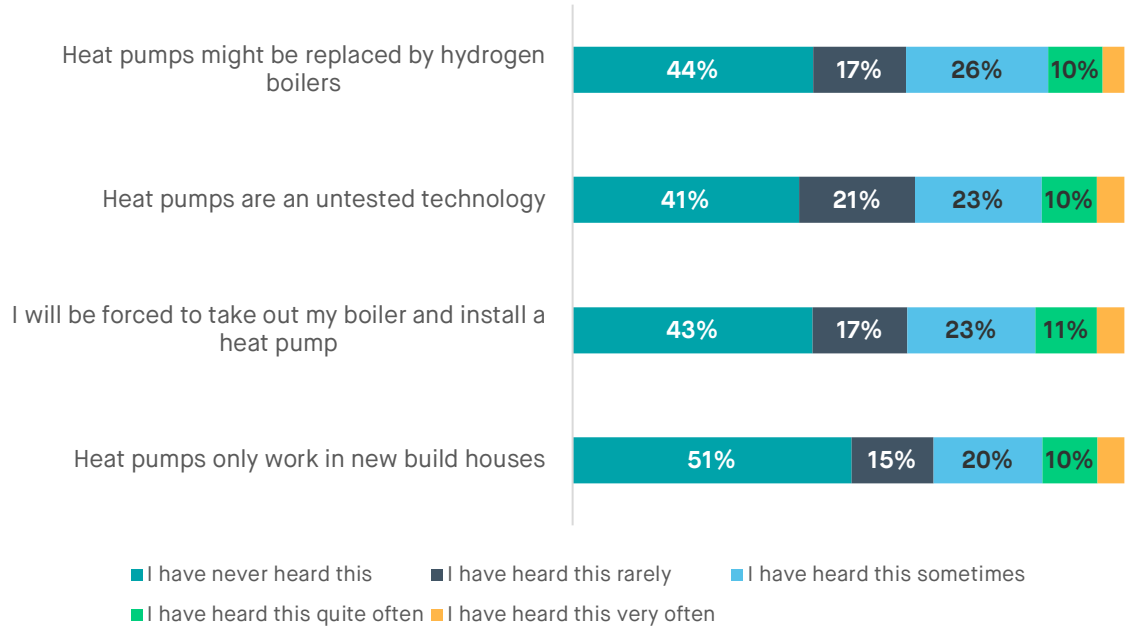
As shown in Figure 14, there are also some homeowners who are also holding out for a decision on the potential of hydrogen for heating use before changing. Hydrogen for heating is not currently an established technology; however, it is being explored as an option. The previous government announced in the Heat and Buildings Strategy

that they would take a decision on hydrogen in 2026, based on evidence gathered, including from some hydrogen village trials. However, several of these have now been postponed.[70] Some focus groups attendees referred to hydrogen for heating, but it was largely not something they were waiting for.

> *"There was something like, even, like, up to two years ago, there was big thing about hydrogen, changing boilers to hydrogen.... it feels like it's kind of dying down a bit. I don't hear about it that often" (urban, high income)*

While people were wary of vested interests, with so much conflicting information and little effort from government to set the record straight, misinformation is easily spread and common myths around heat pumps continue to perpetuate. While only a minority of people hear of these regularly ("I hear this quite often" and "I hear this very often"), the substantial portion who have heard of them.

Figure 15: How often have you heard the below statements from politicians/public figures



Source: Analysis of SMF net zero and heat pumps survey 2024

Eventually all households will be transitioned to using low carbon heating sources, but all indications from government have been that this will be a phased introduction. However, one of the most noticeable and most concerning myths is around the compulsion to replace a functioning heating system. A small but notable portion (16%) described themselves as having regularly heard that they would be forced to take out their existing boiler and install a heat pump, and a further 23% heard this sometimes. Having heard the myth is not the same as belief in the myth, but the prevalence of it in the public consciousness is cause for concern.

As noted above, this was not as prevalent in focus groups. Participants did not expect to be forced to remove an existing boiler, and did not seem familiar with the myth, but were aware that a change to heating systems was coming.

The confusion over heat pumps. is likely to have come from several public figures speaking about *not* forcing the public to remove their existing gas boiler, including then PM Rishi Sunak. In his announcement on the rollback of key green policies, he stated "*I'm announcing today that we will give people far more time to make the necessary transition to heat pumps. We'll never force anyone to rip out their existing boiler and replace it with a heat pump. You'll only ever have to make the switch when you're replacing your boiler anyway, and even then, not until 2035.*" Amidst the reversals of actual policies, the statement on forced replacement of working boilers did not represent any change – this has never been government policy.

The line about not forcing people to rip out their boilers has also been trotted out by current Energy Security and Net-Zero Secretary Ed Miliband. *"On home heating – as we said in our manifesto – no one's going to be forced to rip out their boiler. We're absolutely clear about that."*.[71] While the line may seem to be a comfort that people will not be forced to change their heating, it in fact, it actually reinforces the idea that forced replacement is possible, and only adds to the confusion and mixed messaging around the heating transition.

And failure clarify the direction leaves the issue at risk of politicisation

In the World Economic Forum's 2024 Global Risks Report, misinformation and disinformation were identified as the greatest short-term risk, with societal polarisation in third.[72] These two risks are also seen to be the most strongly connected risks, each amplifying the other. Divisive issues and ones that there is already less clarity on, like the heating transition, could be more exposed to these risks. As we have seen in Germany, feelings of discontent can easily be seized upon and amplified by climate sceptics. If government continues to let things go as they are, there is a risk of heat pumps being the forefront of a new culture war in the UK, with the technology weaponised.

CHAPTER FIVE – WHERE NEXT FOR POLICY?

Success of the net zero transition relies on people making significant changes to their behaviour, something which is not easy to achieve. As identified by UCL's International Public Policy Observatory, when it comes to high value green purchases like heat pumps, the desire to make a change is necessary but not sufficient.[73] They also need the capability to make the change - that is, they need to feel confident in their purchase.[74] As some of our focus group participants attested, they have the motivation to move to a heat pump, they have the financial capability, but they lack the confidence in the product.

Trust is evidently a huge issue and needs to be prioritised by the government going forward. To make progress, the government needs to take steps across three areas. It needs to build trust in net zero and the transition as a whole, and make people feel that they are a part of it. It needs to build trust in heat pumps specifically. Finally, it needs to make heat pumps a financially feasible option for more people. This chapter discusses the steps government needs to do those three things.

We urgently need a net zero public engagement strategy

Public engagement is seen as an important part of good policy making. Fundamentally it is how policy makers involve the public in their decision making. It helps to increase the information available to government for decision making and crucially helps to build the legitimacy of policies.[75] Additionally, as a signatory to the 2016 Paris Agreement on Climate Change, the UK has committed to engaging its citizens on climate change.

Since then, many bodies have called on the government to deliver on their commitment. In the CCC's 2021 Progress Report to Parliament, developing a public engagement strategy was a priority recommendation.[76] In 2022 a House of Lords Environment and Climate Change Committee report recommended that a public engagement strategy be developed by April 2023. The call was repeated once again in early 2023 by former Energy Minister Chris Skidmore in his Net Zero Review. Previous Conservative administrations did promise a public engagement strategy when it hosted COP26 in 2021. However, such a strategy never materialised. Despite its importance and an international commitment to doing so, the UK still lacks a comprehensive public engagement strategy for net zero.

This government must urgently design and deliver a strategy to keep the public informed about what is being done to reach net zero and involve them in decision making as much as possible. In December 2024, the government responded the CCC's priority recommendation on improving public engagement on low carbon choices. They have said that in 2025 they will publish a Public Participation Strategy, to set out how government will approach public engagement.[77] We welcome this move from government. As we have seen in our research, the public need to be made to feel more involved in the transition; to persuade them net zero it is not an alien imposition. The public is still broadly supportive of net zero but, as we have seen overseas, that can flip if policy is implemented badly or is perceived to overreach.

Ownership of the strategy should lie with the Department for Energy Security and Net Zero. However, implementation of the strategy will need to be cross-departmental, reflecting the wide-ranging nature of policies needed to achieve net zero. Some of the strategy should be delivered by central government, however given the need for public involvement, local government, community groups and other organisations on a grassroots level need to be involved in its delivery.

Public engagement is not (and should not be) a one size fits all type of operation. Engagement on climate change can take many forms, from large scale national communications campaigns to local level citizens assemblies. Whichever style of engagement is used, it should cover at least one of the six elements set out by the UN's Action for Climate Empowerment framework. These are, climate change education, public awareness, training, public participation, public access to information and international cooperation. These elements should be incorporated across the strategy to empower all members of society to engage in climate action.

CAST has also said that the principles of any public engagement should take a people centred approach; adopt fair and inclusive processes; be guided by strong leadership; engage at the right time and the right way; and include ongoing evaluation and monitoring.[78]

And a specific strategy for home heat decarbonisation is particularly urgent

While the UK needs an overall net zero engagement strategy, it also specifically needs one to cover the decarbonisation of home heat. Changes to heating systems is one of the most significant steps a household can take to reduce their emissions, and the vast majority of houses will need to move to low carbon heating. Given the high levels of low carbon heating penetration, Nordic countries are arguably the best place to look for inspiration.

Take up of low carbon heating in Nordic countries is high– over 40% of houses in the region are now warmed by heat pumps. Growth started around 2000, stalled around 2012 and then accelerated once more from 2015.

The starting points in these countries was different to the UK. They lacked a widespread gas grid, and so were instead reliant on heating oil. After the 1970s oil price shock, the Nordic countries sought to achieve energy independence – indeed, in 2005, Sweden created the Commission for Oil Independence. This mission has maintained lasting cross-party support, creating policy stability. We have, of course, just had our own energy price shock. Is there still time for the government to capitalise on it?

According to Nesta, Sweden "engaged consumers from the very start of the process and used a positive narrative which focused on energy security and to bring down costs". They had bodies set up to provide consumers with redress if and when things went wrong. Informational campaigns helped to explain and build trust in the technology.[79]

From this and our work, we can suggest some principles in particular for the heating element of a net zero engagement strategy:

- **Consistency in mission and messaging.** The public want and need leadership from government on net zero. To fulfil this, government needs to be clear about the aims of heating decarbonisation, why it sees it as an important tool in the net zero arsenal and how it has come to its decision on heat pumps. Previous SMF research on the heating transition has found that consistency in messaging and policy certainty is vital for heating engineers and manufacturers to invest themselves into the heating transition.[80] This is also true for households, and decisions they make on their heating, they too need certainty. Changes to and movements to boiler phase out dates, as well as past changes such as to the FiT scheme have made the public doubtful and uncertain of government policy and mission. This commitment needs to be frequently reiterated at central and local levels.
- **Driven by consensus.** While there is broad agreement for the need to decarbonise homes among the public, how this should be done is not universally agreed upon. Making a concerted effort to involve groups who are opposed or uncertain about the transition is important for building the legitimacy and addressing their concerns. Citizens assemblies have been used to draw people from across communities together to discuss key climate policy issues and build consensus on how to proceed. These types of measures can also be done on a local level and help give local residents a say on how heat decarbonisation is done in their area.
- **Draw on independent voices and messengers.** Improving public education and awareness of low carbon heating is essential for building trust in the technologies. Vocal support for an information on heat pumps needs not only to come from government but from trusted independent voices too. We know that the public has high levels of trust in scientists, and when it comes to heat pumps in heating engineers and consumer websites. These voices can be drawn on for evidence at deliberative or consensus building events like climate assemblies but should also be used in wider information campaigns used by local and central government.
- **Use trusted bodies to quality assure products and delivery and provide recourse for consumers if problems arise.** The public needs more education and awareness on the technologies used to achieve a decarbonised heating system. Consumer protection is and assurances from government that they will not be left high and dry if things go wrong will help to build the confidence. Accreditation and quality assurance schemes from low carbon heating technologies already exist, but these need to be much more widely publicised.
- **Target messaging to subgroups where there are specific concerns.** The concerns that people have around the decarbonisation of home heat are varied, and different subsets of the population have different hesitancies toward heat pump adoption. Addressing the specific concerns rather than providing the same general information across the board should help to provide greater confidence in the technology and the transition. We discuss potential groups for targeting, and their concerns, below.

Our survey helps to show what concerns different types of people have with the net zero transition and heat pumps in particular. It may be too late to "engage consumers

from the very start of the process" but that does not mean that the government should not try to catch up.

We have segmented homeowners based upon income and age. We have found these factors to be the most significant markers when it comes to different attitudes toward the transition. Younger and richer homeowners are more likely to already feel involved and engaged in the transition to heat pumps. Older and poorer homeowners meanwhile are more likely to have reservations. We have sought to see how different their opinions are across:

- What they think of net zero
- What they want the government to about net zero
- What would they be willing to do for net zero?
- What they want the government to prioritise
- The percentage of them that have or want a heat pump.
- What are their barriers to heat pump adoption?
- Where they want to hear about heat pumps from

Full details of the analysis can be found in Annex 1. When it comes to net zero, those on lower incomes were less supportive of the aim, and more concerned about personal cost. Those on lower incomes over 45 were more likely to be sceptical about the benefits of net zero, while those under 45 were more likely to be climate sceptic. Those on middle and higher incomes are more likely to support the net zero transition, and homeowners in these groups under 45 are more likely to think net zero will bring benefits, such as through job creation. Over 45s in these groups however are more sceptical of potential economic benefits and more cautious of the cost.

When it comes to barriers toward heat pump installation, all groups had high cost or needing more information as the first or second greatest barrier. The third greatest barrier however sees a lot more variety. Those on lower and middle incomes over 45 are more likely to think heat pumps won't work in their homes. Those on lower and middle incomes under 45 and those on higher incomes over 45, think their bills will increase. Those on higher incomes under 45 are more likely to wait for a government incentive, before installing a heat pump each of these groups require therefore, will be quite different. Government should use this type of data to tailor messaging and approaches to these groups, to target them more effectively.

Messaging for all homeowners over 45 for instance, should be focused on the suitability and reliability of heat pumps for all types of buildings and in all weathers the UK experiences. . For those concerned about the cost of heat pumps, messaging should address the long-term overall cost and highlight the financial support that is available, to help address the initial, upfront cost.

Targeted messaging is only one part of the engagement picture, and successful public engagement is not without its difficulties. One of the biggest barriers that a public engagement strategy is likely to come up against is a lack of confidence in the process, that engagement will make any difference and that citizens voices will actually be taken into account. As many key net zero policies have already been decided upon by government, the engagement that is done will need to be clear in

what it is trying to achieve. On heating for instance, public engagement should not masquerade as giving citizens an opportunity to overturn the decision on the move to low carbon heating. Rather it should be clear about educating people about the technologies available, how they work and their contribution to emissions reduction.

Government needs to actively work to combat heat pump misinformation

The World Economic Forum identified misinformation and disinformation as the biggest short term risk to society, and the fifth greatest long term risk.[81] As our focus group and survey data shows, myths about heat pumps and their performance are still circulating. As an area that is unfamiliar, people may be more vulnerable to believing and then spreading misinformation. Misinformation about heat pumps has also been noted by government on both social and mainstream media, with some outlets continuing "to give voice to unscientific views" on heat pumps.

Government needs to actively combat this mis and disinformation on heat pumps, and climate change more broadly. The Grantham Institute at The LSE has advocated for "pre-bunking" misinformation on climate change. This involves giving the public tools to recognise misinformation before it becomes popular.[82] To help with this, government needs to provide leadership on low carbon heating. They need to take, maintain and reiterate a consistent message on low carbon heating and promote actual accurate information on heat pumps. They should seek to amplify this positive accurate messaging through trusted messengers, which we elaborate on in a later recommendation.

However, given misinformation around heat pumps is already an issue, the government also needs to debunk existing heat pump myths. Some of this work should be underway soon, as in early 2025 it was reported the government has hired a "nudge unit", the Behavioural Insights Team to help combat misinformation around heat pumps.[83] By dispelling common heat pump myths and preventing the spread of misinformation, it is hoped that more people will be nudged toward getting a heat pump. That the government has taken an active step toward combatting misinformation in this way is an excellent step, but it cannot be the only one. on the matter. As well as the nudge unit, government itself should call out heat pump mis or disinformation when presented with it on social or in traditional media.

Government should role model the installation and use of heat pumps

As well as providing information, those we spoke to were also keen to see the state lead by example. In our survey, 38% of people wanted to see the government taking the same actions they expect from the public. Many government and public sector buildings – libraries, GPs surgeries or schools – are already heated through heat pumps. Since 2020, so far 848 heat pumps have been installed in public buildings under the first three waves of the Public Sector Decarbonisation Scheme all across the country.[84] Where, that is the case, this should be publicised, such as by putting up posters or other signs to make people aware that the building is being heated by a heat pump. For extra detail, posters could include information on the building's EPC rating and what insulation measures (if any) are also installed in the building. The

Government also should, as a matter of course monitor the number of public buildings that are being heated with a heat pump and publish this as part of a tracker, to show their continued commitment and action towards decarbonising heating in their own buildings, like they are asking the public to.

First and foremost, this is very much a low-cost measure that can raise the profile of heat pumps. It will help demonstrate that heat pumps can successfully heat buildings, challenge myths about their efficacy, show that the government is 'practicing what it preaches', and as a result will hopefully build greater trust in government messaging on heat pumps. Government efforts to install more heat pumps in its own premises will also help to build momentum in the heat pump market, hopefully fostering innovation and cost reductions.

Government should also encourage this practise in other businesses, and in particular businesses that operate in an older premises, which may often be regarded as not suitable for a heat pump owing to the building's age. The National Trust, for instance, has fitted heat pumps in a number of its properties despite their age and often their status as listed buildings.[85] Showing that heat pumps can work effectively in these properties can help to build belief in their suitability for all types of homes.

Government should use existing trusted messengers and information sources to build trust in heat pumps

When it comes to information on heat pumps, we know there are two things the public want: an absence of vested interests and a level of expertise. This makes them hesitant to trust government, those selling heat pumps or anyone else who may be seen as benefitting from a heat pump installation. We know from the DESNZ Public Attitudes tracker that scientists working at universities and scientific organisations are the most trusted sources when it comes to providing accurate information on climate change.[86] However, we also know that when it comes to heat pumps some of the most trusted sources are heating engineers and consumer websites. As can be found in our attitude table in Annex 1, consumer information sites were found across all ages and incomes, to be a trustworthy information source. People want evidence and data on heat pumps environmental credentials and their performance.

As a first step, consumer websites should include heat pumps explicitly in the home heating section of their websites, so that it is easy for consumers to find at first glance. Consumer website *Which?* for instance presents its information on heat pumps separately from the heating and cooling section. Secondly, they should work with respected climate scientists, to strengthen and enhance their existing coverage of heat pumps. Scientists can provide evaluations of the environmental impact of a heat pump, (e.g. the potential carbon savings and the wider impact of heat pumps on their immediate environment etc).

Consumer websites should also provide reviews of different heat pumps, as they do for gas boilers. This would help to build consumers' familiarity with heat pump brands, their customer service offer, and confidence in the products. It could help to get over the nervousness of being a first adopter among their friends and family.

Focus group participants also expressed an interest in seeing a heat pump in action. Fortunately, this type of service already exists. Nesta have established a "visit a heat pump" service so that those interested in installing a heat pump can see one working in an ordinary home, rather than in a model home or in a lab.[87] Those interested in using the service can filter heat pumps by location, property type, heat pump type, and heat pump brand. As with government modelling heat pumps in their own buildings, this would address people's desire for examples. Seeing a fellow homeowner, a "someone like me" heat their home with a heat pump could, our research suggests, be persuasive.

Knowing the sources that people trust and the information that people want, government websites that provide information on heat pumps should provide links to these trusted websites to help better inform homeowners and give them the information they are looking for.

Government should continue to provide financial support for low carbon heating adoption through extending the Boiler Upgrade Scheme

The government's Boiler Upgrade Scheme currently offers a £7,500 flat grant towards residential heat pump purchases and also grants for biomass boilers[v]. The scheme's closing date is currently set for December 2027. The success of the scheme so far is mixed. In February 2023 the Lords Environment and Climate Change Committee concluded that the BUS was failing to deliver, as uptake of grants was too low. Part of the reason for this, they found, was poor awareness of low carbon heating, and poor promotion of the BUS. Within the first nine months of the scheme (then at a lower grant level of £3,000), only a third of the annual budget had been used. Increasing the amount offered in the grant to £7,500 saw a significant increase in voucher applications. Nonetheless, take up is still lower than hoped, and since its launch in 2022 the BUS has issued a total of 53,238 vouchers.

Government should keep the scheme in place, but needs to work to publicise it better, extend the time that it is available, and commit to providing additional funding each year. Government should commit to continuing to fund home heat decarbonisation through the BUS, by committing additional funding for the rest of the duration of this parliament. They should change the current closing date for applications from December 2027 to at least June 2029. This would provide long term policy certainty to both industry and the public. Long term policy certainty and long-term funding certainty is something that we have found is crucial for heating engineers to be willing to reskill and retrain to be able to fit and commission low carbon heating systems. Long term, consistent funding has also been found to be an important factor in the success of France's heating transition.

If successful, this push to increase take-up would help to prime the heat pump market, pushing costs down. It would also increase the number of people who know

[v] Eligible technologies for the Boiler Upgrade Scheme include £7,500 for air source and ground source heat pumps, and £5,000 for biomass boilers.

someone who has a heat pump. As our survey has shown, those who know someone who has a heat pump are more likely to be favourable towards them.

Government should focus on narrowing the price disparity between electricity and gas to strengthen the economic case for heat pumps

One of the difficulties that heat pumps face is that as well as a high upfront cost, customers perceive them to have a high running cost owing to the higher cost of electricity than gas, making the economic case for a heat pump a challenge.

Rebalancing electricity prices

Heat pumps are highly efficient, up to 300% efficient, which means they can turn roughly one unit of electricity into three units of heat. Even the most efficient gas boilers are only 90% efficient. However, in the UK, gas is much cheaper than electricity. Heating a house (particularly a leaky one), with electricity, therefore, can become very expensive when compared to a gas boiler. Both will have to work harder, but as electricity is more expensive the heat pump owner is likely to feel the bite of a high energy bill more. Analysis by Nesta has found that homes will see energy bill savings on electrified heating systems, when the electricity-to-gas price ratio (EtGPR) reaches 2.0.[88] However, as highlighted by the UK collaborative Centre for Housing Evidence has highlighted, the EtGPR has been above 3.0 for more than 15 years. In 2024 the EtGPR was 4.0, making heating with electricity 4 times more expensive than heating with gas.[89]

The reason electricity is more expensive is because gas sets the marginal wholesale price of electricity.[90] Additionally, there are environmental and social levies on electricity, while there are no such levies on gas.[91]According to analysis of Ofgem data by the EcoExperts, environmental taxes make up 25.48% of total electricity bills, while on gas bills, it's only 2.46%.[92] We have previously called for the rebalancing and decoupling of electricity prices from gas to help address the issue of cost difference. This can be done either by moving the levies on electricity onto gas, or by moving them into general taxation.[93]

Increasing domestic electricity production

It is also necessary to increase domestic electricity production, to bring down the electricity cost. Doing so will help make the economic case for running a heat pump, and that doing so is a financially viable option. With running costs reduced and support for covering the installation costs, consumer demand should begin to take care of itself. The government is already working to increase renewable energy production, on a national and community level, through the creation of GB Energy. It is also aiming for a National Grid that is powered by 95% renewable energy by 2030.[94] The National Energy Systems Operator report in November 2024 concluded that it is possible, but will require a strategic and concerted effort to do so.[95] Key to meeting this and to going beyond is address the current backlog in grid connections, which means it can take renewable energy projects up to ten years to get connected and come online.[96] The government should make resolving this backlog and accelerating grid connections a priority, in order to work towards energy abundance as fast as possible.

NESO also recognised that there is uncertainty around the future of market arrangements, which could hinder investment. In 2022 the then government consulted on the Review of Electricity Market Arrangements (REMA), and in spring 2024, the government ran a second consultation.[97] Advancing REMA is necessary to provide confidence to the industry and drive investment in renewable energy and low carbon flexibility solutions. Reform of the electricity markets however is a cross-party issue. While the initial consultations for the review were under the Conservative government, Labour sees market reform as something which sists alongside the Clean Power 2030 Action Plan, and as crucial for securing investment into domestic energy generation. The government and aims to conclude policy development (using the responses to the consultations) by mid-2025, before moving on to implementation.[98]

ANNEX 1

Aspect of net zero	High Income <45	High Income 45+	Middle Income <45
% Feel part of the transition	*51%*	*27%*	*34%*
What do they think of net zero?	*Strong support, thinks will benefit them & economy*	*Above average support but think it will be tough, sceptical on economic benefits*	*Above average support, more likely to think net zero will create jobs*
What do they want from the government on net zero?	*What & why of policy, govt role modelling*	*Why of policy from central govt and to hear more from local govt*	*What & why of policy, govt role modelling*
What would they be willing to do for net zero?	*Renewable generation in home, buy electric car, install heat pump*	*Renewable generation in home top then heat pumps, pub transport etc*	*Public transport, install renewable tech in home and be near pylons etc*
What do they want the government to prioritise?	*Renewable gen., relatively keen on EVs*	*Especially keen on renewable gen, less keen on home heat & fuel taxes*	*Renewable gen and home energy efficiency*
% have/want to a heat pump	*37%*	*9%*	*23%*
What are their barriers to heat pump adoption?	*1) 41% need info* *2) 36% high cost* *3) 19% wait for govt incentive*	*1) 59% high cost* *2) 39% need info* *3) 24% think bill will increase*	*1) 42% high cost* *2) 29% need info* *3) 21% think bill will increase*
What channels do they want to hear about this on?	*Consistency across segments in going to consumer websites (Which?, Money Saving Expert), heating engineers and energy providers for "reliable and trustworthy" information. Younger people more likely to go to social media than older, but still much less so than these and several other channels.*		

Aspect of net zero	Middle Income 45+	Lower Income <45	Lower Income 45+
% Feel part of the transition	*25%*	*24%*	*16%*
What do they think of net zero?	*Expects no personal/economic benefit; expects will be expensive*	*More likely to be climate sceptic, less likely to worry about government cost*	*Least supportive, sceptic of benefits and worried about costs & unfairness*
What do they want from the government on net zero?	*Cross-party vision on net zero, as well as what and how of policy*	*Transparency on the why of policy*	*Cross-party vision on net zero, as well as what and how of policy*
What would they be willing to do for net zero?	*Renewable generation in or near their home; public transport*	*Renewable generation in or near home; public transport; not changing diet*	*Big support for using more public transport*
What do they want the government to prioritise?	*Renewable generation and home efficiency; less keen on fuel taxes*	*Renewable energy generation and keen on O&G sector taxes*	*Renewable generation, home energy efficiency and O&G sector taxes*
% have/want to a heat pump	*5%*	*27%*	*6%*
What are their barriers to heat pump adoption?	*1) 62% high cost* *2) 35% need info* *3) 33% think won't work*	*4) 44% high cost* *5) 27% need info* *6) 25% think bill will increase*	*4) 62% high cost* *5) 33% need info* *6) 29% think won't work*
What channels do they want to hear about this on?	*Consistency across segments in going to consumer websites (Which?, Money Saving Expert), heating engineers and energy providers for "reliable and trustworthy" information. Younger people more likely to go to social media than older, but still much less so than these and several other channels.*		

ENDNOTES

[1] Paul Taylor, "Farmers Are in Revolt and Europe's Climate Policies Are Crumbling. Welcome to the Age of 'Greenlash,'" *The Guardian*, February 16, 2024, sec. Opinion, https://www.theguardian.com/commentisfree/2024/feb/16/europe-farmers-climate-green-protest-eu.

[2] "CCC Insights Briefing 1 The UK Climate Change Act" (Climate Change Committee, 2020).

[3] "Progress in Reducing Emissions: 2024 Report to Parliament" (Climate Change Committee, July 2024); "Reducing UK Emissions, 2018 Progress Report to Parliament" (Committee on Climate Change, June 2018).

[4] "Progress in Reducing Emissions: 2024 Report to Parliament."

[5] "Reducing UK Emissions, 2018 Progress Report to Parliament"; Christina Demski, "Net Zero Public Engagement and Participation: A Research Note" (Department for Business, Energy & Industrial Strategy, March 2021).

[6] "Progress in Reducing Emissions: 2024 Report to Parliament."

[7] "Progress in Reducing Emissions: 2024 Report to Parliament."

[8] "Progress towards Reaching Net Zero in the UK," *Climate Change Committee* (blog), July 2024, https://www.theccc.org.uk/climate-action/uk-action-on-climate-change/progress-snapshot/.

[9] "DESNZ Public Attitudes Tracker: Net Zero and Climate Change Spring 2024, UK" (Department for Energy Security and Net Zero, July 3, 2024).

[10] "DESNZ Public Attitudes Tracker: Net Zero and Climate Change Spring 2024, UK."

[11] "DESNZ Public Attitudes Tracker: Net Zero and Climate Change Spring 2024, UK."

[12] "UK Public Perceptions and Readiness for a Just Transition to Net Zero," *The Young Foundation* (blog), September 2022, https://www.youngfoundation.org/our-work/publications/uk-public-perceptions-and-readiness-for-a-just-transition-to-net-zero/.

[13] "DESNZ Public Attitudes Tracker: Net Zero and Climate Change Spring 2024, UK."

[14] "DESNZ Public Attitudes Tracker: Net Zero and Climate Change, Summer 2024, UK" (Department for Energy Security and Net Zero, 2024).

[15] "DESNZ Public Attitudes Tracker: Heat and Energy in the Home, Winter 2023, UK" (Department for Energy Security and Net Zero, March 2024).

[16] "A Guide to the Decarbonisation of Heat in the UK," *Energy Systems Catapult* (blog), accessed January 3, 2025, https://es.catapult.org.uk/guide/decarbonisation-heat/.

[17] "Record Number of Heat Pumps Installed in UK Homes in 2023," *MCS Foundation* (blog), accessed January 3, 2025, https://mcsfoundation.org.uk/news/record-number-of-heat-pumps-installed-in-uk-homes-in-2023/; Ben Gallizzi, "UK Boiler Statistics 2023," Uswitch, January 4, 2024, https://www.uswitch.com/boilers/boiler-statistics/.

[18] Department of Energy & Climate Change and Environment Agency, "2010 to 2015 Government Policy: Low Carbon Technologies, Appendix 6: Renewable Heat Incentive (RHI)," GOV.UK, May 2015, https://www.gov.uk/government/publications/2010-to-2015-government-policy-low-carbon-technologies/2010-to-2015-government-policy-low-carbon-technologies.

[19] Energy Saving Trust, "Mind the Gap? The Curious Case of the 'Future Support for Low Carbon Heat Consultation' and the Missing Millions," Energy Saving Trust, March 10, 2021, https://energysavingtrust.org.uk/mind-gap-curious-case-future-support-low-carbon-heat-consultation-and-missing-millions/.

[20] "Heat and Buildings Strategy," 2021.

[21] Rishi Sunak, "PM Speech on Net Zero: 20 September 2023," GOV.UK, September 20, 2023, https://www.gov.uk/government/speeches/pm-speech-on-net-zero-20-september-2023.

[22] Sunak.

[23] Reform UK, "Our Contract with You," 2024.

[24] Pippa Crerar, Fiona Harvey, and Kiran Stacey, "Rishi Sunak Announces U-Turn on Key Green Targets," *The Guardian*, September 20, 2023, sec. Environment, https://www.theguardian.com/environment/2023/sep/20/rishi-sunak-confirms-rollback-of-key-green-targets.

[25] Demski, "Net Zero Public Engagement and Participation: A Research Note."

[26] Katie Watson, "Why Is Public Engagement and Participation with Net Zero so Important?," cast.ac.uk, March 30, 2022, https://cast.ac.uk/why-is-public-engagement-and-participation-with-net-zero-so-important/.

[27] Peter Baeck, "The Public Want Their Say on Climate Action. Is Anyone Listening?," nesta, November 27, 2023, https://www.nesta.org.uk/blog/the-public-want-their-say-on-climate-action-is-anyone-listening/.

[28] Tom Sasse, Sarah Allan, and Jill Rutter, "Public Engagement and Net Zero" (Institute for Government, September 2021); "Decarbonising Home Heating, Report - Value for Money" (National Audit Office, March 18, 2024), https://www.nao.org.uk/reports/decarbonising-home-heating/.

[29] Lindsey McCarthy, "Domestic Heating Transitions: A Literature Review" (Centre for Regional Economic and Social Research, Sheffield Hallam University, March 2023), https://www.shu.ac.uk/centre-regional-economic-social-research/publications/domestic-heating-transitions-a-literature-review.

[30] Sheffield Hallam University et al., "Interim Report of the JUSTHEAT Project: A Social and Cultural History of Home Heating" (Sheffield Hallam University, December 20, 2023), https://doi.org/10.7190/cresr.2023.8293971428.

[31] "DESNZ Public Attitudes Tracker: Net Zero and Climate Change, Summer 2024, UK."

[32] "Citizen Support for Climate Action," European Commission, 2023, https://climate.ec.europa.eu/citizens/citizen-support-climate-action_en.

[33] Szymon Kardaś, "Power to the People: How the EU's Energy Transition Can Help Fight the 'Greenlash'" (European Council on Foreign Relations, October 1, 2024), https://ecfr.eu/publication/power-to-the-people-how-the-eus-energy-transition-can-help-fight-the-greenlash/.

[34] Brett Myer and Tone Langengen, "How to Address the Growing Backlash Against Net-Zero Policy" (Tony Blair Institute for Global Change, August 3, 2023), https://institute.global/insights/climate-and-energy/how-to-address-growing-backlash-against-net-zero-policy.

[35] "Farmers Defence Force," *DeSmog* (blog), accessed January 6, 2025, https://www.desmog.com/farmers-defence-force/.

[36] Michael Lind, "The Farmers' Revolt against Green Politics," *New Statesman*, March 20, 2024, https://www.newstatesman.com/international-politics/2024/03/wales-farmer-revolt-against-green-politics; Eline Schaart, "Angry Dutch Farmers Swarm The Hague to Protest Green Rules," *POLITICO*, October 16, 2019, https://www.politico.eu/article/angry-dutch-farmers-swarm-the-hague-to-protest-green-rules/.

[37] Paul Tullis, "Nitrogen Wars: The Dutch Farmers' Revolt That Turned a Nation Upside-Down," *The Guardian*, November 16, 2023, sec. Environment,

https://www.theguardian.com/environment/2023/nov/16/nitrogen-wars-the-dutch-farmers-revolt-that-turned-a-nation-upside-down.

[38] Jon Henley, "Rural Populist Party Emerges as Big Winner in Dutch Elections," *The Guardian*, March 16, 2023, sec. World news, https://www.theguardian.com/world/2023/mar/16/rural-populist-party-farmer-citizen-movement-big-winner-dutch-elections.

[39] Hanne Cokelaere and Bartosz Brezeinski, "Europe's Farmer Protests Are Spreading. Here's Where and Why," *POLITICO*, January 31, 2024, https://www.politico.eu/article/farmer-protest-europe-map-france-siege-paris-germany-poland/; "Fertile Ground for Disinformation" (European Fact-Checking Standards Network), accessed January 6, 2025, https://climatefacts.efcsn.com/reports/3760d048-299e-4ee9-9b0b-bedb524584d8.

[40] "Germany's Impressive Heat Pump Sales Growth: +53% in 2022," European Heat Pump Association, January 19, 2023, https://www.ehpa.org/news-and-resources/news/germanys-impressive-heat-pump-sales-growth-53-in-2022/.

[41] C Sullivan-Thomsett et al., "How Not to Transform: Learning from the Backlash against Low-Carbon Heating Policy in Germany," CAST Briefing (Centre for Climate Change and Social Transformations, April 2024); Hans von der Burchard, "How Heat Pumps Exploded Germany's Ruling Coalition," POLITICO, September 7, 2023, https://www.politico.eu/article/heat-pumps-exploded-germany-ruling-coalition-green-law/; Paul Hockenos, "Germans Want Climate Policy—Just Not in Their Homes," *Foreign Policy* (blog), May 11, 2023, https://foreignpolicy.com/2023/05/11/germany-climate-heat-pump-habeck/.

[42] von der Burchard, "How Heat Pumps Exploded Germany's Ruling Coalition"; Sullivan-Thomsett et al., "How Not to Transform: Learning from the Backlash against Low-Carbon Heating Policy in Germany."

[43] Karl Mathiesen, "How the Far Right Weaponized Heat Pumps," POLITICO, October 4, 2023, https://www.politico.eu/article/robert-lambrou-alternative-for-germany-heat-pump-election-climate-change/.

[44] Mathiesen; "Heizhammer stoppen," *Alternative für Deutschland* (blog), accessed January 6, 2025, https://www.afd.de/heizhammer-stoppen/.

[45] von der Burchard, "How Heat Pumps Exploded Germany's Ruling Coalition"; Sullivan-Thomsett et al., "How Not to Transform: Learning from the Backlash against Low-Carbon Heating Policy in Germany."

[46] von der Burchard, "How Heat Pumps Exploded Germany's Ruling Coalition."

[47] Hans von der Burchard, "From Hero to Zero: Germany's Robert Habeck Picks up the Climate Tab," POLITICO, June 1, 2023, https://www.politico.eu/article/robert-habeck-germany-picks-up-climate/.

[48] "2024 European Election Results | Germany," European Parliament, https://results.election.europa.eu/ (http://www.europarl.europa.eu/portal/en, July 23, 2024), https://results.election.europa.eu/en/germany/.

[49] Lisa Kuner, "Populist AfD 'Sand in the Gears' of German Climate Efforts," Clean Energy Wire, May 24, 2024, https://www.cleanenergywire.org/news/populist-afd-sand-gears-german-climate-efforts.

[50] Sullivan-Thomsett et al., "How Not to Transform: Learning from the Backlash against Low-Carbon Heating Policy in Germany."

[51] Sullivan-Thomsett et al.

[52] Patrick Westring et al., "European Heat Pump Market and Statistics Report 2024" (European Heat Pump Market Association, August 2024).

[53] "France - Energy Mix," IEA, accessed January 6, 2025, https://www.iea.org/countries/france/energy-mix.

[54] Jennifer Russon, "Heat Pump Rollout in France and the UK: A Comparative Analysis" (MCS Charitable Foundation, June 2023).

[55] Russon.

[56] Lorraine Whitmarsh and Sam Hampton, "Keir Starmer Says the UK Can Decarbonise without Disruption – That's Neither True nor Helpful," The Conversation, November 14, 2024, http://theconversation.com/keir-starmer-says-the-uk-can-decarbonise-without-disruption-thats-neither-true-nor-helpful-243636.

[57] "Cross Party MP Joint Letter for a Net Zero Target," The Climate Coalition, 2018, https://www.theclimatecoalition.org/joint-letter-2019.

[58] Jennifer McKiernan, "Starmer Announces UK Target for 81% Carbon Emissions Cut by 2035," BBC News, November 12, 2024, https://www.bbc.com/news/articles/cx2ny8zndpxo; "Government Sets out Plan for New Era of Clean Electricity," Department for Energy Security & Net Zero, accessed January 8, 2025, https://www.gov.uk/government/news/government-sets-out-plan-for-new-era-of-clean-electricity.

[59] Ipsos and EDF, "Obs' COP 2023 World Opinion in the Face of Climate Change," n.d.

[60] Baeck, "The Public Want Their Say on Climate Action. Is Anyone Listening?"

[61] Niamh O Regan, "Insulating Britain: Examining the Barriers and Motivations to Decarbonising Our Homes," Social Market Foundation., November 24, 2023, https://www.smf.co.uk/publications/insulate-britain/.

[62] Baeck, "The Public Want Their Say on Climate Action. Is Anyone Listening?"

[63] "Autumn Budget 2024," HM Treasury, October 30, 2024, https://www.gov.uk/government/publications/autumn-budget-2024.

[64] "DESNZ Public Attitudes Tracker: Heat and Energy Use in the Home, Summer 2024, UK," 2024.

[65] "Trust and Confidence in Britain's System of Government at Record Low," National Centre for Social Research, June 12, 2024, https://natcen.ac.uk/news/trust-and-confidence-britains-system-government-record-low.

[66] Steve van Riel, "The Fight for Trust" (Social Market Foundation, October 2024).

[67] Amy Norman and Niamh O Regan, "Installing for Time?," 2022.

[68] Norman and O Regan.

[69] Norman and O Regan.

[70] "Hydrogen Heating: Overview," Department for Energy Security & Net Zero, December 17, 2024, https://www.gov.uk/government/publications/hydrogen-heating-overview/hydrogen-heating-overview--2.

[71] Louise Frohlich, "Labour to Scrap 2035 Ban on New Gas Boilers," The Eco Experts, June 24, 2024, https://www.theecoexperts.co.uk/news/labour-scraps-gas-boiler-ban.

[72] "The Global Risks Report 2024, 19th Edition" (World Economic Forum, January 2024).

[73] Carol Vigurs and Jeremy Williams, "The Behaviour Change Wheel: A New Method for Characterising and Designing Behaviour Change Interventions" (International Public Policy Observatory, December 13, 2023), http://implementationscience.biomedcentral.com/articles/10.1186/1748-5908-6-42.

[74] Vigurs and Williams.

[75] Katie Watson, "Why Is Public Engagement and Participation with Net Zero so Important?," Centre for Climate Change and Social Transformations, March 30, 2022, https://cast.ac.uk/why-is-public-engagement-and-participation-with-net-zero-so-important/.

[76] "Joint Recommendations 2021 Report to Parliament" (Climate Change Committee, June 2021); "In Our Hands: Behaviour Change for Climate and Environmental Goals" (Environment and Climate Change Committee, October 12, 2022).

[77] "Accelerating to Net Zero: Responding to the CCC Progress Report and Delivering the Clean Energy Superpower Mission (Accessible Webpage)," Department for Energy Security & Net Zero, December 17, 2024, https://www.gov.uk/government/publications/committee-on-climate-change-2024-progress-report-government-response/accelerating-to-net-zero-responding-to-the-ccc-progress-report-and-delivering-the-clean-energy-superpower-mission-accessible-webpage.

[78] "Five Principles for Good Public Engagement: How to Get People Involved in the Climate Conversation" (Centre for Climate Change and Social Transformations, July 2024).

[79] Tom Leach, "Insights: What Can We Learn from Sweden's Roll-out of Heat Pumps?," nesta, 2024, https://www.nesta.org.uk/feature/how-to-make-good-things-happen/what-can-we-learn-from-swedens-heat-pumps/; Jan Rosenow, "Guest Post: How Heat Pumps Became a Nordic Success Story," Carbon Brief, October 2, 2023, https://www.carbonbrief.org/guest-post-how-heat-pumps-became-a-nordic-success-story/.

[80] Norman and O Regan, "Installing for Time?"

[81] "The Global Risks Report 2024, 19th Edition."

[82] "What Are Climate Misinformation and Disinformation and What Is Their Impact?," Grantham Research Institute on climate change and the environment, April 22, 2024, https://www.lse.ac.uk/granthaminstitute/explainers/what-are-climate-misinformation-and-disinformation/.

[83] Ben Quinn, "UK Government Hires 'Nudge Unit' to Help Dispel Heat Pump Myths," *The Guardian*, January 1, 2025, sec. Environment, https://www.theguardian.com/environment/2025/jan/01/uk-government-dispel-heat-pump-myths-misinformation-media.

[84] "Public Sector Decarbonisation Scheme," Department for Energy Security & Net Zero, September 23, 2024, https://www.gov.uk/government/collections/public-sector-decarbonisation-scheme.

[85] "Heat Pump Energy at Our Places," National Trust, accessed January 6, 2025, https://www.nationaltrust.org.uk/our-cause/nature-climate/climate-change-sustainability/heat-pump-energy-at-our-places.

[86] "DESNZ Public Attitudes Tracker: Net Zero and Climate Change, Summer 2024, UK."

[87] "Visit a Heat Pump," nesta, accessed January 6, 2025, https://www.nesta.org.uk/project/visit-a-heat-pump/.

[88] Nicholas Harrington, "Heat Pump Deployment and the Electricity-to-Gas Price Ratio," *UK Collaborative Centre for Housing Evidence* (blog), September 19, 2024, https://housingevidence.ac.uk/heat-pump-deployment-and-the-electricity-to-gas-price-ratio/.

[89] Harrington.

[90] Lauren Orso and Madeleine Gabriel, "The Electricity-to-Gas Price Ratio Explained – How a 'Green Ratio' Would Make Bills Cheaper and Greener," nesta, March 30, 2023, https://www.nesta.org.uk/blog/the-electricity-to-gas-price-ratio-explained-how-a-green-ratio-would-make-bills-cheaper-and-greener/.

[91] Orso and Gabriel.

[92] Beth Howell, "Why Is Electricity More Expensive than Gas?", The Eco Experts, February 25, 2022, https://www.theecoexperts.co.uk/news/electricity-more-expensive-than-gas.

[93] Niamh O Regan, "Supply Change: Seizing Opportunity in the UK Heat Pump Supply Chain," Social Market Foundation., October 2023, https://www.smf.co.uk/publications/uk-heat-pump-supply-chain/.

[94] "How Much of the UK's Energy Is Renewable?", National Grid Group, accessed January 6, 2025, https://www.nationalgrid.com/stories/energy-explained/how-much-uks-energy-renewable.

[95] "Clean Power 2030" (National Energy System Operator, 2024), https://www.neso.energy/publications/clean-power-2030.

[96] "Clean Power 2030."

[97] "Review of Electricity Market Arrangements (REMA): Second Consultation," Department for Energy Security & Net Zero, March 12, 2024, https://www.gov.uk/government/consultations/review-of-electricity-market-arrangements-rema-second-consultation.

[98] "Review of Electricity Market Arrangements (REMA)."