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Strategy Committee

Decarbonising heat in homes

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Business, Energy and Industrial Strategy Committee

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Summary

The UK was one of the first major global economies to legislate a target to achieve net zero carbon emissions by 2050, but the UK will not hit its net zero target if it does not decarbonise residential heating. The Government is not yet on track to deliver on its own targets and more urgent changes are required. Whilst the volatility of the gas market is exposing families to ever higher heating bills, more needs to be done to explain to the public why, how, and when their heating systems will be required to change and the potential costs and benefits this transition may bring.

Our inquiry has highlighted that decarbonising residential heating is a difficult task due to the scale, complexity, and cost of the challenge. According to the Climate Change Committee (CCC), there are 29 million existing homes that need to be upgraded to low carbon heating systems by 2050. This is complicated by the fact that the UK's housing stock is one of the oldest and worst insulated in all of Europe, with only 15% of housing being built since 1990. It is expected that heating in homes, in the UK, will be decarbonised by one of three low carbon technologies: (i) heat pumps, (ii) hydrogen and/or (iii) heat networks, alongside the essential work of increasing energy efficiency through insulation upgrades. The suitability of these alternative heating solutions is dependent on factors including regional geography, house type, what heating systems are currently in use, and whether existing homes are connected to the gas grid, as well as other changes needed in the home.

The CCC estimates that an investment of about £250 billion will be needed to fully decarbonise homes by 2050, the equivalent of about £9 billion each year from the late 2020s to 2050. According to the CCC, the total cost of heat decarbonisation in each home will be, on average, under £10,000. This cost reflects a combination of low carbon heating systems and energy efficiency retrofit costs. Asking households to pay upwards of an extra £10,000, as part of the objective of net zero, to replace their existing home heating which is working perfectly adequately is a major challenge. The *Heat and Buildings Strategy* announced the introduction of the Boiler Upgrade Scheme to help households recuperate the costs associated with installing some low carbon heating technologies, such as air source heat pumps and biomass boilers. However, the scheme is not of the scale that is required to meet the Government's targets of decarbonising residential heat.

The Government should work with industry, consumers, and affected workers to produce an effective road map detailing how the transition to low carbon heating will take place, and to include what this will mean for different households in different parts of the country and for workers whose jobs might be affected in existing carbon intensive parts of the heating sector. We recommend this is done at local level in partnership with local government. The long overdue *Heat and Buildings Strategy* published in October 2021 failed to provide sufficient policy detail or clarity on delivery.

Our inquiry has also brought to our attention the gaps in regulation and existing policy that obfuscate the delivery of low carbon heating systems. For example, how implementing the Future Homes Standard in 2025 will require homes built between now and 2025 to be upgraded to low carbon heating systems with additional and unnecessary associated costs.

Throughout our inquiry, we have established how heat pump markets and supply chains can be scaled up to meet Government targets, particularly the target to deliver 600,000 heat pumps a year by 2028. It is vital that the Government meets its target or there will be a great risk that the UK will fall off course in delivering net zero by 2050. We have recommended that the Government introduce a heat decarbonisation sector deal to sufficiently scale up the heat pump market to meet the Government's heat pump target, as well as develop and innovate other low carbon heating technologies to deliver the transition to decarbonised home heating.

A crucial aspect of scaling up, relevant for all low carbon heating technologies, is the upskilling of the heating workforce. As the demand for low carbon heating technologies increases, new heating systems will need to be installed and serviced in homes. The current carbon intensive heating sector workforce should be given the opportunity of accessing the training and education required to transition to the low carbon heating sector. We have also recommended that the Government create a low carbon heating apprenticeship programme to get young people low carbon competent and ready for this important and growing sector.

Transitioning to low carbon heating affects households as the task is predicated on their willingness to allow changes to be made in their homes. Our inquiry found that consumer awareness was extremely limited. Consumers must be made aware of the required transition to low carbon heating, what needs to be done and how this will affect them. The *Heat and Buildings Strategy* did not outline how consumer awareness and engagement will be increased, but this work is essential. We recommend that the Government creates a public awareness campaign, in partnership with energy companies, so that consumers become more aware of the changes needed.

Parliament has declared a climate emergency and we need to deliver net zero emissions by 2050. Our inquiry into the decarbonisation of residential heat has highlighted that there is still much that needs to be done if we are to deliver the decarbonisation of heat, and how essential this is if the UK is to hit its net zero target. Contrary to the Government's approach to the publication of the *Heat and Buildings Strategy* and heat policy as a whole, now is not the time to delay.

1 Introduction

1. In June 2019, the UK became the first major global economy to enshrine into legislation its commitment to achieve ‘net zero’ emissions of greenhouse gases by 2050, compared to 1990 levels.¹ As a step towards reaching this target, on 21 April 2021, the Government committed to reducing UK emissions by 78% by 2035.² The Government did not set out a precise explanation of how the targets would be achieved but the Climate Change Committee has recommended pathways in its *Sixth Carbon Budget Report* for the Government to pursue.³

2. The heating sector in the UK accounts for almost one third of the UK’s annual carbon footprint. In 2019, 17% of heating emissions from buildings came from homes;⁴ this is comparable to the contribution of all petrol and diesel cars.⁵ In its *Clean Growth - Transforming Heating* (2018) report, the Department for Business, Energy and Industrial Strategy (BEIS) identified that “heating is arguably the most difficult of the major energy consuming sectors of the economy to decarbonise”.⁶ Today, the UK Government is considering how to help households deal with the escalating cost of heating their homes using gas, an issue we consider in our *Energy pricing and the future of the Energy Market* inquiry.⁷

Our inquiry

3. On 10 July 2020, we launched the *My BEIS* inquiry, which invited stakeholders from across the entire BEIS Committee remit⁸ to submit suggestions for inquiries in this Parliament.⁹ We received in excess of 200 submissions and on 16 July 2020, we invited twelve participants to ‘pitch’ their idea to us.¹⁰ Dr. Jan Rosenow, Director of European Programmes, Regulatory Assistance Project, proposed that we conduct an inquiry into the decarbonisation of heating in homes.¹¹

4. Our predecessor Committee had undertaken work on energy efficiency and published its report, *Energy efficiency: building towards net zero*, in July 2019.¹² This was followed by the Environmental Audit Committee’s report, *Energy Efficiency of Existing Homes*,

1 Climate Change Act (2050 Target Amendment) Order 2019, [section 1](#)

2 HM Government, [UK enshrines new target in law to slash emissions by 78% by 2035](#), accessed 20 April 2021

3 Committee on Climate Change, [The Sixth Carbon Budget](#), December 2020

4 HM Government, [Heat and Buildings Strategy](#), October 2021, p 23

5 In 2018 Progress Report to Parliament, the Committee on Climate Change found that, in 2016, petrol and diesel cars contributed to 15% of the total emissions for the transport sector.

6 Department for Business, Energy and Industrial Strategy, [Clean Growth Transforming Heating](#), December 2018, p 23

7 Business, Energy, and Industrial Strategy Committee, [Energy pricing and the future of the Energy Market](#), accessed 25 January 2021

8 Further information about the Committee’s remit can be found on the [Business, Energy and Industrial Strategy Committee’s](#) website

9 Business, Energy, and Industrial Strategy Committee, [My BEIS inquiry](#), accessed 18 August 2021

10 Further details can be found in the *My BEIS* inquiry report. Business, Energy and Industrial Strategy Committee, First Report of Session 2019–21, [My BEIS inquiry: proposals from the public](#), HC 612

11 Dr Rosenow’s inquiry proposal solely focused on the decarbonisation of heat in residential buildings and not commercial buildings. From the *My BEIS* inquiry, we have also decided to take forward suggestions for inquiries on carbon pricing, decarbonising industry, and institutional arrangements to meet net zero.

12 Business, Energy and Industrial Strategy Committee, Twenty-First Report of Session 2017–19, [Energy efficiency: building towards net zero](#), HC 1730

which was published on 22 March 2021.¹³ Dr Rosenow's proposal expanded on this work and focused specifically on the switch to low carbon heating technologies in the effort to decarbonise domestic heating.

5. On 2 October 2020, we launched our inquiry into decarbonising domestic heating to examine the impact of Government policy on the decarbonisation of domestic heating to date, and to identify the policies, priorities and timelines that must be included in the Government's much anticipated and long overdue *Heat and Buildings Strategy*, which was published on 19 October 2021.¹⁴

6. Decarbonising domestic heating is a multi-faceted challenge; often, the prerequisite for consumers to switch over to low carbon heating technologies is to increase the energy efficiency of their homes. Progress to decarbonise heating can only be achieved effectively if energy efficiency is delivered. Our inquiry considered the viability of low carbon heating technologies and the barriers faced in scaling up these technologies. We also examined the costs associated with decarbonising heating, how they can be minimised, and how they should be distributed. Finally, our inquiry focused on where the responsibility for the governance, coordination and delivery of low carbon heating lies and what actions should be taken in the immediate and longer-term to make progress in the decarbonisation of heating in homes.

7. We took oral evidence between February 2021 and July 2021 from representatives of the heating and energy sectors and from the Rt Hon Kwasi Kwarteng MP, Secretary of State for Business, Energy, and Industrial Strategy, and the Minister for Housing, Christopher Pincher MP, from the then Ministry for Housing, Communities, and Local Government. Subsequent to the publication of the *Heat and Buildings Strategy* on 19 October 2021, we held a final evidence session, focusing on the reaction to the *Heat and Buildings Strategy*. We are grateful to all who provided written and oral evidence to our inquiry. We are also grateful to our specialist adviser, Dr. Jan Rosenow, Director of European Programmes, Regulatory Assistance Project, for his contributions to our inquiry.¹⁵

8. This report sets out the considerable challenges that lie ahead in the transition to decarbonised domestic heating and makes recommendations about the steps which need to be taken for the Government to meet its own targets for the decarbonisation of domestic heating. In chapter two, we identify policy gaps. Chapter three sets out specific challenges to be addressed by the heating industry itself, for example, immature supply chains, which hinder the deployment of low carbon heating technologies, and the 'skills gap' amongst the workforce required to deliver low carbon heating technologies. Chapters four and five focus on consumer action required at the household level. Chapter four explores the burden on the consumer of both the upfront costs of installing low carbon heating systems and the running costs to operate these heating systems; whilst chapter five examines the lack of consumer engagement in the transition to low carbon heating and the absence of a robust consumer protection framework. In the final chapter, we set out

13 Environmental Audit Committee, Fourth Report of Session 2019–21, [Energy Efficiency of Existing Homes](#), HC 346

14 The Heat and Buildings Strategy is the Government's strategy to decarbonise heating in buildings to ensure that net zero can be delivered by 2050. After repeated delays, it was finally published on 19 October 2021.

15 Dr Rosenow's declaration of interests to the Committee can be found here: [Formal Minutes](#) of the Business, Energy and Industrial Strategy Committee in Session 2021–22, p 39

how the governance and co-ordination of the transition to low carbon heating could most effectively operate to deliver the large-scale transition to decarbonised domestic heating, which is a core element of the Government's stated ambition to achieve net zero by 2050.¹⁶

Background

9. To date, progress on decarbonising heating in residential buildings has been limited. The Climate Change Committee (CCC) states in its *Sixth Carbon Budget Report* that direct emissions from residential buildings reduced by about 17% from 1990 to 2020.¹⁷ Between now and 2050, emissions from residential buildings need to fall to zero at a rate of 3.4% per year based on current emission levels.¹⁸ This means that the rate of emissions reductions needs to increase to a rate six times higher in the next three decades than in the previous three decades. Where progress has been made on reducing carbon emissions from heating, it is largely from an increase in energy efficiency, in particular the installation of cavity walls and loft insulation,¹⁹ and, to a significant extent, from the installation of more efficient heating systems such as condensing gas boilers.

10. The scale, complexity, and costs involved are the main reasons why delivering low carbon residential heating is considered a great challenge. According to the CCC in 2019, there are approximately 29 million homes in the UK.²⁰ In 2017, the majority of residential buildings (85%) were connected to the gas grid, using a boiler and wet-based central heating system.²¹ The remaining 15% of homes (approximately 4 million) are not connected to the gas grid, using either oil or liquid petroleum gas (LPG) as their main heating fuel or electric heating. Compared to natural gas, due to the higher carbon intensity of oil and LPG, these 'off-gas' homes make up a greater share of heating emissions.²²

11. In the UK, it is expected that most of the heating in homes will be decarbonised by one of three low carbon technologies: (i) heat pumps,²³ (ii) hydrogen²⁴ and/or (iii) heat networks²⁵ (also known as district heating). The CCC projects, in the *Sixth Carbon Budget Report*, that by 2050 all heating in homes is provided by low-carbon sources; of which 52% is heat pumps, 42% is district heating, 5% is hydrogen boilers and around 1% is new direct electric heating.²⁶ There is no 'silver bullet' solution or 'one size fits all' approach to decarbonise domestic heating; this is widely acknowledged by witnesses who have

16 Department for Business, Energy and Industrial Strategy, [Clean Growth Transforming Heating](#), December 2018, p 3

17 Committee on Climate Change, [The Sixth Carbon Budget](#), December 2020, p 62

18 Committee on Climate Change, [The Sixth Carbon Budget](#), December 2020, p 62

19 EDF ([DHH0076](#)); Energy UK ([DHH0095](#))

20 Committee on Climate Change, [UK Housing: Fit for the future?](#), February 2019, p 9

21 Committee on Climate Change, [Annex 2. Heat in UK buildings today](#), October 2016, p 3

22 Ibid

23 A heat pump is a device used to warm (and sometimes cool) buildings by transferring thermal energy from a cooler space to a warmer space. The technology is similar to a fridge running in reverse. Heat pumps can transfer thermal energy from the air (air source heat pumps), ground (ground source heat pumps), or a body of water (water source heat pumps).

24 Unlike fossil fuels, hydrogen emits no greenhouse gases when it is combusted (e.g., in a boiler). This means that if industrial processes to produce hydrogen can be decarbonised, then hydrogen could act as a zero (or very low) carbon fuel.

25 A heat network – sometimes called district heating – is a distribution system of insulated pipes that takes heat from a central source and delivers it to a number of domestic or non-domestic buildings. Provided that the fuel for the heat network is low carbon then the heat network itself will also be low carbon.

26 Committee on Climate Change, [The Sixth Carbon Budget](#), December 2020, p 115

contributed to the inquiry.²⁷ The suitability of these alternative solutions is dependent on factors including regional geography, house type, the heating systems currently in use, and whether existing homes are connected to the gas grid, as well as changes needed in the home to install low carbon heating systems, for example, changing pipework, radiators or installing additional equipment. If specific factors preclude the use of the three major technologies or it is suitable and cost-effective to adopt another approach, then other low carbon technologies, such as biomass boilers and geothermal energy, could be used in a minority of homes. Regardless of what low carbon heating technology is used, increased energy efficiency in all homes across the UK is expected to play a great role in the decarbonisation of domestic heat because it will optimise the usage of heating in homes and use less energy for heating.

12. The scale of the challenge is further complicated by the fact that the UK's housing stock is one of the oldest and worst insulated in Europe, with only around 15% of existing stock built since 1990.²⁸ Most homes are expected to still be in place in 2050.²⁹ In October 2020, the UK Energy Research Centre projected that one million homes will need to be retrofitted each year for the next thirty years to meet the net zero target by 2050.³⁰

13. To deliver net zero by 2050, the heating in these homes will have to be retrofitted to low, or zero, carbon, and this comes at a significant cost. In its *Sixth Carbon Budget Report*, the CCC estimated that an investment of about £250 billion will be needed to fully decarbonise homes.³¹ This is equivalent to an annual rate of about £9 billion each year from the late 2020s to 2050.³² According to the CCC, the total cost of decarbonisation per existing home is expected to be on average under £10,000; this cost reflects a combination of installing low carbon heating systems and costs of improving energy efficiency.³³ In the *Sixth Carbon Budget Report*, the CCC states that energy efficiency is projected to deliver ongoing operating cost savings, which will result in lower overall energy bills for households.³⁴ The CCC also expects in the Balanced Pathway³⁵ that behavioural change is projected to contribute around £0.4 billion of savings per year by 2050.³⁶ We will explore the behavioural change required further in chapter five.

14. Less than 5% of heating currently used across the UK's homes is from low-carbon sources.³⁷ In 2018, 27,000 heat pumps were installed across the UK, compared to 1.7 million gas boilers.³⁸ The Coalition for the Energy Efficiency of Buildings identified that the UK is currently on course to miss its 2020 targets for heating and cooling emissions reductions, achieving 7.5% reductions from 1990 levels (as of 2018), compared to a target of

27 See for example, Social Market Foundation ([DHH0027](#)); Naked Energy Ltd ([DHH0029](#)); UK Collaboratorium for Research on Infrastructure and Cities ([DHH0030](#))

28 Committee on Climate Change, [Annex 2. Heat in UK buildings today](#), October 2016, p 1

29 Ibid

30 UK Energy Research Centre, [he pathway to net zero heating in the UK](#), October 2020, p 4

31 Committee on Climate Change, [The Sixth Carbon Budget](#), December 2020, p 120

32 Ibid

33 Ibid

34 Committee on Climate Change, [The Sixth Carbon Budget](#), December 2020, p 21

35 The Balanced Pathway makes moderate assumptions on behavioural change and innovation and takes actions in the coming decade to develop multiple options for later roll-out (for example, the use of hydrogen and/or electrification for heavy goods vehicles and buildings). While it is not a prescriptive path that must be followed exactly, it provides a good indication of what should be done over the coming years. Committee on Climate Change, [The Sixth Carbon Budget](#), December 2020, p 24

36 Committee on Climate Change, [The Sixth Carbon Budget](#), December 2020, p 120

37 Committee on Climate Change, [Net Zero The UK's contribution to stopping global warming](#), May 2019, p 139

38 Oral evidence taken on 16 July 2020, HC 142, Q5 [Dr Jan Rosenow]

12% by 2020.³⁹ In April 2021, the UK changed its climate change targets to become more ambitious (by aiming to reduce emissions by 78% by 2035). The 2020 targets for heating and cooling emissions have been missed which highlights the need for prompt action. In written evidence to our inquiry, OVO Energy asserted that that the UK “need[s] to make rapid progress this decade if [it is to get] on a trajectory to reach net zero emissions by 2050”.⁴⁰

15. Progress to decarbonise heating has also been limited due to the lack of direction from the Government. In December 2020, the Government committed to publishing a *Heat and Buildings Strategy* “early in 2021”, which would “set out the immediate actions we will take for reducing emissions from buildings, including deploying energy-efficient measures and transitioning to low-carbon heating. This ambitious programme of work will enable the mass transition to low-carbon heat and set us on a path to meet our net-zero 2050 emissions targets”.⁴¹ However, the publication of the *Heat and Buildings Strategy* had been repeatedly delayed and it was finally published on 19 October 2021. The *Net Zero Strategy* was published at the same time as the *Heat and Buildings Strategy*.⁴²

16. Meanwhile, in November 2020, the Prime Minister, in his *Ten Point Plan for a Green Industrial Revolution*, announced a series of targets across different low carbon heating technologies: to install 600,000 heat pumps every year by 2028, generate 5GW of low carbon hydrogen production capacity by 2030, and to develop the first town heated entirely by hydrogen by the end of the decade.⁴³ However, while these targets provide an insight into where the UK is aiming to be by the mid-2030s, they were not an adequate replacement for the *Heat and Buildings Strategy*, which was expected to provide a comprehensive roadmap detailing how the transition to low carbon heat will be delivered, including an outline of specific and costed measures and actions that will ensure the UK meets these targets. While the *Heat and Buildings Strategy* has been welcomed for its ambition,⁴⁴ it is also a missed opportunity by the Government to outline comprehensive and detailed plans to achieve the decarbonisation of domestic heat. For example, despite the strategy taking a ‘fabric first’ approach with energy saving improvements, there is no detailed plan for what these specific retrofit measures would be or how they would be rolled out to existing homes.⁴⁵

17. In September 2021, a global surge in demand for gas following a cold winter,⁴⁶ combined with increased demand following Covid-19 restrictions easing and economies opening, as well as ongoing tensions surrounding the Nord Stream 2 gas pipe⁴⁷ resulted in a natural gas market crisis across the UK and Europe.⁴⁸ In the UK, the media reported concerns about the security of supply,⁴⁹ the collapse of several smaller energy companies⁵⁰

39 Coalition for the Energy Efficiency of Buildings ([DHH0071](#))

40 OVO ([DHH0106](#))

41 HL Deb, 8 December 2020, [cols 1108](#), [Lords Chamber]

42 GOV.UK, [Net Zero Strategy](#), 19 October 2021

43 HM Government, [PM outlines his Ten Point Plan for a Green Industrial Revolution for 250,000 jobs](#), accessed 18 August 2021

44 [Q115](#) [Marcus Shephard]

45 [Q115](#) [Marcus Shephard]

46 The Guardian, [UK energy market crisis: what caused it and how does it affect my bills?](#), accessed 4 October 2021

47 Clean Energy Wire, [Gas pipeline Nord Stream 2 links Germany to Russia, but splits Europe](#), accessed 4 October 2021

48 Power Technology, [As it happens: the UK gas price and petrol crisis](#), accessed 4 October 2021

49 Financial Times, [Asian buyers outbid Europe for spot supplies of US natural gas](#), accessed 22 September 2021

50 Power Technology, [UK’s “unavoidable loss” gas prices pushes smaller utilities to ruin](#), accessed 23 September 2021

and, ultimately, higher energy bills for consumers.⁵¹ The energy price cap (which applies a maximum charge for single variable, or default, tariffs for a period before any re-rating) was increased on 1 October, with about 15 million households facing a 12% rise in energy bills - this places pressure on many households, but in particular vulnerable households and the fuel poor.⁵² On 22 September 2021, we held an urgent oral evidence session with the Secretary of State, Rt. Hon. Kwasi Kwarteng MP, about the crisis.⁵³ At the time of writing (January 2022), these pressures have not abated and are expected to continue for at least the rest of this year, increasing by £400 to £600 in April 2022.⁵⁴ Whilst there are challenges associated with low carbon heating technologies and the lack of Government policy, market conditions affecting the price of gas, and calls for Treasury intervention, could be used to catalyse progress on the decarbonisation of domestic heat.

51 The Guardian, [Energy price cap: millions of Britons face higher gas and electricity bills](#), accessed 1 October 2021

52 BBC, [Energy price cap: Why are fuel bills rising?](#), accessed 4 October

53 Business, Energy and Industrial Strategy Committee, [UK Gas Market](#), 22 September 2021

54 BBC, [Up to 1.5m more could struggle to pay energy bills next year](#), accessed 18 January 2022

2 Addressing the policy and regulation gap

18. Professor Nick Eyre, Professor of Energy and Climate Policy, and Senior Research Fellow, University of Oxford, identified that the scale of the task of decarbonising heat in homes is “so big” that we will “have to throw a whole bunch of policy instruments at the problem”.⁵⁵ The most significant policy instrument is the *Heat and Buildings Strategy*, but the repeated delays in the publication of the Strategy and subsequent lack of certainty or direction created a policy vacuum for the heating sector. The long-awaited publication of the *Heat and Buildings Strategy* has failed to fully address the policy and regulation gap.

19. In the *Energy White Paper*, published in December 2020, the Government set out a few key policies relevant to the decarbonisation of domestic heating. Firstly, it committed to regulate heat networks, but provided no clarity on the regulatory framework. Secondly, it set out its commitment to publish the Future Homes Standard by 2025, which outlines how new build homes will become low carbon. Questions have been raised about the viability of delivering the policy as the Government has not set out how homes built between now and 2025 will be retrofitted and what the costs associated with this will be.

20. Moreover, the Future Homes Standard sets out that fossil fuel heating systems must be phased out of new homes by 2025. However, there is a lack of clarity around when fossil fuel heating systems will be phased out in existing homes. Phasing out fossil fuel heating systems is a key milestone in the transition to low carbon heating because it is at this point that householders will consider and install low carbon heating systems in their homes. In this chapter, we explore how the impact of these policy gaps and uncertainties should be addressed.

Establishing policy certainty

21. In chapter one, we noted that limited progress has been made on the decarbonisation of domestic heat across various government departments since 1990. The UCL Centre for Behaviour Change identified that a “major reason for lack of progress in residential decarbonisation has been the absence of a stable policy environment”.⁵⁶ The Government has been slow to publish a long-term roadmap or strategy for the decarbonisation of heating in homes. In December 2018, BEIS published a report, *Clean Growth–Transforming Heat*, which provided an overview of evidence on heating. In the report, the Department committed “to develop a new roadmap for policy on heat decarbonisation” and publish it within eighteen months.⁵⁷ The roadmap was due to be published around June 2020. However, no such roadmap was published and there are no further references to a “heat roadmap”. Instead, it appears as though the label of a “heat and buildings strategy” replaced the “heat roadmap”.

22. The publication of the *Heat and Buildings Strategy* was initially scheduled for August 2020;⁵⁸ this is roughly in line with the timeline for the original heat roadmap. On 8

55 [Q12](#)

56 UCL Centre for Behaviour Change, Decarbonisation of Homes in Wales Independent Advisory Group ([DHH0082](#))

57 Department for Business, Energy and Industrial Strategy, [Clean Growth Transforming Heating](#), December 2018, p 8

58 Public Accounts Committee, Forty-Sixth Report of Session 2019–21, [Achieving Net Zero](#), HC 935, p 5

December 2020, the Government stated that “we will publish a [*Heat and Building Strategy*] in early 2021 that will set out the immediate actions we will take for reducing emissions from buildings, including deploying energy-efficient measures and transitioning to low-carbon heating. This ambitious programme of work will enable the mass transition to low-carbon heat and set us on a path to meet our net-zero 2050 emissions targets”.⁵⁹ On 9 July 2021, *The Times* reported that the Strategy would be published in Autumn.⁶⁰ In the 2021 *Progress Report to Parliament*, the CCC stated that “[e]ffective policies must be developed at greater pace” and added that delays of a year or more to “many vital and long-promised plans, such as the *Heat and Buildings Strategy*” have resulted in a “large policy gap”.⁶¹ On 19 October 2021, the *Heat and Buildings Strategy* was published.⁶²

23. While the *Heat and Buildings Strategy* has addressed some of the policy and regulation gaps, significant gaps remain that could affect the progress towards the Government’s own target of decarbonising heat in homes. A notable example has been outlined by Marcus Shephard, Senior Analyst, CCC, who argued that the strategy relies on “co-ordinated improvements” in heating and the efficiency of buildings and the fact that there is “no integrated offer on home retrofit within the strategy, and that is detrimental”.⁶³ The absence of a retrofit strategy for existing homes restricts the installations of some low carbon heating technologies in homes, as a pre-requisite to installing some low carbon heating technologies is energy efficient homes. This ongoing policy gap hinders the progress of decarbonising heat and continues to fail to recognise the essential relationship between low carbon heating technologies and energy efficiency in our homes.

24. The delays in publishing the *Heat and Buildings Strategy* were costly. Witnesses told us that progress in the decarbonisation of domestic heating could be accelerated if the policy gap was sufficiently addressed. EDF informed us that “[a]t a policy level the government is still to set a strategic vision for decarbonisation of heat or to develop a policy mix”.⁶⁴ OVO Energy added that to “avoid the lowest pace of progress on decarbonising heat and reaching net zero, the *Heat and Buildings Strategy* must set out the policy interventions the Government will bring forward in this Parliament”.⁶⁵ Some of the policy instruments announced in the *Heat and Buildings Strategy* that will be introduced in this Parliament, include the Boiler Upgrade Scheme and consultations on low carbon heating technologies. However, as will be explored later in the report, it is unlikely that these policies will significantly quicken the pace of progress because, as Marcus Shephard, Senior Analyst, CCC, set out there are “delivery risks associated with many of the policy proposals”. He continued “it is critical that the Government work together to move forward on these, with both regional and local governments and the private sector, delivering their consultations in good time so that they can move on addressing these gaps”.⁶⁶

25. The policy gap is not merely the result of the delayed publication of the *Heat and Buildings Strategy*. Researchers at the University of Salford told us that “policy [to decarbonise domestic heat] over the past 10 years has been ineffective. Policy in recent

59 HL Deb, 8 December 2020, [cols 1108](#), [Lords Chamber]

60 The Times, [The Times view of Boris Johnson’s green agenda: No Hot Air](#), accessed 3 September 2021

61 Committee on Climate Change, [Progress in reducing emissions 2021 Report to Parliament](#), June 2021, p 16

62 HM Government, [Heat and Buildings Strategy](#), October 2021

63 [Q115](#)

64 EDF ([DHH0076](#))

65 OVO ([DHH0106](#))

66 [Q115](#)

decades has been fragmented and stop/start”.⁶⁷ The UCL Centre for Behaviour Change asserted that the “uncertainty and confusion caused by so many policy changes” has “impaired” the decarbonisation of domestic heating.⁶⁸

26. Witnesses have stressed the importance of a stable policy environment for the heating sector because this will encourage the market to scale up. The Energy Networks Association (ENA) informed us that “a clear signal from the Government is key for the industry, supply chains, skills to develop and progress accordingly”.⁶⁹ For there to be a clear strategic policy direction, there needs to be sufficiently ambitious and measurable targets to measure outcomes. Thus, the ENA emphasised the need for the policy direction to be “coupled with an overarching target”.⁷⁰ Energy UK agreed, and noted that “industry will only respond and upskill if it is given a sufficiently forward-looking target”.⁷¹ The Durham Energy Institute specified that it is important that the policy direction “outline[s] how these targets and steps will be achieved”.⁷² Subsequent to the publication of the *Heat and Buildings Strategy*, Juliet Phillips, Senior Policy Advisor, E3G, told us that the strategy “sets the right direction of travel for low-carbon heat this decade”, however, she makes clear that “the hard work is still to be done in turning ambitions and targets into actual delivery on the ground”.⁷³

27. Witnesses called for there to be policy longevity and for the *Heat and Buildings Strategy* to adopt a long-term approach. The Federation of Master Builders said that the Strategy should not only cover “this Parliament”, but also “the next ten years at least”.⁷⁴ If the Government opts for the *Heat and Buildings Strategy* to cover this Parliament or the next decade, some acknowledgement of what the Government expects over the thirty years to 2050 is also required. Jenny Hill, Head of Buildings and International Action, CCC, noted that “a robust, equitable and ambitious strategy that sets a direction for the next thirty years” is required.⁷⁵ Similarly, the Energy Saving Trust called for “clear interim timelines” to 2050.⁷⁶ On 16 November, Marcus Shephard, Senior Analyst, CCC said that the strategy “sets out a level of ambition that aligns with the CCC’s balanced pathway to net zero and the fourth, fifth and sixth carbon budgets”.⁷⁷ While it is clear that the strategy takes a longer term approach, he warned that there are “several key policy gaps in both the near and medium term that could limit progress”.⁷⁸

28. Policy Connect called for the strategy to deliver joined up policy that is consistent with the decarbonisation of other sectors.⁷⁹ Crucially, clear strategic direction in the heating sector is only possible if there is clear and coherent energy policy. The ENA warned that

67 University of Salford ([DHH0044](#))

68 UCL Centre for Behaviour Change, Decarbonisation of Homes in Wales Independent Advisory Group ([DHH0082](#))

69 Energy Networks Association ([DHH0021](#))

70 Energy Networks Association ([DHH0021](#))

71 Energy UK ([DHH0095](#))

72 Durham Energy Institute, Durham University ([DHH0053](#))

73 [Q114](#)

74 Federation of Master Builders ([DHH0134](#))

75 [Q40](#)

76 Energy Saving Trust ([DHH0066](#))

77 [Q115](#)

78 Ibid

79 Policy Connect ([DHH0094](#))

“[w]ithout a coordinated and strategic approach [...], it is likely that decisions will be made on a piecemeal and short-term basis leading to sub-optimal outcomes for consumers and increasing the risk of not meeting the net zero target”.⁸⁰

29. Marcus Shephard highlighted that one of the weaknesses of the *Heat and Buildings Strategy* was a lack of “policy coherence”. He said that, “the policies need to support each other, which they do not necessarily do” and he used the example of the Boiler Upgrade Scheme,⁸¹ which, he stated,

If the boiler upgrade scheme is too small, it means that the other proposed instruments such as the boiler obligation, standards in new homes, off-gas properties and the private rented sector need to do more of the heavy lifting. [...] there needs to be policy consistency.⁸²

30. **Ineffective historic heating policy and the absence of a clear, strategic policy direction for low carbon heating has created confusion and uncertainty in the transition to low carbon heating and has affected investor confidence. We welcome the long overdue publication of the Heat and Buildings Strategy. However, a greater amount of clarity is required to give the sector certainty and a clear direction of travel.**

31. **Evidence was clear that for low carbon heating installations to work effectively and to heat homes adequately, properties need to be upgraded to the correct levels of energy efficiency. It is critical then that Government policies and strategies are interlinked. If people are encouraged to switch to low carbon heating sources without the knowledge or incentive for energy efficiency upgrades, then there are risks of scheme failure and loss of public trust if the new low carbon heating sources are not heating homes to the desired temperature and insulation.**

32. ***To successfully decarbonise domestic heating in time to deliver net zero by 2050, the Government must provide clear, strategic direction and guidance. The Government must now focus on providing a coherent policy environment that encourages policy consistency and certainty in the transition to low carbon domestic heat.***

33. ***We call on Ministers to publish a heat technology road map, produced in partnership with chief technologists from industry partners, to clearly set out the development, scale up and integration milestones of different low carbon heating technologies, and the associated interventions, such as energy efficiency upgrades, and initiatives required to hit our heating targets in the UK. This should be published by September 2022.***

Energy White Paper commitments

34. The Government published the *Energy White Paper* in December 2020.⁸³ It outlined BEIS’ plans to facilitate the UK’s transition to net zero by developing a cleaner energy system. The *Energy White Paper* delineates how the Government will “transform energy”,

80 Energy Networks Association ([DHH0021](#))

81 The Boiler Upgrade Scheme was announced in the *Heat and Buildings Strategy*; it will be implemented and funded by £450 million over a period of three years. It aims to support the installation of up to 30,000 heat pumps per year.

82 [Q124](#)

83 Department for Business, Energy and Industrial Strategy, *Energy White Paper*, [CP 337](#), December 2020

provide people with a “fair deal”, and drive a “green recovery” while supporting green jobs over the next decade.⁸⁴ It includes commitments to developing key technologies, which could contribute to the decarbonisation of heating in homes.

Box 1: Commitments relevant to the heating sector included in the *Energy White Paper*

Extending existing schemes such as the Energy Company Obligation (ECO) to 2026, the Warm Homes Discount to 2025/6.

Regulations for non-domestic rented buildings to be at least EPC Band B by 2030 where cost-effective.

Consulting on ending gas grid connections to new homes by 2025.

Growing the installation of heat pumps to a rate of 600,000 per year by 2028.

Increasing the proportion of biomethane in the gas grid.

New funding for heat networks.

Evaluating hydrogen as a heating option.

Source: *Energy White Paper*, December 2020

35. As part of our inquiry, we have also focused on the *Energy White Paper*’s commitment to regulate heat networks and to publish the Future Homes Standard. We explore this more below but our interest in the commitment to regulate heat networks derives from the lack of policy direction on what this regulation will look like and when it will be delivered. The Future Homes Standard is pertinent to our inquiry as homes built between now and 2025 will require retrofitting to low carbon standards, which will incur extra costs. No provision has been made for this in Government policy to date.

Heat networks

36. A heat network, sometimes called district heating, is a distribution system of insulated pipes that takes heat from a central source and delivers it to several domestic or non-domestic buildings.⁸⁵ Provided that the fuel for the heat network is low carbon, the heat network itself will also be low carbon. The CCC suggest that around 19% of UK heating will need to come from heat networks by 2050 if the UK is to meet its carbon targets cost effectively.⁸⁶ The Energy Technologies Institute report, *District Heat Networks in the UK Potential, Barriers and Opportunities*, published in 2018, suggested that by using low carbon fuels in heat networks, heat networks could potentially meet nearly half of UK heat demand.⁸⁷

84 Department for Business, Energy and Industrial Strategy, *Energy White Paper*, [CP 337](#), December 2020 p 4

85 HM Government, [Heat networks](#), accessed 13 September

86 Committee on Climate Change, [The Sixth Carbon Budget](#), December 2020, p 115

87 Energy Technologies Institute, [District Heat Networks in the UK Potential, Barriers and Opportunities](#), November 2018, p 30

37. Caroline Bragg, Head of Policy, Association for Decentralised Energy, highlighted there is a “big gap” in heat network regulation and that industry supports the introduction of regulations “as soon as possible”.⁸⁸ Similarly, the Aldersgate Group, an organisation of businesses focused on environmental sustainability, told us that heat network regulation is “key to make heat networks a viable solution”.⁸⁹

38. The *Energy White Paper* committed £122 million of funding through the new *Heat Network Transformation Programme*.⁹⁰ The Government also outlined its intention to legislate during this Parliament for the regulation of heat networks “to protect consumers and reduce carbon emissions”.⁹¹ Since the publication of the *Energy White Paper* and the Government’s general commitments to regulate heat networks, it is unclear what specific plans the Government has. Professor Jan Webb, Professor of Sociology of Organisation, University of Edinburgh, told us that if the Government wants to expand the use of heat networks, then it could “introduce regulation, basic licensing for heat network operators, standards for technical performance and a kind of concession area licensing”.⁹² Professor Webb also told us that a guaranteed rate of return for investment in heat network infrastructure - similar to other energy infrastructure projects - could increase private sector investment, reduce costs, and speed up roll out.⁹³

39. Before 2014, the locations of heat networks were unrecorded by the Government, and their operation was unregulated. In 2014, the *Heat Network (Metering and Billing) Regulations* came into force.⁹⁴ This meant that operators had to install meters and bill customers based on their consumption of heating, cooling, or hot water. However, this did not regulate heat networks or ensure consumer protections. In October 2021, the Government launched a consultation on its heat network zoning plans.⁹⁵ A heat network zone is a designated area within which heat networks are the lowest cost, low carbon solution for decarbonising heating for an area. Within a zone, certain types of building must connect to their local heat network in a given timeframe.⁹⁶ The current heat network zoning plans primarily focus on identifying locations where heat networks could be deployed, helping the Government identify and record where heat networks exist. If the location of heat networks continues to be unrecorded, consumers will not know if a heat network is an option for them (unless they live in a building which provides no option other than a heat network) and investors, local authorities and other relevant stakeholders will not be able to leverage existing infrastructure effectively.

40. Furthermore, the CCC’s 2021 *Progress Report to Parliament* states that there are no annual public statistics on low-carbon heat networks.⁹⁷ This hinders the analysis of patterns and trends of heat networks, for example, understanding the number of heat networks installed and in what locations, thereby making it difficult to track the efficacy of heat networks and measure their impact. The CCC also stated that the “Government should prioritise annual reporting on total heat delivered through heat networks, split

88 [Q26](#)

89 Aldersgate Group ([DHH0054](#))

90 Department for Business, Energy and Industrial Strategy, *Energy White Paper*, [CP 337](#), December 2020, p 113

91 *Ibid* p 114

92 [Q9](#)

93 [Q9](#)

94 HM Government, [Heat networks](#), accessed 13 September

95 HM Government, [Proposals for heat network zoning](#), 8 October 2021

96 HM Government, [Proposals for heat network zoning](#), 8 October 2021, p 14

97 Committee on Climate Change, [Progress in reducing emissions 2021 Report to Parliament](#), June 2021, p 113

by heating technology”.⁹⁸ The lack of reporting on heat networks also complicates their regulation because, without an understanding of how many heat networks are operational in the UK and where they are operational, their use cannot be effectively regulated.

41. Compared to the UK as a whole, which aims to deliver net zero by 2050, Scotland has an earlier target to deliver net zero by 2045.⁹⁹ The Scottish Parliament has already legislated for the use of heat networks through the *Heat Networks (Scotland) Act 2021*, which became law on 30 March 2021.¹⁰⁰ It aims to increase the use of heat networks in Scotland by providing rules and regulations; these rules cover areas such as making applications, identifying exemptions, granting licences, and setting up heat network zones. The Durham Energy Institute at the University of Durham told us that “the rest of the UK should follow the example of Scotland on heat networks”.¹⁰¹

42. The *Heat and Buildings Strategy* set out the Government’s aims to increase the use of heat networks by proposing the introduction of heat network zoning in England by 2025; this will help “drive demand for heat network connections and grow the market”.¹⁰² The proposal sets out that buildings within a heat network zone must connect to the network within a set timeframe and buildings not connecting must apply for exemption.

Regulation

43. Between February and June 2020, the Government ran a consultation on heat network regulations: *Heat networks: building a market framework*.¹⁰³ The consultation aimed to gather views on “policy options for regulating heat networks to protect consumers and ensure fair pricing, while supporting market growth and the development of low-carbon networks”.¹⁰⁴ The consultation was supported by the Durham Energy Institute, University of Durham, who told us that it is a step “towards bringing in a regulatory framework for heat networks to address investor confidence, protecting consumer rights and move to low-carbon sources”.¹⁰⁵ The Government response to the consultation was published on 29 December 2021. The response announced the appointment of Ofgem as the regulator for the heat network market and the launch of a consultation on how policy costs for regulating the heat network market can be recovered.¹⁰⁶

44. There is currently some voluntary regulation of heat networks carried out by the Heat Trust, an independent, non-profit consumer champion organisation; however, this only covers about 11% or 12% of the consumers connected to heat networks.¹⁰⁷ Stephen Knight, Managing Director, Heat Trust, could not fully explain to us why such a low number of heat networks are part of the voluntary scheme or what was preventing other heat networks from taking part.¹⁰⁸

98 Committee on Climate Change, [Progress in reducing emissions 2021 Report to Parliament](#), June 2021, p 113

99 Scottish Government, [Reaching net zero](#), accessed 18 January 2022

100 Scottish Parliament, [Heat Networks \(Scotland\) Bill](#), accessed 13 September 2021

101 Durham Energy Institute, Durham University (DHH0053)

102 HM Government, [The Heat and Buildings Strategy](#), October 2021 p 160

103 HM Government, [Heat networks: building a market framework](#), accessed 13 September 2021

104 HM Government, [Heat networks: building a market framework](#), accessed 13 September 2021

105 Durham Energy Institute, Durham University (DHH0053)

106 GOV.UK, [Heat Networks: Building a Market Framework Government Response](#), December 2021

107 [Q17](#)

108 [Q27–30](#)

45. We congratulate the Department on its work on heat networks, including the consultation on heat network zoning. We support the rollout of heat networks across the country, the retrofitting of high-density housing, and the installation of heat networks in new build developments. However, we recognise the real concerns of consumers who are often given no choice but to receive their energy supply from one designated supplier. *Whilst the introduction of the Heat Network (Metering and Billing) Regulations has helped, we call on Ministers to urgently give Ofgem the mandate and resources to expand and enforce consumer protections in the heat network market, recognising the often monopoly status of some providers in certain areas of the country.*

46. *We recommend that the Government consider the Scottish Government's approach of legislation for heat networks. If Ministers disagree with the approach taken in Scotland, an explanation in response to this report is required.*

47. Furthermore, the Government must rapidly develop its data collection and records on the location of heat networks, and statistics about their use. Without a detailed understanding of how many heat networks are operational in the UK and where they are located, the Government cannot effectively regulate the use of heat networks. *We recommend that the Government publish annual statistics about their use on its website.*

The Future Homes Standard

48. In the *Energy White Paper*, the Government outlined that:

[t]he Future Homes Standard [FHS] will require new-build homes to be fitted with low carbon heating, and high levels of energy efficiency. Homes built to the Future Homes Standard will be zero carbon ready and have 75 to 80 per cent lower carbon emissions than those built to current standards. We will seek to implement the standard as soon as possible.¹⁰⁹

Despite the *Energy White Paper* stating that the FHS will be published “as soon as possible”, it is not expected to become a requirement until 2025. NIBE Energy Systems, a Swedish manufacturer, however, noted that “early implementation of the Future Homes Standard would be pivotal for the sector”.¹¹⁰ Canetis Technologies, a technology innovator, identified that the “initial priority” to decarbonise heating should be in new homes, suggesting that these changes could be “executed promptly, perhaps as early as 2023 or even earlier given the Government is motivated to make early progress”.¹¹¹

49. Emma Harvey, Programme Director, Coalition for the Energy Efficiency of Buildings, Green Finance Institute, pointed out that any homes built between now and 2025 would subsequently need to be retrofitted and incur additional costs; she described this as “an oversight”.¹¹² The Government had committed to build at least 300,000 new homes per year by the mid-2020s, and at least one million during this Parliament.¹¹³ If the Government

109 Department for Business, Energy and Industrial Strategy, *Energy White Paper*, [CP 337](#), December 2020, p 102

110 NIBE Energy Systems ([DHH0123](#))

111 Canetis Technologies ([DHH0097](#))

112 [Q128](#)

113 Stimulating housing supply - Government initiatives (England), [Briefing Paper 06416](#), House of Commons Library, 11 February 2021, p 3

meets its own target, by the end of this Parliament, one million homes will need to be retrofitted to be low carbon. Policy Connect stated that bringing the FHS forward would avoid this, resulting in significant savings.¹¹⁴

50. In its response to the consultation on part L of the building regulations, the Government responded to calls from industry to bring forward the FHS to 2023.¹¹⁵ It stated “[o]ur work on a full technical specification for the Future Homes Standard has been accelerated and we will consult on this in 2023. We intend to introduce the necessary legislation in 2024, ahead of full implementation of the Future Homes Standard in 2025”.¹¹⁶ The Government noted that the timeline set out provided “industry with the time it needs to develop the supply chains and skills that will be necessary to deliver the Future Homes Standard and accounting for market factors”.¹¹⁷

51. Despite initially declining our invitation to attend our oral evidence session (because the then Ministry for Housing, Communities and Local Government claimed he had a “limited” role in the decarbonisation of heating in homes¹¹⁸), we asked the Minister for Housing, Christopher Pincher MP, about the costs of retrofitting homes built between now and 2025. He explained that the cost would be less than you “might suppose”, this is:

particularly because, by the time that retrofit is required, given the uplift in skills and the number of heat pumps that BEIS is driving, the cost of them and of their installation will have fallen off by even more than they presently cost. The costs will be minimal.¹¹⁹

The Minister’s assessment that costs will be “minimal” is unrealistic and based on assumptions rather than costed proposals.

52. We note that the then Ministry for Housing, Communities and Local Government felt it only played a “limited role” in the decarbonisation of heating in housing and demand that Ministers prioritise this crucial work more clearly in the future.

53. The Future Homes Standard is another key policy in the Energy White Paper. It aims for new build homes to be fitted with low carbon heating, and high levels of energy efficiency to ensure that homes built to the Future Homes Standard will be zero carbon ready and have 75% to 80% lower carbon emissions than those built to current standards. Considering the Government aims to build one million homes in this Parliament alone, which will be heated by fossil fuel heating systems, it is naïve to assume that these homes will not need to be retrofitted at significant cost. This will be particularly detrimental to families on low incomes and to developments by housing associations.

54. We acknowledge that the Government wants to give industry the time to develop its supply chains; however, this appears to be to the detriment of new build

114 Policy Connect ([DHH0094](#))

115 Ministry of Housing, Communities and Local Government, [The Future Homes Standard: 2019 Consultation on changes to Part L \(conservation of fuel and power\) and Part F \(ventilation\) of the Building Regulations for new dwellings](#), January 2021

116 Ibid p 22

117 Ibid p 23

118 Ministry of Housing, Communities and Local Government, [Letter from Minister for Housing to Chair of the Committee](#), 1 July 2021

119 [Q70](#)

homeowners, who will have to pay to retrofit their homes. It is unnecessary to wait until 2025 to implement the Future Homes Standard. *To minimise expensive retrofit costs, the Government should bring forward the implementation of the Future Homes Standard to 2023 instead of 2025.*

55. *We also call on Ministers to set out, in response to this report, what measures are being considered to assist tenants who rent their homes in managing the transition to low carbon heating with their landlords; and what support might be put in place for housing associations and equivalent social housing providers with the costs of retrofitting newly built houses heated by gas boilers.*

Phasing out fossil fuel heating

56. In the 2019 Spring Statement, the then Chancellor of the Exchequer, Rt Hon Phillip Hammond MP, announced that as a part of the Future Homes Standard, all fossil-fuel heating systems would be banned in all new houses.¹²⁰ This policy was subsequently incorporated into the current Government's programme of work. From when the Future Homes Standard is implemented in 2025, gas boilers will therefore be banned in new build homes. However, a lack of clarity remains in relation to the phase out of fossil fuel heating systems, namely, gas boilers, in existing homes.

57. The *Energy White Paper* stated that the Government must “set a clear path that sees the gradual move away from fossil fuel boilers over the next fifteen years as individuals replace their appliances and are offered a lower carbon, more efficient alternative”.¹²¹ Most fossil fuel heating systems have an average lifetime of about 15 years, which suggests that the last year in which fossil heating systems could be sold (without requiring early retirement of the equipment before the end of its natural life) would be around the mid-2030s. For the UK to meet its net zero targets by 2050, it is important that before 2050 all heating equipment that uses fossil fuels is retired. Hence, the CCC proposed a ban on the sale of gas boilers by 2033 and oil boilers by 2028.¹²² Jenny Hill, Head of Buildings, and International Action, CCC, told us that “those dates are consistent with the Paris Agreement and with keeping 1.5 degrees on the table”.¹²³

58. It has been suggested that setting an end-date for the sale of fossil fuel heating systems would be analogous to the policy to prohibit the sale of petrol and diesel cars from 2030 because it provides a regulatory backstop to ensure that the market and households receive clarity.¹²⁴ Juliet Philips, E3G, a climate change think tank, stated the phase out date can “send one of the clearest signals to consumers and industry about the direction of travel”.¹²⁵ Similarly, the Microgeneration Certification Scheme, an energy standards organisation, informed us that “this signal gives time for the boiler industry to retrain to new business models and stimulate heat pump manufacturing in the UK in a sustainable way that provides certainty.”¹²⁶

120 HM Government, [Spring Statement 2019: Philip Hammond's speech](#), accessed 14 September 2021

121 Department for Business, Energy and Industrial Strategy, *Energy White Paper*, [CP 337](#), December 2020, p 15

122 Committee on Climate Change, [The Sixth Carbon Budget](#), December 2020, p 71

123 [Q39](#)

124 Edie, [Government confirms 2030 ban on petrol and diesel cars, unveils £20m electric vehicle package](#), accessed 22 September

125 [Q150](#)

126 MCS Charitable Foundation and MCS Service Company Ltd (MCS Certified) ([DHH0109](#))

59. The *Heat and Buildings Strategy* outlines the Government’s ambition “to phase out the installation of new natural gas boilers beyond 2035”.¹²⁷ It commits to ending the installation of high-carbon fossil fuels to heat homes that are not connected to the gas grid in England from 2026 and non-domestic buildings not connected to the gas grid from 2024.¹²⁸ The Government has since clarified that at this point, the 2035 date does not constitute an outright ban whereby consumers will be forced to remove their boilers, instead it is an overall policy goal.¹²⁹ Juliet Phillips, Senior Researcher, E3G, informed us that while the Government’s ‘signalling its intention’ to phase out gas boilers “sends a really strong signal” to industry and households, the “devil lies in the detail and we need to make sure that these are implemented strongly”.¹³⁰

60. **Delivering net zero by 2050 will require a ban on the installation of fossil fuel heating systems by the mid-2030s at the latest. We note that the Government signalling, instead of setting, an end-date for the phase out of gas boilers fails to give industry and consumers a clear date to work towards in decarbonising home heating. We urge the sector to come forward with more ambitious plans for pricing and innovation to encourage a robust regulatory framework.**

61. *We recommend that in the context of the phasing out of gas boilers, the Government adopts a clear and specific end-date by regulating through legislation the phase out of gas boilers. We also recommend that the Government sets out its plan on how it expects the industry and consumers to phase out the installation and use of gas boilers by 2035.*

127 HM Government, [The Heat and Buildings Strategy](#), October 2021 p 15

128 Ibid

129 Energy Live News, [Boris Johnson confirms ban on all new gas boilers by 2035](#), accessed 16/12/2021

130 [Q114](#)

3 Supply chains and skills

In the 2021 *Progress Report to Parliament*, the CCC announced that the 2020s should focus on “scale-up”, meaning that the UK must build supply chains and new markets for low-carbon technologies. The CCC identified heat pumps as a low carbon heating technology, which “can scale from being niche offerings to dominating the market and fully pushing out sales of high-carbon alternatives by 2030, or soon after”.¹³¹ We focused on the scale up of heat pumps primarily because the Government has a target to reach 600,000 heat pumps a year by 2028 and the heat pump market must be scaled up in order to deliver this target.¹³² Scaling up low carbon technologies concerns not only the supply chains but also the skills of installers, who must deliver low carbon heating technologies to consumers. It is clear that the requisite technologies and capabilities currently fall short of what is required to meet targets for net zero. In this chapter, we will explore how heat pumps need to be scaled up to meet the Government’s targets and explore how a sector deal could facilitate this. We will also consider the ‘skills gap’, support for installers of low carbon heating technologies and transition support for existing installers and engineers of gas boilers.

Heat pumps

Background

62. Published on 18 November 2020, the Prime Minister’s *Ten Point Plan for a Green Industrial Revolution* committed to a target of installing 600,000 heat pumps per year by 2028.¹³³ However, the current rate for installations is low. In 2019, 34,896 hydronic heat pumps (which transfer heat using fluids), including hybrids, were sold in the UK for the year at a total value of £78 million at manufacturer sales price.¹³⁴ In the 2021 *Progress Report to Parliament*, the CCC stated that “[d]espite a small improvement in the rates of heat pump installation, these remain far below the levels that are necessary”.¹³⁵ It noted that annual heat pump installations in homes rose slightly from 33,000 in 2019 to 36,000 in 2020, driven mainly by an increase in retrofit installations to just under 23,000.¹³⁶ The Heat Pump Association explained that the low rate of installations was due to the failings of the Government’s support schemes, which have not provided sufficient assistance to consumers with the upfront cost of the low carbon heating systems.¹³⁷

The Government’s targets vs. the CCC’s advice

63. Evidence to our inquiry highlighted the UK’s heat pump deployment targets do not go far enough and that the target is also too ambitious for what the UK can achieve if no policy interventions are taken. Juliet Phillips, Senior Policy Adviser, E3G, described

131 Committee on Climate Change, [Progress in reducing emissions 2021 Report to Parliament](#), June 2021, p 142

132 HM Government, [PM outlines his Ten Point Plan for a Green Industrial Revolution for 250,000 jobs](#), accessed 18 August 2021

133 HM Government, [PM outlines his Ten Point Plan for a Green Industrial Revolution for 250,000 jobs](#), accessed 18 August 2021

134 Business, Energy and Industrial Strategy, [Heat Pump Manufacturing Supply Chain Research Project](#), November 2020, p 11

135 Committee on Climate Change, [Progress in reducing emissions 2021 Report to Parliament](#), June 2021, p 19

136 Ibid, p 113

137 Heat Pump Association ([DHH0080](#))

the UK's heat pump target as "ambitious", particularly given the current "low levels" of installations of heat pumps.¹³⁸ Energy UK called for a "a more ambitious commitment".¹³⁹ It claimed that the target could be "strengthened by establishing an additional target of delivering 1 million low carbon heat installations between now and 2025 to stimulate the market".¹⁴⁰

64. The CCC agreed that heat pumps must scale up to be able to replace the majority of current gas boiler demand by the early 2030s.¹⁴¹ For the UK to be on track to meet its heat decarbonisation targets, the CCC has called for 900,000 heat pumps by 2028.¹⁴² While it is clear that the Government target falls short of the CCC's suggested target, Dr Richard Lowes, Research Fellow and Lecturer, University of Exeter, commented that in the context of what can be delivered in the current market, both the Government and the CCC's targets are "extremely stretching".¹⁴³

65. Jenny Hill, Head of Buildings and International Action, CCC, contrasted both the CCC and the Government's targets for heat pump deployments. She stated:

It may not sound like a big difference overall, but that is a figure that includes new build. If you deduct new-build from the total number, it is actually 600,000 retrofit heat pumps in our scenarios compared to possibly 300,000 or a bit over in the Government's ambition. You can see that it is effectively half.¹⁴⁴

This notion that the Government's targets are "effectively half" of what the CCC advises calls into question whether current Government targets are sufficient to put the UK on track to deliver net zero. She continued:

the Government [...] are not looking at going further to 2030, necessarily. In our working, we look at how you can achieve a full-scale turnover of the stock within, say, a 15 to 18-year period. Essentially, if you want to keep open the option of a high heat pump scenario, you need to be in a position where you get to something like 1 million heat pumps a year by 2033 or thereabouts. If the market plateaus at 300,000 a year through to 2030, you can see that is a real challenge.¹⁴⁵

She suggested that the Government has adopted a short-term view of the heat pump market that could stifle the rate of installations and the development of the market; this is because there is no strategic view on how the heat pump target could stimulate the development of the heat pump market.

66. We asked the Secretary of State about the difference between the Government's targets for heat pumps and the CCC's targets, he stated that:

138 [Q109](#)

139 Energy UK ([DHH0095](#))

140 Energy UK ([DHH0095](#))

141 Committee on Climate Change, [Reducing UK emissions Progress Report to Parliament](#), June 2020, p 57

142 [Q33](#)

143 [Q4](#)

144 [Q33](#)

145 *Ibid*

[t]he basis on which you have 900,000 or more is in the case that hydrogen does not succeed [...] there are other technologies that we will need to harness, which could mean that the number of heat pumps you need will be less than the figure that they have put forward. We are working on different assumptions, and that is a legitimate thing for us to do.¹⁴⁶

The Secretary of State's assumption that the CCC views hydrogen as a non-starter is not accurate. The CCC assume in their Balanced Pathway scenario that 11% of homes will use hydrogen for heat (this will mostly be a hybrid hydrogen scenario).¹⁴⁷ Even if the Government does not use the CCC's scenarios and assumes that there will be other technologies, such as hydrogen, available at a larger scale than the CCC expects, the Government's own Hydrogen Strategy, published in August 2021, does not see a large-scale role for hydrogen in residential heat decarbonisation. For example, the hydrogen strategy does not foresee more than 70,000 homes using hydrogen by 2030.¹⁴⁸ It details that by 2035 the Government expects 0–10% of homes to use hydrogen for heating (we note the range starts with zero).¹⁴⁹ Furthermore, the *Heat and Buildings Strategy* states that the Government will make strategic decisions about the role of hydrogen for heating in 2026.¹⁵⁰

67. In the *Heat and Buildings Strategy*, the Government announced plans to introduce a market-based mechanism, which would require boiler manufacturers to achieve the sale of a certain level of heat pumps, or potentially alternative low-carbon appliances, proportional to their fossil fuel boiler sales over a given period.¹⁵¹ The Government also published a consultation¹⁵² on this policy and the impact assessment,¹⁵³ which reveals that the Government considers setting a target of around 400,000 heat pump installations by 2028. In 2028, the Government expects the market mechanism to deliver an additional 210,000 installations per year beyond other policies.¹⁵⁴ Marcus Shephard, Senior Analyst, CCC, informed us that this policy was “promising” if delivered well but he stated that it was a “novel approach” to delivering a significant scale up of heat pumps.¹⁵⁵

68. It is vital that the Government should meet its target to deliver a minimum of 600,000 heat pumps a year by 2028 or it will fall off course in delivering net zero by 2050. The Government has not outlined in the Heat and Buildings Strategy its plans for how it will meet the heat pump target and what contingencies are in place if the target is missed. We recommend that a plan is put in place for off gas grid properties. Electrification is the only option for these properties and any programme should be undertaken in conjunction with energy efficiency measures. Such an approach will assist a cohort more likely to be fuel poor.

69. We ask the Government to set out in response to this report the intended milestones and targets it has in place to ensure that the UK meets its 2028 target and what funding it will put in place to ensure that each of these milestones is met. The Government

146 [Q80](#)

147 Committee on Climate Change, [The Sixth Carbon Budget](#), December 2020, p 118

148 HM Government, UK Hydrogen Strategy, [CP 475](#), August 2021

149 Ibid

150 HM Government, [The Heat and Buildings Strategy](#), October 2021 p 9

151 HM Government, [The Heat and Buildings Strategy](#), October 2021 p 105

152 HM Government, [Open consultation overview: Market-based mechanism for low carbon heat](#), October 2021

153 HM Government, [Market-based mechanism for low carbon heat impact assessment](#), October 2021

154 HM Government, [Market-based mechanism for low carbon heat impact assessment](#), October 2021 p 14

155 [Q117](#)

must outline what contingencies it has in place to make sure that the heat pump target is fulfilled. The Government must have integrated and coherent policies, such as an effective energy efficiency programme, that complements and aligns with the target of 600,000 heat pump installations per year by 2028.

70. *To ensure that the UK does not fall off course in achieving its targets for carbon emissions reductions, we recommend that the Government works with industry to consider how the Climate Change Committee's advice to deliver 900,000 heat pumps a year by 2028 can be achieved.*

71. *We further recommend that the Government should convene the retail banking sector to encourage and facilitate low-cost and innovative lending products for consumers, and that public funds are used most widely in supporting lower income families with appropriate grants.*

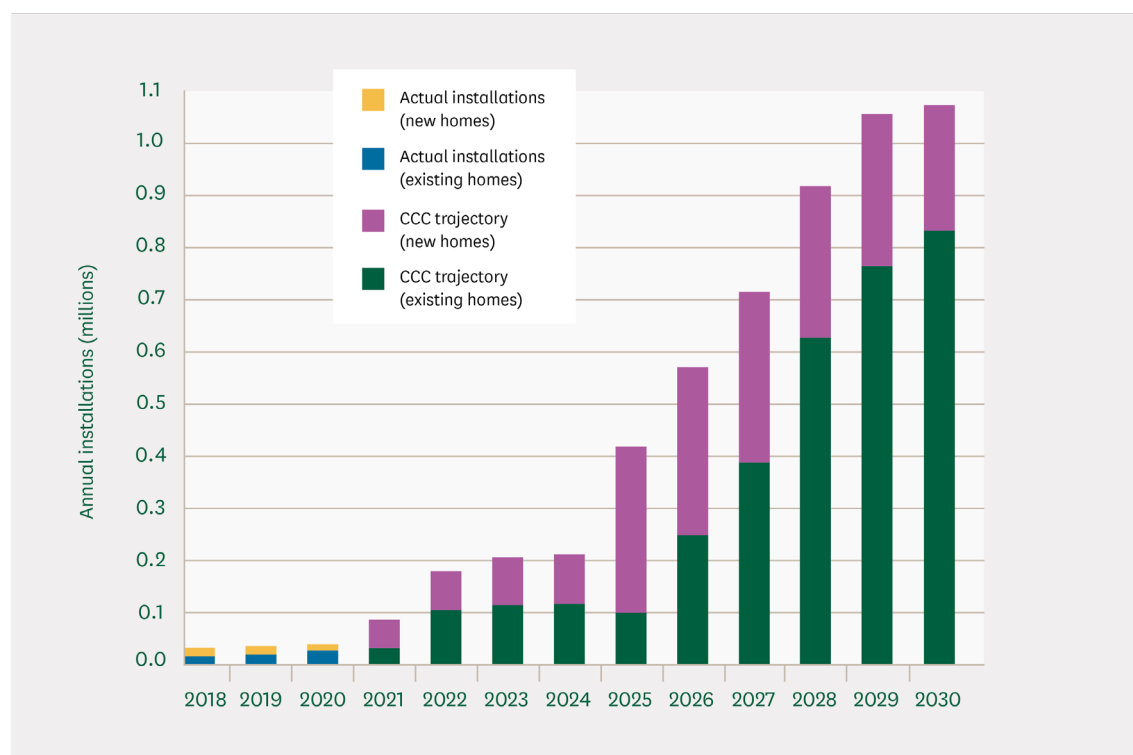
Scaling up the heat pump market

72. Relative to both the CCC's and the Government's targets, the current rate of heat pump installations remain significantly below what is needed over the next few years. The CCC estimates that by 2025, just over 400,000 heat pump installations are required per year, rising to just over 900,000 per year by 2028 and over one million by 2030.¹⁵⁶ The figure below (taken from the CCC's 2021 *Progress Report to Parliament*) depicts the disparity in current heat pump installations and what is required to ensure the UK is on course to achieve net zero.¹⁵⁷

¹⁵⁶ Committee on Climate Change, [Progress in reducing emissions 2021 Report to Parliament](#), June 2021, p 113

¹⁵⁷ Ibid

Current heat pump installation rates in homes set against the CCC's Balanced Pathway



Whether it is to meet the Government's target of delivering 600,000 heat pumps a year by 2028 or the CCC's 900,000 heat pumps a year by 2028, Dr Richard Lowes, Research Fellow and Lecturer, University of Exeter, made clear that the UK "need[s] to get to this extremely large number of heat pumps quickly to meet our carbon targets".¹⁵⁸ He also highlighted that even though significant scaling up of the heat pump market is required at pace, actions need to be thought through and not rushed.¹⁵⁹

73. The Secretary of State acknowledged that "a massive ramp-up" was required to deliver 600,000 heat pumps a year by 2028. He did not detail how this "ramp-up" would be achieved but added "given the incentives and the direction that we are showing, that is not unattainable in six years".¹⁶⁰ To date, contrary to the Secretary of State's statement, the Government does not have clear incentives or a clear direction for how to significantly scale up the heat pump market. We also asked the Secretary of State if the target to install 600,000 heat pumps a year by 2028 can be achieved considering the current rate of heat pump installations, to which he responded "it will have to be delivered".¹⁶¹ When pushed on how specifically it will be delivered, he said "[o]ne start is the publication of the heat and buildings strategy. That will give a very clear indication to the market of our direction in this".¹⁶²

¹⁵⁸ [Q3](#)

¹⁵⁹ [Ibid](#)

¹⁶⁰ [Q77](#)

¹⁶¹ [Q75](#)

¹⁶² [Q76](#)

74. The Secretary of State's assertion that the target to deploy 600,000 heat pumps will "have to be delivered" highlights the Government's determination but there is still a lack of specific, strategic action on its part to ensure that low carbon heat targets are delivered. *The Government must set out a clear, long term plan as to how the current rate of installations will be increased in order to scale up the market.*

75. We acknowledge the introduction of the market-based mechanism outlined in the Heat and Buildings Strategy; however, it will not deliver the scaled-up heat pump market needed to achieve the Government's heat pump target. *The Government must expand the market-based mechanism as well as explore other options to catalyse the development and scaling up of the heat pump market.*

A heat decarbonisation sector deal

76. Steve Keeton, Director of External Affairs, Vaillant, identified that "we will need certain different policy measures to enable us to start to speed up the implementation and installation of heat pumps in the market".¹⁶³ One such policy measure that has been suggested by our witnesses is a sector deal for the heat pump market. The Government defines sector deals as "partnerships between the government and industry on sector-specific issues [which] can create significant opportunities to boost productivity, employment, innovation and skills".¹⁶⁴ The Government currently has a range of industry sector deals including life sciences, aerospace, and offshore wind. Jenny Hill, Head of Buildings and International Action, CCC, told us that "[c]ollaboration is key, and sector deals are definitely one way to get there".¹⁶⁵

The CBI and the University of Birmingham published a report, *Net-zero the road to low-carbon heat*, in July 2020; it argued that "there are lessons to be learned from the offshore wind sector relating to the cost reduction programme of that sector and interventions that might be accommodated into the heat sector".¹⁶⁶ A Parliamentary Office of Science and Technology note (2019) explains how the developments in wind power have led to a reduction in costs.¹⁶⁷ Wind power has grown rapidly in the past 10 years; in 2018, onshore and offshore turbines generated 17% of UK electricity. The UK Government supports offshore wind with competitive subsidies, which have enabled cost reductions to date. Further support was pledged in the 2019 Offshore Wind Sector Deal. It is fair to say that cost reductions in the wind sector occurred before a formal sector deal was negotiated. However, before the sector deal was formally negotiated there was consistent and intentional collaboration between the Government and industry, therefore, it could be argued that a de facto sector deal was in place. In theory, if a sector deal for heat pumps is negotiated at this stage, then it means that there can be consistent and intentional collaboration between the Government and industry in the heat pump market and this could effectively nurture the growth of the market.

77. E3G stated that "[s]upply chain development could be boosted by a heat pumps sector deal—analogueous to that for the offshore wind industry".¹⁶⁸ Further, in oral evidence, Juliet

163 [Q76](#)

164 HM Government, [Introduction to Sector Deals](#), 28 June 2019

165 [Q60](#)

166 CBI; University of Birmingham, [Net Zero the road to low carbon heat](#), July 2020, p 54

167 Developments in wind power, Research Briefing [602](#), Parliamentary Office of Science and Technology, May 2019

168 E3G ([DHH0124](#))

Phillips, Senior Policy Adviser, E3G, stated that a sector deal could “help scale up heat supply chains and jobs across the country”.¹⁶⁹ The Coalition for the Energy Efficiency of Buildings told us that the UK “can strengthen its place in the world and attract world-leading expertise on zero-carbon heating through launching a long-term Heat Pumps Sector Deal to attract foreign direct investment for the manufacture and installation of zero carbon heating solutions across this decade”.¹⁷⁰ In essence, a sector deal for heat pumps could significantly scale up the heat pump market and reduce costs, this could put the UK on course to meet the target to deploy 600,000 heat pumps a year by 2028.

78. We asked the Secretary of State whether he had considered a sector deal for heat pumps. He replied, “we will have to wait and see the heat and buildings strategy” but acknowledged that there was “definitely a plan and consideration in terms of incentivising the sector”. He added:

I do not think it will be a separate sector deal. It is quite a small sector when you compare it to the oil and gas sector and others, but there is definitely an approach that we want to incentivise production in this area¹⁷¹

79. **To meet the Government’s targets for decarbonising heat, significant action needs to be taken to innovate and develop low carbon heating markets and in bringing these markets to scale. Scaling up the markets for low carbon heating technologies also offers opportunities for cost reductions. A heat decarbonisation sector deal would create intentional and consistent collaboration between the Government and industry to effectively nurture the low carbon heat markets and reduce costs.**

80. *We recommend that the Government introduce a heat decarbonisation sector deal by 2023 so that there may be a heightened focus on scaling up low carbon heating markets and reducing costs.*

Skills gap

81. We have established how heat pump markets and supply chains can be scaled up to meet Government targets but a crucial aspect of scaling up, relevant for all low carbon heating technologies, is the upskilling of the installers who will install and service low carbon heating technologies in our homes. Research published in November 2020 by Eunomia Research & Consulting Ltd on behalf of BEIS found that, in 2019, the UK heat pump industry supported around 2,000 full-time jobs “to build, install and maintain heat pumps”.¹⁷² The research found that “it is hard to estimate the number of jobs that the industry will support in the future but can be assumed that this figure will increase manyfold if heat pump deployment and UK-based manufacturing increase as forecast”.¹⁷³

82. Many witnesses to our inquiry identified a ‘skills gap’ in the heating sector - this means that workers do not have the capacity or expertise to deliver low carbon heating solutions. As the markets for low carbon heating technologies expand, as well as the energy efficiency work that is also required, it is vital that installers are provided with the

169 [Q101](#)

170 Coalition for the Energy Efficiency of Buildings, E3G ([DHH0071](#))

171 [Q85](#)

172 Business, Energy and Industrial Strategy, [Heat Pump Manufacturing Supply Chain Research Project](#), November 2020, p 13

173 Ibid

skills they need to deliver these technologies. Juliet Phillips, Senior Policy Advisor, E3G, told us that “[t]his is a huge gap but also a huge opportunity [...] to build green skills and green jobs through upskilling and training”.¹⁷⁴ GMB Union recommended that any upskilling or workforce restructuring must be done “in full consultation with the existing home heating workforce”.¹⁷⁵

83. Evidence to the inquiry stated that skills and capacity has a direct interaction with the supply chain. The National House Building Council told us that to “avoid delays in the supply chain and sub-standard installations in low carbon technologies” skills and capacity issues must be addressed.¹⁷⁶ E.ON identified, that to achieve the significant scale up the deployment of heat pumps during the 2020s “requires an installer base that is capable of delivering this”.¹⁷⁷ However, it highlighted that “the lack of clear policy drivers in the short-medium term means that heating installers have no immediate incentive to upskill”.¹⁷⁸

84. Witnesses noted a clear role for the Government in upskilling installers. The National House Building Council suggested a “[c]ollaboration between industry and Government” to upskill installers.¹⁷⁹ Similarly, the Association for Decentralised Energy stated that the Government should introduce “support and a long-term strategy for education and training in green jobs”; it continued that this should include “grants focused on reskilling”.¹⁸⁰ The Federation of Master Builders pointed to the *Heat and Buildings Strategy* to “include a comprehensive skills strategy that identifies skills gaps within the industry, and sets out concrete steps for how to plug these”.¹⁸¹

85. Policy Connect called for training programmes to be delivered at a local level “[a]s the best fitting low carbon heating programmes are likely to differ regionally, these training programmes should be developed and delivered in a regionally specific way”.¹⁸² The Local Government Association agreed that councils and combined authorities in tandem with business and industry would be the most appropriate vehicle to deliver training.¹⁸³

86. Installers must be accredited as well as skilled; the National House Building Council told us that “[w]ithout the correct skilled professional there can be a number of issues which could lead to delays in the supply chain and sub-standard installations”.¹⁸⁴ Currently, there are only around 850 MCS (Microgeneration Certificate Scheme) certified heat pump installation companies in the UK. This equates to around 2,000 individual installers compared to 100,000 plus Gas Safe engineers.¹⁸⁵ OVO Energy noted that an estimated 200,000 installers trained to install low carbon heating systems to the right standards were needed to achieve net zero compatible transition.¹⁸⁶

174 [Q149](#)

175 GMB ([DHH0031](#))

176 NHBC ([DHH0118](#))

177 E.ON UK ([DHH0043](#))

178 E.ON UK ([DHH0043](#))

179 NHBC ([DHH0118](#))

180 Association for Decentralised Energy ([DHH0138](#))

181 Federation of Master Builders ([DHH0134](#))

182 Policy Connect ([DHH0094](#))

183 Liquid Gas UK ([DHH0119](#))

184 NHBC ([DHH0118](#))

185 OVO ([DHH0106](#))

186 OVO ([DHH0106](#))

87. Furthermore, the Centre for Research into Energy Demand Solutions and Policy Connect called for installers to have a holistic understanding of the low carbon heating sector so that they can encourage consumers to install low carbon heating solutions and advise consumers on the most appropriate and cost-effective heating solution for their residence.¹⁸⁷ Vaillant UK agreed and suggested that if installers are low carbon competent then, “[a]t the time of a distress boiler replacement or annual service an installer should conduct a low carbon ready assessment on the heating system, radiator suitability and upgrades”.¹⁸⁸

88. The Federation of Master Builders called for early investment in apprenticeships to “build greater capacity for retrofit in five to ten years’ time”.¹⁸⁹ Ian Rippin, CEO of Microgeneration Certification Scheme, called for “a low-carbon heating technician apprenticeship as a specialist route into the market. [...] This sector has come of age now and deserves its own apprenticeship model”.¹⁹⁰

89. In the *Heat and Buildings Strategy*, the Government outlined that it is working with industry to upskill engineers to make them low carbon competent and to introduce new people into the sector.¹⁹¹ However, the strategy does not provide a specific programme detailing how engineers can be upskilled nor how businesses can transition to low carbon heating specialists.¹⁹²

90. **It is vital that the heating and energy efficiency workforce has the capacity and skills required for the job at hand. This will require training new workers as well as supporting existing workers in the home heating sector. It is imperative that the Government actively supports and encourages the upskilling of workers, with a commitment to prioritising the existing home heating workforce, through local, work-based training schemes. We expected the Heat and Buildings Strategy to provide a strategic direction on how the heating workforce would be upskilled and we waited a long time for this to be published. However, the strategy failed to adequately deal with this issue.**

91. *The Government must urgently develop a low carbon heating training programme, in partnership with industry and trade unions. The training programme should align with the Government’s own target to deploy 600,000 heat pumps by 2028 and the plans it has to deliver on this goal. The Government must support and collaborate with industry and trade unions early in development of this training. It should also work with industry and trade unions to develop a low carbon heating technician apprenticeship to encourage young people to enter the sector.*

92. *At present there is no company that operates as a “one stop shop” where customers can procure all the services required for a successful retrofit installation and change to a low carbon heating system. Consideration should be given to project management upskilling with regards to whole system and energy efficiency installations to make it easier for people to be able to convert to low carbon heating systems.*

187 Centre for Research into Energy Demand Solutions (CREDS) ([DHH0101](#)); Policy Connect ([DHH0094](#))

188 Vaillant UK LTD ([DHH0112](#))

189 Federation of Master Builders ([DHH0134](#))

190 [Q70](#)

191 HM Government, [The Heat and Buildings Strategy](#), October 2021 p 44

192 [Q116](#) [Ian Rippin]

93. *In addition to working with industry and trade unions, we recommend that the Government works closely with local and regional authorities in England allowing local leaders to deliver coherent services to their populations, for example through the regional delivery of the adult skills budget and promote the connection between net zero policies and 'green job' creation.*

4 Costs

94. The Energy Networks Association told us that the costs associated with decarbonising heat in the homes needs “careful consideration” particularly given the financial impact of the transition to decarbonised domestic heat on the consumer.¹⁹³ A key financial barrier for the consumer in the transition to low carbon heating is the upfront costs associated with installing low carbon measures. To mitigate some of these upfront costs, the Government created financial support schemes; two of the main schemes are the Green Homes Grant, a major energy efficiency scheme, and the Renewable Heat Incentive, the main funding mechanism for installing low carbon heat. In this chapter, we will explore these schemes in further detail, assess their impact and examine what is required from financial support schemes to address upfront costs and incentivise people to pursue low carbon heating solutions.

95. Another financial barrier for the consumer is the operational costs of low carbon heating systems compared to fossil fuel systems, hence, we have also focused on assessing how the apportioning of environmental levies affects the running costs of heating systems. We will further consider this issue in our *Energy costs and the future of the Energy Market* inquiry.¹⁹⁴

Financial support schemes

Green Homes Grant

96. The Green Homes Grant (GHG) was one of the main financial schemes from the Government focused on delivering energy efficiency upgrades in homes. It was announced, as a part of the “green recovery” from Covid-19, in July 2020. The £2 billion scheme was divided into two parts: a £1.5 billion voucher scheme and a £500 million Local Authority Delivery (LAD) scheme.¹⁹⁵ Available from September 2020, the grant covered two thirds of the cost of energy efficiency installations up to a value of £5,000 in all households or £10,000 in low-income households.¹⁹⁶ The GHG was expected to run between September 2020 and March 2021 and enable up to 600,000 households to save up to £600 on their energy bills.¹⁹⁷

97. In February 2021, the then Minister of State for Energy and Clean Growth, Anne-Marie Trevelyan MP, announced that the underspend of around 95% of the £1.5bn¹⁹⁸ allocated to the GHG would not be rolled over to the next financial year.¹⁹⁹ We wrote to the Secretary of State in February 2021, expressing concerns about issues with the administration and delivery of the scheme, the future of the GHG, and the ambition of

193 Energy Networks Association ([DHH0021](#))

194 Business, Energy, and Industrial Strategy Committee, [Energy pricing and the future of the Energy Market](#), accessed 25 January 2021

195 HM Government, [Greener homes, jobs and cheaper bills on the way as government launches biggest upgrade of nation's buildings in a generation](#), accessed 28 September 2021

196 HM Government, [Quality assurance at heart of new £2 billion green homes grants](#), accessed 28 September 2021

197 National Audit Office, [Green Homes Grant Voucher Scheme](#), September 2021, p 5

198 E3G, [Green Homes Grant letter](#), February 2021

199 The Guardian, [Hundreds of millions in green grants for English homes pulled despite delays](#), accessed 28 September 2021

the scheme.²⁰⁰ On 27 March 2021, the Secretary of State confirmed that the GHG voucher scheme would be discontinued and stop taking new applications at 5pm on 31 March 2021. He acknowledged that the scheme had “not been delivering at the rate and scale we had originally hoped” and had been facing “a number of delivery challenges, which have been exacerbated by the understandable impact of the Covid pandemic”.²⁰¹ Juliet Phillips, Senior Policy Advisor, E3G, contested the Secretary of State’s claim that the issues with the scheme had been exacerbated by Covid-19.²⁰² Moreover, Steve Keeton, Director of External Affairs, Vaillant, explained that Covid -19 had not been “a massive contributor to why the [GHG] has not kicked off”.²⁰³

98. We received written evidence to our inquiry before the GHG was terminated; much of which criticised the short-term nature of the scheme. Professor Nick Eyre, Professor of Energy and Climate Policy, and Senior Research Fellow, University of Oxford, criticised the short-term design of the GHG, he stated:

We already knew at the outset that a one-year programme was not the right way to construct this. I understand why it was tempting, given the need to have an economic recovery package, to have a very large one-year stimulus, but, as we have been talking about, this is a 30-year problem, not a one-year problem. We need to build supply chains, and you will not build them in a year. We need to be thinking much longer term than that.²⁰⁴

99. In order to build supply chains and provide the markets with certainty, the Microgeneration Certification Scheme (MCS), an energy standards organisation, suggested that “the Government should also consider extending the [GHG] scheme for a period of 10 years”.²⁰⁵ Similarly, the National Housing Federation stated that “[w]e also need long-term funding solutions that are well designed, fair and sustainable”.²⁰⁶ The Secretary of State acknowledged that there were lessons to be learned in relation to the GHG, not least that “the short timeframe we gave ourselves, was very challenging. We had to build up the supply chain [...] and we needed to take a longer view”.²⁰⁷

100. In September 2021, the National Audit Office (NAO) published a report into the GHG, entitled, *Green Homes Grant Voucher Scheme*.²⁰⁸ A key finding of the report is that the scheme did not deliver the expected number of home energy efficiency installations or support the expected number of jobs; BEIS forecast that the GHG would deliver energy efficiency measures in 600,000 homes and support up to 82,500 jobs over six months. According to the NAO report, since the GHG was disbanded and by the time all work is completed, BEIS forecasts that the GHG will eventually support efficiency measures in 47,500 homes. Its economic modelling also estimated that this level of activity will support up to 5,600 jobs over 12 months.²⁰⁹ This is supported by YouGov polling, commissioned

200 Business, Energy, and Industrial Strategy Committee, [Letter from Chair to Secretary of State for Business, Energy and Industrial Strategy](#), 24 February 2021

201 Department for Business, Energy, and Industrial Strategy, [Letter from Secretary of State to Chair of the Committee](#), 27 March 2021

202 [Q108](#)

203 [Q83](#)

204 [Q30](#)

205 MCS Charitable Foundation and MCS Service Company Ltd (MCS Certified) ([DHH0109](#))

206 National Housing Federation ([DHH0046](#))

207 [Q93](#)

208 National Audit Office, [Green Homes Grant Voucher Scheme](#), September 2021

209 Ibid, p 7

by the Energy and Climate Intelligence Unit in September 2020, which found that 22 times more households were interested in taking part in the scheme than it had capacity for.²¹⁰ Moreover, by 8 February 2021, the GHG received 71,953 applications but just 22,165 vouchers had been approved and issued to customers; the value of these vouchers was £94.1 million.²¹¹ The scheme was clearly not adequately equipped to deal with the demand.

101. In calling for a replacement scheme for the GHG, witnesses emphasised again the need for policy certainty.²¹² The CCC's 2021 *Progress Report to Parliament* outlined that “there is an urgent need for well-designed, fully-funded policy that works for deployment of energy efficiency improvements and low-carbon heat” in homes.²¹³ While the Secretary of State acknowledged he “engaged in a conversation” about how the GHG could be replaced, he was unable to provide any detail or an indicative timescale for introduction of a replacement scheme.²¹⁴

102. Witnesses to our inquiry have called for local authorities to be involved in both the design and delivery of financial support schemes. Michael Lewis, CEO of E.ON UK, described the Local Authority Delivery Scheme (LAD)²¹⁵ as a “very successful” and “oversubscribed” part of the GHG. Juliet Phillips, Senior Policy Advisor, E3G, echoed the “[LAD scheme] has already delivered action on the ground. [Local authorities] successfully managed to get the money they were provided by Government out of the door.”²¹⁶ The Secretary of State agreed that the LAD scheme had helped “50,000 households with a household income of less than £30,000 a year”.²¹⁷

103. Citizens Advice advocated that all new support schemes “should be designed with appropriate monitoring, advice and support to help consumers navigate the complexity”.²¹⁸ James Richardson, Chief Economist, National Infrastructure Commission, agreed that support schemes should be “simple for people to understand”.²¹⁹

104. The Green Homes Grant was an important and welcomed initiative. However, the way in which the Government designed the Green Homes Grant, both as a short-term stimulus instead of a long-term national infrastructure project and as a hastily developed, outsourced scheme, was misguided. It is vital that the lessons are learned from the failure of the Green Homes Grant and that these lessons are implemented in the design and delivery of future financial support schemes.

105. *We call on the Government to prioritise the development and launch of a replacement for the Green Homes Grant, delivered locally through regional and local government in England instead of centrally by the Department. Ministers should provide an update on this work in response to this report.*

210 Energy & Climate Intelligence Unit, [Green Homes Grant polling: policy implications of a predicted surge in demand](#), September 2020

211 PQ [1515 2](#) [on Green Homes Grant Scheme], 9 February 2021

212 [Q134](#) [Juliet Phillips]; [Q40](#) [James Richardson]

213 Committee on Climate Change, [Progress in reducing emissions 2021 Report to Parliament](#), June 2021, p 26

214 [Q97](#)

215 The Local Authority Delivery Scheme is a part of the Green Homes Grant, whereby local authorities can bid for funding under this scheme to improve the energy efficiency of low-income households in their area.

216 [Q149](#)

217 [Q88](#)

218 Citizens Advice ([DHH0040](#))

219 [Q40](#)

Renewable Heat Incentive

106. The Government's primary financial support scheme for the delivery of low carbon heat is the domestic Renewable Heat Incentive (RHI). Participants of the scheme are paid based on the amount of renewable heat produced by their heating system; eligible systems include biomass boilers, solar water heating and certain heat pumps.²²⁰ Payments are made on a quarterly basis for a seven-year period.²²¹ The domestic RHI was opened to applicants in 2014 and it paid is for by HM Treasury. BEIS publishes monthly statistics on the take-up of the domestic RHI.²²²

107. The Government's Clean Heat Strategy (2017) stated that through the domestic RHI, the Government is spending £4.5 billion between 2016 and 2021 to support innovative low carbon heat technologies in homes.²²³ So far, the scheme had enabled householders to install over 55,000 low carbon heating technologies. However, the National Audit Office's report, *Low carbon heating of homes and businesses and the Renewable Heat Incentive*, published in February 2018, highlighted that, in its 2012 business case, the Department planned to deliver 513,000 new installations in Great Britain by 2020.²²⁴ As of December 2017, the RHI had delivered just 78,048 new installations in Great Britain. At current rates of take-up, the NAO estimated the RHI will achieve around 111,000 new installations by March 2021, just 22% of its original expectations.²²⁵ It is clear that the RHI failed to deliver the rate of installations that it had intended. According to the NAO report, the main reasons for underperformance identified by BEIS include high upfront costs, low public awareness, and complex installation requirements.²²⁶

108. Written evidence to our inquiry highlighted that RHI repayments being made over seven-years instead of upfront was an issue for consumers. Thirteen Group, a housing association, told us that "whilst we acknowledge funding available through the RHI scheme offers some payback to reduce the overall cost variance it is paid back over 7 years and places higher levels of initial capital outlay that slows the delivery of schemes".²²⁷ E.ON added that because of repayments being made over seven-years, the RHI addressed the issue of upfront costs with "limited success".²²⁸

109. The RHI failed to encourage the low carbon heat market. Dr Richard Lowes, Research Fellow and Lecturer, University of Exeter, stated that "the RHI was expected to lead towards a mature market that led to learning. Unfortunately, we do not have that".²²⁹ Dr Will McDowall, Associate Professor, University College London, explained that:

[the RHI] did not really do enough to focus on the building supply chain and ensuring technology development. We need to learn from that experience, because that is a key thing we did not get right with the design of the RHI.²³⁰

220 HM Government, [Domestic Renewable Heat Incentive \(RHI\)](#), accessed 16 September 2021

221 Ibid

222 HM Government, [Renewable Heat Incentive Statistics](#), accessed 16 September 2021

223 HM Government, [Clean Growth Strategy](#), October 2017, p 79

224 National Audit Office, [Low carbon heating of homes and businesses and the Renewable Heat Incentive](#), February 2018, p 6

225 National Audit Office, [Low carbon heating of homes and businesses and the Renewable Heat Incentive](#), February 2018, p 8

226 Ibid

227 Thirteen ([DHH0025](#))

228 E.ON UK ([DHH0043](#))

229 [Q30](#)

230 [Q30](#)

Boiler Upgrade Scheme

110. The Boiler Upgrade Scheme was announced in the *Heat and Buildings Strategy*; it is expected to be the successor scheme to the Renewable Heat Incentive.²³¹ It was previously known as the Clean Heat Grant, but this has now been subsumed by the Boiler Upgrade Scheme. The scheme is set to open in Spring 2022, and it offers capital grants to consumers to install heat pumps, and in some cases, biomass boilers. For an air source heat pump, grants of £5,000 will be offered and for a ground source heat pump, financial support of £6,000 will be offered.²³² The scheme's £450 million funding is expected to help install 90,000 heat pumps over three years.²³³

111. The reception of the new scheme has been mixed; Zoe Guijaro, Senior Policy Researcher, Citizens Advice, told us “it was really good to see that BEIS have taken on board a lot of feedback from previous grant schemes such as the RHI. But it will still leave a big shortfall” because the grant scheme will not cover the full costs consumers will face when transitioning their homes to low carbon heating, which she projected could be upwards of £20,000.²³⁴ The cost of installing a new heating system can be this high because of the work that might be required to install a heat pump compared to the base cost for a heat pump unit. Associated works to accommodate the changeover to a heat pump system can include energy efficiency measures being required and the adaptations to accommodate these, including: the installation of a hot water tank and necessary plumbing and possible joinery works; new radiators and associated plumbing; the removal and disconnection of an existing gas boiler, as well as works to site the heat pump outside of the property. Asking households to pay upwards of an extra £10,000, as part of the objective of net zero, to replace their existing home heating which is working perfectly adequately is a major challenge. Further concerns about the scheme were expressed by Ian Rippin, CEO, Microgeneration Certification Scheme, a standards organisation, about how the heat pump market through this scheme would scale up to meet the 600,000 installations of heat pumps by 2028 target. He stated that this “seems to be a bit of a void to me”.²³⁵

112. We welcome the new Boiler Upgrade Scheme announced in the Heat and Buildings Strategy. To ensure the success of the scheme, we recommend that in the delivery of the scheme, the Government must:

- (1) *explain what lessons have been learnt from various failed past schemes and how this scheme will therefore be delivered differently,*
- (2) *focus public funds on lower income households and homes which will require the most expensive and/or complicated installations to decarbonise. This will require a fundamental rethink on the support packages currently available. The boiler replacement grants of £5,000 or £6,000 will mean lower income households cannot switch to low carbon heating, when the overall cost may be as high as £15–20,000.*
- (3) *incentivise banks to create low-cost loan products for consumers,*

231 HM Government, [The Heat and Buildings Strategy](#), October 2021

232 HM Government, [The Heat and Buildings Strategy](#), October 2021 p 16

233 HM Government, [The Heat and Buildings Strategy](#), October 2021 p 16

234 [Q114](#)

235 [Q115](#)

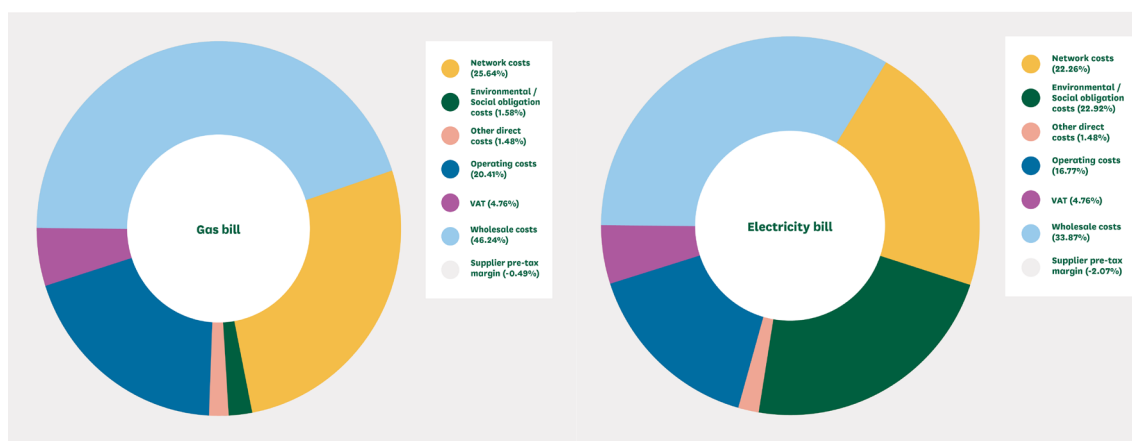
- (4) *partner with industry and trade unions to create jobs and training pathways, and*
- (5) *ensure the scheme lasts for at least a decade instead of merely a few years.*

Environmental levies

113. In the transition to low carbon heating, there is a financial burden on the consumer. We have already explored how financial support schemes from the Government can support the consumer in dealing with the upfront cost of installing low carbon heating systems. This section will focus on how environmental levies, imposed on businesses, and often passed on to consumers, increase the running costs for some low carbon heating systems, for example heat pumps, and how this can be a disincentive to switch to low carbon heating systems. We will explore how levies can be apportioned to mitigate some of these running costs and at the same time incentivise consumers to switch to low carbon heating systems.

114. The Government's website defines environmental levies as "taxes to encourage your business to operate in a more environmentally friendly way".²³⁶ The Regulatory Assistance Project informed us that "[e]lectricity is now cleaner than gas, and electrification of heating will play an important part in the decarbonisation of heating".²³⁷ In the transition to low carbon heating and given the rise of electrification, environmental levies pose a financial barrier to those wanting to transition from the use of natural gas to the use of electricity for the heating of their home. This is because levies placed on a unit of electricity are currently greater than that on natural gas.

115. Ofgem estimates that around 23% of electricity bills (£140/year per home) are made up of 'environmental and social levies',²³⁸ compared to just 2% of gas bills (£11/year per home).²³⁹ Using Ofgem's data, the Energy and Climate Intelligence Unit produced the below figure to show that in 2019, a typical electricity bill was £612, with the total of all levies therefore accounting for £140. To compare, the typical gas bill was £572 and just £11 (2%) was due to environmental and social levies.²⁴⁰



²³⁶ HM Government, [Environmental taxes, reliefs, and schemes for businesses](#), accessed 22 September 2021

²³⁷ HM Government, [Environmental taxes, reliefs, and schemes for businesses](#), accessed 22 September 2021

²³⁸ Ofgem, [Energy data and research](#), accessed 22 September 2021

²³⁹ Ibid

²⁴⁰ Energy and Climate Intelligence Unit, [Energy bills: getting the balance right](#), accessed 8 February 2021

116. Researchers at the University of Oxford noted that the way that environmental levies are currently distributed “negatively impact” the financial attractiveness of heat pumps.²⁴¹ The CCC’s *Sixth Carbon Budget Report* explains that a household switching its heating from a gas boiler to a heat pump would face an extra policy cost of over £100 a year on its energy bills.²⁴² The Energy Systems Catapult add that environmental levies currently “skew consumer choice” in favour of carbon intense heating technologies.²⁴³ Essentially, environmental levies increase the running costs of a heat pump. Researchers from the University of Oxford argued that revising the balance of environmental levies would help address the disparity in the running costs of a gas boiler and a heat pump.²⁴⁴

117. There has been much commercial consensus amongst the evidence submitted to our inquiry that gas and electricity bills should be reapportioned, particularly from companies advocating for heat electrification. OVO Energy suggested that the policy costs should be covered by general taxation instead of levies, and until this is the case, the burden of environmental levies should be “shifted” to gas.²⁴⁵ Similarly, E-ON calls for “removal of legacy policy costs on the electricity bill (funded instead out of general taxation)”.²⁴⁶ Furthermore, Octopus Energy noted that, while in the short-term, policy costs could be moved to gas “in the medium to long-term, a more sustainable solution needs to be found to recovering such costs without distorting investment choices between different systems for heating”.²⁴⁷ Given the ongoing gas market crisis has led to increased energy bills for the consumer, those on standard tariffs, with typical household levels of energy use, could be subject to an increase of £139 - from £1,138 to £1,277 a year,²⁴⁸ shifting policy costs onto gas bills could have similarly significant increases in energy bills. Therefore, a longer-term solution is more favourable; the Energy Systems Catapult told us “policy must work to distribute costs evenly by allowing markets to build up over time”.²⁴⁹

118. Evidence to the inquiry outlined that rebalancing gas and electricity bills will impact vulnerable consumers and the fuel poor. The Energy Saving Trust noted in its written evidence that the average bill savings from improved energy efficiency from schemes funded through the levies (£290 based on Ofgem’s latest estimate of average bills) obscures the impact on low-income households upon whom energy bill levies can have a “regressive impact”.²⁵⁰ Dr Angie Needle, Director of Strategy, Cadent Gas, told us that “[i]f we add a levy on to gas, we have to be really careful, because we are potentially putting people into more extreme fuel poverty [...] Adding to their gas bill is something we need to try to avoid and/or protect those people from as best we can”.²⁵¹

241 Dr Jake Barnes (Researcher at University of Oxford); Dr John Rhys (Researcher at University of Oxford); Dr Sivapriya Bhagavathy (Researcher at University of Oxford) ([DHH0117](#))

242 Committee on Climate Change, [The Sixth Carbon Budget](#), December 2020, p 295

243 Energy Systems Catapult ([DHH0063](#))

244 Dr Jake Barnes (Researcher at University of Oxford); Dr John Rhys (Researcher at University of Oxford); Dr Sivapriya Bhagavathy (Researcher at University of Oxford) ([DHH0117](#))

245 OVO ([DHH0106](#))

246 E.ON UK ([DHH0043](#))

247 Association for Decentralised Energy ([DHH0138](#))

248 BBC, [Energy price caps: Why are fuel bills rising?](#), accessed 4 October

249 Energy Systems Catapult ([DHH0063](#))

250 Energy Saving Trust ([DHH0066](#))

251 [Q90](#)

119. The CCC supports the rebalancing of environmental levies. In the *Sixth Carbon Budget Report*, it proposed that environmental levies could be moved to the Exchequer spend, whereby energy bills would reduce but tax would increase, or spread more evenly across electricity and gas bills.²⁵²

120. From the evidence we have received, it is clear that there is an uneven distribution of environmental levies, which impacts the attractiveness of electrification as an option for low carbon heat because running costs for electrified heat options, such as heat pumps, are higher than the running costs of a gas boiler. However, it is also important to consider that reapportioning the way environmental levies are skewed now could impact the fuel poor and vulnerable households, who could face an increase in their energy bills. This is reflected in the ongoing gas market crisis as the rise in the energy price cap, which limits how much a supplier can charge for their energy, could see the numbers in fuel poverty in England rise to an estimated 4.1 million.²⁵³ In a similar sense, reapportioning environmental levies onto gas bills could push more people into fuel poverty as gas bills will increase. For lower income households that heat electrically—and are twice as likely to be in fuel poverty—energy bills would come down; this would help meet statutory targets. For above average gas users, costs will rise, and some low income and fuel poor households fall into this group.²⁵⁴ This stresses the importance of providing adequate financial support to help consumers switch from gas heating and upgrade the energy efficiency of their homes.

121. The *Net Zero Strategy*, also published on 19 October, states that “we will look at options to shift or rebalance energy levies and obligations away from electricity to gas over this decade”.²⁵⁵ Marcus Shephard, Senior Analyst, CCC, described this as a “clear commitment” from the Government, and added that it is “vital to make heat pumps more cost effective to run”.²⁵⁶ However, Juliet Phillips, Senior Policy Advisor, E3G, stated that the call for action over the decade is “too slow”, instead “we need to have some clearer and faster timelines here”.²⁵⁷ This is particularly pertinent if the Government wishes to meet their heat pump targets by 2028, as if they act earlier there could be a positive impact on the rate of installations.

122. The Government is currently undertaking the Contracts for Difference Auction Round 4, which is the biggest auction to date. It will commit £265 million per year in levies to electricity bills unless there is a change of policy.²⁵⁸ The Nuclear Energy (Financing) Bill, if passed, will allow a new nuclear power station to be constructed using a regulated asset-based funding model.²⁵⁹ The Government’s impact assessment states that the capital and financing cost of a new station will cost between £24 billion and £63 billion, to be financed as a levy on electricity bills.²⁶⁰ The administrative costs associated with the failed

252 Committee on Climate Change, [Progress in reducing emissions 2021 Report to Parliament](#), June 2021, p 298

253 Sky, [Energy crisis: Fuel poverty warning as price cap goes up at time of ‘chaos’ for economy](#), accessed 4 October

254 HM Government, [National statistics: Fuel poverty detailed tables 2019](#), accessed 21 September 2021

255 HM Government, [Net Zero Strategy](#), October 2021, p 22

256 [Q115](#)

257 [Q126](#)

258 GOV.UK, [Contracts for Difference \(CfD\) Allocation Round 4: statutory notices](#), November 2021

259 House of Commons Library, Nuclear Energy (Financing) Bill 2021–22, [CBP-9356](#), January 2022

260 Parliament.UK, [Impact assessment: Regulated Asset Base model for new nuclear](#), October 2021, p13, table 2

retail energy companies and the necessary transfer of customers will also add a further £2 billion of costs onto consumer bills.²⁶¹ We will explore the issue of rising consumer energy bills in our forthcoming *Energy pricing and the future of the Energy Market* inquiry.²⁶²

123. The current apportioning of environmental levies disincentivises the switch to electrified low carbon heating solutions, such as heat pumps, because the running costs are greater than a gas boiler. As we have seen with the ongoing gas market crisis, increases in gas prices have increased energy bills, which has, in turn, disproportionately affected the fuel poor. The reapportioning of environmental levies should not further burden the fuel poor with an even greater increase in energy bills. We welcome the Government’s commitment in the Net Zero Strategy to shift or rebalance energy levies.

124. We recommend that the Government reapportions environmental levies to improve the financial attractiveness of electrified heat and to encourage the uptake of electrified low carbon heating systems incrementally over several years. The levies should reflect the relative carbon emissions of gas and electricity. We further recommend that this reapportioning must be accompanied by mitigating negative impacts on the fuel poor and vulnerable consumers, for example through targeted financial support programmes focusing on fuel poor households.

125. We call on Ministers to mandate the Committee on Fuel Poverty to monitor and report annually on the transition costs on fuel poor households.

261 Parliament.UK, [Impact assessment: Regulated Asset Base model for new nuclear](#), October 2021, p13

262 Business, Energy, and Industrial Strategy Committee, [Energy pricing and the future of the Energy Market](#), accessed 25 January 2021

5 Consumer engagement and protection

126. UK District Energy Association identified that the decarbonisation of home heat is “where the public will ultimately experience the reality of reaching Net Zero. Retrofitting homes and installing low-carbon heating systems will test the public’s willingness to adapt and support Britain’s Net Zero ambitions”.²⁶³ Achieving net zero by 2050 to a large extent depends on having the right mix of policy targets, financial incentives and support and public engagement. Electrical Safety First stated that “public awareness and engagement are critical to ensure policy becomes reality.”²⁶⁴ For changes to be made in homes, whether that be replacing pipework, radiators or boilers or even installing additional equipment, consumers need to be made aware of the transition to low carbon heat, buy in to the transition, and undergo some level of behavioural change. Crucially, this behavioural change is brought about by gaining the confidence of consumers and ensuring consumer protections.

Consumer awareness

127. The *Energy White Paper* stated that “public awareness is low about the connection between climate change and how we heat homes”²⁶⁵ and “the majority of the population has not heard of low carbon heating technologies”.²⁶⁶

128. In May 2021, Ofgem published the results from its annual consumer engagement survey for 2020. It found that the majority of consumers believe that they are already doing all they can to save energy at home.²⁶⁷ The survey identified that barriers to the adoption of low carbon technologies included high perceived costs, perceived disruption from the installation process, and doubts about reducing energy bills.²⁶⁸ Similar findings were reported by the Social Market Foundation (SMF) in *Boiler alert: addressing the challenges and trade-offs from the decarbonisation of home heat* (November 2020). Of the people SMF surveyed, more than 30% were not familiar with alternatives to conventional gas heating.²⁶⁹ It is apparent, therefore, that consumer awareness of the transition to low carbon heat is low.

Consumer buy-in and behavioural change

129. Consumer buy-in and behavioural change is a key facet of consumer awareness. Network owners regarded consumer buy-in as one of the greatest barriers in the delivery of low carbon heating technologies.²⁷⁰ Moreover, the Decarbonisation of Homes in Wales Independent Advisory Group at the UCL Centre for Behaviour Change highlighted that “scaling up the adoption of low carbon heating technologies will require behaviour change

263 Social Market Foundation ([DHH0027](#))

264 Electrical Safety First ([DHH0023](#))

265 Department for Business, Energy and Industrial Strategy, *Energy White Paper*, [CP 337](#), December 2020, p 100

266 Department for Business, Energy and Industrial Strategy, *Energy White Paper*, [CP 337](#), December 2020, p 100

267 Ofgem, [Consumer Survey 2020: Update on Consumer Engagement with Energy](#), April 2020

268 Ibid

269 Social Market Foundation, [Boiler alert: addressing the challenges and trade-offs from the decarbonisation of home heat](#), November 2020

270 [Q33-36](#)

at levels that are unprecedented in this sector”.²⁷¹ It continued that “[p]olicy will need to be drafted in ways that ensure it is targeting the key influences for each behaviour required”.²⁷² This is echoed by the CCC in the *Sixth Carbon Budget Report*, it argued that “[p]olicies for the 2020s must be designed to encourage the sorts of societal and behaviour changes that would reduce emissions”.²⁷³ Emma Harvey, Programme Director, Coalition for the Energy Efficiency of Buildings, Green Finance Institute, asserted that “[b]ehavioural change does not happen by itself,” and suggested that both the Government and industry would need to instigate extensive public awareness campaigns.²⁷⁴ The Social Market Foundation agreed and argued that the Government should promote a “much more widespread public understanding of the need to transition to low carbon heat systems and secure buy-in for the policies needed”.²⁷⁵

130. The CCC’s *Sixth Carbon Budget Report* supported the role of Government in guiding people to make the right choices and bring about behavioural change.²⁷⁶ Citizens Advice suggested that the Government should “undertake a review of the required behaviour change to decarbonise and how to achieve it”.²⁷⁷

Consumer awareness campaign

131. Currently, in terms of engaging consumers in the decarbonisation of domestic heat, the Government is supporting simpleenergyadvice.org.uk,²⁷⁸ which is an impartial energy advice service that was created in conjunction with BEIS. However, the Government has put the onus on the individual consumer to get in touch with the advice service to become informed about the transition to low carbon heat, instead of actively educating the public. The National Housing Federation pointed out, however, that “a website and helpline alone will not deliver the change in hearts and minds that is required”.²⁷⁹ Currently, for the consumer to be educated about the transition to low carbon heating, they have to proactively seek the information.

132. Witnesses to the inquiry called for an awareness campaign to be developed. SSE, an energy company, noted that an effective awareness campaign would “highlight the societal benefits of the transition against some inevitable short-term disruption in the heat experience as construed today”.²⁸⁰ The Aldersgate Group agreed that a campaign would “highlight the benefits of new heating technologies to address consumer concerns and gain public acceptability for these solutions”.²⁸¹

133. An added benefit of such a campaign would be to help the Government build consumer trust, which could in turn encourage consumers to invest in low carbon heat. Citizens Advice explained that a part of building trust with consumers is by using “trusted

271 UCL Centre for Behaviour Change, Decarbonisation of Homes in Wales Independent Advisory Group ([DHH0082](#))

272 Ibid

273 Committee on Climate Change, [The Sixth Carbon Budget](#), December 2020, p 89

274 [Q103](#)

275 Social Market Foundation ([DHH0027](#))

276 Committee on Climate Change, [The Sixth Carbon Budget](#), December 2020, p 55

277 Citizens Advice ([DHH0040](#))

278 The website was developed in conjunction with the Department for Business, Energy, and Industrial Strategy. It provides consumers with advice on energy efficiency and low carbon heating options.

279 National Housing Federation ([DHH0046](#))

280 SSE ([DHH0061](#))

281 Aldersgate Group ([DHH0054](#))

channels and provid[ing] particular support to vulnerable consumers”.²⁸² According to SGN, a gas distribution company, moving away from “negative messaging” of gas boilers being “banned” to “positive messaging” of installations happening by a certain date is a “more effective way of engaging the public in the transition”.²⁸³ This move to “positive messaging” could also serve to build public confidence and trust.

134. The Association for Decentralised Energy detailed that a part of developing and delivering a national awareness campaign is “ensuring that tradespeople are familiar with and can advise customers on a range of heat decarbonisation technologies”.²⁸⁴ However, Mathew Copeland, Policy Manager, National Energy Action, told us low income and vulnerable households “really value having advice from trusted third parties, not necessarily from their suppliers, where there might be a bit of a lack of trust at times”.²⁸⁵

135. Local authorities could play a central role in raising public awareness of the transition to low carbon heat. The UK Collaboratorium for Research on Infrastructure and Cities said that “[g]iving leadership to local authorities in any engagement is a must”,²⁸⁶ and the Microgeneration Certification Scheme, an energy standards organisation, suggested that this should be “funded by the Government and delivered through Local Authorities”.²⁸⁷ The Energy Saving Trust recommended “central coordination to ensure consistent advice and quality, combined with regional/ local delivery”.²⁸⁸ It is clear that, whatever form of consumer engagement the Government adopts, stakeholders envisage a key role for local authorities in the delivery of that engagement.

136. On 2 June 2021, the Scottish Government launched a major new TV, radio, and digital campaign to encourage people to tackle the climate emergency. The *Let’s do Net Zero* campaign aims to highlight the benefits to society of working towards and achieving net zero. The campaign will be rolled out in two phases: the first phase will focus on informing the public in Scotland about the climate emergency and net zero, signposting to the website [netzeronation.scot](https://www.netzeronation.scot) for information. The second phase will outline what Scotland as a whole is doing. Naomi Baker, Policy Officer, Energy Saving Trust, told us “we need the kind of advice service that is currently running in Scotland, funded by the Scottish Government, Home Energy Scotland. That is impartial and Government-backed advice”.²⁸⁹

137. The Secretary of State acknowledged that there was “a job to be done to drive people’s knowledge and consciousness” but highlighted that progress had been made over the past five years: “[p]eople are talking about boilers and heat pumps. They are reading about what we might be doing to gas boilers. They are reading about alternatives to gas, and they are conscious—not everybody, but more and more people are”.²⁹⁰ However, the increase in ‘general awareness’ described by the Secretary of State is not currently resulting in large

282 Citizens Advice ([DHH0040](#))

283 SGN ([DHH0057](#))

284 Association for Decentralised Energy ([DHH0138](#))

285 [Q6](#)

286 UK Collaboratorium for Research on Infrastructure and Cities ([DHH0030](#))

287 MCS Charitable Foundation and MCS Service Company Ltd (MCS Certified) ([DHH0109](#))

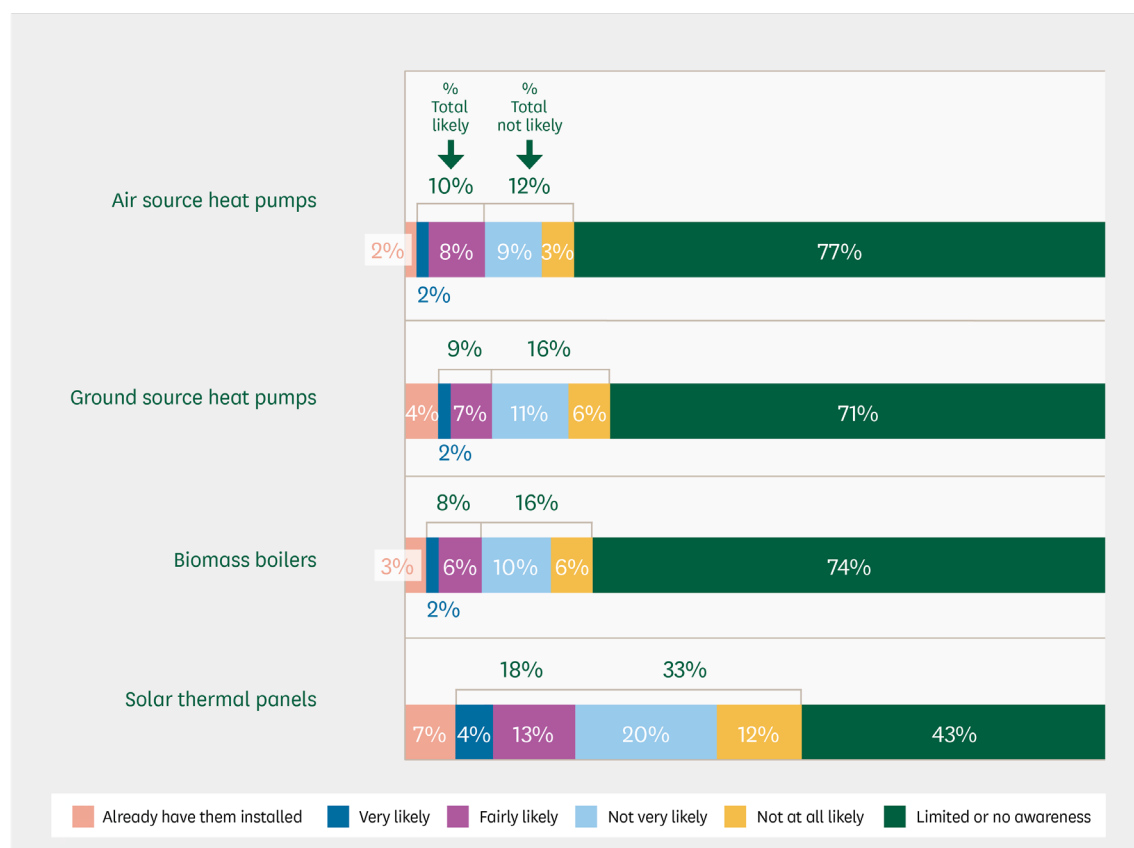
288 Energy Saving Trust ([DHH0066](#))

289 [Q128](#)

290 [Q103](#)

scale behavioural change. The below figure taken from the BEIS Public Attitudes Tracker (December 2020, Wave 36, UK) official statistics conveys that respondents' 'likelihood' of installing renewable heat systems in the next few years is limited.

Likelihood of installing renewable heat systems in the next few years (based on all people) December 2020



Clearly, familiarity with the term 'heat pump' does not necessarily mean that the level of consciousness or awareness around heat pumps has changed nor does it mean that consumers are ready to accept the great changes required in their homes.

138. The *Heat and Buildings Strategy* recognises that there is “currently low public awareness of any need to switch to low-carbon heat sources and systems and little understanding of the scale of the challenge”.²⁹¹ However, the Strategy does not outline a comprehensive programme of how public awareness can be increased. It states that “we will review and improve our communications to ensure that the public have the information they need to make decisions that are best suited to their building and heating needs”.²⁹² However, this does not go far enough. Juliet Phillips states that there is “much more of a need for a nationwide awareness and information push”.²⁹³ This is supported by Zoe Guijaro, Senior Policy Researcher, Citizens Advice, who informed us that we need to see commitments to public awareness “actioned”.²⁹⁴

139. **Consumer engagement and awareness when it comes to the decarbonisation of domestic heat is low. One of the greatest shortfalls of the Heat and Buildings Strategy is**

291 HM Government, [The Heat and Buildings Strategy](#), October 2021 p 182

292 HM Government, [The Heat and Buildings Strategy](#), October 2021 p 183

293 [Q121](#)

294 [Q134](#)

that it misses the opportunity to outline the Government’s plan to drive up consumers’ understanding of the importance of the transition to low carbon heating in homes. The Government’s commitment to “review and improve [its] communications” does not go far enough. We note that the Scottish Government has an independent advice body, Home Energy Scotland. If people are not aware that a change needs to be made in their home and for what purpose the change needs to be made, then the Government will fail to deliver low carbon domestic heat by 2050 through slower uptake and loss of public support.

140. It is clear that current technologies to decarbonise home heating lack widespread consumer awareness and are at price points that make transition costly for most households. The sector needs to demonstrate more commitment to improving their product capabilities and greater potential for price reductions as production volumes increase. The costs of innovations in decarbonising home heating currently lie too heavily on households for us to be confident that consumers will not balk at the impact on their family budgets.

141. *The Government should establish a national consumer awareness campaign that, as a minimum, informs the public on why the decarbonisation of heat is needed, what low carbon heating solutions are available and the changes that consumers may have to make in their homes to install low carbon heating. The Government should require energy suppliers to send this information to households alongside their energy bills.*

Consumer protections

142. Simply educating households about the transition to low carbon heating options will not bring about the change required; instead, households need to have the confidence to do this. A key part of this confidence is robust consumer protections. Thus, alongside a national consumer awareness campaign, stakeholders have identified the need for greater consumer protections. UK Heating Matters, an organisation of technology companies, told us that “[l]ow carbon heating must become more attractive, regulated, and visible to households”.²⁹⁵ We have been told by Citizens Advice that these consumer protections should cover all households especially the fuel poor and vulnerable households.²⁹⁶

143. Juliet Phillips, Senior Policy Advisor, E3G, explained that “[a]s people are retrofitting their homes, we need to make sure it is of the highest quality and that people are getting good value for money in the transition”.²⁹⁷ This means that consumer protections should cover the standards of work that are carried out by energy companies and the rates that energy companies set to carry out the work needed. This is corroborated by Stephen Knight, Managing Director, Heat Trust, who argued that “it is really critical that there are consumer protections in place to ensure that consumers are not ripped off”.²⁹⁸

144. Stakeholders informed us that the Government must learn from the failures of previous government schemes, when consumers were unprotected from sub-standard works. Policy Connect explained that:

295 UK Heating Matters ([DHH0032](#))

296 Citizens Advice ([DHH0040](#))

297 [Q119](#)

298 [Q6](#)

As the failure of the Green Deal²⁹⁹ highlighted, the quality assurance framework of the scheme was found to be overly complex, yet did not guarantee high quality work. The scheme demonstrated that energy efficiency and low carbon measures can have a complex nature and especially in the case of new schemes, products and technologies, consumers are likely to have limited understanding of how they work and potential risks. This highlights that a key element of consumer protection strategies is to set adequate quality assurance frameworks and standards.³⁰⁰

The Government must learn from the failure of past policy to deliver strong, accessible consumer protections which will safeguard consumers from poor quality low carbon heating technology installations.

145. Citizens Advice emphasised that consumer protections should be extended to all installations of low carbon heating systems not just those installed under a government support scheme.³⁰¹ This is furthered by Naomi Baker, Policy Officer, Energy Saving Trust, who stated that if a consumer invests in low carbon heating technologies themselves they need to be assured that protections are in place because “[w]e do not have time to have any poor performance hindering this route”.³⁰² To altogether avoid the issue of poor-quality installations, the Social Market Foundation recommended that a “consultation on current installation standards[...]should also be undertaken to identify where new rules might improve the minimum standards in the industry”.³⁰³

146. By improving and strengthening consumer protections, consumers’ confidence to install low carbon heating solutions may increase. The Centre for Research into Energy Demand Solutions stated that stronger consumer regulation will encourage customers to “feel they can advance into a market in which they have little experience with confidence and protection”.³⁰⁴ Ombudsman Services informed us that without a robust consumer protection framework “there is a risk that consumer trust in a nascent industry will not increase, impacting negatively on consumer uptake”.³⁰⁵ Essentially, a robust consumer protection framework is vital for building consumers’ trust and confidence to install low carbon heating technologies.

147. Creating a robust set of consumer protections requires a suitable regulator; witnesses suggested that Ofgem should regulate heat. Policy Connect told us that “a more comprehensive review is needed of Ofgem’s role in heat”.³⁰⁶ This is because Ofgem already regulates power and gas. Mathew Copeland, Policy Manager, NEA, conveyed that alongside the fuels that create heat, heat should be regulated because this means that “no matter how heat is created, there will be adequate protection and regulation for vulnerable consumers”.³⁰⁷ He noted that the Government should work with Ofgem to determine how

299 The Green Deal was a Government scheme that provided loans to households to finance energy efficiency home improvements. The loan was designed to be paid back through savings made on energy bills. The scheme ran from 2013 to 2015 - it was a failure.

300 Policy Connect ([DHH0094](#))

301 Citizens Advice ([DHH0040](#))

302 [Q128](#)

303 Social Market Foundation ([DHH0027](#))

304 Centre for Research into Energy Demand Solutions (CREDS) ([DHH0101](#))

305 Ombudsman Services ([DHH0035](#))

306 Policy Connect ([DHH0094](#))

307 Mr Matthew Copeland (Policy Manager at National Energy Action) ([DHH0038](#))

to regulate heat.³⁰⁸ In oral evidence to our inquiry, Neil Kenward, Director of Strategy and Decarbonisation, Ofgem, told us that “Ofgem probably is the future heat regulator”.³⁰⁹ To ensure adequate consumer protections are in place, the Government has to determine who will regulate the heat sector and one of these options is Ofgem. There is agreement that Ofgem would be best placed to fulfil the role of regulator, and thus, there is no apparent reason to delay the decision.

148. Zoe Guijaro, Senior Policy Researcher, Citizens Advice, informed us that “one major key piece that is missing [in the *Heat and Buildings Strategy*] is consumer protection”.³¹⁰ She outlined that currently protections are in place for those accessing Government funding to install low carbon technologies, mostly heat pumps, and that there are almost no protections in place for those installing low carbon technologies without Government funding support. Thus, she stated that there is “a need for a wholesale review of consumer protections”.³¹¹ This was also highlighted by Marcus Shephard, Senior Analyst, CCC, who informed us that “the lack of strong systems for quality assurance, compliance checks, and wider regulation and governance creates some contradictions within the policy framework that has been laid out”.³¹²

149. Currently, there are no sufficiently robust consumer protections in place for the heating sector, especially for poor quality installations. The Heat and Buildings Strategy failed to set out a robust consumer protections framework that will build consumer confidence and trust in energy companies and the heating sector as a whole. To protect consumers, a robust framework of protections must be brought in for the heating sector to ensure that standards are maintained and that, where failures take place, consumers have options for recourse. We also recommend that the Government should give Ofgem the responsibility to regulate companies and providers in the heating sector, as well as the powers and resources it will need to introduce and enforce robust consumer protections. The Government should also establish an ombudsman process to manage individual complaints.

308 Mr Matthew Copeland (Policy Manager at National Energy Action) ([DHH0038](#))

309 [Q51](#)

310 [Q114](#)

311 [Q114](#)

312 [Q115](#)

6 Governance and co-ordination

150. Net zero is a target enshrined into law by the Government, so, as the Heat Pump Federation noted, the Government must take “the lion’s share of responsibility for delivering Net Zero by 2050”.³¹³ However, to deliver net zero, the Government must co-ordinate with other actors, such as local authorities and energy networks, to formalise a governance structure that will drive policy decisions and deliver the decarbonisation of domestic heat.³¹⁴ As James Richardson explained “[w]e need much more clarity on who does what and how that is all going to be co-ordinated”.³¹⁵ In this final chapter, we focus primarily on England and on the role of local authorities in the transition to low carbon domestic heat, the opportunities of creating a national delivery body and the role of, and co-ordination between, Government departments to deliver low carbon domestic heat.

Local authorities

151. In addition to adopting a local approach to increasing public awareness around the decarbonisation of heat (as outlined in the previous chapter), evidence to our inquiry has also highlighted the necessity of a localised approach to the delivery of low carbon heat. The Energy Networks Association told us that “[s]olutions [to decarbonise domestic heat] will be driven locally as well as nationally”.³¹⁶ Hence, localised approaches are becoming prevalent in the challenge to decarbonise domestic heat, whether that be through the Energy System Catapult’s Local Area Energy Planning³¹⁷ or the Government’s zoning plans.³¹⁸ This notion of the localised delivery of heat is presented in the 2021 *Progress Report to Parliament*, where the CCC established that “there is an urgent need to formalise a governance framework to drive decisions on heat infrastructure and zoning from the mid-2020s, including a role for area-based energy plans”.³¹⁹

152. SSE, an energy company, established that a localised approach warrants a greater role for local authorities as they are most aware of the challenges and opportunities for their local areas.³²⁰ SSE went further to state that, due to the decarbonisation of heat occurring at different rates across the country, “local authorities should also have flexibility to set local trajectories, based on their circumstances, in order to decarbonise heat in the most cost-effective way”.³²¹ The University of Southampton told us that the greater role of local

313 Heat Pump Federation ([DHH0128](#))

314 In June 2021, we launched our inquiry: Net Zero Governance. The terms of reference can be found on the Committee’s website: Business, Energy, and Industrial Strategy Committee, [Call for Evidence](#), accessed 18 September 2021. Our first evidence session for the inquiry was held on 21 September 2021.

315 [Q42](#)

316 Energy Networks Association ([DHH0021](#))

317 Local Area Energy Planning is a methodology to deliver cost effective low carbon technologies. It was developed by the Energy Systems Catapult. There are four key elements of the methodology: the use of robust technical evidence to consider the whole energy system; a comprehensive assessment of wider non technical factors; a well-designed and involving social process which engages appropriate stakeholders; and a credible and sustained approach to governance and delivery. See for further detail: <https://es.catapult.org.uk/reports/local-area-energy-planning-the-method/>

318 Zoning is the process of identifying areas of land upon which specific policies, laws, regulations, or powers apply. BEIS has adopted this concept of zoning to deliver low carbon heating, for example, through heat network zoning.

319 Committee on Climate Change, [Progress in reducing emissions 2021 Report to Parliament](#), June 2021, p 170

320 SSE ([DHH0061](#))

321 SSE ([DHH0061](#))

authorities will also promote greater accountability.³²² Essentially, a localised approach to delivering heat stipulates greater involvement from local authorities, which promotes accountability.

153. We heard that the powers, roles, and responsibilities of local authorities to deliver low carbon heat locally needs to be clearly defined; the Microgeneration Certification Scheme, an energy standards organisation, told us that “greater clarity about [local authorities] role is needed to stimulate the investment needed to meet Net Zero”.³²³ Alongside being involved in the delivery of low carbon heat, witnesses have explained that local authorities should be given a role in the design of heat policy. Polly Billington, CEO of UK100, went further and suggested that local authorities should be involved in policy design because “they will understand where you are going to have residents’ buy-in, where you are going to have residents’ resistance and what kind of technologies will work”.³²⁴

154. The Institute for Government noted in its report, *Net Zero how government can meet its climate change targets*, published in September 2020, that the Government “needs to find new ways of supporting local authorities, which have a critical role but lack capability and resources”.³²⁵ Moreover, the Centre for Research into Energy Demand Solutions argued that local authorities should be given greater resources to deliver decarbonised domestic heat.³²⁶ Ambion Heating, a company delivering computer-controlled infrared heating, explained that “[g]iven the widespread underfunding of local authorities, additional funding should be provided”.³²⁷ Moreover, the Durham Energy Institute highlighted “the [Heat and Buildings Strategy] should empower them”.³²⁸

155. Commenting on the current co-ordination between local and central government, the Secretary of State said “the whole way we talk to local government about net zero is at an early stage. The legislation was passed only two years ago”.³²⁹ It is understandable due to the considerable pressures posed by the Covid-19 pandemic; however, it is disappointing that despite it being more than two years since legislation entrenching net zero into law was passed, the Government is only at a very early stage of discussions with local governments. Therefore, this must be a priority if the Government’s own targets to decarbonise domestic heat are to be achieved.

156. In the *Heat and Buildings Strategy*, the Government recognises that “[a]cross the UK, local areas have already made great strides towards our Net Zero future”.³³⁰ It also recognises the key role that local authorities already play in the decarbonisation of heating, including developing and delivering heat network connections, implementing, and enforcing national regulations and enforcing minimum energy efficiency standards. However, there are barriers to local action, including limited resources and the ability to access relevant technical expertise, and this is recognised in the *Heat and Buildings Strategy*. And so, the Government commits to undertake further work to understand these constraints and identify where it can support local authorities.

322 University of Southampton ([DHH0064](#))

323 MCS Charitable Foundation and MCS Service Company Ltd (MCS Certified) ([DHH0109](#))

324 [Q34](#)

325 Institute for Government, [Net zero how government can meet its climate change targets](#), September 2020

326 Centre for Research into Energy Demand Solutions (CREDS) ([DHH0101](#))

327 Ambion Heating ([DHH0036](#))

328 E.ON UK ([DHH0043](#))

329 [Q95](#)

330 HM Government, [The Heat and Buildings Strategy](#), October 2021 p 108

157. The *Heat and Buildings Strategy* also outlines the role that local authorities and other local actors can play now to decarbonise buildings, including planning for decarbonisation including gathering and mapping data on local energy infrastructure, decarbonising their own stock (including their own non-domestic buildings) and focusing support to help tackle homes with low energy performance and address fuel poverty.³³¹

158. **We were pleased to see in the Heat and Buildings Strategy the Government's recognition of the role that local authorities play in the decarbonisation of domestic heat and the net zero agenda as a whole. The Government must avoid setting unfunded mandates for local and regional governments to deliver its national targets. We recommend that in the Spending Review, the Government considers what additional resources may be needed by local and regional governments in England to deliver this crucial part of the Government's overall strategy to deliver net zero by 2050.**

A national delivery body?

159. Given the need for close working and co-ordination between central and local government, and a range of organisations at regional and local level, the National Grid Electricity System Operator told us that “a clear framework and single point of coordination would help to facilitate this transition”.³³² In its report, *Net Zero: the road to low carbon heat* (July 2020), the CBI and the University of Birmingham called for a “National Delivery Body (NDB)” which should be “an independent, impartial body that will work with government on creating, coordinating and delivering an overarching national decarbonisation of heat programme”.³³³ They added that it was crucial that the decarbonisation of heat programme should be “locally formulated and locally delivered by local authorities who will synergise their own local and energy plan with the national programme”.³³⁴

160. Witnesses to our inquiry suggested a number of key roles and responsibilities for the delivery body. Jenny Hill, Head of Buildings and International Action, CCC, highlighted the fact that “in the UK we are missing that middle tier of governance between central Government and local government”.³³⁵ So, the Association for Decentralised Energy envisaged that the delivery body could work as a “conduit between local and national government”.³³⁶ SSE, an energy company, further suggested that it could “oversee and coordinate local authorities’ activities” to provide advice, skills support and share best practice.³³⁷

161. Additionally, the Association for Decentralised Energy suggested that it is a centre for expertise and knowledge sharing, “creating a central repository for evidence to support long-term decision making on low carbon heat”,³³⁸ and Energy UK suggested that the delivery body “coordinate efforts to tackle the stark knowledge gap” and deliver the public awareness needed.³³⁹ The Association for Decentralised Energy also sees a

331 HM Government, *The Heat and Buildings Strategy*, October 2021 p 107–109

332 National Grid Electricity System Operator (DHH0034)

333 CBI; University of Birmingham, *Net Zero the road to low carbon heat*, July 2020, p 11

334 Ibid

335 Q49

336 Association for Decentralised Energy (DHH0138)

337 SSE (DHH0061)

338 Association for Decentralised Energy (DHH0138)

339 Energy UK (DHH0095)

role for the delivery body to “support consumers by providing financial mechanisms and reducing costs”.³⁴⁰ The Association for Decentralised Energy has outlined that the delivery body could work across sectors “to bring together decision-making on transport, communications, national energy networks, and more”.³⁴¹ This strategic oversight will mean that the delivery body is a crucial actor not just in the decarbonisation of heat but also in the transition to net zero as a whole.

162. Stakeholders, such as, the Microgeneration Certification Scheme³⁴² and the Association for Decentralised Energy³⁴³ suggest that the *Heat and Buildings Strategy* should set out the powers, roles, and responsibilities of the national delivery body.

163. **Throughout our inquiry we have heard about the co-ordination gap between central policies and the delivery of these policies at the local level. It is an oversight of the Heat and Buildings Strategy that it did not explore how the delivery of low carbon heat can be improved. Further to our recommendation to establish a heat decarbonisation sector deal, we recommend that Ministers engage local and regional government representatives in this sector deal.**

A defined role for the new Department for Levelling Up, Housing and Communities

164. In September 2021, the Prime Minister’s expanded the role of the Ministry of Housing, Communities, and Local Government (MHCLG), to become the Department for Levelling Up, Housing, and Communities.³⁴⁴ While local government was dropped from the title, it is still within the remit of this Department; the website for the Department for Levelling Up, Housing, and Communities states that its work focuses on “investing in local areas to drive growth and create jobs, delivering the homes our country needs, supporting our community and faith groups, and overseeing local government, planning and building safety”.³⁴⁵ Despite this change to the machinery of Government, we believe that much of what we heard in our inquiry still remains valid and that the newly created Department should heed to the criticisms of its predecessor.

165. Evidence to our inquiry heard that there is limited co-ordination across Government departments on the decarbonisation of domestic heat, including between BEIS and the then Ministry for Housing, Communities and Local Government (MHCLG). The CCC’s *Progress Report to Parliament* Report 2021 stated that “[t]here are signs of a multi-speed approach within Government to raising ambition and putting in place effective policies. Some departments (e.g., Defra, MHCLG, but also parts of BEIS and the Treasury) are lagging behind others and appear timid in their approach. The path to Net Zero requires high ambition and an effective policy framework in all areas”.³⁴⁶

166. Stakeholders informed us that there was an absence of collaboration and co-ordination across Government departments. The National Housing Federation’s written

340 Association for Decentralised Energy ([DHH0138](#))

341 Association for Decentralised Energy ([DHH0138](#))

342 MCS Charitable Foundation and MCS Service Company Ltd (MCS Certified) ([DHH0109](#))

343 Association for Decentralised Energy ([DHH0138](#))

344 HM Government, [Ambitious plans to drive levelling up agenda](#), accessed 22 September 2021

345 HM Government, [Department for Levelling Up, Housing, and Communities About Us](#), accessed 23 September 2021

346 Committee on Climate Change, [Progress in reducing emissions 2021 Report to Parliament](#), June 2021, p 16

evidence submission: “BEIS leads on energy efficiency, including in homes, but MHCLG holds all the policy levers that are key to improving existing and new housing stock (such as building standards, supply and planning). And HM Treasury hold the purse strings”.³⁴⁷ Similarly, Dr Richard Lowes, Research Fellow and Lecturer, University of Exeter, told us that “[w]hile [BEIS and Ministry of Housing, Communities and Local Government] are now talking to each other much more than they were, there is still no official governance relationship between the two”.³⁴⁸ Dr Lowes cites the example of the Future Homes Standard (which now sits with the Department for Levelling Up, Housing, and Communities, formerly with MHCLG) to demonstrate an example of where there should be collaboration between the Departments. Polly Billington, CEO, UK100, highlighted the fallacy that MHCLG, who hold a direct relationship with local government, “does not have net zero, decarbonisation or climate change right at its heart”.³⁴⁹ The UK Collaboratorium for Research on Infrastructure and Cities explicitly states in its evidence that the governance of the decarbonisation of heat will require the “alignment” of BEIS and MHCLG.

167. The National Housing Federation highlighted that the *Heat and Buildings Strategy* “needs to set out how government will work together to deliver the net zero ambition”.³⁵⁰ Councillor David Renard, Chair of the Environment, Economy, Housing and Transport Board, Local Government Association, told us that “[w]e are also aware that a lot of the work takes place in different Government Departments, so we really need to see a joined-up approach across the whole of Government and work with partners, both locally and nationally. It is really about co-ordination for us”.³⁵¹

168. We asked the Secretary of State about the co-ordination between BEIS and MHCLG. He replied that he has set up a net zero buildings council with MHCLG so that “[w]e can try to work in a very co-ordinated way. We have worked in a co-ordinated way, but we want to continue doing that and making the case as coherently as we can within Government”.³⁵² The Secretary of State was unable to elaborate or explain what co-ordination there is between the departments and what future plans for co-ordination look like. With the creation of the new Department for Levelling Up, Housing, and Communities, we are keen to see how it will co-ordinate with BEIS on the decarbonisation of heat.

169. *The Department for Levelling Up, Housing and Communities should give higher priority to the decarbonisation of homes and the support it offers to local and regional government in England, and should, in partnership with the Department for Business, Energy and Industrial Strategy, publish joint milestones and metrics setting out which department is accountable for which aspects of the decarbonisation of heating in homes.*

170. *We call on the COP26 President, the Rt Hon Alok Sharma MP, in his capacity as chair of the Cabinet Office Climate Adaptation and Implementation Committee, to take ministerial responsibility for improved coordination between Departments and to present an annual report to Parliament on progress in the delivery of cross departmental net zero policies.*

347 National Housing Federation ([DHH0046](#))

348 [Q27](#)

349 [Q44](#)

350 National Housing Federation ([DHH0046](#))

351 [Q96](#)

352 [Q106](#)

Conclusions and recommendations

Addressing the policy and regulation gap

1. Ineffective historic heating policy and the absence of a clear, strategic policy direction for low carbon heating has created confusion and uncertainty in the transition to low carbon heating and has affected investor confidence. We welcome the long overdue publication of the Heat and Buildings Strategy. However, a greater amount of clarity is required to give the sector certainty and a clear direction of travel. (Paragraph 30)
2. Evidence was clear that for low carbon heating installations to work effectively and to heat homes adequately, properties need to be upgraded to the correct levels of energy efficiency. It is critical then that Government policies and strategies are interlinked. If people are encouraged to switch to low carbon heating sources without the knowledge or incentive for energy efficiency upgrades, then there are risks of scheme failure and loss of public trust if the new low carbon heating sources are not heating homes to the desired temperature and insulation. (Paragraph 31)
3. *To successfully decarbonise domestic heating in time to deliver net zero by 2050, the Government must provide clear, strategic direction and guidance. The Government must now focus on providing a coherent policy environment that encourages policy consistency and certainty in the transition to low carbon domestic heat.* (Paragraph 32)
4. *We call on Ministers to publish a heat technology road map, produced in partnership with chief technologists from industry partners, to clearly set out the development, scale up and integration milestones of different low carbon heating technologies, and the associated interventions, such as energy efficiency upgrades, and initiatives required to hit our heating targets in the UK. This should be published by September 2022.* (Paragraph 33)
5. We congratulate the Department on its work on heat networks, including the consultation on heat network zoning. We support the rollout of heat networks across the country, the retrofitting of high-density housing, and the installation of heat networks in new build developments. However, we recognise the real concerns of consumers who are often given no choice but to receive their energy supply from one designated supplier. *Whilst the introduction of the Heat Network (Metering and Billing) Regulations has helped, we call on Ministers to urgently give Ofgem the mandate and resources to expand and enforce consumer protections in the heat network market, recognising the often monopoly status of some providers in certain areas of the country.* (Paragraph 45)
6. *We recommend that the Government consider the Scottish Government's approach of legislation for heat networks. If Ministers disagree with the approach taken in Scotland, an explanation in response to this report is required.* (Paragraph 46)
7. Furthermore, the Government must rapidly develop its data collection and records on the location of heat networks, and statistics about their use. Without a detailed understanding of how many heat networks are operational in the UK and where they

are located, the Government cannot effectively regulate the use of heat networks. *We recommend that the Government publish annual statistics about their use on its website.* (Paragraph 47)

8. We note that the then Ministry for Housing, Communities and Local Government felt it only played a “limited role” in the decarbonisation of heating in housing and demand that Ministers prioritise this crucial work more clearly in the future. (Paragraph 52)
9. The Future Homes Standard is another key policy in the Energy White Paper. It aims for new build homes to be fitted with low carbon heating, and high levels of energy efficiency to ensure that homes built to the Future Homes Standard will be zero carbon ready and have 75% to 80% lower carbon emissions than those built to current standards. Considering the Government aims to build one million homes in this Parliament alone, which will be heated by fossil fuel heating systems, it is naïve to assume that these homes will not need to be retrofitted at significant cost. This will be particularly detrimental to families on low incomes and to developments by housing associations. (Paragraph 53)
10. We acknowledge that the Government wants to give industry the time to develop its supply chains; however, this appears to be to the detriment of new build homeowners, who will have to pay to retrofit their homes. It is unnecessary to wait until 2025 to implement the Future Homes Standard. *To minimise expensive retrofit costs, the Government should bring forward the implementation of the Future Homes Standard to 2023 instead of 2025.* (Paragraph 54)
11. *We also call on Ministers to set out, in response to this report, what measures are being considered to assist tenants who rent their homes in managing the transition to low carbon heating with their landlords; and what support might be put in place for housing associations and equivalent social housing providers with the costs of retrofitting newly built houses heated by gas boilers.* (Paragraph 55)
12. Delivering net zero by 2050 will require a ban on the installation of fossil fuel heating systems by the mid-2030s at the latest. We note that the Government signalling, instead of setting, an end-date for the phase out of gas boilers fails to give industry and consumers a clear date to work towards in decarbonising home heating. We urge the sector to come forward with more ambitious plans for pricing and innovation to encourage a robust regulatory framework. (Paragraph 60)
13. *We recommend that in the context of the phasing out of gas boilers, the Government adopts a clear and specific end-date by regulating through legislation the phase out of gas boilers. We also recommend that the Government sets out its plan on how it expects the industry and consumers to phase out the installation and use of gas boilers by 2035.* (Paragraph 61)

Supply chains and skills

14. It is vital that the Government should meet its target to deliver a minimum of 600,000 heat pumps a year by 2028 or it will fall off course in delivering net zero by 2050. The Government has not outlined in the Heat and Buildings Strategy its plans

for how it will meet the heat pump target and what contingencies are in place if the target is missed. *We recommend that a plan is put in place for off gas grid properties. Electrification is the only option for these properties and any programme should be undertaken in conjunction with energy efficiency measures. Such an approach will assist a cohort more likely to be fuel poor.* (Paragraph 68)

15. *We ask the Government to set out in response to this report the intended milestones and targets it has in place to ensure that the UK meets its 2028 target and what funding it will put in place to ensure that each of these milestones is met. The Government must outline what contingencies it has in place to make sure that the heat pump target is fulfilled. The Government must have integrated and coherent policies, such as an effective energy efficiency programme that complements and aligns with the target of 600,000 heat pump installations per year by 2028.* (Paragraph 69)
16. *To ensure that the UK does not fall off course in achieving its targets for carbon emissions reductions, we recommend that the Government works with industry to consider how the Climate Change Committee's advice to deliver 900,000 heat pumps a year by 2028 can be achieved.* (Paragraph 70)
17. *We further recommend that the Government should convene the retail banking sector to encourage and facilitate low-cost and innovative lending products for consumers, and that public funds are used most widely in supporting lower income families with appropriate grants.* (Paragraph 71)
18. The Secretary of State's assertion that the target to deploy 600,000 heat pumps will "have to be delivered" highlights the Government's determination but there is still a lack of specific, strategic action on its part to ensure that low carbon heat targets are delivered. *The Government must set out a clear, long term plan as to how the current rate of installations will be increased in order to scale up the market.* (Paragraph 74)
19. We acknowledge the introduction of the market-based mechanism outlined in the Heat and Buildings Strategy; however, it will not deliver the scaled-up heat pump market needed to achieve the Government's heat pump target. *The Government must expand the market-based mechanism as well as explore other options to catalyse the development and scaling up of the heat pump market.* (Paragraph 75)
20. To meet the Government's targets for decarbonising heat, significant action needs to be taken to innovate and develop low carbon heating markets and in bringing these markets to scale. Scaling up the markets for low carbon heating technologies also offers opportunities for cost reductions. A heat decarbonisation sector deal would create intentional and consistent collaboration between the Government and industry to effectively nurture the low carbon heat markets and reduce costs. (Paragraph 79)
21. *We recommend that the Government introduce a heat decarbonisation sector deal by 2023 so that there may be a heightened focus on scaling up low carbon heating markets and reducing costs.* (Paragraph 80)
22. It is vital that the heating and energy efficiency workforce has the capacity and skills required for the job at hand. This will require training new workers as well as supporting existing workers in the home heating sector. It is imperative that the

Government actively supports and encourages the upskilling of workers, with a commitment to prioritising the existing home heating workforce, through local, work-based training schemes. We expected the Heat and Buildings Strategy to provide a strategic direction on how the heating workforce would be upskilled and we waited a long time for this to be published. However, the strategy failed to adequately deal with this issue. (Paragraph 90)

23. *The Government must urgently develop a low carbon heating training programme, in partnership with industry and trade unions. The training programme should align with the Government's own target to deploy 600,000 heat pumps by 2028 and the plans it has to deliver on this goal. The Government must support and collaborate with industry and trade unions early in development of this training. It should also work with industry and trade unions to develop a low carbon heating technician apprenticeship to encourage young people to enter the sector.* (Paragraph 91)
24. *At present there is no company that operates as a "one stop shop" where customers can procure all the services required for a successful retrofit installation and change to a low carbon heating system. Consideration should be given to project management upskilling with regards to whole system and energy efficiency installations to make it easier for people to be able to convert to low carbon heating systems.* (Paragraph 92)
25. *In addition to working with industry and trade unions, we recommend that the Government works closely with local and regional authorities in England allowing local leaders to deliver coherent services to their populations, for example through the regional delivery of the adult skills budget and promote the connection between net zero policies and 'green job' creation.* (Paragraph 93)

Costs

26. The Green Homes Grant was an important and welcomed initiative. However, the way in which the Government designed the Green Homes Grant, both as a short-term stimulus instead of a long-term national infrastructure project and as a hastily developed, outsourced scheme, was misguided. It is vital that the lessons are learned from the failure of the Green Homes Grant and that these lessons are implemented in the design and delivery of future financial support schemes. (Paragraph 104)
27. *We call on the Government to prioritise the development and launch of a replacement for the Green Homes Grant, delivered locally through regional and local government in England instead of centrally by the Department. Ministers should provide an update on this work in response to this report.* (Paragraph 105)
28. We welcome the new Boiler Upgrade Scheme announced in the Heat and Buildings Strategy. *To ensure the success of the scheme, we recommend that in the delivery of the scheme, the Government must:*
 - 1) *explain what lessons have been learnt from various failed past schemes and how this scheme will therefore be delivered differently,*
 - 2) *focus public funds on lower income households and homes which will require the most expensive and/or complicated installations to decarbonise. This will require*

a fundamental rethink on the support packages currently available. The boiler replacement grants of £5,000 or £6,000 will mean lower income households cannot switch to low carbon heating, when the overall cost may be as high as £15–20,000.

- 3) *incentivise banks to create low-cost loan products for consumers,*
- 4) *partner with industry and trade unions to create jobs and training pathways, and*
- 5) *ensure the scheme lasts for at least a decade instead of merely a few years.*

(Paragraph 112)

29. The current apportioning of environmental levies disincentivises the switch to electrified low carbon heating solutions, such as heat pumps, because the running costs are greater than a gas boiler. As we have seen with the ongoing gas market crisis, increases in gas prices have increased energy bills, which has, in turn, disproportionately affected the fuel poor. The reappportioning of environmental levies should not further burden the fuel poor with an even greater increase in energy bills. We welcome the Government's commitment in the Net Zero Strategy to shift or rebalance energy levies. (Paragraph 123)
30. *We recommend that the Government reapportions environmental levies to improve the financial attractiveness of electrified heat and to encourage the uptake of electrified low carbon heating systems incrementally over several years. The levies should reflect the relative carbon emissions of gas and electricity. We further recommend that this reappportioning must be accompanied by mitigating negative impacts on the fuel poor and vulnerable consumers, for example through targeted financial support programmes focusing on fuel poor households.* (Paragraph 124)
31. *We call on Ministers to mandate the Committee on Fuel Poverty to monitor and report annually on the transition costs on fuel poor households.* (Paragraph 125)

Consumer engagement and protection

32. Consumer engagement and awareness when it comes to the decarbonisation of domestic heat is low. One of the greatest shortfalls of the Heat and Buildings Strategy is that it misses the opportunity to outline the Government's plan to drive up consumers' understanding of the importance of the transition to low carbon heating in homes. The Government's commitment to "review and improve [its] communications" does not go far enough. We note that the Scottish Government has an independent advice body, Home Energy Scotland. If people are not aware that a change needs to be made in their home and for what purpose the change needs to be made, then the Government will fail to deliver low carbon domestic heat by 2050 through slower uptake and loss of public support. (Paragraph 139)
33. It is clear that current technologies to decarbonise home heating lack widespread consumer awareness and are at price points that make transition costly for most households. The sector needs to demonstrate more commitment to improving their product capabilities and greater potential for price reductions as production

volumes increase. The costs of innovations in decarbonising home heating currently lie too heavily on households for us to be confident that consumers will not baulk at the impact on their family budgets. (Paragraph 140)

34. *The Government should establish a national consumer awareness campaign that, as a minimum, informs the public on why the decarbonisation of heat is needed, what low carbon heating solutions are available and the changes that consumers may have to make in their homes to install low carbon heating. The Government should require energy suppliers to send this information to households alongside their energy bills.* (Paragraph 141)
35. Currently, there are no sufficiently robust consumer protections in place for the heating sector, especially for poor quality installations. The Heat and Buildings Strategy failed to set out a robust consumer protections framework that will build consumer confidence and trust in energy companies and the heating sector as a whole. *To protect consumers, a robust framework of protections must be brought in for the heating sector to ensure that standards are maintained and that, where failures take place, consumers have options for recourse. We also recommend that the Government should give Ofgem the responsibility to regulate companies and providers in the heating sector, as well as the powers and resources it will need to introduce and enforce robust consumer protections. The Government should also establish an ombudsman process to manage individual complaints.* (Paragraph 149)

Governance and co-ordination

36. We were pleased to see in the Heat and Buildings Strategy the Government's recognition of the role that local authorities play in the decarbonisation of domestic heat and the net zero agenda as a whole. The Government must avoid setting unfunded mandates for local and regional governments to deliver its national targets. *We recommend that in the Spending Review, the Government considers what additional resources may be needed by local and regional governments in England to deliver this crucial part of the Government's overall strategy to deliver net zero by 2050.* (Paragraph 158)
37. Throughout our inquiry we have heard about the co-ordination gap between central policies and the delivery of these policies at the local level. It is an oversight of the Heat and Buildings Strategy that it did not explore how the delivery of low carbon heat can be improved. *Further to our recommendation to establish a heat decarbonisation sector deal, we recommend that Ministers engage local and regional government representatives in this sector deal.* (Paragraph 163)
38. *The Department for Levelling Up, Housing and Communities should give higher priority to the decarbonisation of homes and the support it offers to local and regional government in England, and should, in partnership with the Department for Business, Energy and Industrial Strategy, publish joint milestones and metrics setting out which department is accountable for which aspects of the decarbonisation of heating in homes.* (Paragraph 169)
39. *We call on the COP26 President, the Rt Hon Alok Sharma MP, in his capacity as chair of the Cabinet Office Climate Adaptation and Implementation Committee,*

to take ministerial responsibility for improved coordination between Departments and to present an annual report to Parliament on progress in the delivery of cross departmental net zero policies. (Paragraph 170)

Formal minutes

Tuesday 25 January 2022

Members present:

Darren Jones, in the Chair

Alan Brown

Richard Fuller-

Nusrat Ghani

Paul Howell

Andy McDonald

Mark Pawsey

Alexander Stafford

Draft Report (*Decarbonising heat in homes*), proposed by the Chair, brought up and read.

Ordered, That the draft Report be read a second time, paragraph by paragraph.

Paragraphs 1 to 170 read and agreed to.

Summary agreed to.

Resolved, That the Report be the Seventh of the Committee to the House.

Ordered, That the Chair make the Report to the House.

Ordered, That embargoed copies of the Report be made available, in accordance with the provisions of Standing Order No. 134.

[Adjourned till Tuesday 1 February at 9:45am]

Witnesses

The following witnesses gave evidence. Transcripts can be viewed on the [inquiry publications page](#) of the Committee's website.

Tuesday 09 February 2021

Dr Richard Lowes, Research Fellow and Lecturer, University of Exeter; **Professor Janette Webb**, Professor of Sociology of Organisation, University of Edinburgh; **Dr Will McDowall**, Associate Professor, University College London, Senior Researcher, Institute for Government; **Professor Nick Eyre**, Professor of Energy and Climate Policy, University of Oxford

[Q1–32](#)

Craig Dyke, Head of Strategy and Regulation, National Grid Electricity System Operator; **Graham Halladay**, WPD Operations Director, Western Power Distribution; **Gus McIntosh**, Director of Energy Futures, SGN; **Ian Rippin**, Chief Executive Officer, Microgeneration Certification Scheme Service Company

[Q33–75](#)

Tuesday 16 March 2021

Steve Keeton, Director of External Affairs, Vaillant Group UK Ltd; **Greg Jackson**, CEO and Founder, Octopus Energy; **Michael Lewis**, CEO, E-ON; **Angie Needle**, Director of Strategy, Cadent Gas

[Q76–88](#)

David Renard, Chair, Local Government Associations' Environment, Economy, Housing and Transport Board; **Patrick Chauvin**, Executive Director - Assets, Stonewater; **Randolph Brazier**, Director of Innovation and Electricity Systems, Energy Networks Association; **George Day**, Head of Markets, Policy and Regulation, Energy Systems Catapult

[Q79–98](#)

Tuesday 20 April 2021

Naomi Baker, Policy Officer, Energy Saving Trust; **Mark Barrett**, Professor of Energy and Environmental Modelling, University College London; **Juliet Phillips**, Senior Policy Advisor, E3G; **Emma Harvey**, Programme Director, Coalition for the Energy Efficiency of Buildings

[Q99–156](#)

Tuesday 08 June 2021

Ed Dodman, Director of Regulatory Affairs, Ombudsman Services; **Stephen Knight**, Managing Director, Heat Trust; **Caroline Bragg**, Head of Policy, Association for Decentralised Energy; **Matthew Copeland**, Policy Manager, National Energy Action

[Q1–32](#)

Jenny Hill, Head of Buildings and International Action, Committee on Climate Change; **Neil Kenward**, Director of Strategy and Decarbonisation, Ofgem; **James Richardson**, Economist, National Infrastructure Commission; **Polly Billington**, Chief Executive Officer, UK100

[Q33–65](#)

Tuesday 20 July 2021

Rt Hon Kwasi Kwarteng MP, Secretary of State, Department for Business, Energy and Industrial Strategy; **Rt Hon Christopher Pincher MP**, the then Minister for Housing, Ministry of Housing, Communities and Local Government; **Charlotte Baker**, Director of Net Zero and Greener Buildings, the then Ministry of Housing, Communities and Local Government

[Q66–153](#)

Tuesday 16 November 2021

Juliet Phillips, Senior Policy Advisor, E3G; **Zoe Guijarro**, Senior Policy Researcher, Citizens Advice; **Ian Rippin**, Chief Executive Officer, Microgeneration Certification scheme; **Marcus Shephard**, Lead Analyst Residential Buildings, Climate Change Committee

[Q114–137/](#)

Published written evidence

The following written evidence was received and can be viewed on the [inquiry publications page](#) of the Committee's website.

DHH numbers are generated by the evidence processing system and so may not be complete.

- 1 Active Building Centre ([DHH0099](#))
- 2 Active Building Centre Research Programme ([DHH0108](#))
- 3 AgilityEco ([DHH0011](#))
- 4 Aldersgate Group ([DHH0054](#))
- 5 Alliston, Dr Alex ([DHH0013](#))
- 6 Ambion Heating ([DHH0036](#))
- 7 Anderson, Dr Ben (Principal Research Fellow, Energy & Climate Change, Faculty of Engineering & Physical Sciences: University of Southampton) ([DHH0059](#))
- 8 Association for Decentralised Energy ([DHH0138](#))
- 9 BEAMA ([DHH0114](#))
- 10 BRE Group ([DHH0111](#))
- 11 Baxi Heating UK ([DHH0007](#))
- 12 Bennamann Ltd ([DHH0050](#))
- 13 Blacklock, Paul ([DHH0005](#))
- 14 Bright Blue ([DHH0004](#))
- 15 Brighton and Hove Energy Services Cooperative ([DHH0084](#))
- 16 British Geological Survey ([DHH0092](#))
- 17 Bulb ([DHH0060](#))
- 18 CBI ([DHH0048](#))
- 19 CIA ([DHH0091](#))
- 20 CPL Industries ([DHH0037](#))
- 21 Cadent Gas ([DHH0012](#))
- 22 Calor ([DHH0098](#))
- 23 Canetis Technologies ([DHH0097](#))
- 24 Cenergist ([DHH0140](#))
- 25 Centre for Alternative Technology ([DHH0024](#))
- 26 Centre for Research into Energy Demand Solutions (CREDS) ([DHH0101](#))
- 27 Chong, Mr Chit (Sustainability Manager, Peabody, BUT RESPONDING AS AN INDIVIDUAL) ([DHH0085](#))
- 28 Citizens Advice ([DHH0040](#))
- 29 Citizens Advice Scotland ([DHH0041](#))
- 30 Clean Air in London ([DHH0042](#))
- 31 Coalition for the Energy Efficiency of Buildings ; and E3G ([DHH0071](#))

- 32 Common Weal Energy Policy Working Group on behalf of Common Weal, Scotland ([DHH0104](#))
- 33 Copeland, Mr Matthew (Policy Manager, National Energy Action) ([DHH0038](#))
- 34 Department for Business, Energy and Industrial Strategy ([DHH0090](#))
- 35 Drage, Eurling Karl (Director, The Kensa Group) ([DHH0110](#))
- 36 Durham Energy Institute, Durham University ([DHH0053](#))
- 37 E.ON UK ([DHH0043](#))
- 38 E3G ([DHH0124](#))
- 39 EDF ([DHH0076](#))
- 40 EDF Energy ([DHH0144](#))
- 41 EOGB Energy Products Ltd ([DHH0020](#))
- 42 Electrical Safety First ([DHH0146](#))
- 43 Electrical Safety First ([DHH0023](#))
- 44 Embassy of Denmark, London ([DHH0072](#))
- 45 Energiesprong UK ([DHH0100](#))
- 46 Energy Networks Association ([DHH0021](#))
- 47 Energy Saving Trust ([DHH0066](#))
- 48 Energy Systems Catapult ([DHH0063](#))
- 49 Energy UK ([DHH0095](#))
- 50 Federation of Master Builders ([DHH0134](#))
- 51 Ferrier, Margaret ((Rutherglen and Hamilton West); and Member of Parliament, House of Commons) ([DHH0017](#))
- 52 GMB ([DHH0031](#))
- 53 GT Energy ([DHH0141](#))
- 54 Gas users Organisation C.I.C. ([DHH0010](#))
- 55 Greater London Authority ([DHH0067](#))
- 56 Green Heat Ltd ([DHH0006](#))
- 57 Grid Edge Policy ([DHH0087](#))
- 58 Ground Source Heat Pump Association (GSHPA) ([DHH0074](#))
- 59 Heat Pump Association ([DHH0080](#))
- 60 Heat Pump Federation ([DHH0128](#))
- 61 Hill, Matthew ([DHH0002](#))
- 62 Husbands, Maurice (Former employee, Shell UK) ([DHH0143](#))
- 63 ICAX Ltd ([DHH0125](#))
- 64 In, OHCS Decarbonising Heat (Director & Principal Consultant, Oil Heating Consultancy Services Ltd) ([DHH0018](#))
- 65 Independent Networks Association ([DHH0026](#))
- 66 Institution of Mechanical Engineers ([DHH0121](#))
- 67 Kensa Group ([DHH0022](#))

- 68 Liquid Gas UK ([DHH0119](#))
- 69 Local Government Association ([DHH0019](#))
- 70 MCS Charitable Foundation and MCS Service Company Ltd (MCS Certified) ([DHH0109](#))
- 71 McLaughlin, Anne ((Glasgow North East); and Member of Parliament, House of Commons) ([DHH0014](#))
- 72 Mills, Mr Francis (Chartered Engineer , Frank Mills Consulting) ([DHH0130](#))
- 73 Mineral Products Association ([DHH0088](#))
- 74 Mineral Wool Insulation Manufacturers Association (MIMA) ([DHH0051](#))
- 75 NHBC ([DHH0118](#))
- 76 NIBE Energy Systems ([DHH0123](#))
- 77 Naked Energy Ltd ([DHH0029](#))
- 78 National Grid Electricity System Operator ([DHH0034](#))
- 79 National Housing Federation ([DHH0046](#))
- 80 National Trust ([DHH0105](#))
- 81 National grid ([DHH0056](#))
- 82 Nationwide Building Society ([DHH0055](#))
- 83 Newcastle University ([DHH0016](#))
- 84 Newlands, Gavin (Member of Parliament, House of Commons) ([DHH0139](#))
- 85 Nottingham Trent University ([DHH0089](#))
- 86 Nuttall, Professor William (Professor of Energy, The Open University) ([DHH0126](#))
- 87 OFTEC ([DHH0102](#))
- 88 OVO ([DHH0106](#))
- 89 Ombudsman Services ([DHH0035](#))
- 90 PHILLIPS, Mr JOHN (Senior Consultant, JPH Performance Management) ([DHH0003](#))
- 91 PassivSystems ([DHH0120](#))
- 92 Pembrokeshire County Council ([DHH0093](#))
- 93 Policy Connect ([DHH0094](#))
- 94 ROCKWOOL UK ([DHH0039](#))
- 95 Recoup Energy Solutions Ltd ([DHH0122](#))
- 96 Regen ([DHH0058](#))
- 97 Regulatory Assistance Project ([DHH0096](#))
- 98 Robert Bosch UK Holdings Ltd ([DHH0015](#))
- 99 Royal Society ([DHH0047](#))
- 100 Ryse Hydrogen ([DHH0115](#))
- 101 SAV Systems ([DHH0028](#))
- 102 SGN ([DHH0057](#))
- 103 SSE ([DHH0061](#))
- 104 Scottish Renewables ([DHH0086](#))

- 105 ScottishPower ([DHH0136](#))
- 106 Social Market Foundation ([DHH0027](#))
- 107 The Association for Decentralised Energy ([DHH0147](#))
- 108 The Association for Renewable Energy and Clean Technology (REA) ([DHH0052](#))
- 109 The Carbon Capture and Storage Association ([DHH0075](#))
- 110 The Hydrogen Taskforce ([DHH0116](#))
- 111 The Sussex Energy Group ([DHH0077](#))
- 112 The Zero Carbon Campaign ([DHH0068](#))
- 113 Thirteen ([DHH0025](#))
- 114 UCL Centre for Behaviour Change; and Decarbonisation of Homes in Wales Independent Advisory Group ([DHH0082](#))
- 115 UCL Energy Institute ([DHH0145](#))
- 116 UK & IRELAND FUEL DISTRIBUTORS ASSOCIATION LTD ([DHH0070](#))
- 117 UK Collaboratorium for Research on Infrastructure and Cities ([DHH0030](#))
- 118 UK District Energy Association ([DHH0127](#))
- 119 UK Energy Research Centre ([DHH0137](#))
- 120 UK Heating Matters ([DHH0032](#))
- 121 UK Noise Association ([DHH0001](#))
- 122 University of Oxford: Dr Jake Barnes (Researcher); Dr John Rhys (Researcher); and Dr Sivapriya Bhagavathy (Researcher) ([DHH0117](#))
- 123 University of Salford ([DHH0044](#))
- 124 University of Southampton ([DHH0064](#))
- 125 VELUX ([DHH0009](#))
- 126 Vaillant Group UK Ltd ([DHH0142](#))
- 127 Vaillant UK LTD ([DHH0112](#))
- 128 Vattenfall Heat UK ([DHH0103](#))
- 129 Wales & West Utilities ([DHH0073](#))
- 130 Waterwise ([DHH0008](#))
- 131 Watts, Mr Gavin ([DHH0062](#))

List of Reports from the Committee during the current Parliament

All publications from the Committee are available on the publications page of the Committee's website.

Session 2021–22

Number	Title	Reference
1st	Post-pandemic economic growth: Industrial policy in the UK	HC 385
2nd	Climate Assembly UK: where are we now?	HV 546
3rd	Post-pandemic economic growth: Levelling up	HC 566
4th	Liberty Steel and the future of the UK steel Industry	HC 821
5th	Pre-legislative scrutiny: draft Downstream Oil Resilience Bill	HC 820
6th	Pre-appointment hearing of the Government's preferred candidate for Chair of the Financial Reporting Council	HC 1079

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Number	Title	Reference
1st	My BEIS inquiry: proposals from the public	HC 612
2nd	The impact of Coronavirus on businesses and workers: interim pre-Budget report	HC 1264
3rd	Net Zero and UN Climate Summits: Scrutiny of Preparations for COP26 – interim report	HC 1265
4th	Pre-appointment hearing with the Government's preferred candidate for the Chair of the Regulatory Policy Committee	HC 1271
5th	Uyghur forced labour in Xinjiang and UK value chains	HC 1272
6th	Mineworkers' Pension Scheme	HC 1346