Department for Energy Security & Net Zero

Evaluation of the Boiler Upgrade Scheme

2024 Interim Report

Research Paper Number 2024/020

Completed by ICF for the Department for Energy Security and Net Zero prior to the recent general election in the United Kingdom in July 2024. As such, any references to government policies, commitments, or initiatives may reflect the stance of the previous administration and were accurate at the time of fieldwork and writing.

July 2024

Acknowledgements

The evaluation team acknowledges and thanks the many individuals who gave up their time and contributed evidence to this evaluation. We also thank the evaluation management team at DESNZ for their valuable input and feedback throughout the study.

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Contents

Glossary

Boiler Upgrade Scheme (BUS)	The Boiler Upgrade Scheme (BUS) is a grant-based mechanism to support the uptake of low carbon heating (LCH) systems in domestic and small non-domestic properties in England and Wales.
Low carbon heating (LCH) system	A low carbon heating (LCH) system is one that provides heat and hot water without using fossil fuels. Examples include the three types of system supported under the BUS (air source heat pumps, ground source heat pumps, and biomass boilers), as well as systems that are not eligible for support under the BUS (e.g. solar water heating systems).
Air Source Heat Pump (ASHP)	An air source heat pump (ASHP) transfers heat from outside a property to heat water (usually in a water tank), which is then used to provide heat and hot water within a property. They are powered by electricity.
Ground Source Heat Pump (GSHP)	A ground source heat pump (GSHP) transfers heat from the ground – whether through a horizontal ground loop or a vertical borehole – to heat water (usually in a water tank), which is then used to provide heat and hot water within a property. They are powered by electricity.
Biomass boiler	Biomass boilers burn organic materials to provide heat and hot water. The organic materials used as fuel typically include wood pellets, wood chips, and wood logs.
Department for Energy Security and Net Zero (DESNZ)	The Department for Energy Security and Net Zero, or DESNZ, is the government department with overall responsibility for the BUS.
The Office of Gas and Electricity Markets (Ofgem)	The Office of Gas and Electricity Markets (Ofgem) is the government regulator for the electricity and gas markets in the UK. Ofgem administers the BUS on behalf of DESNZ.
Liquefied Petroleum Gas (LPG)	Liquefied Petroleum Gas (LPG) is a fuel that can be used within a boiler to provide heat and hot water. It is typically used in off-gas grid properties, as an alternative to natural gas.
Distribution Network Operator (DNO)	Distribution Network Operators (DNOs) control the connection of properties to the National Grid and need to be notified if property owners want major electrical changes to a property (such as installing a heat pump).

Energy Performance Certificate (EPC)	Energy Performance Certificates (EPCs) provide a rating (from A to G) of the energy efficiency of a property. They are valid for 10 years from the date of issue. When the research for this report was carried out, to be eligible for a BUS grant properties were required to have a valid EPC with no outstanding recommendations for loft or cavity wall insulation. This is no longer the case.
Microgeneration Certification Scheme (MCS)	The Microgeneration Certification Scheme (MCS) is an accreditation scheme for installers of small-scale renewable energy technologies, including heat pumps and biomass boilers. Any LCH system installed under the BUS must have been done so by an MCS-certified installer.
The Home Insulation and Energy Systems Quality Assured Contractors Scheme (HIES)	The Home Insulation and Energy Systems Quality Assured Contractors Scheme (HIES) is a consumer protection organisation covering the installation of renewable energy products, including heat pumps and biomass boilers. Like the RECC (see below), members of the HIES go through an accreditation process and commit to abide by the Scheme's rules and code of practice.
Renewable Energy Consumer Code (RECC)	The Renewable Energy Consumer Code (RECC) is a consumer protection scheme for the installation of small-scale renewable heat or power generation systems, including heat pumps and biomass boilers. It is similar to the HIES (see above).
Self-build home	A new home commissioned by the potential user of the home, rather than by a third-party developer. The self-builder's input might vary from doing the actual building work to contracting the work to an architect or building company. Unlike new build homes, self-build homes are eligible for support under the BUS.
Domestic	Domestic properties are buildings which function as a home or other domicile for a household.
Non-domestic	Non-domestic properties are buildings in which businesses or other organisations operate, which do not principally function as a home or other domicile.
Renewable Heat Incentive (RHI)	The Renewable Heat Incentive (RHI) was the predecessor initiative to the BUS, the domestic version of which closed to new applications in March 2022. It provides financial support to increase the uptake of renewable heating technologies, including heat pumps and biomass boilers.

Green Homes Grant – Vouchers (GHG-V) Scheme	The Green Homes Grant – Vouchers (GHG-V) Scheme ran from September 2020 till March 2021, and provided grants to encourage the uptake of energy-saving renovations and renewable heating technologies, including heat pumps and biomass boilers.

Executive Summary

In March 2023, the Department for Energy Security and Net Zero ('the Department') commissioned a combined process, impact, and economic evaluation of the Boiler Upgrade Scheme (BUS). The BUS supports the installation of low carbon heating (LCH) systems – heat pumps and in limited circumstances biomass boilers – in domestic and small non-domestic properties in England and Wales. It subsidises the upfront cost of these systems by issuing grants, delivered in the form of 'vouchers'. In October 2023 the grant value increased to £7,500 for air source heat pumps (ASHPs) and ground source heat pumps (GSHPs), whilst the grant value of £5,000 for biomass boilers remained the same. Most of the research presented in this report was carried out before the new values were announced on 20 September 2023, in a period when the grant was £5,000 for ASHPs and £6,000 for GSHPs. This evaluation of the BUS is being undertaken by ICF, working with Eunomia, University College London (UCL) and BMG Research. This Interim Report, which presents early evaluation findings, is the first published deliverable. It is informed by a survey and interviews with property owners that had a LCH system installed under the BUS (1,310 survey responses and 40 interviews), interviews with three property owners that submitted applications but did not have an installation, and a survey and interviews with installers registered to do BUS installations (247 survey responses and 30 interviews).

Main findings

Uptake of the BUS

- **Between May 2022 and September 2023 the BUS part-funded 15,738 LCH system installations**. According to BUS statistics[1], the Scheme has supported an average of over 900 LCH system installations per month, most of which were ASHPs installed in domestic properties. These have typically replaced natural gas-fuelled heating systems (46% of installations).
- **Properties with a BUS installation were typically relatively large, though a wide variety of property types were involved**. Half (52%) had four or more bedrooms, and most commonly they were detached properties, though many had different profiles (e.g. smaller bungalows). Ninety-four percent of domestic properties were being used as a main home. LCH systems typically replaced comparatively old heating systems (40% were thought to be 15+ years old).
- **The availability of the BUS grant was the most common trigger for property owners to act when they did.** Two thirds (65%) of survey respondents cited the availability of the grant as their trigger for action (the survey was undertaken prior to the

[1] DESNZ (February 2024) Boiler Upgrade Scheme statistics: January 2024. September 2023 was used as the cutoff because this aligned with the period of the BUS when fieldwork with property-owners and installers was carried out; more up to date application and redemption statistics, including for the post-grant uplift period, are available from the Boiler Upgrade Scheme official statistics.

announcement of the grant increase), whilst a third (35%) had a LCH system installed as part of a wider refurbishment or building upgrade (including self-build projects). Some 34% of survey respondents indicated that they had not had a LCH system installed previously because they had only just built or occupied the property.

- **Fifty-five percent of survey respondents said they would have been unlikely to have installed a LCH system in the absence of the BUS grant**. These are, however, self-reported data. When interviewed, property owners said this was primarily because they could not have afforded the full price of their system or did not want to pay it. Some 41% of survey respondents said they would likely have installed their LCH system even if there had been no BUS. Of these, only 38% would not have done so as quickly (i.e. the availability of BUS funding brought forward their plans).
- **BUS registered installers are typical of businesses serving the current LCH market**. They are mostly micro businesses (employing fewer than 10 people) and are increasingly focused on ASHPs, though often deriving income from other renewable and fossil fuel heating systems. They joined the BUS because they needed to be able to offer the subsidy to sustain or grow their business and saw the Scheme as a natural successor to previous LCH grant schemes that they had participated in (such as the Renewable Heat Incentive – RHI).
- **Installers' revenue from LCH system installations was stable under the BUS**. The proportion that earned more than half their income from installing LCH systems grew from 28% of survey respondents before the BUS to 33% when the survey was carried out. This suggests the Scheme has not (yet) had a transformational impact on installer businesses. Indeed, many said they joined the BUS for continuity rather than growth.
- **Most installers (82%) believed there were factors that limited consumer demand for BUS installations**. The cost of LCH systems – even factoring in the BUS grant (though this pre-dated the increase in grant value) – was seen as the major barrier. Installers also felt the public had a limited awareness and understanding of the benefits of LCH systems and of the availability of grant support through the BUS. The installer survey was undertaken before the launch of the government's Welcome Home to Energy Efficiency campaign, which was designed to raise awareness about LCH systems and the BUS amongst consumers.
- **Installers often faced problems completing BUS installations due to supply-side constraints**. Just over half (58%) of surveyed installers reported that there were factors that limited their ability to carry out BUS installations. Most commonly they cited the amount of time they had to spend on administration and compliance tasks. These were primarily those required through the Microgeneration Certification Scheme (MCS) and/or consumer codes, rather than BUS-specific requirements. Installers were also constrained by the availability of skilled staff to work on installations.

Delivery of the BUS

- **Most property owners that had a LCH system installed under the BUS were satisfied with their overall experience of the Scheme (86%)**. Most found the various steps in the customer journey relatively easy, including confirming with Ofgem that they consented to have a LCH system installed under the BUS.
- **Most installers (72%) were satisfied with Ofgem's model for administering the BUS**. They believed it had been designed with them in mind and accommodated learning from previous government schemes. Improvements to installer guidance were suggested to make it more user-friendly and accessible (visual guides, checklists, and bullet points).
- **Most property owners (75%) found it very/fairly easy to find a BUS registered installer to quote and carry out the LCH system installation**. Property owners were generally able to source quotes regardless of the system they wanted, their location or their property characteristics. Most (60%) obtained a quote from more than one installer.
- **Most interviewed property owners said they were not charged for the technical survey or heat loss calculations carried out as part of system design**. Interviewed installers explained that this was because they wanted to incentivise uptake, and so preferred not to charge for this step in the customer journey. If they did charge, interviewed installers explained that this was because they needed to recoup costs and avoid wasting resources on leads that were not viable or serious.
- **Just under two thirds (61%) of property owners said they found it easy to pay for the cost of the installation that were not covered by the BUS grant**. Another 35% reportedly found it difficult. Most property owners used their savings/investments or regular income to pay the balance, though a minority had to take on debt (e.g. a mortgage extension). Twenty-one percent of property owners reportedly hired an installer who asked them to pay the cost of the LCH system in full and then refunded the value of the BUS grant later. This billing model was often applied where the property was a self-build.
- **Twenty per cent of property owners said they had to install loft insulation around the time as receiving their BUS grant and 10% had to install cavity wall insulation**. To receive a BUS grant, when the research for this report was carried out properties needed to have no outstanding recommendation for loft or cavity wall insulation on their Energy Performance Certificate (EPC). This is no longer the case. Overall, 23% of property-owners had to install at least one of these two measures to be eligible for a BUS grant. A small minority reportedly found it difficult to schedule and/or pay the cost of these additional works, but for most property owners this was a relatively simple process. They typically used an insulation specialist.
- **Most property owners had a satisfactory installation experience**. Seventy-one per cent of survey respondents were satisfied with the amount of disruption they experienced and 74% were satisfied with the duration of the installation. Seventeen percent were dissatisfied with the handover of the new system once the installation was

completed. Some interviewees explained that they had been left with what they felt was overly technical written material and had not had an adequate explanation of how to programme and use their new LCH system.

- **A small proportion (11%) of property owners had made a formal complaint about their installation experience**. Amongst property owners that had made a complaint[2], the majority (92%) had complained to their installer (equivalent to 10% of all survey respondents). Just 12% of those that had complained had done so to the MCS (equivalent to 1% of all survey respondents).
- **Most survey respondents were satisfied with their new LCH system (79%)**. Just 7% were dissatisfied. Some 14% had already recommended their system to friends, and 69% said they definitely or probably would do so in the future. The survey was carried out in summer 2023 and many respondents had only recently had their LCH system installed, so had limited experience of using their new system to heat their property.

[2] n=145

Introduction

In March 2023, the Department for Energy Security and Net Zero ('the Department') commissioned an evaluation of the Boiler Upgrade Scheme (BUS). The study is scheduled to finish in March 2026 and is being undertaken by ICF, working with Eunomia, University College London (UCL), and BMG Research.

The Boiler Upgrade Scheme (BUS)

The BUS was set up by DESNZ to support the installation of low carbon heating systems – heat pumps and, in limited circumstances, biomass boilers – in domestic and small non-domestic properties in England and Wales. The BUS was launched with a £450 million budget and was initially scheduled to run for three years between April 2022 and March 2025. It was subsequently extended for another three years until March 2028 and was allocated an additional £1.547 billion of funding. The BUS is a key component of the Government's plan to decarbonise the heating of buildings, as outlined in the Heat and Buildings Strategy[3]. The electrification of heating is the only proven option for decarbonising the majority of buildings in the UK, and so increasing the deployment of heat pumps is a strategic priority. The government has committed to grow the heat pump market to 600,000 heat pump installations per year by 2028[4]. The BUS is part of a package of measures designed to support the delivery of our target, alongside support through the Energy Company Obligation, Home Upgrade Grant and Social House Decarbonisation Fund. The introduction of the Future Homes Standard from 2025 will also require low carbon heat in new buildings.

The BUS is increasing the uptake of low carbon heat systems by subsidising their upfront costs, thus tackling one of the main barriers faced by consumers. The subsidy takes the form of a 'voucher', currently worth £7,500 for air source heat pumps (ASHPs) and ground source heat pumps (GSHPs), and £5,000 for biomass boilers. The grant value increased in October 2023 from the prior values of £5,000 for ASHPs and £6,000 for GSHPs. Most of the research presented in this report was carried out before this change was announced (on 20 September 2023). To be eligible for a voucher, properties must have a valid Energy Performance Certificate (EPC). When the research presented in this report was carried out, to be eligible for a BUS grant properties were required to have no outstanding recommendations for loft or cavity wall insulation on their EPC; this is no longer the case. New build properties are not eligible. Self-build properties are eligible provided they are not built by companies or developers. The total capacity limit of any low carbon heating (LCH) system[5] installed must not exceed 45 kWth[6],[7]. The BUS has an installer-led delivery model and only registered installers

[3] BEIS (2021) Heat and Buildings Strategy
[4] HM Government (2020) The Ten Point Plan for a Green Industrial Revolution
[5] The term low carbon heating (LCH) system is used to collectively refer to ASHPs, GSHPs and biomass boilers.
[6] kWth (kilowatt thermal) is a measure of thermal output (heat).
[7] Shared Ground Loops (SGLs) may now have a limit of 300 kWth, however the limit was 45 kWth when this research was conducted.

(who must also be accredited by the Microgeneration Certification Scheme, or MCS) can apply for and redeem vouchers. The BUS is administered by Ofgem on behalf of DESNZ.

Evaluation aim and methodology

The Department commissioned a combined process, impact, and economic evaluation of the BUS. This is the first evaluation Interim Report; another will follow in 2025 with a Final Report to be published in 2026[8]. This report is based on the following research activities[9], further details about which are provided in a separate Technical Methodological Report[10]:

- **Research with property owners that had a LCH system installed under the BUS**. This consisted of an online survey that was completed by 1,310 property owners (a response rate of 33%) and in-depth telephone interviews with 40 property owners[11]. Survey data were weighted. Research explored property owners' experiences of participating in the BUS, including why they joined the Scheme and how satisfied they were with their experiences. Three further interviews were undertaken with property owners that applied for a BUS voucher but did not go on to have an installation (either because the voucher was not issued or because it expired).
- **Research with BUS-registered installers**. This consisted of a telephone survey that was completed by 247 installers (out of 1,057 companies – a response rate of 23%[12]) and in-depth telephone/video interviews with 30 installers. Survey data were not weighted. The research explored installers' experiences of joining the BUS and, if relevant, submitting applications and completing installations.

The strength of the evidence in this report is that the analysis is based on a rich and varied evidence base about the experiences of property owners and installers that have participated in the BUS. Survey data provide evidence from representative samples of property owners and installers. Interview data enable in-depth analysis of their experiences. All research was undertaken under conditions of anonymity to encourage participants to be candid about their experiences – positive and negative. The evidence enables analysis of why installers and property owners have chosen to participate in the BUS, how effectively it is being delivered, and areas for improvement.

The limitation of the evidence in this report is that the research focussed on property owners that had a BUS installation and installers that registered with the Scheme (even if they have not completed a BUS installation). Absent from this report are the views of property owners that have not submitted an application, and installers that have not registered with the BUS.

[8] The BUS extension period will be evaluated through separate means which are yet to be decided.
[9] The evaluation commenced with a scoping exercise, which involved interviews with DESNZ officials and a review of key literature pertaining to the BUS and to the LCH market. Evidence is referenced in this report.
[10] See BUS Evaluation 2024 Technical Report.
[11] A sample of 4,000 property owners was selected from a sampling frame consisting of individuals with a BUS-funded installation between 1 October 2022 and 30 April 2023, excluding anyone being investigated for compliance or fraud reasons (as at July 2023).
[12] The sampling frame for this survey consisted of all registered installers as at the end of May 2023, excluding any installers that were suspended or had not completed the registration process (as at July 2023).

The results of research that has been undertaken with these ‘non-participants’ will be reported in 2025. Research with property owners has focussed on their experiences of the BUS rather than their lived experiences of their LCH system (though it does briefly explore their initial impressions). Follow-up research with property owners will take place in 2024, after the 2023/24 heating season has finished.

Uptake of the BUS

This chapter summarises the uptake of the BUS and analyses the characteristics of property owners and properties where BUS-funded installations have been delivered. It then analyses installer companies that have delivered installations under the BUS.

Key findings

Between May 2022 and September 2023 the BUS part-funded 15,738 LCH system installations. The BUS has supported an average of just over 900 LCH system installations per month, most of which were ASHPs installed in domestic properties. These have typically replaced natural gas-fuelled heating systems (46% of installations).

Almost all (94%) domestic properties with a BUS installation were being used as a main home. Many BUS properties were large (52% had 4+ bedrooms) detached properties, though many had different profiles (e.g. smaller bungalows). Many of the heating systems replaced were comparatively old (40% were thought to be 15+ years old).

BUS participants reported a variety of motivations for having a LCH system installed instead of a fossil fuel system, though a desire to reduce their carbon emissions was the most common (cited by 86% of survey respondents). The availability of the BUS grant was the most common trigger for property owners to act when they did (65% of survey respondents). Thirty-five percent had a LCH system installed as part of a wider refurbishment or building upgrade (including self-build projects).

Over half (55%) of surveyed property owners said they would have been unlikely to have installed a LCH system without a BUS grant. This was mostly due to the cost (23% said they had not previously had a LCH system installed because they could not have afforded it). Forty-one percent of property owners said that they would likely have installed their LCH system even if there had been no BUS. Of these, 38% would not have done so as quickly (i.e. the availability of BUS funding brought forward their plans).

BUS installers are typical of the LCH market: mostly micro businesses and focused on ASHPs (though often deriving income from other renewable and fossil fuel heating systems). They joined the BUS because they needed to offer the subsidy to sustain or grow their business and saw the Scheme as a natural successor to previous schemes.

Installers' revenue from LCH system installations has stayed stable under the BUS, suggesting the Scheme had not (yet) had a transformational impact on their businesses (and reflecting the fact that many joined the Scheme for continuity reasons).

Most installers (82% survey respondents) believed there were factors that limited demand for BUS installations amongst consumers. Perceived barriers included LCH system costs,

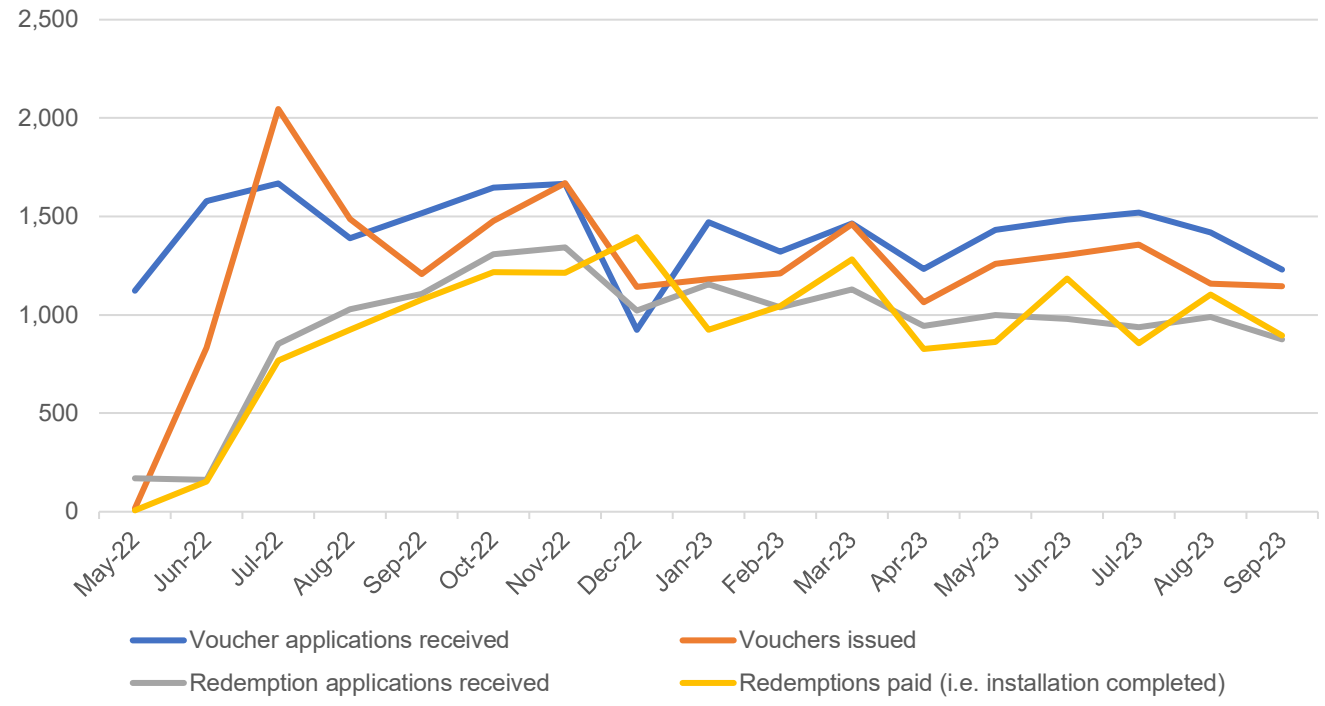
limited understanding of LCH systems, and limited awareness of the BUS grant. The installer survey was undertaken before the launch of the government's Welcome Home to Energy Efficiency campaign, which was designed to raise awareness about LCH systems and the BUS amongst consumers.

Many installers faced problems completing BUS installations (58% of surveyed installers said there were factors that limited their ability to carry out installations). Commonly cited issues included time spent on administration and compliance tasks (mostly those required through the MCS and/or consumer codes), and the availability of skilled staff.

BUS applications, vouchers issued, and installations

As Figure 1 shows, apart from a 'spike' in activity in the months after the Scheme launched, the number of voucher applications and vouchers issued each month remained consistent during the period of April 2022 to September 2023. Note that these data pre-date the increase in the BUS grant value from October 2023 onwards.

Figure 1: The volume of BUS applications and redemptions, per month (April 2022 to September 2023)[13]

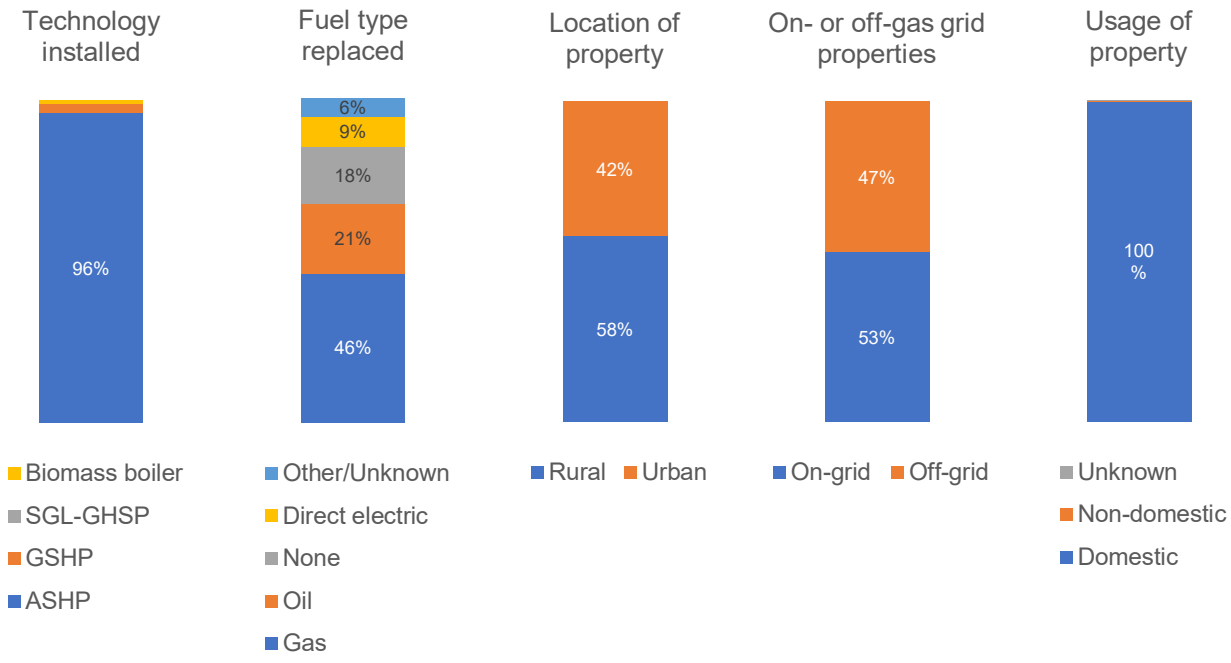


Source: DESNZ (February 2024)[14]; Note: data are for all technology types and for domestic and non-domestic.

[13] September 2023 was used as the cutoff because this aligned with the period of the BUS when fieldwork with property-owners and installers was carried out; more up to date application and redemption statistics, including for the post-grant uplift period, are available from the Boiler Upgrade Scheme official statistics.
[14] DESNZ (February 2024) Boiler Upgrade Scheme statistics: January 2024

Focussing on BUS-funded installations (again, based on redemptions paid), Figure 2 provides a profile of all 15,738 installations completed between May 2022 and September 2023. The vast majority of BUS installations are ASHPs (96% of the total) in domestic properties (99.5% of the total). In just under half of properties (46%) the LCH system replaced a natural gas-fuelled system. In eighteen percent of cases there was no previous heating system: in most cases this was because the property was new (a self-build[15]).

Figure 2: Profile of BUS-funded installations, April 2022 to September 2023



Source: DESNZ (February 2024)[16]; Note: SGL-GSHP means Shared Ground Loop GSHP.

Profile of property owners with installations

The following profile of property owners and their properties is based on data from the survey of property owners with a BUS installation. Note that the BUS is intended for property owners, which influences the profile of participants; other government schemes target specific segments of the population who are not eligible or may not be willing or able to participate (e.g. social housing tenants).

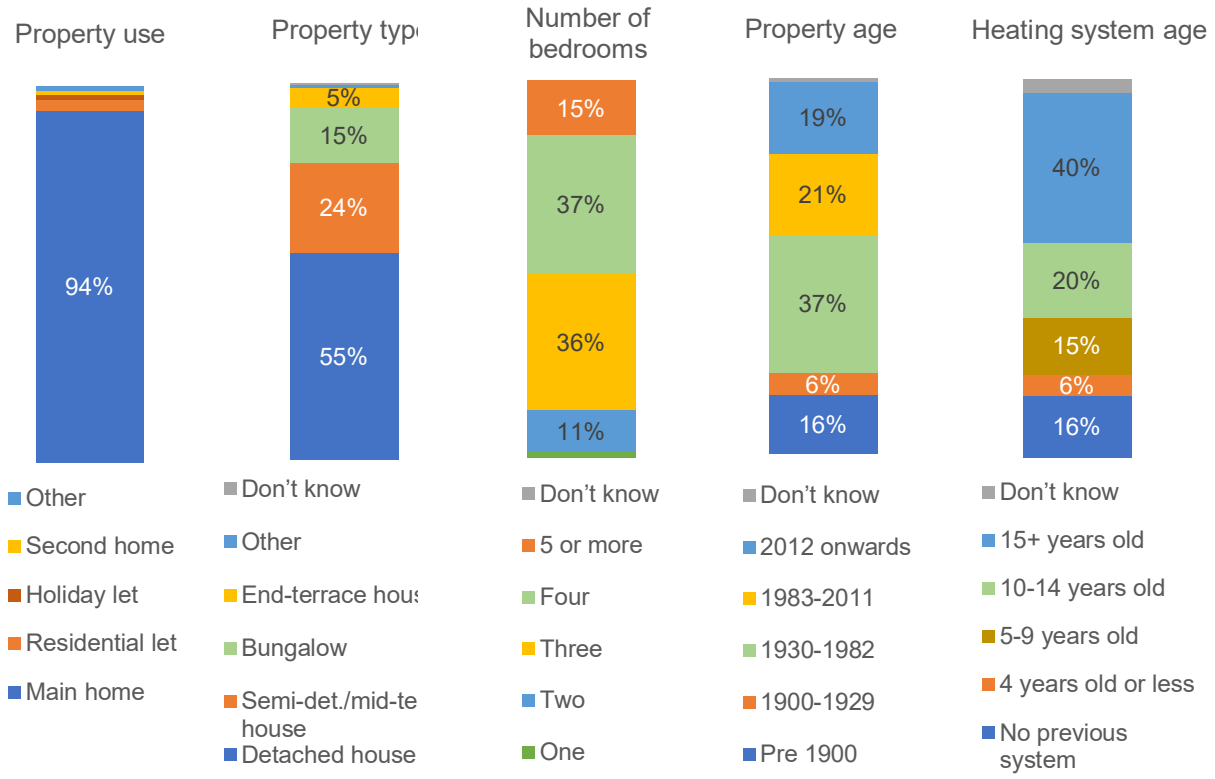
Characteristics of properties where LCH systems were installed

Figure 3 provides a profile of the properties in which a LCH system was installed under the BUS. The vast majority (94%) were used as main homes; just 3% were used as residential lets. Detached properties accounted for just over half of installations (55%), followed by semi-

[15] Note that new build properties are not eligible for support under the BUS. Self-build properties are eligible if they have been built mainly using the labour or resources of the first owner and have never been owned by a business or organisation.
[16] DESNZ (February 2024) Boiler Upgrade Scheme statistics: January 2024

detached or mid-terrace properties (24%) – end-terrace properties were a separate category (5% of properties). Properties tended to be relatively large: 37% had four bedrooms and 15% had five or more bedrooms. A mix of property ages were reported but build dates between 1930 and 1982 were most common (37%). Nineteen percent of properties were built after 2012, which reflects the fact that many were self-builds. Property owners tended to be replacing older heating systems: 40% were estimated to be at least 15 years old.

Figure 3: Characteristics of properties with BUS installations



Source: Wave 1 Property owner survey; QA01 Which of these best describes how you use, or plan to use, the property? QA04 Roughly, when was the property built? QA05 Roughly, how old was the heating system you replaced with the [LCH system installed]? Unweighted base: All (n=1,310); QA02a Which of the following best describes the property? QA03a How many bedrooms does the property have? Unweighted base: All domestic properties (n=1,308).

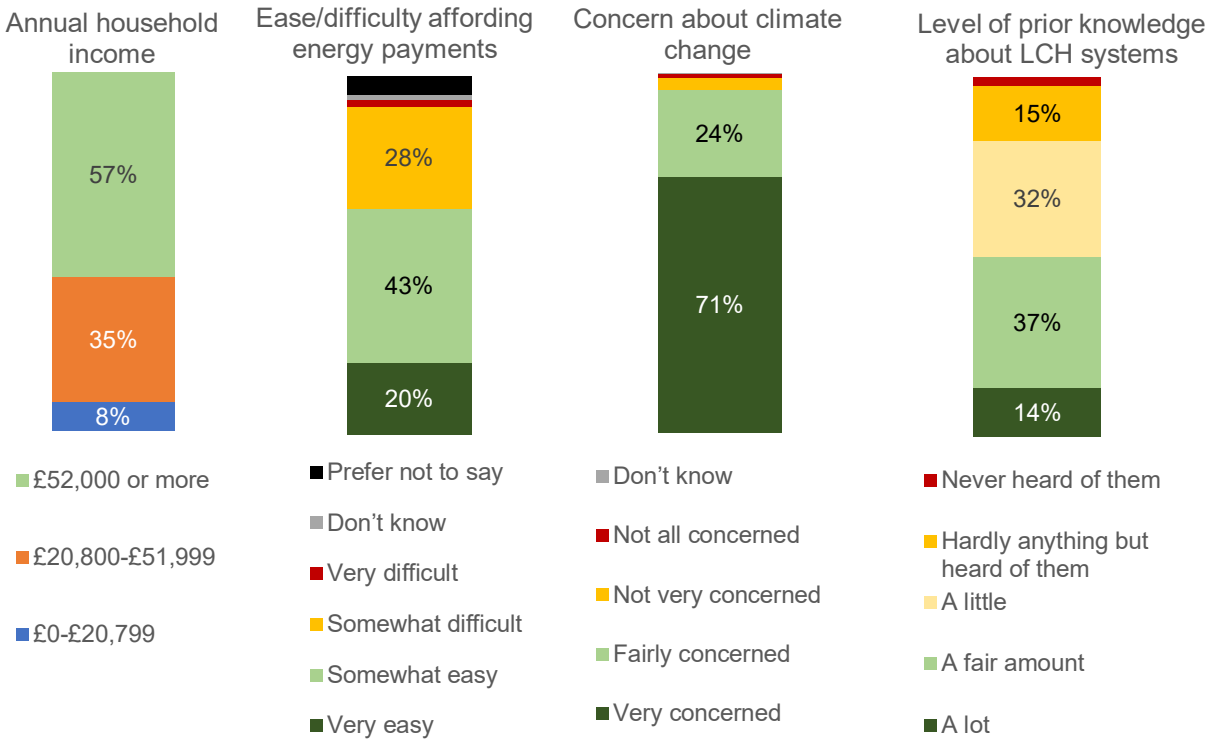
Characteristics of property owners

Figure 4 provides a profile of BUS property owners. Over half (57%) had an annual household income of more than £52,000, which is high compared to the median national household income of £32,300[17]. BUS participants were also more likely to find it very or somewhat easy to afford their energy payments than the wider population (63%, compared to 45% of the British population[18]). A high proportion described themselves as very concerned about climate change (71%)[19], and they were typically aware and knowledgeable about LCH systems even

[17] ONS (January 2023) Average household income, UK: financial year ending 2022
[18] ONS (July 2023) Impact of increased cost of living on adults across Great Britain
[19] This survey question replicated a question asked as part of the UK-wide Public Attitudes Tracker (PAT) survey, noting that this is a survey of the whole population, not just owner-occupiers. By way of comparison, in Summer 2023, 40% of people in the UK said they were very concerned about climate change.

before they had one installed through the BUS (51% said they knew a lot or a fair amount when they first heard about the Scheme[20]).

Figure 4: Characteristics of BUS property owners



Source: Wave 1 Property owner survey; QF04 How concerned, if at all, are you about climate change, sometimes referred to as 'global warming'? QF06 When you first heard about the BUS, how much would you say you knew about a [LCH system installed]? Unweighted base: All (n=1,310); QF03 What is the household's approximate total income before tax and any other deductions? QF05a How easy or difficult is it to afford your energy payments? Unweighted base: All domestic properties (n=1,308).

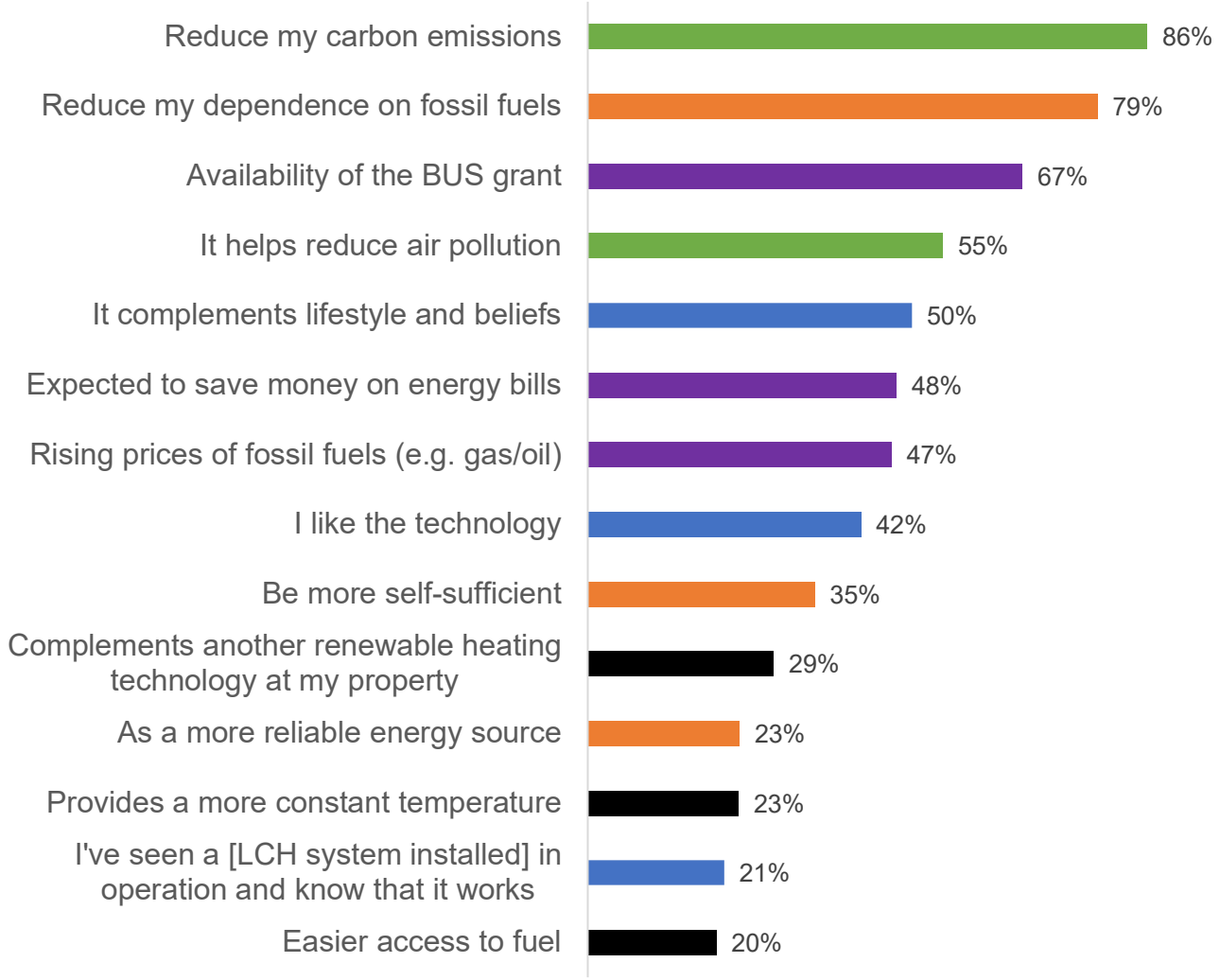
Why property owners participated in the BUS

Motivations for choosing a LCH system over a fossil fuel system

Property owners that had a LCH system installed were asked why they had chosen this instead of a fossil fuel system (Figure 5). The environmental benefit of moving to a LCH system was the most commonly cited motivation: 86% wanted to reduce their carbon emissions and 79% wanted to reduce their dependence on fossil fuels. The availability of financial support for a LCH system was a motivation for 67% of property owners – at the time, the BUS grant was £5,000 for an ASHP or biomass boiler and £6,000 for a GSHP.

[20] Again, this question replicated a question used in the PAT survey. Amongst the UK population, 32% said they knew either a lot or a fair amount about LCH systems in Summer 2023.

Figure 5: Property owners' motivations for having a LCH system installed rather than a fossil fuel system

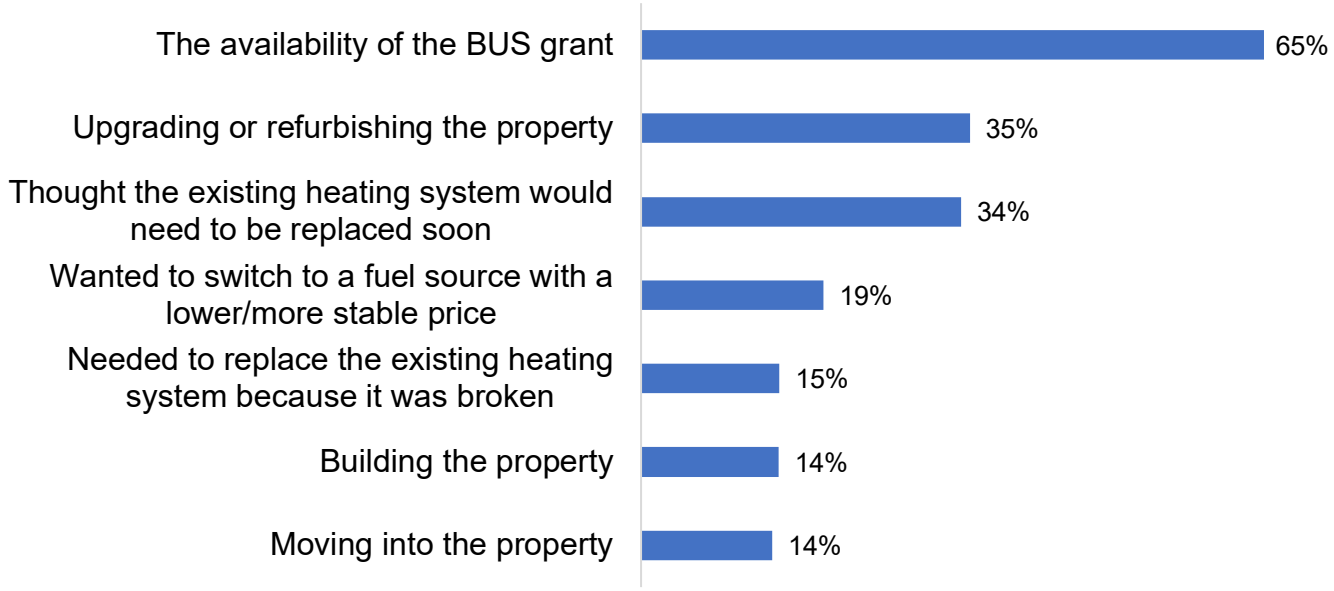


Source: Wave 1 Property owner survey. QB02. Why did you decide to install [LCH system installed], rather than a fossil fuel heating system? Unweighted base: All (n=1,310); Note: multiple answers possible so figure sums to more than 100%; for brevity, not shown are any options selected by under 20% of respondents; colour code indicates higher level category: green=Environmental reason, orange=Self-sufficiency reason, purple=Financial reason, blue=Attitudinal reason, black=Technical reason.

Triggers for acting when they did

Property owners were asked why they elected to have a LCH system installed when they did, rather than waiting (Figure 6). The opportunity to access the BUS grant was the single most common trigger for action, cited by 65% of property owners. Other common reasons were the concurrent timing of property remodelling or building works, whether this was upgrading or refurbishing an existing property or building it from scratch (self-builds). Fewer people acted because their existing system was broken (long lead times mean a LCH system installation is rarely a distress purchase), but a third (34%) of property owners were prompted to act by a perception that their existing system would soon need to be replaced.

Figure 6: Why property owners had installed their BUS LCH system when they did



Source: Wave 1 Property owner survey. QB03. Did any of the following prompt your decision to have [LCH system installed] installed now, as opposed to waiting? Unweighted base: All (n=1,310); Note: multiple answers possible so figure sums to more than 100%; for brevity, not shown are any options selected by under 10% of respondents.

The importance of different triggers varied depending on a variety of characteristics. Property owners with older heating systems were more likely to act because they felt their existing system needed replacing – 52% of property owners whose heating system was 15+ years old cited this as a trigger for action (the second most important reason after the availability of the BUS grant), compared to 29% of those whose system was 14 years old or less. The installation of GSHPs in particular was associated with major building works: 51% of property owners that installed this system did so because they were building their property, and another 42% because they were upgrading or refurbishing it.

Interviews with property owners explored motivations and triggers for acting in more detail. Many interviewees had been considering and researching LCH systems for some time, even many years (as showed, knowledge of LCH systems was relatively high amongst BUS participants). However, whilst many interviewees had been investigating LCH systems for some time, there was usually something that had triggered them to act when they did. Echoing the results shown in Figure 6, common triggers for interviewees included a mix of push and pull factors, such as the availability of the BUS grant, the sequencing of a LCH system installation to fit with wider renovation works, and in some cases a need to replace an existing heating system that was nearing or had reached the end of its life. Other building works that triggered a LCH system installation included self-build projects, renovation projects and the installation of other green energy products (particularly solar PV, which survey and interview evidence suggests have sometimes been 'paired' with LCH systems installed under the BUS).

> *"We were going to have the solar panels anyway, regardless. And it seemed like we might as well have [the ASHP] done at the same time with the same*

company. They already had the scaffolding up on the house. They knew both systems and could install it all. It was just easier to get it done all at once".

Property owner, ASHP installation, September 2023

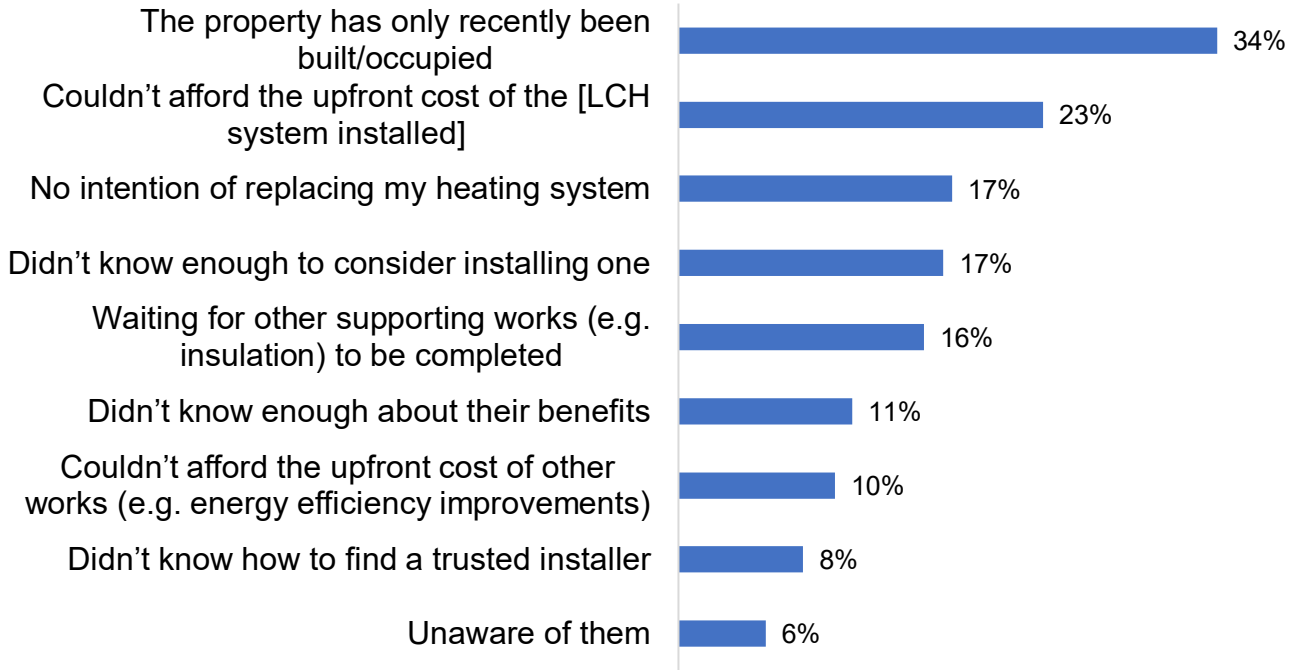
Barriers that were overcome

As Figure 7 shows, property owners had faced a variety of barriers that had prevented them from having a LCH system installed at their property prior to the BUS. The most common reason (34% of survey respondents) was that their property had only recently been built or moved into, reflecting the number of self-build properties amongst BUS installations (16% of survey respondents were from BUS installations in self-build properties). The affordability of a LCH system had been a barrier for a quarter (23%) of property owners; this has consistently been identified as an issue in other research studies. A lack of knowledge of LCH systems was an uncommonly cited barrier amongst survey respondents, again perhaps reflecting the fact that BUS participants were generally well-informed about LCH systems (see Figure 4). For some property owners there were a mixture of factors that had deterred them in the past – as this quote from an interview illustrates – and what prompted them to act was that LCH systems had become more attractive than fossil fuel systems.

"We moved to this bungalow as a retirement bungalow 11 years ago and we spent a lot of money making it as efficient as possible. At that point we would have bought an ASHP, but it was far too expensive and just didn't stack up with the price of gas, the price of electricity, and the cost of installing, and the boiler we had was new at that time."

Property owner, ASHP installation, September 2023

Figure 7: What had previously stopped property owners from installing a LCH system



Source: Wave 1 Property owner survey. QB04. Why did you not previously have [LCH system installed] installed in the property? Unweighted base: All (n=1,310); Note: multiple answers possible so figure sums to more than 100%; for brevity, not shown are any options selected by under 5% of respondents.

Though not shown in Figure 7, 4% of survey respondents indicated that they had not previously had a LCH system installed in their property because they had negative opinions about them. These individuals were asked a follow-up question about the nature of these opinions. A small base size (51 respondents) means these results need to be treated with caution, but the most common explanations were that they did not think the system would make their property warm enough (57% of this subgroup) and/or that they did not think it would warm their property quickly enough (40%).

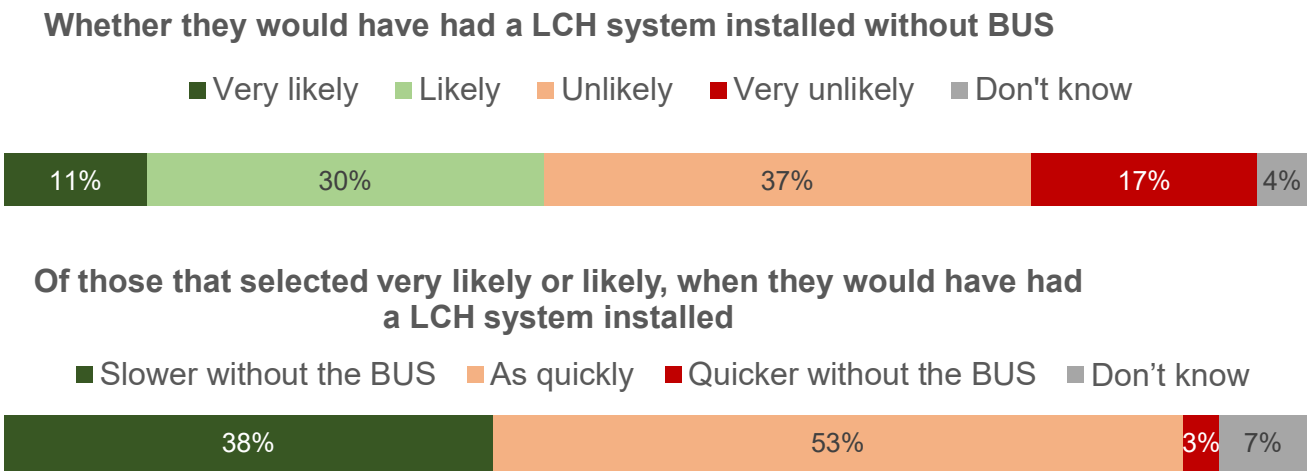
Whether property owners would have had a LCH system installed anyway

Property owners with a BUS installation were asked whether this installation would have happened anyway, in the absence of the BUS grant (the upper chart in Figure 8). This is, of course, what property owners stated when they answered the survey, and does not necessarily provide an accurate indication of what they would actually have done if they had not accessed the BUS. Forty-one percent of survey respondents said they would likely have installed their LCH system anyway, compared to 55% that said this would have been unlikely. Survey respondents from self-build properties were more likely to say that their BUS installation would have happened anyway (62% of owners of self-build properties believed the installation would very likely/likely have taken place without BUS support, compared to 37% of owners of other types of property). Interestingly, the likelihood that the installation would have happened anyway did not vary significantly depending on the annual household income of the property owner).

During the survey, property owners who said they would have likely installed their LCH system anyway[21] were then asked when this would have happened (the lower chart in Figure 8). Around half (53%) of this subset of survey respondents said it would have happened at the same time; overall, this means 22% of all survey respondents said they would have likely installed a LCH system at the same time if there had been no BUS funding available. Thirty-eight percent of the subsample of respondents who would very likely/likely have installed a LCH system anyway believed that the availability of BUS funding meant this happened quicker than would otherwise have been the case, though the survey did not explore how much quicker.

[21] n=542

Figure 8: Property owners' assessment of whether BUS installations would have happened anyway, and if so, when



Source: Wave 1 Property owner survey. Upper chart - QB05. If the BUS grant had not been available, how likely would you have been to have had a [LCH system installed] installed anyway? Lower chart - QB05a. Without the BUS grant, would the installation of the [LCH system installed] have been done as quickly? Unweighted base: Upper chart - All (n=1,310); Lower chart – All that selected very likely or likely at QB05 (n=542).

Interviews with property owners suggested that a common reason why LCH system installations would not have gone ahead without the BUS grant was the cost involved. As Figure 7 indicated, an inability to afford the upfront cost was one of the main reasons why property owners had not previously had a LCH system installed, and interviewees indicated that they were unwilling or unable to pay the 'premium' to have a LCH system installed, as this quote illustrates.

> *"I had an oil boiler which was 20 years old, and I would have had to replace it at a cost of probably around £4,000. And it was an additional £800, or something like that, for the ASHP with the [BUS] grant...without the grant there would have been no possibility of going ahead as the cost would have been approaching £10,000."*

Property owner, ASHP installation, September 2023

Conversely, some interviewees reported that they would have had their LCH system installed, even without the BUS. These were typically self-build projects or major refurbishments. Interviewees were committed to having a LCH system due to the perceived environmental benefits and had sometimes used one in a previous property.

For other interviewees, the impact of the BUS grant was more complex, potentially speeding up what they would otherwise have done anyway by saving them the time that they would have needed to spend raising the necessary finance. Some interviewees were waiting for LCH system technologies to 'mature' and for costs to fall, and the availability of subsidy caused them to act now rather than continue to wait. Finally, in other instances, whilst the LCH system installation would have reportedly happened anyway, the availability of the BUS grant freed up money that could then be spent on other green energy improvements, as this quote shows.

> *"We would have done it [installed a LCH system], but we wouldn't have been able to put on our solar panels."*

Property owner, Biomass boiler installation, September 2023

Profile of installer companies that have participated in the BUS

By the end of September 2023, 1,224 installers had registered with the BUS. Sixty-two percent of these businesses registered around the time or soon after the BUS launched (between March 2022 and Jul 2022). Since July 2022, an average of around 30 new installers have registered with the Scheme each month.

Characteristics of BUS installers

Just under two-thirds (63%) of BUS registered installers had between 2-9 employees (across all their operations, not just BUS installations)[22]. Another 7% were sole traders. Most BUS installers were thus micro businesses. This is typical of the industry.

The majority (74%) of BUS registered installers reportedly installed LCH systems both within and outside of the BUS (just 26% said they were wholly reliant on the BUS for their LCH work)[23]. Installers typically did work outside the BUS because these installations were not eligible for a BUS grant, including like-for-like LCH system replacements, installations in new builds, large LCH systems (above the 45kWth capacity limit for BUS support), or ineligible technologies (notably hybrid heat pumps).

With regards to the LCH systems offered under the BUS, most interviewees stated that their focus was increasingly on ASHP installations. Whilst GSHP installations were offered by some interviewees, installers suggested that the technology had a smaller (and declining) market share. This was due to the higher cost of GSHPs, the comparatively low value of the BUS grant, a frequent lack of sufficient outdoor space, and colder ground temperatures in Northern England. Few interviewees offered biomass boiler installations due to their case specific nature, reported increasing cost of fuel, and a perceived low level of customer demand.

Amongst survey respondents, LCH system installations generally made up less than 50% of installers' total revenue, both prior to the BUS (65% of respondents) and after the Scheme launched (64% of respondents)[24]. Most interviewees had a diverse installation offering across systems and technologies, including fossil fuel heating systems and solar photovoltaics (PV)/solar thermal. Some also offered batteries, storage heaters and insulation measures. Whilst the market offering of some interviewees had not changed over the past decade or so, others had seen a greater shift towards the renewables market, away from fossil fuel systems.

[22] Installer survey; QA01. As of right now, what is the number of employees for the business? Base: All (n=247).
[23] Installer survey; QA04. Does your business currently install outside of the BUS? Base: All (n=247).
[24] Installer survey; QA07(1 and 2). Approximately what proportion of your business's revenue is from [LCH system(s) installed] installations? Before you started working on BUS installations. Since you started working on BUS installations. Base: All (n=247).

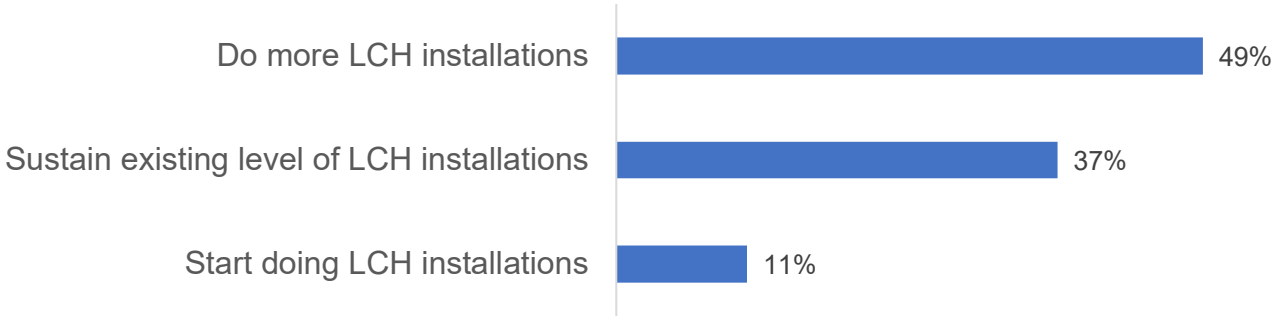
This shift had reportedly been supported by government subsidy schemes, as well as changes in energy and fuel prices.

Many interviewees (installers) had worked on installations supported via previous government grant schemes, notably the RHI and the Green Homes Grant – Vouchers (GHG-V) Scheme. A few had also worked under the Energy Company Obligation (ECO) and Green Deal schemes. Involvement in these schemes, alongside the requirements of MCS registration, had required most interviewees to join consumer codes and competent person schemes prior to the BUS.

Installers' motivations to participate in the BUS

As part of the survey, installers were asked about their motivations for participating in the BUS (Figure 9). Most installers (86%) registered with the BUS to do more LCH system installations or sustain their existing levels of installations.

Figure 9: Installers' reasons for getting BUS registration



Source: Wave 1 Installer Survey. QB01: Did you sign up your business with the BUS so that you could…? Base: All (n=247). Note: for brevity, not shown are any options selected by under 10% of respondents.

Interviewees explained that they saw the BUS as a natural extension to previous government schemes to increase LCH uptake. They believed the Scheme provided them with continuity of business in the LCH market, particularly following what they regarded as the sudden end to the GHG-V Scheme. Multiple interviewees from smaller businesses explained that their ability to offer BUS grants brought in customers and helped them to compete within the market, particularly with larger businesses who could offer lower installation quotes.

> *"After the sudden end of the GHG[-V Scheme], we had no choice but to go with the BUS – we had bought in staff to help with the previous demand."*

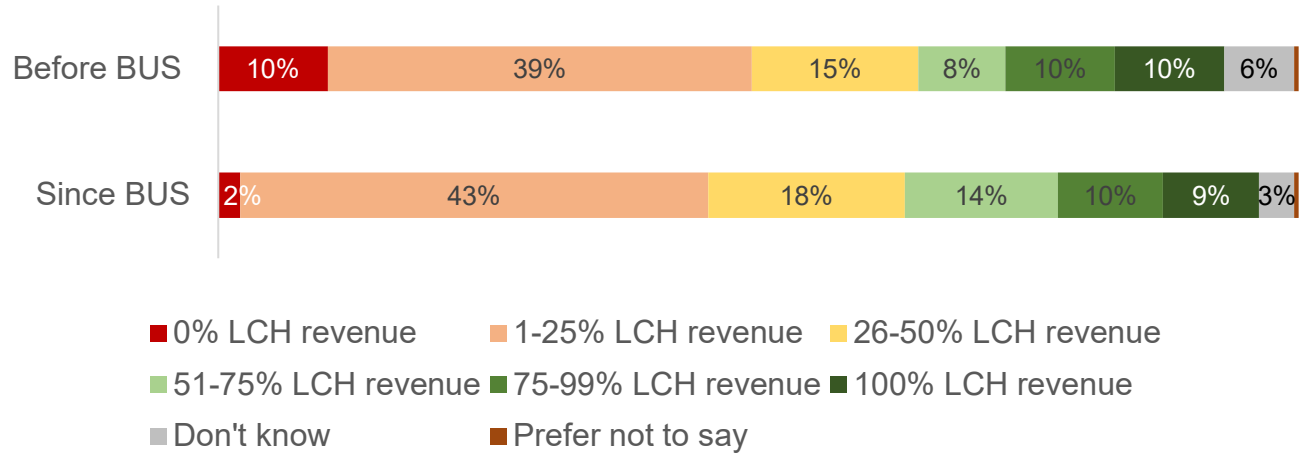
BUS-registered installer, the Midlands, September 2023

As Figure 9 showed, just 11% of installers had registered with the BUS to start installing LCH systems. Interviewees from these businesses joined the BUS believing that it would allow them to cater to growing consumer interest in heat pumps and future proof their business, given they perceived that the trend away from fossil fuel systems would continue.

Installers' experiences of delivering LCH system installations

Research with installers explored whether their delivery of LCH systems had changed as a result of their participation in the BUS. As part of the survey, installers were asked what proportion of their revenue came from LCH system installations, both prior to and following the start of their BUS participation (Figure 10). To date, the BUS has had a small impact on the proportion of revenue that most installers derive from doing LCH system installations.

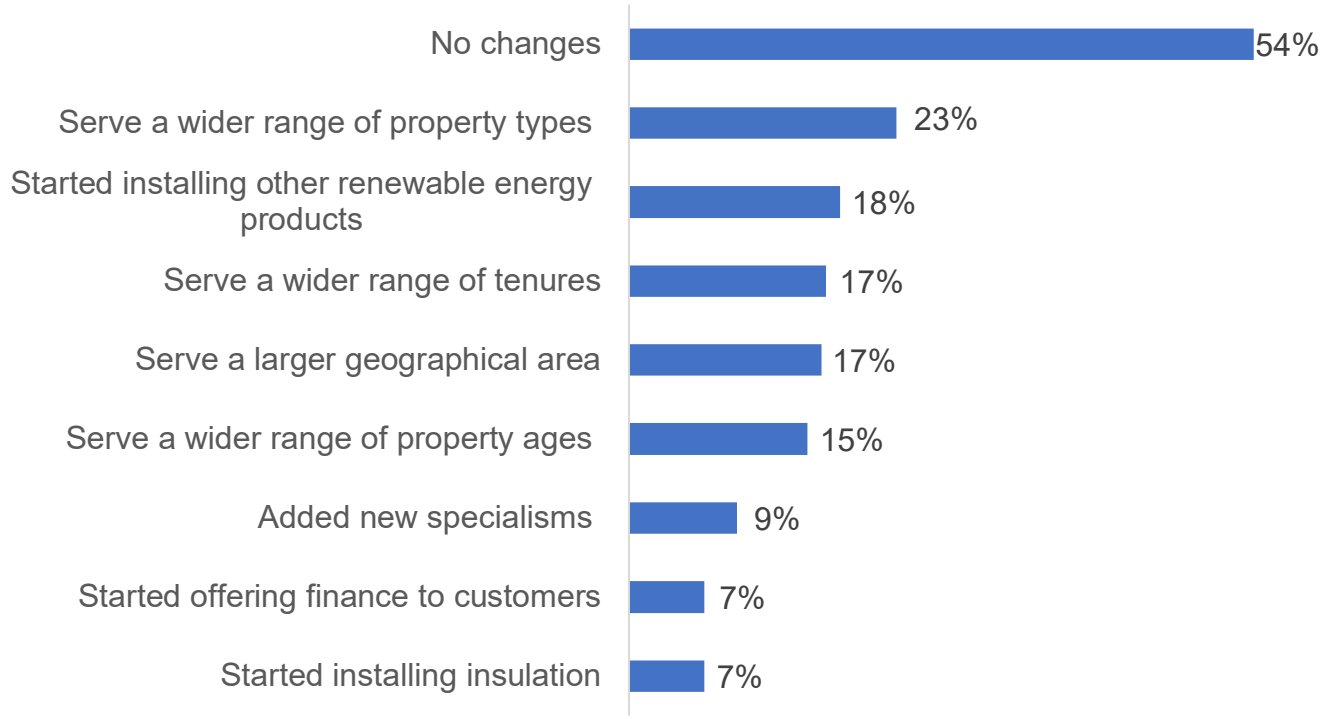
Figure 10: Proportion of installers' revenue coming from LCH system installations



Source: Wave 1 Installer Survey. Upper Chart - QA07(1). Approximately what proportion of your business's revenue is from LCH system installations before you started working on BUS installations? Lower chart - QA07(2). Approximately what proportion of your business's revenue is from LCH system installations after you started working on BUS installations? Base: All (n=247).

Installers were asked whether they had made any changes to their market offering because of the BUS (Figure 11). Most survey respondents (54%) had made no changes, though the survey did not explore whether this was because they already served a diverse range of properties or because they saw no reason to diversify their market offer due to the BUS. The most common change was serving a wider range of property types (23% of respondents).

Figure 11: Changes to installers' market offering as a result of the BUS



Source: Wave 1 Installer Survey. QE01: Have you made any of the following changes to your market offer because of the BUS? Base: All (n=247). Note: for brevity, not shown are any options selected by under 5% of respondents; multiple answers possible so figure sums to more than 100%.

Installers' experiences of factors affecting BUS uptake

Consumer demand for BUS installations

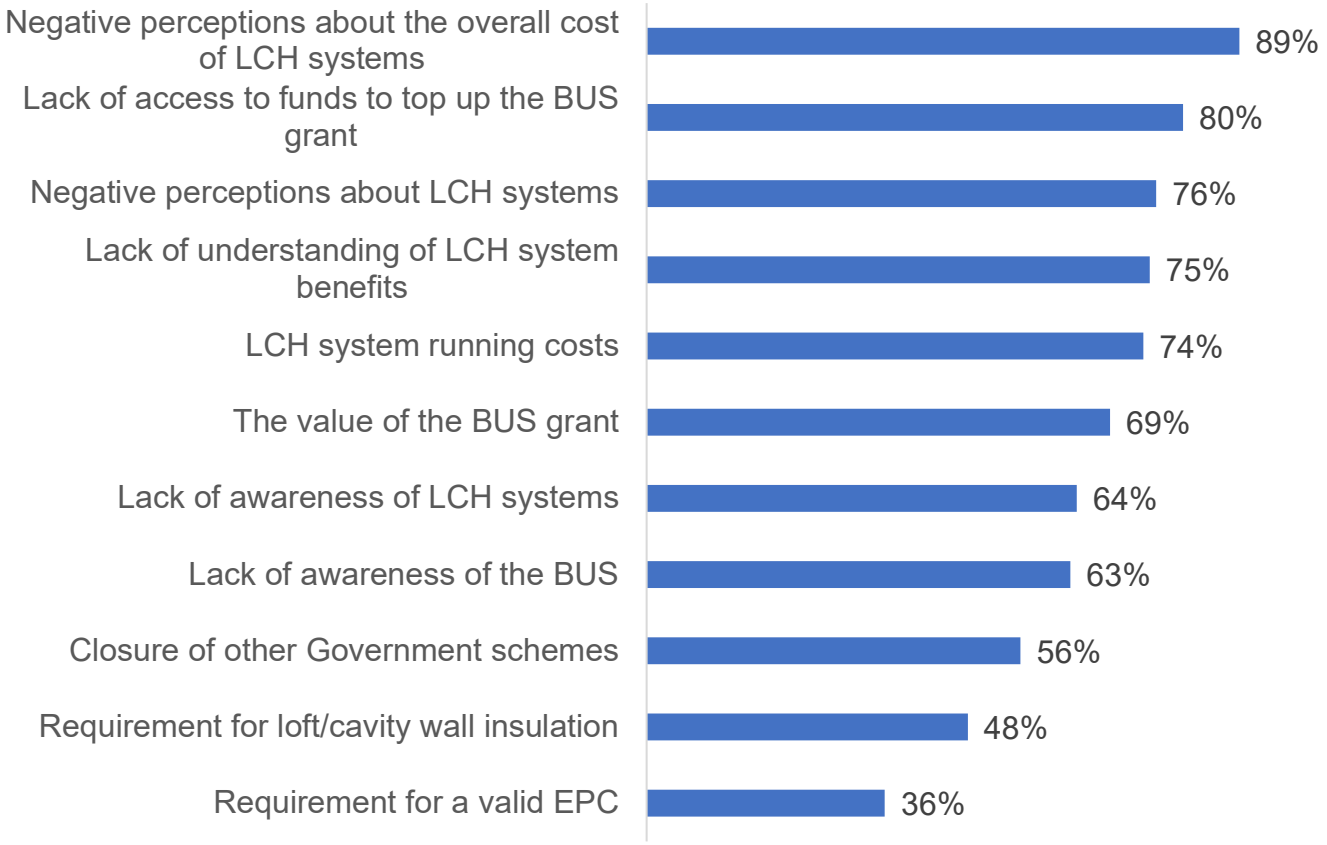
Within the interviews, installers were asked about their perceptions of what typically drove property owners to enquire about BUS-funded LCH systems. Common drivers of customer demand included a desire to make savings on energy bills (particularly for those with LPG or oil heating systems), environmental concerns, a need for heating system replacement, and home renovations. Most LCH system installations were thought to be in detached or semi-detached properties, due to space and noise challenges associated with flats and terraced properties (as Figure 3 showed, this is supported by evidence from the property owner survey). All installer interviewees believed that paying 0% VAT on LCH systems was an important incentive to LCH system uptake, alongside the BUS.

As part of the survey, installers were asked if there were any factors that they thought limited consumer demand for the BUS[25]. Most (82%) thought that there were factors that limited BUS demand, whilst 17% did not believe there were any limitations.

[25] Source: installer survey, QC02: Do you believe there is anything that limits demand for Boiler Upgrade Scheme installations amongst consumers? Base: All (n=247).

Those installers that felt that there were limiting factors were then asked what these were (Figure 12). Three of the five most commonly cited limitations on demand were related to installation costs: of LCH systems in general and also the relative value of the BUS grant (note that this question was asked before the grant value increase). Other perceived barriers included a lack of customer understanding of the BUS and of LCH systems. These findings are consistent with what property owners themselves identified as the barriers to having a LCH system installed (as shown in Figure 7), in particular the deterrent effect of the upfront cost of LCH systems, relative to fossil fuel systems.

Figure 12: Factors perceived by installers as limiting BUS demand from consumers



Source: Wave 1 Installer Survey. QC02a: What do you think limits demand amongst consumers? Base: All that believed there were factors that limited consumer demand (n=202). Note: for brevity, not shown are any options selected by under 10% of respondents; multiple answers possible so adds up to more than 100%.

Many installer interviewees believed that the BUS grant amounts were too low to have a notable effect on LCH uptake. Most interviews were undertaken prior to the announcement that the grant value was increasing; a handful of interviews were undertaken after the increase in the BUS grant value was announced, and amongst these installers there was greater satisfaction with the funding level. It is also the case that there are other government schemes (such as the Home Upgrade Grant Scheme) that are targeted at lower income households.

> *"BUS targets a certain client group, i.e., with £10k in the bank. People who need help are those on benefits, low-income households, those struggling day-to-day."*

BUS-registered installer, North East England & Yorkshire and the Humber, September 2023

A comparison was often made by installers to the grant models and approaches taken in other countries, which were viewed as having a greater impact on LCH uptake than the BUS. This included Scotland, where the comparator scheme includes a grant and a loan.

Installer interviewees also highlighted technologies and situations that they believed should be included within the scope of the BUS. A few interviews believed that hybrid heat pumps[26] should have been included (as the following quote illustrates), whilst others mentioned air-to-air heat pumps, solar thermal panels, and like-for-like heat pump replacements.

> *"[The] biggest barrier is not allowing hybrid systems. Many customers want a boiler connected [to the heat pump] as a backup or boost."*

BUS-registered installer, South East England, September 2023

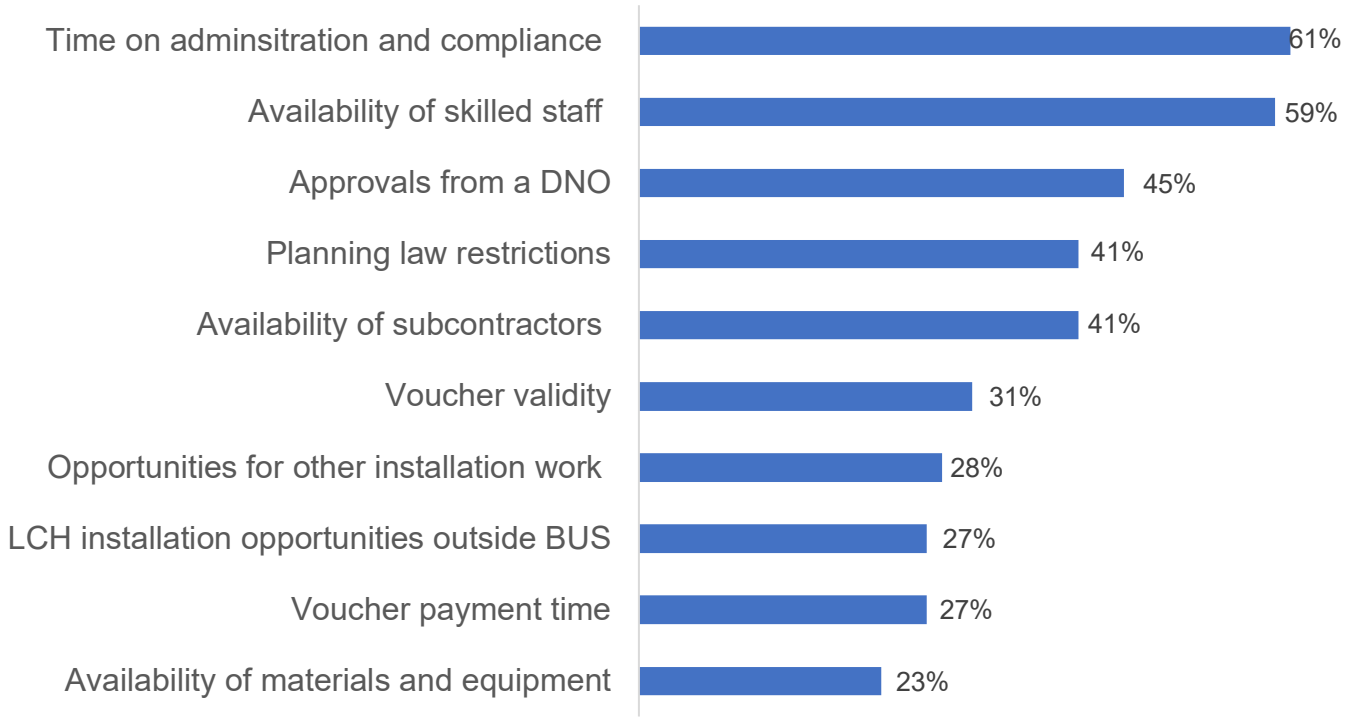
Finally, some of the installers who had carried out no installations under the BUS reported they had found that the costs to property owners of having loft and/or cavity wall installation installed, in addition to the LCH itself, was an obstacle. They suggested that other grants, interest-free loans, or energy tariff reductions should be made available to support property-owners to meet these additional costs. Note that this research was carried out before the BUS was changed; properties are no longer required to have loft and/or cavity wall installation to be eligible for a BUS grant.

BUS delivery constraints

During the survey, installers were asked if there were any factors that affected their ability to complete BUS installations – excluding the consumer demand-related barriers discussed above[27]. Just over half (58%) of surveyed installers believed that they did face limitations, compared to 43% that did not perceive there to be any delivery constraints. Installers that perceived there to be delivery constraints were asked what these were (Figure 13). Notable factors identified by this sub-group of installers included time spent on administrative and compliance tasks (61% of respondents), the availability of skilled staff to work on installations (59% of respondents) and the need for approvals from a Distribution Network Operator (DNO)[28] (45% of respondents). These issues are discussed below Figure 13.

[26] Hybrid systems were excluded in order to maximise the carbon savings that would be generated by the BUS.
[27] Source: installer survey, QC05: Is there anything that limits the number of Boiler Upgrade Scheme installations that your business is able to do? Base: All (n=247).
[28] DNOs control the connection of properties to the National Grid and need to be notified if property owners want to major electrical changes to a property (such as installing a heat pump or an electric vehicle charging point). Upgrades to the connection infrastructure may be required, especially if multiple heat pump installations are proposed for a single street.

Figure 13: Factors limiting installers' ability to complete BUS installations



Source: Wave 1 Installer Survey. QC05a: What limits the number of installations that your business does under the BUS? Again, when answering please exclude any issues relating to the scale of demand from consumers. Base: All that believed there were delivery constraints (n=142). Note: for brevity, not shown are any options selected by under 10% of respondents; multiple responses possible so sums to more than 100%.

Several installer interviewees noted that they needed additional employees (both on- and off-site) to meet BUS demand. However, some had found it difficult to recruit skilled staff and, as a result, were increasing their reliance on subcontractors instead.

> *"[We] have currently taken on two additional staff as a result of the BUS. We would like more but have struggled to recruit people. As a result, we have taken on six additional subcontractors."*

BUS-registered installer, East of England, October 2023

Several installer interviewees identified the time required to meet administrative and compliance requirements as a factor that limited their ability to complete BUS installations. As discussed below (Section: Installers' treatment of administrative costs), BUS administrative obligations were generally seen by installers as relatively light touch. Administrative obligations were mostly external to the BUS, and consisted of the requirements associated with the MCS, consumer code obligations, and the need to obtain relevant credentials for staff. Smaller installers believed that meeting such requirements took time and favoured larger companies due to the costs involved.

Installer interviewees also identified Scheme eligibility criteria as factors that limited their ability to meet demand from consumers – particularly the requirement that properties should not have outstanding loft and/or cavity wall insulation recommendations on the EPC. Note that this

requirement has since been removed. As well as a barrier to demand for BUS installations (see Figure 12), interviewed installers noted that the compliance with this requirement caused delays and added costs. A Chartered Surveyor was needed to demonstrate that loft and/or cavity wall insulation could not be installed. Alternatively, if these changes were made then an updated EPC was required.

There was recognition amongst some installers that these insulation requirements and other BUS criteria enabled the proper installation and functioning of LCH systems. It was believed by some installer interviewees that, in the absence of such criteria, the BUS could be exploited by 'rogue traders' and lead to the installation of cheap, ineffective, and potentially unsafe, LCH systems.

Delivery of the BUS

This chapter presents analysis of how the BUS delivery model has been experienced by participating installers and property owners, including how satisfied they have been with their involvement with the Scheme.

Key findings

Most (86%) property owners that had a LCH system installed were satisfied with their overall experience of the BUS. Most reportedly found the various steps in the customer journey relatively easy, including confirming with Ofgem that they consented to have a LCH system installed under the BUS.

Most installers (72%) were satisfied with Ofgem's administration of the BUS, believing it had been designed with them in mind and had accommodated learning from past schemes.

Three quarters (75%) of property owners found it very or fairly easy to find a BUS registered installer willing and able to provide a quote and carry out the LCH system installation when they wanted it done. Property owners were generally able to source quotes regardless of the system they wanted, their location or the characteristics of their property. Note, though, that this finding is based on the views of property owners that completed an installation. Most (60%) obtained a quote from more than one installer.

Most interviewed property owners were not charged for the technical survey or heat loss calculations carried out as part of system design. Interviewed installers explained that this was because they wanted to incentivise uptake, and so preferred not to charge for this step in the customer journey. If they did charge, interviewed installers explained that this was because they needed to recoup costs and avoid wasting resources on leads that were not viable or serious.

Whilst 61% of property owners found it easy to pay for the cost of the installation that were not covered by the BUS grant, 35% reportedly found it difficult. Most property owners used their savings or investments to pay the balance, though a minority had to take on debt (e.g. a mortgage extension). Twenty-one percent of property owners were asked to pay the cost of the LCH system in full and were refunded the value of the BUS grant later. This billing model was often applied where the property was a self-build.

When the research presented in this report was carried out, to receive a BUS grant, properties could not have an outstanding recommendation for loft or cavity wall insulation (this requirement has since been removed). Twenty per cent of property owners had to install loft insulation around the same time as receiving their BUS grant, and 10% had to

install cavity wall insulation. Some reportedly found it difficult to schedule and/or pay the cost of these additional works, but for most property owners this was a simple process.

Most property owners had a satisfactory installation experience. Seventy-one per cent of survey respondents were satisfied with the amount of disruption they experienced and 74% were satisfied with the duration of the installation. Seventeen percent were dissatisfied with the handover of the new system once the installation was completed. Some interviewees explained that they had been left with what they felt was overly technical material and had not had an adequate explanation of how to programme and use their new LCH system.

Interviewees reported a variety of faults and snagging issues once the installation was completed. These were typically resolved by installers. A small proportion of property owners (11% of survey respondents) had made a formal complaint about their installation experience. Amongst property owners that had made a complaint[29], the majority (92%) had complained to their installer (equivalent to 10% of all survey respondents). Just 12% of those that had complained had done so to the MCS (equivalent to 1% of all survey respondents).

Seventy-nine percent of survey respondents were satisfied with their LCH system and 7% were dissatisfied. Fourteen percent had already recommended their system to friends, and 69% said they definitely or probably would. The survey was carried out in the summer and many respondents had only recently had their LCH system installed, so had limited experience of using their new system to heat their property.

Overview of participants' experiences of BUS delivery

The BUS delivery model is installer-led, rather than consumer-led. Registered installers are responsible for almost all the administrative tasks that are required for property owners to access the BUS grant. This includes submitting grant applications (referred to as "vouchers") and redeeming the vouchers once a LCH system installation has been completed. Property owners begin their BUS journey by engaging with a registered installer. In most cases, property owners only interact with the Scheme administrator, Ofgem, to confirm that they consent to the voucher application being made on their behalf. The installer then proceeds with the installation of the LCH system. The BUS grant is paid to the installer following installation of the approved LCH system, and installers pass on the grant value to property owners.

All BUS installations must be completed by a MCS certified installer and must comply with MCS standards for heat pump and biomass boiler installations. Installers must also be a member of either the RECC or HIES consumer codes, which require them to evidence their compliance with a set of requirements about their delivery model (e.g. how they handle complaints). Ofgem manages and administers the Scheme. This includes the production of

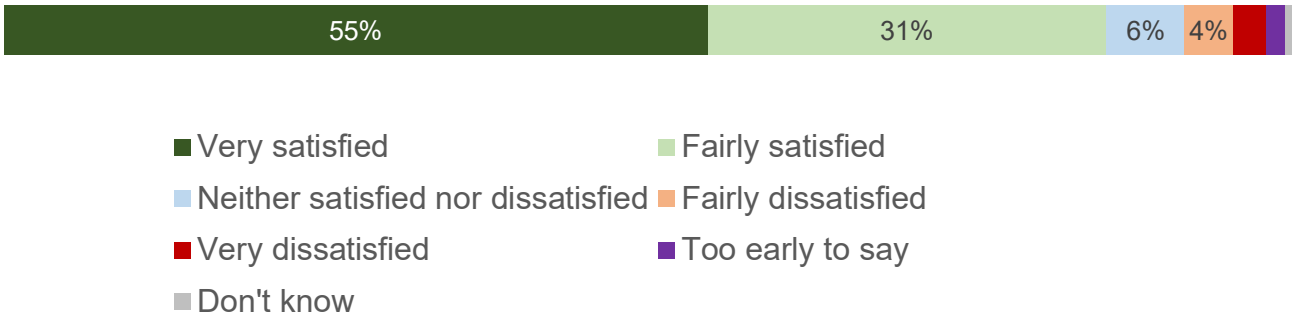
[29] n=145

and updates to Scheme guidance, the operation of the online portal that registered installers can use to manage vouchers, the processing and payment of vouchers, and audits to identify possible cases of non-compliance and fraud.

Overview of property owners' satisfaction with their BUS experience

As Figure 14 shows, most of the surveyed property owners that had a LCH system installed under the BUS were satisfied with their overall experience of the Scheme. Fifty-five percent were very satisfied and 31% were fairly satisfied. However, since these survey respondents were successful in having a LCH system installed, satisfaction levels may differ amongst property owners who exited the Scheme without completing their installation. There were very few differences in overall satisfaction levels between subgroups. Individuals who came into the Scheme knowing less about LCH systems were slightly more likely to be dissatisfied with their experiences, though this was still a small minority (8% of individuals who were previously unaware of LCH systems were very/fairly dissatisfied, compared to 3% of individuals who said they knew a lot about them).

Figure 14: Property owners' satisfaction with their BUS experience

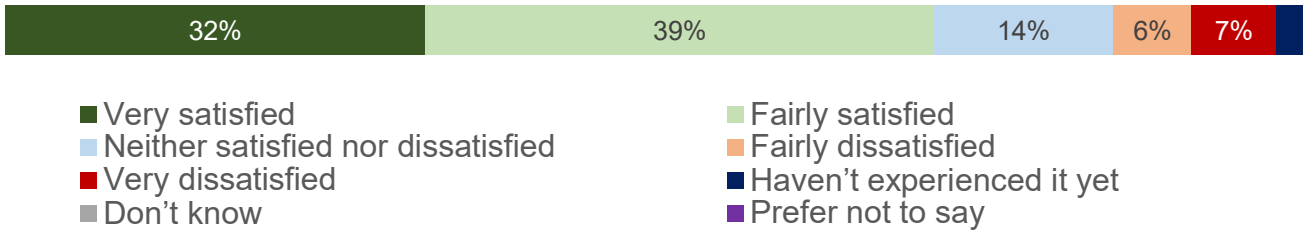


Source: Wave 1 Property owner survey. QE05. Taking everything into account, how satisfied or dissatisfied are you with your experience of the BUS overall? Unweighted base: All (n=1,310).

Overview of installers' satisfaction with Ofgem's administration of the BUS

BUS is installer-led, and so it is primarily installers who interact with the Scheme administrator, Ofgem. As shown in Figure 15, 72% of surveyed installers were either very or fairly satisfied with Ofgem's administration of the BUS. The level of satisfaction was consistent across installers, regardless of their size or the number of BUS installations they had completed. Interviewees believed that the administrative model had been designed with installers in mind and accepted lessons learned from previous government-funded schemes.

Figure 15: Installers' satisfaction with Ofgem's administration of the BUS



Source: Wave 1 Installer Survey. QD01: Overall, how satisfied or dissatisfied are you with Ofgem's administration of the BUS? Base: All (n=247).

Initial engagement with the BUS by property owners

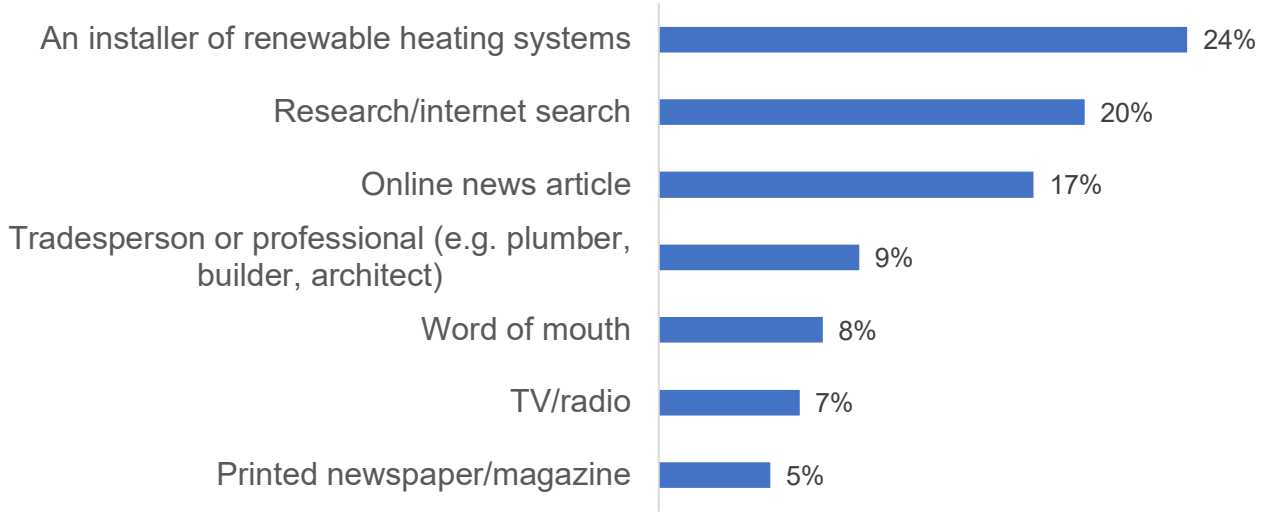
The BUS has been promoted/marketed to property owners by various stakeholders and through multiple channels. When the research for this report was undertaken, government promotion of the Scheme had primarily been through public announcements and a targeted, relatively small-scale, digital marketing campaign that ran from January to March 2023. Since the BUS is installer-led, the onus has also been on installers to promote the Scheme to generate demand. Some of the larger BUS installers have run nationwide or regional marketing campaigns, whilst others have taken a more localised approach to attract customers (e.g. adverts in local newspapers or proactively approaching potential customers). Some installers targeted their marketing activities at market segments they believed were more likely to yield viable leads, as this quote illustrates.

> *"I buy data and we aim specifically at people over the age of 50 who have either got solar panels or oil [as a fuel]."*

BUS-registered installer, North East England & Yorkshire and the Humber, October 2023

Interviewed installers relied to varying degrees on word-of-mouth and customer or manufacturer recommendations. For example, some installers had arrangements with manufacturers whereby they would recommend the installer to their customers, providing the installer with a small commission for each heat pump sale that they ultimately installed. Figure 16 shows how property owners reported that they had first heard about the BUS. There was a mix of routes into the Scheme. The most common (24% of survey respondents) was being informed about the Scheme by an installer of renewable heating systems. Another 20% had learned about the BUS themselves via research/online research (the survey did not explore what sources and sites they had accessed).

Figure 16: How property owners had first heard about the BUS



Source: Wave 1 Property owner survey. QB01. How did you first hear about the BUS? Unweighted base: All (n=1,310); Note: for brevity, not shown are any options selected by under 5% of respondents[30].

Organising a BUS installation

Finding an installer and getting a quote(s)

Property owners must use a BUS registered installer to install a LCH system if they wish to access the BUS grant. They can search the MCS register to ascertain whether an installer is BUS registered or they can search for installers online and, as Figure 16 showed, some installers proactively reach out to property owners to get business.

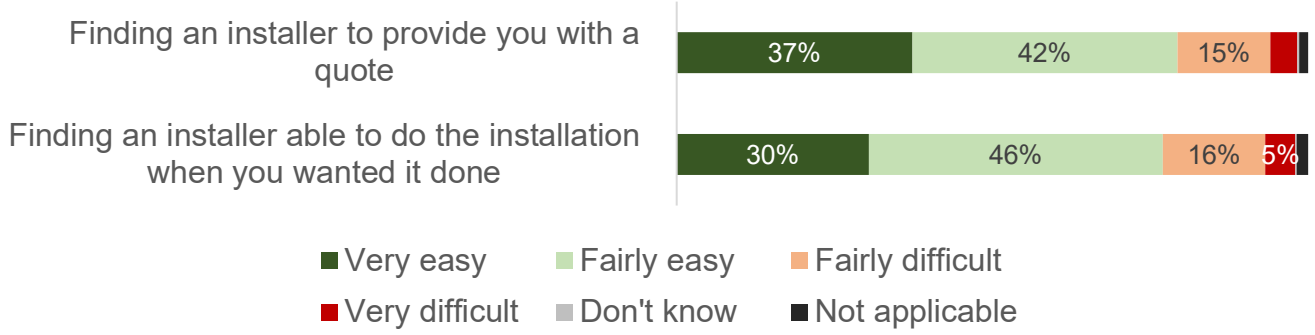
Figure 17 indicates that over 75% of the property owners surveyed found it fairly/very easy to find a BUS registered installer willing and able to provide a quote and carry out the LCH system installation. However, since these were surveyed property owners who were successful with their LCH system installation under the Scheme, there may be different findings from property owners that were not approved for a BUS grant or were unable to find an installer to submit a voucher application on their behalf. By way of comparison, under the GHG-V Scheme (which supported LCH systems and insulation), many participants found it difficult to find a willing installer[31]. Similar proportions of property owners that went on to have ASHPs, GSHPs or biomass boilers installed found the process of finding installers to quote and do the works

[30] This includes 3% of respondents who indicated they heard of the BUS via a social media notification or advert. As noted above, in early 2023 DESNZ ran a digital marketing campaign, which used social media channels to raise awareness about the BUS (albeit targeted at specific subgroups). The 37 individuals who selected social media were asked which site they had heard about the BUS on (though it is not known whether this was the DESNZ campaign or other marketing/messaging): 49% said Facebook, 17% said YouTube and 15% said Twitter. Note, however, that the survey sample was drawn from individuals whose installation was completed by the end of April 2023, by which point it may have been too early for individuals who saw the DESNZ campaign to have 'translated' into completed BUS installations.

[31] For the GHG-V Scheme, 55% of voucher applicants reportedly found it fairly or very difficult to find installers to provide quotes for measure(s) they wished to install. Source: BEIS (2022) Evaluation of the Green Homes Grant Voucher Scheme: process evaluation report.

easy; the same was true of properties in urban and rural areas of England and Wales. There were no notable differences in responses depending on the property type or size, suggesting that, broadly speaking, installers can be found to serve all property types, regardless of location (the survey did not collect more granular data on, for example, properties in Conservation areas).

Figure 17: Property owners' assessment of the ease/difficulty of finding an installer



Source: Wave 1 Property owner survey. QB07. How easy or difficult did you find the following steps in participating in the BUS? Unweighted base: All (n=1,310).

Forty percent of property owners said they only obtained a single quote for the LCH system they went on to install. Another 33% obtained two quotes and 27% obtained three or more quotes. Property owners who had a biomass boiler installed were the most likely to only obtain a single quote (73% of survey respondents); verbatim comments provided in their survey responses suggest that this is likely due to there being limited numbers of BUS registered biomass boiler installers. In almost all cases, property owners obtained quotes from installers that were BUS registered – just 8% of the property owners that obtained two or more quotes reported that at least one of these came from a non-BUS registered firm[32].

Interviews with property owners found that those who had only obtained a single quote tended to be more confident about their chosen installer, usually because they knew them already (e.g. because they were using them to install other measures), or because they had been recommended by friends/family. In some cases, property owners only got one quote because there was only one installer in their local area.

Property owners stated that most installers provided them with an initial indicative quote based on basic information provided by the property owner (e.g. the size, age and type of property and the type of LCH system they wanted). Once property owners confirmed they were happy to proceed based on the indicative quote, installers would then usually undertake a full survey (including heat loss calculations), prepare a design for the system, and provide a more detailed, revised quote. In most cases, interviewees reported that the full survey was provided free of charge. Some property owners found installers that would charge for the survey and

[32] n=774 (property owners that obtained two or more quotes).

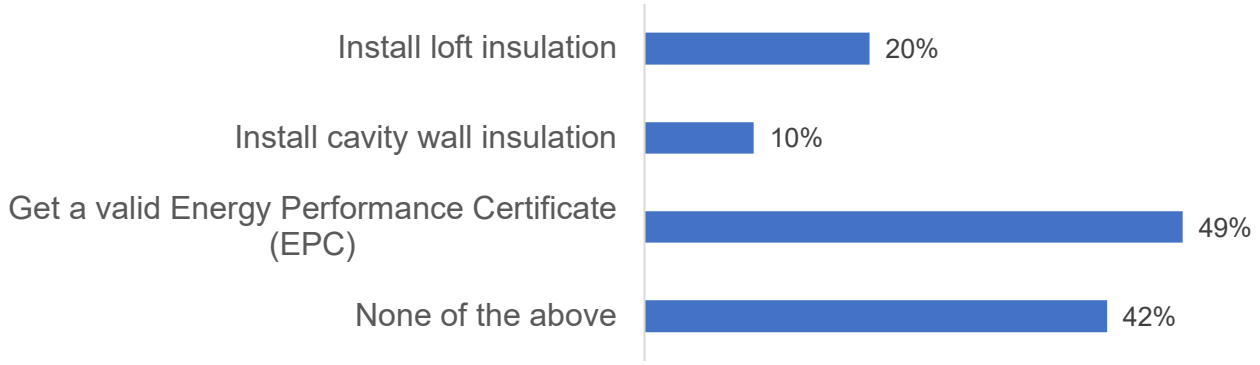
instead chose one that offered the survey for free. Others accepted the charge since they considered the survey to be a skilled and professional service that took time to complete.

Installers were also asked about their charging model. Those that did not charge for surveys explained that this was because doing so might deter potential customers, or that not charging differentiated them within the market. Other installers charged for the survey, either as an additional cost to the customer, or one that was worked into the installation price. Several installers charged for the heat loss calculation but not the survey itself. Some installers carried out free phone-based surveys as a pre-qualification, and then charged for an in-person survey if they were deemed appropriate for a LCH system. The installers that charged reportedly did so to avoid wasting resources on enquiries that were not viable or serious, and/or because they perceived that it incentivised people to proceed to installation.

Carrying out supporting insulation works to access the BUS grant

At the time of the research, to be eligible for a BUS grant, properties were required to have a valid EPC that was less than 10 years old, with no outstanding recommendations for loft or cavity wall insulation (this requirement has since been removed). To meet this requirement, 20% of property owners had to have loft insulation installed around the same time as they had their LCH system installed, and 10% had needed to install cavity wall insulation (Figure 18). Interviewees who had insulation installed were typically supportive of this requirement since they understood the importance of having a well-insulated property to increase the efficiency of their LCH system and reduce running costs.

Figure 18: Whether property owners had taken selected actions to access their BUS grant



Source: Wave 1 Property owner survey. QB06. Did you need to do any of the following to access the BUS grant? Unweighted base: All (n=1,310). Note: multiple answers possible so figure sums to more than 100%; for brevity, don't know is not shown.

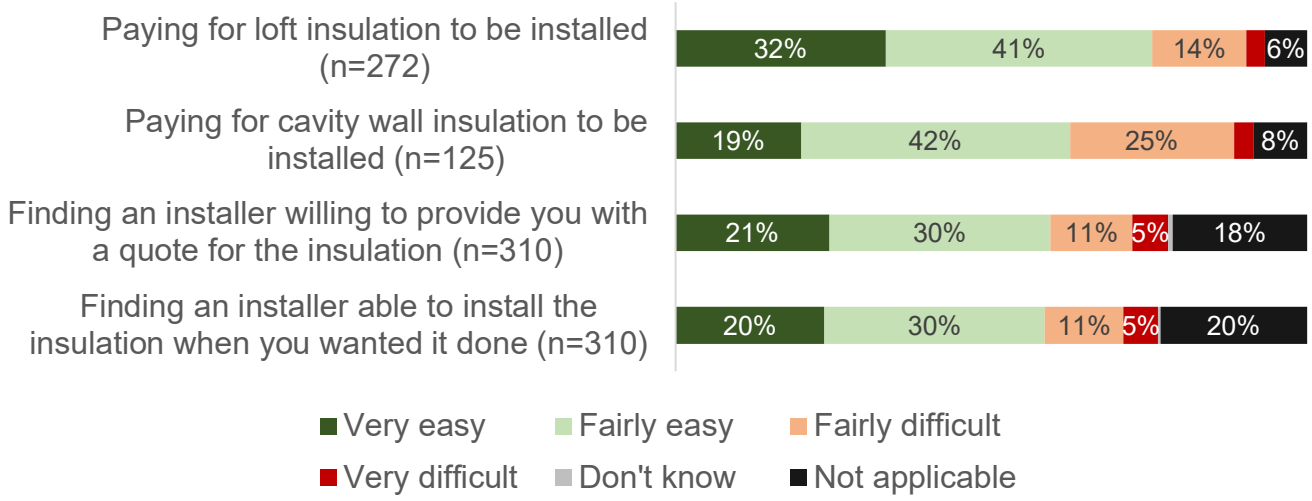
Interviewed installers reported that the need for supporting insulation works varied depending on the characteristics of properties. Some interviewees noted that, for most of their enquiries, properties were already well-insulated and had a valid EPC. Others believed that most properties needed some additional insulation alongside a LCH system, particularly if they were undergoing major refurbishment works. Some installers perceived that property owners who participated in the BUS were particularly conscious about energy efficiency.

> *"Most people [that] want to have a heat pump are aware that they need the double glazing, they need the cavity wall, and they need the loft insulation. That knowledge exists… everybody's now attuned to the fact that they need it".*

BUS-registered installer, North East England & Yorkshire and the Humber, September 2023

As Figure 19 shows, paying for cavity wall insulation was difficult for some property owners (28% reported that they found it fairly/very difficult). Paying for loft insulation was less commonly a problem. Finding and scheduling an installer to do insulation works was typically not a problem[33]. It should be noted, however, that the survey was of property owners that had a BUS installation; anyone who was unable to afford or schedule insulation works is not included in these data. In 88% of cases, loft and/or cavity insulation works were done by a different company to the one that carried out the LCH system installation. Some interviewees explained that they preferred to use an insulation specialist – rather than re-use their LCH system installer – due to concerns about the costs they were quoted, or because they were unsure about the potential quality of the works.

Figure 19: Property owners' assessment of the ease/difficulty of having additional insulation works done



Source: Wave 1 Property owner survey. QB07. How easy or difficult did you find the following steps in participating in the BUS? Unweighted base: Bases vary and are shown in chart. Note: not applicable was selected by respondents primarily because insulation works were undertaken as part of a wider property renovation or self-build.

[33] Many property owners selected not applicable when asked about their experience of having insulation installed alongside their LCH system, even though they had confirmed that these works were carried out by a different installer to the one that had completed their BUS-funded installation. There was no open text response in the survey for them to add an explanation. Many were self-build or large renovation projects, and it is likely that they selected not applicable because the insulation works were done as part of these other works.

Billing and payment for BUS installations

Billing models used by installers

BUS installers are encouraged to reduce the bill paid by consumers by the value of the BUS voucher, though they can determine their own billing model. Evidence from research with installers and property owners indicates that there are two main billing models in operation: first, customers are billed the cost of the installation minus the value of the BUS grant, and second, customers are billed the full amount and reimbursed the value of the BUS grant once the installer has redeemed the BUS voucher and been paid by Ofgem. Evidence from the property owner survey indicates that the former is the most common billing model used. Seventy-seven percent of property owners reported that the BUS grant value had been deducted from the quoted installation cost. In some of these cases, property owners had signed a contract for the full cost, but the final payment equated to the value of the BUS grant – whether they had to make this last payment was contingent upon the installer successfully redeeming the BUS voucher. In another 21% of cases the property owner indicated that they had paid the full cost of the installation and later had been refunded the value of the grant.

Installer interviewees indicated that they use the pay in full then refund model because of the risk that the redemption application may not be successful (illustrated in the following quote and see below for further discussion of installers' perceptions of risk). This approach was not necessarily applied across the board, and installer interviewees noted that their billing approach sometimes varied on a case-by-case basis depending on both the customer and the cashflow situation of the installer at the time.

> *"What I've always done is I've said to the people [property owners] that I'm going to invoice them for the full amount, and then when I get the £5,000, I'll give them it straight back, which they're happy about…Say I was doing it and I really pushed myself, I could probably do 10 [LCH installations] a month. That would be like £50,000 of me being out of pocket…I couldn't run a business like that. Everyone I've spoken to are happy to pay [in full]".*

BUS-registered installer, North East England & Yorkshire and the Humber, September 2023

Installers' treatment of administrative costs

Surveyed installers were asked the average amount of time spent on BUS-related administration per BUS-funded LCH system installation[34]. Nearly half of respondents (44%) spent between one and two hours per voucher. Just under a quarter of respondents (23%) spent between three and four hours. Twenty percent of respondents reportedly spent over eight hours on administration per voucher. The reasons for this variation are not certain. It could be because respondents included time spent on MCS administration, design work and

[34] Installer survey; QD03: On average, per voucher, how much time do you estimate your business spends on administration under the Boiler Upgrade Scheme? Base: All that had submitted >=1 BUS applications as at the end of May 2023 (n=221).

site surveys in their estimations, rather than purely BUS-related administration. Survey data also indicates that those with more employees (10-49) typically spent longer on administration than those with fewer employees or sole traders. This may be because larger businesses are more likely to have dedicated administrative staff so could afford to spend more time.

Most interviewees felt that the amount of resources (in terms of cost, time, and labour) required to administer their participation in the BUS were as expected and reasonable. Interviewees explained that many elements of the BUS administrative process would have to be followed anyway as they were the requirements associated with consumer code membership and accreditations (e.g. MCS, NAPIT, RECC).

> *"[The resource requirements] are negligible…it does not impact at all on any costs because you are working through the process in line with your consumer code and accreditation. Whether the [BUS] voucher was being claimed or not, we would still be going through the same process."*

BUS-registered installer, London, October 2023

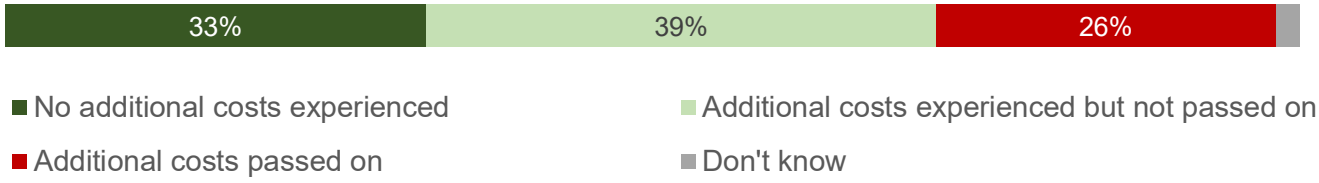
In contrast, a minority of interviewees believed that the resources required to administer BUS participation were higher than expected. Whilst interviewees noted that the resource requirements varied on a case-by-case basis, they believed that the extra costs incurred per LCH system installation varied from £100 to £400 (if a complex case). Interviewees noted the resources needed for credit checks, the relatively quick turnaround required on commissioning certificate submission, BUS audits, and challenges post-voucher redemption. They also noted the duplication of paperwork across different regulatory, consumer code, and standards organisations (e.g. NAPIT, RECC, MCS, Ofgem). Several interviewees reported that these administration and compliance requirements were higher for self-builds than retrofit projects, as the following quote – which concerns the effort needed to meet all requirements, not just those related to the BUS – illustrates.

> *"I would say there is probably an average of half a day's extra work [per installation]…I did not know there would be so much [administration] on each individual job…the level of detail that you have to put in for the whole process is quite unexpected considering it is a domestic heating system."*

BUS-registered installer, South East England, September 2023

As shown in Figure 20, a quarter of survey respondents (26%) reported that they passed additional costs associated with BUS administration onto their customers as part of the LCH system installation quotation. Another 39% said they did not pass on additional costs.

Figure 20: Installers' treatment of additional costs associated with BUS administration



Source: Wave 1 Installer Survey. QD05: Do you pass on any additional costs associated with delivering [LCH system(s) installed] installations under the BUS when quoting for an installation? Base: All that had submitted >=1 BUS applications as at the end of May 2023 (n=221).

Interviewed installers explained that any additional costs were treated as an overhead and absorbed by the business. One interviewee reported that whilst they had passed on the administrative costs under previous schemes, they did not under the BUS due to a perceived reduction in the scale of the administrative burden.

> *"I used to charge more on previous schemes due to large admin time. There has been a significant reduction in admin time for the BUS so [I] do not do that."*

BUS-registered installer, Midlands, September 2023

How easy/difficult property owners found it to pay for their BUS installation

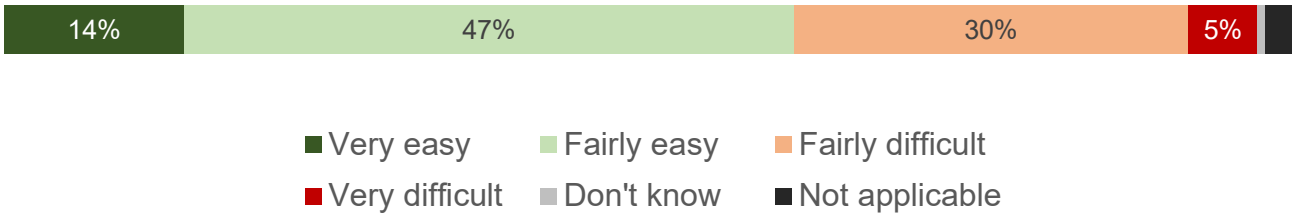
During the survey, property owners were asked how easy or difficult they had found it to pay for the cost of their LCH system that was not covered by the BUS grant (noting that the survey took place when the grant was worth £5,000 or £6,000). The results are shown in Figure 21. Though over half of survey respondents found it very easy/fairly easy, 30% reportedly found it fairly difficult to pay the outstanding balance (another 5% found it very difficult). Property owners that had an ASHP installed were more likely to find it fairly/very easy to pay the outstanding balance than those that had a GSHP or a biomass boiler installed (62%, compared to 45% and 22% of survey respondents respectively). Ease/difficulty of payment is linked with the total cost of the system being installed. Sixty-six percent of respondents whose system cost £9,999 or less found it fairly/very easy to pay for the costs not covered by the BUS grant, but this dropped to 50% of respondents whose system cost £20,000 or more (typically GSHP installations)[35].

There were no notable differences depending on respondents' household income:39% of those with an income of less than £28,000 a year and 37% of those with an income of £52,000 or higher reportedly found it fairly/very easy to pay the costs not covered by the BUS grant[36]. This could, of course, be because lower-income households were unable to source the finance needed and did not make it as far as having had an installation. Interviews with property owners found that many individuals who invested in the most expensive LCH systems were

[35] n=207 and n=114 respectively.
[36] n=69 and n=619 respectively.

retired and did not earn large salaries; instead they still found it easy to pay for their systems using savings/investments (including using pension drawdowns).

Figure 21: How easy/difficult property owners found it to pay for their LCH system



Source: Wave 1 Property owner survey. QB07. How easy or difficult did you find the following steps in participating in the BUS: Paying for the costs of the installation that were not covered by the BUS grant? Unweighted base: All (n=1,310).

When interviewed, the most common reasons why property owners found it difficult to pay for their LCH system were the high cost of systems relative to their savings and difficulties accessing finance (e.g. one interviewee who was approaching retirement age found it difficult to get a mortgage). For one interviewee, LCH system installation costs had escalated due to materials costs inflation that took place over the course of a delay to a wider renovation project. Even if they found paying the cost of their LCH system difficult, interviewees had persisted due to the strength of their motivation(s) to have one installed (see Figure 5). This was particularly true where they had financial incentives to make the switch away from a fossil fuel system, e.g. because it was becoming increasingly uneconomical.

> *"We had night storage heaters... then last year they abolished the night-time tariff, and the electricity price went up…and that was unaffordable. We were paying £500 a month on electricity for just having the heating on."*

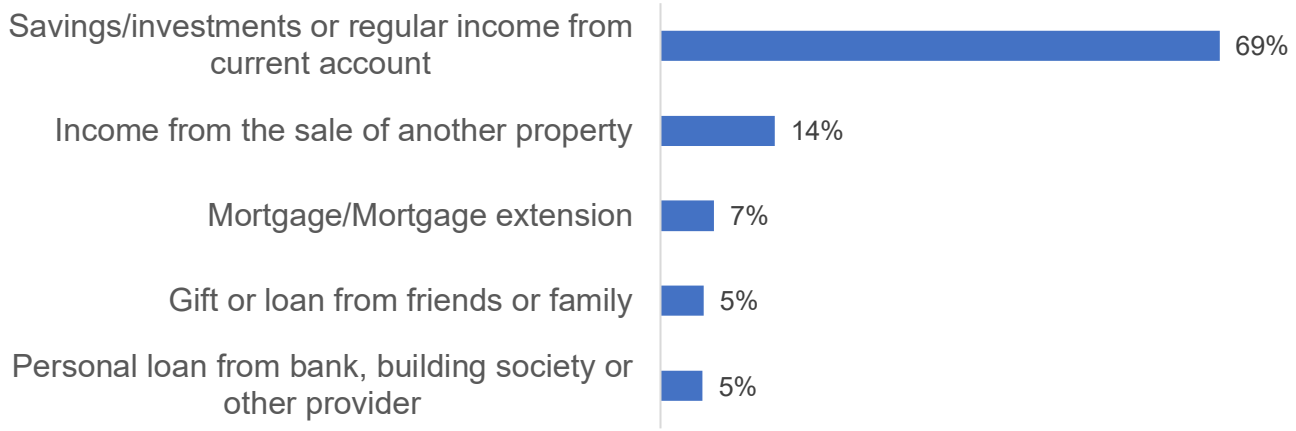
Property owner, Biomass boiler installation, September 2023

How property owners paid for their LCH system

Typically, the BUS grant was not sufficient to cover the entirety of the cost of a LCH system installation. As Figure 22 shows, most property owners (69%) paid the outstanding balance using their savings, investments, or regular income from their current account. Relatively few property owners took on debt to pay for their LCH system, whether a mortgage or mortgage extension (7% of property owners) or a personal loan (5% of property owners). There were no notable variations in the funding sources that were accessed depending on the household income band of property owners. However, property owners who reportedly found it very difficult to pay for their LCH system[37] (Figure 21) were more likely to have accessed some form of debt: amongst this subsample, 11% had used a mortgage or mortgage extension, 10% had taken on a personal loan, and 20% had used another form of debt (e.g. credit card).

[37] n=28

Figure 22: How property owners paid for installation costs not covered by the BUS grant



Source: Wave 1 Property owner survey. QC01. How did you pay for the costs of the installation that were not covered by the BUS grant? Unweighted base: All (n=1,310). Note: multiple answers possible so figure sums to more than 100%; for brevity, not shown are any options selected by under 5% of respondents.

Though not shown in Figure 22, most property owners (90%) only used one source of funding on top of their BUS grant. However, property owners that installed either GSHPs or biomass boilers were more likely to have used multiple sources of finance to top-up their BUS grant, likely reflecting the high installation cost of these systems compared to ASHPs. Twenty-four percent of GSHP installations were paid for by two or more additional sources of finance, compared to 9% of ASHP installations[38]. Interviewees who accessed multiple funding sources to pay for a GSHP or biomass boiler were sometimes concerned about the impacts of having taken on debt and/or had to balance these costs against their wider financial situation.

> *"We've got a five year loan [for] three and a half thousand… and we saved a bit of money and got the grant… But we were concerned about affordability. We didn't really want to get a £15,000 loan and then realise that we couldn't afford to upgrade our mortgage at the end of our term. Because not only did we see the electricity prices rising, we also saw the mortgage rates rising."*

Property owner, Biomass boiler installation, September 2023

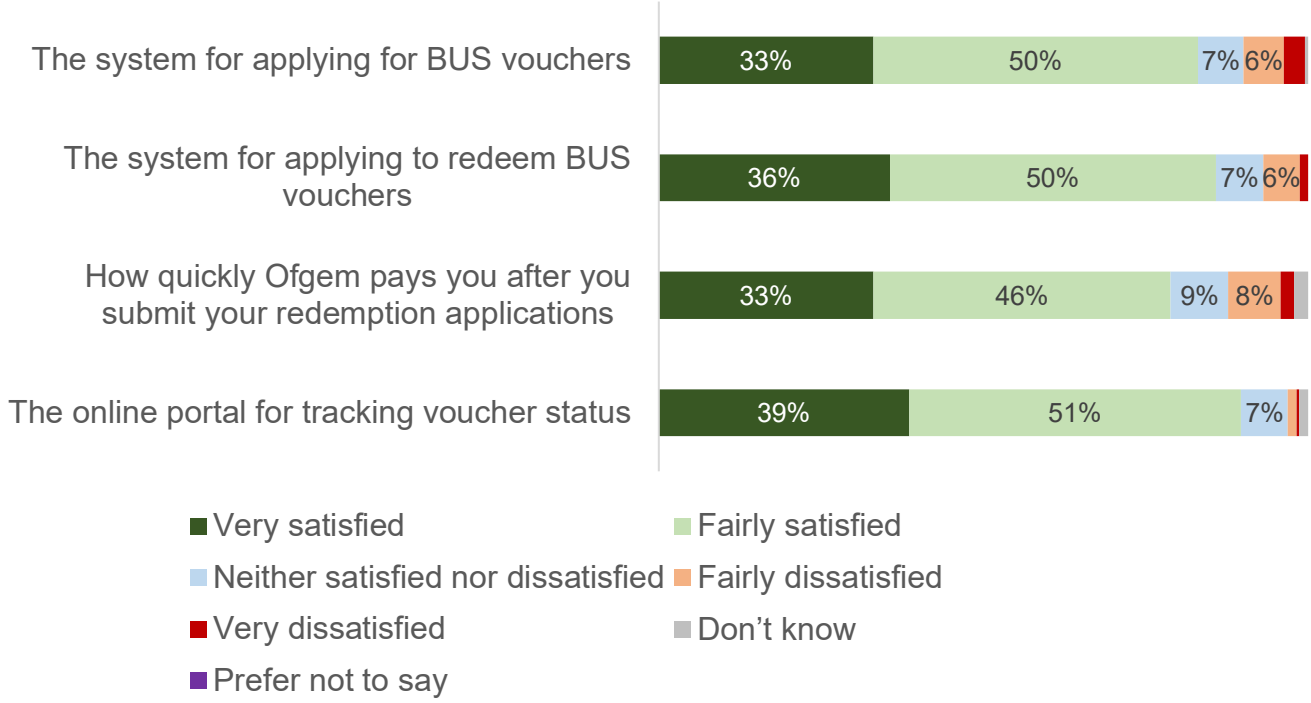
Applying for and redeeming a BUS voucher

BUS voucher applications are made by installers using a digital platform that was introduced by Ofgem in November 2022 to replace manual processing of applications. Ofgem carries out eligibility checks and confirms with property owners that they have consented to the LCH system installation. Once the installation is complete installers apply to redeem the voucher. An online system for submitting voucher redemptions was introduced by Ofgem in May 2023. After further checks, Ofgem pays installers the value of the BUS grant.

[38] n=27 for GSHPs, and n=1262 for ASHPs.

Most BUS installers were very/fairly satisfied with the BUS processes for applying for, tracking, and redeeming a BUS voucher, and the speed with which they were paid (Figure 23).

Figure 23: Installers' satisfaction/dissatisfaction with selected BUS processes



Source: Wave 1 Installer Survey. QD02: Thinking about your experience of the BUS, how satisfied or dissatisfied are you with the following? Base: All (n=247).

Most interviewed installers found the voucher application and redemption process straightforward and noted that it had improved over time (especially with the switch by Ofgem to a digital submission model). They noted the benefits of the installer-led model since the installer has control and oversight over the whole process. Several interviewees believed the model worked well for customers since it reduced the administrative burden they faced, and eliminated the risk that misunderstandings by customers might cause delays or introduce errors into applications[39].

In contrast, some interviewed installers had reservations about the installer-led model. In most cases, this was due to its perceived impact on business cashflow and the shouldering of risk (the increase in grant value to £7,500 was seen to have further exacerbated the risk). Since a redemption application could be rejected – even though the LCH system installation had been completed – the installer-led model put installers at risk that they would not be fully paid for their work. Delays in repayment (especially if works were audited) could impact upon installers' cashflow. To mitigate these concerns, some installers have required property owners to pay in full for their LCH system installations (as discussed above).

[39] This was reported to have been an issue under the GHG-V Scheme which had a customer-led model (BEIS (2022) Evaluation of the Green Homes Grant Voucher Scheme: Process Evaluation).

As noted above, property owners must confirm with Ofgem that they consent to have the LCH system installed under the BUS. Most found this process simple: 42% of survey respondents said this had been very easy and another 40% said that it had been easy. Another 11% selected don't know or not applicable; during interviews several individuals could not recall having provided consent to Ofgem (it is a light-touch process), which likely explains why many survey respondents could not answer this question.

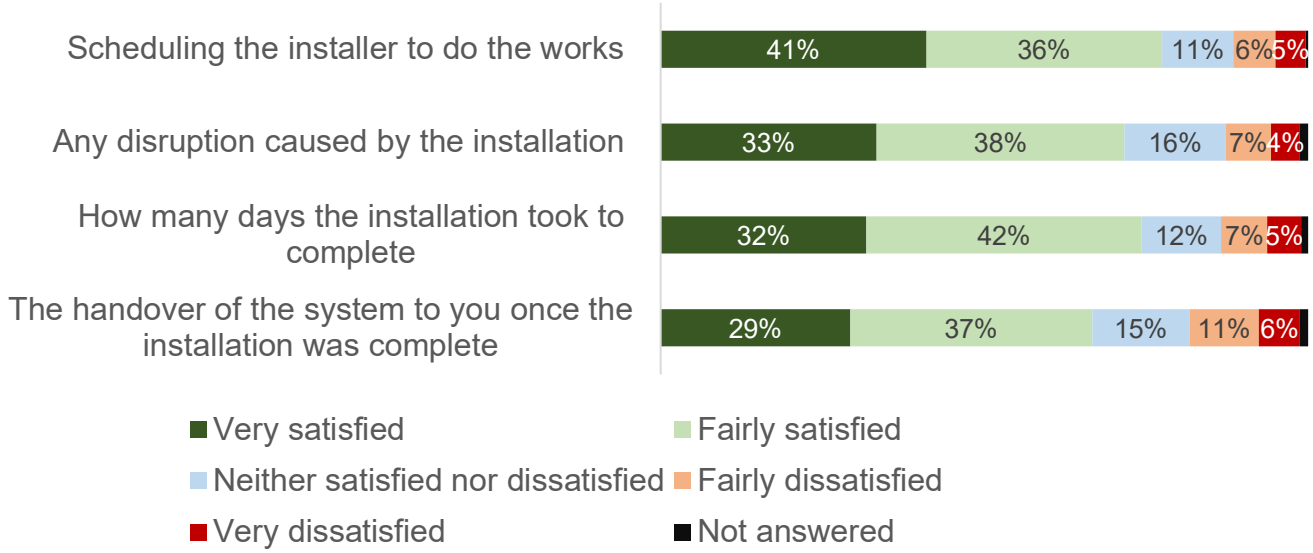
Having a LCH system installed under the BUS

As part of the survey, property owners that had a LCH system installed under the BUS were asked how satisfied or dissatisfied they were with various aspects of their installation experience (Figure 24). Most respondents were very/fairly satisfied. Interviewees often found the process disruptive – e.g. not having heating or hot water, having to vacate rooms or even move out temporarily – but provided they were briefed in advance and perceived the installation to have been well-managed, they tended to accept this as a necessary feature of a LCH system installation.

> *"It was an upheaval but the two workmen that came were polite, on time, and tidied up after themselves…they basically had to go around the house lifting all the floors…so it was a proper upheaval and we had to lose the bathroom as well… We had to decamp to the bedroom during the installation. They did that room first and then allowed us to just have that as a tidy room and then they could make mess everywhere else…We could manage that for two weeks."*

Property owner, Biomass boiler installation, September 2023

Figure 24: Property owners' satisfaction/dissatisfaction with the installation experience



Source: Wave 1 Property owner survey. QD01. How satisfied or dissatisfied were you with the following?
Unweighted base: All (n=1,310).

As Figure 24 shows, the quality of the handover of the new system was the area where dissatisfaction was highest, though even then only a minority of property owners (17%) were dissatisfied. Some interviewees did not feel they had been adequately prepared to use their new heating system. Some property owners reported being left with overly technical operating manuals (in one case an Italian manual with no English translation) without being shown how to use their system. Several interviewees also suggested they would have liked to have been shown how to undertake basic maintenance. Several property owners used YouTube videos to show them how to use their system, due to inadequate handovers from their installer. In other cases, property owners had to arrange follow-up visits from their installers to ask questions about how to use and programme their LCH system efficiently.

Why BUS vouchers expire before an installation is completed

If not redeemed, BUS vouchers expire after three (ASHPs, biomass boilers) or six months (GSHPs). Expiries are not uncommon; of the 21,022 BUS vouchers that had been issued by the end of September 2023, 3,007 (14%) expired before an installation was completed (expiry 'rates' ranged from 14% of vouchers issued for an ASHP installation to 11% of issued GSHP vouchers). If a voucher expires then the installer must apply for a new voucher. Again, this is not uncommon. Sixty-two percent of property owners who had an expired voucher went on to successfully reapply for a voucher, and 53% went on to have an installation[40]. These figures are underestimates of the reapplication and installation rate since the Scheme is still live.

Several installer interviewees had experienced a voucher expiry. The most common explanation they gave was that they had experienced on-site delays which had meant they had been unable to complete the LCH system installation when they intended. This was most often the case where the installation was being carried out as part of a self-build or large renovation project, where the timing of the LCH system installation was dependent upon other factors. Other installers noted that they had sometimes applied for the voucher too early in the customer journey, leaving them with insufficient time to complete the installation. Whilst the re-application process was not difficult (as shown in Figure 23, most installers were satisfied with the voucher application process), installers disliked the duplicated administrative burden and the uncertainty that resulted from having to re-apply for a voucher.

> *"Vouchers can expire too quickly: installations can take a while due to supply delays, planning the install itself, and then finally installing. A lot of coordination is needed to meet a deadline and each voucher extension takes a lot of admin."*

BUS-registered installer, East of England, October 2023

[40] Source: This analysis was carried out by identifying unique property owners based on their email address and analysing what had happened to each BUS voucher application submitted on their behalf. This is an underestimate of the reapplication and installation rate since property owners sometimes used different email addresses for applications, meaning they would not be identified as having submitted a follow-on application having had a voucher expire. However, using email addresses was better than using alternative identifiers (e.g. property address or property owner name) due to variations in the way that these variables have been recorded in the BUS database (e.g. addresses are written in different ways).

Interviewed property owners also noted that they had vouchers that expired because of on-site scheduling delays. Sometimes these were not the fault of their chosen contractor (e.g. in one case a property owner interviewee had waited 18 months for planning approval for the installation of a GSHP), but in other cases interviewees believed that installers had not had the capacity to complete installations when they needed to (as shown in Figure 13, installers also noted that they were constrained by a lack of available staff/sub-contractors to do the work). In other cases, property owners explained that they had caused vouchers to expire. In some cases this was temporary (e.g. it had taken them longer than expected to secure finance to pay for the installation), whilst in other cases they had changed their mind and cancelled the installation, as this quote illustrates.

> *"We really went off the idea…we were faced with this very large bill for a heat pump, plus we have to get planning permission for everything we do...So it all became very difficult and there is an issue…around Listed properties as they're leaky buckets basically."*

Property owner, no installation (expired voucher), October 2023

Frequency and resolution of complaints

LCH system installations are complex and there can be post-installation problems. All BUS installations must be completed by installers that are MCS accredited and a member of a consumer code, which ensures property owners have various routes of recourse available. Data from the property owner survey indicates that most BUS participants have not faced substantive problems: only 11% had made a formal complaint about their LCH system installation. As discussed below, property owners were mostly satisfied with their LCH system and thus did not need to make a complaint. Some interviewed property owners were dissatisfied with one or more aspects of their experience but did not want to make a complaint. This was usually because they did not deem the issue problematic enough to merit taking things further, or because they did not think anything could be done to resolve it (e.g. higher than expected running costs).

If property owners had made a complaint, in almost all cases this was made directly to the installer that had completed the works (92% of those that made a complaint[41], equivalent to 10% of all survey respondents). Twelve per cent of property owners that made a complaint did so to the MCS (equivalent to just 1% of all survey respondents). As noted below, some of these property owners had first complained to their installer.

The low number of complainants limits the quantitative analysis that can be undertaken of the outcome of these complaints. Of the property owners that complained to their installer[42], 19% were very/fairly satisfied with the outcome and 30% were very/fairly dissatisfied (most of the remainder were neither satisfied nor dissatisfied or did not answer). Of this subset of property owners that were dissatisfied with the outcome of their complaint to their installer[43], 31% had

[41] n=145
[42] n=134
[43] n=45

also complained to another organisation – most commonly the MCS – but the number of survey respondents is too low to enable analysis of the outcome.

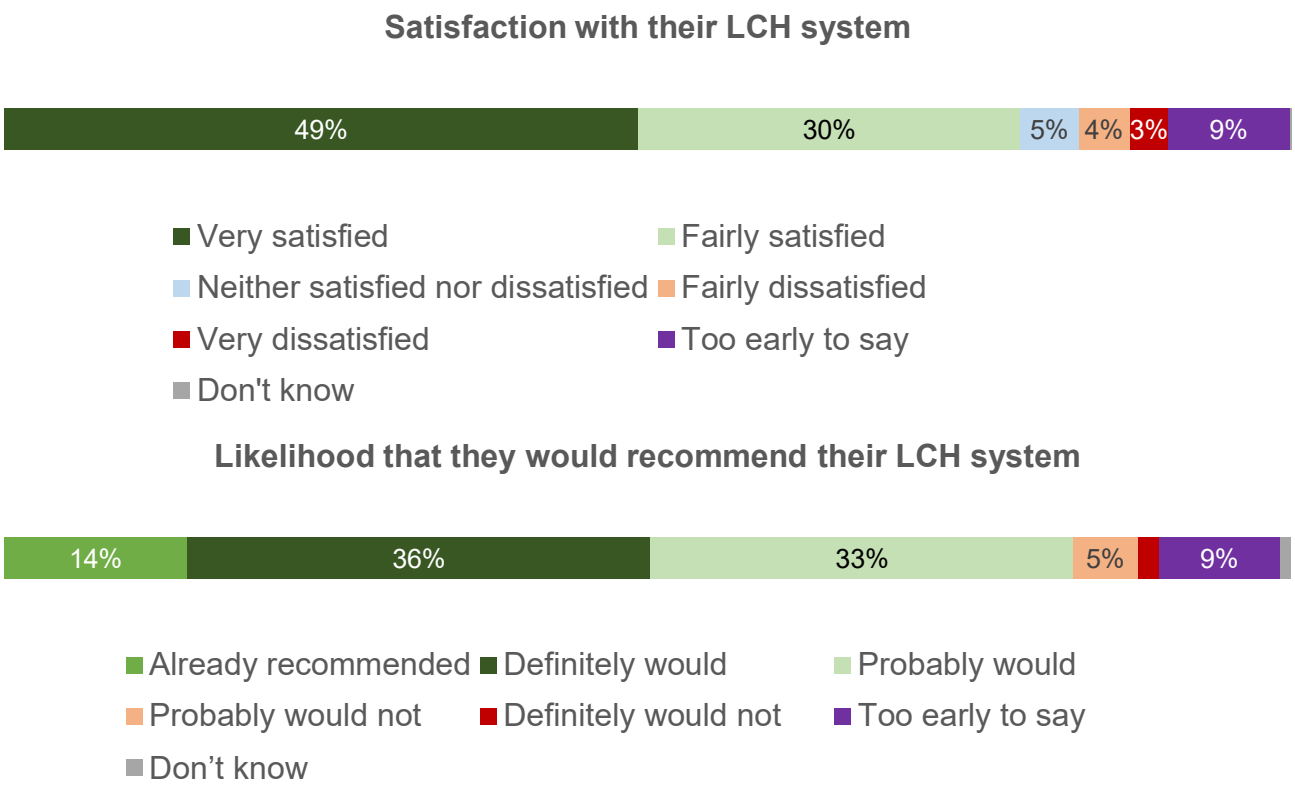
Complainants' experiences were discussed during interviews. Generally speaking, complaints concerned faults and other snagging issues which, for the most part, installers eventually resolved. Some property owners had more persistent problems with LCH system performance (e.g. insufficient hot water, or intermittent heat), or were dissatisfied with the running cost of their system (as noted above, other property owners deemed this an unresolvable issue and did not complain). Such issues were sometimes unresolved at the point of interview, with property owners considering escalation, or having to wait (one interviewee was told to use their system for a full year before the installer would consider visiting to check its efficiency).

Property owners' satisfaction with their LCH system

Property owners were asked whether, at the time of the survey (which was undertaken in summer 2023), they were satisfied/dissatisfied with the LCH system they had installed (the upper chart in Figure 25). Note that these data concerned installations that had taken place between October 2022 and April 2023; those that had systems installed in spring 2023 may not have had much experience using their system to heat their home[44]. This uncertainty is reflected the proportion of people selecting too early to say in Figure 25 (9%). Despite this, most property owners were very/fairly satisfied with their LCH system (79%). There were some differences depending on the system installed: 21% of properties with a GSHP were very/fairly dissatisfied (compared to 7% of AHSP and 4% of biomass boiler property owners)[45]. As the lower chart in Figure 25 indicates, property owners were also highly likely to recommend their LCH system to friends: 14% had already done so, and 69% definitely/probably would do so.

[44] Further fieldwork is planned with a sample of these property owners to explore in more detail their lived experience of their system. This is currently scheduled to take place in spring 2024, after the 2023/24 heating season.
[45] n=27 for GSHPs, and n=1,262 and n=21 for ASHP and biomass boilers respectively.

Figure 25: Property owners' satisfaction with their LCH system and whether they would recommend it



Source: Wave 1 Property owner survey. Upper chart - QE03 Taking everything into account, how satisfied or dissatisfied are you with your [LCH system installed] overall? Lower chart - QE04 Based on your experience to date would you recommend a [LCH system installed] to friends? Unweighted base: All (n=1,310).

Interviewed property owners were asked about their impressions to date of their LCH system, noting the caveats made above about whether they were able to make an assessment when the interview took place. On balance, most property owner interviewees perceived their new system positively. Several noted that any concerns they had prior to the installation had proven unfounded, as this quote – about the noisiness of their system – illustrates.

> *"Noise levels - I really don't understand what the planners were worried about. You can't hear the thing at all. Our neighbours are absolutely fine with it."*

Property owner, ASHP installation, September 2023

Thermal comfort was the main consideration for interviewees. Most were happy with the warmth of their property, though some compared their LCH system unfavourably to the fossil fuel system they had replaced. The two quotes below illustrate these two viewpoints. Running costs also influenced interviewees' perceptions of their LCH system, and their propensity to recommend one to friends.

> *"In terms of how well it heats the property, it's absolutely fine and we've not noticed any difference between that and the old oil boiler…Everyone who comes*

to the house says it's nice and warm. The hot water is fine too. We're never short of hot water and it keeps it topped up really well".

Property owner, ASHP installation, September 2023

"Compared to the gas central heating, we've found it doesn't get as hot and it's harder to keep the house warm. I think because the radiators don't get as warm…we had a few weeks where there was a lot of snow, and the system just doesn't really work when it's very cold".

Property owner, ASHP installation, September 2023

Interim Conclusions

This final chapter presents the interim conclusions of the evaluation. During the scoping phase of the evaluation, the team agreed with the Department 16 process, impact and economic evaluation questions that guide the evaluation. At this interim stage it is too early to provide answers to all 16, especially in relation to the BUS impacts and value-for-money (this will instead be included in future evaluation workstreams). These conclusions thus focus on the process evaluation questions where the evidence presented in this report allows some early conclusions about the delivery of the BUS to be drawn (noting that these results are based on evidence collected from property owners and installers that participated in the Scheme).

How effective has Ofgem's delivery of the Scheme been? What has been installers' experiences of the delivery of the BUS? Has participating in the Scheme imposed any undue burdens on them and, if so, what and to what extent?

To date, evaluation evidence comes from the survey and interviews with BUS-registered installers. Most installers (72% of survey respondents) were satisfied with their interactions with Ofgem and their experiences of its administrative systems (Section: Overview of installers' satisfaction with Ofgem's administration of the BUS). Installer interviewees explained that, for the most part, they thought that application systems were well-designed and effectively delivered. Most installers were satisfied with the system for applying for vouchers (83% of survey respondents) and redeeming vouchers (86%) (Section: Applying for and redeeming a BUS voucher). Most installers (79%) were satisfied with how quickly they were paid by Ofgem after their vouchers were redeemed (though the auditing of installations did slow the process down). Installer interviewees felt there were adequate channels for installers to provide feedback to Ofgem. The evolution of administrative systems, notably the shift to a digital administrative system, indicates that learning has been captured and acted upon.

What has been property owners' experiences of the delivery of the Scheme by Ofgem?

Since the BUS uses an installer-led model (see below), property owners have very little interaction with Ofgem. Unless their installation is audited, their only obligation is to confirm to Ofgem that they consent to the installation going ahead. During the survey property owners were asked how easy or difficult they found this, and the majority (82%) said that they had found it either very easy or easy. Whilst this evidence is limited to property owners that went on to have an installation, there was no evidence from installers or elsewhere that the consent procedure is acting as a barrier to BUS uptake.

How easy or difficult did installers find it to participate in the BUS? What were the enablers and barriers to participation?

Evidence to date comes from the survey and interviews with BUS-registered installers, and the evaluation does not presently have any evidence from LCH system installers that might have been deterred from participating in the BUS. Amongst BUS-registered installers, evidence

suggests that most found the Scheme easy to participate in. Joining the BUS was straightforward for most installers, provided they were already MCS accredited and were members of a consumer code (as was typically the case, since participating installers were mostly not new to the market). The BUS uses an installer-led delivery model, meaning that installers are responsible for BUS processes (voucher applications etc.). Most interviewed installers were satisfied with this approach since it was simple and aligned with their existing delivery models (Section: Applying for and redeeming a BUS voucher). Two-thirds (67%) of surveyed installers reportedly spent between one and four hours on administration per BUS voucher (Section Installers' treatment of administrative costs). Twenty percent said they spent over eight hours on administrative tasks per voucher; whilst it is not clear whether they included time spent on MCS administration, design work and site surveys in their estimations, rather than purely BUS-related administration, this suggests that there is scope for improvements in BUS processes or the guidance issued by Ofgem to installers. Some interviewed installers believed that the payment model – whereby the BUS grant is only paid to them once they have completed an installation and redeemed the voucher – introduced risk (e.g. that the voucher might not be successfully redeemed). For some interviewed installers this caused cashflow problems, especially if there was a delay in payment (e.g. because the installation was audited).

How have property owners heard of and learned about the BUS? What were their experiences of the marketing of the Scheme by installers and DESNZ?

Property owners learned about the BUS from a variety of sources, most commonly (24% of survey respondents) from LCH system installers (Section: Initial engagement with the BUS by property owners). Most property owners were typically very concerned by climate change (71% of survey respondents) and half (51%) already knew a lot of a little about LCH systems even before they joined the Scheme (Section: Profile of property owners with installations). They were thus receptive to BUS marketing and promotion, whether by installers or the comparatively more limited activities undertaken by DESNZ in early 2023. Note that the fieldwork carried out for this report took place before the launch of the government's Welcome Home to Energy Efficiency campaign, which was designed to raise awareness about LCH systems and the BUS amongst consumers.

How easy or difficult did property owners find it to participate in the BUS? What were the enablers and barriers to participation?

The BUS uses an installer-led model that makes it simple for property owners to participate. Evidence from the survey and interviews with property owners that had a BUS installation suggests that they typically found the BUS element of their experience simple, though as noted above, other than confirming to Ofgem that they consented to the installation there was little for them to do. Most property owners found the other elements of the installation customer journey fairly easy and were typically satisfied with their experiences (Section: Organising a BUS installation). Most property owners (61% of survey respondents) found it very or fairly easy to source the finance needed to pay for the cost of the installation that were not covered by the BUS grant (Section: How easy/difficult property owners found it to pay for their BUS

installation). Only a minority had to take on debt to pay the balance. As shown in , however, BUS participants had a higher than average annual income. The requirement that most property owners should not have an outstanding recommendation for loft or cavity wall insulation on their EPC – which has since been removed – was an issue for some property owners. This was because they needed to schedule and pay the cost of these works on top of their LCH system. What is presently missing from the evidence base, however, is information about the experiences of property owners that did not make it as far as an installation, which is scheduled to be collected later in the evaluation.

Installers were also asked about what they saw as the enablers and barriers to property owners' participation in the BUS (Section: Consumer demand for BUS installations). Most perceived that the high cost of LCH systems (89% of survey respondents) and the value of the BUS grant (69%) were important limitations to greater uptake. Note that most research was carried out before the BUS grant increased to £7,500 for ASHPs and GSHPs. Installers also perceived that a lack of widespread awareness (64% of survey respondents) and/or understanding of the benefits of LCH systems (75%) amongst the public was a barrier.

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