UK Government

Evaluation of the Boiler Upgrade Scheme

2026 Final Report

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Acknowledgements

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Glossary

Low carbon heating (LCH) system	LCH systems are heating systems that reduce carbon emissions compared to fossil fuel heating systems. They provide heat and hot water without using gas, oil or other fossil fuels and are typically powered by electricity or renewable fuels.
Boiler Upgrade Scheme (BUS)	The BUS is a grant-based mechanism to support the uptake of LCH systems in domestic and small non-domestic properties in England and Wales.
Air Source Heat Pump (ASHP)	An 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 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)	DESNZ is the Government department with overall responsibility for the BUS.
The Office of Gas and Electricity Markets (Ofgem)	Ofgem is the government regulator for the electricity and gas markets in the UK. Ofgem administers the BUS on behalf of DESNZ.
Distribution Network Operator (DNO)	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)	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. At the start of the BUS, to be eligible for a voucher 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 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 HIES is a consumer protection organisation covering the installation of renewable energy products, including heat pumps and biomass boilers. 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 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 RHI was the predecessor initiative to the BUS. While the domestic version of the RHI closed to new applicants in March 2022, payments to existing participants continue until 2029. 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 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.
Energy Company Obligation (ECO)	The ECO scheme supported the delivery of energy efficiency measures – including LCH systems – in the homes of low income, fuel poor and vulnerable households. It was delivered by energy suppliers. The phase of the BUS covered by this evaluation overlapped with ECO4, which ran from 2022-2026.

Home Upgrade Grant (HUG)	The HUG scheme supported low income owner occupiers and private rented tenants in off-gas grid properties in participating areas of England with a low EPC rating to install energy-saving measures and LCH systems. The HUG was replaced by the Warm Homes: Local Grant scheme from April 2025.
Warm Homes - Social Housing Fund	The Fund (previously known as the Social Housing Decarbonisation Fund) supports social housing providers to install energy-saving measures – including LCH systems.
Deadweight	Outcomes that would have occurred even without public funding or intervention. High deadweight indicates lower value for money, as public resources do not generate additional benefits.
Value for Money (VfM)	An assessment of whether a programme delivers the maximum possible benefit for the resources used.
Five-Es framework (5Es)	A framework for assessing value for money that considers economy, efficiency, effectiveness, equity and cost-effectiveness in the delivery of a programme.
Quasi-experimental analysis (QEA)	A group of statistical methods used to estimate the causal impact of a policy or programme where randomised control trials are not feasible. These methods compare observed outcomes with a modelled counterfactual.
Interrupted Time Series (ITS)	A QEA method that examines changes in trends over time by comparing outcomes before and after the introduction of a policy or intervention, while accounting for underlying trends.
Synthetic Difference-in-Differences (SDiD)	A QEA technique that estimates policy impacts by constructing a weighted comparison group.
Full-time equivalent (FTE)	A standard measure of employment that converts total hours worked into the equivalent number of full-time jobs, allowing comparison across organisations and time periods.
Impact Assessment (IA)	A formal appraisal conducted by government to assess the expected costs, benefits and impacts of a policy before it is implemented. The BUS Impact Assessment set out initial assumptions on uptake, costs and emissions savings.

Executive Summary

In March 2023, the Department for Energy Security and Net Zero commissioned a combined process, impact, and economic evaluation of the 2022-2025 Boiler Upgrade Scheme (BUS)[1]. 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 was 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. A further significant change during the evaluation period was the removal, from May 2024, of the requirement for properties to have no outstanding loft or cavity wall insulation recommendations. The research presented in this report includes evidence from before and after the grant uplift and changes to insulation requirements were introduced. This evaluation of the BUS was undertaken by ICF, working with Eunomia, University College London (UCL), and BMG Research. This 2026 Final Report is the third published report, following the 2024[2] and 2025[3] Interim Reports.

This Final Report draws on a comprehensive mixed-methods evaluation combining large-scale quantitative and qualitative data collection and analysis. Primary research included four waves of a broadly representative survey of property owners who received BUS-funded installations, conducted at six-monthly intervals from summer 2023 (wave 1) to spring 2025 (wave 4), and two waves of a follow-up survey of property owners carried out after at least one heating season (wave 1 in summer 2024 and wave 2 in autumn 2025). Qualitative research with participating property owners comprised in-depth interviews and case studies, alongside interviews with non-participant property owners. The evaluation also included two waves of a broadly representative survey of BUS-registered installer companies (wave 1 in summer 2023 and wave 2 in summer 2024), together with interviews with participating installers and non-participant LCH system installers. This research was complemented by analysis of administrative data from the BUS and other databases, market assessment interviews with industry stakeholders, and quasi-experimental analysis (QEA) to estimate installation and employment additionality. The value for money (VfM) of the BUS was assessed using a 5Es framework. Evidence from all sources was systematically synthesised against the evaluation questions, comparing findings over time, across stakeholder groups and across methodologies, to draw conclusions.

[1] The extension of the BUS from 2025 to 2030 is not the focus of this evaluation.
[2] DESNZ (January 2025) Evaluation of the Boiler Upgrade Scheme: 2024 Interim Report
[3] DESNZ (January 2026) Evaluation of the Boiler Upgrade Scheme: 2025 Interim Report

Main findings

Delivery and participant experiences of the BUS

- **Ofgem's administration functioned well overall, although payment timing created residual risks for some installers**. Most installers (73%) were satisfied with Ofgem's administration, which was widely seen as simpler than previous schemes. Whilst most installers (77%) were satisfied with how quickly they were paid after submitting a voucher redemption application, the lag between LCH system installation and payment of the voucher – inherent to the BUS design – caused cashflow problems for 29% of installer companies. This lag could be prolonged in the small number of instances where audits delayed voucher redemption. However, the BUS data shows that the average time taken to pay a voucher was 8.6 days and 90% of redeemed voucher payments were made within 10 working days.
- **Property owner interaction with Ofgem was generally minimal, reflecting the simplicity of the scheme**. In most cases the only interaction was for property owners to confirm they consented to the LCH system installation and most survey respondents (85%) found this process to be easy.
- **The BUS grant was central to overcoming financial barriers to LCH installation**. Although participants were already motivated by environmental concerns (85% wanted to reduce their carbon emissions), 68% said the grant prompted them to install their LCH system when they did, by reducing upfront costs that had previously prevented them from proceeding.
- **Awareness of the BUS was largely driven by self-directed research**. Participants most commonly (28%) learned about the BUS through their own research and found it easy to understand the scheme once aware, although it is not clear exactly what prompted decisions to undertake their own research or what information they found and the extent to which it included BUS promotional materials. However, qualitative evidence shows that non-participants often misunderstood the scheme, confusing it with loans or means-tested support.
- **Take-up was constrained by a combination of cost, suitability, and timing barriers, many outside the BUS's control**. From the installer perspective, 76% reported factors limiting demand, most commonly concerns about installation costs, property suitability, and running costs. Non-participants echoed these issues, alongside household circumstances, (mis)perceptions of LCH systems, and property readiness.
- **Expansion of the installer market improved the customer journey, though some dropout reflected wider delivery constraints**. Ease of obtaining quotes rose from 79% at wave 1 of the property owner survey to 89% at wave 4, and ease of scheduling installations from 76% to 85%. However, BUS administrative data showed 11% of

vouchers issued between 2022-25 expired, often due to delays linked to planning issues[4] or coordination with wider renovation works rather than scheme design.

- **Installation disruption was generally manageable and shorter than often assumed**. Despite concerns about disruption, 77% of participants were satisfied with installation timescales, and 48% reported installations completed in five days or fewer.
- **LCH system handover was generally effective, though inconsistencies affected some survey respondents' confidence using and optimising their system**. While most property owners were satisfied with handover, 16% reported dissatisfaction, and only 26% felt completely confident programming their system to minimise running costs. Where handover was weaker, users were more likely to need follow-up support and take longer to adapt to ambient heating.

Post-installation experiences

- **Property owners' overall satisfaction with their LCH system was high and increased over time**. By the follow-up survey (9-21 months after installation), 91% of respondents were very or fairly satisfied (of whom 64% were very satisfied). This compared to 80% who were very or fairly satisfied with their LCH system shortly after it was installed.
- **Most property owners were satisfied with the temperature of their property when using their LCH system**, though they often went through a period of adjustment as they learned how to use their system and adapted to the different way of heating their home. A large majority (93%) described indoor temperatures as about right overall, including during the coldest mornings and evenings. A minority (42%) of property owners reported using supplementary heating alongside their LCH system during the previous winter. This most commonly involved the use of open fires or stoves burning wood or coal and could be for aesthetic/comfort reasons as well as to maintain warmth.
- **Satisfaction with hot water provision was high**. Most property owners felt that hot water temperatures were about right (94%), and large majorities were satisfied with both the speed at which hot water heated up and the quantity available.
- **Property owners were typically satisfied with the level of noise produced by their LCH system (89%)**, including during cold weather when systems were operating more intensively (85%).
- **Most commonly, property owners reported that their total energy bills decreased after they installed a LCH system (42%)**. Experiences with bills varied depending on the type of heating system replaced, with 52% of those replacing a gas boiler reporting that their energy bills had decreased. Experiences also varied by whether additional technologies such as solar PV or battery storage were installed.
- **Nearly half (46%) of property owners had switched electricity tariff since installing their LCH system**, mostly to reduce energy bills. Switching became more common over

[4] All research was carried out prior to the easing of planning laws in England in May 2025, which removed the one-metre boundary rule and expanded permitted development rights.

time, with increasing uptake of time-of-use and dedicated heat pump tariffs, which were associated with a greater likelihood of reported reductions in total energy bills.

- **Over half (56%) of respondents to the follow-up property owner survey reported that they had serviced their LCH system since installation**, with a further 7% having attempted but not yet succeeded. Among those who had tried to arrange servicing, satisfaction with the ease of finding an engineer was generally high (81% were very or fairly satisfied), though many found servicing more costly than they had anticipated.
- **Most property owners (70%) had not experienced any issues with their LCH system since installation**. Among the minority who had experienced problems, these most commonly related to interruptions to heating or hot water and were typically resolved by the installer, though poorly handled issues sometimes shaped overall perceptions of LCH systems. Just 12% of property owners said they had complained in some shape or form about an aspect of their installation, usually to the installer, with only 1% making a formal complaint to MCS.
- **Almost two thirds (64%) of on-grid property owners had disconnected their properties from the gas grid since having their LCH system installed**. Where property owners had not attempted to disconnect, this was most commonly because they continued to use gas for cooking.
- **Most property owners were willing to recommend their LCH system to others**, though this was sometimes conditional, based on property characteristics and installation quality. Sixty percent of follow-up survey respondents said they already had or definitely would recommend their system, while only 7% said they probably or definitely would not.

Outcomes and impacts of the BUS

- **Between April 2022 and March 2025, the BUS awarded £328.2 million in grants and supported 49,136 LCH system installations**. This compared to a budget of £450 million, supporting the deployment of up to 90,000 LCH system installations. Most of the underspend occurred in 2022/23, reflecting weaker early demand under the scheme. Stronger uptake in 2024/25 – driven by the grant uplift and changes to insulation requirements – led to £188 million in grant awards.
- **QEA estimates indicate that 74% of BUS-funded installations were additional, equivalent to 36,508 installations that would not otherwise have occurred**. This finding is closely corroborated by property owners' self-reported behaviour, with 74% stating that their LCH installation would not have taken place, or would have been delayed, without the scheme.
- **Over their assumed lifetime, BUS-funded installations are estimated to deliver net GHG savings of 2.5 $MtCO_2e$**, very marginally below the 2.6 $MtCO_2e$ forecast in the Impact Assessment. This minor shortfall reflects lower-than-expected installation volumes but was partly offset by greater-than-anticipated replacement of coal and oil heating systems, as well as installations in properties with higher heat demand than assumed in the Impact Assessment.

- **The BUS successfully attracted a large pool of installer companies and influenced how they operated in the LCH system installation market**. Installer participation increased over time, with around 1,600 installers classed as active on the scheme by March 2025, indicating broad engagement across the LCH sector. Many installer companies joined the BUS to expand or diversify their market activity, including increasing LCH installations or entering the LCH market for the first time.
- **Quantifiable employment impacts associated with the BUS appear more modest than originally projected**. QEA estimates suggest that BUS-participating small and medium sized enterprises (SMEs) increased their LCH workforce by around 7.1% more than comparable SME non-participants, though this difference was uncertain and not statistically significant[5]. These estimates are subject to important and significant limitations, as they exclude employment impacts within larger installer firms – which delivered a substantial share of BUS installations – and do not capture employment supported through widespread subcontracting under the scheme.
- **Installer survey evidence indicates limited employment growth during the scheme's first year but points to emerging growth by 2024**, particularly among newer entrants to the LCH market. Among installer companies registering with the BUS after April 2023, average full-time equivalent employment on LCH installations increased from 4.8 to 6.4 jobs per firm, suggesting modest employment growth following participation in the scheme.
- **Overall, the BUS contributed to change in the LCH market – including increased investment, skills development, innovation, and modest reductions in LCH system costs** – but these outcomes cannot be attributed to the scheme alone. By stimulating demand, particularly for ASHPs, the BUS helped provide market certainty, while operating alongside other policies, regulatory changes, and wider market dynamics that also shaped sector outcomes.

Value for money (VfM) of the BUS

- **Overall, the BUS demonstrated good economy**. Administrative costs compared favourably with similar schemes, were within government guidelines, and fell substantially over time (having initially been higher than expected as BUS demand was lower than planned but administrative systems were fully staffed). Service quality was maintained and fraud and error kept at low, acceptable levels, indicating that public resources have been managed effectively.
- **The BUS demonstrated good efficiency**, with strong quality of scheme administration, installations delivered at a lower cost than predecessor schemes (albeit higher than initially anticipated), and evidence of consistently high customer service delivery performance by Ofgem. The scheme has also supported a more efficient LCH market.

[5] The estimate has a large standard error, indicating substantial uncertainty. In practical terms, the true employment impact could plausibly lie anywhere between a reduction of around 20% and an increase of around 44%, compared with similar non-participating firms. This means the estimated effect cannot be distinguished from no impact with confidence.

- **The BUS demonstrated good effectiveness**, achieving high additionality and delivering energy and GHG emission savings broadly in line with expectations despite lower-than-anticipated LCH system installation volumes.
- **The BUS demonstrated good equity**, with strong participation from micro and small installer businesses. While uptake was higher amongst households earning over £52,000 a year, this is an outcome that reflected the early-stage of technology uptake in England and Wales and the fact that property owners needed to put their own money into an installation.
- **The BUS demonstrated good cost-effectiveness**, delivering carbon abatement at a lower cost than anticipated and generating substantial net social benefits despite lower-than-expected LCH system deployment volumes. Although total benefits and the benefit-cost ratio were slightly below Impact Assessment estimates, the scheme is still projected to return significantly more value than it cost over the period 2022-25.

Introduction

In March 2023, the Department for Energy Security and Net Zero (DESNZ) commissioned an evaluation of the Boiler Upgrade Scheme (BUS)[6]. The evaluation was undertaken by an evaluation team of ICF working with Eunomia, University College London (UCL), and BMG Research, and concluded in March 2026. This is the Final Report from the evaluation and follows on interim reports published in 2024[7] and 2025[8].

The Boiler Upgrade Scheme (BUS)

The BUS was established by DESNZ to support the installation of low carbon heating (LCH)[9] systems – primarily heat pumps, and in limited circumstances biomass boilers – in domestic and small non-domestic properties in England and Wales. Launched in April 2022 with an initial £450 million budget, the scheme was originally scheduled to run until March 2025 and has since been extended to March 2030 with additional funding of £2.687 billion[10]. This evaluation focuses on the 2022-25 phase of the BUS.

The BUS is a central component of the Government's approach to decarbonising heat in buildings, as recently reaffirmed in the Warm Homes Plan[11]. It succeeded two other schemes that supported LCH deployment – the Renewable Heat Incentive (RHI) and the Green Homes Grant – Vouchers (GHG-V) scheme. Over its 2022-25 phase the BUS operated alongside other government schemes supporting LCH deployment, including the fourth phase of the Energy Company Obligation (ECO4). The BUS supports LCH system uptake by subsidising upfront installation costs through 'vouchers', currently valued at £7,500 for ASHPs and GSHPs, and £5,000 for biomass boilers. Key changes during the evaluation period include an increase in grant values in October 2023 and the removal, from May 2024, of the requirement for properties to have no outstanding loft or cavity wall insulation recommendations. The BUS excludes new-build properties, allows eligible self-builds, applies a 45 kWth system capacity limit[12], and is administered by Ofgem on behalf of DESNZ. Only MCS-accredited installers may apply for and redeem vouchers.

Evaluation aim and methodology

The aim of this study was to evaluate the delivery, impacts and value for money (VfM) of the BUS during its 2022–25 phase. Following a detailed scoping phase, the evaluation team

[6] The extension of the BUS from 2025 to 2030 is not the focus of this evaluation.
[7] DESNZ (January 2025) Evaluation of the Boiler Upgrade Scheme: 2024 Interim Report
[8] DESNZ (January 2026) Evaluation of the Boiler Upgrade Scheme: 2025 Interim Report
[9] The term low carbon heating (LCH) system is used to collectively refer to air source heat pumps (ASHPs), ground source heat pumps (GSHPs) and biomass boilers.
[10] DESNZ (January 2026) Warm Homes Plan
[11] DESNZ (January 2026) Warm Homes Plan
[12] kWth (kilowatt thermal) is a measure of thermal output (heat). Shared Ground Loops (SGLs) may now have a limit of 300 kWth, however the limit was 45 kWth when the research for this evaluation was conducted.

agreed with DESNZ a set of 16 process, impact and economic evaluation questions. These questions guided the evaluation, informing the methodological approach and shaping the research topics explored across the study. The full set of evaluation questions is presented in the conclusions chapter of this report.

Data collection and analysis

This Final Report synthesises evidence from research undertaken across the evaluation; further methodological detail is provided in the accompanying Technical Methodological Report[13]. Table 1 summarises the primary and secondary data collection and analysis undertaken and supporting survey data tables are published alongside this report.

Table 1: Overview of the primary and secondary data collection and analysis

Research	Details
Primary research with property owners with a BUS-funded installation	Four waves of an online survey of property owners with a BUS-funded LCH system installation, undertaken shortly after installation (broadly representative samples; 5,394 responses in total[14]; weighted to BUS participation populations): Wave 1: surveyed late summer 2023; installations 1 October 2022 to 30 April 2023 Wave 2: surveyed early spring 2024; installations 1 May 2023 to 31 October 2023 Wave 3: surveyed late summer 2024; installations 1 November 2023 to 30 April 2024 Wave 4: surveyed early spring 2025; installations 1 May 2024 to 31 October 2024
	Two waves of an online follow-up survey of property owners with a BUS-funded LCH system installation, undertaken after at least one heating season (census of all respondents to the original property owner survey; 3,724 responses in total[15]; weighted to BUS participation population): Wave 1: surveyed summer 2024; installations 1 October 2022 to 31 October 2023 Wave 2: surveyed summer 2025; installations 1 November 2023 to 31 October 2024
	Forty in-depth telephone interviews with property owners with a BUS-funded LCH system (interviewed September 2023)
	Six in-depth case studies of property owners with a BUS-funded LCH system, undertaken after they had used their system for a heating season (interviewed winter 2024)

[13] Evaluation of the Boiler Upgrade Scheme, 2026: Technical Report
[14] At each wave, a sample of 4,000 property owners with a BUS-funded installation completed in the previous 6-7 months were surveyed (sub-populations for each wave were as follows: wave 1 - 7,961, wave 2 - 5,254, wave 3 - 9,043, wave 4 - 12,335). Response rates were 33% for Waves 1-3 and 37% for Wave 4.
[15] Each follow-up survey wave involved property owners who had previously responded to the main property owner survey. The first follow-up wave involved respondents from Waves 1-2 of the main survey, while the second involved respondents from Waves 3-4 plus a targeted top-up sample of post-May 2024 BUS participants living in properties with low or no insulation. Response rates were 63% for Wave 1 and 51% for Wave 2.

Research	Details
Primary research with BUS-registered installer companies	Two waves of a telephone survey of BUS-registered installer companies (census of all registered installer companies; 516 survey responses in total[16]; weighted to BUS installer population): Wave 1: surveyed late summer 2023; BUS-registered as at April 2023 Wave 2: surveyed late summer 2024; BUS-registered as at April 2024
	Thirty in-depth telephone interviews with BUS-registered installer companies (interviewed August to October 2023)
Primary research with non-participants	Thirty telephone interviews with property owners that had not applied for a BUS voucher (interviewed March to April 2024)[17]
	Five telephone interviews with property owners that had applied for a BUS voucher but not completed an LCH system installation under the scheme (interviewed September 2023 and May 2024)
	Ten telephone interviews with LCH system installers that had not registered under the BUS (interviewed March to April 2024)
Secondary data analysis	Analysis of the BUS Administrative Database (applications, vouchers and installations) and the MCS Installations Database (MCS MID), used across uptake, profiling, impact and VfM analysis.
Market assessment	Twenty interviews with LCH industry stakeholders (manufacturers, installers and trade associations), alongside analysis of a suite of indicators tracking LCH market development and supply-side change over the course of the BUS.
Quasi-experimental analysis (QEA)	Interrupted Time Series (ITS) analysis of the additionality of LCH installations funded under the BUS
	Synthetic Difference-in-Differences (SDiD) analysis of the additionality of employment change within BUS-registered installer companies
VfM analysis	A 5Es[18] analysis of the VfM of the BUS, drawing on administrative data, QEA results, primary research evidence, and a DESNZ-led Cost-Benefit Analysis (CBA) of impacts of the BUS on greenhouse gas (GHG) emissions[19]

[16] At each wave, the installer survey involved companies registered with the BUS, excluding those that were suspended or had not completed registration. Wave 1 was conducted in August/September 2023 using the population of installers registered as of April 2023 (sub-population 1,102) (23% response rate), and Wave 2 was conducted in August/September 2024 using installers registered as of April 2024, excluding companies previously contacted (sub-population 1,511) (24% response rate).
[17] The latter group was sampled from a database of householders who were aware of ASHPs and therefore does not represent the general population, amongst whom awareness of LCH systems is typically lower.
[18] The 5Es framework assesses VfM by considering economy, efficiency, effectiveness, equity and cost-effectiveness in the delivery of a programme.
[19] Though the CBA was undertaken by DESNZ the methodology was reviewed by the evaluation team.

Synthesis of evidence

To answer the evaluation questions, the evaluation team undertook a systematic synthesis of the evidence generated through the research activities set out in Table 1; further detail is provided in the accompanying Technical Methodological Report. In summary, all evidence was mapped against the 16 evaluation questions, and for each question the team assessed areas of convergence and divergence across evidence sources. This included comparison over time (for example, consistency across survey waves), across stakeholder groups (such as property owners, installers and non-participants), and across methodological approaches (including quantitative and qualitative survey data[20], interviews, administrative data analysis and QEA techniques). This structured synthesis enabled the evaluation team to draw robust conclusions by considering the relative strength, coverage and consistency of evidence across the research programme.

Strengths and limitations of the evidence base

The evaluation has used a comprehensive mixed-methods design, drawing on a range of data collection and analysis methods tailored to the evaluation questions following a detailed evaluation scoping phase. Evidence has come from large-scale quantitative surveys with broadly representative samples of property owners and installer companies, in-depth qualitative research including detailed case studies, administrative data analysis, and robust QEA techniques to quantify impacts and assess additionality. A key strength of the approach has been the systematic triangulation of evidence across these research activities, ensuring the evaluation has been able to draw upon a wide range of viewpoints and experiences – including individuals and organisations that have directly benefited from the BUS and those that have not. The use of repeat waves and longitudinal research has also enabled research instruments to be refined and updated, ensuring that data collection remains responsive to the evolving policy, market and delivery context throughout the lifetime of the scheme.

While the evaluation methodology is robust overall, there are some inherent limitations that should be considered when interpreting the findings. As with any evaluation operating in a complex and evolving policy environment, it has not always been possible to fully isolate the effects of the BUS from other concurrent policies, market developments and external factors, including changes in energy prices and wider economic conditions. Although QEA techniques have strengthened causal inference where feasible, these analyses were constrained by the availability and structure of the underlying administrative datasets. This limited both the coverage of impact assessment (for example, employment impacts could only be estimated for SME installer companies) and the level of disaggregation that could be undertaken (such as by property owner characteristics or type of LCH system installed). The ITS used in the QEA of installation additionality relied on a relatively short pre-intervention period that coincided with various energy market ‘shocks’ (e.g. the start of the Russian-Ukrainian war) and changes that likely affected take-up of LCH systems (e.g. the removal of VAT from ASHPs in April 2022) and thus the estimated counterfactual scenario. Some strands of the evaluation necessarily rely on

[20] While the property owner and installer surveys mostly used closed-ended questions that were analysed quantitatively, they also included a handful of open-ended questions that provided respondents with an opportunity to submit evidence in their own words. These data were analysed using qualitative techniques.

self-reported data for aspects such as motivations, experiences and behaviour, which are subject to recall and perception effects despite careful survey design and triangulation. More generally, whilst the surveys of property owners and installers had good response rates, there remains a risk that non-response bias may affect the findings, if respondents differ systematically from non-respondents in ways that are correlated with their experiences or outcomes. Finally, while the evaluation has drawn on a wide range of evidence sources, certain outcomes – such as real-world system performance, changes in energy consumption, and longer-term market effects – cannot be fully captured within the scope and timeframe of the current evaluation.

The structure of this report

The remainder of this report is structured around the main themes of the evaluation:

- Chapter 2 focuses on scheme delivery and participants' experiences of having a LCH system installed.
- Chapter 3 explores property owners' post-installation experiences.
- Chapter 4 analyses the outcomes and impacts of the BUS, assessing whether the scheme met the objectives outlined in its original Impact Assessment.
- Chapter 5 provides a VfM assessment of the BUS.
- The final chapter draws together the conclusions of the evaluation team, synthesising evidence from across this report.

Delivery and Participant Experiences of the BUS

This chapter analyses property owners' and installers' experiences of the BUS, covering the end-to-end journey from awareness and engagement through to LCH system installation, alongside evidence on scheme administration and delivery.

Key findings

Ofgem's administration functioned well overall, although payment timing created residual risks for some installers. Most installers (73%) were satisfied with Ofgem's administration, which was widely seen as simpler than previous schemes. Whilst most installers (77%) were satisfied with how quickly they were paid after submitting a voucher redemption application, the lag between LCH system installation and payment of the voucher – inherent to the BUS design – caused cashflow problems for 29% of installer companies. This lag could be prolonged in the small number of instances where audits delayed voucher redemption. However, the BUS data shows that the average time taken to pay a voucher was 8.6 days and 90% of redeemed voucher payments were made within 10 working days.

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Take-up was constrained by a combination of cost, suitability, and timing barriers, many outside the BUS's control. From the installer perspective, 76% reported factors limiting demand, most commonly concerns about installation costs, property suitability, and

running costs. Non-participants echoed these issues, alongside household circumstances, (mis)perceptions of LCH systems, and property readiness.

Expansion of the installer market improved the customer journey, though some dropout reflected wider delivery constraints. Ease of obtaining quotes rose from 79% at wave 1 of the property owner survey to 89% at wave 4, and ease of scheduling installations from 76% to 85%. However, BUS administrative data showed 11% of vouchers issued between 2022-25 expired, often due to delays linked to planning issues or coordination with wider renovation works rather than scheme design.

Installation disruption was generally manageable and shorter than often assumed. Despite concerns about disruption, 77% of participants were satisfied with installation timescales, and 48% reported installations completed in five days or fewer.

LCH system handover was generally effective, though inconsistencies affected some survey respondents' confidence using and optimising their system. While most property owners were satisfied with handover, 16% reported dissatisfaction, and only 26% felt completely confident programming their system to minimise running costs. Where handover was weaker, users were more likely to need follow-up support and take longer to adapt to low-temperature heating.

Initial engagement with the BUS by property owners

Promotion of the BUS

The 2022-25 phase of the BUS was promoted to property owners by a range of stakeholders and through multiple communication channels. Government-led promotion included public announcements, a small-scale targeted digital marketing campaign that ran from January to March 2023, and the nationwide, multi-channel Welcome Home to Energy Efficiency campaign that ran from October 2023 to March 2024. These campaigns made a discernible contribution to awareness-raising among consumers. For example, looking at the Welcome Home campaign, 31% of a subgroup of respondents to wave 3 of the property owner survey who heard about the BUS via social media notifications or adverts[21] identified the Welcome Home campaign as the source[22].

Installer awareness of the two government communication campaigns was relatively limited (though the campaigns were targeted at consumers). Only 17% of installers surveyed at wave

[21] Wave 3 sampled property owners who had a BUS-funded installation during the period when the Welcome Home campaign was active (installations between 1 November 2023 and 30 April 2024). This analysis uses a subgroup of respondents who said they heard about the BUS via a communication channel (social media) where the Welcome Home campaign was active – Unweighted base: all Wave 3 respondents who heard about the BUS via social media notification or advert (n=31).

[22] The campaign itself did not refer to the BUS by name (instead it referred to government grant support) but images, audio and video clips from the Welcome Home campaign were embedded in the questionnaire to jog respondents' memories.

2 recalled the Welcome Home campaign[23]; however, this was measured in August/September 2024 (several months after the campaign had ended), so recall may have diminished over time. Among installers who remembered either the 2023 digital campaign or the 2023/24 Welcome Home campaign, 43% reported that these communications had led to an increase in the number of enquiries they received[24].

Responsibility for generating consumer demand also sits with the installation sector, which was expected to actively promote the BUS. Larger national installers ran wide-reaching heat pump advertising campaigns, often referring directly to the scheme or highlighting the lower upfront costs it enabled. Installer interviews found that smaller or more locally focused companies instead adopted more targeted, place-based outreach. Their approaches included advertising in local newspapers, engaging directly with potential customers, and prioritising households they considered more likely to convert into viable leads – for example, older homeowners with solar panels who were currently using oil-fired heating.

How property owners learned about and understood the BUS

Findings from the property owner survey show that people first learned about the BUS through a range of routes. The most common was their own research, typically online, cited by 28% of respondents[25]. The proportion of property owners who first heard about the BUS from renewable heating installers declined (from 24% at wave 1 to 16% at wave 4), while the share who first heard about it from energy suppliers increased (from 0% at wave 1 to 11% at wave 4). This shift likely reflects the expanding involvement of certain energy suppliers in the BUS installation market[26].

Once aware of the scheme, most BUS participants (90%) reported that it was very or fairly easy to find out more information[27]. It is important to note, however, that these respondents had all successfully completed a BUS-funded installation, and therefore may have had higher initial awareness and motivation. In-depth case studies of participant property owners found that they had often been planning their LCH system installation for some time and were therefore particularly attuned to information about opportunities for financial support.

Interviews with non-participating property owners found varied levels of awareness and understanding of the BUS. Some interviewees understood the scheme well, but others had limited knowledge or held misconceptions about key elements. This included believing the BUS was means-tested or restricted to low-income households, assuming it was a loan rather than a grant, and confusing the BUS with the ECO4 scheme (which likely contributed to the

[23] Unweighted base: All wave 2 respondents (n=269). QC04. The government ran a nationwide marketing campaign between October 2023 and March 2024 called Welcome Home to Energy Efficiency which promoted the Boiler Upgrade Scheme. Are you aware of this campaign?
[24] Unweighted base: All respondents that were aware of the BUS marketing or Welcome Home to Energy Efficiency campaigns (n=136). QC04a. Do you think that this campaign led to any change in the number of enquiries that you received from customers?
[25] Unweighted base: All respondents (n=5,394). QB01. How did you first hear about the BUS?
[26] It may also reflect question interpretation by respondents, since if their LCH system installer was also an energy company, they could have selected either option.
[27] Unweighted base: All respondents (n=5,394). QB07. How easy or difficult did you find the following steps in participating in the BUS? Finding out information about the Boiler Upgrade Scheme.

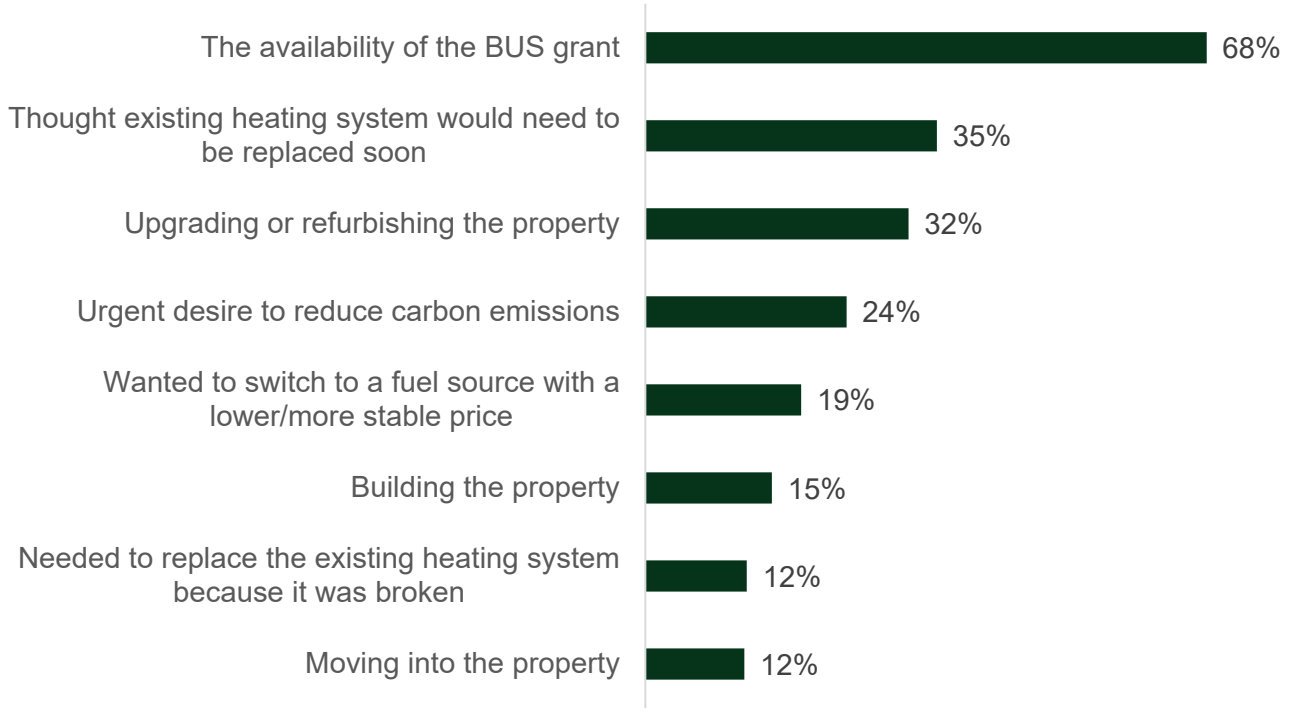
misperception that the BUS targeted low-income households). This confusion led some to discount the BUS as an option and to abandon the idea of installing a LCH system – which they had been considering – in favour of a fossil fuel system.

Property owners' motivations to have a LCH system installed

BUS participants were most commonly motivated to install a LCH system due to the perceived environmental benefits when compared to a fossil fuel heating system. The property owner survey found that 85% of property owners chose a LCH system because they wished to reduce their carbon emissions[28]. Relatedly, 67% of BUS participants described themselves as very concerned about climate change, and another 27% were fairly concerned[29]. Just under half (47%) of property owners said they wanted to install a LCH system because they expected to save money on their energy bills.

As Figure 1 shows, the availability of financial support through the BUS was the main trigger for property owners to install a LCH system when they did, rather than waiting (cited by 68% of survey respondents). Other common triggers were the concurrent timing of major building works, whether this was upgrading or refurbishing the property or building it from scratch.

Figure 1: Why property owners had installed their BUS LCH system when they did



Source: Waves 1 to 4 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=5,394); Note: multiple answers

[28] Unweighted base: All respondents (n=5,394). QB02. Why did you decide to install a LCH system, rather than a fossil fuel heating system?
[29] Unweighted base: All respondents (n=5,394). QF04. How concerned, if at all, are you about climate change, sometimes referred to as 'global warming'?

possible so figure sums to more than 100%; for brevity, not shown are any options selected by under 10% of respondents.

Interviews with non-participants and property owners who dropped out of the BUS highlighted that they often held strong pro-environmental beliefs. However, any initial enthusiasm they had for LCH systems could weaken or reverse as they encountered more concrete information about costs, disruption, or installer advice about what they should expect from a LCH system. Their motivation was thus undermined by growing uncertainty about whether installing a LCH system was appropriate, affordable, or manageable at that point in time, as discussed below.

Barriers to take-up of LCH systems under the BUS

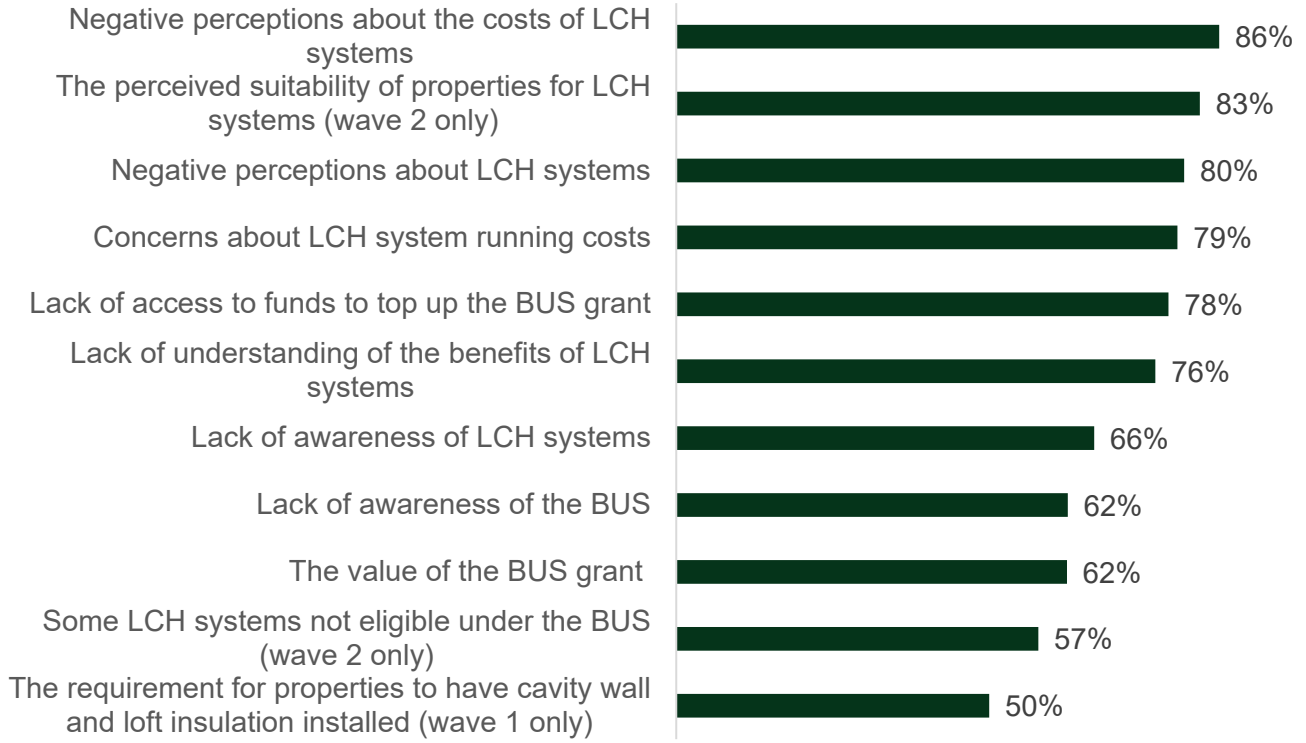
Installers' views on barriers to uptake under the BUS

BUS-registered installers were asked whether, in their experience, there were factors that constrained consumer demand under the BUS. Most (76%) believed that there were, with 23% reporting that nothing limited demand under the scheme[30]. There was a statistically significant decrease between survey waves in the share of installers who perceived demand-limiting factors – from 82% at wave 1 to 71% at wave 2. Wave 2 took place after the grant uplift and during a period (summer 2024) of strong growth in BUS-funded installations (see Figure 27), which may have influenced installers' perceptions of the attractiveness of the BUS to consumers.

Installers who identified demand-limiting factors were asked what these were (Figure 2). They highlighted a range of barriers to uptake of LCH systems, with cost-related factors dominating. While some barriers were specific to the BUS and within the scheme's control – notably the perceived adequacy of the grant and the types of LCH system eligible for support[31] – many were seen as wider market barriers. These included installers' perceptions that consumers hold negative views about LCH systems and their costs, concerns about the suitability of properties for LCH installations, and concerns about ongoing running costs.

[30] Source: Wave 1 and 2 installer survey. QC02. Do you believe there is anything that limits demand for BUS installations amongst consumers? Unweighted base: All respondents (n=516).
[31] In 2025 DESNZ consulted on expanding the range of LCH technologies supported under the BUS to improve consumer choice, and from Spring 2026 (i.e. outside the scope of this evaluation), £2,500 grants will be made available to support the installation of air-to-air ASHPs.

Figure 2: Installer-perceived barriers to consumer demand for BUS



Source: Waves 1 and 2 installer survey. QC02a: What do you think limits demand amongst consumers? Base: All that believed there were factors that limited consumer demand (n=392). Note: for brevity, not shown are any options selected by under 50% of respondents; multiple answers possible so adds up to more than 100%.

Property owners' views on barriers to having a LCH system installed

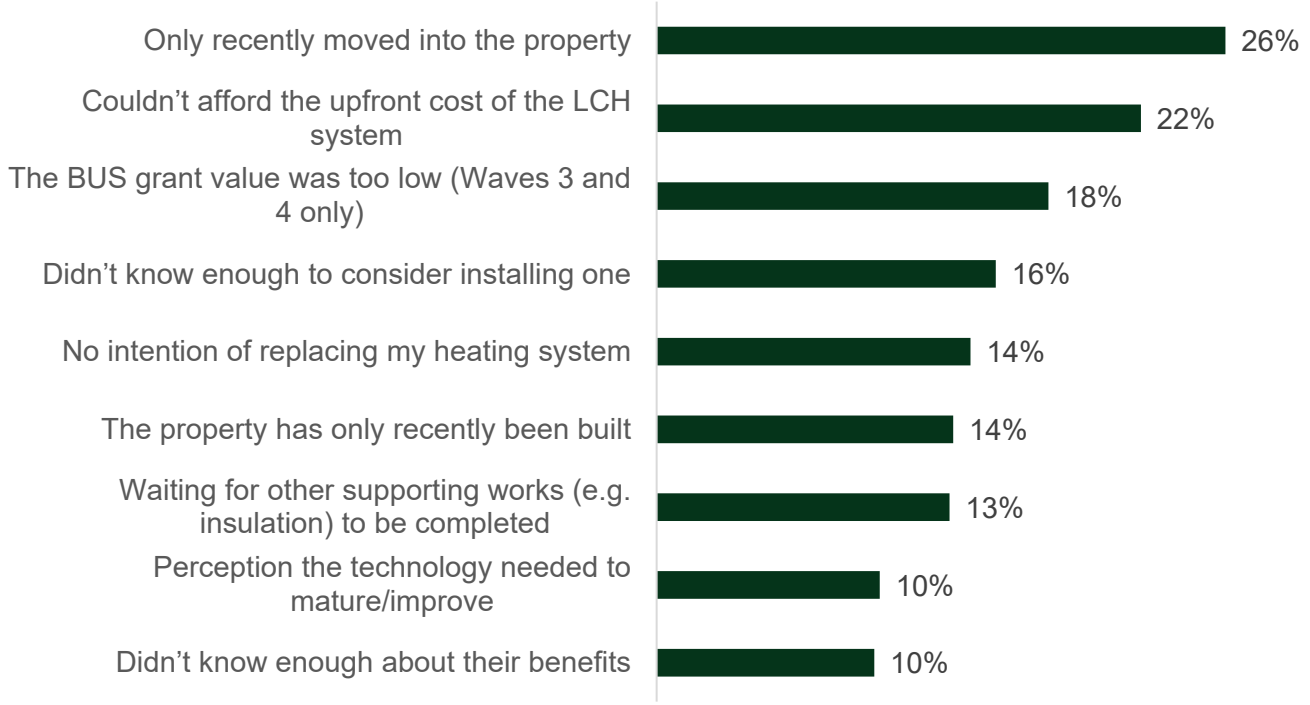
Evidence on property owners' perceptions of barriers to LCH uptake draws on two main sources: the property owner survey of BUS participants, and qualitative research with property owners who had not participated in the BUS.

As shown in Figure 3, BUS participants reported a range of reasons for not having installed a LCH system prior to joining the scheme. Several of the most frequently cited barriers were structural in nature and closely aligned with the views expressed by installers (see Figure 2), including a lack of awareness or understanding of LCH technologies more generally. These barriers exist independently of the BUS and reflect wider characteristics of the LCH market rather than the design of the scheme itself. Other commonly cited barriers were context-specific. These included cases where property owners had only recently moved into their property, had recently constructed a new property, or had not previously intended to replace an existing heating system. In such cases, the timing of a heating system replacement was a more important constraint than the availability of financial support through the BUS.

A smaller but notable proportion of respondents also identified barriers that relate more directly to the BUS (Figure 3). Twenty-two percent of respondents had not previously installed a LCH system because they could not afford the upfront costs – the uptake barrier that the BUS was introduced to address. Relatedly, at waves 3 and 4 of the survey, property owners who had joined the scheme after the grant was uplifted were asked if the pre-uplift grant size had

previously been a barrier, and 18% of respondents indicated that it had. These results demonstrate that the grant uplift materially improved the ability of the BUS to overcome upfront cost barriers to LCH system uptake, with the significant increase in installations following the October 2023 uplift indicating that the higher grant level made a meaningful contribution to increased uptake (see Figure 27).

Figure 3: Why BUS participants had not installed a LCH system before



Source: Waves 1 to 4 property owner survey. QB04. Why did you not previously have a [LCH system installed] installed in the property? Base: All respondents (n=5,394). Note: for brevity, not shown are any options selected by under 10% of respondents; multiple answers possible so adds up to more than 100%.

Qualitative interviews with non-participants provide further insight into barriers to LCH uptake, noting that all interviewees were already aware of ASHPs and therefore are not representative of the national population. Interviews included both those who had not seriously considered installing a LCH system and those who had explored the option but chosen not to proceed. Cost was the only commonly cited barrier within the direct control of the BUS: for interviewees unaware of the scheme, full capital costs were often seen as prohibitive, while those aware of the BUS continued to express concerns about residual costs after applying the grant.

Interviewees also identified a range of more general barriers to LCH system uptake:

- **Concern about the suitability of LCH systems for specific property types**. This was particularly pronounced among owners of older and/or poorly insulated homes, who were concerned that their properties would not retain heat effectively, leading to low indoor temperatures and/or high running costs. Many interviewees believed that LCH systems were primarily suitable for newer, well-insulated properties. This perception is consistent with BUS participant survey findings, where a substantial proportion of property owners had previously avoided installing a LCH system for similar reasons.

- **Installation-related disruption**. Many interviewees expressed apprehension about the scale of disruption associated with installation, including the need for new pipework, larger radiators, hot water tanks, or other alterations to their property. These concerns were particularly salient among older households, those with young children, and those who had recently completed refurbishments.
- **Timing and life-stage factors**. Some interviewees had recently installed a new gas or oil boiler and were reluctant to replace what they perceived to be a functioning system. Others anticipated moving house in the near future and did not consider it worthwhile to invest in a major heating system upgrade under those circumstances.
- **Expectations of high running costs**. Interviewees frequently compared current electricity prices unfavourably with both historic averages and the price of gas, leading to concerns that LCH systems would be more expensive to operate than their existing heating systems. These perceptions were often based on wider energy market conditions rather than knowledge of actual LCH system performance.
- **The operation and effectiveness of LCH systems**. These included worries about achieving adequate space heating and hot water temperatures, slow heat-up times, potential risks associated with lower hot water temperatures (e.g. Legionella), noise from external units, and the loss of internal or external space due to additional equipment. While evidence from BUS participants suggests that such concerns are not typically borne out in practice (see Chapter: Post-Installation Experiences), they nevertheless acted as a deterrent to both LCH uptake and participation in the BUS.

Interviews with non-participants and property owners who exited the BUS after getting a voucher suggest that barriers to take-up of LCH systems tend not to operate in isolation. For many, multiple barriers combined to create a cumulative sense of risk and effort that outweighed their initial motivations. This rethinking could take place even when property owners had advanced along the BUS customer journey, and as they began to engage seriously with the prospect of installing a LCH system (see Section: Delivery barriers, including reasons for drop-outs).

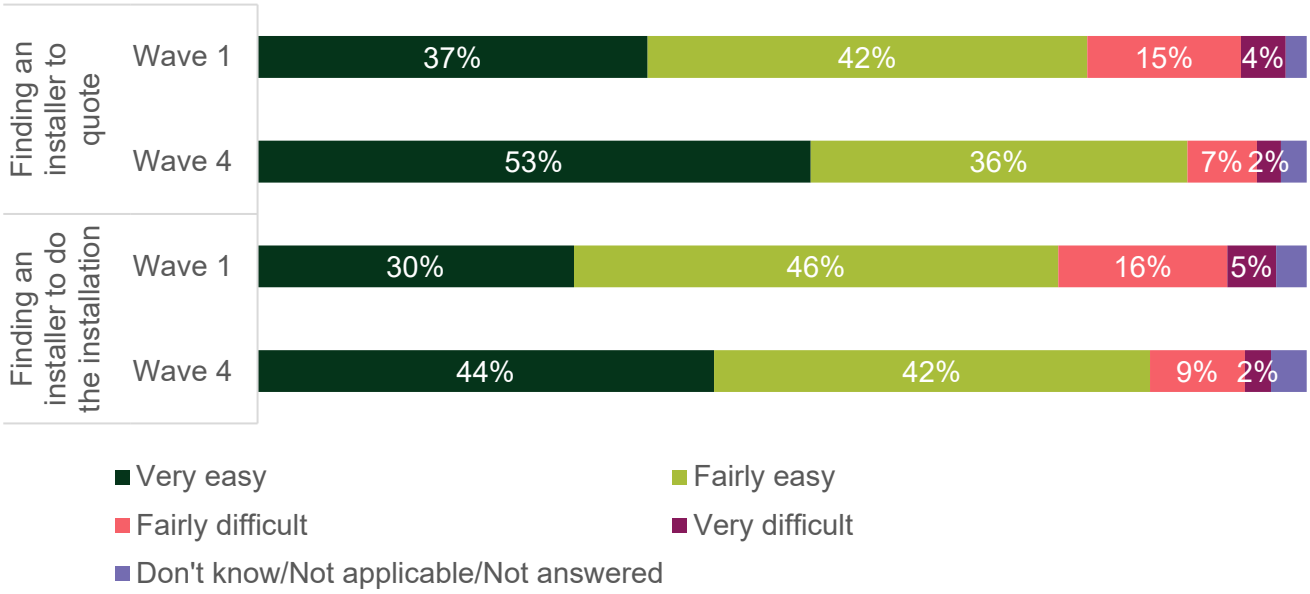
Finding and engaging an installer

All BUS installations must be completed by a BUS-registered installer. To get BUS-registered, installer companies must be MCS-accredited and must comply with MCS standards for heat pump and biomass boiler installations. For consumer protection purposes, BUS-registered installers also needed to be a member of an approved consumer code.

The property owner survey found that the process of finding and engaging a BUS-registered installer was, for most, relatively straightforward. It also became easier as the BUS installer market grew. As Figure 4 shows, the share of survey respondents who found it very or fairly easy to get an installer to give them a quote rose from 79% at wave 1 of the property owner survey to 89% at wave 4. Furthermore, most property owners (57% across all four survey

waves) got multiple quotes[32]. Interviews found that where property owners only got one quote, this could be out of choice (e.g. because the installer had been recommended). As Figure 4 also shows, the share of property owners who found it very or fairly easy to get an installer to do the installation when they wanted it done rose from 76% to 85%. These were statistically significant changes.

Figure 4: Property owners' assessment of the ease/difficulty of finding an installer



Source: Wave 1 and 4 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 for wave 1 and n=1,481 for wave 4).

Despite the overall positive picture, qualitative research with BUS participants and non-participants found that some faced challenges. In a small number of cases installers did not respond to enquiries, cancelled or did not attend home surveys, and sometimes did not provide quotes after visiting the property. Even among participants, several interviewees and case studies described inconsistent heat-loss calculations, widely differing system designs, and large variations in quoted system sizes. Issues were more likely to have been experienced for properties with limited internal space, where the property owner wanted a more uncommon heat pump model, or where installations needed to be coordinated with major building works.

The installer survey also indicates that the sector at times found it challenging to meet demand, though the scale of this issue diminished over time. At wave 1 of the installer survey, 34% of installer companies said their ability to meet BUS demand was constrained by the availability of appropriately skilled staff – this dropped to 30% at wave 2 (though the decrease was not statistically significant)[33].

[32] Unweighted base: All respondents (n=5,394). QB09. How many installers did you get a quote from?
[33] Unweighted base: All respondents (n=247 at wave 1 and n=269 at wave 2). QC05. Is there anything that limits the number of BUS installations that your business is able to do? QC05a. What limits the number of installations that your business does under the BUS?

Coordinating and delivering BUS-funded installations

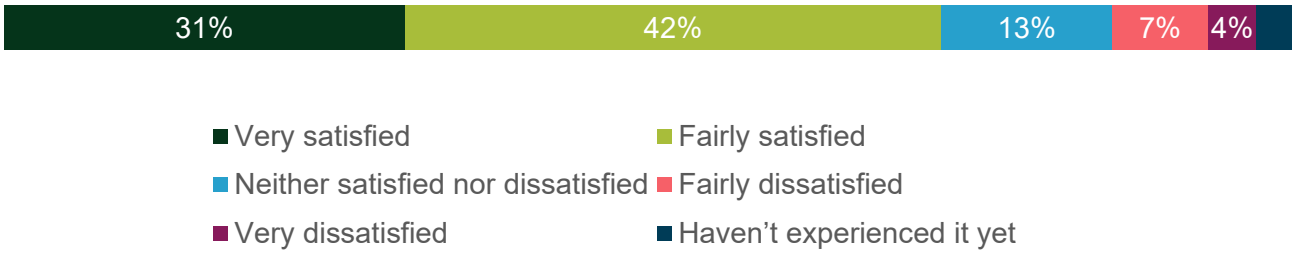
Under the BUS, responsibility for coordinating access to the grant lies with installer companies, rather than property owners. Installers submit grant applications (referred to as 'vouchers') and redeem the vouchers once a LCH system installation has been completed. The BUS grant is paid to the installer following installation of the approved LCH system. Installers pass on the grant value to property owners by discounting the installation cost, though the evaluation did note differences in how and when this discount was applied[34].

Experiences of BUS administrative processes

Installers' perceptions of administrative processes

The BUS is installer-led, and it is primarily installer companies who interact with the scheme administrator, Ofgem. As shown in Figure 5, 73% of surveyed installers were either very or fairly satisfied with Ofgem's overall administration of the BUS.

Figure 5: Installers' satisfaction with Ofgem's administration of the BUS

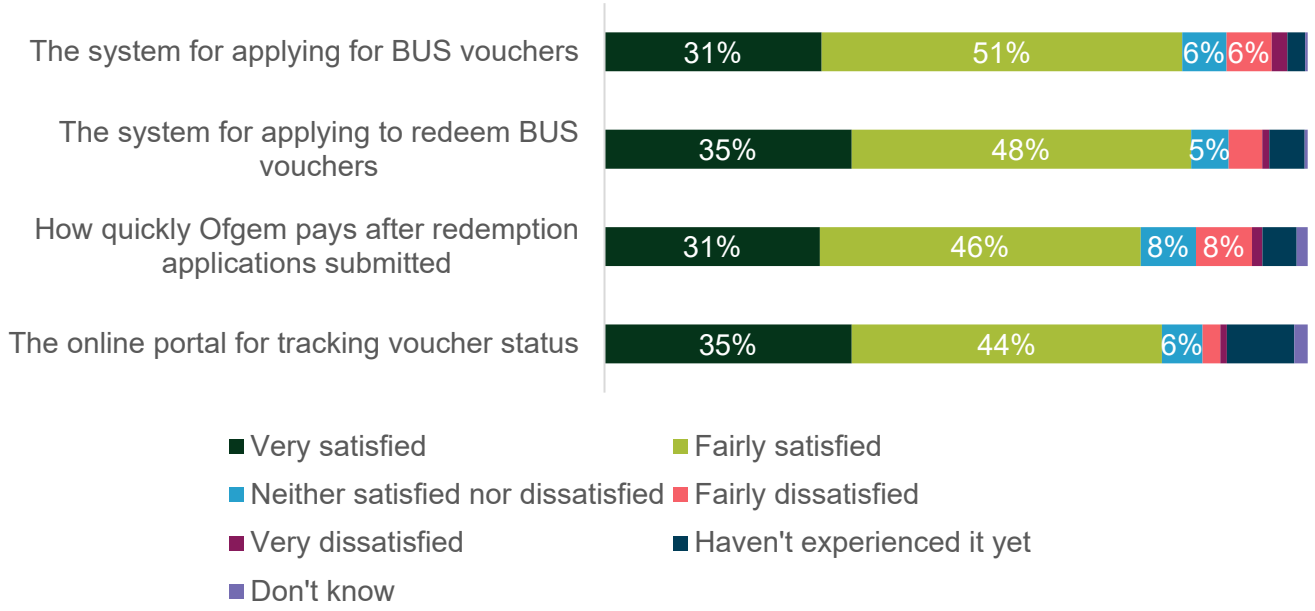


Source: Waves 1 and 2 Installer Survey. QD01: Overall, how satisfied or dissatisfied are you with Ofgem's administration of the BUS? Unweighted base: All (n=516).

Installers apply for a BUS voucher through a digital platform, after which Ofgem checks that applications are correctly submitted and that the proposed installation is eligible for BUS funding. Once the installation is complete, installers apply to redeem the voucher and following further checks and potentially an audit (see Section: Property owners' perceptions of Ofgem's administrative processes), Ofgem pays installers the value of the BUS grant. Ofgem also undertakes post-payment audits. Since the launch of the BUS, Ofgem has progressively digitised and improved these administrative processes[35], with installers able to submit and monitor voucher applications digitally from November 2022 and to submit voucher redemption applications digitally from May 2023. Subsequent refinements further digitised and streamlined scheme administration, reducing the administrative burden on installers and helping to speed up processing times. As Figure 6 shows, most installers were very or fairly satisfied with their experience of Ofgem's systems for applying for, tracking, and redeeming BUS vouchers.

[34] In 2025 DESNZ consulted on introducing a requirement that installers deduct the grant value from their quoted price; at the time this report was drafted (early 2026) this change had not yet been confirmed.
[35] These changes are described in Ofgem's annual reports for the BUS, covering 2022/23, 2023/24, and 2024/25.

Figure 6: Installers' satisfaction or dissatisfaction with BUS administrative processes



Source: Wave 1 and 2 Installer Survey. QD02. Thinking about your experience of the BUS, how satisfied or dissatisfied are you with the following? Base: All (n=516).

Qualitative evidence about installers' perceptions of Ofgem's administrative processes came from interviews with installer companies and open-text responses to the installer survey. Installers perceived the BUS to be a relatively straightforward scheme to use, and simpler than previous initiatives (RHI, GHG-V). It was also noted that Ofgem's administrative processes improved over time as they became more fully digitised. Some installers found the overall system slow and complex where they were dealing with non-standard projects and unusual eligibility circumstances, while they waited for Ofgem to make and communicate a decision.

The administrative burden on installer companies

During the installer survey, respondents were asked how much time they spent on administrative tasks per BUS voucher – encompassing the initial application and, if this led to an installation, redemption related requirements (and excluding MCS-related tasks)[36]. Note that both survey waves were undertaken after Ofgem fully digitised all stages of the application and redemption process in May 2023. Overall, just under half of survey respondents (48%) said they spent 2 hours or less on administration per BUS voucher, and another 22% said they spent 3-4 hours. For most installer companies, therefore, BUS administrative requirements were relatively quick and light-touch. Qualitative feedback from installers emphasised that the administrative burden for standard ASHP installations under the BUS was low, even though the installer-led model meant that responsibility for administration was largely their responsibility. However, for non-standard installations it could be much higher – particularly

[36] QD03. On average, per voucher, how much time do you estimate your business spends on administration under the BUS? Please include all the time spent filling in applications, responding to any queries from Ofgem, and any other administration that is unique to the BUS - i.e. not what you would normally do as part of the installation of a LCH system. Please exclude any administrative tasks associated with the MCS, other competent person schemes, or consumer codes. If your business had to get MCS certification to participate in the Boiler Upgrade Scheme please exclude the time this took from your estimate.

self-build projects where installers had to collect and submit more documentary evidence to demonstrate eligibility[37].

Impacts of the BUS on installer companies' cashflow

As Figure 6 shows, just 9% of surveyed installer companies were very or fairly dissatisfied with how quickly Ofgem paid them the value of the BUS grant after they had submitted a redemption application. Consistent with this, analysis of BUS administrative data indicates that the median time between redemption submission and payment was seven calendar days over the period 2022-25[38]. Payment speed was nevertheless an important issue for installer companies, as the period between completion of works and voucher payment could pose cashflow difficulties. Installers also highlighted payment delays arising from protracted audits as a particular cashflow risk, especially where audits depended on property owners submitting evidence or facilitating site visits in a timely manner. Interviews with LCH system installer companies that had not registered with the BUS found that concerns about the perceived lag between installation and voucher payment acted as a deterrent to participation.

As the 2025 Interim Report discussed, most BUS-registered installer companies (69%) said that they had not experienced cashflow problems due to the scheme, while 29% indicated that they had[39]. Sole traders were more likely than larger firms (50 or more employees) to have experienced cashflow problems. Installer companies that had experienced a cashflow problem due to the BUS were asked how they minimised the risk. They most commonly spaced out installations (54% of this subset of respondents[40]) or passed on the risk to customers by charging them in full then refunding the BUS grant value once the voucher was redeemed (32% of respondents), or by requiring customers to pay a large upfront deposit (30% of respondents). Billing models are discussed in more detail below (Section: Billing models used by installers).

Property owners' perceptions of Ofgem's administrative processes

In most cases, property owners only interacted with the scheme administrator, Ofgem, to confirm they consented to the BUS voucher application being made on their behalf. This was a simple process, which 85% of property owner survey respondents found very or fairly easy[41]. The consent process is primarily digital; however, Ofgem offered alternative options – such as postal or telephone methods – to property owners who were unable to use the digital route. Evidence from the property owner survey indicates that individuals with a disability were slightly less likely to find the consent process easy. In total, 79% of survey respondents who

[37] This evidence was needed to prove that these were not new build properties, which are not eligible for support under the BUS

[38] As discussed below (Section: Ofgem's delivery of the BUS), Ofgem had a KPI concerning the elapsed time between receipt of a redemption application and voucher payment. In 2022/23, an average of 87% of redemption applications were paid within the target of 12 working days. In 2023/24 and 2024/25, the target was tightened to payment within 10 working days, which Ofgem met for an average of 98% of applications in both years.

[39] Unweighted base: All wave 2 respondents (n=261). QC07. Has your business ever experienced cashflow problems caused by lags between doing an installation and getting paid the Boiler Upgrade Scheme voucher?

[40] Unweighted base: All wave 2 respondents who experienced cashflow problems due to the BUS (n=77). QC07a. Do you do any of the following to minimise cashflow problems?

[41] Unweighted base: All respondents (n=5,394) QB07. How easy or difficult did you find the following steps in participating in the Boiler Upgrade Scheme? Confirming with Ofgem that you consent to the installation.

said they had a disability that limited their day-to-day activities a lot said they found it very or fairly easy to confirm with Ofgem that they consented to having an application made on their behalf. Amongst individuals with no disability the proportion was 85%, a statistically significant difference – albeit small[42].

Some property owners also interacted with Ofgem's processes if their BUS-funded installation was audited[43]. Whilst the property owner survey did not include a specific question on audit experiences, many audited property owners left comments in an open-ended wrap-up question – and whilst these are not representative of all experiences, they do provide qualitative insight into participant perceptions. Positive perceptions typically reflected relief or reassurance when audits proceeded smoothly, particularly where required evidence was straightforward to supply. Negative perceptions focused on concerns about safeguards in place for data security and frustration, in the case of self-build property owners, where documents had to be submitted on multiple occasions (e.g. remotely and again to the on-site auditor). Others noted that audits could delay BUS grant payments for weeks, and where they had already paid their installer in full (see Section: Billing, payment and affordability of BUS installations) this caused delays in receiving reimbursement, leaving property owners temporarily but significantly out of pocket financially.

Ofgem's delivery of the BUS

As scheme administrator, Ofgem was tasked with meeting a set of Key Performance Indicators (KPIs) – noting that some services were overseen by Ofgem rather than being delivered directly. There were just 3 interim KPIs used in 2022/23, all of them concerning operational processing targets. In 2023/24 and 2024/25 the final KPI framework was expanded to include audit and compliance (with nine new KPIs), and the operational processing KPIs were expanded to include customer service (with six new KPIs). Delivery of the KPIs was kept under review by DESNZ and targets varied across the scheme years.

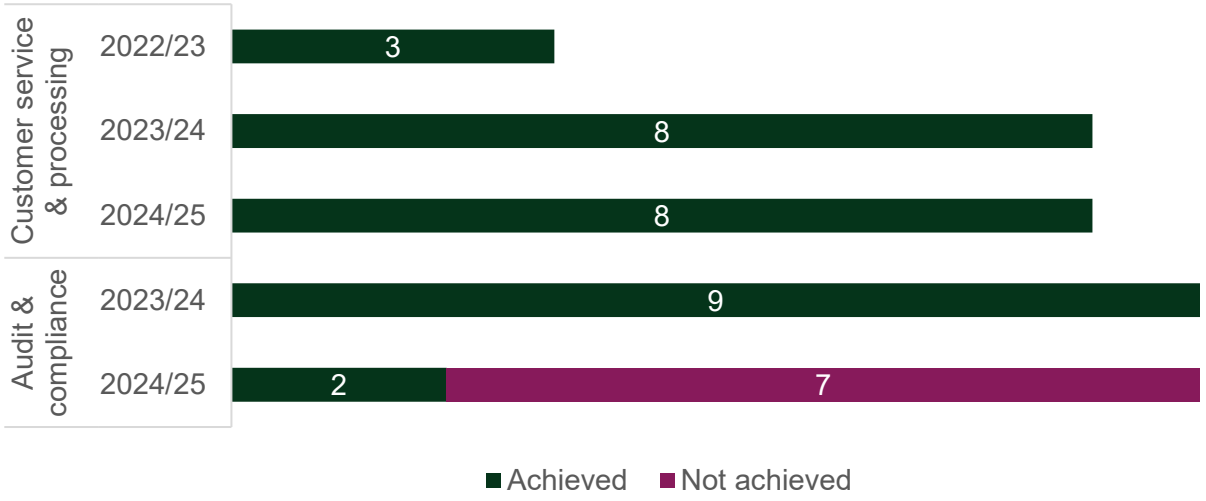
Customer service and processing KPIs covered various elements of the BUS delivery model, albeit with a focus on whether Ofgem was meeting its requirements in a timely manner (e.g. for 2023/24 and 2024/25, that 90% of redeemed voucher payments were made within 10 working days). Audit and compliance KPIs measured whether Ofgem completed the target number of audits and whether it did so in a timely manner (e.g. that 90% of forecast statistical site audits were completed per month). As Figure 7 shows, between 2022-25 Ofgem met most delivery KPIs. The only notable exception was in 2024/25 when performance against audit and compliance KPIs deteriorated (7 out of 9 KPIs were missed). Ofgem changed the audit

[42] Unweighted base: All respondents (n=150 for individuals with a disability and n=4,049 for individuals without. QF07a. Do you have any physical or mental health conditions or illnesses lasting or expected to last 12 months or more? QF07b. Do any of your conditions or illnesses reduce your ability to carry out day-to-day activities?

[43] Ofgem carries out statistical (i.e. random) and targeted audits of BUS-funded LCH system installations, to check that scheme eligibility requirements have been met. Common examples of non-compliance included cases where installed systems did not meet full space and water heating requirements, were not appropriately installed in line with MCS requirements, did not replace fossil fuel or electric heating systems, or where the previous fossil fuel heating system was still in place. Audits typically require property owners to submit documentary information, including commissioning and property ownership documentation, proof of address, and copies of supporting evidence. For self-build properties additional information may be requested. Ofgem take a sampling approach to audit, with 5.03% of all voucher redemptions selected for a site visit by an official on behalf of Ofgem in 2022-25.

contractor during this period, and the process of transitioning between the two providers temporarily impacted the volumes of audits selected and closed.

Figure 7: The number of delivery KPIs achieved or not achieved by Ofgem, 2022/23 to 2024/25



Source: DESNZ

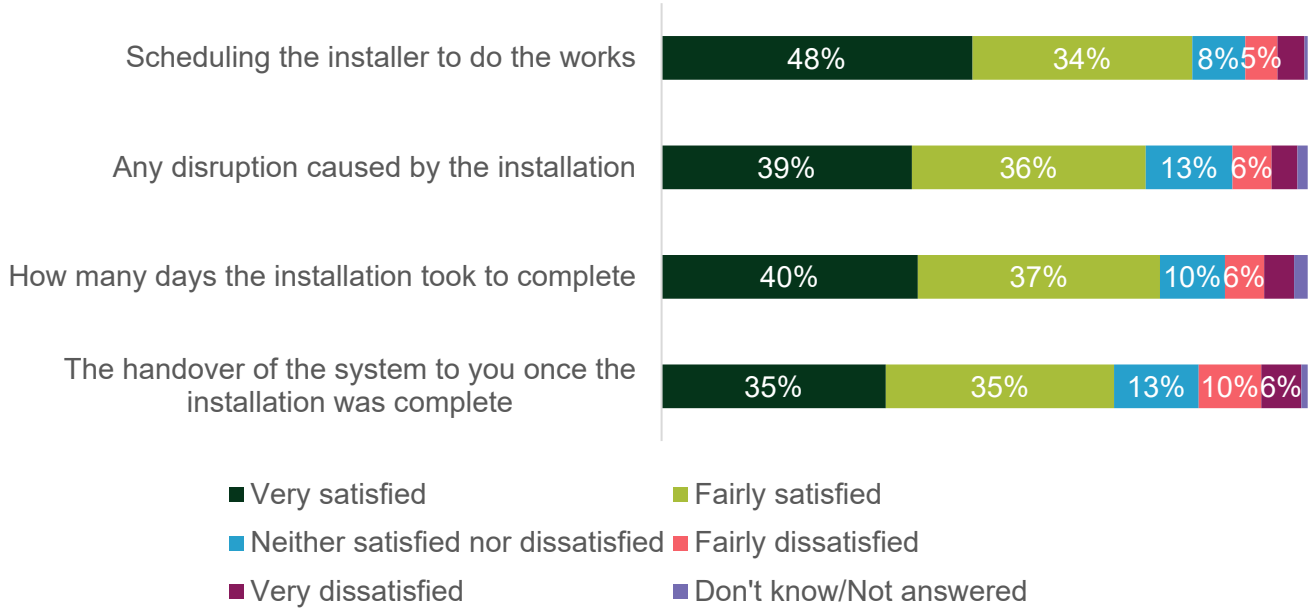
Property owners' LCH system installation experiences

Property owners' experiences of LCH system installation

As Figure 8 shows, the property owner survey found that most were either very or fairly satisfied with all aspects of their installation experience. For example, whilst the installation of an LCH system is often said to be disruptive, 39% of survey respondents were very satisfied with their experience, and only 10% who were very or fairly dissatisfied. Similarly, 77% were very or fairly satisfied with the duration of the installation process. In terms of installation timescales, just under half of BUS-funded installations (48%) were reported to have been completed in five days or fewer[44]. A further 29% took longer; however, this includes cases where LCH systems were installed as part of wider renovation projects, meaning respondents were sometimes unable to identify the precise duration of the installation itself.

[44] Unweighted base: All respondents (n=5,394) QD02a. How many days did the LCH system installation take?

Figure 8: Property owners' satisfaction or dissatisfaction with their installation experience



Source: Waves 1 to 4 property owner survey. QD01. How satisfied or dissatisfied were you with the following? Unweighted base: All (n=5,394).

Carrying out insulation improvements and additional works

From May 2024, properties were no longer required to have no outstanding recommendations for loft or cavity wall insulation on their Energy Performance Certificate (EPC) to be eligible for the BUS. Despite this relaxation, evidence from the property owner survey indicates that installing insulation alongside a LCH system remained common. Among survey respondents, the proportion who installed one or both of loft and/or cavity wall insulation at the same time as their LCH system increased from 23% of those who applied before the requirement change to 36% of those who applied after it. Wave 2 of the follow-up survey explored the insulation status of properties over winter 2024/25:

- Loft insulation: Most respondents (71%) had insulation of 270mm or more, and a further 23% had insulation under 270mm. Those joining the scheme after May 2024 were slightly more likely to have insulation under 270mm (25%, compared with 21% pre-change). Even among this post-May 2024 group, only 1% could have had loft insulation but did not.
- Cavity wall insulation: Three-quarters (77%) of respondents had cavity wall insulation, and in a further 15% of cases it was not suitable due to solid walls. Just 3% of properties had uninsulated cavity walls. Respondents who joined post-change were somewhat more likely to have uninsulated cavity walls, but the difference was small (5% compared with 1% pre-change).

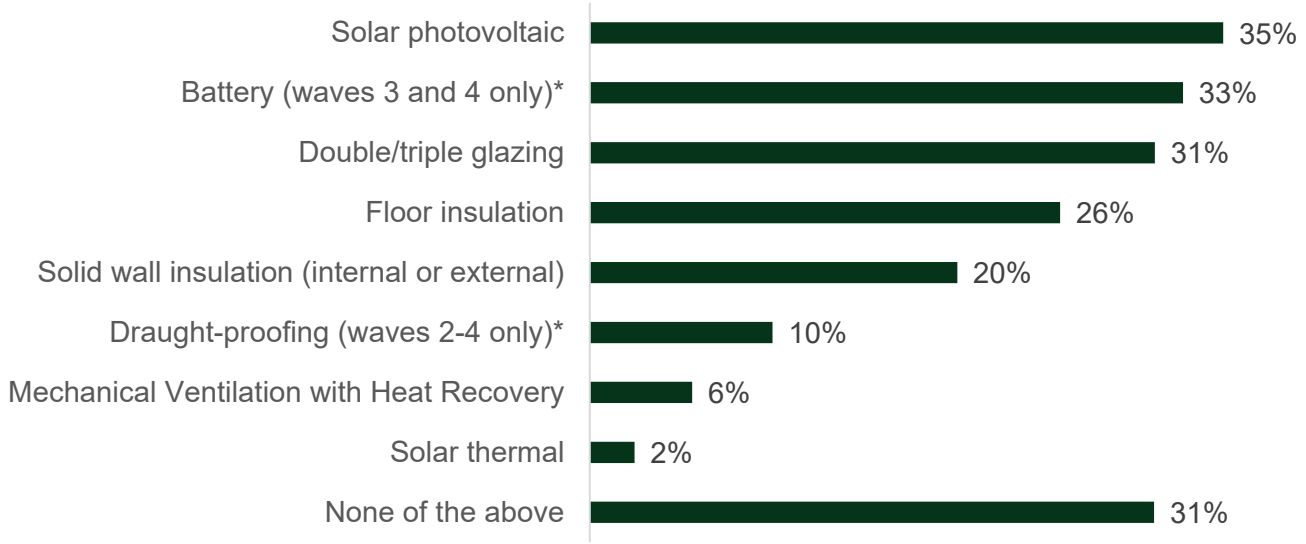
Interviews and survey responses show that having loft or cavity wall insulation remained a priority for property owners even once it was no longer mandatory. Property owners consistently perceived insulation as improving thermal efficiency, reducing heat loss, enabling LCH systems to operate more effectively, and lowering running costs. Installers also reported

continuing to recommend insulation for these reasons. In addition, many property owners installed their LCH system as part of wider building or renovation works (refer back to Figure 1), within which insulation often formed a natural component of broader energy-efficiency upgrades.

Based on the results of the property owner survey, the 2025 Interim Report presented evidence on other works that property owners had done around the same time as they installed a LCH system. Analysis looked at two areas of work:

- Installation of ancillary equipment supporting a LCH system[45]. The most common activity was the installation of a new or larger hot water tank, which 86% of property owners had done. Two thirds (68%) of property owners had installed larger radiators and 53% had needed to replace internal pipework.
- Installation of additional energy-related technologies. As Figure 9 shows, it was common for property owners to make additional changes – only a minority (31%) said they did not install any of the technologies shown to them around the same time as installing their LCH system, though note that this could be because they already had these technologies installed. Property owners installed a mixture of energy generation/storage and energy efficiency measures - solar photovoltaic (PV) systems (solar panels that generate electricity) were the most common, with 35% of property owners reporting that they installed them around the same time as their LCH systems.

Figure 9: Whether property owners installed additional energy-related technologies at the same time as installing their LCH system



Source: Waves 1 to 4 property owner survey. QB06b. Did you have any of the following installed around the same time as the [LCH system installed]? Unweighted base: All (n=5,394). Note: * n=2,786 (waves 3 and 4)[46], n=4,084

[45] Source: Wave 3 and 4 property owner survey. Unweighted base: All respondents (n=2,786) QD03. Did you do any of the following in addition to having the LCH system installed? Replaced internal pipework?
[46] Note: This figure is based on Waves 3 and 4 only, as these waves included specific response options for battery installations. Earlier waves used back-coded open-text responses and have therefore been excluded to provide a more robust estimate. For a full breakdown of battery responses and related analytical caveats, see the accompanying tables.

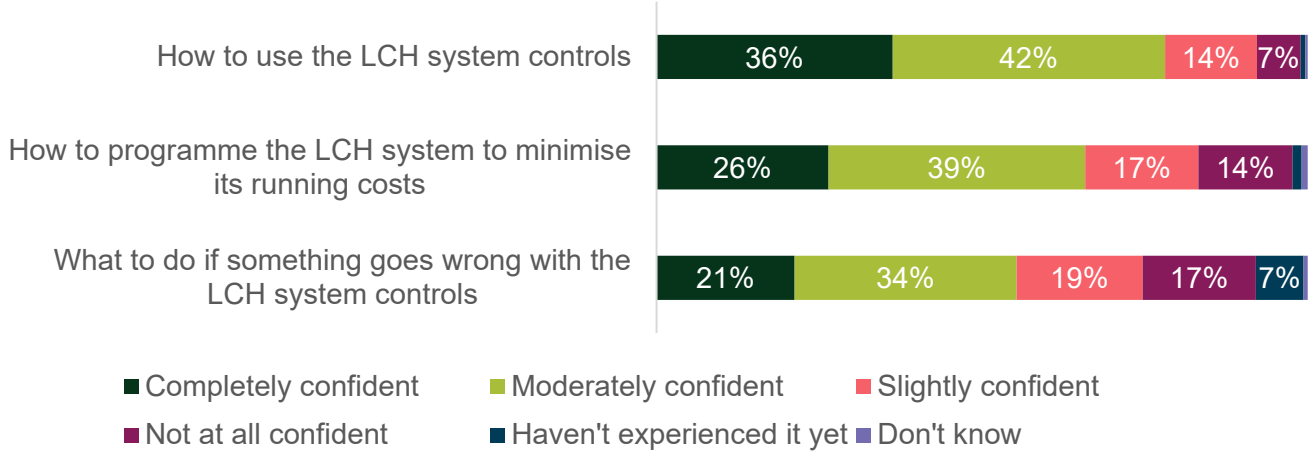
(waves 2-4); multiple answers possible so figure sums to more than 100%; for brevity, something else and don't know are not shown (both <=1%).

System handover and confidence using the LCH system

Figure 8 illustrated that, whilst most property owners were very or fairly satisfied with the handover of their new LCH system, a notable proportion were very or fairly dissatisfied (16% of the total). Property owner interviews found that some property owners thought the information they were given at handover was too technical and had left them with insufficient understanding of how to control their new LCH system. Individuals had needed to recontact their installer, sometimes on multiple occasions, to ask questions about how to use and programme their LCH system efficiently. Qualitative research with property owners found that where the handover was perceived as incomplete or overly technical, they were more likely to be uncertain about how to operate their LCH system efficiently and have concerns about running costs. Whilst these issues rarely resulted in formal complaints (see Section: LCH system faults and complaints), they did shape users' confidence, how quickly they adapted to ambient heating, and their willingness to recommend LCH systems to others.

The follow-up survey asked property owners to assess their confidence with three aspects of their system controls (Figure 10). A minority of respondents rated themselves as completely confident that they knew how to use the controls. Instead, most property owners said they were moderately or slightly confident, indicating that there remained gaps in their knowledge even after having used their LCH system for at least one winter heating season. The property owner case studies also found examples where individuals had a mixed experience of the handover that left them unsure of how to programme their system or deal with unexpected problems (e.g. a lack of wi-fi connectivity). Case study property owners who had a technical or engineering background found it simpler to understand the information they were given or told, ask the right questions, and source answers themselves if they did not get a satisfactory response from their installer. Less technically minded individuals found it harder and consequently felt less confident that they knew how to use their new ASHP.

Figure 10: Property owners' confidence they understand how to use the LCH system



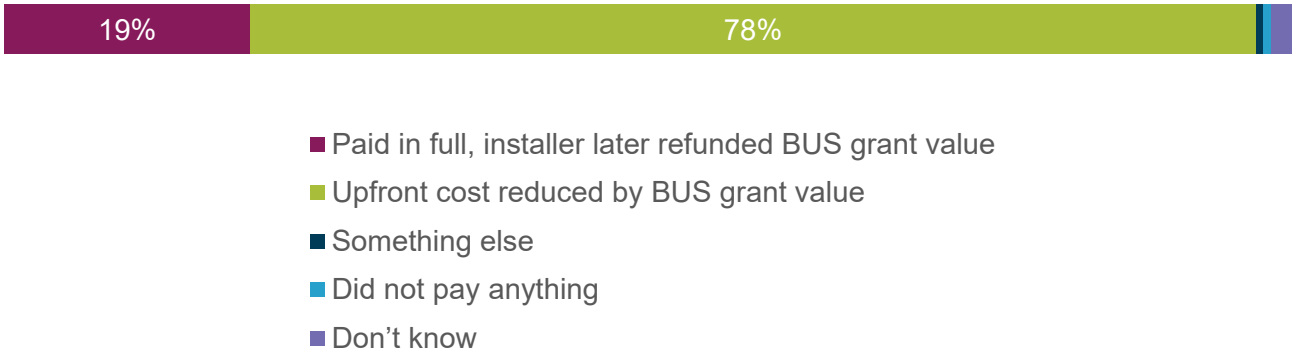
Source: Waves 1 and 2 property owner follow-up survey. QC08. How confident or unconfident are you that you understand the following…? Unweighted base: All respondents that have experience of using their LCH system (Yes at QR03) (n=3,636).

Billing, payment and affordability of BUS installations

Billing models used by installers

During the period covered by this evaluation, BUS installers were encouraged to reduce the bill paid by consumers by the value of the BUS voucher, but were able to determine their own billing model[47]. As Figure 11 shows, most property owners (78%) reported that their installer reduced the quoted cost of their LCH system installation by the value of the BUS grant. This proportion remained broadly stable across waves 1 to 3 of the property owner survey but increased to 83% at wave 4 (covering installations completed between May and October 2024). This suggests either a shift in installers' billing practices over time, or that the BUS market increasingly came to be dominated by installer companies that discounted their quotes by the value of the grant.

Figure 11: How property owners were billed for their LCH system installation



Source: Waves 1 to 4 property owner survey. QC02. How did your installer bill you for the [LCH system installed]? Unweighted base: All respondents (n=5,394).

As discussed earlier (Section: Impacts of the BUS on installer companies' cashflow), the time lag between completion of an installation and receipt of the BUS voucher payment posed cashflow challenges for some installer companies. One way of managing this risk was to charge customers the full installation cost upfront and refund the value of the BUS voucher once it had been successfully redeemed. Among respondents to waves 2 to 4 of the property owner survey who were billed in this way, a quarter (26%) reported receiving their refund within one month, and a further third (32%) within one to two months[48]. However, a minority experienced longer delays, including 8% who reported waiting more than six months. Property owners did not always know the reasons for these delays, although open-text survey responses suggest that drawn-out audits were a contributing factor in some cases.

Qualitative research with participant and non-participant property owners highlighted that installers' billing models affected their perceptions of financial risk and fairness. Open-text survey responses and interviews highlighted property owners' concerns about paying large

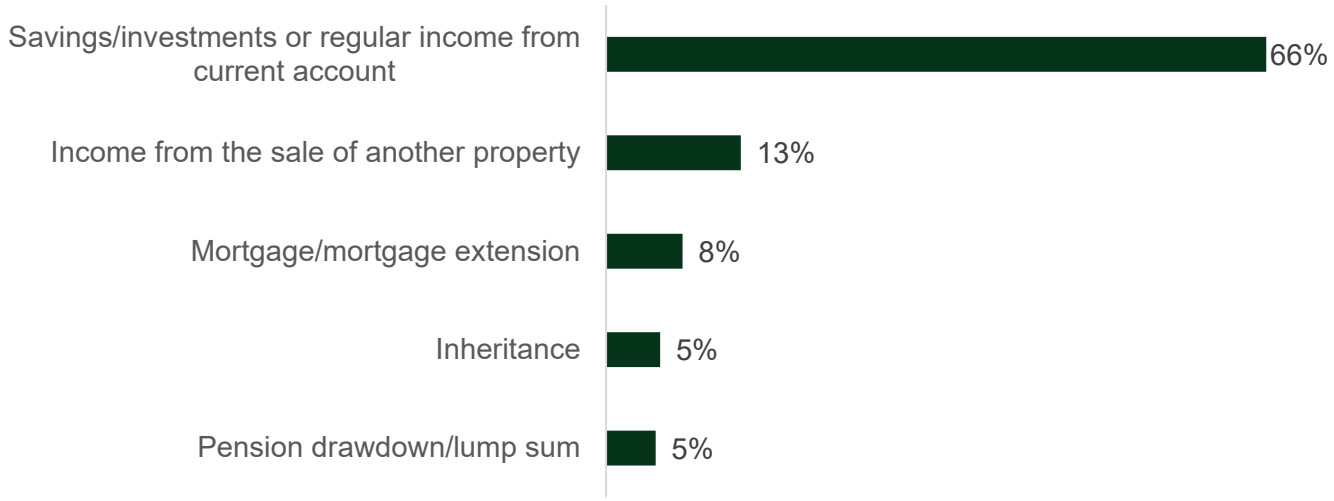
[47] At the time this report was drafted, changes were planned that would require installers to deduct the voucher value from their quote.
[48] QC02b. How long after the installation was completed were you refunded the value of the Boiler Upgrade Scheme grant? Unweighted base: All wave 2-4 respondents who paid for the new system in full (n=614).

sums upfront and a reliance on installers to pass on grant funding in full and on time. Even where property owners ultimately had the means to pay for their LCH system, these factors sometimes affected their confidence and willingness to proceed, particularly for higher-cost systems or self-build projects.

How property owners paid for their LCH system

The BUS was designed to contribute towards, rather than fully cover, the cost of installing a LCH system. As shown in Figure 12, most property owners (66%) met the remaining installation costs using savings, investments, or regular income from their current account. A smaller proportion relied on borrowing, with 8% using a mortgage or mortgage extension (although not shown in the chart, 4% used a personal loan from bank, building society or other provider). As shown in Figure 31, BUS participants tended to be relatively high earners, which likely explains why many were able to fund the residual costs from their own financial resources.

Figure 12: How property owners paid for installation costs not covered by the BUS grant

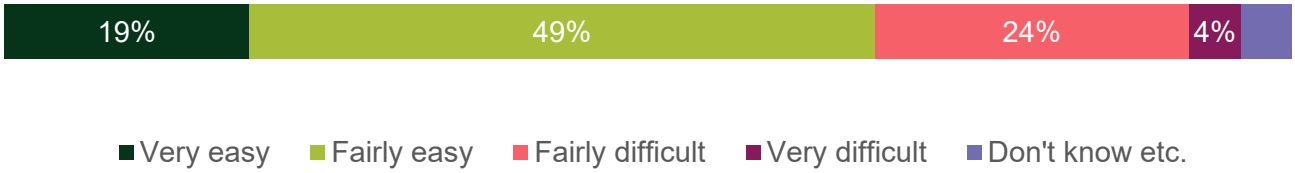


Source: Waves 1 to 4 property owner survey. QC01. How did you pay for the costs of the installation that were not covered by the BUS grant? Unweighted base: All (n=5,394). Note: multiple answers possible so figure sums to more than 100%; for brevity, not shown are any options selected by under 5% of respondents.

Affordability of BUS-funded installations

Property owners were asked how easy or difficult they found it to pay for the portion of installation costs not covered by the BUS grant (Figure 13). Overall, 68% of respondents reported that paying these costs was very or fairly easy, while 28% said it was very or fairly difficult.

Figure 13: How easy or difficult property owners found it to pay for their LCH system



Source: Waves 1 to 4 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 respondents (n=5,394).

Affordability varied significantly by the type of LCH system installed. While 28% of respondents who installed an ASHP reported finding it very or fairly difficult to pay the residual costs, this rose to 43% among those who installed a GSHP and to 73% among those who installed a biomass boiler[49]. As shown in Table 2, ASHP installations under the BUS were substantially less expensive than GSHP installations and somewhat less expensive than biomass boilers.

The October 2023 grant uplift improved affordability for ASHP installations significantly, relative to other technologies. The share of average ASHP installation costs covered by the BUS grant increased from 42% to 64%, compared with a smaller increase for GSHPs (from 27% to 30%). Correspondingly, the proportion of ASHP recipients who reported that it was very or fairly easy to pay the residual costs increased from 64% among those receiving the pre-uplift grant to 73% among those receiving the post-uplift grant[50].

Table 2: Median total installation costs for LCH systems under the BUS, 2022-25#

	ASHP	GSHP	Biomass boiler	Shared Ground Loop GSHP
Average cost	£12,850	£25,000	£15,288	£18,945

Source: DESNZ (April 2025)[51]; Notes: # Costs are self-reported by MCS-certified installers and include the cost of the LCH system, labour and VAT, plus the BUS grant value; costs are nominal – i.e. costs at the time the installation was lodged with the MCS – and do not adjust for inflation.

Progress through the BUS delivery model

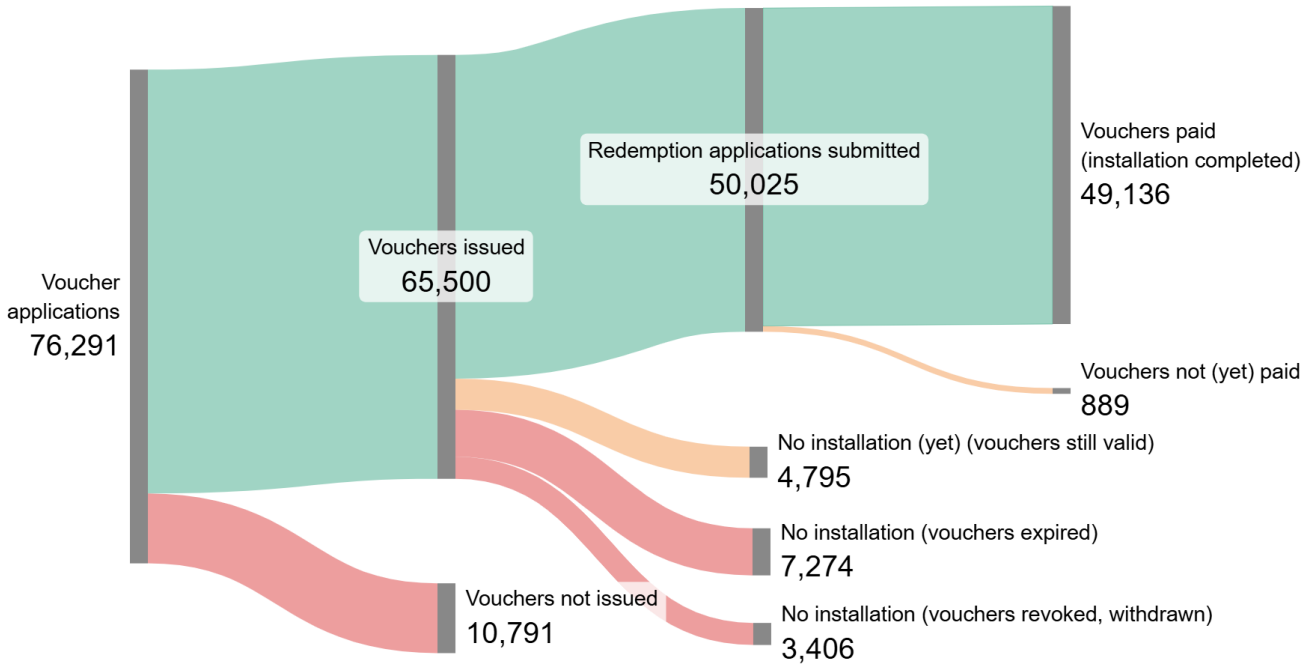
BUS voucher applications and outcomes

A total of 76,291 BUS voucher applications were submitted between March 2022 and March 2025. Figure 14 shows the flow of these applications through the various steps in the BUS delivery model, including the number that had, by March 2025, led to the successful installation

[49] n=5,239, n=111 and n=43 (note, therefore, for biomass boilers the results should be treated with caution).
[50] n=2,521 and n=2,718
[51] DESNZ (April 2025) Boiler Upgrade Scheme statistics: March 2025

of a LCH system[52]. A total of 10,791 applications did not lead to a voucher being issued, though in many cases there were multiple applications for the same property. Where vouchers were not issued this was most commonly because they were withdrawn by the applicant or because the application was ineligible. Most (75%) of the 65,500 issued vouchers had led to a LCH system installation by the end of March 2025 – though 16,364 (25%) had not. In 7,274 cases (11% of vouchers issued), the voucher expired before an installation was completed[53], and in another 3,406 cases (5%) the voucher was withdrawn or revoked prior to an installation taking place.

Figure 14: Progression and outcomes of BUS voucher applications, 2022-25



Source: DESNZ[54]

Delivery barriers, including reasons for drop-outs

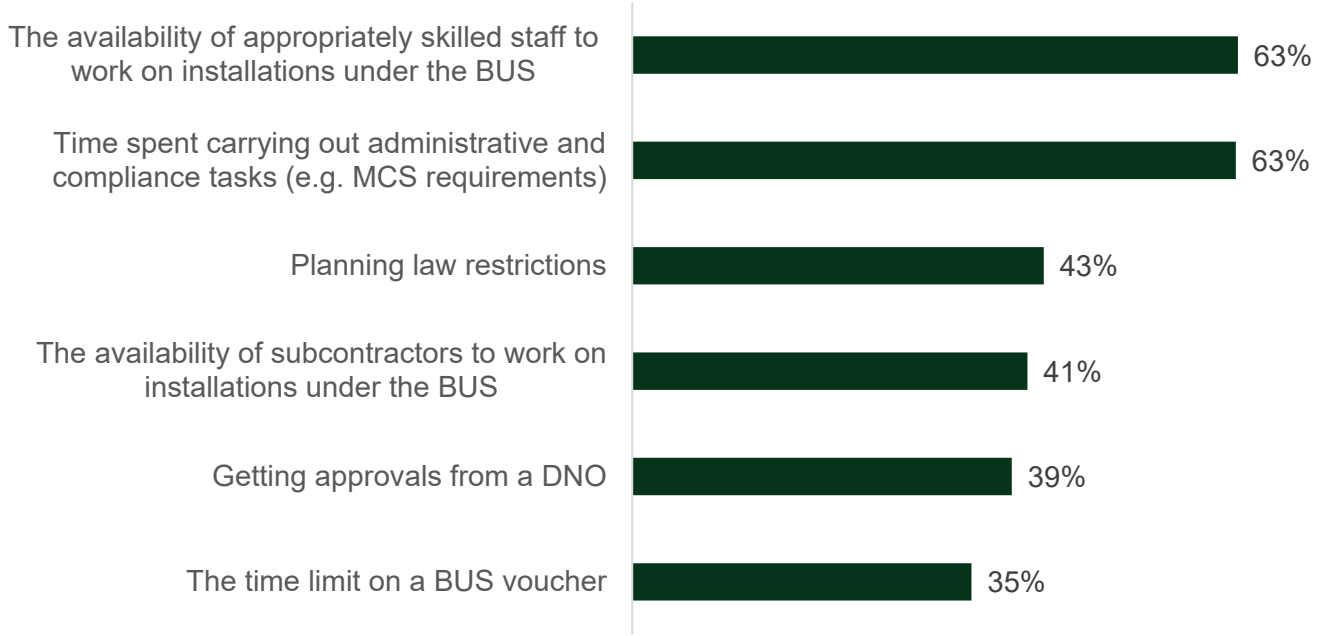
Surveys and interviews with installer companies, participating property owners, and property owners who dropped out of the BUS provide insights into the challenges encountered as prospective LCH system installation projects move through the BUS delivery model, and in some cases exit the scheme without completing an installation.

Installer companies were asked whether there was anything that limited their ability to deliver BUS-funded installations. Overall, exactly half of survey respondents (50%) said that they had faced such barriers, though the proportion declined between waves 1 and 2 of the survey (down from 57% to 44%), a statistically significant decrease that indicates an improved working

[52] Note that this is a snapshot of the situation as at the end of March 2025, and that several applications made during the reference period for this evaluation were still 'live' and may ultimately have led to an installation.
[53] If not redeemed, BUS vouchers expire after three (ASHPs, biomass boilers) or six months (GSHPs).
[54] These outcomes are based on ICF analysis of the detailed unpublished BUS Administrative Database. The numbers of applications, issued vouchers and completed installations aligns with published BUS statistics - DESNZ (April 2025) Boiler Upgrade Scheme statistics: March 2025

environment for LCH system installers[55]. Installer companies that perceived there to be delivery constraints were then asked what these were (Figure 15). Most issues were not directly related to the BUS but rather reflected general LCH market issues: shortages of skilled staff (whether internally or within subcontractors), planning law restrictions[56], and issues getting approvals from a Distribution Network Operator (DNO)[57]. Almost two thirds (63%) of installer companies noted that time spent on administrative and compliance tasks related to LCH system installations constrained their delivery capacity. Interviewed installers explained that this was mostly MCS-related tasks, and that BUS-specific administration was, for standard installations, light-touch (see Section: The administrative burden on installer companies).

Figure 15: BUS installation delivery barriers faced by installer companies



Source: 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 said there is something that limits the number of installations they do (n=259). Note: for brevity, not shown are any options selected by under 35% of respondents; multiple answers possible so adds up to more than 100%.

Around a third (35%) of installer companies experiencing delivery constraints cited the BUS voucher time limit as a problem. As shown in Figure 14, voucher expiry was the most common reason vouchers did not result in installations. Interviews with installer companies and property owners with expired vouchers found that this was sometimes because the property owner had changed their mind and abandoned the planned installation, e.g. because they had developed doubts about the LCH system and/or the trustworthiness of the installer. On other occasions it

[55] QC05. Is there anything that limits the number of BUS installations that your business is able to do? When answering please exclude any issues relating to the scale of demand from consumers. Unweighted base: All respondents (n=247 at wave 1 and n=269 at wave 2)
[56] Both installer survey waves were carried out prior to the easing of planning laws in England in May 2025, which removed the one-metre boundary rule and expanded permitted development rights.
[57] 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 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.

was because delays had meant it was not possible to complete the installation within the voucher validity period. LCH system installation delays were caused by the factors shown in Figure 15 plus other scheduling issues – e.g. where a LCH system was being installed as part of a larger renovation or construction project, and overruns elsewhere meant the heating system could not be installed according to the original timetable.

Post-Installation Experiences

This chapter discusses property owners' post-installation experiences, including their satisfaction with their new LCH system, their experiences using LCH systems for heating and hot water, changes in energy bills and tariffs, and decisions regarding mains gas connection.

Key findings

Property owners' overall satisfaction with their LCH system was high and increased over time. By the follow-up survey (9-21 months after installation), 91% of respondents were very or fairly satisfied (of whom 64% were very satisfied). This compared to 80% who were very or fairly satisfied with their LCH system shortly after it was installed.

Most property owners were satisfied with the temperature of their property when using their LCH system, though they often went through a period of adjustment as they learned how to use their system and adapted to the different way of heating their home. A large majority (93%) described indoor temperatures as about right overall, including during the coldest mornings and evenings.

A minority (42%) of property owners reported using supplementary heating alongside their LCH system during the previous winter. This most commonly involved the use of open fires or stoves burning wood or coal and could be for aesthetic/comfort reasons as well as to maintain warmth.

Satisfaction with hot water provision was high. Most property owners felt that hot water temperatures were about right (94%), and large majorities were satisfied with both the speed at which hot water heated up and the quantity available.

Property owners were typically satisfied with the level of noise produced by their LCH system (89%), including during cold weather when systems were operating more intensively (85%).

Most commonly, property owners reported that their total energy bills decreased after they installed a LCH system (42%). Experiences with bills varied depending on the type of heating system replaced, with 52% of those replacing a gas boiler reporting that their energy bills had decreased. Experiences also varied by whether additional technologies such as solar PV or battery storage were installed.

Nearly half (46%) of property owners had switched electricity tariff since installing their LCH system, mostly to reduce energy bills. Switching became more common over time, with increasing uptake of time-of-use and dedicated heat pump tariffs, which were associated with a greater likelihood of reported reductions in total energy bills.

Over half (56%) of respondents to the follow-up property owner survey reported that they had serviced their LCH system since installation, with a further 7% having attempted but not yet succeeded. Among those who had tried to arrange servicing, satisfaction with the ease of finding an engineer was generally high (81% were very or fairly satisfied), though many found servicing more costly than they had anticipated.

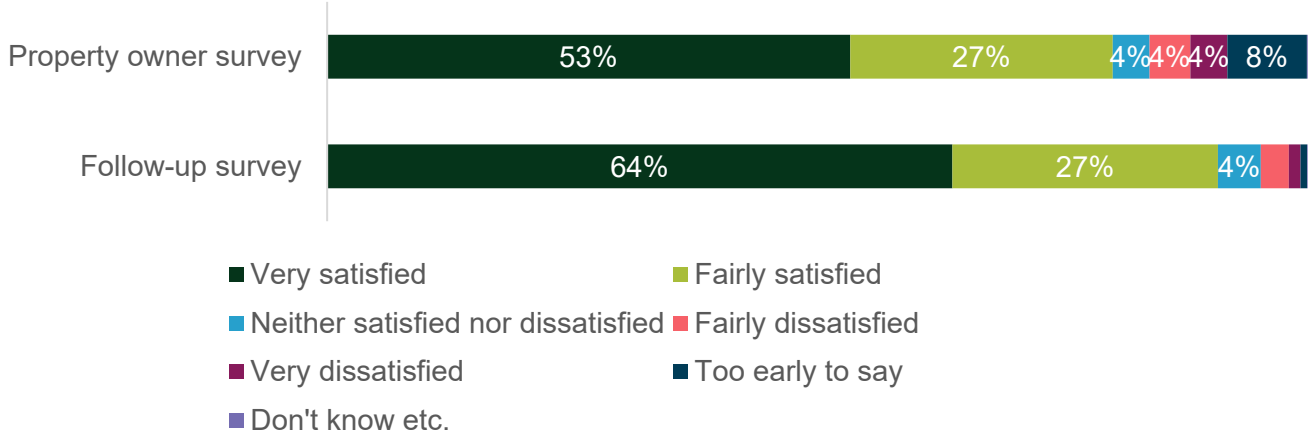
Most property owners (70%) had not experienced any issues with their LCH system since installation. Among the minority who had experienced problems, these most commonly related to interruptions to heating or hot water and were typically resolved by the installer, though poorly handled issues sometimes shaped overall perceptions of LCH systems. Just 12% of property owners said they had complained in some shape or form about an aspect of their installation, usually to the installer, with only 1% making a formal complaint to MCS.Almost two thirds (64%) of on-grid property owners had disconnected their properties from the gas grid since having their LCH system installed. Where property owners had not attempted to disconnect, this was most commonly because they continued to use gas for cooking.

Most property owners were willing to recommend their LCH system to others, though this was sometimes conditional, based on property characteristics and installation quality. Sixty percent of follow-up survey respondents said they already had or definitely would recommend their system, while only 7% said they probably or definitely would not.

Property owners' overall satisfaction with their LCH system

In both the property owner survey and the follow-up property owner survey, respondents were asked how satisfied or dissatisfied they were with their LCH system. Figure 16 compares levels of satisfaction across the two surveys for a matched subsample of respondents who completed both. Most of this subset of BUS participants reported being very satisfied with their LCH system at both surveys. Satisfaction increased over time, with 91% reporting that they were very or fairly satisfied at the follow-up survey (of whom 64% were very satisfied). By this stage, property owners had been using their LCH system for between 9 and 21 months, including at least one heating season, and therefore had more experience on which to base their assessment. At the time of the follow-up survey, only 4% of respondents reported being very or fairly dissatisfied with their LCH system. Levels of satisfaction did not differ depending on whether properties had or did not have loft or cavity wall insulation.

Figure 16: Property owners' satisfaction with their LCH system at the property owner and follow-up surveys



Source: Waves 1 to 4 property owner survey and Waves 1 and 2 property owner follow-up survey. QE03. Taking everything into account, how satisfied or dissatisfied are you with your [LCH system installed] overall? Unweighted base: All respondents to both surveys that still have their BUS-funded installation at the follow-up survey (Yes at QA01) (n=3,310)

Experiences of space heating

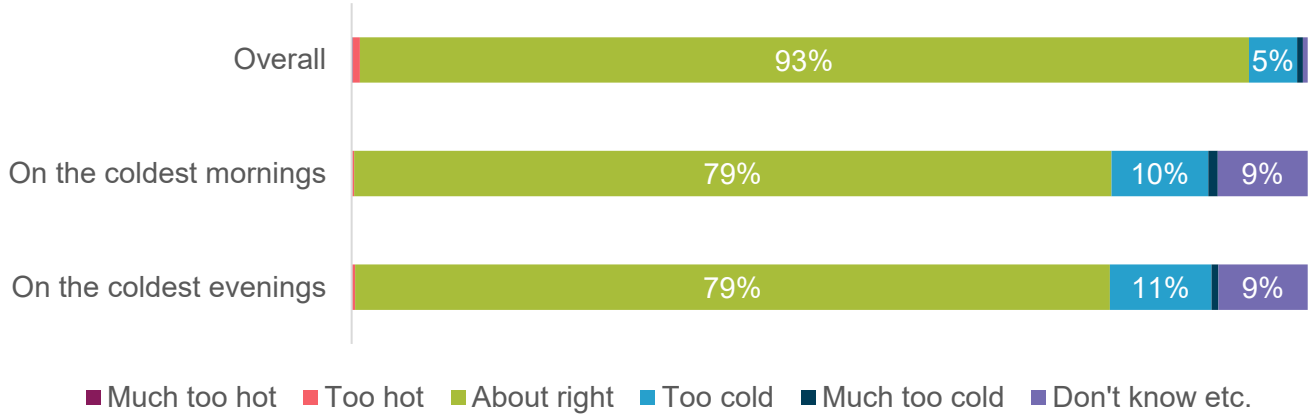
Satisfaction with the temperature of the property

Both waves of the follow-up survey were conducted during the summer, after respondents had experienced at least one full heating season using their LCH system (wave 1 covering winter 2023/24 and wave 2 winter 2024/25[58]). As shown in , most property owners felt that the temperature of their home was about right, both overall (93% of respondents) and during the coldest periods (79% on both the coldest mornings and coldest evenings). On the coldest evenings, 11% of respondents reported that their property was too cold, while 1% said it was much too cold. It is important to note that dissatisfaction with indoor temperature can occur regardless of the type of heating system used[59].

[58] Met Office average temperature data for winter 2023/24 and winter 2024/25 (UK-wide) indicate that winter 2023/24 was particularly mild (1.2°C above the 1991-2020 average). Winter 2024/25 was also relatively mild (0.53°C above the 1991-2020 average), albeit to a lesser extent. Rates of satisfaction with thermal comfort thus remained high even though wave 2 respondents were referencing a slightly cooler winter than wave 1 respondents.

[59] A survey of heat pump and gas boiler users found similar levels of satisfaction: around 85% of survey respondents were very or fairly satisfied with their space heating experience for both systems. Source: Nesta (2023) Heat pumps: A user survey

Figure 17: Property owners' satisfaction with the temperature of the property



Source: Waves 1 and 2 property owner follow-up survey. QC01/1a. Overall, which of the following describes the internal temperature achieved in the property by the [LCH system installed] – overall; on the coldest mornings; on the coldest evenings? Unweighted base: All respondents that have experience of using their LCH system (Yes at QR03) (n=3,636).

The survey also asked about satisfaction with how quickly and evenly LCH systems heated properties, recognising that the heat produced by lower-temperature systems can feel different from that generated by higher-temperature fossil fuel systems. Most respondents (74%) were very or fairly satisfied with how quickly their LCH system heated their property, while only 7% were very or fairly dissatisfied. Satisfaction was even higher in relation to how evenly rooms were heated, with 85% reporting that they were very or fairly satisfied[60].

Case studies and other qualitative research with property owners highlighted that positive views of heating using a LCH system were sometimes accompanied by a period of adjustment as they familiarised themselves with the different way in which heat is delivered[61], compared with conventional fossil fuel systems. Property owners who received clear explanations at handover (see Section: System handover and confidence using the LCH system), or who actively sought information about how their system should be run (for example by watching online videos and demonstrations), tended to adapt more quickly. Conversely, where property owners expected an experience similar to the rapid, high-temperature heating provided by their previous system, they sometimes interpreted slower warm-up times as a performance issue, even where overall thermal comfort was satisfactory. Several case study participants ultimately came to prefer the gentler, more consistent and more evenly distributed heat produced by their LCH system but noted that this shift in perspective had taken time.

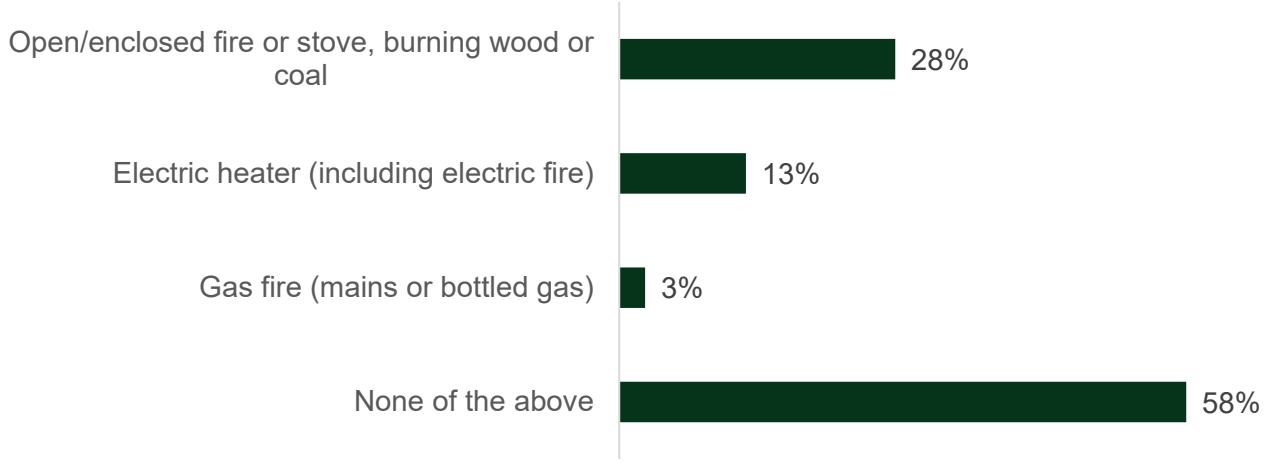
Use of supplementary heating

As shown in most property owners (58%) reported that they had not used any supplementary heating during the previous winter. However, 42% had used at least one additional heating

[60] Unweighted base: All respondents that have experience of using their LCH system (Yes at QR03) (n=3,636). QC02. How satisfied are you with the following: how quickly the [LCH system installed] heats up the property, how evenly the [LCH system installed] heats up the rooms within the property?
[61] Rather than providing short bursts of high-temperature heat on demand, as would be the case with many fossil fuel heating systems, LCH systems typically operate at lower temperatures over longer periods to maintain a steady indoor temperature.

method, most commonly an open fire or stove burning wood or coal (used by 28% of property owners). The use of supplementary heating declined between survey waves, driven primarily by a reduction in the proportion of respondents using open fires or stoves (from 31% at wave 1 to 26% at wave 2). This trend may partly reflect growing awareness of the health and air-pollution impacts associated with burning wood or coal[62], alongside changes in the profile of properties participating in the BUS, including an increase in the share of urban properties connected to the gas grid.

Figure 18: Whether property owners used supplementary heating over the winter



Source: Waves 1 and 2 property owner follow-up survey. QC03. Over the past winter, did you regularly use any of the following to heat some or all of the property in addition to the [LCH system installed]? Unweighted base: All respondents that have experience of using their LCH system (Yes at QR03) (n=3,636). Note: multiple answers possible so figure sums to more than 100%; for brevity, not shown are any options selected by under 1% of respondents (which includes an 'other' option where respondents were invited to specify their supplementary heating system).

Use of supplementary heating varied depending on property owners' perceptions about their thermal comfort. Nearly three quarters (74%) of the small minority of survey respondents who felt their home was too cold or much too cold on the coldest evenings also said they used supplementary heating, compared with 37% of those who felt their home temperature was about right[63].

The use of supplementary heating during winter is widespread regardless of whether property owners have a LCH or fossil fuel heating system. Findings from a separate DESNZ study[64], which explored secondary heating use among households primarily heated by gas boilers, showed that households used secondary heating for a range of reasons. For some, this was to maintain warmth; for others, it was driven by comfort or aesthetic considerations, or the desire to raise the temperature of a single room for a short period (such as a living room in the evening). Case study and qualitative evidence from research with BUS participants highlights that this was also the case with users of LCH systems, who mostly used supplementary

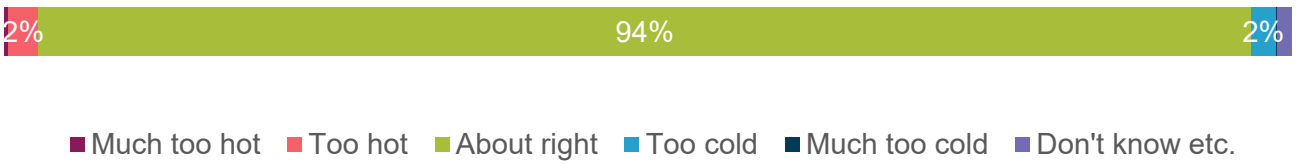
[62] Nationally, use of fixed room heaters, fires and stoves (solid fuel, wood) for heating decreased between 2022-2024.
[63] n=434 and n=3,078
[64] DESNZ (August 2025) Understanding secondary heating behaviours: research findings

heating selectively and often for similar comfort- or convenience-related reasons rather than because their LCH system was unable to meet overall heating needs.

Experiences of hot water heating

As shown in , the vast majority of follow-up survey respondents (94%) felt that the temperature of their hot water was about right. Only small proportions reported that it was too hot (2%) or too cold (2%). Property owners were also asked about their satisfaction with how quickly their LCH system heated hot water and the quantity of hot water provided[65]. Satisfaction was high on both measures: 87% of respondents were very or fairly satisfied with the speed at which their hot water heated up, and 90% were very or fairly satisfied with the amount of hot water their system provided.

Figure 19: Property owners' satisfaction with the temperature of the hot water



Source: Waves 1 and 2 property owner follow-up survey. QC06. Which of the following describes the water temperature achieved in the property by the [LCH system installed]? Unweighted base: All respondents that have experience of using their LCH system (Yes at QR03) (n=3,636).

Case studies and other qualitative research with property owners found that experiences of hot water provision using LCH systems were shaped primarily by the availability of hot water, rather than by overall satisfaction with the temperature. While most property owners found that the hot water temperature was adequate, some described constraints related to hot water volume or recovery time, particularly during periods of higher demand (e.g. back-to-back showers in larger households). Qualitative evidence suggests that these issues were more closely linked to system design factors (such as hot water tank size) or household usage patterns than to the operation of the LCH system. In several case studies, concerns about hot water provision persisted alongside otherwise positive views of space heating, suggesting that experiences of hot water could influence how property owners felt about the system overall.

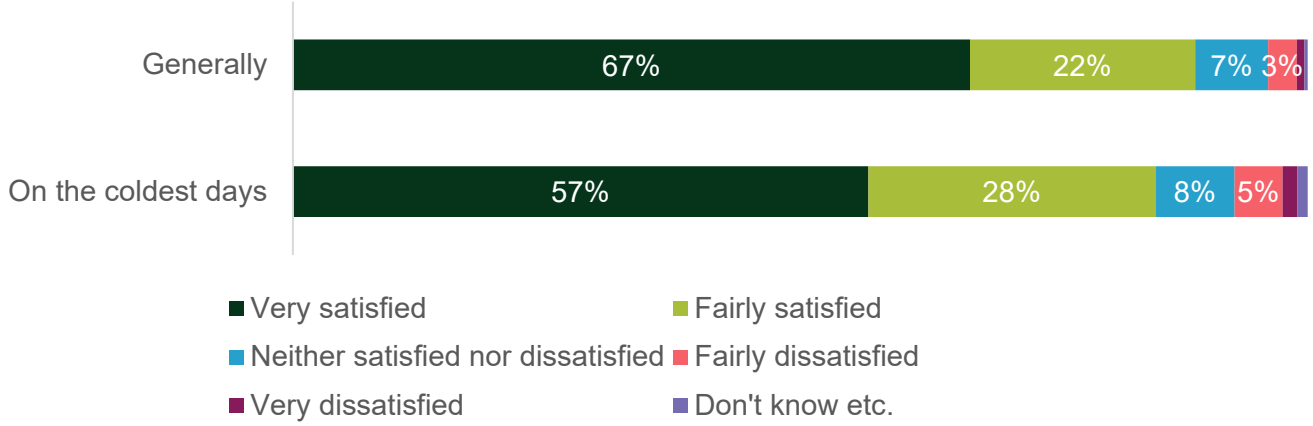
Experiences of the noise produced by the system

As shown in , most property owners were satisfied with the noise level of their LCH system, including on the coldest days, when heat pumps can be louder due to factors such as lower air temperatures or defrost cycles. Overall, 89% of respondents were very or fairly satisfied with

[65] Unweighted base: All respondents that have experience of using their LCH system (Yes at QR03) (n=3,636). QC07. How satisfied are you with the following: how quickly the [LCH system installed] heats up water, how much hot water the [LCH system installed] provides?

noise levels in general, and 85% were very or fairly satisfied with noise levels on the coldest days.

Figure 20: Property owners' satisfaction with the noisiness of their LCH system



Source: Waves 1 and 2 property owner follow-up survey. QE01. How satisfied are you with the noise level of the [LCH system installed]: generally, on the coldest days? Unweighted base: All respondents that still have their BUS-funded installation (Yes at QA01) (n=3,721).

Case study research and analysis of open-text survey responses suggests that experiences of noise from LCH systems were generally positive, with most participants reporting that noise was not an issue in day-to-day use. However, where noise was noticed, it tended to be particularly prominent for those affected. Qualitative evidence indicates that concerns were often linked to specific circumstances, such as the location of external heat pump units relative to living or sleeping spaces, unconventional system installation locations (e.g. on flat rooves), or during periods of colder weather when systems were working harder.

Energy bills and tariffs

The following section discusses property owners' experiences of energy bills as they transitioned to a LCH system. Note that these data are all self-reported by respondents, and property owners were not asked to quantify changes in energy use and bills in kilowatt hours (kWh) or pounds.

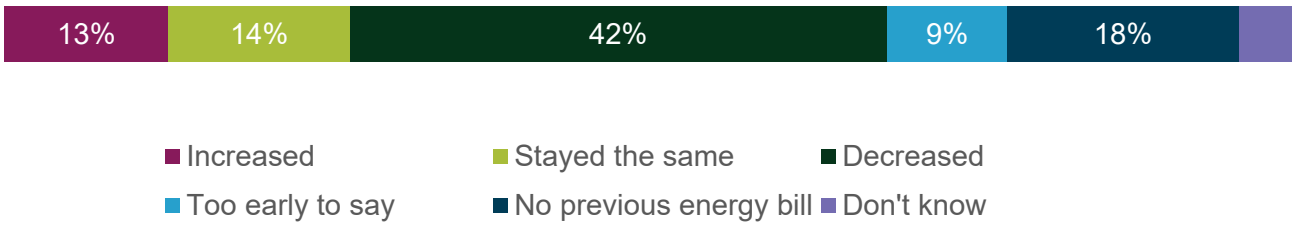
Changes in total energy bills

Follow-up survey respondents were asked how their total energy bills – covering electricity and any other fuels used – had changed since the installation of their LCH system (Figure 21). Across both survey waves, 42% of property owners reported that their total energy bills had decreased following installation. There was a statistically significant difference between the two survey waves. At wave 1, 37% of respondents reported a decrease in energy bills, rising to 45% at wave 2[66]. It should be noted that respondents were comparing energy bills over different reference periods, and that average energy bills were higher in summer 2025 (wave

[66] n=1,640 (wave 1) and n=2,081 (wave 2)

2) than they were in summer 2024 (wave 1)[67]. When focusing only on those respondents able to indicate changes in their energy bills following installation[68] (across both waves), the survey results suggest that 61% of respondents reported a decrease in energy bills, 20% reported no change, and 19% reported that their energy bills had increased[69].

Figure 21: Change in total energy bills reported by property owners



Source: Waves 1 and 2 property owner follow-up survey. QD01. Thinking about the overall bills for energy (total for electricity, gas and/or other fuels) have you noticed a change since the [LCH system installed] was installed? Unweighted base: All respondents that still have their BUS-funded installation (Yes at QA01) (n=3,721).

Reported changes in energy bills varied by the type of heating system replaced. Across waves 1 and 2, over half of property owners who replaced direct electric heating (57%) or a gas boiler (52%) reported a decrease in energy bills after installing an LCH system. Those replacing oil boilers were less likely to report a decrease (38%), although this proportion was still substantially higher than the share reporting an increase in bills (19%)[70].

Changes in energy bills were also associated with whether property owners installed solar PV and/or battery storage around the same time as their LCH system – an arrangement that, as shown earlier (Figure 9), was relatively common. Among property owners who installed solar PV, 45% reported a decrease in energy bills, compared with 39% of those who did not[71], a statistically significant difference. The difference was larger for battery storage: 50% of those who installed a battery reported lower energy bills, compared with 38% of those who did not[72].

Wave 2 of the follow-up survey also explored whether changes in energy bills differed depending on whether property owners participated in the BUS before or after the relaxation of

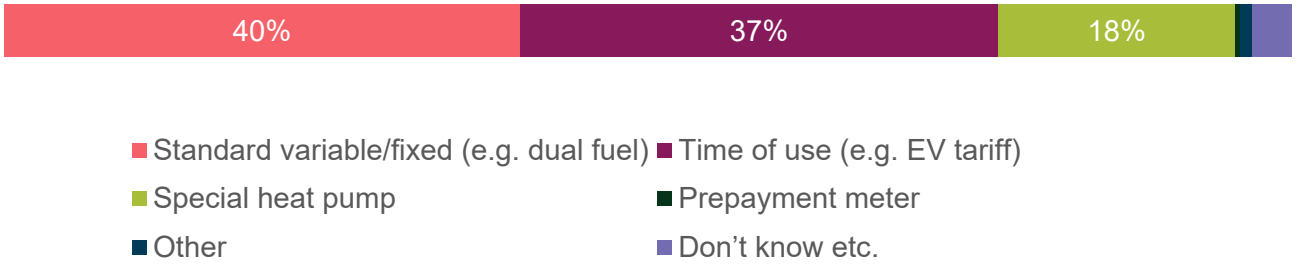
[67] Energy prices increased between summer 2024 and summer 2025. For example, the Ofgem price cap for a typical dual-fuel household rose from £1,568 in July-September 2024 to £1,720 in July-September 2025. Source: Ofgem, Changes to energy price cap between 1 July and 30 September 2025
[68] The respondents able to indicate changes in their energy bills are those who responded to QD01 by saying that their energy bill had increased, stayed the same, or decreased following installation (n=2,817) and excludes those who responded by saying it was too early to say, they had no previous energy bill, or did not know what the change had been.
[69] All the other analysis in this section is based on all responses for QD01 (n=3,721) including those who were able to indicate changes in their energy bills as well as those who were not (e.g. those who responded by saying it was too early to say, they had no previous energy bill, or did not know what the change had been).
[70] n=207 (direct electric systems), n=2,400 (natural gas systems) and n=717 (oil systems).
[71] As discussed above, the survey only explored whether property owners had installed solar PV around the same time as their LCH system – if they did not this could be because they already had solar PV. These results thus do not confirm whether energy bill change was associated with the presence, or not, of solar PV.
[72] Unweighted base: All that responded to both the property owner and follow-up property owner surveys and still had their BUS-funded installation (Yes at QA01) (n=1,260 for those that installed solar PV and n=2,050 for those that did not install solar PV; n=849 for those that installed a battery and n=2,461 for those that did not).

loft and cavity wall insulation requirements in May 2024. There was no statistically significant difference between the two groups. Among wave 2 respondents, 12% of those who participated when insulation was required reported an increase in energy bills, compared with 13% of those who participated after the requirement was relaxed[73]. The absence of a difference is likely to reflect the fact that, as discussed earlier (Section: Carrying out insulation improvements and additional works), BUS participants typically had loft and/or cavity wall insulation regardless of whether it was a formal requirement of the scheme.

Energy bill tariffs and the extent of switching

As shown in Figure 22, BUS participants were on a range of electricity tariffs at the time they responded to the follow-up property owner survey. The most common tariffs were standard variable or fixed tariffs, used by 40% of respondents, followed closely by time-of-use tariffs – where the unit price of electricity varies by time of day – used by 37%. A further 18% of respondents reported being on a dedicated heat pump electricity tariff[74]. The share of property owners on heat pump tariffs increased substantially between the two survey waves, rising from 11% at wave 1 to 25% at wave 2; this change was statistically significant. Use of other time-of-use tariffs also increased, from 35% at wave 1 to 39% at wave 2. Correspondingly, the proportion of respondents on standard variable or fixed tariffs fell markedly, from 51% of respondents at wave 1 to 32% at wave 2.

Figure 22: Property owners' current electricity tariff



Source: Waves 1 and 2 property owner follow-up survey. QD02. What electricity tariff are you currently on? Unweighted base: All respondents that still have their BUS-funded installation (Yes at QA01). Unweighted base: All respondents (n=3,721)

The decline in the use of standard variable and fixed tariffs partly reflects increased rates of tariff switching among BUS participants. By wave 2 of the follow-up survey, 46% of respondents reported that they had switched their electricity tariff since installing an LCH system, representing a statistically significant increase from 35% at wave 1[75]. Respondents who had switched tariff were asked about their motivations (Figure 23). Just under half (46%)

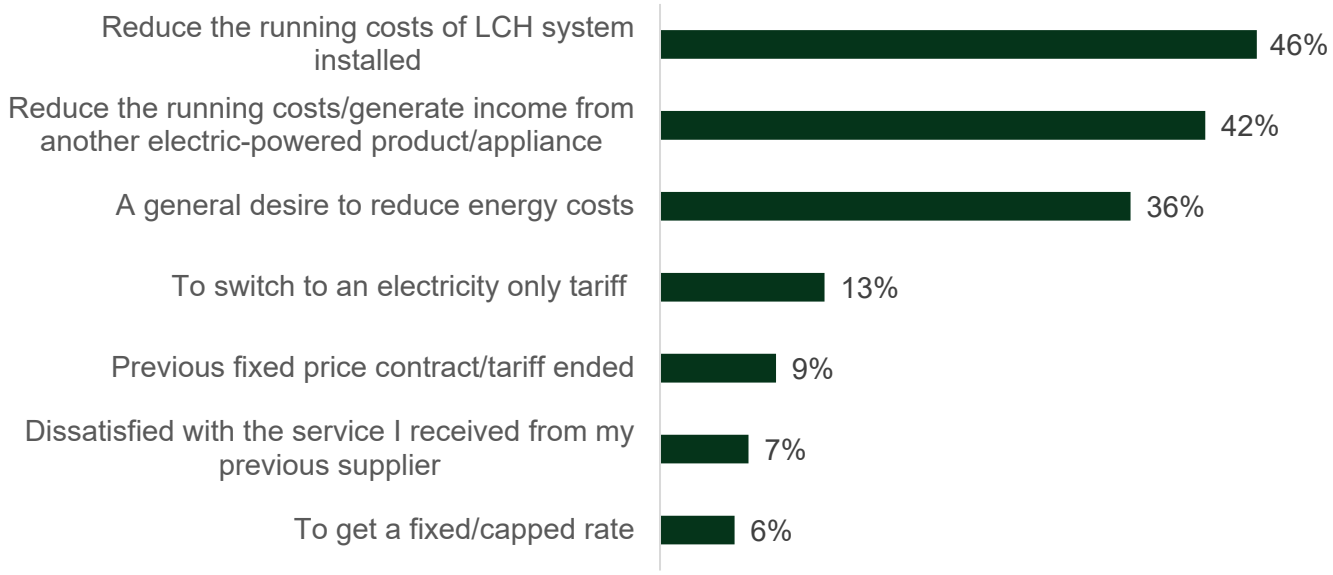
[73] n=978 for those wave 2 respondents that participated before changes to insulation requirements, n=1,103 for those that participated afterwards

[74] These are relatively new tariff types and are not offered by all energy suppliers. Those presently on the market are typically similar to time-of-use tariffs in that they offer discounted electricity prices during off-peak periods, or they provide an all-day discount tied to the use of a particular heat pump model/energy supplier.

[75] QD03. Have you changed your electricity tariff since [LCH system installed] was installed? Unweighted base: All respondents that still have their BUS-funded installation (Yes at QA01) (n=1,640 at wave 1 and n=2,081 at wave 2).

reported that they switched to reduce the running costs of their LCH system. Others cited a more general desire to reduce overall energy costs, to lower the running costs of other electricity-powered technologies or appliances (such as electric vehicles), or to generate income – for example, by selling surplus solar PV electricity back to the grid.

Figure 23: Why property owners had switched energy tariff since installing a LCH system



Source: Waves 1 and 2 property owner follow-up survey. QD03b. Why did you change your electricity tariff? Unweighted base: All respondents that had changed tariff (Yes at QD03) (n=1,716). Note: multiple answers possible so figure sums to more than 100%; for brevity, not shown are any options selected by under 5% of respondents.

The type of electricity tariff used was also associated with reported changes in energy bills following LCH system installation. Property owners on time-of-use or dedicated heat pump tariffs were more likely to report a reduction in energy bills than those on standard variable or fixed tariffs (52% and 50%, respectively, compared with 31%)[76]. As noted earlier, tariff choice was one of several factors influencing changes in energy bills, alongside LCH system type, complementary technologies, and wider energy price movements.

Qualitative evidence suggests that navigating tariff options was not always straightforward. Some property owners reported being unaware of heat pump specific tariffs, while others described difficulties accessing these tariffs because they did not have a smart meter. As a result, while tariff switching was seen by many as an important way to manage running costs, others found the process confusing or time-consuming.

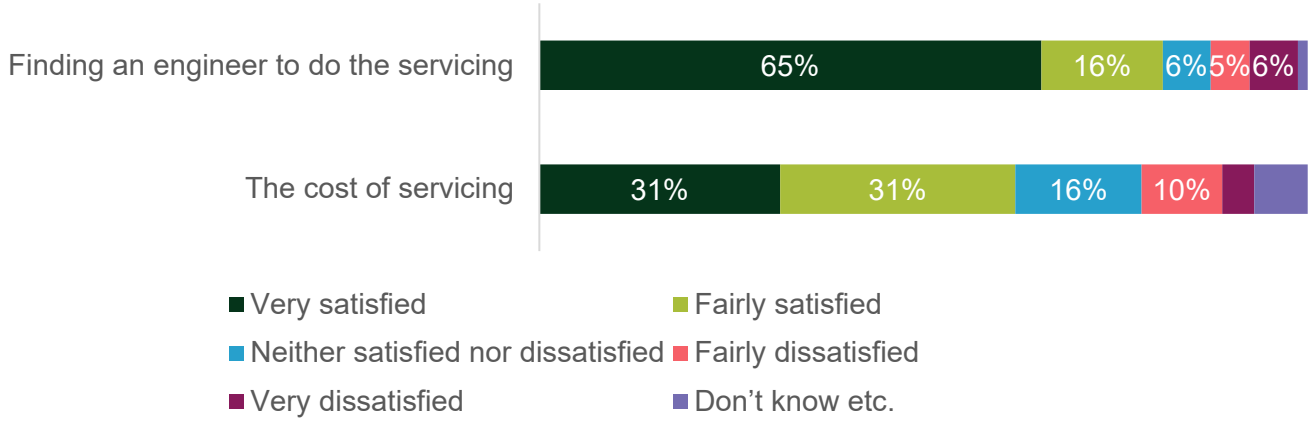
[76] n=1,437, n=740 and n=1,402 respectively.

Property owners' post-installation experiences

Having LCH systems serviced

As with fossil fuel heating systems, LCH systems require periodic servicing to ensure they are operating correctly and to address any potential issues. In some cases, an annual service may also be required to maintain warranty validity. Property owners' experiences of servicing their BUS-funded LCH systems were explored through wave 1 of the follow-up survey. At this point – between 9 and 21 months after installation – just over half of property owners (56%) had serviced their LCH system. A further 7% had attempted to arrange servicing but had not yet been able to do so, while 37% had not tried. Among property owners who had attempted to have their LCH system serviced, satisfaction with the ease of finding an engineer was high: 81% reported being very or fairly satisfied (Figure 24). Satisfaction was lower in relation to servicing costs, with 62% very or fairly satisfied and 15% reporting that they were very or fairly dissatisfied.

Figure 24: Property owners' satisfaction with selected aspects of LCH system servicing



Source: Wave 1 property owner follow-up survey. QB02a. How satisfied or dissatisfied were you with the following: finding an engineer; the cost of the servicing. Unweighted base: All respondents that selected Yes or No, tried but haven't been able to have it serviced at QB02 (n=1,060).

While survey respondents generally reported high levels of satisfaction with the ease of finding an engineer, qualitative evidence suggests that this process was not always straightforward. In several cases, participants reported that their original LCH system installer no longer offered servicing, or that servicing was restricted to manufacturer-approved engineers, which limited choice and, in some instances, increased waiting times. Some property owners found the cost of servicing their LCH system higher than the cost of servicing their previous heating system. Case study and open-text survey responses suggest that these challenges sometimes created uncertainty about the long-term maintenance of a LCH system, even where systems were otherwise performing well.

LCH system faults and complaints

The follow-up survey explored whether property owners had experienced any faults with their LCH system – including ancillary equipment such as hot water tanks – since installation.

Across the two survey waves, 70% of respondents reported that they had not experienced any faults, while 29% said that they had. These findings are based on self-reported experiences and have not been independently verified by the evaluation team. The reported incidence of faults declined between survey waves, falling from 32% at wave 1 to 27% at wave 2; this decrease was statistically significant[77]. Property owners reported a range of fault types, most commonly a loss of heating (22% of all respondents), no hot water (21%), or water leakage within the property (18%). Some faults required the repair or replacement of individual components, and in a small number of cases whole heat pump units were reportedly removed and replaced. Fault rectification was typically carried out or coordinated by the installer responsible for the original LCH system installation.

All BUS-funded installations must be completed by installers who are MCS-accredited and members of a consumer code, providing property owners with formal routes for redress where issues arise. Across all four property owner survey waves, 12% of respondents reported having made a complaint about their LCH system installation[78]. This relatively low level of complaints suggests that most faults were resolved satisfactorily without the need for escalation. Where complaints were made, property owners most commonly complained directly to the installer (10% of all respondents). Very few reported making a complaint to MCS (1%) or using the consumer codes.

Case studies and analysis of survey respondents' open-text answers suggest that experiences of faults and complaint resolution were shaped as much by how issues were handled as by the issues themselves. While most BUS participants reported that faults were satisfactorily resolved and did not have a lasting impact on their overall experience of using their LCH system, others described frustration where problems took time to fix or required repeated contact with installers or manufacturers.

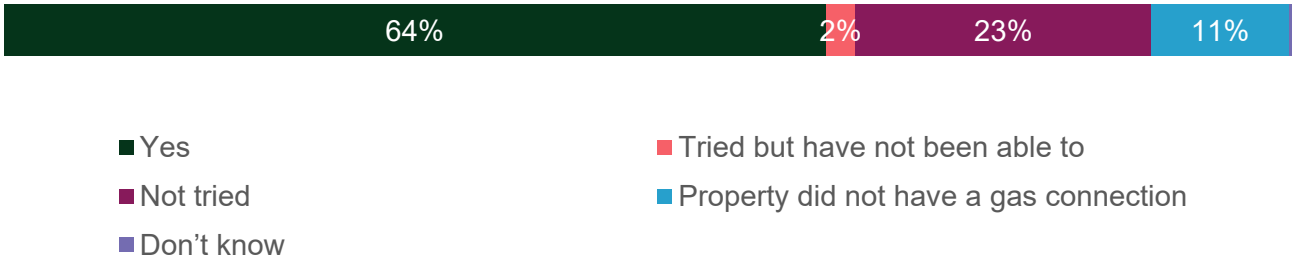
Disconnecting from the gas grid

BUS statistics[79] indicate that between 2022-25, 59% of properties receiving a BUS-funded installation were connected to the gas grid. This suggests a substantial pool of properties that could potentially disconnect from the gas grid after switching to a LCH system[80]. In the follow-up survey, owners of on-grid properties were asked whether they had disconnected from the gas grid since installing their LCH system (Figure 25). At the time of the survey, 64% reported that they had successfully disconnected, while a further 2% had attempted to do so but had not yet been able to. There was a statistically significant increase between survey

[77] QB03. Has the [LCH system installed] system (including equipment installed at the same time such as pipework, a new hot water tank or new radiators) had any faults since it was installed? We ask about running costs, whether the property is warm enough and whether the hot water is warm enough later, so please focus here on faults and operational problems. Unweighted base: All respondents that still have their BUS-funded installation (Yes at QA01) (n=1,640 at wave 1 and n=2,081 at wave 2).
[78] QE02. Have you made any formal complaints about the [LCH system installed] installation to any of the following organisations? Unweighted base: All respondents (n=5,394).
[79] DESNZ (April 2025) Boiler Upgrade Scheme statistics: March 2025
[80] Disconnecting from the gas grid involves removing the gas meter and capping the gas supply to the property. It may ultimately also involve disconnecting the gas pipe from the property to the mains gas network. Disconnecting from the gas grid means that property owners no longer have to pay the gas standing charge.

waves in the proportion of on-grid property owners who had disconnected: from 58% at wave 1 to 68% at wave 2.

Figure 25: Whether property owners from on-grid properties had disconnected from the gas grid[81]



Source: Waves 1 and 2 property owner follow-up survey. QB04. Since you had [LCH system installed] installed, have you disconnected the property from the gas grid? By this we mean that you have ended your gas supply contract and had your gas meter removed? Unweighted base: All property owners from on-grid properties (n=2,576).

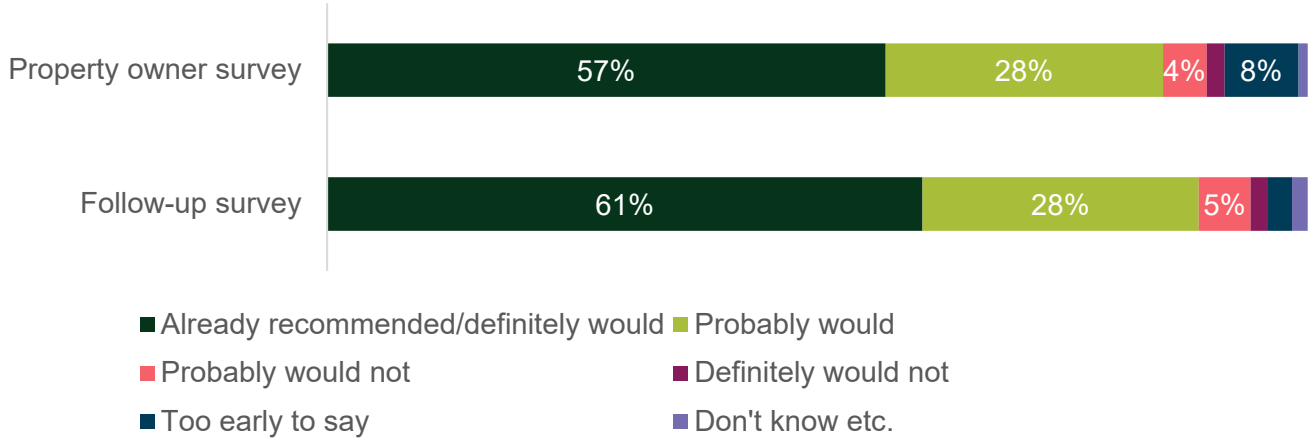
Property owners who had not attempted to disconnect were asked about their reasons. Across both survey waves, the most common reason by far was continued use of gas for cooking appliances (81% of those who had not tried to disconnect[82]). A further 19% reported that they still used gas for other heating appliances (use of supplementary heating is discussed in Section: Use of supplementary heating).

Whether property owners had or would recommend their LCH system

Figure 26 presents findings on whether respondents would recommend their LCH system to friends, again comparing responses across the property owner and follow-up surveys. At the follow-up survey, 60% of this subset of property owners reported that they either already had or definitely would recommend their LCH system, while a further 29% said they probably would. Overall, the vast majority of property owners were sufficiently positive about their LCH system to recommend it to others, with just 7% stating that they definitely or probably would not do so. There was little change in respondents' propensity to recommend their system between the two surveys, suggesting that views on whether to recommend an LCH system were largely formed soon after installation and remained stable over time.

[81] Some property owners said their property did not have a gas connection – despite being listed in the BUS database as on-grid. This is likely to be a mix of errors in the BUS data, possible misinterpretation by survey respondents, and cases where properties genuinely did not have a gas connection to remove.
[82] QB04a. Why have you not tried to disconnect the property from the gas grid? Unweighted base: All property owners from on-grid properties who had not tried to disconnect from the gas grid (n=607). Note: multiple answers possible so sums to more than 100%.

Figure 26: Whether property owners would recommend their LCH system



Source: Waves 1 to 4 property owner survey and Waves 1 and 2 property owner follow-up survey. QE04. Based on your experience to date would you recommend a [LCH system installed] to friends? Unweighted base: All respondents to both surveys that still have their BUS-funded installation at the follow-up survey (Yes at QA01) (n=3,310).

Whilst property owners who were satisfied with their LCH system (Figure 16) were more likely to recommend one to friends, this was not always the case. Case study research and analysis of open-text survey responses indicates that while property owners were typically happy with their personal experiences of using a LCH system, some expressed caution about recommending them more widely. They were concerned that their own positive experiences were contingent upon their specific set-up, including property characteristics (particularly insulation levels), installation quality and their own understanding of how to effectively control their LCH system. Their willingness to recommend a LCH system was thus conditional rather than unqualified.

Outcomes and Impacts of the BUS

This chapter examines the outcomes and impacts of the BUS, assessing the extent to which the scheme delivered its intended objectives and exploring the reasons for observed performance.

Key findings

Between April 2022 and March 2025, the BUS awarded £328.2 million in grants and supported 49,136 LCH system installations. This compared to a budget of £450 million, supporting the deployment of up to 90,000 LCH system installations. Most of the underspend occurred in 2022/23, reflecting weaker early demand under the scheme, while stronger uptake in 2024/25 – driven in part by the grant uplift – led to £188 million in grant awards.

QEA estimates indicate that 74% of BUS-funded installations were additional, equivalent to 36,508 installations that would not otherwise have occurred. This finding is closely corroborated by property owners' self-reported behaviour, with 74% stating that their LCH installation would not have taken place, or would have been delayed, without the scheme.

Over their assumed lifetime, BUS-funded installations are estimated to deliver net GHG savings of 2.5 $MtCO_2e$[83], very marginally below the 2.6 $MtCO_2e$ forecast in the Impact Assessment. This minor shortfall reflects lower-than-expected installation volumes but was partly offset by greater-than-anticipated replacement of coal and oil heating systems, as well as installations in properties with higher heat demand than assumed in the Impact Assessment.

The BUS successfully attracted a large pool of installer companies and influenced how they operated in the LCH system installation market. Installer participation increased over time, with around 1,600 installers classed as active on the scheme by March 2025, indicating broad engagement across the LCH sector. Many installer companies joined the BUS to expand or diversify their market activity, including increasing LCH installations or entering the LCH market for the first time.

Quantifiable employment impacts associated with the BUS appear more modest than originally projected. QEA estimates suggest that BUS-participating SMEs increased their LCH workforce by around 7.1% more than comparable SME non-participants, though this difference was uncertain and not statistically significant[84]. These estimates are subject to

[83] Megatons of Carbon Dioxide Equivalent, which is the standard unit for measuring GHG emissions as it enables the calculation of aggregate emissions across different gases.
[84] The estimate has a large standard error, indicating substantial uncertainty. In practical terms, the true employment impact could plausibly lie anywhere between a reduction of around 20% and an increase of around 44%, compared with similar non-participating firms. This means the estimated effect cannot be distinguished from no impact with confidence.

important and significant limitations, as they exclude employment impacts within larger installer firms – which delivered a substantial share of BUS installations – and do not capture employment supported through widespread subcontracting under the scheme.

Installer survey evidence indicates limited employment growth during the scheme's first year but points to emerging growth by 2024, particularly among newer entrants to the LCH market. Among installer companies registering with the BUS after April 2023, average full-time equivalent (FTE) employment on LCH installations increased from 4.8 to 6.4 jobs per firm, suggesting modest employment growth following participation in the scheme.

Overall, the BUS contributed to change in the LCH market – including increased investment, skills development, innovation, and modest reductions in LCH system costs – but these outcomes cannot be attributed to the scheme alone. By stimulating demand, particularly for ASHPs, the BUS helped provide market certainty, while operating alongside other policies, regulatory changes, and wider market dynamics that also shaped sector outcomes.

The expected results of the BUS

In February 2022 DESNZ prepared an Impact Assessment[85] that identified three quantifiable results of the scheme – summarised in Table 3. The Impact Assessment also explained that the scheme would generate outcomes and impacts that were not quantifiable, e.g. because it was not possible to do so accurately. These were instead assessed qualitatively and included supply chain development and impacts on LCH system innovation and cost reduction. The remainder of this chapter consists of an assessment of whether the BUS delivered its expected quantifiable and non-quantifiable impacts.

Table 3: Quantifiable results of the BUS, and the estimated scheme impacts

Result	Definition	Estimated impacts
LCH system installations	ASHPs, GSHPs and biomass boilers installed in England and Wales	Up to 90,000 installations[86] (2022-25), with up to £450 million of grants disbursed

[85] DESNZ (February 2022) Future Support for Low Carbon Heat: BUS - Final Impact Assessment
[86] The Impact Assessment modelled ~89,900 LCH system units installed, made up of 650 GSHPs, 300 biomass boilers, and 88,950 ASHPs. This was based on an assumed voucher value of £5,000 for ASHPs and biomass boilers and £6,000 for GSHPs, meaning that if more than 650 GSHPs were installed then the ~89,900 figure would be unachievable. Furthermore, from October 2023 the voucher values increased to £7,500 for ASHPs and GSHPs, meaning that the maximum possible number of installations decreased.

Result	Definition	Estimated impacts
Greenhouse gas (GHG) abatement	Net carbon emissions abated by replacing fossil fuel heating systems with LCH systems[87]	2.6 $MtCO_2e$ (2022/23 to 2042/43[88])
Jobs supported by stimulating demand for LCH systems	FTE jobs in the LCH sector supported directly and indirectly[89]	2,100 direct and 1,800 indirect FTE jobs supported each year (2022-25)

Source: Boiler Upgrade Scheme Impact Assessment (2022)

Impacts on LCH system installations

The volume of LCH system installations under the BUS

As Table 4 illustrates, between 23 May 2022 (when the scheme opened to applications) and 31 March 2025, a total of 49,136 LCH systems were installed under the BUS[90]. This compared to the central BUS Impact Assessment expectation of up to 90,000 installations[91]. A total of £328.2 million of grants were disbursed – 73% of the capital budget allocated to the BUS during this period (£450 million). Most of the underspend happened in the first year of the scheme. The BUS initially had an annual budget of £150 million worth of grants per financial year (2022/23 to 2024/25). During 2022/23 just £50 million was spent[92], followed by £88.3 million in 2023/24. Increased demand under the BUS led to two budget increases in 2024/25, and the maximum budget for 2024/25 was eventually set at £205 million (£188.6 million of grants were actually disbursed during that year). Over its three-year timespan, therefore, the BUS supported fewer LCH installations than the ~90,000 presented in the Impact Assessment (which was modelled assuming full take-up of the annual budgets at the launch grant levels).

[87] Switching away from heating systems that consume fossil fuels at the property (i.e. gas, oil, Liquid Petroleum Gas – LPG, coal) reduces non-traded carbon emissions. Conversely, switching to a heating system powered by electricity increases traded carbon emissions. Net carbon emission savings are thus non-traded carbon savings minus traded carbon increases.
[88] In the Impact Assessment it was assumed that ASHPs and GSHPs have a lifetime of 20 years, whilst biomass boilers have a lifetime of 15 years. Assumed heat pump lifetimes were reduced to 18 years in subsequent models, based on latest evidence. This updated assumption was used in the modelling of GHG emission savings cited in this report.
[89] In the Impact Assessment, direct jobs supported were calculated using a bottom-up approach that used the Construction Industry Training Board (CITB) model to estimate the amount of time required to install a LCH system (including individuals working on the installation and supporting roles, such as surveyors and office jobs). By installing LCH systems, the BUS was thus expected to support employment. Indirect jobs were estimated using an employment multiplier (0.9 indirect FTE jobs per 1 direct FTE job), reflecting the impacts of LCH installations on the wider LCH industry (manufacturing etc.).
[90] These data are consistent with published BUS statistics through to the end of March 2025. This may not align with subsequent data publications due to revisions to historical data.
[91] The Impact Assessment included a low deployment estimate equal to ~44,900 LCH system installations, but for the purposes of this report we have used the central estimate as the benchmark.
[92] Ofgem (January 2026) BUS monthly scheme update

Table 4: The volume and value of installations carried out through the BUS, 2022-25

LCH system type	Volume of installations	Value of grants paid
ASHP	47,678	£318,777,500
GSHP	1,125	£7,747,500
Biomass boiler	309	£1,545,000
Shared Ground Loop GSHP	24	£162,000
All	**49,136**	**£328,232,000**

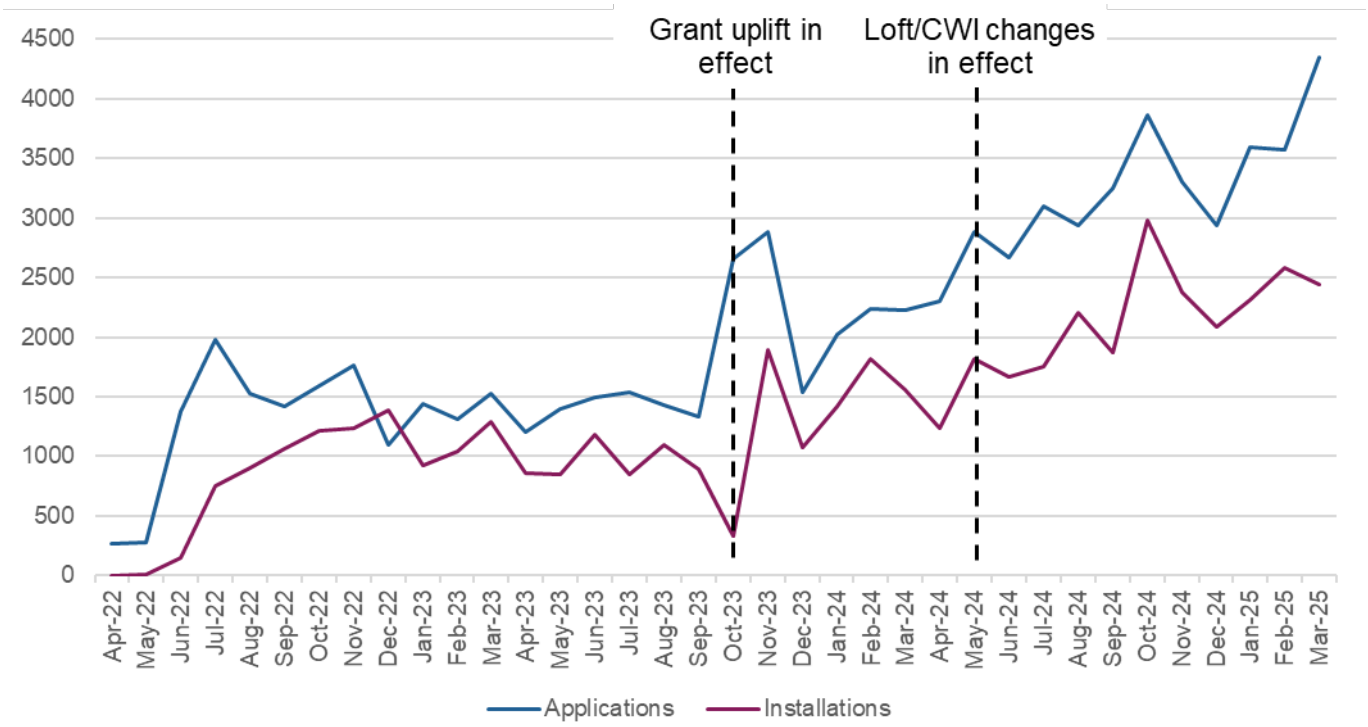
Source: BUS Administrative database through till the end of March 2025; Note: this table shows total installation numbers and grants paid between 2022/23 and 2024/25, as at the end of March 2025, and does not account for any subsequent changes (e.g. grants reclaimed due to fraud).

Figure 27 shows the number of BUS voucher applications and LCH system installations each month between 2022-25. Plotted on the timeline are the dates when: the BUS grant value was uplifted (October 2023)[93]; and loft and cavity wall insulation requirements were relaxed (May 2024). Prior to the grant uplift, an average of 31 BUS-funded installations were completed per day. In the period after the uplift[94] this rate almost doubled to 58 installations per day. As discussed earlier (Section: Affordability of BUS-funded installations), uplifting the grant value for ASHPs significantly increased the proportion of system costs paid for by the BUS voucher. Research with participating property owners found that increasing the subsidy level was key in overcoming one of the main barriers to LCH uptake – the comparatively high upfront costs of LCH systems. As discussed previously (Section: Barriers to take-up of LCH systems under the BUS), the upfront costs were one of the main reasons why property owners had not previously installed a LCH system, and the availability of financial support through the BUS was the most common trigger for them to act when they did.

The relaxation of insulation requirements was followed by a slightly smaller increase in installation volumes – an increase from an average of 58 installations to 66 installations per day[95]. As discussed above (Section: Carrying out insulation improvements and additional works), BUS participants often chose to install loft and/or cavity wall insulation alongside a LCH system even after the rules were relaxed, and so this change did not stimulate a such a significant change in scheme take-up.

[93] DESNZ analysis found that half of the new applications received in the first week after the grant increase were reapplications (i.e. applications made and approved prior to the uplift and then withdrawn and resubmitted to benefit from the higher grant).
[94] From 23 October 2023 through till 7 May 2024, after which insulation requirements were relaxed.
[95] From 8 May 2024 through till 31 March 2025.

Figure 27: The volume of BUS applications and installations, per month# (April 2022 to March 2025)



Source: DESNZ (April 2025)[96]; Notes: # the months correspond to the date that the step was logged in the BUS administrative database – the spike in the number of applications received at the end of October 2023 and the time lag till voucher issuance meant that in November 2023 the number of vouchers issued exceeded the number of applications received in that month; data are for all technology types and for domestic and non-domestic properties.

The additionality of BUS-funded LCH system installations

Additionality considers the extent to which BUS-funded LCH system installations would have happened anyway, even if there had not been a BUS. These non-additional installations are referred to as 'deadweight'. High levels of deadweight represent an inefficient use of public resources, as funding is allocated without delivering net new outcomes. This would not only undermine the cost-effectiveness of the BUS but also carries a significant opportunity cost, as resources could instead have been directed to other more impactful interventions.

This evaluation has estimated the additionality of BUS-funded installations using two methods:

- QEA involving using an Interrupted Time Series (ITS) approach to model a counterfactual scenario where there was no BUS.
- Research with participating property owners, where individuals were asked to assess the likelihood that they would have installed their LCH system regardless of the BUS.

Whilst the QEA analysis is the more robust methodology, synthesising this with the self-reported additionality provides more confidence in the validity of the results.

[96] DESNZ (April 2025) Boiler Upgrade Scheme statistics: March 2025

QEA-estimated additionality

Following an extensive scoping exercise, an ITS approach was identified as the most viable and robust QEA method for estimating the additionality of BUS-funded LCH systems. A detailed description of the methodology is provided in the supporting Technical Methodological Report[97]. In summary, the ITS approach used weekly data on MCS-certified LCH system installations[98] in England and Wales to estimate how installation volumes would have evolved between 2022-25 in the absence of the BUS. The analysis excluded installations supported by other government schemes – notably, but not exclusively, the RHI (prior to 2022), ECO4, and SHDF – in order to isolate the net effect of the BUS. The counterfactual was an estimate of the weekly number of LCH system installations that would have taken place in England and Wales if the BUS had not been introduced, based on trends observed prior to the launch of the scheme. The ITS model was used to project this pre-BUS trend forward into the post-BUS period. The difference between the observed post-BUS installations and the modelled counterfactual provided an estimate of the number of LCH system installations attributable to the BUS, and therefore the additionality of the scheme.

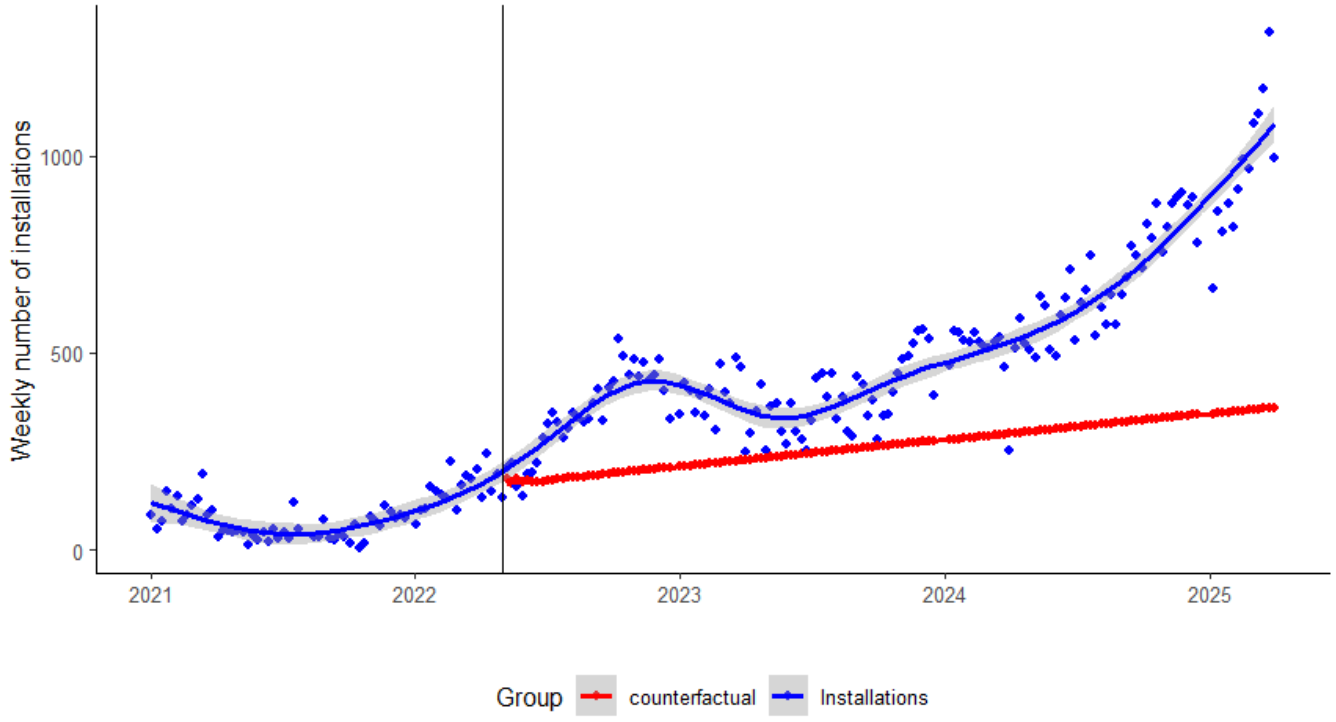
Figure 28 shows the number of BUS-eligible LCH system installations in England and Wales between January 2021 and March 2025. The black vertical line shows when the BUS was introduced:

- The blue dots and trend line before the black vertical line shows the actual weekly number of LCH system installations prior to the launch of the BUS (excluding installations funded by government schemes).
- The blue dots and trend line after the black vertical line shows the actual weekly number of LCH system installations after the launch of the BUS (including BUS-funded installations and excluding installations funded by other government schemes).
- The red dots and trend line after the black vertical line shows the modelled counterfactual; that is, the weekly number of installations that would have been expected if the BUS had not been introduced (excluding installations funded by other government schemes).

In almost all weeks following the launch of the BUS, the actual number of LCH system installations was higher than the number predicted by the counterfactual. Overall, the results of the ITS analysis indicate that 74% of BUS-funded installations between 2022-25 would not have taken place in the absence of the scheme. This was equivalent to an estimated 36,508 additional LCH systems installed during the period.

[97] Evaluation of the Boiler Upgrade Scheme, 2026: Technical Report
[98] Limited to BUS-eligible technology types: ASHPs, WSHPs, GSHPs and biomass boilers.

Figure 28: Actual LCH system installations and the modelled counterfactual (2021 to 2025)



Notes: The x-axis shows the start of each calendar year. As described above the chart, the blue line represents the estimated non-linear trend in observed LCH system installations and the grey area represents the 95% confidence interval. The black vertical line indicates the introduction of the BUS. The red line represents the modelled counterfactual.

The BUS Impact Assessment assumed that 70% of LCH system installations under the scheme would be additional. This estimate was based on analysis of the preceding RHI scheme. The Impact Assessment noted, however, that the BUS was expected to appeal to a broader range of applicants than the RHI, and suggested that scheme additionality might turn out to be higher – as proved to be the case.

As Figure 28 illustrated, the modelled additionality of the BUS has not been constant over time. After a strong start, a drop in the volume of BUS-funded installations in the first half of 2023 meant that the weekly installation rate was, at times, not much higher than the modelled counterfactual (i.e. that there was no BUS). The rapid increase in the BUS installation rate from October 2023 onwards – driven by the grant uplift – changed this, and the weekly number of LCH systems was then much larger than the modelled counterfactual all the way through till March 2025.

Property-owner estimated additionality

As part of the property owner survey, respondents were asked to assess how likely it was that they would have installed their BUS-funded LCH system in the absence of the scheme and, where they indicated this was likely, whether the installation would have taken place over the

same timeframe[99]. Although this self-reported measure of additionality is considered less robust than the estimate derived from the QEA approach, it provides a useful point of comparison and validation.

As Figure 29 shows, 58% of all respondents to the property owner survey said it was unlikely or very unlikely that they would have installed their LCH system without BUS support. Another 15% said that it was likely that they would have done it anyway, but that it would have been slower. Combining these two groups suggests that the self-reported additionality of the BUS – defined as enabling LCH system installations to happen or happen faster – was 74% over the period October 2022 to October 2024 when the surveys were undertaken. This is identical to the additionality estimate generated using the QEA approach, providing confidence in the robustness of the modelled results[100].

Figure 29: Self-reported additionality of BUS-funded installations, 2022-24

Source: Waves 1 to 4 property owner survey. QB05. If the BUS grant had not been available, how likely would you have been to have had a LCH system installed anyway? Unweighted base: All (n=5,394). QB05a. Without the Boiler Upgrade Scheme grant, would the installation of a [LCH system installed] have been done as quickly? This question refers to how quickly you would have made your decision to install a [LCH system installed] and begin that process.

Interviews with property owners and installers, and case studies of properties with a LCH system installation, provide some further insights into the factors driving BUS additionality:

- The effect of the grant uplift. As discussed previously, the unaffordability of LCH systems was one of the main reasons why property owners had not previously had a LCH system installed, and many property owner interviews were unwilling or unable to pay the full 'premium' to have a LCH system installed. Self-reported additionality increased after the BUS grant was uplifted in October 2023 – using the same definition outlined above it went from 69% prior to the uplift to 79% afterwards[101]. This was a statistically significant difference.
- Additionality and self-build properties. Self-reported additionality was statistically significantly lower where properties were self-builds – 48%, compared to 81% of retrofit

[99] QB05. If the Boiler Upgrade Scheme grant had not been available, how likely would you have been to have had a LCH system installed anyway? QB05a. Without the Boiler Upgrade Scheme grant, would the installation of a LCH system have been done as quickly? This question refers to how quickly you would have made your decision to install a LCH system and begin that process.
[100] Figure 3 showed that 22% of property owners explained that they had not previously installed a LCH system due to the high upfront costs. This is a barrier directly tackled by the BUS. However, the higher counterfactual estimate reflects the scheme's role in reducing multiple barriers to adoption, not solely upfront cost.
[101] n=2,591 and n=2,761 respectively

installations[102]. Interviews with property owners from self-build properties found that the costs of their LCH system were relatively small when compared to the costs of the wider construction project. Having accumulated enough funds to build a new house, paying for the LCH system on top of that was not such a large step. Interviews with BUS installer companies found similar explanations, with installers believing that BUS installations were more likely to have happened anyway where they were part of larger projects and the cost of the LCH system was relatively small.

Characteristics of BUS-funded LCH system installations

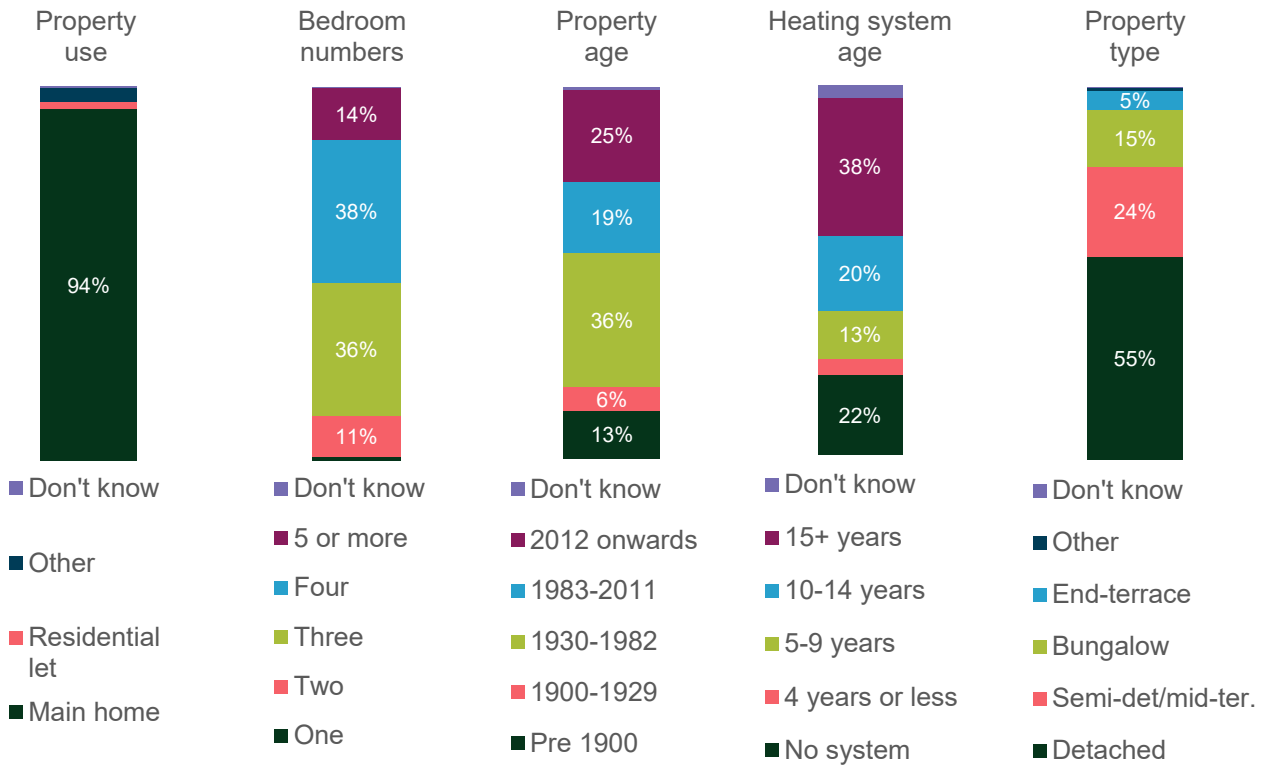
Using wave 1 survey data, the 2024 Interim Report provided an initial profile of BUS-funded installations, covering property and property owner characteristics. Here we present updated data from all four waves of the property owner survey.

Property characteristics

Figure 30 provides a profile of the properties in which a LCH system was installed under the BUS. The vast majority (94%) of properties were used as main homes; just 2% were used as residential lets. Detached properties accounted for just over half of installations (55%), followed by semi-detached or mid-terrace properties (24%) – end-terrace properties were a separate category (5% of properties). Properties tended to be relatively large: 38% had four bedrooms and 14% had five or more bedrooms. A mix of property ages were reported but build dates between 1930 and 1982 were most common (36%). A quarter of properties were built after 2012, which reflects the fact that many were self-builds. Property owners tended to be replacing older heating systems: 38% were estimated to be at least 15 years old.

Figure 30: Characteristics of properties with BUS installations

[102] n=459 and n=3,729 respectively



Source: Waves 1-4 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=5,394); QA02a Which of the following best describes the property? QA03a How many bedrooms does the property have? Unweighted base: All domestic properties (n=5,386).

Property owner characteristics

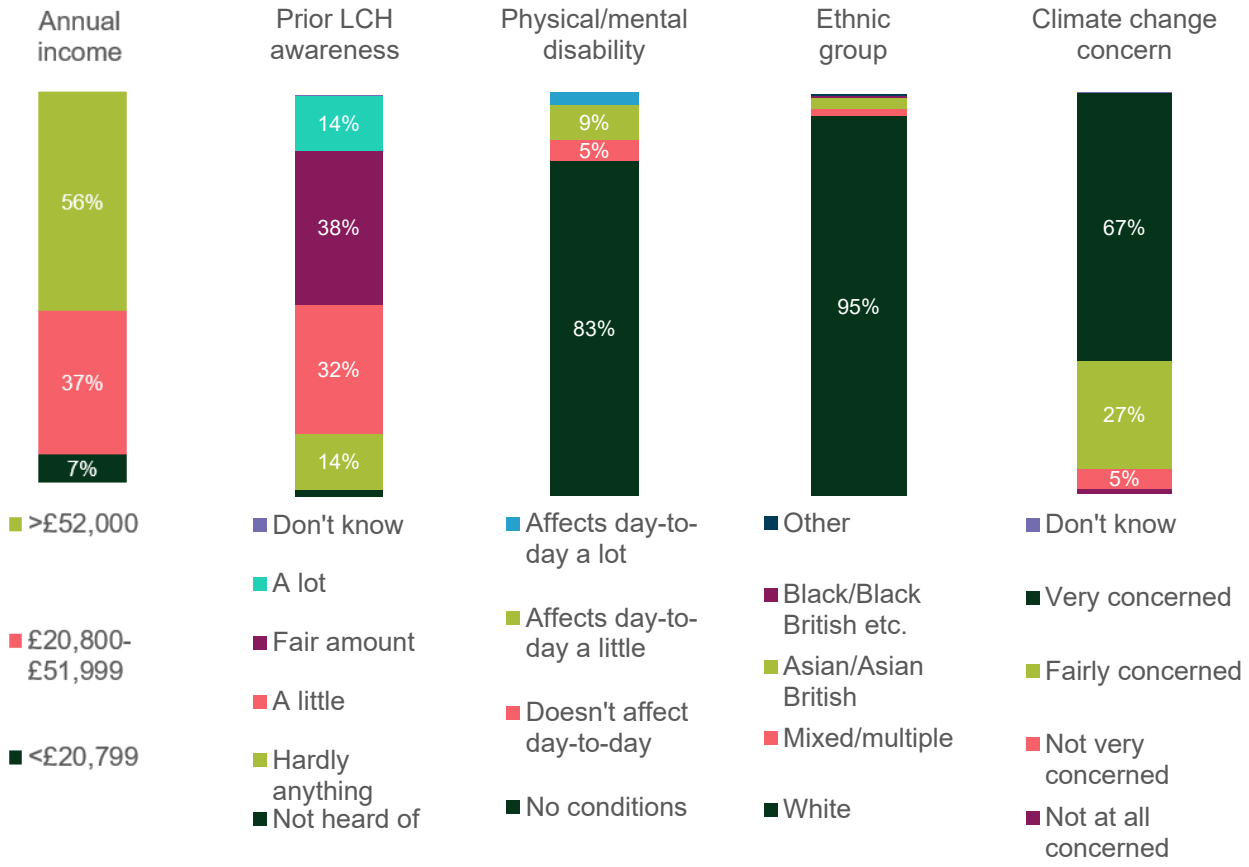
Figure 31 provides a profile of BUS-participating property owners. Fifty six percent had a gross annual household income (i.e. before tax and other deductions) of more than £52,000[103]. In comparison, national median unequivalised gross household income of owner occupiers, in England and Wales[104] in 2023/24 was £54,740[105]. A high proportion described themselves as very concerned about climate change (67%)[106], and they were typically aware and knowledgeable about LCH systems even before they had one installed through the BUS (52% said they knew a lot or a fair amount when they first heard about the scheme[107]). Most BUS participants did not have a long-term physical or mental health condition that affected their day-

[103] The household income bands shown in Figure 31 were used because they were the same as the bands used during surveys of RHI applicants, enabling a comparison between schemes. Those who answered prefer not to say or didn't answer have been excluded from this chart for consistency with 2024 Interim Report. Full details of all responses can be found in the supporting Wave 4 Property Owner Survey Tables.
[104] Median income is a better comparator than mean income, because the latter can significantly skewed by a small number of high income households.
[105] ONS Median unequivalised gross household income by tenure status, England and Wales: financial year ending 2024 (June 2026). This is a more accurate income comparator to that used in the previously published Interim Reports (median disposable income).
[106] 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 Spring 2025, 35% of people in the UK said they were very concerned about climate change.
[107] Again, this question replicated a question used in the PAT survey. Amongst the UK population, 33% said they knew either a lot or a fair amount about LCH systems in Spring 2025.

to-day activities (83% said they had no such conditions, compared to 76% nationally[108]). BUS participants were significantly more likely to identify as White (95%) compared to the owner-occupier population of England as a whole (91%)[109].

[108] ONS (January 2023a) Census 2021: Disability. National comparisons should be treated with some caution because i) time periods differ slightly to the BUS sample; and ii) the BUS population is property owners, whereas national comparators include individuals from a variety of tenures.
[109] Ministry of Housing, Communities and Local Government (April 2025) Home ownership: Ethnicity facts and figures. Note that data for Wales were not available.

Figure 31: Characteristics of property owners with a BUS installation



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=5,394); QF03 What is the household's approximate total income before tax and any other deductions? Unweighted base: All domestic properties excluding those who answered 'prefer not to say' or who didn't answer (n=4479). QF07a. Do you have any physical or mental health conditions or illnesses lasting or expected to last 12 months or more? QF07b. Do any of your conditions or illnesses reduce your ability to carry out day-to-day activities? Unweighted base: All except respondents who selected don't know or did not wish to answer (n=4,913). QF07c. What is your ethnic group? Choose one option that best describes your ethnic group or background? Unweighted base: All except respondents who selected don't know or did not wish to answer (n=4,992).

Impacts on greenhouse gas abatement

The BUS contributes to the abatement of GHG emissions by reducing energy demand in properties – given that heat pumps are significantly more efficient than fossil fuel heating systems – and by replacing carbon-intensive heating with lower-carbon alternatives. GHG abatement impacts were modelled by DESNZ using actual BUS delivery data and data derived from the evaluation (e.g. scheme additionality), replacing the assumptions used in the original Impact Assessment.

Energy demand reductions

In total, the LCH systems installed under the BUS between 2022-25 are expected to reduce heat energy demand by approximately 10.5 TWh[110] over their assumed 18-year lifetime[111]. This is marginally lower than the 11 TWh reduction assumed in the Impact Assessment, largely reflecting the fact that fewer LCH systems were installed than originally expected. This minor shortfall was partly offset by higher-than-expected energy demand reductions per installation, driven by three key factors:

- Higher modelled efficiency of ASHPs and GSHPs[112], meaning that switching to these technologies generated greater energy demand savings than previously assumed.
- Higher actual annual heat demand per BUS property than initially predicted, increasing the potential for savings. This is likely to reflect the fact that BUS-supported properties were, on average, larger than assumed in the Impact Assessment and therefore required more energy to heat.
- A higher proportion of coal and oil heating system replacements, which are relatively inefficient, and a lower proportion of direct electric heating replacements, which are comparatively more efficient.

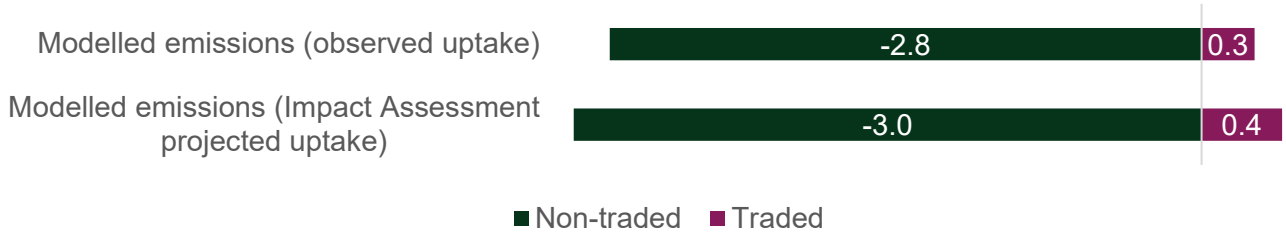
Greenhouse gas abatement

It is estimated that LCH systems installed under the BUS between 2022-25 will reduce GHG emissions by a net 2.5 $MtCO_2e$ over their assumed lifetime. As shown in Figure 32, this net reduction comprises 2.8 $MtCO_2e$ of GHG emissions abated through the displacement of fossil fuel heating systems (classified as 'non-traded' emissions), partially offset by 0.3 $MtCO_2e$ of additional emissions associated with the electricity consumption of installed LCH systems (classified as 'traded' emissions).

Total GHG emissions savings under the scheme were very marginally below the 2.6 $MtCO_2e$ reduction projected in the Impact Assessment. This minor shortfall primarily reflects the lower number of LCH installations delivered relative to initial expectations, offset because – as discussed above – BUS-funded installations displaced a greater proportion of coal- and oil-fuelled heating systems than anticipated. These systems have substantially higher GHG emissions than other heating technologies.

[110] TWh, or terawatt-hours, is a unit of energy commonly used to measure large-scale electricity consumption.
[111] The BUS Impact Assessment assumed an ASHP lifetime of 20 years, but this was reduced to 18 years as part of subsequent modelling which was based on Element Energy and UCL, for DESNZ (July 2019) Analysis on abating direct emissions from 'hard-to-decarbonise' homes with a view to informing the UK's long term targets.
[112] Based on in situ heat pump performance data from the EoH Demonstration (EoH-D) Project.

Figure 32: Total lifetime changes in GHG emissions (MtCO2e) from BUS-funded installations, disaggregated by emissions sector



Source: DESNZ BUS Cost Benefit Analysis; Note: negative values indicate a decrease in GHG emissions; positive values indicate an increase

Market and employment impacts

Participation in the BUS by installer companies

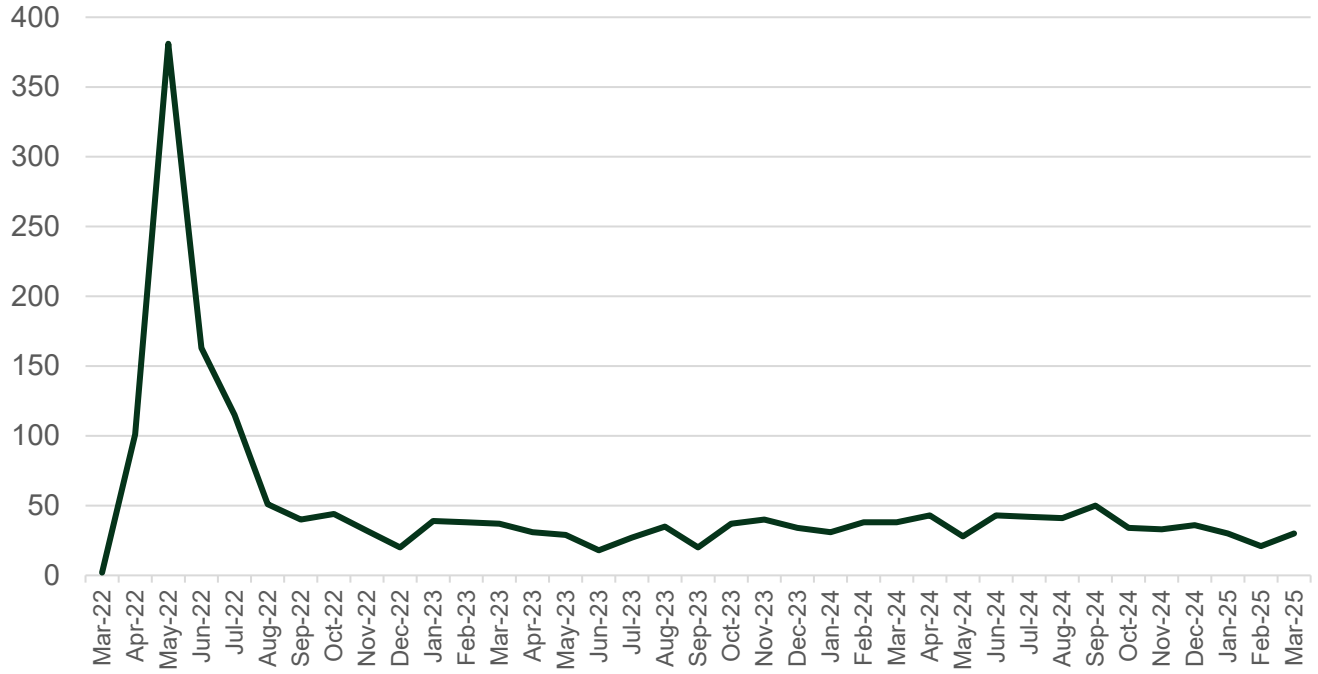
To participate in the BUS, installer companies must be MCS-accredited, certified to install heat pumps or biomass boilers, and members of an approved consumer code (such as RECC or HIES). Installers are also required to register with Ofgem, providing basic company information and nominating an authorised representative. Survey evidence indicates that this registration process worked well in practice: 81% of respondents were very or fairly satisfied[113].

Installer registrations

By the end of March 2025, 1,875 installer companies were currently or had previously been registered with the BUS[114]. The scheme attracted most of the companies that were active in the LCH installation sector – e.g. around 70% of all companies that completed at least one MCS-accredited heat pump installation between 2022 and 2025 were registered with the BUS[115].As shown in Figure 33, registrations peaked shortly after the BUS launched. Forty-one per cent of all installer companies registered by March 2025 had joined during the first few months of the scheme's operation (March-July 2022). Following this initial surge, the BUS continued to attract a steady flow of new entrants, averaging 32 new registrations per month. Neither the grant uplift introduced in October 2023 nor subsequent changes to insulation requirements had a noticeable impact on registration volumes.

[113] Unweighted base: All respondents (n=516); QD02. Thinking about your experience of the BUS, how satisfied or dissatisfied are you with the following? Registering with Ofgem to be a BUS installer.
[114] Note that this figure does not equate to the number of active installer companies that property owners could use, since companies could have gone out of business having once been registered, could be registered but inactive, and companies can be temporarily suspended if they no longer meet Ofgem's criteria for being part of the BUS. To illustrate this point, as at March 2025 there were 1,829 registered BUS installers, of whom 1,581 were classed as 'active'. The difference between 1,875 and 1,829 likely reflects exits from the market due to liquidation, consolidation etc.
[115] Between 2022-25 an estimated 2,666 installer companies completed at least one MCS-registered heat pump installation (ASHP or GSHP). (This number is estimated because some companies had multiple MCS numbers and/or trading names). The 1,875 BUS-registered installer companies represented around 70% of this total – noting that many MCS-accredited installers served different markets (e.g. social housing, new builds) or primarily operated in Scotland and would thus have been less likely to register for the BUS.

Figure 33: The volume of new BUS installer company registrations, per month (March 2022 to March 2025)



Source: Source: BUS Administrative database through till the end of March 2025; Note: data shows new registrations and does not show de-registrations or cases where registration has been suspended.

Profile of BUS-registered installer companies

Installer survey data show that most BUS-registered installers were micro-businesses, reflecting the wider structure of the LCH industry. Nearly two-thirds (61%) employed 2-9 people, while a further 7% were sole traders[116]. Around a quarter (26%) were small businesses with 10-49 employees, and only 5% employed more than 50 staff. Most installer interviewees reported offering a broad range of services beyond LCH systems, including fossil fuel heating, solar PV or solar thermal, and, in some cases, batteries, storage heaters and insulation. A small number of BUS-registered installers were energy companies.

For most businesses, LCH installations represented a minority of overall revenue. Two-thirds (66%) of installer companies reported that less than half of their annual income came from LCH installations[117]. Consistent with this, most BUS-registered installers operated both within and outside the scheme, with only 25% reporting that they were wholly reliant on the BUS for their LCH installation work[118]. Installers typically worked outside the BUS where installations were ineligible for a grant – for example, like-for-like LCH replacements, new builds, systems above the 45 kWth capacity limit, or ineligible technologies such as hybrid heat pumps.

[116] QA01. As of right now, what is the number of employees for the business? Please include all part- and full-time workers paid from your payroll, including those temporarily absent but still being paid. This is everybody, not just people who work in the heat pump or biomass boiler sector. Please exclude self-employed workers and subcontractors. Unweighted base: All respondents (n=516).
[117] QA07. Approximately what proportion of your business's revenue is from LCH system installations? Unweighted base: All respondents (n=516).
[118] QA04. Does your business currently install outside of the BUS? Unweighted base: All respondents (n=516).

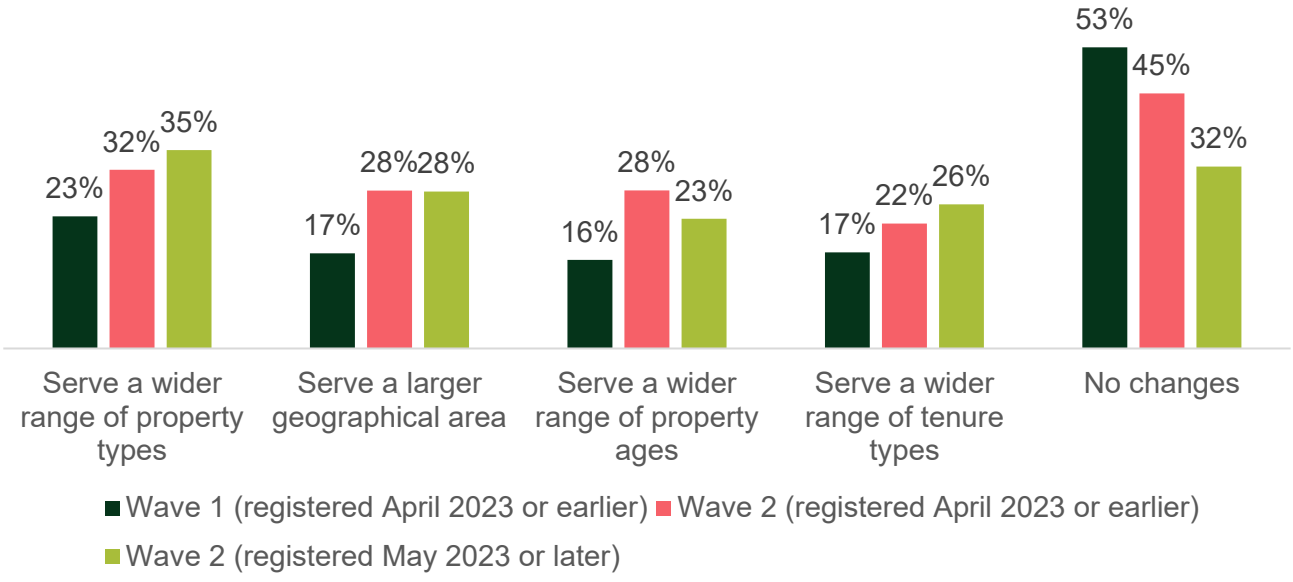
Nevertheless, the BUS remained an important revenue source. Among businesses that had completed at least one BUS-funded ASHP installation, an average of 58% of their MCS-certified ASHP installations between 2022 and 2025 were funded through the scheme[119]. Reliance on the BUS varied by both timing of registration and company size. Installers that joined the scheme later were more dependent on it than early entrants. Among companies registering before April 2023, the BUS accounted for an average of 48% of MCS-certified ASHP installations over the period, compared with 75% among companies registering in or after April 2023. Smaller businesses were also more reliant: on average, 70% of installations carried out by sole traders were BUS-funded, compared with 41% among businesses employing more than 50 staff[120].

Changes to installers' market offerings

Figure 34 shows how BUS-registered installers adapted their market offerings after joining the scheme. Among early adopters, change was relatively limited. Just over half (53%) of installers who registered in or before April 2023 reported making no changes to their market offering. Many of these companies had previously delivered installations under earlier LCH support schemes, such as the RHI, and therefore viewed the BUS as a continuation of existing activity.

Later entrants were more likely to adapt their business models in response to the scheme. At wave 2 of the installer survey, only 32% of companies registering in or after May 2023 reported making no changes. Instead, many reported expanding their market reach, including serving a wider range of property types (35%) and operating across a wider geographical area (28%). For these later entrants, the BUS more often acted as a catalyst for business expansion rather than simply supporting existing LCH activity.

Figure 34: Changes to installers' market offerings as a result of the BUS



[119] Source: MCS MID Database extract (2022-2025). Base: All installers that had carried out at least one BUS-funded installation and could be matched to the MCS MID database (n=1,575)
[120] n=35 for sole traders and n=22 for businesses with 50+ employees. Note that due to small base sizes these results should be treated with caution.

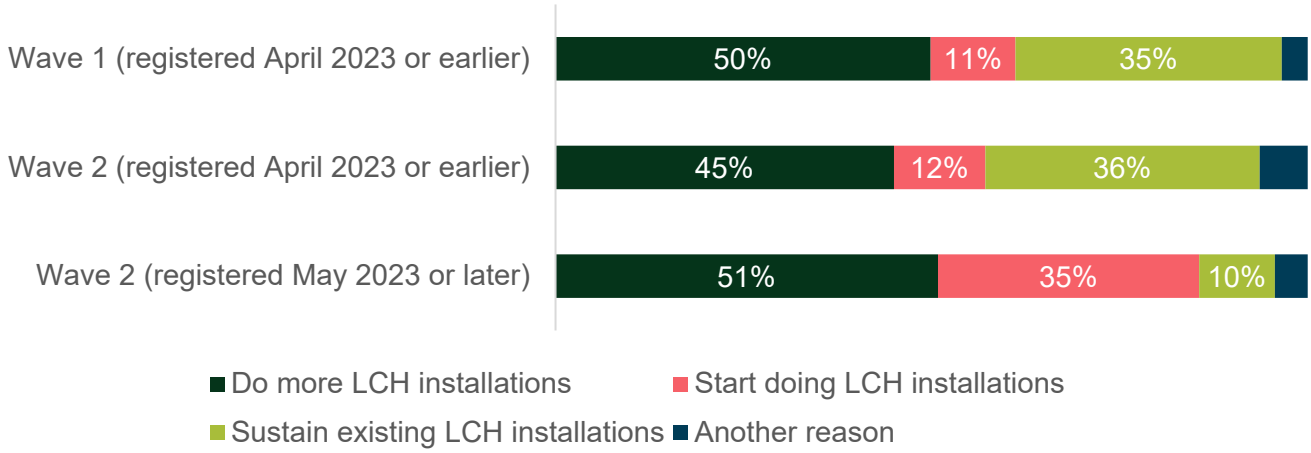
Source: Wave 1 and 2 installer survey. QE01: Have you made any of the following changes to your market offer because of the BUS? Base: All (n=247 for wave 1, n=156 for wave 2 registered April 2023 or earlier, n=113 for wave 2 registered May 2023 or later). Note: for brevity, not shown are any options selected by under 20% of respondents; multiple answers possible so figure sums to more than 100%.

Reasons for participating – or not participating – in the BUS

Many early BUS registrants had installed LCH systems under earlier government schemes, most notably the RHI and the GHG-V scheme. Interviews suggested that these installers viewed the BUS as a natural successor, allowing them to maintain or expand LCH installation activity with minimal changes to their business models.

Over time, the BUS also attracted new entrants, including some large energy companies. Survey evidence indicates that later registrants were more likely to be new to LCH installations. At wave 2, nearly a third (32%) of companies registering after May 2023 had not installed any LCH systems in the year prior to joining, compared with just 12% of early registrants[121]. Consistent with this, 35% of later registrants reported signing up specifically in order to start installing LCH systems, compared with 11% of early registrants (Figure 35).

Figure 35: Installer companies' reasons for registering with the BUS



Source: Wave 1 and 2 installer survey. QB01: Did you sign up your business with the BUS so that you could…? Base: All (n=247 for wave 1, n=156 for wave 2 registered April 2023 or earlier, n=113 for wave 2 registered May 2023 or later).

Interviews with ten installers not registered with the BUS explored reasons for non-participation. These businesses were broadly similar in profile to registered installers, being predominantly micro-firms and ASHP installers. Eight of the ten were MCS-accredited.

The most commonly cited reason for not registering was concern about cashflow, particularly the time lag between completing an installation and receiving payment following voucher redemption. As discussed earlier (Section: Impacts of the BUS on installer companies' cashflow), evidence from BUS-registered installers suggests that this issue was not widespread in practice. A second perceived barrier was the administrative burden associated

[121] QA06. In the 12 months before your business registered with the BUS, approximately how many [LCH system(s) installed] units did your business install in England and Wales? Unweighted base: All respondents (n=247 for wave 1 and n=113 for wave 2 new entrants).

with participation in the BUS, particularly for sole traders and micro-firms with limited back-office capacity. Again, survey evidence indicates that for standard installations, BUS-related administrative requirements were generally minimal (Section: The administrative burden on installer companies).

Interviewees also reported that sufficient work was available outside the BUS, including in the new-build market and through other schemes such as ECO4. In addition, non-registered installers were often able to work indirectly on BUS-funded installations through 'umbrella' arrangements, whereby commissioning sign-off and administration were undertaken by a BUS-registered, MCS-accredited individual. Under this model, both parties had to adhere to MCS subcontracting requirements, but this approach allowed installers to avoid the costs and administrative requirements associated with direct participation in the BUS.

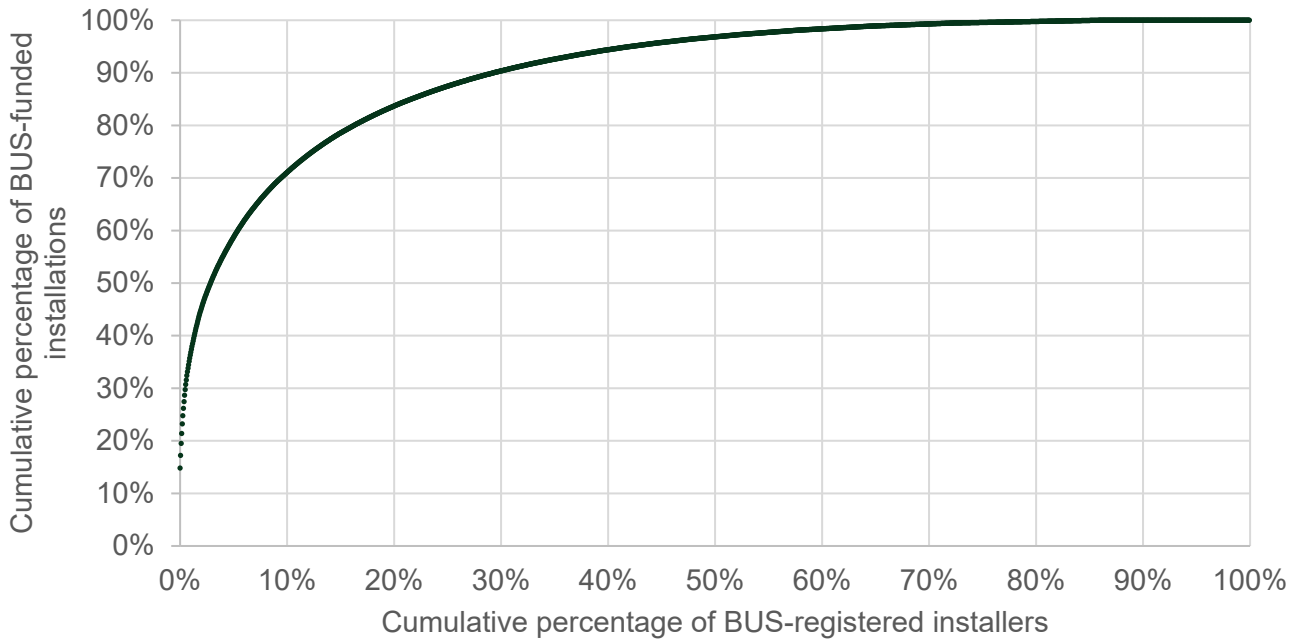
BUS installation market structure

Figure 36 shows the cumulative share of BUS-funded installations delivered by BUS-registered installers between May 2022 and March 2025. The market was somewhat skewed[122]: 20% of installers delivered 84% of all BUS-funded installations over the period. Thirteen per cent of registered installers did not complete a single BUS-funded installation, likely reflecting inactive registrations rather than formal de-registration. The median number of BUS installations per registered installer was five, while the mean was 26, reflecting a small number of high-volume installers completing hundreds – or in some cases thousands – of installations.

Only 2% of BUS-funded installations were completed by sole traders[123]. Micro-firms (2-9 employees) accounted for 26% of installations, while small businesses (10-49 employees) and medium and large companies (50+ employees) each accounted for 36%. Medium and large companies therefore delivered a high share of installations compared to their representation amongst BUS-registered installers (where they made up only 5% of companies), although this may reflect differences in delivery capacity given their larger workforces.

[122] Such a skew is not unusual, and the BUS installer market recorded a Herfindahl-Hirschman Index (HHI) score of 261, which indicates a relatively low level of market concentration (a score below 1,500 – out of 10,000 – is generally considered to be low), and thus good levels of consumer choice and competition.
[123] Employment data come from the installer surveys and thus describe employment either in summer 2023 or summer 2024. Data on installation numbers cover the whole 2022-2025 period. The 516 companies which responded to the surveys were responsible for 25,168 of all BUS-funded installations – 51% of the total.

Figure 36: The cumulative share of BUS-funded installations delivered by BUS-registered installers (May 2022 to March 2025)#



Source: Source: BUS Administrative database through till the end of March 2025; Note: # Cases where the BUS voucher was paid to the installer between 1 May 2022 and 31 March 2025.

Employment impacts of the BUS

The BUS was expected to support employment within the LCH sector by enabling the installation of LCH systems, creating work for installers (direct impacts) and companies elsewhere in the supply chain (indirect impacts). As summarised in Table 3, the BUS Impact Assessment modelled that the scheme would support directly support 2,100 FTE jobs per year, alongside 1,800 indirect FTE jobs per year. Based on actual LCH system installation numbers, updated DESNZ modelling estimated that the scheme supported 600 direct FTE jobs per year and 200 indirect FTE jobs per year. Importantly, however, the modelling assumptions were changed between these two estimates[124], so this is not a like-for-like comparison.

The focus of the evaluation has been on assessing the direct employment impacts of the BUS – jobs supported within the companies that have been installing LCH systems under the scheme. Estimates of these employment impacts come from two sources:

- QEA analysis led by HMRC, working with the evaluation team, which compared SME installer companies that had completed at least one BUS-funded LCH system installation with a control group of SMEs operating in similar sub-sectors within the construction sector.

[124] The BUS Impact Assessment model used a Construction Industry Training Board model to estimate time taken per LCH system installation, whereas the updated modelling used the Heat Pump Association's model. Furthermore, in the Impact Assessment, indirect jobs were estimated using 0.8 as a multiplier (i.e. 1 direct job supported 0.8 indirect jobs). For the updated modelling the multiplier was revised down to 0.28.

- Reports from BUS-registered installer companies themselves, collected via the installer survey.

Employment change: QEA-derived estimate

A synthetic difference-in-differences (SDiD) approach was used to estimate the additionality of employment change among BUS participants. A detailed description of the SDiD methodology is provided in the accompanying Technical Methodological Report. In summary, the analysis used Pay-As-You-Earn (PAYE) employment headcount data held by HMRC to compare employment changes over the period 2022-25 between SME installer companies that completed at least one BUS-funded LCH system installation and a control group of SME firms operating in comparable construction sub-sectors. Large companies were excluded from the QEA exercise because their overall staff headcount was more likely to be by a wider range of business activities beyond LCH system installations. As discussed earlier, given that larger companies accounted for a significant and increasing share of BUS-funded installations over the course of the scheme, this means that QEA-based estimates of employment change are likely to underestimate the impacts of the BUS on jobs within the LCH installation sector.

The analysis indicates that the BUS had a small positive impact on employment within participating SME installer companies[125]; however, this effect was uncertain and not statistically significant. Employment in BUS SME installer companies increased by 7.1% more than in comparable non-participating SMEs over the period 2022-25[126]. This estimate was subject to a large standard error, implying a wide range of plausible values. As a result, the associated confidence interval included zero, indicating that the analysis cannot rule out the possibility of no difference in employment growth between BUS participants and the control group[127].

It is not possible to directly compare the QEA-derived employment estimates with those presented in the BUS Impact Assessment. This reflects two key methodological differences: first, the QEA uses employment headcount data, whereas the Impact Assessment reported employment impacts in FTE terms; and second, the QEA estimates relative differences in employment change between participating and non-participating firms, rather than the absolute number of additional jobs supported by the scheme.

[125] The QEA did not consider where this additional employment came from, e.g. whether positions were filled by individuals moving from the fossil fuel heating sector or elsewhere.
[126] The QEA involved four different estimation models – reported here are the results of the main model. Robustness checks were carried out using models with slightly different assumptions – notably by varying the duration of the 'anticipation effect' (how far in advance of a company's first BUS-funded installation the analysis started to measure employment change), and the treatment of zeros in the employment data (whether they were treated as true zeros or as missing data). The three other models estimated that employment grew by between 3.7% and 11.5% more in BUS SME installer companies than it did in the control group, though in each case these results were not statistically significant.
[127] The estimated employment effect of 7.1% has a large standard error (+/-16.3 percentage points), reflecting substantial uncertainty around the point estimate. The corresponding 95% confidence interval ranges from -20.2% to +43.9%. The 95% confidence interval refers to the range that would contain the true (population) impact with a probability of 95%. Because this interval includes zero, the estimated effect is not statistically significant and should be interpreted with caution.

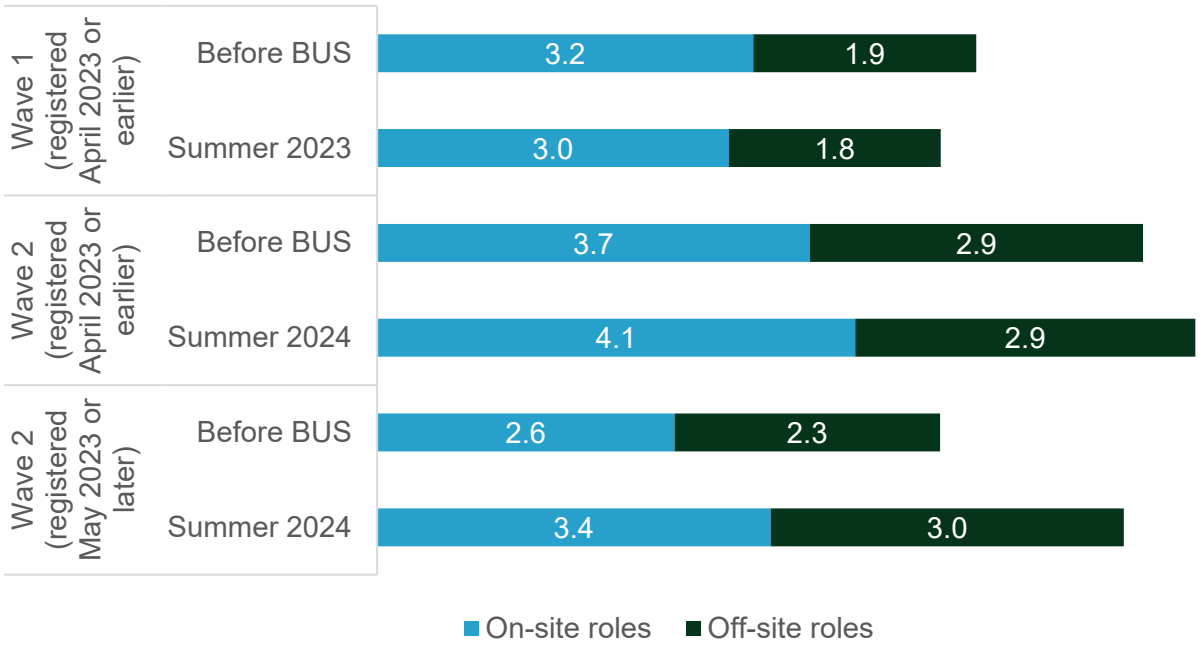
Employment change: self-reported data

Through the installer survey, BUS registered installer companies provided data on their LCH system related FTE employment before they became involved with the scheme and at the time of the survey (summer 2023 for wave 1 and summer 2024 for wave 2). Employment estimates were split between on- and off-site roles[128]. Figure 37 shows the results. Amongst companies that registered in the first year of the BUS, LCH-related employment had actually decreased slightly between spring 2022 (before BUS launch) and summer 2023 (from an average of 5.2 FTEs to 4.8 FTEs – a statistically significant drop). This may be linked to initial downsizing by installer companies that had scaled up employment to meet demand under the RHI (applications spiked towards the end of that scheme) but had been unable to maintain this headcount while BUS uptake was low. Moving forward to summer 2024 – again amongst registrants from year 1 (though not the same businesses that responded to the wave 1 survey) – LCH-related employment had increased from an average of 6.6 FTEs to 7 FTEs, a statistically significant rise. This increase took place in on-site (i.e. installation) roles. These two groups of installer companies (i.e. early registrants) are comparable, but the latter group had one more year of BUS experience. This suggests that the rapid growth of BUS installations from October 2023 onwards (Figure 27) led to growth in LCH employment amongst participating businesses.

As Figure 37 also shows, the largest change in LCH-related employment happened amongst businesses that registered with the BUS in or after May 2023. By summer 2024, average LCH-related employment within this group stood at 6.4 FTEs, up from an average of 4.8 FTEs from before they joined the BUS. This group were more likely to have been new to the LCH installation market, and so this relatively large employment growth is likely to reflect their investment in increasing LCH system installation capacity (both on- and off-site employment increased amongst this group).

[128] On-site roles included home surveys, and LCH system design and installation. Off-site roles included marketing, administration and management

Figure 37: Installer companies' LCH-related FTE employment before and after their BUS participation (summer 2023 or summer 2024)



Source: Wave 1 and 2 Installer Survey. QA02. Before your business's involvement with the BUS, how many FTE staff employed by your business were involved in the delivery of LCH system(s)? QA03. And now, how many full-time equivalent staff are currently involved in the delivery of [LCH heating system(s) installed] under the Boiler Upgrade Scheme? Please exclude anyone who is a subcontractor, i.e. who isn't directly employed by your business: 1) Employed, off-site work including marketing, administration and management 2) Employed, on-site work including survey, design and installation. Base: All that provided employment data (n=238 for wave 1, n=147 for wave 2 registered April 2023 or earlier, n=110 for wave 2 registered May 2023 or later).

Wider sectoral impacts of the BUS

The BUS Impact Assessment explained that by increasing the volume of LCH system installations, the scheme was expected to have a range of indirect impacts on the LCH sector, including domestic supply chain development and potentially product innovation and cost reductions. However, these wider sectoral outcomes were considered secondary to the primary objectives of the BUS, and the scheme was recognised as just one of several factors influencing these developments.

The wider sectoral impacts of the BUS were explored through a market and supply chain assessment based on interviews with LCH sector stakeholders and market data analysis. That analysis drew the following conclusions about the wider impacts of the BUS:

- **Investment and market confidence**. LCH sector stakeholder interviews indicated that the BUS provided much-needed short- to medium-term market certainty following the end of the RHI and GHG-V schemes. This certainty encouraged investment by LCH system installer companies in the recruitment of engineers and in back-office functions. Visible growth in demand for heat pumps also incentivised investment in installer training (backed by the Heat Training Grant), further driving up installer capability. There was also reportedly increased investment in domestic heat pump manufacturing

capacity, driven by increased demand under the BUS and supply-side support initiatives including the Heat Pump Investment Accelerator Competition – HPIAC.

- **LCH system installation quality and system performance**. Average manufacturer-reported heat pump performance – measured as Seasonal Coefficients of Performance (SCOPs[129]) – improved slightly between 2019-2022 (up from 3.58 in 2019 to 3.73 in 2022[130]) but remained largely unchanged over the 2022-25 lifetime of the BUS. Interviewed LCH system manufacturers and installers believed that there had been some improvements to heat pump performance over the course of the BUS, largely driven by external drivers including European refrigerant regulations[131] and overseas manufacturing practices. Interviewees thought growing UK demand for heat pumps together with domestic supply chain initiatives such as the HPIAC would eventually lead to further tailoring of heat pumps to the UK market and climate.
- **Innovation and LCH system cost reductions**. The BUS was only expected to have an indirect impact on LCH system costs, primarily as a result of the economies of scale that follow from a larger market. Between 2021 and 2024[132], the real cost of ASHPs installed under the MCS (i.e. not just systems installed under the BUS) decreased by approximately 9%[133]. However, industry stakeholders believed that, despite market growth driven by the BUS, LCH system installation volumes between 2022-25 were too low to drive significant cost reductions. The number of heat pump models on the UK market increased from 344 in 2019 to 663 in 2024[134] and there has been innovation in both functionality and performance over this period. The BUS was felt by industry stakeholders to have made a contribution to these changes, amongst other drivers.
- **Supply chain robustness**. Industry stakeholders considered the UK supply chain for ASHPs to be robust, well-stocked, and resilient, with few delays or shortages experienced between 2022-2025. Falling sales in mainland Europe were thought to have increased the available supply of ASHPs in the UK. As discussed above, by driving demand for heat pumps the BUS increased manufacturer confidence in the market and stimulated investment in domestic manufacturing (though the UK is still a net importer of ASHPs).

Overall, therefore, the observed LCH sector changes reflect the combined influence of multiple policies and contextual factors, including the legacy of previous LCH support schemes, parallel programmes targeting other market segments (such as social housing), regulatory changes,

[129] A SCOP value measures how efficiently a heat pump performs on average over an entire heating season, showing how much heat it delivers for each unit of electricity used.
[130] Source: MCS MID Database extract (2019-2025). Measured as the average manufacturer reported SCOPs of low temperature heat pumps registered on the MCS MID.
[131] The EU F-gas Regulation (Regulation (EU) 2024/573) will require the heat pump industry to transition to the use of refrigerants with a lower global warming potential by 2027.
[132] Note that from 1 April 2022 onwards, VAT was removed from ASHPs. Before April 2022, heat pump installations were charged at the reduced VAT rate of 5%.
[133] Source: MCS MID Database extract (2019-2025). Measured as the average (median) cost of an MCS-accredited ASHP and installation (unit, labour, VAT and ancillary costs). Note that from 1 April 2022 onwards, VAT was removed from ASHPs. Before April 2022, heat pump installations were charged at the reduced VAT rate of 5%. These cost reductions will thus partly reflect changes in the VAT rate.
[134] Source: MCS MID Database extract (2019-2025). Measured as the number of unique MCS-accredited heat pump models installed in the UK.

and wider economic conditions. Whilst the BUS made an important contribution, it should be understood as one component of a broader policy landscape.

Value for Money of the BUS

This chapter presents a 5Es assessment of the VfM of the BUS, analysing the economy, efficiency, effectiveness, equity and cost-effectiveness of the scheme.

Key findings

The BUS demonstrated good economy – administrative costs compared favourably with similar schemes, were within government guidelines, and fell substantially over time (having initially been higher than expected as BUS demand was lower than planned but administrative systems were fully staffed). Service quality was maintained and fraud and error kept at low, acceptable levels, indicating that public resources have been managed effectively.

The BUS demonstrated good efficiency, with strong quality of scheme administration, installations delivered at a lower cost than predecessor schemes (albeit higher than initially anticipated), and evidence of consistently high customer service delivery performance by Ofgem. The scheme has also supported a more efficient LCH market.

The BUS demonstrated good effectiveness, achieving high additionality and delivering energy and GHG emission savings broadly in line with expectations despite lower-than-anticipated LCH system installation volumes.

The BUS demonstrated good equity, with strong participation from micro and small installer businesses. While uptake was higher amongst households earning over £52,000 a year, this is an outcome that reflects the early-stage of technology uptake in England and Wales and the fact that property owners need to put their own money into an installation.

The BUS demonstrated good cost-effectiveness, delivering carbon abatement at a lower cost than anticipated and generating substantial net social benefits despite lower-than-expected LCH system deployment volumes. Although total benefits and the benefit-cost ratio were slightly below Impact Assessment estimates, the scheme is still projected to return significantly more value than it cost over the period 2022-25.

Economy – use of public resources

Economy considers whether inputs to a programme or intervention have been procured at the appropriate quality and at the lowest reasonable cost. For the BUS, this assessment covers administrative and delivery costs, procurement practices, and the management of public funds, including the extent of fraud and error. Overall, the BUS represented good VfM when assessed against the economy criterion (see Table 5 for a summary).

Administrative costs. Between 2022/23 and 2024/25, the total cost of administering the BUS (excluding set-up) was £36 million. This equated to £472 per application and £733 per LCH system installation (noting that Ofgem incurred administrative costs processing unsuccessful applications). This was higher than the £317 per-installation cost assumed in the BUS Impact Assessment, largely because fewer installations were delivered than expected. However, administrative costs accounted for around 10% of the total BUS budget, which is within government guidelines[135]. Costs per installation were also lower than those observed in comparable schemes (for example, administration of the GHG-V scheme was estimated at over £1,000 per installation[136]) and fell substantially over time, decreasing by 55% between 2022/23 and 2024/25 as the BUS administrative model became more efficient.

Service quality. As discussed earlier (Section: Experiences of BUS administrative processes), most installer companies and property owners participating in the BUS were consistently positive about their interactions with Ofgem, indicating that administrative cost reductions were not achieved at the expense of service quality.

Fraud and error. Erroneous payments[137] under the BUS totalled an estimated £7.3 million between 2022/23 and 2024/25[138], equivalent to 2.2% of total scheme payments. This level is within government guidelines for fraud and error[139] and is comparable to the 1.8% rate under the Domestic RHI scheme[140].

Table 5: Economy assessment of the BUS

Sub-question	Assessment metric	BUS output and comparator(s)
Was the cost of administering the BUS reasonable?	Administration cost per BUS-funded installation	£733 per installation (GHG(V) equivalent >£1,000) per installation
Did Ofgem deliver a quality service?	Proportion of property owners and installers satisfied with Ofgem's administrative processes	85% of property owners rated the consent process as very or fairly easy; 73% of installer companies were very or fairly satisfied with Ofgem's processes overall
Was the BUS impacted by fraud and error?	Fraud and error as a share of total BUS payments	Estimated 2.2% of total BUS grant payments were made in error Domestic RHI equivalent 1.8%

[135] Policy Programme Transformation Unit (2017) Administration Costs Guidance
[136] NAO (2021) Green Homes Grant Voucher Scheme
[137] These are estimated by Ofgem based on their audit programme – an 'error' involved payment of a grant for an installation that, following audit, was deemed to be non-compliant with the scheme rules.
[138] Source: Ofgem Annual BUS Reports for 2022/23, 2023/24 and 2024/25.
[139] NAO (2025) Good practice guide - Estimating and reporting fraud and error in annual reports and accounts
[140] Source: Ofgem Annual DRHI Reports – e.g. 2024/25

Efficiency – converting inputs to outputs

Efficiency considers how well programme inputs are converted into outputs, including the administrative performance of the scheme, the cost of delivering installations, and the extent to which the BUS has supported the effective functioning of the LCH market. Overall, the BUS represented good VfM when assessed against the efficiency criterion (see Table 6).

Quality of scheme administration. Ofgem's performance against delivery KPIs was mostly strong (Section: Ofgem's delivery of the BUS). As Figure 7 shows, between 2022/23 and 2024/25, every customer service and processing KPI was achieved. Performance against audit and compliance KPIs was somewhat weaker; whilst all KPIs were met in 2023/24, in 2024/25, 7 of 9 KPI targets were missed, though this reflected a period of transition between external contractors.

Cost per installation. Actual BUS capital expenditure (Capital Departmental Expenditure Limit, or CDEL) per BUS-supported LCH system installation was £6,680. This was higher than the £5,000 per installation that was assumed in the Impact Assessment, because of the voucher uplift in October 2023 and the actual distribution of LCH system types installed (e.g. more GSHPs were installed than forecast). However, this average cost remains substantially lower (by ~30%) than the average per-installation payments under the Domestic RHI scheme (approximately £9,000[141]). When administrative expenditure (Resource Departmental Expenditure Limit, or RDEL) is included, the total cost per BUS installation increased to £7,412 – higher than the cost estimated in the Impact Assessment (£5,400 per installation) but again significantly lower than the Domestic RHI equivalent (per-installation cost of £10,628).

Market efficiency. As discussed previously (Section: Finding and engaging an installer), the proportion of property owners reporting difficulty finding an installer declined over the course of the scheme (from 21% at wave 1 to 12% at wave 4 of the property owner survey), and the scheme has engaged approximately 70% of the MCS-accredited installer base (Section: Installer registrations). Evidence on workforce impacts is mixed but suggests modest positive employment impacts from year two of the scheme, particularly among newer market entrants, contributing positively to the functioning of the LCH system installer market.

Table 6: Efficiency assessment of the BUS

Sub-question	Assessment metric	BUS output and comparator(s)
How strong was the quality of scheme administration?	Performance against customer service & audit and compliance KPIs	All customer service and processing KPIs met; several audit and compliance KPIs missed in 2024/25 due to transition between external contractors

[141] DESNZ (March 2023) Inquiry on Boiler Upgrade Scheme – Government Response

Sub-question	Assessment metric	BUS output and comparator(s)
How efficiently were installations delivered?	Public cost per LCH system installed (CDEL; CDEL+RDEL)	£6,680 CDEL per installation; £7,412 CDEL+RDEL per installation (RHI equivalent £7,000 CDEL and £10,628 CDEL+RDEL, both per installation)
Did the BUS improve the efficiency of the LCH market?	Ease of accessing registered installers and evidence of impacts on installer market capacity	At wave 4 of the property owner survey only 12% of property owners reported difficulty finding a BUS installer; strong LCH system installer participation in the BUS; modest workforce growth from year 2 onwards

Effectiveness – delivering intended outcomes

Effectiveness considers the extent to which the BUS has achieved its intended outcomes, including deployment of LCH systems, delivery of additional installations, and contribution to reductions in energy demand and GHG emissions. Overall, the BUS delivered good VfM against when assessed against the effectiveness criterion (see Table 7).

Deployment of LCH systems. As discussed earlier (Section: The volume of LCH system installations under the BUS), the BUS had delivered 49,136 LCH system installations by March 2025, compared to a central Impact Assessment assumption of 89,900. However, this figure was based on the pre-uplift grant values, and moreover deployment increased year-on-year, with installations in 2024/25 reaching approximately 85% of the Impact Assessment assumption for that year. This demonstrates improving performance over time, albeit against a lower overall volume than initially anticipated.

Installation additionality. The QEA estimated that 74% of BUS-supported installations would not have occurred in the absence of the scheme (Section: QEA-estimated additionality), exceeding the 70% additionality assumption used in the Impact Assessment (which was based on the predecessor Domestic RHI scheme). The BUS has thus been very effective in driving genuinely additional uptake of LCH systems.

Energy demand and carbon impacts. Despite lower LCH system deployment volumes, the BUS delivered net lifetime energy demand reductions of 10.5 TWh and GHG emission savings of 2.54 $MtCO_2e$, both broadly in line with Impact Assessment expectations (see Section: Impacts on greenhouse gas abatement). This reflects higher-than-anticipated impacts per installation, driven by greater average heat demand in participating properties, higher system efficiency, and a larger share of oil and coal boiler replacements than expected.

Table 7: Effectiveness assessment of the BUS

Sub-question	Assessment metric	BUS output and comparator(s)
Did the BUS deliver the intended number of LCH installations?	Number of BUS-supported LCH system installations	49,136 installations delivered by March 2025, within the Impact Assessment deployment estimates – ~45,000 installations (low estimate) to ~90,000 installations (central estimate) Annual deployment hit ~85% of initial expectations in 2024/25
To what extent were BUS-supported installations additional?	Proportion of LCH system installations that were additional	74% of installations estimated to be additional (RHI equivalent 70% additionality)
Did the BUS deliver its intended energy and GHG emission abatement outcomes?	Net changes in energy demand, GHG abatement due to LCH system installations	10.5 TWh lifetime energy demand reduction; 2.54 $MtCO_2e$ lifetime GHG emissions savings

Equity – distribution of costs and benefits

Equity considers whether the benefits of the scheme have been distributed fairly, including accessibility for different types of installers, participation across household income groups, and whether scheme design or delivery processes disadvantaged particular groups. Overall, the BUS is assessed as representing good VfM against the equity criterion (Table 8).

Access for micro and small businesses. As discussed earlier (Section: Profile of BUS-registered installer companies), the BUS has been widely accessed by micro and small installer businesses, which accounted for 95% of BUS-registered installers and delivered around 64% of installations between 2022-25. Evidence from installer surveys suggests that some barriers to participation exist – such as skills shortages, compliance requirements, and cashflow considerations – and that these disproportionately affect smaller businesses to an extent, but overall the installer-led model supports participation by a diverse set of businesses. However, most of these barriers are outside the control of the BUS.

Distribution across household income groups. Evidence from the property owner survey (Section: Property owner characteristics) indicates that BUS participants were more likely to be from higher-income households. However, this distribution was broadly consistent with the focus of the BUS on property owners, and reflected the early stage of technology uptake and the fact that property owners needed to put their own money into an installation, and was also consistent with the household income profile under the Domestic RHI. Over the 2022-25 phase of the BUS there were other (more generous) LCH system support schemes targeted explicitly at lower-income households.

Accessibility of scheme delivery. For the most part, any difficulties property owners faced accessing the BUS were inherent to challenges having a LCH system installed rather than the design of the BUS delivery model, which was mostly installer-led. As noted previously (Section: Property owners' perceptions of Ofgem's administrative processes) property owner survey evidence indicates that participants with a disability were slightly less likely to report finding Ofgem's consent confirmation process easy compared to those without a disability (79% compared to 85%).

Table 8: Equity assessment of the BUS

Sub-question	Assessment metric	BUS output
Did the BUS support fair access for micro and small businesses?	Composition of installer base and share of installations delivered	95% of BUS-registered installers were micro or small businesses, delivering around 64% of BUS-funded installations
Was participation distributed fairly across household income groups?	Household income distribution of BUS participants	56% of participating households earned over £52,000 per year, but this was not disproportionately given scheme design and complementary policies
Did scheme delivery disadvantage any particular groups?	Ease of consent and administrative processes for different groups	Property owners with a disability were slightly less likely to find the consent process easy (79%, compared to 85%)

Cost-effectiveness – benefits relative to costs

Cost-effectiveness considers whether the benefits generated by the scheme justify the public resources invested, including the cost of carbon abatement and the overall balance of monetised costs and benefits. This analysis is based on DESNZ CBA modelling – note that this incorporates the QEA-derived estimate for the additionality of LCH system installations installed under the BUS. It has used the same methodology as the Impact Assessment and applied this to the latest scheme data and assumptions based on the latest Departmental Evidence Base. Overall, the BUS is assessed as likely to have delivered good VfM against the cost-effectiveness criterion (see Table 9).

Carbon cost-effectiveness. The BUS delivered lifetime GHG emission reductions at an average cost of £89 per tonne of CO_2e abated. This is slightly lower than the £92 per tonne estimated in the Impact Assessment, reflecting the fact that BUS installations replaced higher numbers of high-emission coal- and oil-fired heating systems (see Section: Greenhouse gas abatement).

Net social benefits. The Social Net Present Value (SNPV) of the BUS is estimated at £294 million, demonstrating that the monetised benefits of the scheme exceed its costs by a

substantial margin. While this is marginally lower than the £310 million estimated at the policy development stage, the difference is consistent with lower LCH system deployment volumes and does not undermine the overall positive net benefit of the scheme.

Benefit-cost ratio. The Benefit-Cost Ratio (BCR) for the BUS is estimated at 1.82, indicating that for every £1 of public expenditure, the scheme generated £1.82 in social benefits. Although this is slightly below the Impact Assessment BCR estimate of 1.96, it remains comfortably above 1, providing clear evidence that the scheme delivers VfM overall.

Table 9: Cost-effectiveness assessment of the BUS

Sub-question	Assessment metric	BUS output
Did the BUS deliver cost-effective carbon abatement?	Carbon cost-effectiveness (£/tCO_2e[142])	£89 per tonne of CO_2e abated, slightly lower than the Impact Assessment estimate of £92
Did the benefits of the BUS outweigh the costs?	Social Net Present Value (£)	£294 million net social benefit
What was the overall return on public investment?	Benefit-Cost Ratio	BCR of 1.82, indicating £1.82 of benefits per £1 spent

[142] Cost (in pounds) per abated tonne of Carbon Dioxide Equivalent, enabling the calculation of aggregate emissions across different gases.

Conclusions

During the scoping phase of the evaluation, the team agreed with DESNZ a total of 16 process, impact and economic evaluation questions that have guided the evaluation. This final chapter presents the conclusions from the evaluation, structured around these questions.

Process evaluation questions

EQ1: How effective has Ofgem's delivery of the scheme been?

Ofgem's delivery of the BUS has been effective overall, with core systems operating reliably and customer-facing processes consistently meeting performance standards. Across the delivery period, key milestones relating to consents, voucher issuance, payments, and enquiry handling were achieved, with customer service KPIs met in all years and performance typically exceeding monthly target thresholds, indicating that systems were accessible and adequately resourced to support scheme delivery. This was reflected in scheme participants' (installer companies and property owners) reported experiences (see below). Performance against audit and compliance KPIs were more variable, particularly in 2024/25, when a number of assurance-related targets regarding the number and timeliness of audits were not met.

EQ2: 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?

Installers' overall experiences of the delivery of the BUS were broadly positive, with most describing the scheme's administrative processes as relatively straightforward – particularly when compared with previous initiatives such as the RHI or GHG-V Scheme. Survey evidence showed that 73% of installer companies were very or fairly satisfied with Ofgem's overall administration of the BUS, and large majorities reported being satisfied with the systems for applying for, tracking, and redeeming BUS vouchers. For most installers and most standard installations, the scheme functioned smoothly and as intended. Qualitative evidence from installers emphasised that administrative processes improved as the scheme matured, systems became more digitised, and interactions with Ofgem became more predictable. Just under half (48%) of installers reported spending two hours or less per BUS voucher and a further 22% reported spending three to four hours, indicating that the scheme did not pose undue burdens most of the time. Qualitative evidence indicates that administration for complex cases (e.g. self-builds) took substantially longer, particularly where repeated evidence submissions, clarifications, or reapplications were required.

Participation in the BUS exposed some installers to cashflow risks, although these were not universal – most (69%) BUS-registered installer companies reported no cashflow difficulties. However, 29% did experience cashflow challenges, and sole traders were disproportionately affected. These risks were inherent to programme design and stemmed from the delay between completing an installation and receiving the BUS grant payment, the possibility of

audit-related payment delays, and the small risk of redemption applications being rejected or voucher payments being revoked after works have been completed. Installer companies that experienced challenges reported using various mitigation strategies, including spacing out installations and charging customers in full and refunding the grant upon payment. Cashflow risks deterred some LCH installers from participating in the BUS.

EQ3: What has been property owners' experiences of the delivery of the scheme by Ofgem?

Most property owners only interacted with Ofgem to confirm consent for their BUS voucher application, and this process was generally viewed positively. The majority (85%) found it easy to complete, including through alternative non-digital routes, although people with disabilities were slightly less likely to report it as easy. There was no evidence from non-participant property owners or installers that the consent process was causing property owners to drop out of the BUS. A smaller group of property owners also engaged with Ofgem during audits of their BUS-funded installations. Qualitative information about audit experiences was provided by some survey respondents. Many viewed the audits as straightforward, with clear evidence requirements. However, others raised concerns about secure handling of personal information, the need to provide the same documentation multiple times, and the practical consequences of audit-related grant payment delays – which resulted in temporary but significant financial exposure for those who had already paid installers in full and were waiting for reimbursement.

EQ4: How easy or difficult did installers find it to participate in the BUS? What were the enablers and barriers to participation?

Overall, the BUS was relatively easy for installer companies to participate in where their existing business models aligned with the scheme's entry requirements and delivery model. The installer-led delivery model broadly reflected how LCH installations are typically delivered, particularly for standard ASHP projects, enabling installers to manage the customer journey and integrate the BUS grant into their pricing structures. A key enabler of participation was the use of established installer accreditation and consumer protection frameworks, notably MCS accreditation and membership of RECC or HIES. For installer companies already operating within these frameworks, this reduced the need for additional scheme-specific onboarding and provided confidence that the BUS aligned with familiar technical, quality, and consumer protection standards, helping to limit delivery and reputational risks.

However, the same entry requirements acted as a barrier for some installers, particularly those installing LCH systems infrequently, operating at smaller scale, or considering entry to the market. Participation in the BUS was also more challenging for non-standard or complex projects, where voucher validity periods and eligibility evidence requirements reduced flexibility and increased commercial risk. In response, some installers engaged indirectly through subcontracting or umbrella arrangements rather than registering with the BUS themselves. This indicates that while the BUS was accessible for experienced and established LCH installer companies, it was at times less easy to participate in for firms whose scale or experience differed, or where LCH system installation projects did not fit the typical model.

EQ5: 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 heard and learned about the BUS through a wide range of channels, with no single dominant route into the scheme (Section: Initial engagement with the BUS by property owners). Property owner survey data showed that the importance of different channels changed over time. Early on it was LCH system installers who were the most common way that property owners learned about the BUS, but over time more property owners came across the scheme whilst carrying out research, typically online. Energy suppliers also became a more important information source, reflecting their growing role within the BUS installation market. Government-led communications between 2022-25 (e.g. the Welcome Home campaign) generated low direct recall amongst property owners, though some installers noted increased levels of enquiries whilst the campaigns were active. Installers' marketing approaches varied. Large national firms – particularly energy companies – promoted the scheme widely, emphasising the role of the BUS in reducing installation costs. Smaller installers tended to rely on targeted local outreach. Participating property owners typically found it easy to access the information they needed, but understanding of the BUS among non-participants was patchy, with some holding incorrect assumptions about eligibility or confusing the BUS with other government schemes (particularly ECO4).

EQ6: How easy or difficult did property owners find it to participate in the BUS? What were the enablers and barriers to participation?

Participation in the BUS became increasingly easy over time for property owners who engaged with the scheme, as delivery arrangements matured and installer capacity expanded. Finding and engaging installers improved as more installers registered with the BUS, and scheduling installations became simpler as installers became more familiar with scheme requirements and processes. The installer-led delivery model also reduced administrative complexity for property owners: unlike other LCH support schemes (RHI, GHG-V), participants did not need to navigate application or voucher redemption processes themselves, which helped to minimise confusion and administrative burden.

That said, participation in the BUS brought some challenges. Even among successful participants, progressing through the BUS typically involved multiple stages, detailed technical discussions and decisions that required confidence and persistence. While the installer-led model generally aligned well with the complexity of the LCH system installation journey, some aspects of scheme design created friction during participation. These included cases where property owners paid in full upfront and waited for the voucher value to be refunded and voucher validity periods that did not always align with longer or more complex renovation projects. Despite these challenges, most issued vouchers (75%) ultimately resulted in an LCH installation, indicating that most participants were able to navigate the BUS customer journey successfully.

EQ7: What lessons can be learnt from the scheme design and implementation to support future policy design?

The BUS evolved over the course of the 2022-25 period, with changes to scheme design informed by emerging delivery and evaluative evidence. The following lessons are therefore high-level reflections on learning generated through implementation:

- Installer-led delivery models can substantially reduce the administrative burden for property owners, particularly where technologies are complex and installation is shaped by a potentially confusing set of administrative and compliance-related requirements. However, such models shift delivery, compliance and cashflow risks towards installers, highlighting the importance of explicitly managing risk allocation within scheme design, including how these risks may be reflected in installer charging and billing practices.
- Upfront grant support is an effective trigger for participation, especially for property owners who are already inclined towards LCH technologies. Grant uplifts were associated with improved affordability and increased uptake, but the evidence shows that grants alone are insufficient to overcome wider barriers related to property suitability, running costs, and the perceived risk and effort of making the switch to LCH.
- Property owner decision-making around LCH is complex and non-linear, and is often embedded within broader renovation, self-build or heating system replacement cycles. Scheme rules and timelines need to accommodate this complexity by achieving a balance between flexibility to reflect real-world project timelines and controls that provide certainty over delivery, eligibility and public expenditure.
- Market capacity and maturity play a critical role in shaping participant experience, with evidence from the BUS showing that ease of participation improved over time as the installer market expanded and delivery processes became more familiar to them. This highlights the importance of maintaining schemes over sufficiently long time horizons and providing policy stability, allowing supply chains to invest and capacity to build.
- Coherence and clarity across support schemes is essential in a crowded delivery landscape. Evidence from BUS non-participants shows that misunderstanding and confusion about scheme eligibility can reduce engagement, even among property owners with interest in switching to LCH.
- Adaptive policy design improves accessibility and effectiveness over time. The grant uplift in October 2023 illustrates the value of using delivery evidence to refine scheme design where initial uptake assumptions proved insufficient to support the desired level of participation.

Outcome and impact evaluation questions

EQ8: Has the BUS achieved its objectives regarding the installation of LCH systems and the abatement of carbon, and why? To what extent are these outcomes additional?

The BUS had an objective to distribute £450 million in grants between 2022 and 2025, supporting up to 90,000 LCH installations, depending on the mix of technologies deployed. In practice, £328.2 million (73% of the budget) was paid out, supporting 49,136 installations. While the scheme succeeded in supporting year-on-year growth in LCH installations, it did not

fully achieve its installation volume objective, primarily due to weaker-than-expected demand in the first year of the scheme.

The shortfall in installation numbers was driven mainly by demand-side constraints. The BUS partially addressed the high upfront costs of LCH systems, but other barriers – such as negative perceptions of LCH technologies, concerns about running costs linked to electricity prices, and property suitability – were largely outside the scheme's control. DESNZ-led marketing campaigns during 2022-25 were short-lived and targeted, and evidence from installers suggests they did not materially increase applications. DESNZ introduced several scheme changes to make the BUS a more attractive proposition to property owners and increase uptake. Evidence indicates these changes were effective. The grant uplift in October 2023 substantially narrowed the gap between grant support and installation costs and was followed by a marked increase in applications and installations. The relaxation of loft and cavity wall insulation requirements in May 2024 further increased demand by removing a potential barrier to uptake.

The additionality of BUS-funded installations was high. QEA estimates indicate that 74% of installations (36,508 systems) would not have occurred without the scheme – exceeding the 70% additionality assumption in the original Impact Assessment. Property owners' self-reported additionality closely aligns with this estimate, providing confidence in its robustness. This indicates that, although overall installation volumes were lower than planned, the BUS was highly effective at stimulating genuinely additional uptake, particularly following the grant uplift.

The 2022-25 phase of the BUS is estimated to deliver net greenhouse gas savings of 2.5 $MtCO_2e$, very marginally below the 2.6 $MtCO_2e$ forecast in the Impact Assessment. This minor shortfall reflects lower installation volumes and was partly offset by higher-than-expected installations in larger, higher-emission properties, including those previously heated by coal and oil. As such, the BUS broadly achieved its carbon abatement objective.

EQ9: How has the scheme design incentivised or disincentivised the uptake of LCH systems, and how has this varied between different groups of property owners? How has the scheme interacted with other incentives?

The design of the BUS incentivised uptake of LCH systems primarily through upfront capital grants that reduced initial cost barriers. The October 2023 grant uplift strengthened this incentive, improving the perceived affordability of LCH systems. However, because the grant covered only part of total installation costs, it was most effective for property owners able to fund residual costs through savings or income, limiting its impact among lower-income households. This profile of take-up is broadly consistent with the wider distribution of home ownership in England and Wales, suggesting that the scheme largely reached its intended core market rather than disproportionately excluding otherwise typical owner-occupiers.

The flat-rate voucher structure also favoured lower-cost systems, such as ASHPs, over higher-cost systems, such as GSHPs, which was reflected in the fact that around 97% of scheme installations were ASHPs. Similarly, the fixed voucher was less effective for older or

less energy-efficient properties, where higher installation and associated upgrade costs reduced the relative value of the incentive, particularly during the early phase of the scheme when property owners were obliged to have loft and cavity wall insulation, if feasible. In addition, the perceived financial risk associated with upfront payment and grant reimbursement arrangements acted as a deterrent for some more risk-averse or liquidity-constrained property owners, further reinforcing the skew towards higher-income participants.

The BUS operated within a wider landscape of complementary incentives, which shaped its overall effectiveness. The scheme combined with the zero-rating of VAT on heat pumps to reduce upfront costs and improve LCH system affordability. Other schemes, such as the HUG and the SHDF, targeted different market segments, leaving the BUS to focus on owner-occupiers rather than lower-income or social housing households. The scheme also interacted with other household-level incentives and investment decisions, with some property owners using the savings made possible through the BUS to unlock or sequence additional energy-related investments such as solar PV or battery storage, to reduce system running costs. The BUS also interacted with and supported the growth of time-of-use and dedicated heat pump electricity tariffs.

EQ10: Why have property owners chosen to participate or not participate in the BUS, and how has this varied between different groups of property owners?

Property owners who participated in the BUS were typically motivated by a combination of financial incentives and pre-existing interest in LCH systems, often driven by concern about climate change and a desire to reduce carbon emissions. The BUS grant was consistently identified as the single most important trigger for participation – 68% of property owners said they acted when they did because of the availability of the grant. Participation in the BUS was more likely where installation aligned with planned heating system replacement, property renovation projects, or self-build projects, since this allowed costs and disruption to be absorbed within wider works. Uptake of the BUS was higher amongst households earning over £52,000 a year and households with access to sufficient savings or investments, who were thus better positioned to fund residual system installation costs not covered by the BUS grant.

Evidence about reasons for non-participation comes from qualitative interviews and should not be treated as representative of the general population. Interviews indicated that non-participation in the BUS was driven primarily by financial, technical and information barriers, which varied across different groups of property owners. High residual costs – even after applying the voucher – remained a key deterrent, particularly for lower-income households and for those considering GSHPs. Concerns about property suitability, whether a LCH system would provide enough warmth, and system running costs were more common among owners of older or poorly insulated homes. Among non-participants, there was evidence of misunderstanding of the BUS, including confusion with other schemes and assumptions that the BUS was means-tested or loan-based. These barriers were more pronounced among households with lower awareness and engagement with LCH systems and less confidence navigating technical information, contributing to participation being concentrated among property owners with favourable financial and property characteristics.

EQ11: Why have installers chosen to participate or not participate in the BUS, and how has this varied between different groups of installers?

Installer participation in the BUS was driven mainly by whether taking part was financially worthwhile and likely to generate sufficient customer demand, with decisions varying by firm size, prior experience in the market, and timing of entry into the scheme. Early participants – many of whom had delivered installations under the RHI and GHG-V schemes – viewed the BUS as a natural successor that enabled them to sustain existing activity. Later entrants, many from adjacent sectors including fossil fuel heating systems and solar PV, were more likely to join to start or expand LCH work. The October 2023 grant uplift – with its visible impact on consumer demand – further incentivised installers to participate in the BUS since it reduced the financial risk of investing in workforce growth and training, MCS accreditation and business development. Across participating installers, the installer-led delivery model and reasonably predictable grant payment schedule were generally viewed positively.

As above, evidence about reasons for non-participation comes from qualitative interviews and should not be treated as representative of the population of LCH system installers. Interview evidence indicates that installers who chose not to participate typically cited the perceived cashflow risk, administrative and compliance burdens (particularly related to MCS accreditation) or the availability of sufficient work outside the BUS in other markets. These factors affected installer companies differently: micro and small firms were more sensitive to perceived cashflow and compliance costs, while medium and larger firms were better able to absorb these risks. Some installers chose not to register with the BUS but undertook BUS-funded work indirectly through subcontracting or umbrella arrangements, showing that the scheme supported activity beyond its directly registered participants.

EQ12: Has the BUS achieved its objectives to support employment within the LCH sector and expand the LCH market? What impacts has the BUS had on the LCH sector, including on investment, supply chains and costs?

The BUS Impact Assessment modelled that the LCH system installations supported through the BUS would directly support 2,100 FTE jobs per year amongst participating installer companies, and a further 1,800 indirect FTE jobs per year. Updated DESNZ analysis, based on actual deployment rates, modelled that the LCH systems installed under the BUS will directly support 600 FTE jobs per year, alongside 200 indirect FTE jobs per year. However the modelling methodology changed between these two employment estimates, which are thus not directly comparable.

Measuring the actual impacts of the scheme on jobs in BUS-registered installer companies was challenging, in part due to high levels of subcontracting within the installer sector which meant jobs were supported within businesses that were not registered with the scheme and could not be identified. Using a QEA approach we estimate that BUS-registered SME installer companies grew by 7.1% more than in comparable SMEs that did not participate in the scheme, though this difference was not statistically significant. The exclusion of large companies from the analysis meant the omission of a handful of businesses that have carried out large numbers of BUS-funded installations – likely leading to an underestimate of the

employment impacts of the scheme. Installers' own assessments of employment creation under the BUS also point to a modest positive impact on job numbers, particularly in the first year of the scheme when installation volumes were relatively low and many installers were initially sustaining RHI-driven capacity rather than expanding. However, the uptick in installation volumes after the grant uplift in October 2023 appears to have translated into greater job creation, particularly amongst newer market entrants, where employment growth amounted to an average of around 1.6 FTE extra jobs per company by summer 2024.

Turning to the wider market impacts of the BUS, the scheme succeeded the RHI and, to a lesser extent, the GHG-V scheme in supporting LCH system installations. The numbers of funded installations were relatively low in the first year of the BUS, with its impacts largely limited to sustaining the market that had built up under the RHI. After the grant uplift in October 2023, however, BUS-funded installation volumes increased rapidly and there is evidence that the scheme had more of a wider market impact. By the end of the 2022-25 phase of the BUS, most MCS-accredited LCH system installer companies were registered with the scheme. Latterly this included many newcomers (including some of the largest energy companies), helping to grow the LCH market. The scheme also catalysed diversification within the market, for example encouraging installers to serve a wider range of property types and geographical areas, to access more BUS customers. The BUS installation market has, however, become more concentrated over time, particularly within a small number of relatively large and vertically integrated companies (whereas most of the sector consists of micro-firms). A fifth (20%) of registered installer companies delivered 84% of installations, and larger firms made up only 5% of registrants but completed 36% of BUS installations.

Though it was not one of the scheme's primary goals, there is some indicative evidence that the BUS may have contributed to wider growth and transformation in the LCH market by boosting demand for ASHPs. Evidence from industry stakeholders and market data suggests the scheme may have played a role in improving LCH system installation quality, encouraged investment and workforce training, and contributed to innovation and modest LCH system cost reductions. However, the evidence base on supply chain effects and cost reductions is limited, and findings in these areas should be treated as suggestive rather than conclusive.

EQ13: How satisfied are property owners with the installation and use of their LCH system, and would they recommend one?

Most participants were very or fairly satisfied with the installation process, including scheduling, timescales and the level of disruption experienced. Around 77% of property owners reported being satisfied with installation timescales, and almost half (48%) said installations were completed within five days, with disruption often perceived as shorter and more manageable than anticipated. Where dissatisfaction occurred, it tended to relate to communication issues with installers, longer-than-expected installations (often linked to wider renovation works), or variability in the quality of system handover; however, such experiences were a minority.

Property owners' satisfaction with LCH system use was also generally high. A large majority reported comfortable indoor temperatures, with 93% describing temperatures as about right overall, including during colder periods. Satisfaction with hot water provision was similarly

strong, with 94% reporting hot water temperatures were about right. Noise was not a major issue for most users. While some property owners experienced an initial period of adjustment as they adapted to ambient heating, this rarely resulted in persistent dissatisfaction. Despite pre-installation concerns about running costs, 42% of property owners reported that their total energy bills decreased after installation, though experiences varied by system type and previous heating system. Confidence in using LCH systems was more mixed: only around a quarter (26%) felt completely confident programming their system to minimise running costs, highlighting the importance of handover quality and aftercare.

Most property owners indicated that they would recommend a LCH system, and willingness to recommend increased over time. By the follow-up survey, 60% said they already had or definitely would recommend their system, while only 7% said they probably or definitely would not. However, recommendations were typically conditional rather than unqualified, with property owners emphasising that their positive experience depended on factors such as property characteristics, installation quality and their understanding of how to effectively control their LCH system.

EQ14: To what extent have property owners changed their energy and heating use as a result of having a LCH system installed? Has the BUS caused property owners to make other energy-related changes?

The installation of a LCH system was associated with changes in how property owners used their heating, particularly a shift towards longer, more consistent heating periods at ambient temperatures. Many property owners reported an initial adjustment period as they adapted to ambient heating, but this rarely resulted in persistent dissatisfaction. The use of another source of heating in addition to a LCH system was somewhat common, with around 42% of property owners reporting some use of supplementary heating, most often open fires or stoves. Evidence suggests this was typically used selectively – such as during very cold weather or to provide rapid localised warmth – and often reflecting habits carried over from previous heating arrangements rather than dissatisfaction with LCH system performance.

There is also evidence that installing a LCH system prompted wider engagement with household energy use. Just under half (46%) of property owners reported switching energy tariff after installing a LCH system, often to better manage running costs, with increasing uptake of time-of-use and heat pump specific tariffs. In addition, a significant minority of property owners undertook other energy-related changes alongside installation, including installing solar PV (35%), battery storage (33%)[143] and making insulation improvements. While these actions were often part of broader renovation or decarbonisation plans, qualitative evidence suggests the BUS frequently acted as a catalyst, encouraging property owners to take a more holistic approach to managing their energy use.

[143] Note: This figure is based on Waves 3 and 4 only, as these waves included specific response options for battery installations. Earlier waves used back-coded open-text responses and have therefore been excluded to provide a more robust estimate. For a full breakdown of battery responses and related analytical caveats, see the accompanying tables.

EQ15: To what extent has the BUS met its requirements under the Public Sector Equality Duty (PSED)[144]?

Property owner research considered two PSED protected characteristics: the ethnic group of property owners, and whether property owners had a disability under the Equality Act. There was no evidence that the design or delivery of the BUS disfavoured either group significantly. Individuals with a disability were slightly more likely to find BUS administrative requirements more difficult, but the difference was minor (Section: Property owners' perceptions of Ofgem's administrative processes). The issues they experienced were more the results of having a LCH system installed, rather than the BUS – e.g. the disruptiveness of the installation experience was felt more negatively by individuals with a disability. Take-up of the BUS was relatively lower amongst both groups (see Section: Property owner characteristics), but there was no evidence that this was due to scheme delivery; rather it likely reflected wider demographic patterns amongst the homeowner population.

Value for money evaluation questions

EQ16: Was the BUS good value for money (VfM)? How could the VfM of the BUS be improved?

Overall, there is strong evidence that the BUS delivered good value for money across the five VfM dimensions (economy, efficiency, effectiveness, equity and cost-effectiveness). Although delivery volumes were lower than anticipated in the BUS Impact Assessment, the scheme is project to generate substantial social value, with estimates of a positive Social Net Present Value and a benefit-cost ratio comfortably above one. Installations were delivered at a lower cost than predecessor schemes, additionality was high (around three-quarters of installations would not have occurred without the BUS), and carbon abatement costs were lower than originally expected. Importantly, per-installation impacts were stronger than forecast because BUS installations tended to replace more carbon-intensive heating systems and served higher-heat-demand properties, partially offsetting lower uptake. Taken together, these factors demonstrate that public spending under the BUS translated into meaningful environmental and social benefits, and that the scheme compared favourably with earlier approaches to supporting LCH uptake.

There are, however, opportunities to improve VfM further. Administrative costs per installation were higher than originally expected, especially in the first two years of the scheme when demand was lower than expected but delivery costs were largely fixed, suggesting scope for a more demand-responsive administrative model. VfM could also be strengthened by improving audit and compliance efficiency, reducing payment delays that create cashflow risks for installers, and continuing to streamline processes as installation volumes increase. On the effectiveness side, maintaining flexibility in grant design to respond to market conditions –

[144] The PSED requires public bodies and those delivering public services to consider how their policies and programmes affect people with different protected characteristics (such as age, disability, and race). For the BUS, this means ensuring the scheme is designed and delivered in a way that does not disadvantage particular groups. A PSED assessment was carried out by DESNZ as part of the preparation of the Business Case for the BUS.

building on the successful 2023 grant uplift – would help maximise deployment within fixed budgets. Finally, while equity performance was broadly good, VfM would be enhanced by improving experiences of administrative processes for disabled participants and exploring ways to stimulate demand among lower- and middle-income households where this can be done cost-effectively, without increasing deadweight and without duplicating the efforts of other government schemes targeting lower income groups.

This publication is available from: https://www.gov.uk/government/publications/evaluation-of-the-boiler-upgrade-scheme-2026

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