Department for Energy Security & Net Zero

Green Homes Grant Local Authority Delivery Scheme Phases 1 & 2

Final Evaluation Report

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1.1 Introduction

This report presents the findings and conclusions of the process and outcome evaluations of Phases 1A, 1B and 2 of the Green Homes Grant Local Authority Delivery Scheme (hereafter referred to as 'the LAD Scheme' or 'the Scheme') commissioned by the Department for Business, Energy and Industrial Strategy (BEIS) in October 2020 and conducted by Ipsos, University College London (UCL) and the Building Research Establishment (BRE).

This report is a synthesis of findings from research at key points in the Scheme:

- October 2020 – March 2021 Scoping and Early Insights Phase 1A
- October 2021 – November 2021 Early Insights Phases 1 and 2
- August 2022 – March 2023 Final Research Phases 1 and 2.

The evaluation brings in findings from all phases of the LAD Scheme, incorporating qualitative and quantitative feedback from a range of stakeholders who were involved with Scheme design and delivery, or who were beneficiaries of the Scheme, as set out in Table 1.

Table 1 Feedback collected for the evaluation

	Quantitative	Qualitative
Local Authorities (LAs)	57 survey responses	21 interviews
Net Zero Hubs	N/A	5 interviews (covering all five Hubs)
Households, homeowners, landlords	2,938 beneficiary household survey responses	8 interviews with homeowners and tenants 7 interviews with private and social housing landlords
Installers and installation industry	46 installer survey responses	25 interviews with installers 3 interviews with industry organisations
BEIS	N/A	2 interviews (with six participants)
Trustmark	N/A	1 interview

This report also draws from Scheme monitoring information about households, applications and measures installed, official statistics from BEIS about the Scheme, and literature about the installer industry and labour market in the sector.[1] The small response rate from installers and industry organisations means that these findings are considered as indicative rather than quantitative, providing depth not breadth and not considered representative of all installers involved in LAD or the whole domestic energy efficiency industry.

1.2 Scheme aims and reach

In July 2020, the Chancellor announced a package of 'Green Economic Stimulus' schemes worth £3.05 billion to support sustainable economic recovery after the pandemic. The Green Homes Grant (GHG) represented £2 billion of this funding, distributed through three packages of support: Social Housing Decarbonisation Fund Demonstrator (SHDF(D)) worth £50 million, Green Homes Grant Vouchers Scheme (GHGVS) worth £1.5 billion, and GHG LAD worth £500 million. The ultimate aim of these packages was to save households money, cut carbon emission and create green jobs.

The LAD Scheme distributed this funding through two Scheme phases worth £200 million and £300 million, directly to LAs in Phase 1, and through Hubs[2] in Phase 2. The LAD scheme specifically targeted low-income households (combined household income under £30,000) and low energy performance homes (properties with energy performance certificate (EPC) ratings of E, F or G during Phase 1A, and some properties with a rating of D in Phases 1B and 2). The Scheme aimed to take low-income families out of fuel poverty by improving the energy efficiency of their homes and thereby reducing their energy consumption. The Scheme also intended to drive reductions in household carbon emissions as part of progress towards the UK's 2050 net zero target, while supporting the growth of green jobs, green supply chain capacity and LA capacity to deliver energy efficiency at scale.

Phase 1 of the Scheme was scheduled to allocate funding between October 2020 and March 2021, with initial expectations that between 15,000 and 20,000 homes would be upgraded. However, due to lower-than-expected applications from LAs, Phase 1 was split into two Phases (1A and 1B) to provide extended timeframes for delivery and use of funds. Phases 1A and 1B were eventually extended to March 2022. Phase 2 of the Scheme was expected to deliver measures to all targeted homes by December 2021, but the timeline for delivery of Phase 2 was also extended, to September 2022.

Overall, the Scheme met around three-quarters of the estimated number of households upgraded (38,290 compared with estimated 55,000) and delivered just over a quarter of total expected measures (49,824 compared to expected 191,000[3]) across both phases of the Scheme. Evidence collected throughout this evaluation suggests that the Scheme partially met

[1] This report triangulates findings from multiple data sources and stakeholder perspectives, across multiple points in time, to provide a final assessment against the process and outcome evaluation questions.
[2] Hubs are regional points of expertise and coordination on energy issues. They are a collaboration of Local Enterprise Partnerships (LEP), working together to increase the number, scale and quality of local energy projects delivered across England.
[3] These were the central estimates in the BEIS Business Case for the Scheme, rather than a fixed target.

many of its intended aims but experienced a number of challenges that prevented it from fully achieving its initial ambitions and objectives.

This final evaluation report employed a mixed-methods approach to systematically assess the extent to which the measures installed through the Scheme generated measurable outcomes for households, LAs and installers.

1.3 Overall evaluation findings

Overall, the evaluation found that the measures delivered through the Scheme generated benefits for households and installers, although difficulties with Scheme delivery meant some of these outcomes had less impact than anticipated.

1.3.1 Participation of Local Authorities in the Scheme

There were high levels of participation in the Scheme, with 93% of all LAs in England participating in one or both Scheme Phases. 233 LAs participated in Phase 1 of the Scheme, increasing to 303 LAs in Phase 2. Findings from the Phase 1 LA interviews demonstrate that the main motivation for LAs' participation in the Scheme was to supplement existing funding or fill funding gaps, enabling LAs to commission or continue work that aligned with their local net zero ambitions. LAs wanted to improve the quality of their local housing stock and help low-income residents in fuel poverty to increase their standards of living – something that became particularly acute during Phase 2 when LAs saw the Scheme as a means of helping residents tackle the cost of living crisis by increasing the energy efficiency of their housing stock. While stimulating the green economy was important across both phases of the Scheme, some LAs particularly emphasised their desire to promote a green economic recovery to the COVID-19 pandemic during Phase 1.

LAs had mixed experiences of the application process for Phase 1 and Phase 2 of the Scheme. Timeframes for applications and support were two of the main issues raised by LAs, with less than half of LAs surveyed saying they were satisfied with the timeframes allowed for completing applications and with the level of support from BEIS. In particular, lack of resources and time to complete applications within the LA was an issue for over two thirds of LAs, with some resource constraints resulting from LAs participating in other BEIS retrofit Schemes at the same time. LAs felt more confident applying for the Scheme in Phase 2, drawing from their experiences of Phase 1 and also benefitted from support and guidance provided by Hubs, although timeframes remained an issue across all Scheme Phases.

1.3.2 Delivery models adopted by Local Authorities

A mixture of delivery models, i.e. ways of delivering the scheme, were used by LAs across the scheme including working within multi-LA consortia, subcontracting work to delivery partners, to delivering wholly inhouse. LAs worked with different partners to deliver the scheme including managing partners, energy efficiency or service companies, foundations and charities, social housing providers and other LAs. No single delivery model adopted by LAs during the Scheme stands out as clearly being the most successful, although short timeframes for Scheme

delivery largely dictated delivery models adopted by LAs in Phase 1 and Phase 2. LAs were unable to conduct lengthy procurement processes, leaving many reliant on existing supplier relationships to manage and deliver the Scheme. In about half of cases, LAs surveyed worked with an installer to manage and deliver Phase 1, with a similar proportion partnering with installers in Phase 2, while a quarter opted to work with a management company across both Scheme phases.

Phase 2 funding was distributed from the Hubs using delivery models, ranging from highly centralised, where Hubs were responsible for almost all delivery management, to devolved models where LAs took on a majority of responsibility. LAs generally expressed positive views about their experience, with two thirds of survey respondents saying it was easy to work with Hubs. Half of LAs surveyed that participated in Phase 1 and 2 of the Scheme preferred the Hub model, compared to a quarter who preferred the Phase 1 approach. However, some LAs also experienced delays in decision making and had difficulties coordinating or communicating with a Hub.

1.3.3 Identification of eligible homes

EPC data was the key mechanism, used by around nine in ten LAs, to identify suitable properties, although Phase 1 EPC requirements (properties below a D rating) made it challenging to identify eligible households. EPC requirements were relaxed in Phase 2 to include D rated properties but the maximum cap of 50% on the number of D rated properties left some installers waiting to work while LAs identified qualifying E-F rated properties. LAs targeted owner-occupied homes the most (three-quarters of LAs), compared to just under half of LAs targeting those living in private rented accommodation. LAs experienced challenges identifying and engaging private landlords and found the financial contribution deterred landlords from participating, leading some LAs to avoid targeting these properties altogether.

Eligibility requirements and engaging households were the main challenges expressed in relation to identifying suitable households. Around half of LAs had difficulty assessing whether installations would be viable within the cost cap or had difficulty confirming household eligibility based on income, while a quarter of LAs said they had issues with community engagement. Further difficulties arose when LAs requested documents proving eligibility, with some households reluctant to share financial information. Despite challenges identifying eligible homes, the evaluation found that the Scheme was effective at reaching fuel poor households, with three quarters (76%) of participating households likely to be fuel poor prior to installations.

1.3.4 Barriers to delivery

This evaluation has identified a number of barriers to delivery that affected the Scheme's success. Timeframes were a significant challenge for LAs and installers throughout. LAs had limited time to prepare for the Scheme (e.g., building capacity to deliver, engaging local supply chains, onboarding new suppliers to procurement frameworks) and make changes to delivery models during Phase 2. Repeated extensions to the Scheme created logistical challenges for LAs and installers scaling up work effectively.

Requiring PAS 2030/2035 (where applicable[4]) and TrustMark certification, although improving outcomes on installation quality, increased delivery costs, which largely limited households to one measure under Scheme cost caps. BEIS made no adjustments to cost caps to accommodate material and labour cost inflation during the Scheme, making it harder to deliver measures within the cost caps. LAs working to a £10,000 cap per property typically found they could only install one measure, but some LAs were able to install more expensive or multiple measures in properties by averaging costs to £10,000 per household. Supply chain capacity issues were also a barrier to delivery. Installers interviewed felt some LAs lacked understanding of local supply chain capacity to deliver the number of planned measures and expressed frustration at being unable to join LA procurement frameworks, limiting their direct engagement with the Scheme. LAs surveyed also reported challenges related to installer capacity (64%) and issues with supply chains (41%).

1.3.5 Engagement of households

The LAD Scheme was relatively successful at engaging homeowners and social housing landlords, but less so for private landlords. Based on monitoring data available for 32,907 households that applied to the Scheme, 70% were owner occupied homes, 22% were owned by social landlords/housing associations and 1% were private rented. In general, homeowners, tenants and landlords found it easy to apply for and participate in the Scheme, although some private and social housing landlords had difficulties getting their tenants to engage with the Scheme. The evaluation did not engage eligible households who did not participate, so there are some potentially unknown factors that might have deterred people from participating.

Households were mainly financially motivated to participate, with 84% citing saving money on energy bills and 53% citing the free/reduced cost installation. Private landlords, housing associations and social housing providers recognised the benefits that measures would have for their tenants but were also highly motivated by expected future legislation on minimum energy efficiency standards of EPC E housing stocks. Large social housing providers with substantial stocks of low-quality accommodation financially rely on initiatives like LAD to upgrade housing stock EPC ratings in line with their internal net zero targets.

1.3.6 Energy efficiency installations delivered

The Scheme delivered to almost three quarters of the expected numbers of households but only delivered a quarter of the expected number of measures.

Solar photovoltaic panels (Solar PV) and insulation (led by solid wall insulation) were by far the most common measures installed and exceeded the proportion of overall measures expected to be delivered. Fewer measures of all other types were installed compared with expectations.

[4] PAS 2035 may not have been required for all projects under Phase 1 or Phase 2 of the Scheme. Some LAD phase 1 projects were allowed to comply with PAS 2030:2017, with the transition period to the new PAS 2030:2019 / 2035:2019 standards extended for LAD Phase 1 until 31 October 2021. All other projects for funded schemes had to comply with PAS 2030/2035:2019 from July 1st onwards. More information can be found at: https://www.gov.uk/government/publications/changes-to-pas-20302017/changes-to-pas-20302017

LAs said they mainly chose measures based on their suitability for their housing stock, that met the cost cap of £10,000 per household, and allowed them to achieve a higher EPC rating.

Interviews and surveys with LAs and surveys found that increasing costs for materials and labour for the scheme made it difficult to deliver multiple measures under the scheme's cost cap. Two thirds of LAs surveyed said that the cost of materials was a key challenge during delivery. LAs that were interviewed, alongside corroborating evidence from installers interviewed, said that the cost cap was too low to install multiple measures and that rising costs in materials made further exacerbated this issue. LAs interviewed, when asked why fewer measures were installed than expected, said that a lack of households who wanted specific measures or who were eligible for measures were also major barriers to delivery. One third of LAs cited delays in the Scheme (both delays from BEIS, and their own delays), as the reason for under-delivery whilst a quarter highlighted short timescales. Issues with procuring installers was also cited by LAs as another reason for under-delivery. More information on barriers to delivery can be found in Chapter 6.4.

1.3.7 Installer willingness to participate in the Scheme

Installers expressed great willingness to participate in the Scheme despite challenges (see below), although they described a gap between their willingness and capacity to participate. The LAD Scheme provided guaranteed revenue for installers during COVID-19 related financial difficulties, providing strong motivation to participate. However, installers not on LA procurement frameworks were unable to bid for work, meaning many installers were subcontracted by organisations on these frameworks to install measures for the Scheme, sometimes at prices that were not considered economically viable, leading installers to turn down work. Some installers also lacked qualified administrative staff capable of bidding for work on the Scheme, which disadvantaged them against companies with specialist project management functions when submitting bids to LAs.

Installers and industry organisations highlighted that a lack of skilled labour capacity is an industry wide issue affecting their ability to meet the demand created by Schemes like LAD. Industry representatives considered PAS 2030 / 2035 standards as positive requirements but also noted that they could be barriers to participation for uncertified installers due to the time it takes to become certified or proficient in the standard. Industry organisations considered the number of available qualified installers to be relatively static, an issue that was further compounded when Schemes competed for the same pool of labour. Repeated extensions to the LAD scheme also created capacity issues as installers redeployed resources and labour from other jobs to scale up and meet new demand.

1.3.8 Costs of LAD to stakeholders

Over half of LAs surveyed said they incurred some costs not covered through the scheme, with half of these respondents incurring additional costs of up to £25,000. There is relatively little evidence to suggest installers incurred additional direct costs, although based on the limited evidence available from interviews with installers, it is possible that they incurred some minor additional indirect costs due to inflation of equipment and material costs.

1.3.9 Fraud and Non-compliance

In general, the evaluation does not have sufficient evidence to suggest whether there was fraud or non-compliance in the Scheme. The processes to manage fraud and non-compliance were insufficient (see Chapter 6.8.2 for more detail), and there have been problems with data collection throughout the Scheme. It has been challenging to reconcile data provided by BEIS, LAs and TrustMark to conclusively identify any evidence or absence of fraud and/or non-compliance.

1.3.10 Consumer experience

Overall, households receiving measures were generally satisfied with their experience of installation and the outcome of the measures installed. Over three quarters (77%) of households surveyed said they were satisfied with the measure installed. Households expressed high levels of satisfaction about aspects of the installation process such as time taken to complete the installation (79%), level of disruption (76%), quality (76%) and suitability of the measure (72%). Some households were dissatisfied with the measure installed, particularly those living in social or private rented accommodation who had little input into the type of measure installed. Few households reported issues during installation, although some households experienced a long wait between application and installation with limited communication about what was happening. Some households (33%) experienced damage or needed additional work after installation - typically needing to replace fixtures or redecorate. Few households experienced issues with the measure itself working correctly after installation (a total of 22%), although a larger proportion of households reported experiencing issues with air source (58%), or hybrid heat pumps (49%). At the time of the survey, two-thirds (67%) of households were still facing the reported issue, compared to the one-third (33%) who reported their problem had been resolved.

Households receiving measures reported improvements to the ability to heat their home, particularly amongst those living in properties with an EPC rating of G. After the Scheme 73% of those living in G rated properties (as modelled by BRE) said it was easy to heat their property, compared to 29% before the Scheme. Households interviewed about the effects of the measures installed reported a number of improvements to their property in terms of warmth and a generally more comfortable living environment.

1.3.11 Energy, carbon and bills savings

The Scheme was successful at delivering energy, carbon and bills savings (according to modelled estimates conducted as part of the evaluation). DESNZ's analysis of verified EPCs, extracted from the EPC register, found that, measures installed as part of the scheme increased the average SAP score by 16 points, taking the average home from the equivalent of an EPC rating E rating to a C after the installations. 76% of participating homes improved their EPC rating by at least one band as a result of the measures installed. In total, 52% (10,705) of homes with an initial recorded EPC certificate rating of D or below improved to EPC C or higher post-installation.

In BRE's modelled measure-specific analysis, wall (solid and cavity) insulation and Solar PV were the single measures responsible for the largest increases in SAP scores. Properties with three or more measures installed were modelled as having the biggest improvements in terms of energy, carbon and bills savings. Installing two measures had a similar effect to installing one measure in most observed cases.

Fuel poverty analysis found that the scheme was successful in targeting fuel poor households, with 76% of participants estimated to be fuel-poor prior to the GHG installations. Measures installed as part of the scheme likely resulted in half (52%) of these households being taken out of fuel poverty.

1.3.12 Influence of PAS 2035

Installers and industry organisations interviewed as part of this evaluation were positive about the effect of PAS 2035 on the industry and on the quality of measures installed by the Scheme, while acknowledging some issues. Installers felt that the high standards of installation required by PAS 2035 helped improve consumer confidence, and also helped gatekeep against unreputable installers which had previously caused problems within the industry. From the evidence available for this evaluation, it did not appear that the Scheme had a significant impact on the number of PAS 2030 certified installers or on the number of installers familiar with PAS2035, with many installers gaining certification or learning standards prior to the Scheme. Some installers were critical of the role of retrofit assessors' rigid application of PAS 2035 and questioned its appropriateness for a scheme which largely delivered single measures, which they felt unnecessarily increased installation costs. Although the evaluation was unable to access full monitoring and audit data on measures, installers and industry organisations interviewed believe PAS 2035 has contributed to ensure good levels of quality in the Scheme.

1.3.13 Effects of the Scheme in creating and supporting jobs

Installers and industry organisations acknowledged the economic importance of interventions like the LAD Scheme, especially as firms recovered from the impacts of COVID-19. In interviews with installers and installation industry organisations, there was agreement that the Scheme had, at a minimum, supported job retention and in many cases had supported a small amount of job creation, with many installers hiring new staff in a range of roles during the Scheme. However, installers and installation industry organisations also indicated that some jobs created through the Scheme were not permanent, with some installers releasing new hires after the Scheme ended. It was felt by installers and installation industry organisations interviewed that overall, the Scheme had been unsuccessful at increasing the industry skilled capacity long term. Interviews with installers also identified that PAS 2035 requirements helped to stimulate employment of new retrofit assessor and coordinators. According to installers, some new employment was only short term, although firms were usually able to redeploy new hires onto other projects. Installers reported that short term extensions to the Scheme did not give firms the confidence to invest in long term employment while short Scheme timeframes prevented some potential installers from wanting to invest in certifications like PAS 2030.

Overall, the Scheme had a positive impact on the turnover for participating firms, although industry representatives felt the Scheme could have had a greater long term economic impact if there was greater long-term certainty of funding. Installers surveyed indicated that the Scheme did contribute a large percentage of business turnover, and the industry consensus is that the Scheme kept many firms operational post COVID-19. However, inflation and inflexible Scheme pricing eroded installer profit during the Scheme. Mark-ups applied by firms sub-contracting work to installers also reduced profit, with some installers reportedly turning down sub-contracting work that was not economically viable. Scheme closure also limited the number of installations that installers were able to complete, with many installers reporting that they had to cancel work when the Scheme funding ended, because there was no onward funding to support continued installation work. These challenges limited the extent to which installers economically benefited from the Scheme.

1.3.14 Effects of the Scheme on building supplier confidence

While the LAD Scheme provided welcome economic stimulus, the industry felt that this specific scheme failed to increase confidence in the supplier market. Installation industry organisations and installers interviewed felt this was because the Scheme has not successfully addressed capacity issues within the industry and because the Scheme lacked a coherent central strategy. Overlapping government energy efficiency schemes meant there had been competition for the same pool of installers, which created instability in the market, meaning that, without a clear strategy, the industry was unsure of what was coming next. Some installers and industry representatives felt that the Scheme ended just as it had started to deliver effectively, and questioned why it was not planned to run for longer from the start.

Although some challenges could have been expected during set up and delivery, installers were frustrated to see similar mistakes recurring across different schemes. Installers interviewed felt the challenges outlined previously (short timescales for delivering schemes, short term extensions or stop-start Scheme phases, high material costs, sub-contracted work offered on unfavourable financial terms) limits short and long term job creation through schemes like LAD, and felt that these challenges had not been adequately addressed to ensure schemes supported the necessary expansion of industry capacity. Installers and industry representatives explained that the repetition of previous mistakes, as well as the challenges they experienced during the LAD Scheme, have weakened their confidence in the Government to deliver similar initiatives in future that are intended to drive demand and create more capacity within the industry.

Despite the challenges noted installers and industry organisations interviewed were confident that demand in the sector will continue to grow, with or without Government funding, and they consider it likely that the Government will continue to provide funding for the sector through other initiatives like LAD.

2 Introduction

In October 2020, the UK Department for Business, Energy and Industrial Strategy (BEIS) appointed a consortium led by Ipsos UK in partnership with Building Research Establishment (BRE) and University College London (UCL) to conduct a process and outcome evaluation of BEIS's Local Authority Delivery (LAD) Scheme. This report is the final evaluation report of the LAD Scheme. In February 2023, the Department for Energy Security and Net Zero (DESNZ) was established, transferring ownership of this report to the new department.

2.1 The LAD Scheme

In July 2020 the Chancellor announced a £3.05 billion package of Green Economic Stimulus Schemes targeted at creating jobs through the delivery of energy efficiency and low carbon heating measures in England.[5] The Green Homes Grant (GHG) represented £2 billion of this funding and targeted installations in homes in England.[6]

The GHG was formed by three packages of support which targeted different types of households:

- Green Homes Grant Local Authority Delivery Scheme (LAD), worth £500 million and distributed in two Phases of £200 million and £300 million, respectively, delivered by Local Authorities (LAs), in Phase 1, and LAs and Hubs, in Phase 2.
- Green Homes Grant Vouchers Scheme (GHG-Vouchers), worth £1.5 billion, was for any private homeowner (of any property type) for projects of up to £5,000 (or £10,000 for low-income homeowners) to cover up to two-thirds of the cost of investments to make their homes more energy efficient.
- Social Housing Decarbonisation Fund Demonstrator (SHDF(D)), worth £50 million to support social housing landlords to demonstrate innovative approaches to retrofitting social housing at scale. This programme upscaled the Whole House Retrofit (WHR) Innovation Competition (previously piloted by three LAs).

The GHG package was part of the Government's response to the economic crisis and was designed to help the country's green recovery from COVID-19 whilst also helping the most vulnerable households reduce their cost of living. Ultimately, the aims of the GHG suite of programmes were to save households money, cut carbon and create green jobs.

Whilst the GHG-Vouchers Scheme supported all households, the LAD Scheme specifically targeted low-income households, that is, domestic dwellings occupied by those with a combined annual household income of no more than £30,000. This included homes owned by private and social housing landlords, and privately owned. The Scheme supported the

[5] https://www.parliament.uk/business/news/2020/july/summer-economic-update/
[6] The Public Sector Decarbonisation Scheme makes up the remaining £1billion of funding under the Green Economic Stimulus Scheme

retrofitting of existing domestic dwellings which had an energy performance certificate rating of E, F or G (in Phase 2, some dwellings with rating of D were also eligible).

2.2 Evaluation objectives and scope

The process and outcome evaluation covered Phases 1A, 1B and 2 of LAD (see section "The LAD Scheme" for more information on the Phases). It had the following aims:

- Provide rapid evidence into how delivery of the Scheme was progressing and provide early insight into delivery of outcomes.
- Provide evidence to understand the barriers and opportunities experienced during delivery.
- Provide a summary of outcomes achieved by the Scheme, and how these vary across the Scheme.
- Draw out learning from the above to support the design of future, or follow-on initiatives and associated evaluation.

There was a particular interest in collecting evidence rapidly in late 2020 and early 2021 to inform the delivery of later phases of this Scheme and other initiatives. There was also a strong focus on understanding the impact of the GHG Schemes on the post-COVID economic recovery.

Separate evaluations were commissioned for the GHGVS and the (SHDF(D)).

2.3 Structure of this report

This report is the Final Evaluation Report, and it synthesises and analyses the evidence collected throughout the evaluation. It covers LAD Phases 1 and 2.

The remainder of this report is structured as follows:

- Methodology
- The LAD Scheme
- Process Evaluation
- Outcomes Evaluation
- Conclusions
- Technical annexes (in a separate report).

2.4 How to read this report

The findings in this report are presented in two chapters, one for the process evaluation and one for the outcome evaluation, followed by conclusions triangulating and synthesising the evidence from both evaluation elements.

The sections in each chapter are structured around the evaluation questions. Each section addresses one or more evaluation questions, which are stated at the beginning, together with information on the sources of information used to answer the question(s). Then, each section introduces the objectives sought by the LAD Scheme, followed by a summary of the evidence collected and the key findings, and finalising with a conclusion that answers the evaluation question(s) and the strength of the evidence this conclusion relies upon.

Some outcome evaluation questions have been assessed following a contribution analysis approach.[7] These sections also start by presenting the objectives sought at the outset and the key assumptions made by the Scheme to meet those objectives, as per the LAD Scheme Theory of Change. Then, the sections are structured around one or more key overarching hypotheses. Each hypothesis is the answer to the evaluation question in an ideal scenario, or in other words, if the Scheme was working as expected. Each hypothesis was assessed using a series of tests that analysed whether the Theory of Change stands true, the contribution of the LAD Scheme, and the contribution of other external factors to those results. To improve the readability of this report, the tests for each hypotheses have been condensed into a summary at the start of each section. These tests form a series of sub-sections which display evidence supporting or rejecting the overall hypothesis. A more detailed breakdown of the Contribution Analysis Framework is available in the Technical Annex, Annex 8.

[7] These sections are: “Influence of PAS 2035”, “Effects of the Scheme in creating and supporting jobs” and “Effects of the Scheme on building confidence across the supplier market”.

3 Methodology

This chapter provides an overview of the methodology deployed to conduct this evaluation. It includes an outline of the approaches used per evaluation task or strand, as well as a description of the data collection methods employed. More detailed descriptions are included in the methodological annexes.

3.1 Overall approach

The evaluation has followed a mixed-methods approach, underpinned by the Theory of Change developed during the scoping phase of the evaluation (see section "LAD Theory of Change"). The terms of reference for the LAD evaluation included a series of evaluation questions that were refined and further developed into an Evaluation Question Matrix (EQM), available in Annex 2.

The evaluation was divided into two main strands:

- A Process Evaluation to assess the delivery of the LAD Scheme, including the reach of the Scheme, the scale and nature of the measures installed, as well as the barriers and enabling factors influencing the delivery of the Scheme.
- An Outcomes Evaluation to assess the experiences of consumers and landlords participating in the Scheme, the energy, carbon and bills savings achieved, and the effect of the Scheme on the installer market and their supply chain.

3.1.1 Process evaluation

The process evaluation assessed the delivery mechanisms used in LAD, the experience of households, the type of energy efficiency installations delivered, the installers' willingness and capacity to participate in the Scheme, and the costs of LAD. For each of these themes, the evaluation team used slightly different approaches, but all based on assessing the lines of enquiry that were set out in the EQM (see the Technical Annex, Annex 2 for more information).

Towards the end of the delivery of the LAD Scheme, it became apparent that the Scheme was delivering fewer installations than originally anticipated, and BEIS expressed a need to obtain insights into why this was the case. In response, the evaluation team developed a framework, inspired in Process Tracing, to provide an assessment of which factors, and in what measure, were influencing under-delivery (see the Technical Annex, Annex 9).

3.1.2 Outcomes evaluation

The evaluation used four main approaches to assess outcomes:

- Evaluation of the **experience delivered for consumers and landlords**, and how this was influenced by the Scheme design. We analysed the households' consumer journey, and the benefits perceived by households.

- Evaluation of **environmental impacts (energy efficiency and carbon savings) and bills savings** associated with measures installed in homes**.** We conducted a quantitative assessment of the energy efficiency improvements achieved by the measures installed through LAD via BRE's BRESMI model, using modelled pre and post-installation EPC ratings for all homes. We used this assessment to generate conservative modelled data on annual energy demand, carbon emissions, and energy bills for each of the dwellings before and after the measures were installed based on a sample of 2,005 cases. For more information on this model, see the Technical Annex, Annex 10.
- Evaluation of **outcomes for installers and their supply chain.** Several evaluation questions covered market outcomes and explored long-term outcomes. As there are multiple external factors that may influence results, and to better understand the role of LAD in achieving results, a Contribution Analysis (CA) approach was used. For more information on this approach, see the Technical Annex, Annex 8.
- Evaluation of the scheme's **targeting of properties in EPC Band D or below**, and the effect of the scheme on **property SAP scores and EPC ratings**. Linked to this, the effect of the scheme on **targeting those in Fuel Poverty** and **moving them out of Fuel Poverty**. DESNZ used a quantitative approach to analyse the proportion of households likely to be fuel poor before and after the measures were installed, using a sample (n=1,055) derived from scheme installation data, new pre and post-installation EPCs confirmed from the EPC register[8] (henceforth referred to as 'verified EPCs'), and income data from the evaluation's household survey. This analysis was completed by DESNZ in February 2024, using data available after Ipsos and BRE's initial analyses. For more information on this approach, see the Technical Annex, Annex 16.

3.2 Data collection methods

This evaluation used a mixed-method approach to answer the evaluation questions, drawing upon the following data gathered throughout the evaluation. More information on data collection methods can be found in the Annexes 4, 5, and 6.

Qualitative data collection methods

Qualitative data collection methods used in this evaluation include in-depth, one-hour interviews, as well as short 30-minute interviews and workshops. Qualitative research was carried out in three Phases:

- The first Phase was conducted between December 2020 and March 2021, a few months after the start of the Scheme. It included fieldwork with the following stakeholders:

[8] EPC Register open data - https://epc.opendatacommunities.org/

  - 11 interviews with LAs
  - 8 interviews with Households
  - 6 interviews with Installers
  - One interview with Trustmark
  - One workshop with BEIS.
- The second Phase of qualitative research was conducted between October and November 2021, approximately a year after the Scheme started, and a few months after the start of Phase 2 of the LAD Scheme. This phase included:
  - 12 interviews with Hubs
  - 5 interviews with Installers.
- The third Phase of qualitative research was conducted between August 2022 and March 2023, approximately around the time that Phase 2 of the Scheme as concluding. This wave included:
  - 10 interviews with LAs
  - 7 interviews with Landlords
  - 7 interviews with Installers
  - 2 interviews with 6 participants from BEIS
  - 3 interviews with representation organisations of the installation industry.

Quantitative data collection methods

We conducted surveys of three audiences:

- Households: two waves between September 2022 and February 2023, with 2,938 responses in total
- LAs: one wave in February 2023, with 58 responses from 57 LAs
- Installers: two waves between October 2022 and February 2023, with 46 responses in total.

All the surveys were conducted in the last phase of the evaluation once the measures had been installed or were near completion. It is important to note that although some surveys (installers and households) were run across two waves, the waves reached out to different participants, and they were not longitudinal.

3.3 Limitations of the evaluation

The evaluation was subject to some limitations in the methodology used and the information available which need to be recognised, as they affect the strength of evidence of this report:

- It was not within the scope of the evaluation to develop a full cross-scheme analysis of deadweight (i.e., the extent to which the programme spend was additional, or

consumers would have installed measures anyway). However, the likelihood of households installing measures or LAs running similar initiatives, without the Scheme, is assessed through the qualitative research.

- Given the low response rates from the surveys of LAs and installers, the sample is not representative of the entire population of LAs and installers taking part in the LAD Scheme. This needs to be taken account in all findings using this data source.
- There were some stakeholders taking part in some stages of the LAD Scheme or benefited by the Scheme that we could not interview due to lack of resources. This includes eligible households who decided not to take part in LAD in order to understand their reasons not to do so, companies managing LAD on behalf of LAs, and installers' suppliers. Their views would have complemented those provided by other audiences and would have helped to build a more robust and complete narrative of the effectiveness of the Scheme. The lack of interviews with installers' suppliers also meant that the evaluation has not been able to assess the economic benefits of LAD for the supply chain, beyond installers.
- There were significant limitations to the available Scheme monitoring information:
    - (i) data was collected by LAs and reported to BEIS, and not all LAs interpreted the template in the same way or completed it to the same level of detail;
    - (ii) the databases required extensive cleaning and QAing by BEIS against external sources before sharing with the evaluation team, and still presented inconsistencies despite this;
    - (iii) the iterative nature of this cleaning and QA resulted in discrepancies and communication difficulties across the different database versions shared with the evaluation team;
    - (iv) data on the activity carried out by retrofit assessors/coordinators and data on audits of the measures installed under LAD was not available.
    - (v) improved data on properties was only available well after all analysis was complete, and was restricted to EPCs, necessitating that DESNZ conduct revised analysis limited to a small number of outcomes affected by this data.
    - The evaluation team therefore had to work with data that was incomplete and that was not fully reliable. This overarching data quality issue substantially limits the strength of evidence of the evaluation, and this applies to all evaluation strands and evaluation questions.[9]
- Assessing the ease or difficulty of heating homes before and after retrofit installations based on both quantitative and qualitative data collected post-installation can pose challenges. The accuracy of such comparisons may be compromised due to a variety of factors. These include participants' memory recall biases, post-improvement bias, and

[9] Throughout this report, we have flagged where there are limitations with data used, or insufficient data to provide assessment, and the extent to which this affects findings within that section.

subjectivity in responses, particularly when respondents are asked to retrospectively recount their earlier experiences.

- Due to the limitations with scheme monitoring information, there is not a single, comprehensive source of pre and post-installation EPC data for properties treated under the scheme, so we and DESNZ have had to review and use multiple datasets and methods throughout the lifetime of this evaluation.
    - Pre- and post-installation EPC data was not available for many homes at the time of the evaluation analysis. It was therefore necessary for BRE to model the energy efficiency of the homes based on the limited data available from other sources and impute values using statistical modelling techniques, and this modelling has been retained for the modelled energy, carbon and financial savings outcomes analysis. Limitations with the simplified model meant that it was not possible to model the impacts of heat pumps, storage heaters, underfloor insulation, doors and draughtproofing. These modelling limitations mean that the impact of these particular measures could not be modelled. As a result, the reported savings underestimate the actual savings achieved in homes that had these measures installed. However, BRE were able to model the impact of the measures installed in the vast majority of homes and, overall, 82%, of the measures installed were modelled so the overall extent of the underestimation is likely to be limited.
    - GHG LAD official Statistics for England[10], (released after the initial evaluation modelling) include pre and post installation EPC band ratings for the participating homes, supplied by Local Authority scheme managers. The data show that, for properties where LAs supplied complete EPC data (29,023), around 58% of homes moved from a band D or below to a band C or higher as a result of the installations.
    - By contrast, in the evaluation's analysis of properties that had verified EPC register data pre and post-installation (21,644), only 52% of homes were found to have moved from below a band C to above.
    - Unlike with the modelling approach, the use of EPCs reduces the attributability of changes resulting directly from measures installed under LAD 1&2. They cannot detect any additional privately-funded energy efficiency measures that were installed between the assessments either side of the LAD 1&2 installation, and this may systematically overstate impact. The verified EPCs are taken from up to 5 years preceding the installation, and the LA-supplied EPCs have no associated date. The likely extent of this confounding is reduced due to the scheme's original policy intent (that these lower income households are much less likely to self-fund energy efficiency measures with high levels of impact to EPC), but DESNZ could not quantify or control for this.
    - Because complete data is not available for all households in either dataset, and DESNZ have no evidence that the distribution of missing data in either dataset is

[10] Green Homes Grant Local Authority Delivery (LAD) and Home Upgrade Grant (HUG) release, February 2024

purely random, they cannot directly account for the difference between these two metrics. DESNZ ultimately chose to use the EPC register data for this evaluation's EPC and Fuel Poverty outcomes analyses because it uses confirmed EPC certificate data rather than being self-reported by Local Authorities.

- For the measure-specific impact analysis, limited information was available regarding what energy performance measures were present prior to the installations, and exactly which were installed as part of the scheme. Based on the data available at the time and the categories available in their simplified model, BRE made assumptions regarding what was already present in the home and what was installed. These assumptions were based on the data available about the dwelling prior to the installations and were underpinned by EHS data on existing energy measures within the social housing stock. The discrepancy between the modelled findings and the published statistics suggests these assumptions may have been conservative for some measures. It is possible that these assumptions may have resulted in an overestimation of the energy efficiency of the homes before the installations and/or underestimation of the impact of some measures.

These limitations and their consequences are explained in more detail in the Technical Annex, Annex 10.

4 The LAD Scheme

4.1 Policy background and overview of LAD

England has had successive fuel poverty strategies since 2001, when the UK Fuel Poverty Strategy was issued.[11] When the LAD Scheme was launched, the statutory commitment was "*to ensure that as many fuel poor homes as is reasonably practicable achieve a minimum energy efficiency rating of Band C, by 2030*".[12]

Meeting this commitment was one of the principles contributing to LAD's objectives. As such, the LAD Scheme aimed to raise the energy efficiency of low income and low energy performance homes; that is, those with energy performance certificate (EPC) ratings of E, F or G (although Band D is also in scope in Phases 1B and 2), including off-gas grid homes. A 2017 analysis found that 31% of household carbon emissions generated in the UK derive from domestic heating, and that a 95% reduction in household carbon emissions is needed to meet the UK's net zero target.[13]

LAD aimed to fund as many projects[14] as possible to support a green recovery in response to the economic impacts of COVID-19 and to help take low-income families out of fuel poverty. The key objectives of LAD were:

- Tackling fuel poverty by reducing energy bills for low-income households by improving the energy efficiency of their home.
- Delivering cost effective carbon savings to carbon budgets and progress towards the UK's target for net zero by 2050.
- Supporting economic resilience and a green recovery in response to the economic impacts of COVID-19, creating thousands of jobs.
- The phasing out of the installation of high-carbon fossil fuel heating and reducing emissions and improving air quality.
- Building the capacity of LAs and supply chains to deliver energy efficiency at scale by utilising the role of Local Net Zero Hubs.

The jobs created by LAD would be in the energy efficiency and low-carbon heat retrofit market including installers of measures such as solid wall, under-floor, cavity wall and roof insulation; air-source and ground-source heat pumps; solar thermal heating; biomass pellet boilers; double and triple glazing; energy efficient doors and hot water tank thermostat and heating

[11] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/42608/1441-govtresp-warm-front-eligibility.pdf
[12] https://www.gov.uk/government/publications/cutting-the-cost-of-keeping-warm
[13] https://energysavingtrust.org.uk/significant-changes-are-coming-uk-heating-market/#:~:text=Energy%20Catapult%20Analysis%20shows%20that,to%20692%20kg%20CO2%20annually.
[14] Projects are defined as the delivery of successful bids submitted by a single LA or consortia. There can be more than one project per LA if an LA is delivering alone, and as part of a consortium.

controls. Jobs could also be supported or created in the supply chains associated with these measures.

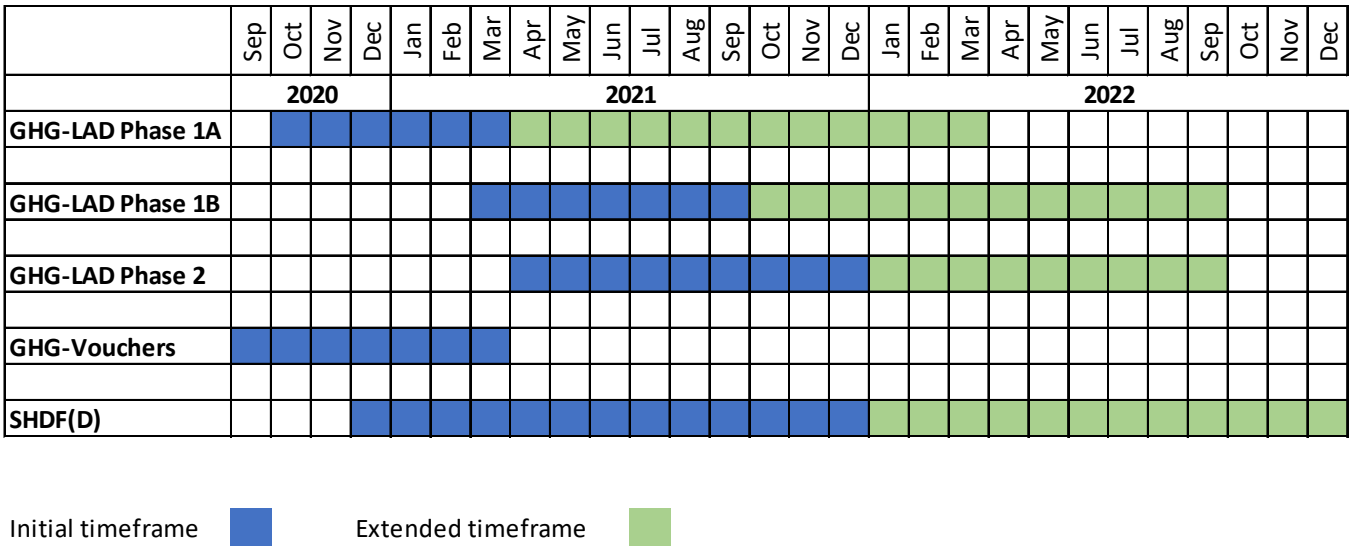
The LAD delivery mechanism was designed to provide funding to LAs and the five Hubs[15] which were responsible for delivering the installation of energy efficiency measures. LAD was delivered through two Phases:

- Phase 1 planned to allocate £200m in grants to LAs for delivery between October 2020 and March 2021. It was forecast that between 15,000 and 20,000 homes would be upgraded. However, due to lower than expected applications from LAs, both in terms of number of applications and ambition on number of homes that would be upgraded, it was decided to divide Phase 1 into two Phases, Phase 1A and Phase 1B, to provide LAs with more opportunities to use LAD to upgrade homes. The timeframes for delivery were also extended to provide more flexibility to use the funds and conduct installations. Both Phases 1A and 1B were extended to March 2022, with one additional month flexibility enabling a managed closure of projects by 30 April 2022 where required. In exceptional circumstances, LAs were allowed to submit recovery plans for Phase 1B, which further extended delivery time to September 2022.
- Phase 2 allocated £300m to the five Hubs,[16] that worked with their regional LAs to continue to deliver energy efficiency upgrades to up to 30,000 homes across England to those most in need. It was initially planned to run until December 2021, but the timeline was then extended to September 2022.

The LAD Scheme started at a similar time to the government funded GHG-Vouchers and SHDF(D) initiatives, running concurrently for several months. LAD and SHDF(D) were led by LAs, which identified and engaged eligible households, in the case of LAD, or housing associations, in the case of SHDF(D). GHG-Vouchers, on the other hand, was consumer-led, offering homeowners the opportunity to apply for up to £5,000 funding (£10,000 for low-income households) to install energy efficiency and low carbon heating measures in their homes. The objectives of the three initiatives were similar, but they focused on different types of households: GHG-Vouchers was open to any household, LAD focused specifically on the least efficient housing and households that were at risk of fuel poverty, and SHDF(D) targeted social housing only. All three initiatives aimed to provide stimulus to the installer market and covered similar energy efficiency and low carbon heating measures, and as such, they drew on the same supply chain to an extent.

[15] Hubs are regional points of expertise and coordination on energy issues. They are a collaboration of Local Enterprise Partnerships (LEP), working together to increase the number, scale and quality of local energy projects delivered across England.
[16] North East, North West, Midlands, South East, South West

Figure 1. LAD, GHG-Vouchers and SHDF(D) Timeframes



The use of different delivery models[17] in Phases 1 and 2 of the LAD Scheme was designed to (a) take advantage of LAs' existing supply chains in Phase 1 of the Scheme, and therefore mobilise quickly; and (b) work through Hubs in Phase 2 to build capacity amongst LAs that had limited capacity in this field. LAs used a variety of approaches including different management and delivery models; a range of methods of identifying households (likely to be) eligible for the Scheme and publicising the Scheme; the mix of private and social housing stock covered; varying offers in terms of the measures being installed and the way in which LAD was blended with other funding to increase the maximum value of installations per household;[18] and the degree to which households input into the package of measures installed in their homes.

Table 2. Key differences between Phases 1 and 2 of LAD

Characteristics	Phase 1	Phase 2
Funding available	£200m	£300m
Funding award mechanism	Competitive bidding from LAs	All Hubs were funded but the amount depended on the proportion of eligible homes in each region
Funding award date	October 2020 for Phase 1A; March 2021 for Phase 1B	March 2021

[17] "Delivery models" refer to the different ways LAs were organised and delivered installations under the LAD Scheme. For example, some LAs delivered the installations in-house, while other subcontracted external partners. Further information on the delivery models is provided in Chapter 5.2.

[18] While the maximum cost of measures per household is set at £10,000 from LAD funding, LAs can provide matched funding and/or combine funds from other schemes such as ECO or the Renewable Heat Incentive. In some instances, LAs (or their sub-contracted delivery agents) provided a one-stop advice service for home improvements that covered LAD as well as other services.

Characteristics	Phase 1	Phase 2
Installation dates	September 2020 to August 2021 for Phase 1A; December 2020 to September 2022 for Phase 1B	April 2021 to September 2022 (with some exceptions allowed to carry out installations by December 2022)
Delivery model	LAs contract delivery partners or installers directly to deliver projects that have already been identified by LAs	Hubs fund LAs and/or delivery partners to identify new projects and install measures
Household eligibility	Homes on and off the gas grid; Low-income households[19] receive installations costing an average of £10,000 per property (with no installation costs incurred by the household); Landlords of low-income households must contribute at least a third of the installation costs, with the average subsidy cost for properties not exceeding £5,000	Homes on and off the gas grid; Low-income households receive installations costing an average of £10,000 per property (with no installation costs incurred by the owner-occupier); Landlords of low-income households must contribute at least a third of the installation costs, with the average subsidy cost for properties not exceeding £5,000
Dwelling eligibility	Phase 1A: Dwellings with EPC rating E or below Phase 1B: Dwellings with EPC rating D or below. Properties with rating D were capped at 50% of all properties benefiting from the Scheme in a given LA	Dwellings with EPC rating D or below. Properties with rating D were capped at 50% of all properties benefiting from the Scheme in a given LA
Installer certification	MCS certification Phase 1A: Trustmark registration was recommended. LAs who did not plan to use it had to notify BEIS. Phase 1B: PAS 2030:2017 required, Trustmark registration recommended. From October 2021, PAS 2030:2019	MCS certification PAS 2030:2019 certification, PAS 2035 compliance, and Trustmark registration required.

[19] Low-income households were defined as households earning below £30,000 a year. This requirement was made flexible for households in London.

Characteristics	Phase 1	Phase 2
	certification and PAS 2035 compliance required.	

The design of the GHG Schemes was informed by the lessons learnt from previous initiatives to fund energy efficiency improvements in homes. These included improvements on the design and implementation of the Green Deal, for instance on the need for high-quality installations. As a result, the GHG Schemes incentivised the industry to move towards PAS 2035 compliance. Because LAs were using existing supply chains in order to speed delivery, PAS 2035 was not a requirement for installers in the initial stages of Phase 1 and was introduced as a requirement for Phase 1B and Phase 2 installations from October 2021. The requirements for each Phase were as follows:

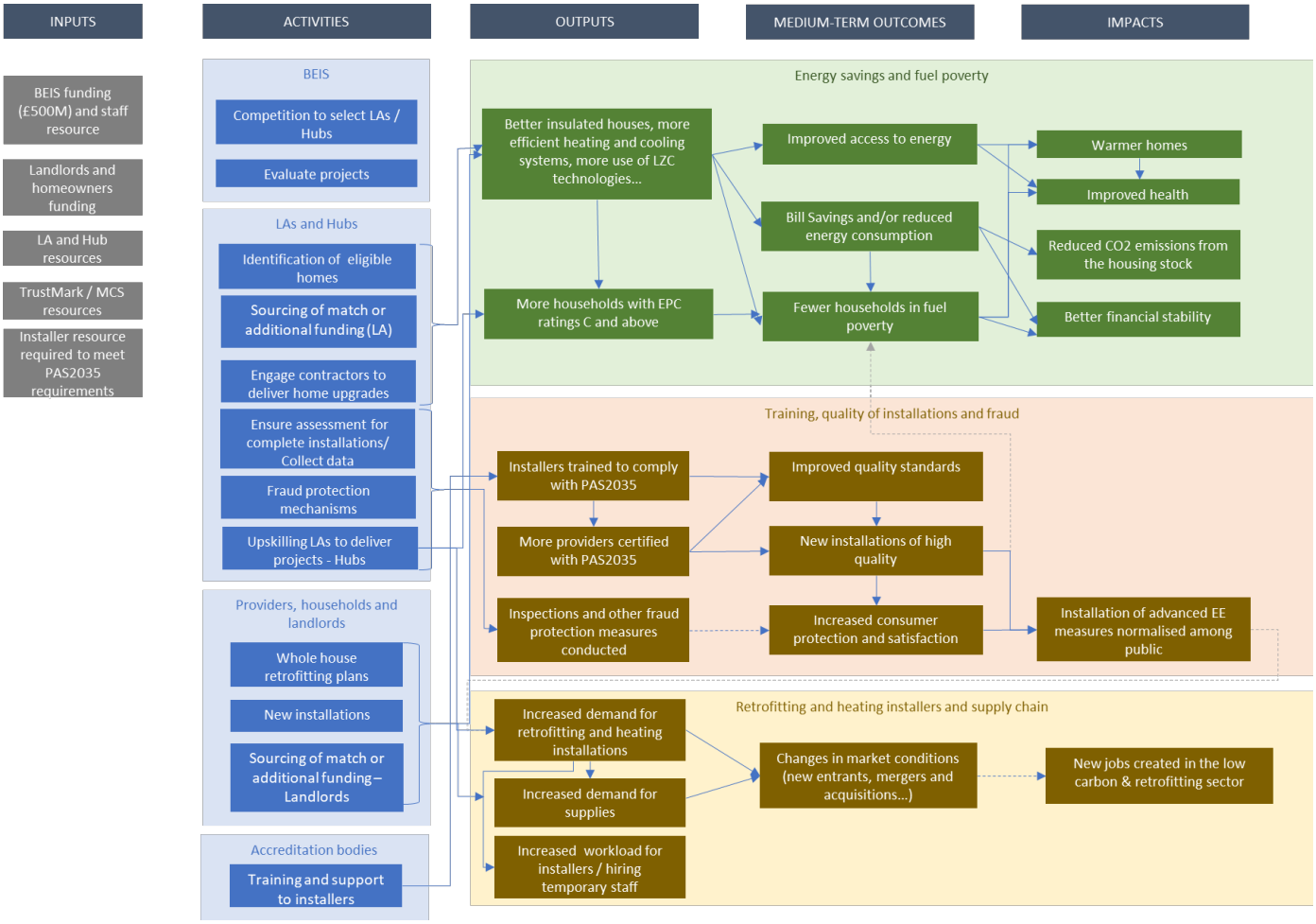
- Phase 1A: There was no specific requirement for PAS, but MCS certification was required to install low carbon measures for all Phases of the Scheme. LAs not using TrustMark registered installers were required to specify how they would ensure good quality work would be undertaken, and the steps taken to ensure consumer protection and consumer redress.
- Phase 1B: Initially, installers were required to be certified to PAS 2030:2017 for LAD measures. Following the extension of the delivery timeframe of Phase 1B, PAS 2035 requirements were introduced, with all Scheme installations completed after 31st October 2021 required to be delivered in accordance with PAS 2035 by installers certified to PAS 2030:2019 for energy efficiency measures and certified to MCS standards for all low carbon measures.
- Phase 2: All installers were required to be TrustMark registered,[20] certified to PAS 2030:2019 for energy efficiency measures and certified to MCS standards for all low carbon measures. Businesses delivering energy efficiency measures within the scope of PAS 2035:2019 and PAS 2030:2019 had to be certified to PAS 2030:2019 and comply, and be able to evidence compliance, with both PAS 2035:2019 and PAS 2030:2019.

4.2 LAD Theory of Change

The evaluation followed a theory-based approach underpinned by a Theory of Change, which was developed by the evaluation team in consultation with BEIS during the scoping phase of the evaluation.

Figure 2. LAD Evaluation Theory of Change

[20] Or part of a scheme that the Secretary of State is satisfied is equivalent to TrustMark.



The Technical Annex, Annex 8 provides additional detail regarding contribution pathways which are not presented in the Theory of Change (Figure 2) to avoid over-complication.

The Theory of Change (Figure 2) developed for the LAD Scheme outlines how the inputs and resources employed for the design and delivery of the programme were expected to deliver medium-term outcomes and impacts. As set out in the figure, the key inputs employed as part of the Scheme included financial resources from BEIS, landlords and homeowners, as well as technical and human resources from LAs and Hubs. These key inputs were employed to finance and support the delivery of key activities, including:

- The management and delivery of the competition organised by BEIS as well as the evaluation of projects to select eligible LAs and Hubs.
- Activities to promote and secure the engagement of contractors to deliver home upgrades.
- Assessments for complete installations and data collection activities.
- Development of fraud protection mechanisms.
- Developing whole house retrofitting plans and delivering new installations.

These activities were expected to realise several outputs, medium-term outcomes and long-term impacts, and the evaluation has assessed the extent to which the Scheme is delivering each of these. The key target outcomes which the evaluation has assessed include:

- The Scheme delivers energy (bill and carbon) savings to participating households.
- The Scheme contributes to reducing the number of households in fuel poverty.
- The requirement for installers to be registered on TrustMark (PAS 2030/2035) contributes to (a) ensuring good quality of installations and improving standards, and (b) improving consumer protection and satisfaction.
- The Scheme supports and creates jobs in the retrofitting and low carbon heating installers sector and their supply chain.

Although not an explicitly stated objective of the Scheme, it was expected to signal a sustained (long-term) increase in demand for retrofit and low carbon installations, which would lead to an increase in the offer of installations (i.e., more jobs), without increasing their price.

4.3 Participation of LAs in the Scheme

Almost all LAs in England (93%) have participated in at least one Phase of LAD. In Phase 1, 233 LAs participated in the Scheme, increasing to 303 in Phase 2. In Phases 1A and 1B, some LAs applied in consortia formed by several LAs, with one leading. There were 56 successful applications in Phase 1A, and 81 in Phase 1B. As indicated above, Phase 1 had an allocation of £200 million of funding that was split across Phases 1A and 1B, and across LAs. The amount of funding allocated to each LA or consortium of LAs varied significantly, ranging from £250,000 to £11.7 million, indicating the different funding needs depending on the size and complexity of housing stock across the LAs and LA consortia.

In Phase 2 of the Scheme, with a total allocation of £300 million, the funding was distributed among the five Hubs (North East, North West, Midlands, South East, South West), as shown in Table 3 below.

Table 3. Funding allocated to Local Net Zero Hubs in Phase 2 of the LAD Scheme

North East	North West	Midlands	South East	South West	Total
£53.2 m	£52.8 m	£61.2 m	£79.6 m	£53.2 m	£300 m

4.4 Low carbon heat and energy efficiency measures installed

The LAD Scheme (Phases 1 and 2) allowed LAs to apply for grants to provide energy efficiency and low-carbon heating home improvements. Any measures compatible with the Standard Assessment Procedure (SAP) that would help improve EPC Band D, E, F or G rated

homes could be installed under the Scheme (with the exception of fossil fuel heating). This included various forms of insulation such as cavity wall, external solid wall, internal solid wall, loft, pitched roof, flat roof, room in roof, under-floor (solid floor), under-floor (suspended floor), and park home insulation. Heat pumps have also been installed within the Scheme, including air source, ground source, and hybrid heat pumps, as well as biomass boilers, solar thermal systems, and electric storage heating replacements.

In addition, the LAD Phases 1 and 2 have implemented various measures to upgrade and improve heating controls, hot water tank insulation, hot water tank thermostats, and electric storage heating upgrades. Double or triple glazing, draught proofing, and external energy efficient doors have also been installed, along with energy efficient windows and secondary glazing. Solar PV has been implemented, as well as energy efficient lighting.

According to the statistics released by BEIS, the Scheme resulted in the installation of 49,824 measures.[21] The monitoring information that the evaluation team holds, however, is incomplete as it only includes 43,195 energy efficiency and low carbon measures installed in 30,441 homes. There is therefore a difference of 6,629 measures for which the evaluation team did not hold monitoring data. These measures have not been included in our analysis.[22] For a more in-depth analysis of measures installed, see section “Energy efficiency installations delivered”.

[21] Official statistics can be accessed here: https://www.gov.uk/government/collections/green-home-grant-statistics
[22] The scheme data analysis is based on the “final” Scheme dataset from November 2022, which did not contain information for all Scheme measures installed. There were challenges throughout and after the Scheme with data collection and data sharing, which have been discussed in the ‘Management of fraud and non-compliance’ section of this report. BEIS have reconciled this dataset with Local Authorities to improve the accuracy of the dataset, but this version was not available for this evaluation. There is no evidence to suggest that the measures that were not included in the dataset differed from the rest of the measures in the dataset.

5 Process Evaluation

This chapter presents the results of the process evaluation of LAD Phases 1 and 2. It covers all the processes and design elements of LAD, from the application by LAs to participate in the Scheme through to selection of households, recruitment of installers, installation of measures and monitoring of the Scheme. Each section is preceded by an introduction which states the evaluation question(s) the section answers.

5.1 Participation of Local Authorities in the Scheme

This section responds to the following evaluation question: 'How effectively are Scheme Leads (LAs and Hubs) able to submit applications and partake in the Scheme?'[23] The sub-section first discusses LAs' motivations for applying to the LAD Scheme, and it then discusses the LAs' experience of submitting their applications to the Scheme across both Phase 1 and Phase 2.

The LAD Scheme was open to all LAs in England and in order to participate, LAs had to submit an application summarising, among other things, the approach they would take to implement LAD, how they would identify and engage eligible households, and how they would procure installers. In total, 56 applications were received in Phase 1A and 87 in Phase 1B. In Phase 2, the applications were submitted through the five Hubs. Some LAs submitted their application individually, whereas others did it in a joint partnership. Therefore, one application does not correspond to one LA. All the applications submitted were accepted. As a result, 233 LAs participated in Phase 1 and 303 in Phase 2. Although there were not specific targets in terms of LAs that would participate, the objective was to reach as many as possible. A breakdown of applications submitted by individual LAs and in partnerships, per phase is shown in Table 4.

Table 4. No. successful applications submitted by individual LAs or partnerships, by phase

Type of application	No. successful applications in Phase 1A	No. successful applications in Phase 1B	No. successful applications in Phase 2
Single LA (either district, unitary or combined LAs)	41	57	118
Consortia / Partnerships	15	23	25

5.1.1 Motivations for participation

LAs interviewed expressed a range of motivations influencing their decision to bid for LAD at Phase 1 and Phase 2:

[23] This is a sub-question of EQ 1: What factors influence the ability of Scheme Leads to deliver installations under the scheme?

- **Funding aligned with, and provided the means to work towards, broader LA priorities**, including preparing homes for a greener, net zero future and working to address fuel poverty concerns in their local area. In Phase 1 there was also a particular emphasis around promoting a green recovery from the COVID-19 pandemic and boosting the green economy whereas in Phase 2, the focus was more on helping residents tackle the cost of living crisis and increasing the energy efficiency of their housing stock.
- **LAD supplemented existing funding sources** or filled gaps that existing funding had not already addressed. For example, it enabled LAs to target different housing stock (namely private housing) from other schemes and target householders who were not on benefits but were cash-poor and/or earning a lower wage. The funding also complemented existing funding from schemes, such as the Energy Company Obligation (ECO), enabling the continuation of work that the LA were also supporting.

- **To stimulate future demand for similar funding** for home improvements, using LAD as a demonstrator. LAs interviewed in 2023 expressed that this was not only about ensuring a continuation of funding for home improvements in their area, but also to provide a consistent and long-term source of funding for installers, delivery providers and charity partners who had been commissioned as part of LAD.
- **To support residents** in terms of fuel poverty, the cost of living crisis, and their health. Of the LAs interviewed in 2023, all emphasised that there was a need in their communities to address fuel poverty and support with the ongoing cost of living crisis. In one case, the team working on LAD was based within the public health team and they emphasised their focus was helping to improve housing stock to keep people independent, out of hospital and out of care.
- **Continuing their programme of work** was a particular motivation for applying for Phase 2 funding. LAs interviewed in 2023 who had taken part in both phases of the Scheme emphasised that Phase 1 was "dipping their toe in the water" and that they now had internal processes and working relationships set up. This meant they were able to continue, and in some cases scale-up, their programme of work.

5.1.2 Application processes

Of those who responded to the LA survey (58), just under half (28) had been involved in the application process for LAD funding in Phase 1, and 22 had been involved in this stage for Phase 2. Overall satisfaction with the application processes for both Phase 1 and Phase 2 was mixed, as exemplified below:

- Satisfaction with the **clarity and expectations around the requirements** of the application with around two thirds (23) saying that they were satisfied, and just one in ten (4) saying that they were dissatisfied with this element of the process.
- Satisfaction with **the level of support available from BEIS** during the process was more polarised with two in five (15) saying they were satisfied and a quarter (9) saying that they were dissatisfied.

- Satisfaction was lowest with the **timeframes allowed for the completion of the application**[24] – 16 LAs said that they were dissatisfied with this element of the process, while two in five (14) said that they were satisfied.

When asked about the challenges they faced during the application stage, survey respondents reported two key challenges:

- Over two thirds (25) reported **a general lack of time and resource to bid** within the LA to complete the application. Over a third (14) also reported that this lack of time and resource was a result of delivering other BEIS retrofit Schemes at the same time.
- **Challenging data requirements** were also reported by LAs as a key challenge in the application stage. 16 respondents said that they had difficulty locating or compiling data on eligible households to target for the Scheme; two in five (15) said that they had difficultly locating or compiling data to support the application (for example on job impacts); and a third (12) said that they had difficulty locating or compiling the required data on housing stock.

LAs interviewed as part of the scoping phase commented on the application process for Phase 1A of the Scheme and noted that this had been challenging. In particular, LAs mentioned the short timeframe during the summer period (when some staff may not have been available to support the bid), limited word counts, lack of ability to include tables and images and limited time for documents such as Data Sharing Agreements to be checked. Some also felt that there had been limited guidance from BEIS regarding potential delivery models. Some anticipated that these challenges may have deterred smaller LAs, or those without relevant processes in place, from bidding.

Applications for Phase 2 were coordinated by the Hubs and LAs interviewed in 2023 had a mixed experience working with the Hubs. In some cases, LAs commented that the application process for Phase 2 was easier than it had been in Phase 1. Where this was the case, the LAs pointed to two factors:

- **Having already delivered LAD in Phase 1 made their application for Phase 2 easier** because their Phase 2 delivery was building on what they had achieved in Phase 1 or was a direct continuation of it. One LA said that during their Phase 1 application there was a "fear of the unknown," because they had not delivered anything like this before, whereas during Phase 2 it was easier to say what they would be able to deliver because "Phase 2 was a continuation" of what they had already achieved.
- **In some cases, LAs commented that receiving support and guidance from the Hub** prior to submitting their application was beneficial. In these cases, LAs recognised that although the content of the application had not changed substantially, having the Hub available to answer questions and provide support made the application process easier, particularly where the LA had less experience

[24] The application window for LAD 1a was four weeks, and was extended to six weeks for LAD 1b (https://www.gov.uk/government/publications/green-homes-grant-local-authority-delivery-scheme-entering-a-bid).

of delivering a Scheme similar to LAD. One LA commented that it was "good to have a team of people who have direct access to government and could help us with queries."

On the other hand, there were a number of LAs who faced challenges with the Phase 2 application for LAD:

- Some LAs had **concerns around the timeframes** when submitting their application for Phase 2. In line with the findings from the survey, one LA commented that there was not enough time for them to effectively plan their workstreams, or that their workstreams did not fit into the timeframes that Phase 2 had built in, resulting in the LA having to submit a change request.
- The **communication from the Hub** was not always effective. One LA commented that the addition of the Hub felt like "putting an extra layer of bureaucracy in" and that some of the communication from them was "substandard". Another LA commented that it sometimes took a long time for the Hub to come back to the LA with decisions and that it would have been more effective if the Hub had more autonomy to make decisions themselves.

5.1.3 Conclusions on participation of LAs in the Scheme

Overall, participation of LAs in the LAD Scheme was high – 233 LAs participated in Phase 1 and 303 participated in Phase 2, meaning a total of 93% of LAs in England participated in the Scheme. This evaluation did not receive feedback from LAs that chose not to participate in Phase 1 or Phase 2 of the Scheme. Therefore, conclusions cannot be drawn about why a LA may have decided not to participate. However, it is understood that the timings to submit the application and the lack of resources available to apply were a particular constraint for many LAs. Other barriers were the lack of pre-existing relationships with installers (covered in more detail in the next section). Over time, however, LAs gained experience implementing LAD. Some LAs considered that the experience of applying to Phase 1 made the application process for Phase 2 easier.

5.2 Delivery models adopted

This section responds to EQ 2: 'How effectively are Scheme Leads (LAs and Hubs) able to procure delivery providers and what commercial models are adopted?' This section outlines the delivery models adopted by LAs in Phase 1 and Phase 2, including whether the Scheme was delivered as a standalone project or blended with other projects, the processes for procuring installers across Phases, and any challenges to this. The last section discusses the lessons learned on the delivery models adopted.

The section is informed by information from the portfolio analysis, the survey of LAs, interviews with LAs and Hubs, and monitoring information on measures installed by LA.

5.2.1 Delivery models adopted in Phase 1

Table 5 provides an overview of the approaches used by LAs to deliver LAD, informed by all successful bids for LAD funding (portfolio analyses Phase 1A and Phase 1B), supplemented with information from the 46 responses to the survey whose LA participated in Phase 1 and the 11 Schemes covered by the interviews conducted with LAs during Phase 1 of LAD.

Table 5. Overview of Scheme delivery features in Phase 1

Delivery approach	Portfolio analysis Phase 1A (56 projects)	Portfolio analysis Phase 1B (81 projects)	Sample for LA Phase 1 interviews (11 LAs)
Single or joint Scheme delivery			
Single LA / single combined LA	41	58	7
Consortium of LAs	15	23	4
Delivery model			
Delivered in-house by the LA or authorities	16	9	1
Delivered and managed in collaboration with partners	31	55	7
Wholly subcontracted to partners	9	13	3
Not stated	-	4	-
Distinct or blended Scheme delivery[25]			
Distinct i.e., Scheme branded as LAD	18	52	6
Blended i.e., LAD funding blended with other funding sources into a LA Scheme	38	28	5
Not stated	-	1	1

Of the survey respondents who took part in Phase 1, over half (24) said that their LA worked with an installer, who, as well as or aside from delivering installations, helped to manage the Scheme. LAs also partnered with a number of other organisations to manage the delivery of LAD during Phase 1:

[25] Please note that as some LAs are using GHG-LAD funding within several schemes in their area – some of which are distinct and some of which are blended – these LAs are included in both categories here.

- A quarter (11) engaged a **managing agent**
- One in five (9) worked with a **social housing provider**
- Around a fifth (8) engaged an **energy efficiency or services company** or a **foundation or charity**
- Around a fifth (8) worked with **other LAs.**

The LAs interviewed during Phase 1 were predominantly working with partners to deliver LAD and a few had wholly subcontracted their Scheme's management. Subcontractors' roles varied. For example, some dealt entirely with recruiting and managing installers, others dealt with communications and publicity, and some also managed the entire customer journey including identifying households. Subcontractor size also varied, with some being larger nationwide companies and others being smaller, local organisations.

LAs stressed that their delivery models and contractual arrangements with installers were largely dictated by the short timeframes for delivering LAD, leading them to rely on existing relationships and supplier frameworks. LAs felt they lacked time to conduct lengthy procurement processes for subcontractors to deliver within the Phase 1A timeframe. Some felt that the only way they could carry out the installations within the timeframes of LAD was by relying on partners to deliver the Scheme, either partly or in full, with LAs often turning to installers/subcontractors they had engaged on previous Schemes. For example, one LA had devolved the role of identifying eligible households to a subcontractor as they had a database of previous properties in fuel poverty that they had previously worked on. Another also relied on their communications partner to identify and target eligible households with LAD communications as they used social intelligence and algorithms to target this audience on social media more efficiently than the LA could. However, not all LAs were satisfied with taking this approach. One stressed that this was not their delivery model of choice but had felt limited to this design for Phase 1A due to the timeframes for submitting their bid application, meaning that they chose an approach which required less time to set up and/or they had used before.

5.2.1.1 Distinct or blended Scheme delivery (Phase 1)

Of those who responded to the survey, and took part in Phase 1, three-quarters of respondents (35) said that they delivered LAD as a standalone project, rather than part of an existing energy efficiency plan.

Of the LAs interviewed during Phase 1, delivery models were split across blended and stand-alone delivery. Those blending the delivery of LAD with other initiatives noted this approach had been chosen to:

- **Complement existing LA programmes and/or Government initiatives** to support continued improvements to homes;

- **Blend with existing LA programmes and/or Government initiatives that were** designed to provide a single point of contact that was free at the point of use for vulnerable people;[26]
- **Provide seamless delivery of LAD with existing initiatives**, especially where the same delivery partners were responsible for managing the installations.

Existing initiatives include those run by central government, which the LA participated in (for example, ECO), but also include existing programmes run by the LAs or in local consortiums (for example, local plans to upgrade social housing). Where LAs ran LAD as a blended Scheme, it was typically with both types of initiatives.

5.2.2 Delivery models adopted in Phase 2

In LAD Phase 2, the funding was distributed via the Hubs to LAs. The delivery models used by the Hubs ranged from being highly centralised with specific contractors to devolved models where tasks and responsibilities lay mainly with LAs. In the middle, there were Hubs where LAs were responsible for procuring the installations, and they were offered support in other tasks (e.g., engaging households) or were offered procurement routes. The delivery models used by each Hub are outlined in Table 6. Below.

[26] For example, one LA blended GHG-LAD funding into an existing scheme to talk about cold homes and the health impacts of this issue, particularly among vulnerable households or households comprised of older people.

Table 6. LAD delivery models in Phase 2, by Hub.

Hub	No. LAs[27]	Summary of delivery model	Identification and engagement of households	Mechanisms to procure installers
South East	141	The LAs are grouped into consortia. The Hub uses a Managing Agent (MA) to manage all aspects of the Scheme, except the procurement of installers. The MA's responsibilities encompass: marketing, household sign up, compliance, eligibility checks, appointment of the retrofit assessors and coordinators and design provision. LAs can, alternatively, manage the Scheme themselves using a Funding Agreement. The routes to commission installations comprise LA's own procurement routes, as well as a DPS put in place by the Hub.	The Hub created a mapping tool using EPC data, BEIS fuel poverty data, and average income, so that LAs could identify hotspots for certain measures. The Hub also provided assistance to LAs on the use of the tool.	The Hub established a Dynamic Purchase System (DPS) and made it available to all LAs. LAs, however, can also use their own procurement routes.
South West	38	Three Delivery Organisations (Dos)[28] were contracted to manage the programme. Their responsibilities cover the whole delivery process, including recruiting households, procuring installers and quality assuring the installations.	The Hub uses Energy Saving Trust home analytics data and a modelling tool, which have been shared with LAs and Dos. To promote the Scheme and engage households, Dos use the LAs' branding and marketing channels where there is agreement to do so.	The three DOs had different methods to engage with installers: DO1 went through a public procurement process with local installers. DO2 engaged with Local Enterprise partnerships (LEPs), industry groups and chambers of commerce to identify local

[27] Source: Publicly available information on Hub websites and/or information provided by Hub interviewees. Websites used include: https://www.neyenergyhub.com/wp-content/uploads/2021/03/LAD2-LA-GUIDANCE.pdf.

[28] The difference between Managing Agents (MAs) and Delivery Organisations (DOs) is that the former manage projects at Scheme level, while the latter manage projects at programme level. For example, MAs are not responsible for procuring installers, while DOs are.

Hub	No. LAs[27]	Summary of delivery model	Identification and engagement of households	Mechanisms to procure installers
				businesses and connect with them. DO3 used their own networks as they have a long track record in the area.
Midlands	62	The Scheme is delivered by the LAs, who are responsible for all tasks (selecting households, procuring installations, reporting, etc.). They are supported by the Hub and five contractors. The contractors provide customer journey support, and their tasks consist of conducting eligibility checks and offering additional services such as tariff switching and income maximisation. They also support the LAs where needed by providing assistance with project development and reporting.	LAs are responsible for determining which households can take part in the Scheme. The customer journey support contractors provide assistance to engage with households, ensure they understand the measures offered, and explain the process. LAs are encouraged to use this support.	Procurement is led by LAs. The Hub has also established two DPS at the regional level that LAs can use: one to procure professional services, and one to procure accredited installers.
North East and Yorkshire	31	The model is highly devolved, with LAs fully responsible for the delivery of the Scheme. In some instances, LAs use Mas, but the relationship and procurement is managed by LAs only. Some LAs are organised in consortia (there are two consortia with four LAs each). The Hub provides coordination support only.	The process to identify households was led and delivered by LAs, without support from the Hub. Engagement of households is also led by LAs.	LAs use their existing procurement routes. Some LAs have implemented new frameworks for the delivery of GHG LAD Phase 2.
North West	39	The 39 LAs are organised in five consortia (one per LEP) some of which have established delivery	The process included reviewing National Statistics	Some LEPs have their own procurement routes and

Hub	No. LAs[27]	Summary of delivery model	Identification and engagement of households	Mechanisms to procure installers
		partners to manage the delivery of installations and supply turnkey services.	data, EPC data, and the Multiple Deprivation Index. The Hub used a Parity Projects modelling tool.[29] The Hub trained LAs on how to use it. LAs are responsible for contacting and promoting the Scheme among households.	contracted delivery partners to deliver the installations, and the Hub also established a DPS for LAs.

[29] Parity Projects is a company that offers data analytics services to assess the potential for improved energy efficiency in homes in the UK.

Of the 42 survey respondents who took part in Phase 2, 18 said that their LA worked with an installer, who, as well as or aside from delivering installations, helped to manage the Scheme. LAs also partnered with several other organisations to manage the delivery of LAD during Phase 2:

- A quarter (10) engaged a **managing agent** during Phase 2.
- A quarter (10) worked with a **social housing provider** to manage LAD delivery.
- A quarter (10) worked with **other local LAs** to manage the delivery of LAD.
- One in five (9) engaged an **energy efficiency or services company** to deliver LAD.
- One in five (9) worked with a **utility company** to deliver LAD installations.
- Just under a fifth (7) engaged a **foundation or charity** to manage delivery.

Some LAs interviewed in 2023 said that due to the short timescales, they decided to continue with the delivery model they had begun with in Phase 1 as they felt they would not otherwise be able to deliver within the LAD timescales. LAs interviewed emphasised that there was not enough time available to them to conduct a lengthy procurement process for Phase 2, and that in some cases they had built up a programme of works with the installer which they were looking to continue in Phase 2.

Some LAs interviewed in Phase 1 noted that they planned to refine their approach for future Phases, but findings from Phase 2 of the qualitative research indicate that LAs did not feel the timeframes outlined for Phase 2 gave them the opportunity to rescope their procurement processes, and they ultimately continued working with the partners they had procured for Phase 1.

5.2.2.1 Distinct or blended Scheme delivery (Phase 2)

Of those who responded to the survey, and took part in Phase 2, the vast majority, 40 (95%) said they delivered as a standalone project, and two said they did not know. Not a single survey respondent said they delivered as part of an existing energy efficiency retrofit plan.

All LAs interviewed in 2023 that had taken part in Phase 2 delivered the Scheme as a standalone project, independent of other similar initiatives being delivered by their LA. However, some LAs had discussed complementing LAD with other initiatives, by building on existing experience and knowledge as well as to support continued improvement to homes in their local area. The initiatives mentioned included the SHDF, ECO and Warm Homes.

5.2.2.2 Working with the Hubs in Phase 2

Overall views on working with the Hub during Phase 2 were positive. When asked about the experience of working with the Hubs, two thirds (28) of survey respondents who had taken part in Phase 2 reported that working with the Hubs was ‘easy’, compared with under one in five (7) who said it was ‘difficult’. This is broken down into over two in five (18) saying that it was ‘fairly easy’ to work with the Hubs, and a quarter (10) who said it was ‘very easy’. In addition, half (15) of the respondents involved in both Phase 1 and Phase 2 of the Scheme said that they preferred the approach taken at Phase 2 (i.e., with Hub support), under a quarter (7) said that

they preferred the approach taken at Phase 1 and just two respondents said they liked both approaches.

Nonetheless, LAs did report that they had faced some challenges when working with the Hubs including:

- **Experiencing delays** with half (21) saying that they faced delays in decision making due to project management structures, such as communicating with BEIS via the Hub and just under half (19) saying that they faced delays to the delivery of Phase 2 of LAD Scheme and that this was a challenge when working with the Hub.
- Two in five (17) had difficulty **meeting the reporting requirements** which were set by the Hub.
- And over a third (15) said that they had difficulties **coordinating or communicating** with the Hub.

These challenges were reflected in the 2023 LA interviews about Phase 2, where in a number of cases, delivery was significantly delayed. In some cases, the delays were due to problems getting contractual agreements with the Hubs in place. This was particularly the case for Hubs whose delivery model included the use of managing agents to deliver the Scheme, where there were problems getting contracts signed off on both sides. In one case, a Funding Agreement was put in place for the LA to deliver installations themselves for the last three months of the Scheme.

The experience working with the monitoring and reporting requirements set for Phase 2 was also mixed. In some cases, LAs were happy with the reporting requirements and said that they would have collected this information anyway as part of the Scheme. In other cases, although the information they were asked to collect was to be expected, the way the information was collected was confusing and time-consuming to input.

> *"We were expected to return two sets of reporting data sheets on a monthly basis, and they don't correlate well. Cross-referencing was really difficult…the information wasn't complete on those two separate ones, and it was really difficult to relate. I think we have wasted hours, as did the Hub, trying to correlate those things. It was really poorly designed."* – LA representative

A smaller number of LAs also had concern– about the coordination and communication that came from the Hub. This was in part due to the time it took to get a response or decision from the Hub (or indirectly from BEIS) and, in a few cases, where the communication was ineffective.

Overall, where LAs were able to effectively draw on the Hub resources, by using them to support with their application and working with them to develop their Schemes, LAs interviewed were largely happy with the Hub model. Where LAs faced significant problems (e.g., through contractual issues) or where the LA did not need to draw on the support of the Hub, LAs were less happy with this model and felt it added an extra layer of bureaucracy.

5.2.3 Models adopted to procure installers

Across both Phase 1 and Phase 2 it was most common for LAs to rely on pre-existing relationships with installers to deliver LAD. It was most common for survey respondents to say that they used an existing supplier for delivery, with just under half (26) of survey respondents saying this, followed by two in five (23) who said that they engaged installers through pre-existing relationships. One in five (13) said that they relied on a subcontractor to engage installers, and just nine LAs said that they engaged installers through an open procurement process.

The majority of LAs also had a pre-existing relationship with the installers they engaged into LAD – two thirds (38) of those surveyed said that they had previously worked with the installers they procured to deliver LAD. This was split into three in ten (16) who said they had worked with all their installers previously and two in five (22) who had worked with some of them previously. Just one in five (13) said that they had not worked with any of the installers they procured to deliver LAD before.

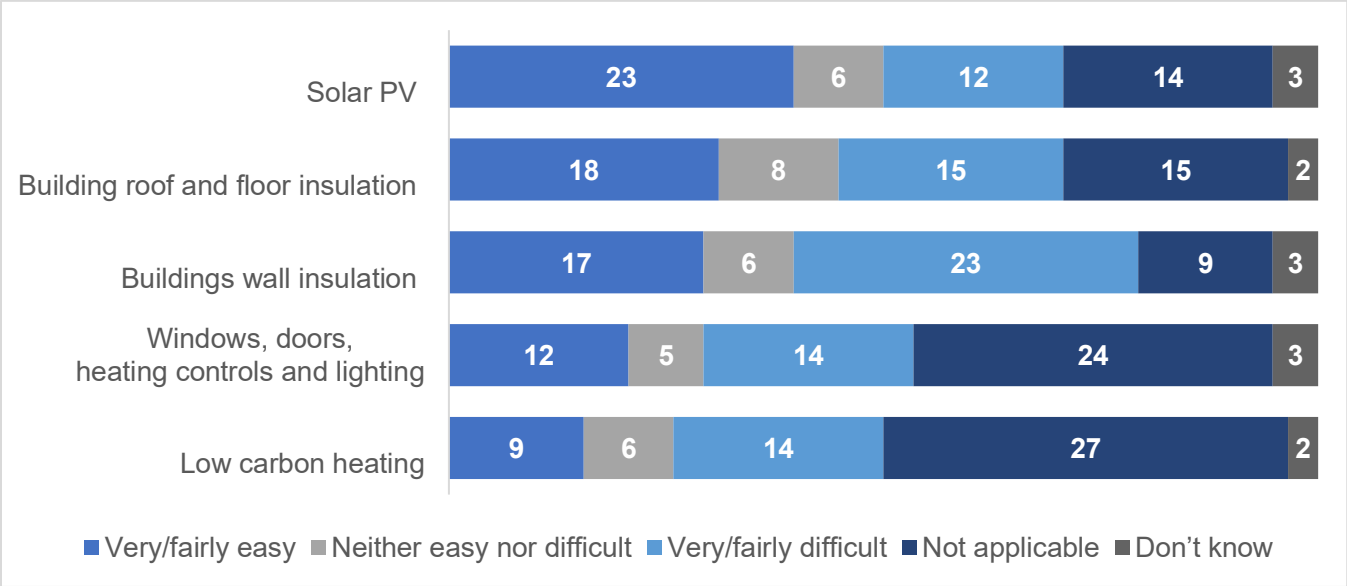
When looking at Phase 2 alone, it was still most common for LAs to use an existing supplier for delivery (15 gave this answer), but this was followed by just under a third (13) who said that they used the framework that was put in place by their Net Zero Hub.

5.2.3.1 Procurement processes

When asked how easy the LA found the procurement process for each measure installed across both Phase 1 and Phase 2, the findings were mixed. LAs found it easier to procure installers to deliver Solar PV and roof and floor insulation, compared with other measures such as wall insulation; windows, doors, heating controls and lighting; and low carbon heating (Figure 3).

- Two in five respondents (23) said that they found it very or fairly easy to procure installers for Solar PV and one in ten (12) said that they found it very or fairly difficult to procure installers for this measure.
- Just under a third (18) said that they found it very or fairly easy to procure installers for roof and floor insulation, compared with a quarter (15) who said they found this very or fairly difficult.
- However, two in five (23) said they found it very or fairly difficult to procure installers for wall insulation, compared with three in ten (17) who said they found this very or fairly easy.
- A quarter (14) said they found it very or fairly difficult to procure installers for windows, doors, heating controls and lighting, compared with one in five (12) who said they found this easy.
- Similarly, a quarter (14) said that they found procuring installers for low carbon heat very or fairly difficult, compared to just nine LAs who said they found this very or fairly easy.

Figure 3. LA views on ease of procurement processes by measure[30]



Question: Thinking about the delivery of the LAD Scheme overall, how easy or difficult was it to procure installers for the Scheme in your Local Authority?
Base: 58 (all respondents)

In the case of park home insulation, just five said they found this easy to procure, and eight said they found this difficult, but just under three quarters (42) said that this was not applicable to them. Of the LA interviews conducted in 2023, the majority said that they had worked with the same installers or contractors they had used during Phase 1 or for other initiatives, and so the procurement process was often a direct award, or a longstanding arrangement they had with this installer.

Three LAs were part of Hubs which provided a procurement framework, but only one of these ultimately used the framework that was put in place. In this instance, the LA raised a concern about procuring installers and contractors who were not familiar with the local area and had to travel in to complete the works.

5.2.3.2 Contractual agreements with suppliers

In terms of contractual agreements with suppliers, over half (30) of respondents to the survey said their LA had a contract with a single supplier for all measures. Other contractual arrangements for LAD were:

- Over a quarter (16) said their **LA did not contract installers directly**
- One in five (11) had a **competitive framework** for all the measures in place, such as a Dynamic Purchase System.
- One in ten (6) had a **mix of competitive and single contracts**, depending on the measure.

[30] The numbers for not applicable apply to those LAs which did not install this measure in their area

- One in ten (6) had **single contracts with specific suppliers** that covered different types of measures.

5.2.3.3 Challenges to engaging installers

Findings from the LA survey outlined several key challenges when engaging installers into the Scheme:

- **Cost** was a key issue with three in ten (35) saying that they had difficulty procuring installers who could deliver the measures within the Scheme's cost caps.
- Problems with **availability and capacity of installers** was also a key challenge – just over half (29) said that there was a lack of capacity among installers to deliver the measures, and under half (26) said that there was a shortage of installers operating in their area.
- **Delays to the procurement process** were experienced by two in five (24) survey respondents.
- Problems with **ensuring quality of installations** was also a leading challenge among local authorities – over a third (20) said that the quality of available installers was a challenge to procuring delivery partners, and three in ten (17) said that there was a lack of TrustMark registered installers compliant with PAS 2035 available to them.

In interviews (both at the scoping phase and in 2023) LAs raised another challenge with engaging installers:

- **A lack of certainty**: the short timelines outlined by LAD initially, and the lack of security in the extensions does not give certainty to installers that they will have consistent and secure funding. LAs interviewed at both stages of the evaluation (Phases 1 and 2) emphasised that installers need secure funding so that they prioritise initiatives such as LAD, over other work.
- **Availability of installers**: some LAs raised a shortage of installers and some element of competition for installer capacity between LAD and other initiatives running simultaneously (for example ECO and the Boiler Upgrade Scheme).

5.2.4 Lessons learned on the delivery models adopted

As explained above, the models adopted by LAs and Hubs were very varied, and there is not a 'single recipe' for what the most successful model looks like. Of the LAs who delivered the highest number of installations in each phase, there was a mix of internal delivery and those who recruited partners or managing agents. There were also those who delivered it both individually and in partnership with other LAs.

The one factor that was decisive was having prior relationships with installers. This was helpful, first, to submit the application to participate in LAD, and then to deliver installations. LAs who participated in Phase 1 research, for instance, emphasised that the initial timeframes provided for Phase 1A delivery were limiting, and as such they had to rely on existing contracts

and relationships to ensure they could deliver within the timeframes outlined. Those LAs who had prior relationships with installers, or at least existing frameworks to draw upon, were able to begin delivering installations more quickly, and as a result were able to deliver more installations over the entire programme.

LAs improved their delivery of LAD over time and were able to scale up delivery towards the end of the programme. This indicates that LAs were able to set up internal processes and develop key lessons over time, which could be used to improve the delivery of the programme.

The experience of the introduction of the Hubs as intermediaries was mixed, with some Hubs working well and providing effective support to LAs, and others being more of an additional step/adding bureaucracy that was not matched with effective support to implement the LAD Scheme. The most successful Hubs were those that had allowed for flexibility in their delivery model and were able to accommodate any existing delivery models or commercial relationships that LAs had in place, whilst still having provisions for the use of managing agents/delivery organisations or procurement frameworks to support LAs that needed it.

5.3 Identification of eligible homes

The LAD Scheme targeted households with incomes below £30,000 and living in dwellings with EPC ratings D or below. By having these requirements, the Scheme expected to target households in fuel poverty. This section answers EQ 3: 'How effectively can eligible homes be identified for participation in the Scheme?'.

5.3.1 Methods used by LAs to identify eligible homes

LAs reported using a range of methods to identify homes and their households likely to be eligible for LAD. The most commonly used method was the use of **EPC data**, with nine in ten (51) of survey respondents saying their LA used this data source to identify eligible homes. Other methods LAs used to identify eligible homes included:

- **Income data:** just over half (30) of respondents to the LA survey used income data to identify eligible households.
- **Other specific and/or targeted methods**: around two in five (22) targeted areas and/or households that had been involved in previous initiatives, and over a third (20) targeted specific housing associations.
- **Referrals:** Over a third (20) identified households through referrals from installers, and just under a third (18) identified households through referrals from charities such as Citizens Advice.
- **Data from other sources**: one in five (12) used data from other initiatives (such as ECO) to identify eligible homes and a similar proportion (11) used data provided by a subcontractor, such as a communications partner or managing agent.

In interviews, LAs also emphasised the importance of drawing on existing local knowledge within their organisation. For example, LAs were aware which areas had a density of a

particular type of home suitable for certain measures and/or areas characterised by high deprivation or known for fuel poverty. Some LAs were also targeting specific housing associations or targeting areas where work was already ongoing or completed as part of previous or existing initiatives.

Some LAs noted that the profile of those benefitting from LAD included areas of high deprivation, older residents, and hard to reach groups, including asset-rich but cash-poor residents that may not be eligible for other initiatives, and low income households in rural areas whose houses may be in need of more expensive measures that could not be covered by other initiatives.

5.3.2 Properties targeted by the Scheme

Survey respondents said that the most common types of homes targeted by the LAD Scheme across both Phases were:

- Terraced houses: 51 targeted semi-detached houses; 50 targeted mid-terrace houses; 49 targeted end-terrace houses.
- Detached houses: 42 targeted bungalows and 34 targeted detached houses).
- Flats / apartments were targeted by a third (19).
- Park homes were targeted by under one in five (11).

It was most common for the properties targeted by the Scheme to be connected to mains gas and electricity – four in five LAs said they targeted properties connected to mains gas (48) and electricity (48). Two in five (24) respondents said that their LA targeted properties with home heating oil and solid fuels, and a quarter of respondents said the LAD Scheme in their area targeted properties that used liquified petroleum gas.

In terms of homeownership, just under three-quarters (43) of respondents to the LA survey said their LA targeted owner-occupiers for LAD Scheme improvements; just over half (31) said that their LA targeted those who rent their home from the LA; just under half (28) said they targeted private renters and a quarter (15) said they targeted those who rent their home from a housing association/housing cooperative or charitable trust.

Just under two in five (22) respondents said that they targeted private landlords as part of the LAD Scheme, compared to one in five (13) who targeted social housing landlords. However, only a small number of LAs interviewed had specific mechanisms to enable them to identify and target private landlords. Where landlords were identified, this was typically through:

- Normal operation of the Scheme, often by their tenants or word of mouth.
- Existing projects that were ongoing at the LA, e.g., one LA had a private rental project which had established relationships with landlords.

Some LAs acknowledged that they had struggled to identify and engage landlords in their LAD-funded schemes. The majority of LAs said that the main hurdle for landlord participation was the level of contribution they were asked to pay. LAs noted that a number of landlords, who

were signed up, dropped out because of this. Across the interviews at both Phases, four LAs specifically mentioned that they were not aiming to target private rentals – despite recognising that there is a great need for intervention among this group – as the need for landlord approval and financing adds another step to the process that they felt they could not accommodate, or that there was not sufficient appetite to get involved among landlords.

5.3.3 Challenges to identifying eligible homes

Respondents to the LA survey outlined some key challenges to identifying households for LAD:

- **The eligibility and requirements of the Scheme**. Over half (30) of respondents said that they had difficulty assessing whether the installations would be viable under the cost cap of £10k per property; just under half (28) also said that they had difficulty confirming whether households were eligible for the LAD Scheme based on income; just under half (26) said they had difficulty confirming whether properties were eligible based on EPC rating; and a third (19) said that they had issues accessing data to confirm the eligibility of households into the Scheme.
- **Issues around engaging householders** to participate in the Scheme. Two in five (22) said that they had difficulty assessing household demand in the area, and a quarter (14) said they had issues with community engagement, such as self-referral systems and web contact forms.

In Phase 2 of the Scheme, not all LAs had responsibility for the identification of households, and therefore not all could answer questions related to this element of the Scheme. Of those LAs interviewed in 2023 that did have responsibility for identifying households, some emphasised that although the eligibility criteria were not unusual, they had difficulty obtaining householders' proof of income and other financial documents. Additionally, some individuals and communities were reluctant to hand over this kind of personal information, and in a few cases, LAs described this process as "intrusive." LAs interviewed emphasised that this was a particular barrier among some vulnerable or minority groups who may have had previous bad experiences with services such as social care or lacked trust in the LA. One LA also mentioned that vulnerable groups (especially older people) can also be more wary of scams, rogue traders or bad experiences with installations that they have heard about from others.

LAs also commented that they found it time consuming to process and check the validity of the information provided. In one case, the LA hired a case worker who had experience processing the applications and financial documents, but in a number of other cases this role was taken by one or two people at the LA responsible also for Scheme delivery. LAs also emphasised they would have liked some more clarity around the requirements. For example, one LA was unclear about the rules of processing redacted documents (i.e., with some information removed or obscured), and whether they were allowed to accept redacted bank statements as proof of income for the Scheme.

Additionally, LAs noted that households can be complex, and the eligibility criteria could be too limiting, meaning that some households in need could not be reached. They provided examples of a two-parent family on minimum wage that would not meet income criteria and an

older couple living with their adult child who was earning over the threshold but not contributing to the household income. Some LAs suggested that using alternative criteria, either instead of, or alongside the income cap would have made the process easier. For example, one LA suggested using Universal Credit as a "passport through" the system, or another would have preferred using indices of multiple deprivation (IMD) data.

Where managing agents were involved in Phase 2, concerns were raised about their ability to identify eligible and needy households with limited local knowledge. One LA commented that the identification of households was not as effective in Phase 2 as it had been in Phase 1. This was because in Phase 1 the LA had done work to fully understand their housing stock (including challenges around rurality and homeownership) and identify where the need was greatest and targeted the Scheme to the local area. In Phase 2, however, the managing agents were not familiar with the particular local challenges and as such focused on installing measures such as Solar PV to ensure the money was spent.

EPC ratings were also a challenge for LAs in terms of identifying households to take part. Only households living in dwellings with EPC ratings below D were eligible to participate in the Scheme. This requirement was relaxed in December 2021 during Phase 2 delivery to also include properties with EPC rating D, however there was a 50% maximum cap on the number of properties with EPC rating D that could be supported by LAs. Installers felt that this requirement had a negative effect on the number of measures installed, and some found themselves waiting for more E-F rated properties to be identified while being unable to work on qualifying D rated properties.

LAs interviewed in 2023 emphasised that balancing the EPC data against the mix of measure types and income data was difficult and resulted in having too many band D properties eligible for the Scheme. This meant some LAs had to disregard eligible properties or put them on hold for the next round of funding.

> *"There was a restriction in the Scheme on the number of properties in EPC D… We encountered in many cases people who were very willing to participate, and they needed it, but we were not able to help them. Not having this artificial limit would help a great deal." – LA representative, Phase 2*

5.3.4 Effectiveness of the Scheme in reaching fuel poor households

As already explained, the LAD Scheme aimed to reach fuel poor households. The current definition of Fuel Poverty used in England is the Low Income, Low Energy Efficiency (LILEE) metric. Under this definition, households are fuel poor if:

- They have a Fuel Poverty Energy Efficiency Rating (FPEER) [31] of band D or below

[31] The FPEER methodology is based on the Government's Standard Assessment Procedure (SAP) for assessing the energy performance of domestic properties while taking into account the impact of policy interventions (e.g., Warm Homes Discount) that directly affect household energy costs. Like SAP, the methodology gives an energy efficiency rating from 0 (lowest) to 100 (highest). This rating can be translated into an energy efficiency 'Band' from G (lowest) to A (highest), rather like the SAP rating being used to generate an overall energy efficiency Band (again from G to A) for Energy Performance Certificates (EPCs). As a general rule, the EPC band will be a good proxy for the FPEER band.

- The household income after housing costs and fuel costs falls below a set income threshold (defined as 60% of the national after-housing-cost (AHC) equivalised income).

The energy efficiency of buildings in the UK is calculated using Standard Assessment Procedure (SAP) scores which run on a scale from 1-100 points. Scores are banded A-G where 100 (band A) is the most energy efficient. In the context of fuel poverty, the top of band D corresponds to an SAP score of 68, meaning that a low-income household living in a home below that score could be defined as fuel poor (depending on their AHC equivalised income).

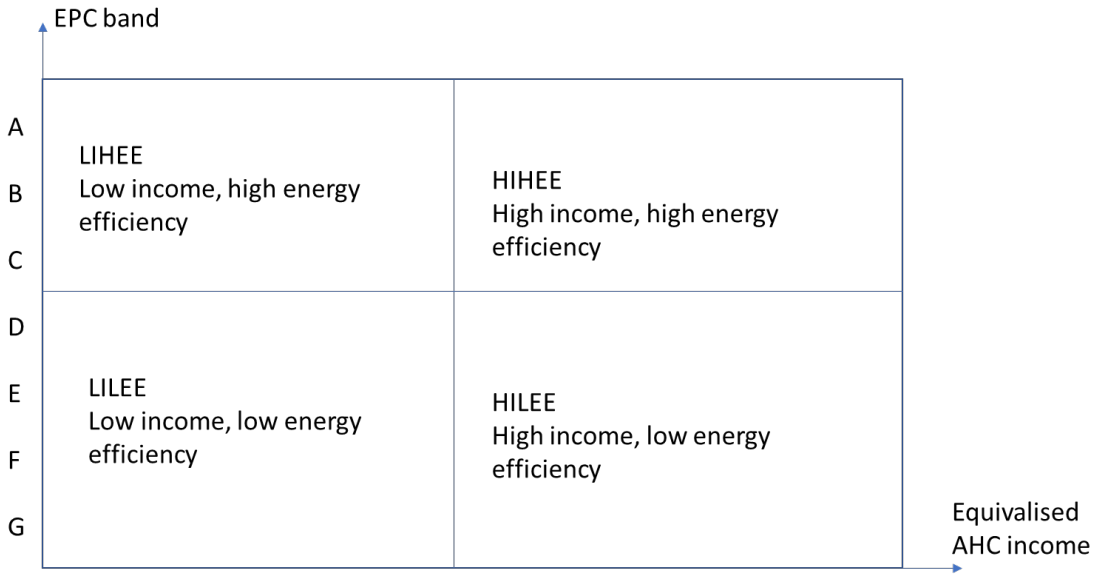
When assessing all households for their fuel poverty status (using the LILEE definition), they are divided into one of four quadrants, namely:

- The LILEE quadrant – households with low income and low energy efficiency. Households where the income is below the threshold and where the Fuel Poverty Energy Efficiency (FPEER)[32] rating of their home is band D or below (these indicate households in fuel poverty).
- The LIHEE quadrant – households with low income but living in a home with high energy efficiency. Households where the income is below the threshold but where the FPEER rating of their home is band C or above (although these households have low income, they are not deemed to be in fuel poverty by this measure because of their home's high energy efficiency).
- The HILEE quadrant – households with higher income and living in a home with low energy efficiency. Households where the income is above the threshold but where the FPEER rating of their home is band D or below (although these homes have low energy efficiency, households are not deemed to be in fuel poverty because of their higher income).
- The HIHEE quadrant – households with higher income and living in a home with high energy efficiency. Households where the income is above the threshold and where the FPEER rating of their home is band C or above (these households are in the most favourable category and are not considered to be in fuel poverty as their homes have high energy efficiency and they have high income).

The quadrants associated with the LILEE method are shown below, together with their associated EPC bands and equivalised AHC income levels.

[32] The fuel poverty energy efficiency rating (FPEER), is based on SAP, but accounts for the impact of policies which discount households' energy bills (e.g. the Warm Home Discount). For example, if a household has a band D Energy Performance Certificate (EPC) and they get a rebate deducted from their energy bill due to receipt of the Warm Home Discount, this could move them into an FPEER band C.

Figure 4. LILEE method associated quadrants



BRE and DESNZ analysed the proportion of households that were in fuel poverty prior to the installations based, EPC register data and data collected through the survey of households (see Technical Annexes 10 and 16 for more information). In total, data were available to analyse 1,055 cases. Of these, 80% of the households were classed as low income based on their after-housing cost income[33], and 97%[34] were classed as living in a low energy efficient home, with an EPC band rating of band D or below.

When looking at both income and energy efficiency, they found that about three quarters (78%) of households in this sample were likely to be fuel poor prior to the LAD installations. Table 7 below shows the number of households in each of the fuel poverty quadrants.

[33] Derived from household-level income data from evaluation's household survey, n=2,389.
[34] This is very similar to the proportion (95%) in the larger sample of households with verified EPCs (n=21,644).

Table 7. Proportion of successful Scheme applicants in each LILEE quadrant

Quadrant	No. of households before installations	Percentage of households before installations
LILEE quadrant – households with low income and low energy efficiency (SAP band D or lower)	823	78%
HILEE quadrant – households with higher income and low energy efficiency (SAP band D or lower)	205	19%
LIHEE quadrant – households with low income but high energy efficiency (SAP band C or higher)	25	2%
HIHEE quadrant – households with higher income and high energy efficiency (SAP band C or higher)	2	<1%
Total of the four quadrants	**1,055**	**100%**

When controlling for the proportion of households at 'Low Energy Efficiency' in the wider EPCs, this hit rate is revised down proportionately to 76% overall.[35] This indicates that the LAD Scheme was very effective at reaching fuel poor households.

5.3.5 Conclusions on the identification of eligible homes

The results of the analysis indicates that the scheme was effective at reaching fuel poor households, with three-quarters of households taking part in LAD likely to be fuel poor prior to installations. Typically, LAs relied-on EPC data, income data and other existing data and LA knowledge to identify homes to target for the Scheme. It was most common for LAs to reach owner-occupiers and social renters for the Scheme, and LAs emphasised that the financial contribution required from landlords was a key barrier to supporting private renters, who were much less likely to be recipients of the Scheme. Other barriers to identifying eligible homes included the Scheme requirements such as assessing whether installations would be possible under the cost-cap, the cap on the participation of EPC band-D properties and balancing both of these factors with the overall desired mix of measure types.

[35] Evaluation Technical Annexes – 16.4

5.4 Barriers to delivery

BEIS required the evaluation to explicitly consider the barriers to delivery to help understand why fewer measures were installed than intended. This led to the development of a framework, inspired by Process Tracing, to provide an assessment of which factors, and in what measure, were influencing under-delivery (see the Technical Annex, Annex 9).

This section responds to the following evaluation questions, that were identified by the evaluation framework:

- What role is COVID-19 having on the delivery of the Scheme? (EQ4)
- What barriers to delivery exist? (EQ 5)

A number of challenges to meeting timescales were raised in both stages of qualitative research with LAs. These included:

- Scheme timeframes
- Scheme contracts
- Scheme design features
- Capacity within the supply chain
- External factors (e.g., the impact of COVID-19 and weather conditions).

The challenges cited above are discussed in detail below.

5.4.1 Scheme timeframes

LAs interviewed in the scoping phase were clear that timeframes for Phase 1A were tight. Some reflected that they had been particularly mindful of this at the point of bidding, for example, by putting forward a risk-averse bid, or pre-emptively submitting planning applications for households they planned to target. A range of factors had further compounded a challenging timeframe including the COVID-19 prevalence rates and restrictions at the time. Local issues were also cited; for example, one LA commented that the timeframes did not reflect the local challenge of carrying out installations in conservation areas. Installers interviewed by Ipsos that had participated in Phase 1 also agreed that the difficulties experienced by LAs affected the amount of time available to apply for work under the LAD Scheme and to complete installations. A particular issue was the lack of familiarity with local supply chains, which took LAs time to understand, resulting in installers being unable to apply to join LA procurement frameworks in time to apply for work.

LAs interviewed at Phase 2 were also clear that the initial delivery timescales that were provided were tight. LAs commented that when the funding was granted for Phase 2, they did not feel that they had enough time to effectively plan new processes or make changes. They reported that, instead, they had to launch into delivery as quickly as possible to maximise the number of measures they could deliver. A number of LAs said that, if they had known about the time extensions from the start, they would have been able to work more effectively by

better resourcing the project and conducting installations in a different way, for instance to use economies of scale (e.g., working street by street, instead of the more scattergun approach they ultimately chose).

> *"We need enough time to bid and work up a plan, then time for marketing and building up a delivery process (a couple of months ideally), and then a big chunk of time to deliver and build up more interest – that would make it a smoother process." – LA representative.*

LAs did note that those who had been involved in Phase 1 were in a better position to deliver Phase 2, as they could build upon their experience, networks and work conducted during Phase 1. For example, LAs had already identified and communicated with eligible households and word had spread about the Scheme, and in fewer cases, LAs had completed installer procurement processes and were able to extend these into Phase 2. Having done much of the planning for the Scheme, and having these processes in place, meant that LAs had a foundation on which to build during Phase 2. Anecdotally, LAs told us this meant they were able to launch into installations faster than they could in Phase 1. Installers interviewed also felt that by Phase 2, LAs had improved their administration of the Scheme, which improved the experience for installers.

Additionally, although all the LAs thought the extensions to LAD Phase 2 were necessary, the stop-start nature of the Scheme had an impact on their ability to deliver installations. In some cases, installers had to 'tool up' and then 'tool down' repeatedly while waiting for an extension to come through. In these cases, LAs emphasised the need for longer timeframes from the outset, to provide security and consistency to installers and the onwards supply chain.

5.4.2 Contractual problems

Scheme requirements were also cited by LAs as a challenge. In Phase 1, it was noted that delays with delivery terms and conditions, data sharing agreements and privacy notices impacted timeframes for starting the Scheme.

In Phase 2, there were significant delays and problems with LAs receiving contracts from the Hubs and getting them signed off by their legal teams. In some cases, this caused significant delays to delivery and meant the LAs had to proceed with Scheme delivery at significant risk.

> *"Ten months in, there was still no contract with the Hub, and no delivery. We couldn't get the contract through our legal teams. In the end we obtained the money directly from the energy Hub, we had to look and think how many measures we could do in three months. We had to have people already signed up…so we were trying to deliver without knowing we had the money." – LA representative, Phase 2*

5.4.3 Scheme design features

Some of the Scheme requirements were brought up by LAs as barriers to effective delivery, particularly the requirement to comply with PAS 2035, and the cost caps applied. These issues are discussed in turn below.

5.4.3.1 PAS 2035 compliance

Phase 2 of the Scheme required compliance with PAS 2035 alongside the TrustMark registration. LA representatives interviewed in 2023 confirmed that they understood the benefit of having this requirement, particularly where multiple measures were being installed under a whole house approach. However, LAs interviewed emphasised that the cost-caps meant that it was unlikely more than one measure would be installed per household, and so LAs questioned whether PAS 2035 was suitable for this Scheme. One LA summed this up by saying:

> *"When you only have 10k average limit, it means that for the most part you can only really afford one measure. I'm not sure if [PAS 2035] is suitable where you have a Scheme which is mostly single measures." – LA representative, Phase 2*

Installers and installation industry organisations interviewed also agreed with the view that rigidly applying PAS 2035 requirements often added unnecessary costs onto measures to ensure they were compliant. In their view, a more subtle application of PAS 2035 would have allowed some households to have more than one measure installed.

5.4.3.2 Cost caps applied

The LAD Scheme enabled households to receive installations worth a maximum of £10,000 (£5,000 for landlords). This cap proved to be challenging to deliver installations for two main reasons: (a) the cost of labour and materials increased in the period 2020-2022, meaning that it became harder, towards the end of the Scheme, to deliver measures within the maximum caps, and (b) the addition of the requirement for PAS 2035 compliance in Phase 2 increased the costs of the measures.

Across the LAs interviewed, some were working to a £10,000 cap per household, while others were working to an average of £10,000 across all the households they were targeting. Where LAs were working to a £10,000 cap per household, it was unlikely that more than one measure would be installed per property, because of the cost. Where LAs were working towards an average of £10,000 per property (allowing some homes to have more expensive measures installed), the LA had to balance the more expensive measures with lower cost measures in other homes. This posed a risk for the LA that had to carefully balance more expensive and lower cost measures across their portfolio of installations and across households. Some LAs suggested that more information and clarity around funding levels would have been helpful.

In the survey of LAs, two thirds (38) of respondents said that the cost of materials was a key challenge during delivery. In the LA interviews conducted in 2023, interviewees emphasised that the cost of installations and labour had gone up significantly over the past few years, also compared to Phase 1.

In interviews conducted in 2023, LAs also noted that the introduction of the requirement for compliance with PAS 2035 for installers in Phase 2 drove the cost of delivery up significantly, particularly for some more complex measures. As a result, many emphasised that they had a significant challenge when delivering LAD under the cost cap of £10,000 per property, when prices had increased substantially. One LA noted:

> *"The cost difference is a lot if you are doing, or not doing PAS. A lot of the PAS 2035 detailing for EWI is unnecessary but has to be done to be compliant." – Installer*

5.4.4 Capacity issues within the supply chain

Issues securing materials and capacity to deliver installations was another challenge for LAs. Just under two thirds of survey respondents (64) said that they faced challenges with installer capacity; over half (31) said the availability of materials was also a key challenge in LAD delivery. Slightly fewer, around two in five, (24) also said they had issues with supply chains. Installers highlighted the difficulties they encountered when trying to work with LAs. In their view, LAs did not have good awareness of local supply chain capacity to deliver the Scheme. Many installers were unable to join LAs' procurement frameworks to bid for work, or lacked the administrative expertise to write bids, and found they were often sub-contracted by construction or management agents to complete work instead. Installers felt that LAs and management agents had not accurately costed work and were reluctant to take on work that was not competitively priced or could result in financial loss.

LAs interviewed in Phase 1 voiced a range of concerns including access to suppliers in the local area, waiting for materials and labour committed to other initiatives to become available, and concerns regarding manufacturer capacity within the timeframes available, particularly reflecting the impact of COVID-19 restrictions. One LA raised concerns that lack of materials could inhibit opportunities to take advantage of economies of scale.

LAs interviewed in Phase 2 also had concerns about the availability and capacity of installers to deliver the Scheme. This was partially due to the short timeframes and stop-start nature of Phase 2 of the Scheme. LAs interviewed emphasised that installers were likely to go where they knew there was work for a longer period of time to ensure consistency and security, rather than on shorter term contracts. Repeated Scheme extensions created challenges for installers resourcing work effectively. Installers said they liked to scale work up to a peak and then scale work down to focus on another initiative or other work. This may explain why LAs felt installers were reluctant to take on shorter term work, which required installers to reallocate labour and material resources from other work they were trying to scale up.

5.4.5 External factors (e.g., the impact of COVID-19 and weather conditions)

Three in five (34) LA survey respondents said that the impact of COVID-19 had been a key issue for them. Interestingly, this finding was not significantly different between Phases, despite COVID-19 restrictions and prevalence rates reducing after Phase 1.

LAs interviewed in Phase 1 emphasised that COVID-19 impacted demand for Phase 1A with some households less comfortable with having installations undertaken, particularly where targeted homes were likely to comprise vulnerable groups who may have been shielding. LAs noted that ensuring that COVID-19 health and safety precautions were carefully put in place impacted timings for community engagement (e.g., door knocking) and the installations themselves. One LA noted that in one area across their consortium, installations were not considered essential and therefore were not carried out. The impact of COVID-19 on internal

LA resources was also noted, with staff in some areas being redeployed to deal with the implications of the pandemic.

When asked about external challenges that affected Phase 2, LAs interviewed emphasised that these were of less of a concern compared to Phase 1, where it was highlighted. In Phase 2, LAs were able to go to people's homes to engage them into the Scheme (including through door knocking) and householders had less concern about having installers come into their homes.

These findings identify a clear difference between the survey and interview respondents, which relates to the specific questions asked. The survey asked LAs about any challenges experienced and provided a list (including COVID-19), whereas the interviews had a more open ended question where the interviewer might not have probed for COVID-19 if the respondent did not highlight this as an issue.

Other external factors such as weather conditions also had an impact on delivery: 25 survey respondents reported this as a challenge they faced. In some locations, extreme weather conditions such as flood warnings during Phase 1 and extreme heat in Phase 2 impacted on the ability to deliver LAD. For example, where there were extreme heat warnings, installations had to come to a stop. Installers also explained that weather and climate conditions affected the timings when they were able to work. Certain measures, like EWI, cannot be installed in the winter, creating delays to installation and time pressures to complete installations before the Scheme ended.

5.4.6 Conclusions on the barriers to delivery

There were notable internal and external barriers that challenged delivery. The requirement to be PAS 2035 compliant was considered beneficial, in principle, by LAs, installers and industry representatives, but they queried its suitability for LAD due to the cost cap meaning only one measure was installed in most homes. The cost cap was also identified as a barrier due to costs of labour and materials increasing between 2020 and 2022, and PAS 2035 requirements increased costs. Supply chain capacity issues were also identified by LAs which were exacerbated by the short term nature of the Scheme impacting installer availability. Finally, the Scheme's delivery was also affected by external events, specifically COVID-19 with regards to obtaining access to people's homes in Phase 1 when lock down restrictions were still in place. As with any scheme affecting the physical condition of buildings, the weather also had an impact both in terms of extreme events and seasonality impacting when some measures could be installed.

5.5 Engagement of households

This section responds to EQ 6: 'To what extent are the homeowners and landlords engaged by the project willing to undertake installations (including with heat pumps)?

The LAD Scheme aimed to engage homeowners, landlords and their tenants. The costs of the installations for homeowners were fully covered by LAD up to £10,000, whereas landlords had

to contribute up to 50% of the total cost, with LAD providing a maximum of £5,000. It was hypothesised that landlords would be incentivised to participate in order to improve the EPC ratings of their dwellings, which would help them to meet expected upcoming regulatory requirements to rent out their properties.

In total, according to the official statistics, 38,290 households received installations under LAD Phases 1 and 2. This figure is below BEIS's central estimate of 55,000 homes at scheme outset (70% of estimate).

The evaluation team held monitoring data for some applications. Of the 32,907 households whose application was available, 70% were owner-occupied homes, 22% were owned by social housing/housing associations, and 1% were privately rented. For 6% of the households, data on tenancy was not available. The LAD Scheme was therefore successful at engaging homeowners and social housing landlords, and unsuccessful at engaging private landlords.

5.5.1 The application process

LAs interviewed used a range of methods to engage households in the Scheme, often in parallel. Leaflet drops and targeted mailshots were the most frequently used methods, while social media / digital marketing, referrals through existing initiatives or the third sector and personal engagement (both via the telephone or face to face door-knocking) were also common. Some also engaged directly with housing associations where they were targeting social housing for installations and relied on word of mouth to further promote the programme. This aligns with how survey respondents said they had heard of the LAD Scheme: around one in five (17%) had received a leaflet or letter advertising the Scheme, with a similar proportion (16%) becoming aware through a LA newsletter. One in eight (13%) had had a conversation either in person or over the phone with their local authority or council, a proportion that increased to 62% for tenants living in social housing.

In interviews, private landlords indicated multiple ways in which they found out about the LAD Scheme, including direct approach by the LA, personal research, and word of mouth recommendation. In one instance, a tenant had escalated a complaint about their property's condition to the LA, who recommended that the landlord install some measures through the LAD Scheme to resolve the tenant's issues.

Overall, the process to engage households seems to have run smoothly, according to the survey of households. A majority of households indicated that it was clear to them how to apply (66%), what the eligibility requirements were (66%), and what the benefits of the improvements would be (67%). Only one in ten (12%) found the application process very or fairly unclear, a proportion that increased for some sub-groups: ethnic minorities (18%), households in the lower income band[36] (15%), and households where the occupant had a long-standing illness, disability or infirmity (16%). Nevertheless, most households (77%) found it easy to apply for the LAD Scheme, and only 6% found it difficult. There are no differences observed by sub-groups.

[36] Annual household income under £16,000.

The landlords who participated in qualitative interviews were unable to precisely recall their experience of applying to the Scheme, in part because there was often a delay between their application and the installation of measures, but a common theme was that they were unsure if there would be additional conditions attached to the funding. However, all the landlords interviewed felt sufficiently reassured about the terms of the LAD Scheme to continue their application. They were also not deterred by the requirement to financially contribute towards the Scheme.

Participating landlords reported a number of difficulties in liaising with tenants. Firstly, participating private landlords reported that their tenants sometimes refused to submit their personal details to prove eligibility to participate in the Scheme (i.e., income details). This prevented landlords from having measures installed to their properties. This was not something that social housing landlords experienced, who have access to more information to prove tenant eligibility.

Participating social housing landlords reported that their tenants were often hard to engage and failed or refused to respond to letters and phone calls. This added some complexity to the process, as landlords and installers had to visit the properties themselves in order to inform them about the Scheme. This slowed down the installation process and led to a number of dropouts. One housing association mentioned that out of 1,200 eligible tenants, only 209 finally applied to participate in the LAD Scheme to receive Solar PV under Phase 2 of the Scheme.

In terms of their discussions with their LAs, social housing and private landlords felt that they were offered the support they needed. They considered that LA communications were generally clear, explaining how the Scheme would be carried out and what the landlords' financial contribution would be towards the measures. In some cases, the LAs were in contact with tenants directly to offer information on the Scheme, which was perceived positively by landlords. This added to an overall good experience, as LAs knew more about the Scheme than landlords did, and they were therefore better placed to provide information.

Landlords mentioned that in most cases they did not need additional support beyond this first point of contact to provide information and reassurance to the tenants. Meanwhile, some landlords said that they were not aware of their LA being in contact with their tenants.

Some LAs interviewed mentioned that it took some time to build up momentum for the Scheme but once this had happened, word spread around the community and the number of applications increased. Some LAs also linked this to larger problems with the timeframes outlined for both Phases and some LAs commented that it would have been beneficial to have more time to sign households up to the Scheme to capture the growing momentum. Other LAs, on the other hand, found the number of responses overwhelming.

5.5.2 Reasons to apply for the LAD Scheme

The main reason why households applied to participate in LAD was to save money on energy bills (84%). Other important reasons were making the property warmer or more comfortable (57%), the fact that the installation was free or at a reduced price (53%), and to reduce energy use for environmental reasons (52%). We looked at whether motivations varied depending on

the type of tenure. Although we could not perform significance testing due to the small size of some sub-groups, it is worth highlighting some differences:

- Private landlords and homeowners were more interested than tenants in bringing the property up to modern standards.
- The potential increase in property value was an appealing factor for about a quarter of the private landlords who participated in the survey, compared to an average of 14% across all groups.
- Tenants who rent from the LA, a housing association, or similar indicated as the main reason "having no choice because the landlord/building owner said the work had to be done" (54%), followed by an interest in saving money in energy bills (45%).

The private landlords and housing associations interviewed were generally willing participants in the LAD Scheme. Their main motivations were to receive additional funding from the government to install measures which would improve the EPC rating of their property, and to create improvements to their properties for their tenants. There was recognition that their properties were not as energy efficient or warm as they could be, so they applied to the Scheme in part to ensure their tenants were able to live in warmer properties with lower energy bills.

> *"We decided to apply as it seemed like a good idea to do the work for the tenant. It was expensive to heat the house. It was quite well insulated, as we'd had cavity wall insulation installed before, but the windows were singled glazed, and the heating wasn't great… It was mainly for the EPC and the tenant…" – Landlord*

The housing associations interviewed cited the need for extra funding to meet net zero plans as the main reason they engaged with the LAD Scheme. In interviews, housing associations noted that they typically owned large volumes of low-quality housing stock with low EPC ratings, usually D or below. One provider said installing energy efficiency measures in their property stock was critical for meeting (at the time) upcoming minimum EPC requirements[37], although they may have potentially referring to regulations in the private rented sector, for which social landlords are exempt. Other providers said installing energy efficiency measures was important for meeting internal EPC targets and net zero plans.

A secondary reason why the housing associations interviewed participated in the scheme was the benefits that participating in the LAD Scheme would deliver to the tenants of properties they own. Tenants interviewed were not proactively requesting energy efficiency measures but housing associations wanted to improve the quality of properties for their tenants many of whom were vulnerable or on low incomes and living in properties with low EPC ratings.

[37] The EPC requirements refer to both internally set EPC targets for their stock of properties and the expected future rules requiring privately rented properties to have an EPC rating of C or above. Social housing providers are excluded from MEES.

5.5.3 Conclusions on engagement of households

Overall, it is concluded that the LAD Scheme was appealing to homeowners, tenants and landlords and that they found it easy to apply and participate in the Scheme. Social housing landlords were more willing than private landlords, as they have a large stock of poor quality properties that need to be improved to meet internal EPC and net zero targets, but have limited funding to do so. It is also likely that the need for private landlords to communicate and administer the application with their tenants discouraged some private landlords from applying. The prospect of reducing energy bills was the main motivating factor across all groups except for tenants living in social/council housing. The evaluation did not consult with non-participating eligible households; it is therefore unknown what factors, if any, might have deterred some people from participating.

5.6 Energy efficiency installations delivered

This section answers EQ 8: "What types of energy efficiency installations are being delivered through the Scheme and to what extent does this align with the Scheme objectives?". Information to answer this question was available from monitoring data, the household survey and the survey of LAs.

As set out earlier, it was estimated that the Scheme could deliver around 191,000 measures across both Phases in 55,000 homes with an expectation that heating controls and insulation would be the most common measures implemented. According to the official statistics[38], 49,824 measures were installed in total in 38,290 homes. Table 8 and 9 below show the split of these figures per Phase of LAD in more detail.

The number of homes upgraded was around three-quarters (70%) of the estimated total set at the outset by BEIS and the number of measures installed only just above a quarter of the number of measures anticipated. The survey of LAs explored the reasons for this. Over three quarters (44) of survey respondents said that their LA delivered fewer measures than they had originally planned. When asked why this was the case, the most common answer given (by 20 (45%) of respondents) was that there was a lack of homes who wanted specific measures installed, were eligible for these measures, or were willing to have these measures installed in their home. Other reasons stated for lower than anticipated number of measures included:

- **Timescales** - over a third (16) of respondents said that they had delivered fewer measures because of delays in the Scheme and 10 said that they underdelivered because of short timescales.
- **Changing or increased costs** was a reason that a quarter (11) of respondents underdelivered on some measures and one in five (9) said that they had issues with procurement in the Scheme.

[38] As at 20 July 2023

- Just 5 (11%) respondents said that **COVID-19** was the reason that they underdelivered on any measure across Phase 1 and 2.

The most common measure installed was, by far, solar PV (17,987 installations). Insulation measures amounted to 21,160 installations, with loft insulation and external solid wall insulation being the most frequently installed. Windows and doors amounted to 3,784 installations, low carbon heat measures to 3,610 installations, and heating control measures to 2,380 installations.

The distribution of measures (proportion of total measures) is quite different to what had been anticipated. In relative terms, the proportion of heating control measures was substantially lower than originally expected, whilst the proportion of electricity related and insulation measures were substantially higher than originally estimated as shown in Table 8. The proportion of window and door measures was in line with the original estimate, whilst low carbon heat measures were a little lower than expected in relative terms.

Table 8. Comparison of types of measures delivered vs. expected

Measure Type	Total no. measures delivered	Percentage of total measures delivered	Total no. expected measures BEIS central estimate	Percentage of total measures estimated
All Insulation Measures	21,160	42%	54,000	28%
All Low Carbon Heat Measures	3,610	7%	20,000	10%
All Heating Control Measures	2,380	5%	87,000	46%
All Window and Door Measures	3,784	8%	12,000	6%
All Electricity Related Measures	18,582	37%	18,000	9%
Unknown Measures	308	1%	0	0%
All Measures	**49,824**	**100%**	**191,000**	**100%**

Sources: Annex U: HMT Enhanced Stimulus Option for HUG D&ES Phase (£200m/£300m) for measures and homes planned, and official statistics (HULA release May 2023) for measures installed and homes upgraded

It is unclear why fewer heating control measures were implemented than expected as the number of LAs who said in the survey that they planned this measure, but did not deliver it, is similar to other measures, and they did not seem to find it harder either to procure installers for this type of measures, compared to other measures.

There were also fewer low carbon heat measures installed than originally planned. This may be the result of to a combination of factors:

- In the survey of LAs, out of 16 respondents who commented on the difficulty or easiness to encourage households to install this type of measures, 12 said it was very or fairly difficult and only four said it was easy. Households may have perceived heat pump installation as more intrusive, especially where multiple measures were required to facilitate their installation, which may have made them less appealing to households.
- For this type of measure to be effective, other insulation measures are often required to be installed alongside the heat pump. According to the official statistics, the average cost of low carbon heat measures was £9,906 in Phase 1 and £9,291 in Phase 2, and therefore the maximum cap of £10,000 per household might have prevented this.

The survey of LAs discounted a lack of willingness to install these measures, and discounted problems with the supply chain to deliver this measure; recruiting installers for this measure was as easy or difficult as for other measures, and 28% of LAs reported having delivered this type of measure (a similar figure to other types of measures).

LAs were also asked to provide estimations in their applications for funding of the measures they planned to deliver, per type of measure. The survey of LAs asked about the types of measures delivered, and how they compared to their original plans. What LAs planned to install and actually delivered aligned with the most common measures installed through the Scheme according to the official statistics.

Table 9. Most common measures planned and delivered by LA survey respondents, by Scheme Phase

Measure Type	Top 4 measures planned and delivered in Phase 1	Top 4 measures planned and delivered in Phase 2
Loft insulation	59% (27)	60% (25)
Solid wall insulation	50% (23)	
Solar PV	46% (21)	62% (26)
Cavity wall insulation	43% (20)	45% (19)
Internal wall insulation		45% (19)

Sources: LA survey, 'QD4 Thinking about Phase 1 delivery, which measures did your Local Authority deliver under the LAD Scheme?' and 'QD4 Thinking about Phase 2 delivery, which measures did your Local Authority deliver under the LAD Scheme?'

When asked why the LA targeted these specific measures, the most common response was that these were the measures that were most suitable for their housing stock (17 (29%) gave

this response). Another key reason that these measures were chosen was that they allowed the LA to achieve the aims of the Scheme. One in five said this mix of measure types was chosen to ensure they met the cost cap of £10,000 per household, and 8 (14%) said that these measures allowed them to achieve a higher EPC rating or that this decision was based on EPC recommendations. There were also a number of measures that were planned by LAs but were not ultimately delivered, mainly:

- In Phase 1, one in five (9) respondents said that they planned to deliver solid wall insulation but did not ultimately deliver it, seven said this was the case for underfloor insulation and five said this was the case for cavity wall insulation.
- In Phase 2, a similar proportion (8) said that they planned to deliver solid wall insulation but did not ultimately deliver it, 6 said this was the case for cavity wall insulation and four said this was the case for loft insulation.

Conversely, there were a very small number of cases where a LA did not plan to deliver a measure but ended up doing so. In Phase 1, 3 (7%) of respondents said that they did not plan to deliver solid wall insulation but ended up doing so. In Phase 2 the rates were slightly higher with 5 (12%) of respondents saying that they did not plan to deliver internal solid wall insulation, but ended up doing so, and 4 (10%) said the same for room in roof insulation.

5.6.1 Conclusions on energy efficiency installations delivered

Overall, the number and type of measures installed did not match the original intentions for the Scheme set by BEIS and via LA applications. The reasons for both the reduced number of measures and type of measures installed related to practical delivery challenges. Timescales including delays to the scheme, increased costs and the impact of COVID-19 impacted the total number of measures that could be delivered. The need to minimise costs, the suitability of homes, the need for rapid delivery and challenges with installer capacity led to the dominance of solar PV and low rates of low carbon heating measure delivery.

5.7 Installers' willingness and capacity to participate

This section answers EQ 10: "Does the energy efficiency and low carbon heating installer market have the capacity/willingness to participate in this energy efficiency project, including compliance with PAS 2035 process? What barriers to participation exist?" The section brings information from the survey of installers and interviews with installers, industry bodies and TrustMark. As the number of respondents involved in these research activities was too low to be considered representative, these findings are qualitative providing depth rather than breadth.

Installation companies interviewed in February and March 2023 were generally very willing to engage with the LAD Scheme, although this willingness was tempered with some reservations about the LAD Scheme design and delivery. Installation companies and installation industry representatives interviewed also described a gap between their willingness to participate in the LAD Scheme and their capacity to participate. They outlined several factors affecting their

capacity to participate in the LAD Scheme, such as difficulty bidding for work, difficulties working with management companies, pricing and inflation, labour shortages and short timelines. The following sub-sections delve into these issues in more detail.

5.7.1 Willingness to participate in the LAD Scheme

The primary reason why installers participated in the LAD Scheme was because it provided a secure and guaranteed stream of income. Installers involved in retrofit work or installing energy efficiency measures stated that they rely on government backed initiatives like LAD or ECO as one of their main sources of income. They like to be involved with initiatives like LAD as it guarantees a pipeline of work over several years, which creates conditions for the business to hire staff and invest in new skills and accreditations. The Scheme coincided with a difficult period for some installation companies that were negatively affected by COVID-19 and needed the income boost provided by LAD. Some installation companies also saw LAD as a stopgap between ECO3 and ECO4.

> *"There was a gap in the delivery of ECO, which meant I would have surplus labour. The other reason was getting involved in a Local Authority Scheme can be very big for a business. I was keen to pursue that… We hoped it would be something long term and pretty good for the business." – Installer*

As the above quote also shows, another key reason installers participated in the LAD Scheme was to build relationships with LAs and other partners involved in the delivery of large initiatives like LAD in the future. Installation companies hoped to use LAD as an opportunity to build their networks and establish themselves as future suppliers for LAs on other projects.

Having the right expertise and certifications also enabled installers to participate in the Scheme. Many installers that worked on the Scheme had previous experience working on other government backed initiatives like ECO or the Green Deal, meaning they were usually PAS 2035 compliant and/or MCS certified, and were registered with TrustMark, making them eligible to complete installations on the Scheme. Four in five (80%) of installers that responded to the survey said they were registered with TrustMark before the Scheme, while over half (56%) were PAS 2035:2019 compliant and 50% were registered with MCS.

> *"Installers already in the ECO sector saw it as another income stream. Most of those firms [were working on ECO and] ECO required PAS 2035 compliance of some sort, [they] had their certifications, so they were the ones able to respond to LAD." – Installation Industry Organisation*

In some cases, installers also had existing relationships with LAs (e.g., they were on a LA procurement framework) or their delivery partners. These installers could directly apply to LAs or were top of mind for LAs and management companies when they needed to contract or sub-contract LAD work. A majority of installers surveyed, nearly six in ten (58%) worked for LAs as a main contractor, while four in ten (43%) were subcontracted to complete work under LAD. The short Scheme time frame prevented LAs from onboarding new installers to procurement frameworks, advantaging installers already onboarded on procurement frameworks. Sub-contracted installers generally had a worse experience of the Scheme than those working

directly with LAs, and the inability to onboard new suppliers to procurement frameworks prevented many installers from working with LAs directly to deliver the Scheme, creating a barrier to participation:

> *"Not being approved by a Local Authority was a complete stop. Lots of people would like to be involved with these types of Schemes, but if they have to go through Local Authorities, they will only trust people in their partnership. All the qualifications you hold, which give you the criteria to work under all these Schemes, go out the window because you're not a Local Authority partner." – Installer*

> *"One Local Authority asked why we didn't come direct, and we told them we weren't on their books. Local Authorities only opened their tender process every so often, so if you miss it, you're out until they open up." – Installer*

Installers said they lacked specialist staff required to manage applications to the Scheme, which disadvantaged them against management companies with project management functions capable of bidding for the same work. In many cases, installers recalled that management companies successfully applied for Scheme work through LAs and then subcontracted local installers to complete the work.

Industry organisations and installers also found management companies, who subcontracted work out to installers, added marginal costs to delivery costs. This reduced the margins for installers and made work unattractive in some cases and unviable in others resulting in installers turning down work for the scheme, further reducing the number of measures installed overall.

> *"There were too many people in the way to make profit margins work. The profit margins for the guy doing the work was not good… One of the large companies was offering companies rates that were effectively below minimum wage, and they wondered why work was being turned down…" – Installer Industry Organisation*

Construction companies and other contractors that did not work on the LAD Scheme were not consulted as part of this evaluation, but installers and the industry organisations generally viewed PAS as a barrier to entry for new entrants to the retrofit industry. Installers and industry organisations were very clear that standards like PAS 2035 have had a fundamentally positive impact on the industry, but they acknowledge that learning PAS 2035 processes is time consuming. Installers that wanted to work on the Scheme did not have enough time to learn these processes before the Scheme finished.

> *"Companies might have got registered with them, but the Scheme would have been over before they got to a measure." – Installer*

Installers that did not participate in the Scheme were not contacted as part of this evaluation, so it is not possible to gauge the extent to which PAS 2035 requirements prevented installers participating or suppress potential job creation in the industry. In the survey of installers, seven

in ten (70%) said they were already compliant with or held certifications, or had begun the process of becoming complaint with or gaining certifications, before the Scheme began. This question did not establish whether this was specifically for the LAD Scheme, or whether this was motivated by other factors or other schemes. This indicates installers are willing to become compliant with PAS2035 and gain other necessary certifications, and that they are not a barrier for installers participating in schemes. However, qualitative feedback from installers suggests that the LAD Scheme alone was not a specific motivating factor in these cases.

5.7.2 Capacity to participate in the LAD Scheme

Installers and industry representatives raised capacity as a major issue affecting the LAD Scheme and the industry as a whole. Although a large number of energy efficiency measures were delivered through the Scheme, overall, the industry felt that they could have installed even more measures had the Scheme been designed differently and had there been more installation capacity within the industry to meet the Scheme targets.

The Scheme design created issues for installers that limited installation volumes. Installers felt LAs were not prepared to quickly deliver the LAD Scheme, which affected their ability to understand the local supply chain. Installers recognised LAs were working under time constraints to deliver the Scheme and felt this limited the amount of engagement they had with installers. As a result, LAs were not sufficiently aware of their local supply chains' capacity to deliver installations and left some LAs reliant on other delivery partners to engage with installers about delivery.

According to installers, it took LAs too long to identify eligible properties and engage with the industry about delivering installations of measures meaning installers had a limited window in which to complete installations before the Scheme closed. In some cases, installers were unable to complete installations due to the time of year. External wall insulation, particularly, cannot be installed during the winter. Installers felt LAs should have had a greater understanding of their housing stock before the LAD Scheme launched, as it would have sped up identification of eligible and suitable properties. In Phase 2 of the Scheme, EPC requirements were relaxed, allowing 50% of installations to be delivered on properties with an EPC rating of D and 50% of installations to be delivered on properties with an EPC rating of E or lower. Although these relaxed requirements expanded the number of eligible households, it created a situation where installers had to wait for a sufficient proportion of homes with an EPC band of E or lower to be identified before they could begin work on properties with an EPC band D. Installers wanted all properties to be identified and assessed for retrofit measures, so that they could quickly scale up and then scale down delivery of measures. In their view, this would have helped them to plan effectively for things like labour, materials, and their future workload as a business. However, the frequent extensions to the Scheme and changes to eligibility requirements meant installers were often in the process of scaling down LAD operations only to need to scale things back up.

> *"Let's say I've got to deliver 100 jobs over 3 months. The workload follows a bell curve. You spend time getting the surveys done…then you start with doing five*

> *jobs a week, then 10 jobs a week at your peak. We started from a standing start, there was no build up and no time to work out teething problems." – Installer*

In practice, this meant ensuring there were labour and materials in place to install measures, two aspects where installers experienced shortages during the LAD Scheme. This affected how quickly they could scale work up again each time LAD was extended. These issues were exacerbated by the price rates for measures used within the LAD Scheme. According to installers interviewed and surveyed, the price rates were unrealistic from the outset and did not keep up with the rate of material inflation, meaning the margin on jobs for installers was reduced.

> *"People weren't doing the work because the work was not worth doing." – Installer*

> *"Between when we priced the work originally and completion, there was a nearly 40% increase on material which we couldn't pass down the line as it was a fixed term contract." – Installer*

It was flagged repeatedly in interviews with installers and with industry representatives that there was insufficient capacity, in terms of the number of retrofit companies and the amount of skilled labour, in the retrofit industry to meet the demand generated by initiatives like LAD. One industry representation organisation said that delays rolling out other initiatives (such as ECO4) have resulted in some installers leaving the industry. According to some installers and industry representatives interviewed, there is a small and declining pool of qualified installers that can work on government initiatives like LAD, while others felt the pool of qualified installers has remained static in size. Installers are often working across multiple initiatives which compete for resources, making it challenging for some installers to participate in new initiatives. Installers felt there was an industry wide problem with the availability of skilled labour during the LAD Scheme.

> *"There are so many Schemes now – boiler upgrade, Green Homes Grant, Green Deal, ECO, LAD, HUG, SHDF – installers and management agencies are managing nine different Schemes. You've got the same number of installers across the Scheme. You need to upskill more installers and provide more apprenticeships."* – Installer

> *"Whatever the Scheme is, you've got a fixed number of installers working in the industry, which has shrunk fivefold since ECO1. There were a lot of cowboys, but they're gone, there's a good core of installers left now."* – Installer

Another capacity issue was caused by the qualification and certification requirements for LAD. Installers and industry representatives felt that there was not enough support or funding made available through the Scheme to enable installers to gain new qualifications and learn new standards, which would make them eligible to deliver installations through the Scheme. Without support to gain learn processes for PAS 2035 compliance, these standards become a barrier for new entrants to the industry, which makes it harder to increase overall industry capacity to meet the demands of initiatives like LAD.

Issues with skilled labour also extended to the lack of administrative staff who were able to bid for work at installation companies. The installers interviewed mentioned that they were not prepared for tendering work with LAs directly and did not have the project management staff or the individual capability to go through LAs' procurement processes. This limited the amount of work installers could bid for directly.

> *"You need good installers, and you need good bureaucrats. You get one or the other in construction but not both. Local Authorities go to the wrong people. I can't just recruit administrative workers; I need specialised people. I have to train them up."* – Installer.

5.7.3 Conclusions on installers' willingness and capacity to participate

In conclusion, it is evident that there was a willingness to get involved in LAD with installers interviewed viewing this as an opportunity for more work in the future. However, capacity challenges related to issues surrounding procurement, challenges working with management companies, costs, labour availability and short timelines, impacted their ability to participate as much as they would have liked and also impacted the measures delivered as identified in the previous section. These factors affecting capacity were not seen as unique to LAD, and installers expressed concerns about the industry's capacity to engage with future initiatives, which is a key lesson to take from the evaluation.

5.8 Costs of LAD

5.8.1 Costs incurred

This section answers EQ14: "What cost is being incurred for installing energy efficiency measures in homes and where are those costs being incurred?"

The costs incurred can be categorised as follows:

- Direct costs from installing the measures: These were the costs incurred by the Government through the funding allocated via LAD to install measures, as well as costs incurred by homeowners and landlords to install said measures.
- Indirect costs, which include:
  - The costs for BEIS, LAs and Hubs of managing the Scheme.
  - Any indirect costs incurred by installers that were not passed on to the Scheme.

5.8.1.1 Direct costs incurred

The official statistics include data on mean cost per measure and number of measures installed, per type of measure. According to these data, the total cost incurred across Phases 1 and 2 of LAD for the 49,124 measures installed was £321 million, of which £274 million were incurred by the Government.

The average cost of the measures was £6,348 in Phase 1 (of which £5,055 were incurred by the government) and £6,531 in Phase 2 (of which £5,899 were incurred by the Government). The cost of some measures was above the maximum cap of £10,000 per household:

- In Phase 1: External solid wall insulation (£13,008 on average), flat roof insulation (£11,878), hybrid heat pumps (£11,787), and air source heat pumps (£11,255)
- In Phase 2: Ground source heat pumps (£22,970), external solid wall insulation (£17,166), air source heat pump (£12,353), and hybrid heat pumps (£11,661).

The average cost per measure incurred by the Government was kept below the £10,000 for all measures except for hybrid heat pumps (£11,787 was incurred, on average, in Phase 1, and £11,661 in Phase 2) and external solid wall insulation in Phase 2 (£12,721).

The costs that were not incurred by the government through LAD were either incurred by LAs (through other initiatives) or by households. Official statistics do not provide detail on these figures, but monitoring data made available to the evaluation team provides data on costs incurred by households for 532 measures. The total cost for households of these measures was £30.9 million (£3,727 per measure).

5.8.1.2 Indirect costs

As explained above, indirect costs could be incurred by those managing the Scheme, or by installers.

When asked about costs incurred for managing the Scheme, over half of respondents to the LA survey (33 out of 58 respondents) said that they had incurred costs that were not covered by the initial funding allocated from BEIS for administration. This is comprised of 31% who said that they incurred minor costs that were not covered, and 26% who said that they incurred significant costs that were not covered. Of those that incurred any uncovered costs, almost half of them (15) said that these costs came to less than £25,000. See the breakdown of these costs in Table 20 in Annex 13.

Installers could also incur costs if they had to comply with certain administrative requirements in order to be able to partake in the Scheme (such as gaining new certifications). Most of the installers who participated in the survey (94%) had some form of certification prior to participating in LAD, and almost half of survey respondents (47%) gained further certifications since participating in LAD. The most common forms of new certifications were registration in TrustMark (15%), PAS 2030:2019 (13%), and MCS (13%). In interviews, two installers commented that they had not incurred any indirect cost from participating in the Scheme, and two other installers referred to direct costs of equipment and installations, but no other indirect costs were mentioned.

In conclusion, it is likely that a minority of installers incurred some costs to obtain certifications or registrations that they would otherwise not have acquired, but no major unexpected costs have been identified through either the quantitative or the qualitative research conducted with installers. There is however little evidence on costs, and the response rate from installers was very low and therefore the strength of evidence for this conclusion is rather weak.

5.8.2 Management of fraud and non-compliance

This section responds to EQ 15: "To what extent is fraud and non-compliance effectively managed within the Scheme?".

At the beginning of LAD, BEIS produced a report[39] that identified potential risks for fraud and non-compliance, and designed mitigation measures. The report was a living document maintained throughout the Scheme to monitor fraud/error risks and adjust the controls used to manage the risks. It also set responsibilities for BEIS, LAs and TrustMark to identify risks.

5.8.2.1 Management of risks by BEIS

The risks that BEIS was responsible for identifying can be categorised as follows:

- Risks related to LAs: including risk of abuse of the £10,000 average requirement for installations, collusion between LA officials and installers, LAs not implementing the quality assurance measures described in the application, LAs receiving funding for work that started prior to the Scheme launch, LAs including non-domestic properties, or LAs using more than 15% of the funding for administrative purposes.
- Risks related to installers: including risk of installers invoicing for work done on properties that do not exist, or money paid for an installation that has already been funded by other government initiatives.
- Risks related to landlords: mainly comprising risk of landlords not contributing financially to the work done on their properties.
- Risks related to external parties, such as claims made for empty properties.

BEIS received data from LAs on a monthly basis through a platform. The statistics team at BEIS cleaned and analysed the data every month, and this was used by the LAD delivery team to monitor progress and potential cases of fraud and non-compliance. However, the data provided by LAs and Hubs was in some cases inaccurate and/or incomplete, which made it harder for BEIS to monitor the Scheme. Interviewees from BEIS also reported capacity issues to perform the statistical analysis and data checks.

> *"[BEIS] delegated responsibility for administration to the LAs and Hubs. Any monitoring mechanisms by the department would have not been to prevent problems directly - we would not have operated anti-fraud and error controls from BEIS. What we did need however was to see that controls were being run within the admin. Failings are threefold:*
>
> *1 - In the delegation of admin to LAs, LAs did not operate counter-fraud/error controls effectively (e.g., the gap in checking that installs were TM lodged).*
>
> *2 - The department did not have assurance through seeing MI and evidence of controls being operated to be satisfied controls were being applied adequately.*

[39] GHG-LAD Counter Fraud Plan

> *3 - Focus and measure of success orbited around spend rates, for instance with LA under-spend being reviewed and criticised but without the same focus on whether eligibility or fraud etc were issues or had solid management in place."* – DESNZ Net Zero Counter Fraud Function

BEIS also received data from TrustMark, which included details on the installations completed and the installers who conducted them. There were problems when reconciling the data provided by LAs and TrustMark, and reconciliation was not possible in some cases. This issue only became evident towards the end of the Scheme.

> *"I have reviewed the data we hold against lodgements in the Data Warehouse for LADs 1a/1b/2 projects. Due to the restrictions around the capabilities of the Data Warehouse at the time, unlike what is possible now within the Retrofit portal, more specific detail is difficult to achieve with the data."* - Trustmark's Assurance Director

Further to this, the survey of households and the monitoring data provided by LAs (and cleaned by BEIS) also had some inconsistencies in aspects such as the type of dwelling where households live, or the type of tenancy.

It is unknown to the evaluation team whether cases of fraud or non-compliance occurred, but it appears clear that the monitoring mechanisms established by BEIS to prevent it were inadequate. This was partly due to LAs not providing complete information, and partly due to BEIS not providing an adequate framework for monitoring and establishing timely compliance checks.

5.8.2.2 Management of risks by LAs

The risks that LAs were responsible for identifying can be categorised as follows:

- Risks related to homeowners: Homeowners falsifying their income to be under the threshold and receive measures, or getting measures installed and charged under the Scheme which are not eligible.
- Risks related to installers: These risks include problems with payments (e.g., invoicing or paying for work that has not been completed), installers charging significantly more than what the measure is worth, or installers/suppliers not being accredited under the correct standard.
- Risks related to external parties, such as organised crime or impersonation fraud.

In terms of managing fraud, the majority of LA representatives surveyed said that they managed this through post-installation checks – 79% said that these post installation checks were conducted with a desk review of the documentation, and 73% said that they were conducted through site visits.

To manage household non-compliance and fraud, over two thirds of respondents (69%) said that they conducted checks on household eligibility such as verifying income against multiple sources. In the survey of households, 5% of respondents reported a household income of

£30,000 or above. However, their income may have increased since they participated in LAD, and therefore it cannot be inferred that they were not eligible when the measures were installed.

To manage installer fraud, three in five respondents (60%) also said that they conducted checks on installation costs, such as conducting local market rate comparisons.

Fewer respondents said that their LA had specific protocols or staff who were responsible for identifying fraud – 29% said their LA had strategic measures in place (such as implementing anti-fraud strategies to conducting fraud risk assessments); the same proportion said there was staff training on fraud risk and mitigation; and 28% said their LA had Audit Officers in place to identify cases of fraud.

The survey of LAs is the only source of information that the evaluation team had to assess how well LAs managed the risks of fraud and non-compliance. Therefore, it is not possible with just this source to provide a robust answer on whether the measures in place were sufficient, or what else could have been done.

5.8.2.3 Management of risks by TrustMark

TrustMark was responsible for identifying risks involving installers (measures not complying to the standards, or installation of measures that are not appropriate for the property) and risks related to LAs (installation of measures that are not eligible).

To ensure the quality of installations funded by Government Schemes, including LAD, TrustMark has developed a Quality Assurance Guidance.[40] TrustMark conduct on site and desktop audits on a sample of properties, selected using a risk model that assigns a risk factor against the lodgement.

The evaluation team did not have data on the audits and checks conducted by TrustMark; however, qualitative information indicates that these checks were implemented effectively (see section “Influence of PAS 2035” for more information).

5.8.2.4 Conclusions on management of fraud and non-compliance

The processes in place to manage fraud and non-compliance by BEIS have been insufficient. The data available is insufficient to judge the extent to which the fraud and non-compliance risks outlined here were realised – but given how incomplete the monitoring information was, the evaluation team considers that it was not possible for BEIS, with the information available, to have effectively managed these risks. Some examples of the data limitations are provided below (see the Technical Annex, Annex 7 for more information):

- At the time of writing this report, there are still discrepancies across databases on basic information such as the number of measures installed through the Scheme.

[40] TrustMark Quality Assurance Guidance. Government Funded Schemes. V1.0 (December 2022), available at: https://www.trustmark.org.uk/docs/default-source/default-document-library/quality-assurance-guidance-government-funded-schemes-v1.1.pdf?sfvrsn=9259407_10

- There are discrepancies on the measures installed between the data provided by TrustMark and the data provided by BEIS to the evaluation team, and it was not possible to fully match the cases.
- Data on costs of installations and where the funding came from to install the measures (whether it was from the LAD Scheme, the LA, or the homeowner) is not available in a large number of cases in the monitoring information provided to the evaluation team.

The shortcomings in the data are due to a mix of reasons:

(a) Inadequate templates or systems put in place by BEIS, which made it difficult for LAs to interpret the templates or guidelines and report back;

(b) lack of accuracy and delays in the data provided by LAs;

(c) Limited capacity to fix data issues: required focussing on key data fields (e.g. addresses and measure type), at the cost of ancillary data (e.g. EPC ratings or tenancy type).

BEIS followed up with LAs in many cases and tried to improve the quality of the data, but these efforts were not always successful.

5.8.3 Conclusions on the costs of LAD

Average costs per measure fell well within the £10,000 cap in both phases of the scheme, although some individual measures, specifically external solid wall insulation, flat roof insulation and heat pumps exceeded this figure. Costs were largely incurred by the Government with the balance being incurred by LAs and households. LAs also incurred indirect costs regarding the management of the scheme but there is no evidence of installers incurring additional costs (noting the small respondent base). The processes that were put in place to manage fraud and non-compliance by BEIS were insufficient, which was exacerbated by the lack of data provided by LAs. Future initiatives should improve the monitoring templates and systems within BEIS and place contractual obligations on LAs to provide the data specifying the format in which these should be provided.

6 Outcomes evaluation

The outcomes evaluation has assessed the results achieved by LAD, as per the Theory of Change for the Scheme, mainly: outcomes for households, in terms of warmer homes and improved health; energy, carbon and bills savings; the contribution of the Scheme to improving the quality of the installations delivered; and outcomes for installers and their supply chain in terms of jobs supported.

6.1 Consumer experience

This section includes the experiences of consumers (households and landlords) with regards to the LAD Scheme (Phase 1 and 2). It addresses EQ7: “Is the project delivering a positive experience for consumers and landlords, and how is this influenced by the Scheme design?”. The section builds upon evidence collected through the survey of households, interviews with households conducted at several stages during the evaluation, and interviews with landlords.

By delivering energy efficiency and low carbon installations, the LAD Scheme aimed to bring positive outcomes to beneficiaries in terms of improved comfort in the home and improved health. This section explores households’ satisfaction along the ‘consumer journey’ and provides a summary of the outcomes reported by beneficiaries.

6.1.1 Satisfaction with the installation process

Before the installation took place, the most common concern among households was that the measures might not be installed properly (46%), followed by any costs associated to the respondent for the installation (29%) and the suitability of the measure to the property (28%).

Survey respondents, however, were generally pleased with the measures they had installed with three quarters (77%) saying they are satisfied with their measures overall. The levels of satisfaction were above 70% for most of the aspects the survey asked about: the time it took to complete the installation (79%), the level of disruption caused, compared to their expectations (76%), its quality (73%), and the suitability of the measure (72%).

In the process evaluation, it was observed that tenants living in social/council housing mainly applied to the LAD Scheme because it was imposed by their landlord (54%). This may have had an impact on their satisfaction with the Scheme, as they were more likely to dissatisfied with the process than the general population (18% dissatisfied compared to 10% for the general population of all households and tenants).

Some households and landlords interviewed in 2021 and 2022, respectively, also expressed some concern with the suitability of the measure offered. For example, two households interviewed in 2021 queried whether the measure installed in their home would positively impact the issues they felt needed addressing, i.e., damp and cold conditions. One participant received insulation but felt that windows were a greater priority and would make a greater

difference to their home (this participant was not offered replacement windows). Another participant was sceptical that the type of insulation installed would make a difference (this participant had hoped for a different type of insulation but was informed that it was not feasible for their home). It is interesting to note that both of these participants were social housing tenants and felt that they had limited control over home improvements as they did not own their home. Whilst not convinced that the measures would address their concerns, they were reluctant to decline the offer.

> "*We didn't mind having it [the measure], but we knew that it wouldn't make a difference. If we were to say 'no, we don't want it' it would look as if we were declining something. So, we accepted it, but it won't do a lot.*" – Household

Overall, landlords reported having a positive and smooth experience during the installation process, with few problems reported. Participants said that the communication between their tenants and the installers was smooth, and no issues were reported to them. The appointments during the installation process were mostly arranged by the installer directly with the tenants, even though some landlords preferred to be present in appointments carried out in the property (e.g., retrofit surveys). The reported cases where landlords had to liaise with installers to book the necessary appointments were very few.

On the negative experiences during the installation process, participants reported that they had to wait a long time between applying for the Scheme and having the measures installed, as well as between the initial survey and the commencement of the installation. The process was long and involved many steps, including a landlord application, a tenant application, the grant payment from the LA, retrofit survey, and lastly the installation itself.

Moreover, the timescales for delivery were a repeated issue that arose, even amongst participants that reported a positive overall experience of installations. Participants were aware of the increased demand for such measures, and showed their understanding towards the installers, however they expressed their frustration about the delays and about tenants not always being kept up to date in regard to the progress of the installation process.

Finally, participants reported that the installation of solar PV was more challenging than other measures. They reported that installers struggled to find subcontractors to carry out the work needed, which created delays and the need to rearrange the appointments with the tenants multiple times.

6.1.2 Satisfaction with the quality of the measures installed

A third (33%) of survey respondents experienced damage or needed additional work as a result of their installation. However, some disruption is inevitable, due to the types of measures being installed and these concerns do not relate to the quality of the measure itself, but more

the installation process. The types of measures where respondents reported damage or a need for additional work were the following:[41]

- Internal solid wall insulation created disturbances for 83% of respondents who received this type of measure. 71% reported that the property had to be redecorated after the installation, and 30% reported that the installer or installation had caused damage to the property.
- Air source heat pumps created disruption for 74% of respondents. The most common disruptions were that pipes had to be re-routed (47%), the property needed to be redecorated (44%), damage was caused (29%), and carpets or flooring needed to be replaced (24%).[42]
- Hybrid heat pumps created disruption for 48% of respondents, mainly because of pipes having to be re-routed (35%), carpets or flooring replaced (23%), and property redecorated (22%).[43]

The types of measures with fewer issues reported were energy efficient lighting (only 12% reported issues) and cavity wall insulation (17%).

About a quarter of survey respondents (22%) reported having experienced some disruption post-installation. The need to redecorate after internal solid wall insulation was probably expected by households, since they did not report significantly more problems post-installation than for other measures. Air source heat pump and hybrid heat pump, however, seem to have been particularly problematic, with 58% and 49%, respectively, reporting issues.

The problems experienced with air source heat pump related, mainly, to faulty heating system (42%), poor installation (25%), poor quality or defective products or components (20%), and lack of information or communication (20%). Some examples of the difficulties experienced after having an air source heat pump installed are:

> *"The system was not set up correctly and was using too much electricity. Had three engineers visit before it was corrected."*

[41] Q: Did the installation listed below cause any damage or lead to additional work being required to other parts of the property? Please select all that apply.
1. Pipes had to be re-routed in the property
2. Carpets or flooring needed to be replaced after the installation
3. Property needed to be redecorated after the installation
4. The installation/installer caused damage to the property
5. The installation/installer caused damage to belongings/personal property
6. Other (please specify)
7. No- the installation did not cause any damage or lead to additional work being required
8. Don't know

[42] Please note, this section discusses heat pumps in the context of how respondents answered a survey question about requirements for additional work. Installing heat pumps requires pipes to be re-routed and major redecoration, things that were anticipated and likely communicated to households ahead of installation. Results should be read as indicating some expected disruption caused by these aspects of installing heat pumps, but overall should not be seen as a problem or issue when installing heat pumps (except where respondents specifically say the installation/installer caused damage to the property or belongings/personal property within the survey).

[43] See footnote 33

> *"We had to call installer as air source heat pump stopped working when we had first frost of winter. Apparently the defrost cycle was not set up correctly during commissioning. An engineer was sent, and this was resolved within a day."*

> *"Had to request return visits from installers as system did/does not heat the property sufficiently. Eventually had to pay for a different independent installer to attend and check the system/recommission it."*

For those that experienced difficulties / faults with air source heat pumps and hybrid heat pumps, for half of them (41% and 50%, respectively), the issues had not been resolved when they participated in the survey. Despite this, two thirds (66%) of the household were overall satisfied with their Air Source Heat Pump, and a similar proportion (68%) satisfied with its quality.

Some landlords (both social and private) interviewed spoke of negative experiences in regard to after-care experiences and a lack of communication between the installers and the tenants (without referring to any particular type of measure). In one case, this led to tenants moving out of the property as the issues caused were not being resolved.

6.1.3 Benefits since installation

Evidence from both the survey of households and the interviews with households and landlords indicates that, in general, people find it easier to warm their home and they have reported improvements in comfort following the installation of measures.

In the household survey, respondents were asked about how easy or difficult it was to heat their property before and after they received the measures installed under LAD. The proportion of those who said it was easy increased from 35% to 54%, and the proportion of those who said it was difficult decreased from 39% to just 17%.

These figures varied between households receiving different types of measures. The most significant changes were observed in cases where insulation measures were installed. For example, amongst households that received park home insulation measures, the proportion of those who said it was easy to heat their property increase from 40% to 79%, and the proportion of those who said it was difficult decreased from 30% to just 9%. For wall insulation, the change of similar scale, with the proportion of households saying it was easy to heat their properties increasing from 32% to 63%, and for those who said it was difficult decreasing from 45% to 17%. For proportion of households saying it was easy to heat their properties did not differ much (from 39% to 47%), however, these households were the ones that reported the biggest change in how difficult it was to heat their homes (from 58% to 29%).

All the figures in this chapter should be interpreted with caution as they rely on respondents' memory of their past experience. This may not be entirely accurate as it can be susceptible to post-improvement biases, where respondents may overestimate the impact of the works on their properties' warmth.

In qualitative interviews, households also referred to increased comfort and warmth in the building. Participants felt that external wall insulation had positive effects on their homes by improving heat retention in the building, making homes feel warmer and more insulated. One participant specifically noted that since the measure was installed, they had not noticed any damp, which had been common prior to the installation.

> *"With the cladding, we have actually gained 3 to 4-degree retention in temperature overnight. Which is massive. (…) Instead of waking up at 10 or 11 degrees in the morning, is now 15, and that makes a huge difference. (…) As soon as they put the external cladding on, it was like someone had put a coat on." (Household)*

Similarly, the landlords interviewed reported having received feedback from tenants about the property being easier to heat and keep warm, resulting in a more comfortable living environment.

Some households have also experienced other benefits. One in ten (13%) say their property is less draughty, a proportion that increases to about a third of respondents for those who received energy efficient doors, windows, and double or triple glazing. Also, about one in ten (10%) indicated that there is less condensation after installing the measures.

Landlords interviewed had also noticed a decrease in the number of issues reported by tenants regarding damp and cold rooms after the measures have been installed. They also mentioned financial benefits for themselves in terms of improved EPC ratings and future rental value of their properties.

6.1.4 Effects of the Scheme on fuel poverty

The statutory fuel poverty target, set in December 2014, has a clear focus on improving energy efficiency to mitigate fuel poverty where it exists. The target is to ensure "*that as many fuel poor homes as is reasonably practicable achieve a minimum energy efficiency rating of Band C, by 2030*".[44] Improving the energy efficiency of dwellings was a key objective of the LAD Scheme.

The key determinant of a change in fuel poverty status was whether the LAD measures installed were likely to have improved the dwellings' energy efficiency rating ('EPC') to band C or above or not.[45] To isolate the direct effects of the LAD measures, other factors which influence a household's fuel poverty status, such as changes in household composition, household income, fuel prices and any other changes to the dwelling were held constant. Given the marked increase in the price of energy and the impacts of the pandemic on households over the period of this evaluation, it was especially important to focus the analysis on the impact of the Scheme itself, without allowing other factors which could not be influenced by the Scheme to obscure the results.

[44] Terms of reference - Committee on Fuel Poverty - GOV.UK (www.gov.uk)

[45] EPC band was used as a proxy for FPEER rating as information regarding income-related benefits such as the Warm Home Discount was not available. See Technical Annex, Annex 11.1 for more details.

Table 10 below shows the proportion of households that were likely to be in fuel poverty, both before and after the measures were installed, from an DESNZ analysis of a sample of households where both EPC and income data was available.

Table 10. Number of households in fuel poverty, before and after the Scheme

		Before Scheme	After Scheme	Change
Number in fuel poverty (Base N = 1,055)		823 (78%)	398 (38%)	425 (-52%)

As outlined in section 5.3.4 “Effectiveness of the Scheme in reaching fuel poor households”, of the 1,055 household cases sampled for this analysis, 78% (823) were identified as likely to be fuel poor (low income, low energy efficiency) and 97% were classed as living in low energy efficiency homes (i.e., homes with a modelled EPC band rating of band D or below) prior to the installations of the measures. Half (425) of the 823 households in the sample identified as likely to be fuel poor prior to the installations were likely to be taken out of fuel poverty as a result of the energy efficiency measures installed through the LAD Scheme.

6.1.5 Health impacts

The health impact of the LAD Scheme on people living in treated properties is less clear. Almost three in ten (28%) survey respondents said measures installed under the Scheme had impacted their or their household’s health – whether mental, physical or both – while more than half (55%) said there had been no impact.

Among those whose health had been impacted, more than four in five (83%) said this had been a positive impact with around one in ten (13%) believing it had had a negative impact.

Households who received low carbon heat measures were more likely to report impact on their health than those receiving other measures (34% compared to 28%). The impact was also more likely to be negative (36% reported a negative impact, compared to 16% for all measures, while 58% reported a positive impact, compared to 83% for all measures). The impacts reported were both on physical and mental health (21%, compared to 7% and 6% for mental and physical health respectively).

Households that have a person with a long-standing illness, disability, or infirmity were also more likely to report experiencing an impact (35% compared to 22% for households with no people having such illness). The impacts felt by this group were mostly positive, with four in five (82%) reporting a positive impact and one in ten (8%) a negative impact.

6.1.6 Conclusions on the consumer experience

Overall survey respondents were generally pleased with the measures they had installed, the time it took to complete the installation, the level of disruption compared with expectations and the quality and suitability of the measure. However, social housing tenants were more dissatisfied with the process than the general population of tenants and households and some felt that the measures installed were less suitable than others but they had limited control over the measures selected. Landlords, households and tenants were largely happy with the installation process although a minority identified that they had to wait a long time between application and installation. A third of households and tenants surveyed experienced disruption with the installation, however, this is to a large degree inevitable considering the types of measures being installed and these concerns do not relate to the quality of the measure itself, but more the installation process. Post installation challenges regarding the actual functionality of the measure were more common with heat pumps than other measures installed.

The LAD Scheme was intended to achieve positive outcomes to beneficiaries in terms of improved comfort in the home and improved health. There is clear evidence that people found it easier to warm their home and they have reported improvements in comfort following the installation of measures. Half (52%) of households identified as likely to be fuel poor prior to the installations were taken out of fuel poverty as a direct result of the energy efficiency measures installed through the LAD Scheme. The reason for this is that the households reached by LAD had very low energy efficiency ratings, and the measures installed in some of these cases were not sufficient to move them out of fuel poverty. The health impact of the LAD Scheme on people living in treated properties is less clear. The evaluation has not identified clear impacts for households and tenants health which may relate to the time required for health benefits to be achieved. Over half of those surveyed reported no impacts on their or their household's health whilst almost a third identified health impacts (physical, mental or both). Of those whose health had been impacted, most (four out of five) noted positive impacts and just over one in ten reported negative impacts.

6.2 Energy, carbon, and bills savings

This section answers EQ 9: "What energy, carbon and bills savings are being delivered by the Scheme and how is the Scheme design influencing this?"

The LAD Scheme aimed to:

- Raise the energy efficiency of low energy performance homes (i.e., those with energy performance certificate (EPC) ratings of D, E, F or G).
- Deliver cost effective carbon savings to carbon budgets and progress towards the UK's target for net zero by 2050.
- Tackle fuel poverty by reducing energy bills and making homes more energy efficient for low-income households.

In order to quantify the extent to which the Scheme achieved these aims, BRE modelled the energy, carbon and financial savings associated with the measures installed under LAD using the BRESMI model (see the Technical Annex, Annex 11 for more information). To quantify the direct effects of the measures, BRE controlled for the effects of other changes to the dwellings that were not a result of the funded improvement. The households modelled were those participating in the survey for whom there was sufficient monitoring data (2,005 households in total). It was not possible to capture actual household energy consumption within the scope of this analysis, so this modelling is the best measure of these scheme outcomes available.

The total number of measures installed within the sample of 2,005 homes was 2,731, although not all of these measures could be modelled (see the Technical Annex, Annex 11.1). It was not possible to model the impacts of heat pumps, storage heaters, underfloor insulation, doors and draughtproofing. This means that for some homes the impacts of the measures installed were under-estimated by the model. However, BRE were able to model the impact of the measures installed in the vast majority of homes and, overall, 82%, of the measures installed were modelled. The overall reported savings are likely to slightly under-estimate the actual savings achieved.

For this sample of 2,005 homes, the mean and median values of SAP, annual energy demand, CO_2e[46] emissions and energy bills were calculated before and after the measures were installed. The majority (73%) of homes modelled only had one measure installed and only 7% had three or more (see Table 11 below).

Table 11. Distribution of multiple measures installed

Number of measures installed in the dwelling	Number of dwellings	Percentage of dwellings	Number of measures
1	1,466	73%	1,466
2	393	20%	786
3	113	6%	339
4	27	1%	108
5	4	0.2%	20
6	2	0.1%	12
Total	2,005		2,731

[46] These are CO_2 equivalent figures which include the global warming impact of CH_4 and N_2O as well as CO_2.

Base: All households modelled, n=2,005

6.2.1 Energy efficiency improvements achieved

As already explained in section 5.3.4 “Effectiveness of the Scheme in reaching fuel poor households”, SAP is the methodology used by the government to assess and compare the energy and environmental performance of dwellings. This energy efficiency rating is based on calculated fuel cost for delivering a predefined level of comfort and service provision, based on standardised assumptions about occupancy and occupant behaviour. It enables a like-for-like comparison of a dwelling’s performance. The SAP rating is used to derive energy efficiency bands, running from A to G, where band A indicates the most efficient homes, corresponding to the highest SAP ratings, and where band G indicates the least efficient homes, corresponding to the lowest SAP ratings.

Based on the Verified EPC data extracted from the EPC register, the mean SAP score for this sample of homes (21,644) prior to the measure installations was 53 which equates to a high EPC band E rating. The mean SAP score of the dwellings after the measures were installed was 69, which equates to a low EPC band C rating.

Table 12 shows the number of dwellings below band C before and after the measures were installed, in our sample of 21,644 properties with verified EPC ratings. In total, 10,705 dwellings (52%) moved from a band D or lower before the scheme to a band C or higher after taking part in the scheme.

Table 12. Number of dwellings below SAP band C, before and after measures

	Number of dwellings before	Number of dwellings after	Change in number of dwellings resulting from the measures
Number of low energy efficient dwellings (SAP band D or lower)	20,574	9,869	-10,705 (52% reduction)
Number of high energy efficient dwellings (SAP band C or higher)	1,070	11,775	+10,705

Base: All households with pre and post-installation data in EPC register as at November 2022, n=21,644

Table 13 shows the distribution of the dwellings across the EPC bands both before and after the measures. In total, EPC ratings improved by at least one band for 76% of the households DESNZ were able to analyse.

Table 13. Energy efficiency ratings of household sample (before and after measures

Numbers of households in each energy band		EPC band after improvements						
		A	B	C	D	E	F	G
EPC band before improvements	A	125	0	0	0	0	0	0
	B	2	153	0	0	0	0	0
	C	19	53	718	0	0	0	0
	D	186	1,406	4,739	3,037	0	0	0
	E	64	674	2,821	3,983	887	0	0
	F	14	145	517	699	485	283	0
	G	0	29	110	187	128	104	76

Base: All households with pre and post-installation data in EPC register as at November 2022, n=21,644

6.2.1.1 Impact of individual measures on SAP score

BRE conducted separate modelling of SAP performance by measure using a sample of 2,005 households who had completed the householder survey. When installed as single measures (rather than in conjunction with other measures), the measures that were found to have the largest impact on SAP score were wall insulation and photovoltaic panels. The other measures installed had notably less impact; however, the sample size of homes which had some of the other measures installed as a single measure was very low, so average figures reported for these should be treated with caution.

Table 14. The impact of individual measures upon the mean and median SAP ratings

Insulation measure	Number of cases	Type of average	Average SAP before	Average SAP after	Change in average SAP
Roof insulation	217	Mean	52	53	1
		Median	56	57	1
Wall insulation (cavity and solid wall insulation)	358	Mean	48	56	8
		Median	52	61	9
Cavity wall insulation	107	Mean	47	52	5
		Median	53	58	5
Solid wall insulation	251	Mean	48	58	10
		Median	52	62	10
Double glazing	22	Mean	55	56	1
		Median	59	59	-
Heating controls	12	Mean	57	58	2
		Median	61	62.5	1.5
Tank insulation	1	Mean	33	37	4
		Median	33	37	4
Photovoltaic	750	Mean	52	60	8
		Median	56	65	9
Solar thermal	2	Mean	38	42	4
		Median	38	42	4

Base: all households modelled by BRE, n=2005

6.2.2 Changes in annual energy demand

As well as modelling the change in SAP score, BRE also modelled the annual energy demand (kWh) of the dwellings before and after the measure installations in order to calculate the average annual energy savings resulting from the improvements.

The model estimates the energy 'demand' of the home i.e. how much energy is required to heat, light and power the home. This demand figure does not account for where the energy comes from (e.g. from the national grid, or from renewables installed on the house). For this reason, the installation of PV panels is modelled as having no effect on the energy 'demand' of the home. Although the installation of PV does not influence the energy demand figures, the model does account for the impact of PV on carbon emissions, fuel bills, SAP score and therefore the installation of PV panels does also influence the change in fuel poverty status figures.

Table 15 below shows the average change to energy demand resulting from the measures. The mean reduction in annual energy demand resulting from the Scheme was 1,927 kWh (8%).

Table 15. Average change in energy demand resulting from the measures

	Type of Average	Average before (kWh)	Average after (kWh)	Change (kWh)
Average annual energy consumption per household	Mean	23,623	21,696	1,927
	Median	21,163	19,385	1,778

Base – all households modelled by BRE, N=2005

Table 16 below shows the average energy demand saving split by the number of measures installed. The number of measures installed had a large effect on the energy savings achieved, with three or more measures installed resulting in almost twice the energy savings of a single measure. Installing multiple measures is subject to diminishing returns (the savings achieved by installing three measures are not three times those achieved by single measures).

Table 16. Average annual energy demand by number of measures

	Type of Average	Average kWh before	Average kWh after	Change
Single measure (N = 1,466)	Mean	23,623	22,064	1,559 (6.6%)
	Median	21,102	19,577	1,525 (7.2%)
Two measures (N = 393)	Mean	23,274	20,551	2,723 (11.7%)
	Median	21,163	18,728	2,435 (11.5%)
Three or more measures (N = 146)	Mean	24,565	21,081	3,484 (14.2%)
	Median	21,573	18,149	3,424 (15.9%)

Base – all households modelled by BRE, N=2005

6.2.3 Reduction in annual carbon emissions

To evaluate how effective the LAD Scheme was in reducing CO_2e emissions, BRE modelled the annual tons of CO_2e produced per annum for each home before and after the measures were installed (see Table 19).[47] The CO_2 figures reported include the global warming impact of CH_4 and N_2O as well as CO_2. On average, homes saw a reduction of almost half a ton of CO_2e per year.

Table 17. Average reduction in carbon dioxide emissions resulting from the measures

	Type of Average	Average CO_2e before	Average CO_2e after	Change
Average tons of CO_2e per annum	Mean	4.99	4.51	0.48 (9.6%)
	Median	4.38	3.91	0.47 (10.7%)

Base: All households modelled by BRE, n=2,005

Table 18 below shows the average reduction in annual carbon emission by number of measures installed. As with the energy savings and SAP rating, the carbon savings increased

[47] Further details on the modelling method can be found in section the technical annexes.

as the number of measures installed increased, with three or more measures installed resulting in almost twice the carbon savings of a single measure.

Table 18. Average reduction in annual carbon emissions by number of measures

	Type of Average	Average CO_2e before	Average CO_2e after	Change
Single measure (N = 1,466)	Mean	5.01	4.60	0.41 (8.2%)
	Median	4.37	3.99	0.38 (8.7%)
Two measures (N = 393)	Mean	4.89	4.26	0.63 (12.9%)
	Median	4.42	3.78	0.64 (14.5%)
Three or more measures (N = 146)	Mean	5.02	4.23	0.79 (15.7)
	Median	4.47	3.66	0.81 (18.2)

Base: All households modelled by BRE, n=2,005

6.2.4 Bill savings achieved

A key objective of the LAD Scheme was to reduce the energy bills for low income and fuel poor households. The fuel prices used for the bill saving modelling were based on 2021 average fuel price figures, as these were the latest figures available at the time of analysis and most closely matched the time period in which the measures were installed. Table 19 in the Technical Annex, Annex 11 shows the fuel prices used and sources for each of the fuel prices. Based on 2021 fuel prices, households saw an average reduction of £180 (14%) on their annual energy bills as a direct result of the measures installed under LAD. This saving is likely to be even higher in 2022/2023 given the increase in energy prices.

Table 19. Average annual fuel bill before and after measures (2021 fuel prices)

	Type of Average	Average annual fuel bill (£) before	Average annual fuel bill (£) after	Change
Average annual fuel bill (N = 2,005)	Mean	£1,262	£1,082	£180
	Median	£1,027	£867	£160

Base: All households modelled by BRE, n=2,005

Table 20 below shows the average reduction in energy bills by number of measures installed. As with the energy and carbon savings, the fuel bill savings increased as the number of measures installed increased, although less markedly than the energy and carbon reductions. On average, homes which had three or more measures installed would have saved around £240 in 2021, compared to £175 for a single measure.

Table 20. Average reduction in annual energy bills by number of measures

	Type of Average	Average annual fuel bill before	Average annual fuel bill after	Saving
Single measure (N = 1,466)	Mean	£1,247	£1,072	£175
	Median	£1,024	£871	£153
Two measures (N = 393)	Mean	£1,294	£1,117	£177
	Median	£1,035	£874	£161
Three or more measures (N = 146)	Mean	£1,327	£1,087	£240
	Median	£1,040	£808	£232

Base: All households modelled by BRE, n=2,005

6.2.5 Conclusions on the impact of LAD on energy, carbon, bills savings, and the fuel poverty status of households

Overall, 95% of the LAD homes were assessed by DESNZ as having low energy efficiency (i.e., having an actual EPC band rating of band D or below), prior to installation of the improvement measures, and 76% of households were identified as likely to be fuel poor (low income, low energy efficiency). These findings clearly indicate the Scheme was successful in targeting low energy efficiency homes and fuel poor households.

Around half of the households who were likely to be fuel poor prior to the installations were estimated to be taken out of fuel poverty as a result of the energy efficiency measures installed through the LAD Scheme. One reason for this is that the average energy efficiency of the homes was low prior to the installations: the average SAP score was 53, equivalent to EPC band E. Whilst homes treated under LAD increased their energy efficiency (by 16 SAP points, on average), for half of the homes the increase was insufficient to reach the minimum SAP score of 68 required to take the household out of fuel poverty.

Three quarters of dwellings modelled only had one measure installed and less than 10% had three or more. This limited the ability of the Scheme to achieve Band C or higher in homes that had low energy efficiency prior to the Scheme, and therefore limited its ability to lift more households out of fuel poverty.

Installing multiple measures influenced the amount of energy and carbon saved, with three or more measures resulting in twice the energy and carbon savings of a single measure. Whilst there are diminishing returns from installing multiple measures, the findings from the evaluation of both the GHG-Vouchers and LAD Schemes indicate that the installation of single measures has a more limited impact on individual household energy, carbon and energy bill savings achieved.

6.3 Influence of PAS 2035

This section responds to *EQ 11: "What influence has the requirement to undertake installations in compliance with PAS 2035 had on the delivery of installations?"*

The rationale for requiring compliance with PAS 2035 was to ensure that installations were delivered to good quality standards, and that the most suitable measures (i.e., those that would deliver the best outcomes in terms of improving energy efficiency and EPC ratings) were installed in each property.

For clarity, it is important to reiterate the difference between PAS 2035 and PAS 2030 as both are discussed in this section:

- PAS 2035 relates to the process that retrofit projects need to follow. This process includes specific stages comprising assessment, design, installation, and evaluation. Each of these stages has requirements which must be met in order to be compliant with the 2035 process. These requirements include the need to have a suitably qualified retrofit professionals undertaking each stage of the retrofit process i.e., a qualified assessor for the assessment, a qualified designer for design etc.
- PAS 2030 is the standard related to the installation stage of the PAS 2035 process and details competencies of the installer and specifications of the measure installed. Businesses can achieve PAS 2030 certification for individual measures they want to install, such as External Wall Insulation or Solid Wall Insulation.

Phase 1A (September 2020 to August 2021) of the LAD scheme required MCS certification and recommended Trustmark registration; LAs who did not plan to seek the latter had to notify

BEIS. Phase 1B (December 2020 to September 2022) required PAS 2030:2017 and a continued recommendation for Trustmark registration; from October 2021, PAS 2030:2019 certification and PAS 2035 compliance were required.

Phase 2 (April 2021 to September 2022, with some exceptions to carry out installations by December 2022) required MCS certification, PAS 2030:2019 certification, PAS 2035 compliance and Trustmark registration.

The section covers the extent to which installations were conducted according to the specifications (MCS and PAS 2030) and installers were compliant with PAS 2035 and applied the whole house approach and provides insights from householders regarding the information received on recommended measures and their satisfaction with the measures installed. The section then assessed the degree to which LAD contributed to the outcomes achieved and influenced installers to become compliant with PAS 2035; and finally assesses the degree to which PAS 2035 influenced the quality of installations.

This section is informed by contribution analysis which was used to evaluate each different aspect of the overall evaluation question; further detail on how the contribution analysis was conducted is provided in Annex 7. The contribution analysis was applied by developing a series of tests that were framed as evidence that would be expected to confirm the Theory of Change, or a specific contribution pathway, or the alternative pathway. Each test was assessed via one or more sources of information and categorised according to its strength.

6.3.1 Extent to which installations were conducted according to the specifications (MCS and PAS 2030 / 2035)

Of the installers that were surveyed about their experience of the LAD Scheme, a total of 31 (78%) were either already PAS 2030:2019 certified before the LAD Scheme or gained their certification during the LAD Scheme.

Data from TrustMark indicates that all the measures included in its database were installed in accordance with PAS 2030:2019 or MCS. However, there were 12,194 fewer measures in the TrustMark database than in the monitoring information provided by BEIS (28% of installations), as shown in Table 21 overleaf.[48]

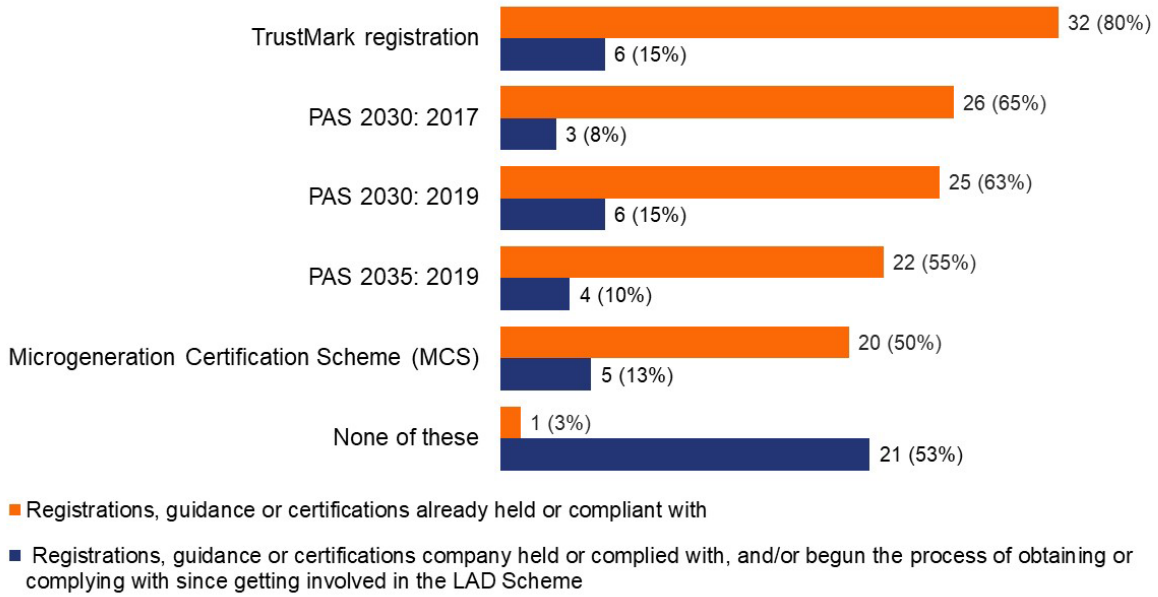
[48] This is based on Trustmark data available to Ipsos at the time of writing. Further data reconciliation has been performed to improve the accuracy and completeness of data collected through the scheme. However, there were some issues with data collection during the Scheme that have affected completeness and accuracy of data sets.

Table 21. Scheme data for measures installed compared to measures registered with TrustMark

	Phase 1				Phase 2			
Measures	**Scheme Data**	**TrustMark (All)**	**TM – PAS 2030**	**TM – MCS**	**Scheme Data**	**TrustMark (All)**	**TM – PAS 2030**	**TM – MCS**
All insulation	10,492	8,051	8,051	0	7,397	4,747	4,747	0
All low carbon heating	1,199	642	69	573	1,854	1,351	404	947
All heating control	912	410	410	0	1,154	790	790	0
All window and door	1,725	950	950	0	1,569	978	978	0
All electricity related	6,082	4,809	190	4,619	10,229	8,085	65	8,020
Total	**20,666**	**14,862**	**9,670**	**5,192**	**22,529**	**15,951**	**6,984**	**8,967**

Although there is a gap in TrustMark's data for some of the measures installed under LAD, qualitative and quantitative data collected from installers and installation industry organisations demonstrates that measures were PAS 2030:2019 and MCS compliant. Installers that participated in the LAD Scheme and installation industry organisations that were interviewed by Ipsos in February and March 2023, clearly and repeatedly mentioned that installations were completed in compliance with PAS 2030 or MCS standards. This was often a contractual condition set by LAs or intermediary management companies that installers had to comply with to receive payment. A large proportion of the installers surveyed by Ipsos in February 2023 also said they held certifications in PAS 2030[49] and MCS. As can be seen in Figure 5 below, 29 (73%) installers surveyed said they obtained PAS 2030:2017 before or during the Scheme and 31 (78%) said they obtained PAS 2030:2019 certification before or during the LAD Scheme, while 25 (63%) gained MCS certification before or during the Scheme.

Figure 5. Registrations, guidance, or certifications that companies already held or were compliant with before the LAD Scheme began, and registrations, guidance or certifications that companies held or complied with, and/or began the process of obtaining accreditations or complying with since getting involved with the LAD Scheme



Source: Survey of installers, February 2023. Base: Which, if any, of the following registrations, guidance or certifications did your company hold, or was compliant with, before getting involved in the LAD Scheme? (40). And which, if any, of the following registrations, guidance or certifications has your company held or complied with, and/or begun the process of obtaining or complying with, since getting involved with the LAD Scheme? (40).

The lack of available TrustMark data for over a quarter of measures means we cannot conclusively say whether all installations were conducted under PAS 2030 or MCS, however the evidence available from installers and installations industry organisations suggests it is probable that measures were installed in compliance with PAS 2030 and MCS.

[49] Installers interviewed did not distinguish between PAS2030:2017 and PAS2030:2019 and referred only to PAS2030.

6.3.2 Extent to which installers were compliant with PAS 2035 and applied the whole house approach

There is insufficient data available to conclusively say the installation of measures during LAD Phase 2 were compliant with PAS 2035, meaning we cannot assess these tests fully. Qualitative and quantitative data gathered from installers and installation industry organisations, however, provide some insight into how PAS 2035 was applied during the Scheme.

Of the installers that were surveyed about their experience of the LAD Scheme, 26 (65%) either already installed measures compliant with PAS 2035 standards before the LAD Scheme (22) or started installing measures to PAS 2035 standards during the Scheme (4). Installers and installation industry organisations that were interviewed about the LAD Scheme also said that Scheme installations were compliant with PAS 2035.

In some cases, installers interviewed about the Scheme felt it was not made clear that standards had changed for Phase 2 to require installations to comply with PAS 2035. Some installers said that they had been penalised later for failing to maintain compliance with PAS 2035 standards. This would suggest, on the one hand, that it was not universally clear to all installers that they needed to be PAS 2035 compliant to participate in the Scheme, and on the other, that in at least some LAs' monitoring mechanisms were in place to assess whether installation was compliant with the guidance.

6.3.3 Extent to which households received information from retrofit assessor/coordinator/advisor on the recommended measure(s) to install

While participating households surveyed were not asked explicitly whether they received information from a retrofit coordinator about recommended measures to install, almost three quarters of survey respondents (72%) said they were satisfied with the suitability of the measures that were installed as part of the Scheme, indicating a majority of respondents received a suitable recommendation of which measure(s) to install. However, over a quarter of respondents *did not say they were satisfied* with the suitability of the measure that was installed,[50] meaning it is not possible to say that households universally felt that they received information from a retrofit coordinator leading to a suitable recommended measure.

Qualitative research with participating households during Phase 1 explored the information provided by retrofit assessors about their recommendations. Households interviewed rarely, if ever, directly referred to the person who conducted the assessment as a retrofit assessor/coordinator, suggesting they were not entirely clear who they were. Some households said that they did not receive enough information about what would happen after the assessment, and lacked communication about installations, which left them feeling uncertain about the next steps. In some instances, participants noted that they had discussed

[50] These are all the respondents that said they were dissatisfied with the suitability of the measures installed or that said they were neither satisfied nor dissatisfied with the suitability of the measures installed.

the process for the installation, and/ or the benefits of the measure/s being offered (e.g., improved heating/ impact on bills) with the LA/ assessor/ installer.

> *"I discussed it [the measure] with the chap who came, who dealt with it all. I was quite happy about that. (…) He came to the house, wandered around and told me about things that would need to be done, and how they would take shape. And that was ok."* – Household

However, PAS 2035 was not a requirement under Phase 1, when this feedback was gathered. Broadly speaking, though, the qualitative feedback from households supports findings from the quantitative research. Most households interviewed were satisfied with the information provided by the retrofit assessor about their recommended measure(s).

Overall, most households surveyed (72%) reported satisfaction with the measure(s) they were recommended, which was corroborated by evidence from households interviewed about their experience of retrofit assessors. However, a minority of households surveyed reported that they had not received sufficient information (13%) and some households that were interviewed did not always feel they had been recommended the best measure for them.

6.3.4 Extent to which homeowners would have installed different measures or would have been less certain about what measures to install, without the advice provided

There was no indication from households interviewed during LAD Phase 1 that they would have installed any measures if they had not been recommended to them as part of the Scheme. Some households interviewed reported that the LA had let them know what measures they were eligible for, which limited their choice of measures available. In other cases, retrofit assessors found the property was only suitable for one measure, which limited the ability of the household to consider other measures. As reported in the previous section, a small number of households interviewed said they thought other measures would have been more suitable or effective for their property compared to what the retrofit assessor recommended, suggesting that in some cases, the recommendation received was unhelpful, or not adequately explained to the tenant/homeowner.

Households interviewed during LAD Phase 1 did not explicitly say that the recommendation they received made them more certain about which measures to install. However, it appears that households found it helpful and reassuring speaking to someone about the measures that could be installed in their property. Some households interviewed reported that they had not considered having measures installed in their property before the Scheme, so having someone to discuss this with helped them understand what they could be eligible for. Overall, the qualitative feedback indicates that retrofit assessors helped increase certainty about which measures to install, in some (but not all) cases and that households found this beneficial.

The survey of households did not specifically query whether households would have installed different measures without a recommendation, or whether recommendations made them more

certain about which measures to install. However, in the survey it appears they were broadly satisfied with the types of measures installed in their home across all types of measures.[51]

Overall, households participating in the qualitative and quantitative research generally did not state a preference for a different measure from that recommended, and the lack of measure preference or consideration would seem to imply that the recommendation provided certainty about which measures to have installed. However, a small number of households interviewed did want to have a different measure installed than the measure they were recommended, suggesting the recommendation was not universally helpful or effective at increasing certainty.

It is our assessment that LAD did not have a significant impact on installers' compliance with PAS 2035. Installers had participated in multiple government grant schemes requiring PAS 2035 compliance that were launched within the first year of LAD delivery, making it impossible to attribute compliance to a single scheme.

There was consistent and clear feedback from installers and installation industry organisations praising the impact of PAS 2035. There was some criticism of retrofit assessors' capabilities and the rigid application of PAS 2035, which installers felt unnecessarily increased the cost of installing some measures (for example, requirements for installing loft insulation). Nevertheless, installers overall felt that PAS 2035 has a positive impact on the quality of installations. This reflects the discussion set out in the process evaluation in Section 5.7.

Although we could not fully assess the effects of the monitoring and auditing mechanisms due to lack of data, installers that participated in the evaluation believed the processes contributed to ensure good quality.

Evidence for this assessment is supported by quantitative data from a survey of installers that participated in the Scheme. See section '6.3.7 Extent to which PA 2035 influence the quality of installations'.

6.3.5 Extent to which LAD influenced installers to become compliant with PAS 2035

Installers and installation industry organisations interviewed in February and March 2023 felt the LAD Scheme did not encourage installers to learn how to install measures compliant with PAS 2035. Most of the installers that worked on LAD were already installing measures compliant with PAS 2035, and barriers were highlighted that prevented other installers learning PAS 2035 standards during the LAD Scheme.

Learning PAS 2035 requirements is a lengthy and costly process. As the LAD Scheme initially had quite a short life span before it was extended, installers did not feel they would have enough time to learn the standard in time for the Scheme, which deterred many installers from beginning to engage with it. One installer interviewed cited the requirement to complete a National Vocational Qualification (NVQ) as one of the main time constraints for learning PAS

[51] More information about this can be found in the Technical Annex in the Household Survey Analysis section.

2035 standards. Installers interviewed also cited the cost of training for staff to understand PAS 2035 standards as another barrier.

> *"It's quite a lot of work before you can be registered. When you're doing that, it's fine, you want the people to do the work correctly, but if someone was coming in as a new starter…[they would struggle]."* – Installer

> *"The cost of becoming accredited as PAS 2035 could be a stumbling block for some companies. The complexity of the technical detailing required to deliver PAS 2035 compliant measures is also a stumbling block."* – Installer

Installers and industry organisations interviewed felt the short lead time into the LAD Scheme did not give installers sufficient time to become PAS 2035 compliant, while the lack of government support and funding to train installers also made it harder for installers to comply with the PAS 2035 standards for the Scheme.

> *"Another barrier is having to comply with standards. PAS 2035 is an expensive process… if policy makers recognised this barrier, they could have put a support programme in place to support businesses through the process of gaining this accreditation."* – Installation Industry Organisation

Installers interviewed were positive about PAS 2035 overall, and many indicated they had future investment planned for their workforce to learn the process for other initiatives in future. However, the LAD Scheme was not a specific motivator for them to comply with the requirements.

Quantitative data from a survey of installers supports the qualitative feedback received. Of the installers surveyed, 21 (55%) said they already performed installations compliant with PAS 2035 before the Scheme, compared with just 4 (10%) that said they learned PAS 2035 standards for installations during the Scheme. This further supports claims by installers that PAS 2035, without funding and support for companies to learn the process, can act as a barrier to companies participating in the Scheme, rather than the Scheme acting as a catalyst for increasing the number of qualified installers.

In summary, a small number of installers learned to install measures compliant with PAS 2035 processes because of the LAD Scheme. However, the majority of installers interviewed and surveyed that worked on the Scheme were already installing measures compliant with PAS 2035 before the Scheme, and the design of the LAD Scheme (e.g. a lack of centralised funding and support to help installers reach PAS 2035 standards) in some ways prevented more installers becoming compliant with PAS 2035.

6.3.6 Extent to which PAS 2035 influenced the quality of installations

Overall installers interviewed felt that PAS 2035 had a positive influence on the LAD Scheme and on the installation industry as a whole. Installers and installer industry organisations interviewed underlined the importance of increasing consumer confidence in the industry by completing work to a high standard and removing unreputable installers who have previously

damaged the industry's reputation. Installers and installation industry organisations interviewed agreed that tighter industry regulation through the introduction of PAS 2035 have fundamentally improved industry standards and reputation. Installers interviewed felt that monitoring measures introduced through PAS 2035 had increased installation quality and successfully forced out unreputable installers. Although PAS 2035 requirements can be more time consuming and expensive, the installers and installation industry organisations interviewed were positive about the requirement for PAS 2035 compliance on LAD to maintain high standards in the industry. According to the installers interviewed, this meant that legitimate installers interested in carrying out good quality work were the ones that benefited from the LAD Scheme.

> *"Before PAS 2035, under the Green Deal and Paris 2013, anyone was allowed to setup a company to deliver energy efficiency measures, it created no end of problems. The cost of doing it is very minimal to comply based on what you get out of it as an installer."* – Installer

> *"Quite rightly that's there…. You'd have an industry like it used to be installing a whole load of rubbish."* – Installer Industry Organisation

Schemes like TrustMark and requirements like PAS 2035 have created a high bar of entry to the industry, which installers interviewed felt can sometimes be a barrier to new entrants into the industry. However, the industry's previous issues with unreputable installers mean installers interviewed regard a high bar of entry and participation as worthwhile as it forces installers to improve the quality of their work or to leave the industry. Installers and industry organisations interviewed felt that there is now a solid core of high-quality installers in the industry, which in turn increases consumer confidence.

There were some criticisms from installers and industry organisations interviewed about the way PAS 2035 standards were applied and assessed, and the effect this had on businesses during the LAD Scheme. Installers and industry organisations interviewed expressed some frustrations about retrofit assessors lack of practical installation experience, which led them to be unnecessarily rigid in their application of standards. Following PAS 2035 resulted in increased labour and material costs for installers for some installers interviewed. In one example that was given, "rigidly following [PAS 2035] requirements that were not relevant or necessary when installing roof insulation" increased the cost of a measure from £500 to £2,000, according to the installer interviewed.

> *"PAS 2035 needs to be applied with more subtlety. Doing it on loft insulation is daft. The process adds about £2000 onto a £500 job. It's like taking a sledgehammer to a walnut." – Installation Industry Organisation*

When PAS 2035 was introduced during Phase 2, LAs and management companies were slow to understand and communicate the requirements with installers interviewed, causing some to install non-compliant measures. LAs and management companies would not pay installers interviewed for non-compliant measures, forcing them to rectify installations to become PAS 2035 compliant at additional cost to their business, in order to be paid. In one instance, an

installer interviewed said they'd found measures installed during Phase 1A / 1B of LAD assessed as non-compliant with PAS 2035 when it was not a requirement at the time of installation.

> *"We had technical monitoring people going out and putting in non-compliance reports on properties with work done under 1A/B 2 but using the standards of later Phases… Technical inspectors don't understand the industry. They are finding technical issues wrong when the installations are done to manufacturer's instructions and best practice guides." – Installer*

The industry organisations interviewed felt that there should be a better process for consistently training retrofit assessors to increase the standard of assessors.

> *"At the beginning of the programme, there weren't enough [retrofit assessors/coordinators]. At the start of LAD, there were a lot who could do an EPC type assessment, but very few who could retrofit properly, in compliance with standards." – Installation industry organisation*

Overall, however, installers interviewed felt that PAS 2035 had a positive influence on the LAD Scheme and on the installation industry as a whole. Installers and industry organisations interviewed said setting high standards has rewarded installers for high quality work while keeping out unqualified installers (in interviews, installers referred to them by the term 'cowboys') and has instilled consumer confidence in the industry. Installers interviewed said a potential downside of creating a high barrier of entry into the retrofit industry through PAS 2035 was that it potentially limited the number of new companies that could participate in LAD. Installers and industry organisations interviewed also highlighted how the rigid application of PAS 2035, inexperienced retrofit assessors, and poor communication from LAs and management companies about requirements for PAS 2035 in Phase 2 of the Scheme created cost and time pressures for installers who had to follow more expensive standards or re-install non-compliant measures.

6.3.7 Conclusions on the influence of PAS 2035

It is not possible to conclude unequivocally that all measures were installed in compliance with PAS 2035 due to the small group of installers and industry representatives that participated in the evaluation, but all installers contacted assured their compliance. Similarly, the lack of available TrustMark data for over a quarter of measures means we cannot conclusively say whether all installations were conducted under PAS 2030 or MCS, but the evidence available from installers and installations industry organisations suggests that this was the case.

There was no indication from households interviewed during LAD Phase 1 that they would have installed any measures if they had not been recommended to them as part of the Scheme and the majority of the households surveyed were satisfied with the measure(s) recommended. It appears that households found it useful to discuss the potential measures with a professional prior to installation with the qualitative feedback indicating that retrofit assessors helped increase certainty about which measures to install, in some (but not all) cases.

As discussed in Section 5.7, whilst most installers and industry representatives recognised the benefits of complying with PAS 2035 (even though they did not always consider it suitable for LAD), it is our assessment that LAD did not have a significant impact on installers' compliance with PAS 2035 due to the demands on them for compliance from several Government initiatives meaning attribution is not possible.

6.4 Extent to which the Scheme created and supported jobs

This section answers *EQ 12: "How is the Scheme creating and supporting jobs in the energy efficiency and low carbon heat sector? Are these jobs new market entrants or existing installers reskilling or certifying to the required standard?"*

The LAD Scheme was part of the Green Economic Stimulus package. The package, and LAD in particular, were intended to increase demand for energy efficiency and low carbon heat measures; in response, installers would recruit new staff (or retain staff that otherwise would have been laid off) and new companies would be created to meet increased demand. It was also hypothesised that installers would train their staff in order to comply with the certifications/ specifications required (PAS 2030, PAS 2035 and MCS) and be able to participate in LAD. Increased demand was expected to be translated into a noticeable increase in demand across the supply chain, enabling suppliers to maintain and recruit new staff to meet demand.[52]

The section is set out in two sub-sections, each with further sub-sections, regarding the extent to which the Scheme had a positive impact on installer turnover and job creation and contributed to upskilling installation staff on PAS 2035. Again, the section uses contribution analysis to evaluate each different aspect of the overall evaluation question, with further detail on the analysis set out in Annex 7. This section relies largely on results of a survey of installers that participated in the Scheme which received a low response rate. While we are satisfied with the validity of the data and the way it was collected, a caveat does apply when generalising the results of installers surveyed as part of this evaluation to the rest of the installer population participating in the Scheme.

6.4.1 Contribution to turnover and jobs

The LAD Scheme had sufficient scale to have a positive impact on installers' turnover, which resulted in a positive contribution to job retention and creation. However, as the LAD Scheme was short lived, these impacts are not seen as sustainable by installers. Although the Scheme resulted in some financial success for firms, it could have had a greater financial impact (and job creating impact) had installers been able to achieve more direct financial benefit from the Scheme.

[52] This audience was not engaged with as part of this evaluation. No quantitative or qualitative data was available to the evaluation team to assess this final hypothesis.

6.4.1.1 Extent to which the turnover and number of jobs in the energy efficiency and low carbon sector increased across the UK

At a sector level, analysis of the Business Register and Employment Survey data shows that that the energy efficiency and low carbon sector grew by 16.4% in the UK between 2020 and 2021 (no data for 2022 is available yet). The biggest increase in employment (full time equivalent) between 2020 and 2021 was in the energy efficient products sector, which grew by 9%.[53] Turnover also increased across the sector by 30.8% from £41.6 billion in 2020 to £54.4 billion in 2021.[54] Energy efficient products accounted for the largest proportion of turnover in the sector (36%), with turnover valued at £19.6 billion in 2021. However, COVID-19 was a key issue affecting businesses, according to the interviews conducted with industry stakeholders. In addition, other government initiatives, such as ECO4, were not working as expected by the industry, according to some of those interviewed, which posed greater difficulties during an already challenging time.

6.4.1.2 Extent to which the participating in LAD increased firm turnover

The Scheme generally had a positive effect on installer turnover, although installers and installation industry organisations interviewed said issues with the Scheme reduced the financial benefit installers felt from the Scheme.

Of the installers surveyed about the Scheme, 25 (63%) agreed that their company turnover would have been lower had they not participated in the LAD Scheme, compared to three (8%) that said their turnover would have been higher had they not participated in the Scheme. As can be seen in Table 26 below, the percentage of turnover that can be attributed to LAD shows a directional increase between 2012/22 compared with 2020 when LAD had only recently been launched. By 2022 for example, 11 (28%) installers said 50% - 99% of company turnover was due to installing measures under the LAD Scheme, compared with four (11%) in 2020, and only three (8%) of installers said the Scheme contributed 0% of company turnover in 2022, compared with 13 (33%) in 2020.

[53] Source - https://www.ons.gov.uk/economy/environmentalaccounts/bulletins/finalestimates/2021
[54] Source - https://www.ons.gov.uk/economy/environmentalaccounts/bulletins/finalestimates/2021

Table 22. Percentage of business turnover attributed to LAD

	2020	2021	2022
Base	**40**	**40**	**40**
Net 0% of turnover	13 (33%)	3 (8%)	3 (8%)
Net: 1% - 24%	10 (25%)	11 (28%)	10 (25%)
Net: 25% - 49%	1 (3%)	7 (18%)	7 (18%)
Net: 50% - 74%	3 (8%)	6 (15%)	8 (20%)
Net: 75% - 99%	1 (3%)	2 (5%)	3 (8%)
Net: 100% of turnover	0	1 (3%)	0
Don't know/prefer not to say	12 (30%)	10 (25%)	9 (22%)

Base: D8B What percentage of your company's turnover was due to installing measures under the LAD Scheme in…? (40). N.B. rounding of percentages may mean not all columns total 100%.

Although installers indicated that the Scheme had increased their turnover, they were more divided about how decisive the impact of the Scheme was on their business. When asked whether the Scheme had enabled their company to continue operating, 17 (43%) agreed and the same proportion disagreed. Installers interviewed agreed business turnover improved as a result of the Scheme and reported making margins of 5% upwards, although some installers felt they did not financially benefit from the Scheme as much as they could have.

Some installers were only able to participate in LAD as subcontractors because they were unable to compete in LA procurement processes against large management companies with specialist bidding capabilities or join LA procurement frameworks altogether. Management companies often lacked specialist knowledge about installing energy efficiency measures and promised LAs unrealistic prices for delivering the measures. They also added their profit margin into the cost of installing measures. This meant management companies were often approaching installers and sub-contractors with unrealistic and unworkable prices for delivery work. In one example, an installer said they were being offered less than minimum wage to complete a job. Installers and installation industry organisations interviewed cited management companies 'skimming off the top' as a leading factor that significantly reduced installer Scheme turnover, limiting their ability to benefit from the Scheme by, for example, hiring new staff to meet increased demand.

Installers interviewed also said their profit was negatively affected by rapid inflation in the cost of materials for energy efficiency measures. External wall insulation, double glazing and internal wall insulation were some of the measures most affected, with costs sometimes increasing by 40 or 50% during the Scheme, according to installers. Lengthy LA procurement processes were unable to react to price changes in the market, and installers were unable to pass on increased material costs, which further eroded installer profit.

6.4.1.3 Extent to which Installers participating in LAD recruited new employees to cope with demand

Most installers that responded to the survey reported that they either grew their number of employees to some degree or maintained their existing staffing levels under LAD. Almost no installers surveyed reported losing staff between 2020 and 2022 and only one installer surveyed (3%) said they had lost installation staff.

Staffing levels in other roles either remained the same or increased during the Scheme. Since 2020, 23 (61%) installers surveyed hired more installation staff, 23 hired (61%) administration and management staff and 20 (53%) hired new estimation/quotation staff. Most businesses added one to nine new staff in these roles, although three (8%) installers interviewed hired 10-19 new installation staff, and 2 (5%) added 10-19 new administration and management staff.

Table 23. Staff hired by installers during the period in which LAD operated

	Estimation and quotation staff	Installation staff	Quality assurance staff e.g., retrofit assessors	Administration and management staff	Other staff
	N=38	**N=38**	**N=38**	**N=38**	**N=38**
Less than 0 (Lost staff)	0	1 (3%)	0	0	0
0	18 (47%)	14 (37%)	23 (61%)	15 (39%)	33 (87%)
Net: 1-9	19 (50%)	20 (53%)	15 (39%)	21 (55%)	4 (11%)
Net: 10-19	1 (3%)	3 (8%)	0	2 (5%)	1 (3%)

Base: D6 How many new staff did your company hire since 2020 in…?

A majority of installers surveyed also agreed that their involvement in the LAD Scheme had enabled their company to employ more staff (21, 53%), although just over one in five strongly disagreed their involvement in LAD had enabled them to employ more staff (9, 23%).

Interviews with installers and industry organisations generally supported quantitative findings about the Scheme's positive effect on employment but raised questions about its long term impact on job creation. Installers interviewed mentioned a few examples of new jobs created and/or jobs retained thanks to the Scheme, while one industry organisation highlighted how the Scheme helped to create employment in retrofit coordinator and assessment roles.

> *"[The Scheme required] assessment coordination businesses that didn't exist. They might just be getting going now without LAD and just SHDF. They'll employ around 300-400 people…" – Installation industry organisation.*

However, the installers interviewed also mentioned that the jobs created in their companies were not long-term jobs and that they had already lost some of the staff recruited for LAD once the Scheme ended. An installer industry organisation interviewed also questioned the extent to which LAD created new jobs or whether it merely helped to retain employment after COVID-19.

> *"The Scheme helped us to create new jobs. We hired a decorator, a driver, and an office worker dealing with LAD. After the completion of works under this Scheme, we had to let go all three of these people." – Installer*

6.4.1.4 Extent to which new firms were created in response to increased demand

All installers who participated in the survey categorised themselves as an existing company that was already in operation before the LAD Scheme. There were no companies interviewed that were specifically started to deliver the LAD Scheme or new branches/subsidiaries of existing companies set up to deliver the LAD Scheme. There is therefore no evidence that new firms were created to (partly) deliver LAD.

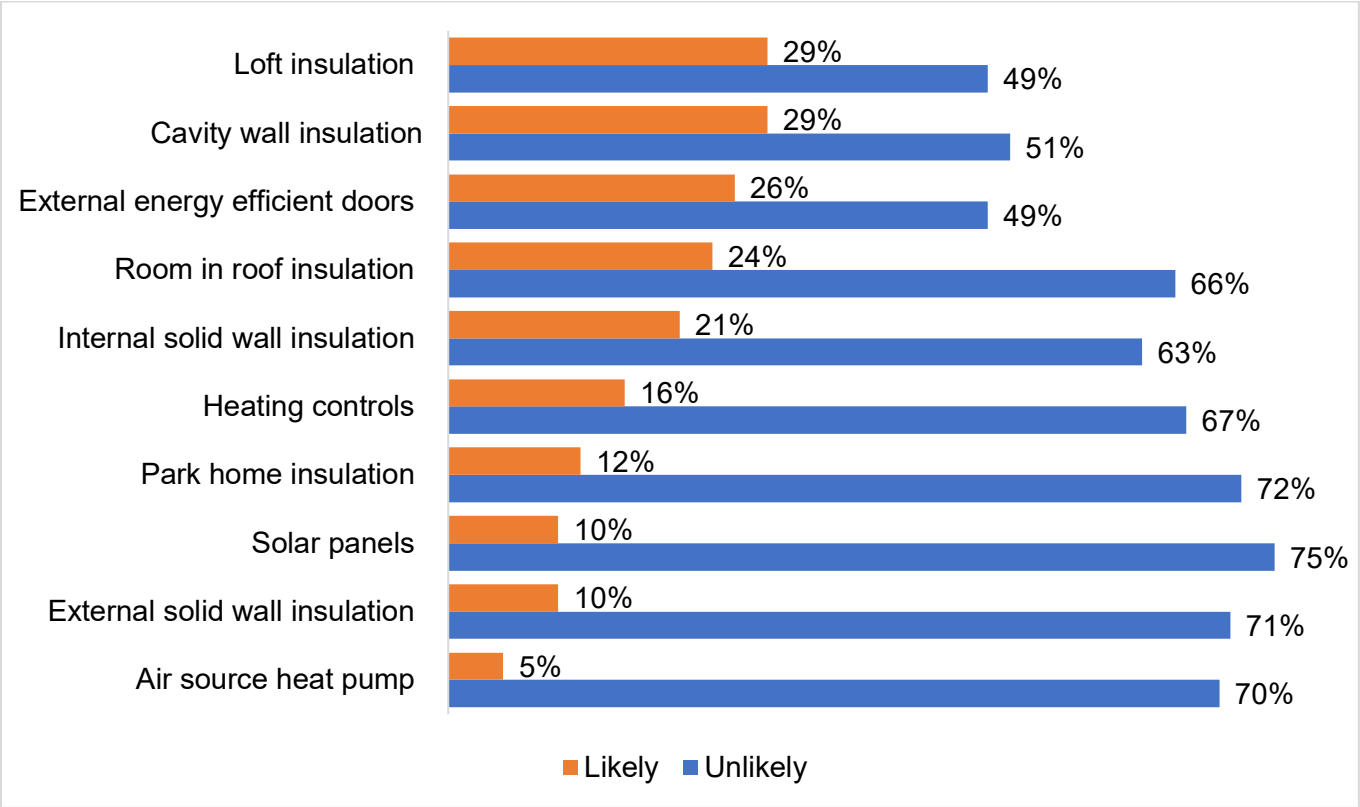
6.4.1.5 Extent to which LAD drives an increase in demand (measures are installed that would not have happened otherwise)

There is evidence to suggest that LAD did increase demand for measures. A majority of households surveyed indicated that, without LAD, it is unlikely they would have contracted the installation they received. This is the case across all measure types, particularly for more expensive measures like external wall insulation, solar PV and heat pumps (see Figure 6). Installers and industry organisations interviewed also agreed that the Scheme helped to drive an increase in demand for measures.

Through interviews with installers and industry representatives it was clear that other public spending programmes such as Social Housing Decarbonisation Fund (SHDF) and ECO were also driving demand for installations.

In addition, installers and industry organisations believe that these initiatives are essential for driving demand in the industry, as many households – especially the ones who most need retrofit measures – are unable to afford the cost of installations.

Figure 6. How likely households would have been to install the measure they received through the LAD Scheme in the next 5 years, had the LAD Scheme not been available



Source: Ipsos Households Survey. Base: F7: If the LAD Scheme had not been available, how likely would you have been to have had the following improvements installed in your home / in the property anyway within the next 5 years? Loft insulation (462); Cavity wall insulation (210), external energy efficient doors (174); Room in roof insulation (66); Internal solid wall insulation (155); heating controls (117); Park home insulation (229); Solar panels (1400); External solid wall insulation (341); Air source heat pump (146).

6.4.1.6 Extent to which total funding delivered through LAD represents a significant share of the market

At the time of launch, installers and industry organisations interviewed thought LAD accounted for a significant share of the installer market, although installers and industry organisations were vague about what proportion it accounted for. At its peak, LAD was probably the second largest Scheme after ECO, according to installers interviewed.

6.4.1.7 Extent to which the length and scale of LAD was sufficient for installers to upscale their capacity

The industry did not have sufficient capacity to supply all Government schemes that were running in parallel around the launch of the LAD Scheme. Short-term initiatives did not provide sufficient incentive to upscale capacity. Installers interviewed felt they could have planned to upscale their capacity more effectively had they known upfront what the full length of the Scheme would be. Installers who thought the LAD Scheme was going to end had started to scale back operations when the Scheme was extended.

The time available to conduct installations was too short, and it was further limited by lengthy bureaucratic processes between LAs and management companies. LAs interviewed said that

alongside management companies, LAs dedicated a significant amount of time to understanding how to deliver the LAD Scheme and how to engage with the installer supply chain. Installers interviewed that could bid for LAD work directly with LAs found their procurement processes slow. Installers interviewed observed that management companies also went through the same slow procurement processes with LAs, before conducting their own procurement processes to subcontract LAD work to installers. Installers interviewed felt the additional bureaucracy and administrative delays limited the amount of time available for installations, which reduced the amount of work installers could completed and the amount of turnover they could generate.

6.4.2 The extent to which LAD contributed to upskilling installers' staff on the required standards (PAS 2030 / PAS 2035)

Overall, the Scheme had a very small positive contribution towards increasing compliance with PAS 2035 and upskilling staff. However, most installers were already certified and trained.

6.4.2.1 Extent to which installers participating in LAD report their staff have been upskilled on PAS 2035

Of the installers who participated in our survey, 32 (80%) were registered with TrustMark prior to getting involved in the LAD and six (15%) started the process of registering with TrustMark once LAD had started. 25 (65%) of the installers surveyed were PAS 2030:2019 certified before the Scheme with a further six (15%) gaining certification during the Scheme, while 22 (55%) said they complied with PAS 2035 processes before the Scheme. Four companies surveyed (10%) said they learned how to be PAS 2035 compliant during the Scheme. Additionally, 17 (43%) installers surveyed reported training their staff to install new measures.

6.4.2.2 Extent to which installers upskilled staff on PAS 2035 after it was announced as a requirement to participate in LAD, in order to participate in the Scheme, and to ensure that quality standards are met

Installers and installation industry organisations interviewed said there was insufficient time for installers to become familiar with PAS 2035 processes between the time of the LAD scheme's announcement and start date. One installer interviewed also said the short duration of the Scheme made it difficult to justify investing in staff training to become PAS 2035 compliant. An installer industry organisation interviewed flagged the need to address capacity issues in the supply chain (for example, having sufficient numbers of qualified or compliant installers) before launching schemes in future.

Learning PAS 2035 processes is expensive and the feedback given by installers and industry organisations interviewed was that the industry needed more financial support to cover training costs. They also wanted more guidance on industry standards and what requirements will be necessary to participate in initiatives like LAD, so they can make longer term plans for training staff.

6.4.2.3 Extent to which other schemes/requirements influence the uptake of PAS 2035 among installers

While some installers surveyed said they learned PAS 2035 processes during the Scheme, in most cases, installers and industry organisations interviewed said that other initiatives, particularly ECO, were the main influencing factor that determined whether they learned how to perform installations compliant with PAS 2035.

6.4.3 Conclusions on the extent to which the Scheme created and supported jobs

The LAD Scheme had a positive impact on installers' turnover, which resulted in a positive contribution to job retention and creation, however these impacts have not always been sustained with examples provided of firms that had to lay off staff once the Scheme ended. According to the installers and industry representatives that participated in the evaluation, although the Scheme resulted in some financial success for firms, it could have had a greater financial impact (and job creating impact) as rapid inflation affecting the costs of measures, procurement processes and the use of management agents eroded profits for some. Overall, the Scheme had a very small positive contribution towards increasing compliance with PAS 2035, with some installers gaining PAS 2030 certification and becoming PAS 2035 compliant during the Scheme which included upskilling staff. However, most installers were already certified and trained prior to LAD's introduction and installers and industry representatives considered that other government initiatives had more influence on PAS 2035 compliance.

6.5 Extent to which the Scheme created confidence across the supplier market

This section answers EQ 13: "To what extent has the Government's commitment to funding of energy efficiency improvements created confidence across the supplier market?"

LAD aimed to create confidence in the supplier market as it was hypothesised that it would help to maintain the outcomes achieved by LAD, such as increasing demand for installations by private individuals and through government schemes, in the long term.

The section is set out in two sub-sections; the first, exploring the extent to which installers are confident the retrofit and low carbon market will grow in the near future and believe the public is becoming more aware of the need to install EE and low carbon measures in domestic buildings. The second sub-section considers the degree to which installers have had positive experiences of participating in LAD and believe the government will continue to support this type of measure in the future. Again, the section is informed by contribution analysis with more detail provided in Annex 7.

6.5.1 Extent to which installers are confident the retrofit and low carbon market will grow in the near future, and that the public is becoming aware of the need to install EE and low carbon measures in domestic buildings

Overall, the three industry organisations interviewed as part of this evaluation were confident that demand for installations will increase in the future, although they raised some concerns in relation to their capacity to respond to sharp and short lived peaks in the demand.

Installers were positive about the financial impacts that can be obtained from interventions like LAD. The LAD Scheme provided installers with reliable work and a stream of income at a difficult financial time during and after COVID-19. Installers had generally worked on other initiatives before LAD and said that they would continue to work on other government initiatives in the future. They recognise that retrofit work and household decarbonisation work is critical to achieving national net zero goals. They were also confident other initiatives will continue to be launched in the future, and many were already engaged in initiatives like ECO and HUG that overlapped with LAD. Installers interviewed felt that LAD, amongst other initiatives, showed commitment to funding energy efficiency improvements.

6.5.2 Extent to which installers have a positive experience of participating in LAD and believe the government will continue to support this type of initiative

Installers considered that there is a lack of a coherent strategy guiding the deployment of initiatives which is causing active damage to the industry and its confidence in government initiatives. According to installers, government initiatives come and go, sometimes overlap, take time to get right and just as they are starting to work, they finish.

> *"The LAD Scheme needed a long-term strategy. […] There needs to be a more coherent plan, otherwise companies go bust or go out of business." – Installation Industry Organisation*

This creates instability and anxiety in the installer market, as installers say they are unsure of what will be coming next. Installers interviewed appreciated that LAD did not work as well as it could have straight away and tolerated the fact it took some time to figure out the best way to deliver it, but the lack of consistency (e.g. extending the Scheme multiple times, changing the terms of the Scheme) caused installers problems. Installers said they have experienced challenges on several initiatives in a row and, in their words, they are "increasingly frustrated that the same mistakes keep happening".

> *"I don't know if LAD specifically has [increased confidence]. I don't think there's a huge understanding of the direction of travel from it. I don't see how it flows in HUG, ECO+." – Installation Industry Organisation*

Some installers and installation organisations interviewed mentioned that the announcement of new initiatives can actually damage installation businesses. When government announces that a new initiative is going to be launched, some installers said that customers cancelled orders and waited to get measures funded by initiatives. If initiatives are delayed or take time to get

going, like LAD did, installers interviewed said they can experience periods without enough work.

Based on their experience of LAD specifically, some installers interviewed said that they would be cautious about working as subcontractors on other government initiatives, due to their experience of working with management companies on LAD. Installers view work with LAs as desirable, as the work is regular and LAs have a good reputation for paying contractors punctually. However, according to installers, the management companies working on LAD took too much profit and reduced the financial benefit for installers. Some installers interviewed also experienced payment issues from management companies.

Installers and installation industry organisations interviewed felt that LAD had not successfully addressed capacity issues in the industry going forwards, and they are not confident that it has created additional capacity in the industry and supply chain to meet demand created by future government initiatives. While some installers said LAD supported job creation, the general view amongst installers interviewed and industry organisations was that LAD had not enabled capacity within the industry to grow. Installers interviewed think that not enough funding reached their organisations, either through being paid low prices for installing measures or through installing a lower volume of measures than was intended. This limited their ability to invest in long term job creation and apprenticeships. Installers and industry organisations also thought there needed to be funding and support provided to help existing installers and new entrants to the industry register with TrustMark, gain PAS 2030 certification and become compliant with PAS 2035. As a result, installers interviewed did not feel that LAD has increased their confidence in the capacity of the industry to deliver future initiatives. Installers and industry organisations that were interviewed said they wanted to be consulted more about the development of future initiatives so they can help the government, LAs, or other delivery partners, to understand the supply chain's capacity to meet the Scheme demands, which will help inform a more coherent plan for future initiatives that gives confidence to the industry.

6.5.3 Conclusion on the effects of the Scheme on building confidence in the market

There is strong evidence that the Scheme built confidence in the supplier market. LAD successfully created demand during a period of economic downturn caused by COVID-19, which kept the industry afloat. The industry is confident that the government will continue to generate demand through new initiatives, and also believes that private installations will continue to increase. However, the LAD Scheme specifically has not driven a long-term increase in demand for new installations. In addition, installers are fundamentally concerned about the challenge of delivering Government schemes that are short term, sporadic, and do not appear to be driven by any overarching strategy Issues with the delivery of LAD Scheme (alongside the GHG-Vouchers Scheme) have weakened industry confidence in the Government to deliver initiatives in future that will successfully drive-up demand in the long term.

7 Conclusions

7.1 Delivery of LAD

The evaluation found that the LAD Scheme has had some success in targeting and delivering energy efficiency and low carbon measures in fuel poor homes. Many LAs know the characteristics of the housing stock in their areas, were able to identify fuel poor households to participate in the Scheme and were able to source installers to conduct the work. The Scheme was particularly effective in identifying fuel poor households: almost three quarters of the households modelled for the evaluation were likely to be in fuel poverty, and almost all households were earning below the maximum threshold of £30,000 per year, according to the survey of households.

The Scheme reached fewer households than expected at the outset, and the number of measures installed was significantly below initial expectations. In designing the Scheme, BEIS planned that households would receive multiple measures to retrofit their homes and become more energy efficient, but the Scheme resulted in around three quarters of the households receiving only one measure. The main reason for this was that the price of installations increased during LAD delivery, and the unchangeable maximum cap of £10,000 (£5,000 for landlords) was insufficient to deliver multiple measures. The evaluation found that the factors that affected the price were the following:

- Shortage of labour and materials, which increased the cost of delivering installations.
- LAs in many cases used delivery partners and intermediaries to deliver the scheme, who then subcontracted the installation of the measures. While this approach helped them to overcome capacity constraints and brought in skills they needed, it also increased the number of middle entities with profit margins, hence driving costs up.
- The PAS 2035 requirement, while improving the suitability and quality of the measures installed, made installations more expensive due to the additional requirements placed on installation.

In addition to the cost, LAs said that the overall shortage of installers and delays in procuring installers also affected the speed at which installations could be delivered, and therefore the number of measures that could be ultimately installed.

Overall, the Scheme was attractive to LAs. A large number of LAs were engaged across both phases of the Scheme (233 in Phase 1 and 303 in Phase 2). The surveys and interviews suggested that they were motivated to participate for three main reasons:

- Creating financial capacity for retrofit. LAs used Scheme funding to supplement existing funding and to fill funding gaps, enabling them to work towards net zero and environmental plans by improving the quality of their housing stock.
- Supporting local residents. LAs wanted to fund retrofit measures to support residents living in fuel poverty, which became more important during Phase 2 as the cost-of-living

crisis became more acute. LAs want to improve the quality of life for people in their area and they feel retrofit schemes help them to achieve positive health (mental and physical) and financial outcomes for these people.

- Stimulating future demand from households for energy efficiency retrofit. In the short term, LAs saw funding during Phase 1 as a means to stimulate a green recovery from the COVID-19 crisis and to complement funding from other schemes (ECO). Longer term, LAs hope to stimulate demand for future funding and scale up programmes of work locally. By participating in the Scheme, LAs were signalling their appetite to participate in other schemes in future.

LAs said that they had improved their capacity and capability to implement LAD as the Scheme progressed. However, they experienced some challenges at the beginning of LAD which hindered their ability to deliver installations:

- Short timeframes. The initial timeframes to deliver LAD were considered by LAs to be too short for all phases of the Scheme. This was particularly acute in Phase 1, where LAs had very limited time to engage suppliers and installers onto the scheme. The short timeframes meant LAs were only able to work with suppliers with whom they already had previous relationships and procurement frameworks. This prevented LAs onboarding new suppliers to procurement frameworks, restricting access to local installers. As LAs needed longer than anticipated to begin delivery, they required extensions to provide more time to deliver installations. These changes created inefficiencies for LAs, their delivery partners and installers in scaling delivery up and down in this changing timeframe, resulting in fewer measures being installed than expected overall. The overall challenge of the short timescale for the phases was exacerbated by the extension being managed in three-month periods rather than one longer extension that could have enabled better planning and resource management.
- Capacity issues and expertise to deliver. Other BEIS schemes running at the same time created competing staff resource demands, and Phase 1A setup coincided with summer holidays, when many LA staff were off work. Staff were unfamiliar with the application process and needed more training to apply to the Scheme. They also lacked guidance about Scheme delivery models, leading LAs to adopt different partnership delivery models with external companies to compensate for capacity and expertise issues.
- Data and identification of households. LAs experienced some challenges with identifying eligible households to participate in the scheme, and with compiling data as part of their application to the Scheme. Scheme data and modelling by BRE indicates LAs were mostly successful at identifying eligible households. However, evidence from the surveys suggests that the overall process of identifying eligible households was very time consuming and inefficient for LAs or their partners during scheme delivery.
- This was however a challenge that they were able to partially overcome, as a high number of households eventually participated.

A range of delivery models were adopted by LAs to varying degrees of success. No single model stands out as the most effective and there are examples of things that worked well to be found in each of the different models adopted by LAs.

An important factor for success in the LAD Scheme identified by LAs was relationships with installers. As LAs were unable to onboard new installers due to Scheme time constraints, LAs with good existing relationships or who had existing procurement frameworks to draw from reported that they were able to begin delivering installations more quickly and delivered more measures overall.

LAs surveyed generally had a positive experience of working with the Hubs in Phase 2, but did also experience some challenges The Hubs with the least delivery challenges were those that had allowed for flexibility in their delivery model and were able to accommodate any existing delivery models or commercial relationships that LAs had in place, whilst still having provisions for the use of managing agents/delivery organisations or procurement frameworks to support LAs that needed it.

7.2 Engaging households and reaching fuel poor households

As noted above, the evaluation found that the Scheme was successful at engaging households and reaching fuel poor households. LAs were able to identify suitable households, despite some challenges raised, and households found it easy to apply. Just over one in ten households found the process unclear, although this rose to almost two in five for some sub-groups, namely: ethnic minorities, households in the lower income band [55], and households where the occupant has a long-standing illness, disability or infirmity.

Households were motivated to participate in the Scheme mainly to save money on energy bills and make their home more comfortable, with a smaller proportion identifying environmental reasons. The LAD scheme was appealing to all types of households, with some differences:

- Social landlords had more appetite for participation than private landlords. Some social housing providers expressed that the scheme provided welcome financial support to upgrade their properties and was a key motivation to participate, in order to upgrade their housing stock to meet their own net zero targets. There was low participation, on the other hand, from private landlords. LAs cited difficulties in engaging landlords and said that the requirement for landlords to contribute funding had been a significant hurdle to get landlords to take part. Private landlords also expressed difficulties in engaging with their tenants to provide the necessary information to apply for the scheme. Future schemes that target private landlords may need to consider additional strategies for communicating the benefits of retrofitting schemes to them, specifically if they are expected to contribute financially to the improvements.
- While social landlords saw the benefits of LAD, some social tenants felt the measures were being imposed on them. Half of the social tenants who participated in LAD did it because their landlord/building owner said the work had to be done, and felt they had no choice.

[55] Annual household income under £16,000.

7.3 Impacts for households

Overall, the LAD scheme has delivered a positive experience for participating households. Most households were satisfied with the suitability of the measures installed and with the quality of the installation. A large of proportion of households who received heat pumps, however, reported problems related to poor installation, poor quality of products or components, a faulty heating system, and lack of information or communication. A substantial proportion said issues with the measures had not been resolved when the survey was conducted. Households who received heat-pumps were also more likely to report negative impacts on their physical and mental health post-installation.

While the Scheme was successful at identifying likely fuel poor households, the evaluation found it did not always directly move them out of fuel poverty. This is because prior to the measures, the housing stock was on average very inefficient, and the properties reached by LAD often needed a combination of several measures in order to reach EPC ratings C or above, as planned in the scheme's original 'Whole House Retrofit' approach. However, most households received only one measure, and a result, only about half of households who were likely to have been fuel poor before the scheme were moved out of likely fuel poverty.

7.4 Type and quality of the installations

The scheme delivered fewer measures than anticipated, and the type of measures installed also differed from what was expected at the outset by BEIS. There were far fewer heat control measures installed than expected and fewer low carbon heating measures (mainly, heat pumps) with substantially more solar PV and insulation measures than anticipated, in relative terms.

The evaluation found that the suitability of the measures, the maximum cap of £10,000 per household, and the availability of installers influenced the change in mix. Solar PV could be installed in homes where fabric measures were not suitable and facilitated energy efficiency improvements without requiring combination with other measures. Heat pumps, on the other hand, often need to be installed together with other insulation measures for them to be effective, but their individual cost was close to the maximum cap. Therefore, they were unlikely to be the most suitable individual measure under the £10,000 cap.

There is overall limited evidence on the quality of the installations delivered, but the evidence available indicates that the requirements placed on installers and installations had a positive effect on ensuring quality.

7.5 Environmental impacts achieved

The evaluation found that the Scheme has delivered positive modelled impacts in terms of improving energy efficiency, reducing energy consumption, and reducing energy bills for households. Overall, 50% of households with a verified initial EPC rating of D or below

improved to EPC C or higher post-installation. All homes modelled by BRE saw an improvement in energy efficiency., The average energy demand decreased by 8%, carbon emissions reduced by 10%, and households saw their energy bills reduced by 14%, on average, as a direct result of the Scheme.

These impacts were particularly noticeable for those households who received multiple measures, compared to households who received only one measure. Whilst there are diminishing returns from installing multiple measures, the installation of single measures has a limited impact on the fuel poverty status of households and the energy, carbon and energy bill savings achieved at the individual level.

7.6 Impacts on the market

The evaluation found that LAD had successfully created demand during a period of economic downturn caused by COVID-19, which contributed to keeping the domestic energy efficiency industry afloat. The Scheme had sufficient scale to have a positive impact on installers' turnover, which resulted in a positive contribution to job retention and creation. Most installers who were consulted for this evaluation were already compliant with PAS 2035; nevertheless, LAD also had a small positive contribution towards increasing compliance with PAS 2035 and upskilling staff.

The industry is confident that the government will continue to generate demand through new schemes, and also believes that private installations will continue to increase. Nevertheless, the general consensus from interviewed stakeholders was that, although the Scheme was a financial success for participating installers, it could have been more financially impactful for the industry. The main issues identified in the evaluation are the following:

- The Scheme was announced as a short-term initiative, and then extended multiple times. The short-term nature of the Scheme did not provide sufficient incentive to installers to upscale their capacity long term. Better planning, more realistic timeframes, and clear communication of timelines to the industry up front by BEIS and LAs would have helped installers to plan their capacity accordingly.
- The procurement models adopted by some LAs used intermediaries such as management companies or large-scale installers to deliver installations. While these models helped to mitigate LAs' capacity and skills gaps (covering a range of areas such as community engagement, property identification and installer procurement and management), they also added the intermediary's profit margin into the cost of installing measures. Some installers felt that the prices offered by intermediaries were below market rates, which, due to reduced profit margins compared with work available outside of the Scheme, impacted their motivation to participate. These cost impacts contributed to the overall under delivery of measures.
- Installer profit was affected by rapid inflation in the cost of materials for energy efficiency measures. Lengthy LA procurement processes were unable to react to price changes in

the market, and installers were unable to pass on increased material costs, which eroded their profits.

- The Scheme had an insufficient initial delivery window for all stakeholders to mobilise and complete installation, and this was compounded by LA delays in mobilisation due to the scheme's novelty and complexity, LA unfamiliarity with working with and procuring within the supply chain, and the piecemeal extensions reducing the ability for installers to commit to more ambitious delivery.

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