Department for Energy Security & Net Zero

Energy Company Obligation (ECO) Evaluation

Phases 2t and 3: Final evaluation report

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Executive summary

Introduction

The Energy Company Obligation (ECO) is a Great Britain-wide obligation placed by government on the largest energy suppliers to upgrade energy efficiency and heating measures of households. The scheme is designed to focus support on households in fuel poverty, reduce greenhouse gas emissions and lower the cost of energy bills. It aims to drive uptake of energy efficiency measures in homes that would not have occurred without the scheme, particularly among low income and vulnerable households in or at risk of fuel poverty. ECO launched in 2013 and since then there have been iterations, including ECO2, ECO2t and ECO3. Measures that have been installed in households as part of ECO include insulation (solid wall, cavity wall, underfloor and loft), as well as replacement boilers and other heating measures[1]. Energy suppliers are obligated to deliver the scheme and they recover the costs of delivering the scheme through customers' energy bills.

In September 2019, the Department for Business, Energy and Industrial Strategy (predecessor to the Department for Energy Security and Net Zero) appointed Kantar Public to undertake a three-wave household survey and follow-on qualitative interviews with households who have received measures under two iterations of the scheme; ECO2t and ECO3. The research was commissioned to provide insights on the type of households that have been reached by the scheme, households' experience of getting the measures installed and the perceived impact. This report represents the findings from three research waves that were conducted between 2020 and 2022. Where findings have remained consistent over time, the report focuses on the most recent wave (wave 3). Where changes have occurred between waves (for example between wave 1 and wave 3, or between wave 2 and wave 3) these are discussed[2]. This report focuses on ECO3 as this was covered in all three waves, whereas ECO2t was only covered at wave 1. Comparisons to ECO2t are made where there are significant differences. The findings for wave 1 can be found in the wave 1 interim report.[3]

Methodology

The research was mixed method, with each wave combining a quantitative survey of households that had received an energy saving measure within the time periods above, with follow-up qualitative research.

For the quantitative survey, a systematic random sample of properties that had received one or more measures from ECO2t or ECO3 was produced at each wave from an ECO database.

[1] These include electric storage heaters, district heating systems, heating controls, smart thermostats and thermostatic radiator valves and heat pumps.
[2] Throughout the report, where the results for one group of participants are compared against the results for another group, any differences discussed are statistically significant at the $p<0.05$ probability level, unless otherwise stated.
[3] https://www.gov.uk/government/publications/eco-evaluation-wave-1-interim-report-2020

Some groups in the sample were boosted to allow for comparisons to be made, including obligation type[4] and country. Selected households received a paper questionnaire to complete and were also offered the option to respond online. Participants were offered a £10 incentive as a thank you to take part. Weighting was applied to ensure that the sample was representative of the population that had received measures through ECO at each wave.

A qualitative element of the evaluation was included to provide detailed insights on household experiences of the ECO scheme. At each wave, in-depth interviews of 60 minutes in length were conducted with 40 participants via telephone. At wave 3, an additional stage of in-home interviews was conducted with 6 participants, resulting in the case studies described throughout the report. In-home interviews had originally been planned to take place at every research wave, however during wave 1 and wave 2 they were not able to happen due to the Covid-19 restrictions in place at the time. The qualitative element was conducted among households that had completed the quantitative survey and had agreed to be contacted for further research and both stages of the qualitative research were purposively sampled to capture and to understand some of the more negative experiences. More detail on the methodology can be found in section 1.3, or in the technical report. Table 1 summarises the different fieldwork waves.

Table 1 Summary of ECO research waves

Wave	ECO scheme	Survey fieldwork period	Qualitative fieldwork period
Wave 1	ECO2t and ECO3	March to May 2020	July to August 2020
Wave 2	ECO3	May to July 2021	August to September 2021
Wave 3	ECO3	May to July 2022	August to October 2022

Findings

Characteristics of households reached by ECO

The scheme has reached more owner occupiers than estimated and fewer private renters or households in social housing

- ECO3 has consistently reached a higher proportion of households who were owner occupiers (72% at wave 3) and lower proportions of private renters (11% at wave 3) and those in social housing (13% at wave 3) compared with initial estimates[5].

[4] Affordable Warmth Standard obligation which is targeted as low income, vulnerable and fuel poor households, and the Affordable Warmth Flexible obligation where households do not need to meet eligibility criteria but are identified by local authorities.
[5] Impact Assessment (publishing.service.gov.uk)

- ECO3 has reached more households who were owner occupiers at wave 3 (72%) compared with wave 1 (66%) and fewer properties in social housing (decreasing to 13% at wave 3 from 19% at wave 1)[6].

The types of measures being installed has changed and there was significant variation depending on tenure

- Over time, fewer surveyed households have received insulation measures (69% at wave 3 compared with 75% at wave 1) and more households have received heating measures (65% at wave 3 compared with 34% at wave 1).
- Owner occupiers were more likely to receive heating measures (76% at wave 3) compared with 54% of private renters and 14% of those in social housing, whereas nearly all (96%) households in social housing received insulation measures compared with under two-thirds (63%) of owner occupiers.
- Owner occupiers were more likely to have had multiple measures installed (69%) compared with private renters (33%) or those in social housing (8%).

The scheme has reached households more likely to be vulnerable or at risk of fuel poverty

- The research has shown that the scheme has reached households on relatively low incomes, with around two in five (42%) households having an annual income of less than £16,000 at wave 3, however this has decreased over time (from 49% at wave 1).
- Households tended to be older, with 44% having at least one person aged 65 or over living there, higher than the national average of 32%.[7]
- Two-thirds (67%) of households were receiving state benefits (compared with the national average of 52%)[8], and just under half (49%) had someone with a long-standing illness, disability or infirmity living there (compared with 25% in England nationally and 30% in Wales[9]).
- Around half (49%) of households received some sort of help towards paying for fuel bills[10].

A lack of knowledge about the availability of energy saving measures prevented households from making changes to their home to reduce energy use

- Before they found out they could get help paying for the measures through ECO3, a third of households (34%) said they had never heard of the measures and a further 28% who heard of the measures but were not aware they could be installed in their home.

[6] There is no clear evidence why this is from this evaluation and it would not be appropriate to speculate. In the 'Limitations of the research' section (1.3.3) we have suggested how this could be explored in future evaluation.
[7] ONS estimates of the number of households (and people in households) by the mix of age groups and number of people aged 65 and over, UK, 2019
[8] Data from the Family Resources Survey: financial year 2020 to 2021. This data is not directly comparable with ECO households due to the differing data collection modes and different question wording.
[9] Census data from 2021 on disability in England and Wales
[10] This includes the Winter Fuel Payment, Warm Home Discount Scheme, Cold Weather Payment or National Concessionary Fuel Scheme

Deciding to get the measures installed

Over time fewer households found out about the scheme by being approached by a salesperson and more found out through word of mouth

- The most common way that surveyed households first found out that they could have the measures installed was by being approached by a salesperson knocking on their door or calling them; 23% at wave 3 down from 27% at wave 1.
- At wave 3 more households found out about ECO3 through friends, relatives or word of mouth (19% compared with 15% at wave 1) whereas 17% received a leaflet or letter.

Many households were initially sceptical when they found about ECO, with some thinking it was scam

- Across all waves, participants in the qualitative research were sceptical when they first learned about the scheme.
- Participants in the qualitative research reported receiving varying levels of information about the scheme and were not always signposted to additional information. Some leaflets lacked detail and were described as basic.
- Other initial concerns were related to the level of disruption and health and safety concerns during the process of installation.
- Households were typically reassured when speaking to friends, family or neighbours who had already benefitted from the scheme. Recommendations from households to help reassure others in the future included a helpline and more advertising to encourage take up and improve trust in the scheme.
- Participants in the qualitative research described feeling positive about the scheme once they had reassured themselves of the legitimacy of it, and felt it presented an opportunity to make their home warmer, reduce the cost of their energy bills and to be more environmentally friendly.

Comfort and cost were the main motivations for getting the measures

- Three in five (59%) surveyed households said that making their home warmer or more comfortable was a reason for having the measures installed, and 57% said it was to save money on energy bills. Environmental reasons were a secondary reason (25%).
- The cost of improvements being too high was the most common barrier that had previously stopped households from making changes to their home to reduce heating costs, increasing to 54% at wave 3, from 48% at wave 1.
- Most surveyed households said that they would have been unlikely to have had the measures installed if there had been no help with funding (69%). Although, one in five (20%) said they would have been likely to have had the measures without the funding, which was higher among owner occupiers (23%) compared with those in social housing (12%) or in privately rented properties (12%).

Two-thirds of households received fully funded measures

- A quarter of surveyed households (25%) paid towards the cost of having the measure(s) installed, while two-thirds (67%) received the measures for free.
- Among households who paid towards the cost of the measures the median amount was £500. Among households that only received insulation (and no heating measures) it was £500[11], and among households that only received heating measures (and no insulation) it was £733.

Households were generally open to the idea of receiving more measures if they had been available at the same time or shortly afterwards

- Around three in five (59%) households agreed that they would have been interested in receiving more measures if they had been available at the same time or shortly afterwards, with around one in twenty (6%) who disagreed.
- The main reason for not being interested in more measures was the belief that it would not make the home any warmer (32%), however the research shows that households that received multiple measures were more likely to say that their home was generally warmer (69%) compare with those who had received a single measure (57%).
- Around three in ten (31%) surveyed households that received measures through ECO3 said they were made aware of the range of different energy saving measures they could have had installed in their home, an increase from 20% of surveyed households at ECO2t.

The installation experience

Most households were satisfied with the process of installing the measures

- More than three-quarters of households (78%) were satisfied with the process of having the ECO3 measures installed.
- Clear communication from the installation company along with tidy workers led to a satisfactory installation, even for the more disruptive measures due to expectations being set.
- One in six (16%) households said that the measures took longer to install than expected which has increased at wave 3 (from 12% at wave 2).
- A lack of information, a lack of aftercare, poor quality work, and damage to the home during installation caused dissatisfaction.
- Around one in ten (9%) households experienced a fault with a measure which required repair, which was higher among households that received heating measures (12%) compared with insulation (8%).

[11] These results should be treated with caution as only 78 households received only insulation and paid towards the cost.

Information received during the installation varied

- Around two-thirds (65%) of surveyed households said that they received enough advice in advance about the measures they had installed and one in five (20%) said they did not.
- Those in social housing were more likely to say they did not receive enough advice (35%) compared with owner occupiers (18%).
- Around a quarter (23%) of surveyed households said that someone involved in the installation discussed whether the measures would influence ventilation, condensation or mould growth with them, and 58% said that this did not happen. Households that received measures after June 2021 when PAS 2035 became mandatory were more likely to say that someone had discussed this (33%) compared with households that received measures before June 2021 (18%).
- More than half (53%) of surveyed households said that they were given a guarantee with instructions about what to do if there were problems with the measure. Around a quarter (27%) said they were not given one and one in five (19%) did not know or could not remember.

The perceived impact of ECO

Most households were positive about the impact of ECO and felt they had benefitted from the scheme

- Around three in five households (58%) felt they had benefitted a great deal or a fair amount from the scheme. Around one in five (18%) felt they had not benefitted very much and 8% not at all.
- Households that received heating measures were more likely to perceive a ‘great deal’ or a ‘fair amount’ of benefit (66%) compared with those who received insulation (55%).

The perceived impact on heating use was mixed with some saying they used their heating more and some who used it less since having the measures

- Around a third (36%) of households said they thought they used their heating less and one in five (20%) said they used it more since having the measures installed. Three in ten (31%) households said their heating use had not changed since receiving the measures.
- Increased use of the heating was seen as a positive outcome for some households who were now able to afford to have the heating on longer by running more efficient measures, or because they had greater control over the heating system. For some households that reported faulty measures having the heating on more was a negative outcome.

- Around three in five (63%) surveyed households reported using additional heating[12] less than they did before the measures were installed.

An increase in energy prices made it difficult for households to see an impact on their bills as a result of the measures

- At wave 3, more than half (54%) of surveyed households said they thought their energy bills would be higher if they had not had the measures installed with 6% saying they thought their bills would be lower.
- Households that received multiple measures were more likely say that they thought their energy bills would be higher if they had not received the measures (59%) compared with those who received a single measure (48%).
- Before the increase in the energy price cap (wave 2), a third of surveyed households (34%) perceived their energy bills to be lower since the measures were installed. One in ten (9%) perceived them to be higher, and a third (32%) saw no change.

Thermal comfort in the home improved as a result of the measures

- Around two-thirds (63%) of households thought their home felt warmer since having the measures installed at wave 3, although this has decreased over time from 69% at wave 1.
- Around three-quarters of surveyed households (73%) said it was easy to heat their home to a comfortable temperature after the installation of ECO3 measures, but more than one in five (22%) households felt it was difficult (an increase from 18% at wave 1).
- Around a third of households (31%) felt their home had moved from difficult to easy to heat to a comfortable after the measures, however 15% felt their home was difficult to heat to a comfortable temperature both before and after the measures were installed.
- Reasons for the home being difficult to heat to a comfortable temperature after the measures were installed included unresolved issues in the home, such as draughts.
- Two in five households felt the temperature drops more slowly when the heating is switched off since having the measures (41%).

Households reported fewer issues in the home since the measures were installed, including condensation, mould and damp

- Households reported fewer issues with condensation, draughts, mould, mildew, damp or rot after receiving the measures (15%) compared with before receiving the measures (42%).
- Households that received solid wall insulation were more likely to say that they had experienced these issues before the measures but not after the measures (39%), compared with households that received cavity wall insulation (28%).

[12] Additional heating refers to other types of heaters used in the home other than the main source of heating e.g. electric plug-in room heaters, open fires, gas fires etc.

The perceived impact on health was higher among households with someone living there with a long-standing illness or disability

- Overall, a quarter (24%) of households reported that the measures had a positive impact on the health of anyone within the household, which was higher among households that had someone living there who had a long-standing illness, disability or infirmity (31% compared with 16% that did not).
- Positive health impacts were also more likely to be reported by surveyed households who said their home was easier to heat to a comfortable temperature after the measures (37%, compared with 13% that reported no change), and households that reported issues with damp, rot, mould, condensation, or draughts before the measures but not afterwards (35%, compared with 22% that still reported these issues after the measures).
- One in five said that the measures had a positive impact on physical health (21%) and 17% on mental health.
- Some respondents from the qualitative research reported health impacts related to improved wellbeing and lower stress levels, as well as controlling physical symptoms of asthma or other long-term conditions such as ME.

The potential for longer term impact

The research suggests that participation in the ECO3 scheme has a positive impact on intended future behaviour.

- Around two-thirds (65%) of surveyed households at wave 3 were more likely to consider other energy saving measures as a result of the scheme, an increase from 60% at wave 1.
- A higher proportion of households that received a boiler said they were more likely to consider other energy saving measures in the future (72%) compared with households that received insulation measures (64%).
- Cost was a common barrier that prevented households from considering additional energy saving measures in future, even if they wanted them.
- When it came to recommending similar measures under the scheme to others, three-quarters (76%) had already had or were likely to do so, a finding that has remained consistent over time.

1 Introduction and background

1.1 Background

The Energy Company Obligation (ECO) scheme was launched in 2013 and is administered by Ofgem. It requires medium and large energy suppliers in Great Britain to upgrade energy efficiency measures and heating measures to households. Energy suppliers are obligated to deliver the scheme and they recover the costs of delivering the scheme through customers' energy bills.

The scheme is designed to focus support on households in fuel poverty, reduce greenhouse gas emissions and lower the cost of energy bills. It aims to drive uptake of energy efficiency measures[13] in homes that might not have occurred without the scheme, particularly among low income and vulnerable households in or at risk of fuel poverty. Since the scheme was launched in 2013, 3.5 million measures have been installed in approximately 2.4 million homes[14].

In September 2019, the Department for Business, Energy and Industrial Strategy (predecessor to the Department for Energy Security and Net Zero) appointed Kantar Public to undertake a three-wave household survey and follow-on qualitative interviews with households who have received measures to evaluate the scheme. The research was commissioned to provide insights on the type of households that the scheme reached, households' experience of getting the measures installed and the perceived impact of taking part in the scheme.

Since the ECO scheme was launched there have been different iterations; ECO1, ECO2, ECO2t, ECO3 and ECO4. This evaluation covers ECO2t and ECO3:

- ECO2t (also known as ECO Help to Heat) ran from April 2017 to September 2018 and was covered in wave 1 of this research only. This included the Carbon Emissions Reduction Obligation (CERO) which focused on reducing carbon emissions of housing primarily through installing insulation measures[15]. CERO was open to all households regardless of socio-demographic characteristics. It also included the Affordable Warmth Obligation (AW) which focuses on reducing home heating bills in low income and vulnerable households through a mixture of insulation and efficient heating systems (described below).
- ECO3 ran from December 2018 to March 2022 and was covered in waves 1 to 3 of this research. This was solely focused on an Affordable Warmth obligation targeting low income, vulnerable and fuel poor households[16]. ECO3 also required a certain proportion of measures to be delivered to rural homes and increased the proportion of the scheme

[13] This includes heating measures such as boiler upgrades.
[14] This report focuses on the research findings. Statistics on the measures installed can be found here: Household Energy Efficiency Statistical Release. Statistics are based on the latest publication at the time of writing (March 2023).
[15] Energy Company Obligation: ECO2t
[16] Energy Company Obligation: ECO3

that could be delivered under a local authority flexible eligibility, described below. Up to 10% of a supplier's obligation could be met through the delivery of new, innovative products.

The population of households eligible to receive measures under ECO covered two obligation types: Affordable Warmth (AW) Standard and Affordable Warmth (AW) Flexible. The AW Standard obligation was targeted at:

- private tenure households in receipt of certain means-tested benefits, or combination of benefits, sometimes needing to have a household income below a set threshold
- private tenure households identified by a local authority as living on a low income and vulnerable to the cold or in fuel poverty
- households in social tenure households living in properties with an energy performance certificate rating of E, F or G, for certain measures

The AW Flexible obligation enabled suppliers to meet a proportion[17] of their target by installing measures in homes which do not meet the standard eligibility criteria, but which have been identified as part of the ECO target population by local authorities. The AW Flexible eligibility was designed to harness the knowledge that local authorities have about the low income, vulnerable and fuel poor households that live in their areas, allowing ECO funding to be better targeted at those that need it most. The intention was that households outside of the core benefits system eligibility criteria would be reached by the scheme.

This report covers findings from all three waves of the research (summarised in Table 2), focusing on how experiences of households have changed over time. Changes over time (for example between wave 1 and wave 3, or between wave 2 and wave 3) are discussed throughout where this has occurred[18]. Where there has not been change over time the report focuses on the findings from the most recent wave, wave 3. This report focuses on ECO3 as this was covered in all three waves, whereas ECO2t was only covered at wave 1. The findings for wave 1 can be found in the wave 1 interim report.[19]

[17] 10% for ECO2t and 25% for ECO3

[18] Throughout the report, where the results for one group of participants are compared against the results for another group, any differences discussed are statistically significant at the $p<0.05$ probability level, unless otherwise stated.

[19] https://www.gov.uk/government/publications/eco-evaluation-wave-1-interim-report-2020

Table 2 Summary of ECO research waves

Wave	ECO scheme	Audience	Fieldwork period
Wave 1	ECO2t installations between April 2017 and September 2018 and ECO 3 installation between December 2018 and November 2019	ECO2t: 1,468 surveyed households ECO3: 1,449 surveyed households 40 in-depth telephone interviews	March 2020 – August 2020
Wave 2	ECO3 installations between December 2019 and November 2020	2,265 surveyed households, 40 in-depth telephone interviews	May 2021 – September 2021
Wave 3	ECO3 installations between December 2020 and November 2021	2,061 surveyed households, 40 in-depth telephone interviews, 6 in-home interviews (case studies)	May 2022 – October 2022

1.2 Aims and objectives

The aim of the research was to provide statistically robust evidence on the characteristics of households that have received measures under ECO, and self-reported impact of the measures to help BEIS understand how the scheme has delivered against its objectives. More specifically, the research assessed:

- characteristics of recipients of energy saving measures under ECO2t and ECO3 iterations of the scheme
- the perceived impact of the energy saving measures within households
- the perceived effectiveness and efficiency of the scheme delivery
- how experiences differ for different types of recipients

1.3 Methodology

This section provides an overview of the methodology. For a more detailed account, and for access to the final research instruments including the survey questionnaire, readers may wish to refer to the technical report.

1.3.1 Quantitative and qualitative fieldwork

At each wave Kantar Public conducted a survey of households that had received one or more energy saving measures under the ECO2t or ECO3 scheme. At each wave, a systematic random sample of households that had received one or more measures was produced for this research from a database of households that had received measures under the scheme.

Some groups of interest were boosted within the sample, including obligation type (AW Standard, AW Flexible) and country (England, Scotland and Wales) to allow for standalone analysis. At wave 3 the sample was also boosted by the type of measure (internal solid wall insulation, external solid wall insulation) to allow for analysis by these sub-groups as these had been groups of interest in earlier waves.

At each wave, the survey was carried out using a combination of postal questionnaires and an online survey. The response rates to the surveys were between 24% and 28%. For more information on the contact strategy, response rates and weighting please see the technical report.

A qualitative element of the evaluation was included to provide detailed insights on household experiences of the ECO scheme. The topics covered in the qualitative research varied at each wave to align with specific areas of policy interest, but broadly focused on understanding the decision-making and installation journey, the process of installation and the impact and benefits of ECO measures installed. The full discussion guides from each wave are available in the technical report.

At each wave, in-depth interviews of 60 minutes in length were conducted with 40 participants via telephone. At wave 3, additional in-home interviews were conducted with 6 of the participants in the in-depth interviews who have reported less positive experiences (see the case studies throughout the report).

1.3.2 Limitations of the research

This research was only carried out with households who had received a measure under the ECO scheme and not with other groups involved in the process, such as energy companies, installation companies, local authorities, or households who had decided not to take advantage of the scheme. Therefore, there are some areas of the scheme that remain unknown, including the interaction with suppliers and installers, how measures are presented to households, and how the contribution paid towards measures is calculated. It also means that it is harder to understand the cause of some of the differences in the characteristics of beneficiary households compared with expectations.

Households were surveyed at one point in time, between 6 and 18 months after they received the energy saving measure. Questions measuring impact rely on the household's perception of change before and after the measures were installed. New households were sampled at each research wave, so it is not possible to analyse how the same households' views changed over time.

Households that had received multiple measures under ECO were asked to think about their experiences of these measures as a whole, rather than about each measure separately. Therefore, when looking at how the experiences of households varied by the type of measure installed it is important to note that households may have received other measures than the group being analysed.

Some further limitations and considerations include the timing of the fieldwork. The first wave of fieldwork took place during the early phases of the Covid-19 pandemic during a period of lockdown, when most of the population were required to remain at home. Survey fieldwork also coincided with an unseasonably warm and dry Spring. These factors may have impacted on the survey response rate and profile of those who took part, as well as potentially having an impact on how participants responded to questions. The third wave of fieldwork took place during rapid increase in energy bills, with the energy price cap (now replaced by the Energy Price Guarantee) which set a maximum price that energy suppliers could charge consumers for each kWh of energy they used, increasing from £1,277 to £1,971 per year. It is probable that this impacted on households' use of heating in the home and impacted on how households responded to some questions.

Further information on methodological limitations and considerations can be found in the technical report. Regardless of these limitations, we are confident that findings from the survey and qualitative interviews are highly reliable.

1.4 Reporting notes

This report focuses on how the experiences of households have changed over the three waves of research. Changes over time (for example between wave 1 and wave 3, or between wave 2 and wave 3) are discussed throughout where this has occurred. Where there has not been change over time the report focuses on the findings from the most recent wave, wave 3. This report mainly focuses on ECO3 as this was covered in all three waves, whereas ECO2t was only covered at wave 1. Comparisons to ECO2t are made where there are significant differences. The findings for wave 1 can be found in the wave 1 interim report.

Insights from the qualitative and quantitative research are provided side by side. The distinction between them is signposted throughout. Where results are reported from 'quantitative research', the 'survey', 'surveyed households' or where percentages are reported, this denotes that findings are from the quantitative research survey. Where results are reported from 'qualitative research' or, 'interviews/those interviewed', this denotes the findings are from the qualitative strands of this research.

Throughout the report, where the results for one group of participants are compared against the results for another group, any differences discussed are statistically significant at the $p<0.05$ probability level, unless otherwise stated[20].

Where percentages shown in charts or tables do not total to exactly 100% this is due to a combination of rounding to the nearest whole number and because some questions allowed participants to choose more than one response option. Qualitative research seeks to explore views and experiences in greater depth and does not aim or allow for statistical analyses. Qualitative findings are not representative nor generalisable and is not meant to be used to provide statistically significant results.

Qualitative case studies have been included where relevant to illustrate examples from the 6 in-home interviews. They were purposely selected to explore less positive household experiences, and they are not meant to be generalised.

[20] A p value <0.05 means there is a <5% probability of observing a difference of this magnitude if, in reality, there was no systematic difference between the two groups when the study was carried out and any observed difference was due to random sampling error alone.

2 Who has been reached by ECO?

Summary of change over waves 1 to 3

ECO3 has reached more owner occupiers at wave 2 (74%) and wave 3 (72%) compared with wave 1 (66%) and fewer households in social housing (decreasing to 13% at wave 3 from 19% at wave 1).

Over the course of the research, there was an increase in income among surveyed households reached by ECO3. The proportion with a household pre-tax income of under £16,000 decreased between wave 1 (49%) and wave 3 (42%).

At wave 3, around half of households (49%) reported having a long-term illness, disability or infirmity, similar to previous waves of ECO3, but higher compared with households reached by ECO2t (32%).

The type of measures installed in properties has changed over time with the proportion of households receiving insulation measures decreasing between wave 1 (75%) and wave 3 (69%). The proportion of households receiving heating measures increased between wave 1 (34%) and wave 3 (65%), with private renters experiencing the largest increase in heating measures (from 22% at wave 1 to 54% at wave 3).

2.1 Property and household characteristics

2.1.1 Tenure

At wave 3, around seven in ten (72%) surveyed households reached by the ECO3 scheme were owner occupiers, including 43% that owned outright with no mortgage to pay off, and 29% that owned with a mortgage[21]. Just over one in ten households (13%) were social housing[22]. Around one in ten households (11%) rented privately. One percent were part owned and part rented (shared ownership) and 1% lived rent-free.

The proportion of owner occupiers reached by ECO3 was higher at wave 2 (74%) and wave 3 (72%) than at wave 1 (66%). The proportion of private renters decreased following wave 1, as had the proportion of households in social housing, shown in Figure 1. These figures are

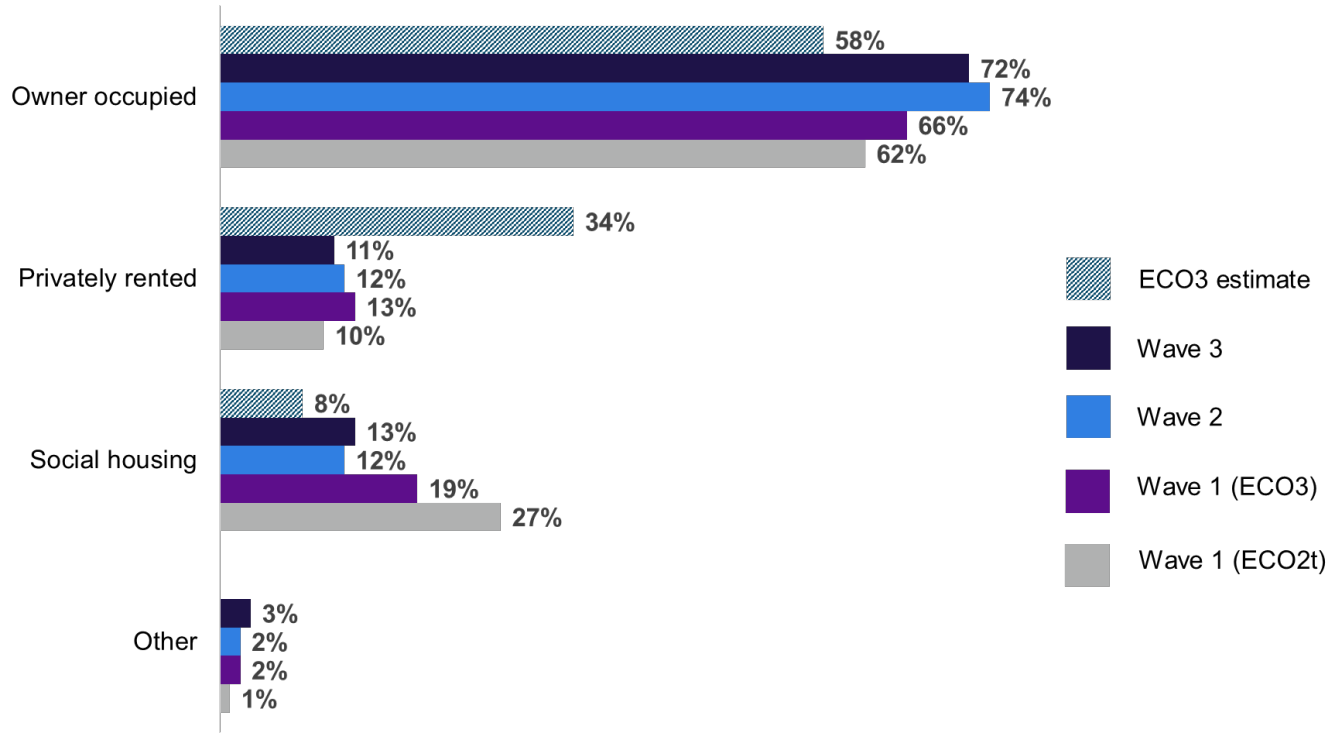
[21] In England 36% of homes were owned outright in 2020, 28% were owned with a mortgage or loan, 19% were privately rented and 17% were social housing: ONS Subnational estimates of dwellings and households by tenure, England

[22] This included 4% that were rented from the council or local authority, and a further 9% that were rented from a housing association, housing co-operative, charitable trust or registered social landlord.

broadly consistent with the total number of households that have received measures under ECO since April 2017[23].

For ECO3, it was originally estimated that 58% of the measures would be installed in owner occupied properties, 34% in privately rented properties and eight percent in social housing[24]. The survey findings confirm that ECO3 reached a higher proportion of owner-occupied homes, and a lower proportion of privately rented homes than originally planned.

Figure 1 Tenure of properties reached by ECO2t and ECO3, waves 1-3



Base: All respondents (wave 1 ECO2t: 1,468, wave 1 ECO3: 1,449, wave 2: 2,265, wave 3: 2,061). Source: Do you (or your household) own or rent the home that you live in?

Tenure varied by obligation. Households reached by AW Flexible were more likely to be owner occupiers (88%) compared with 68% of AW Standard. By contrast, 16% of households reached by AW Standard were in social housing, compared with one percent of AW Flexible.

The type of measure installed varied by tenure, shown in Figure 2. Households in social housing were more likely to have had insulation measures installed (87%) compared with households that were owner occupiers (66%) or private renters (64%). More specifically, households in social housing were more likely to have had cavity wall insulation installed (78% compared with 21% of owner occupiers and 12% of private renters).

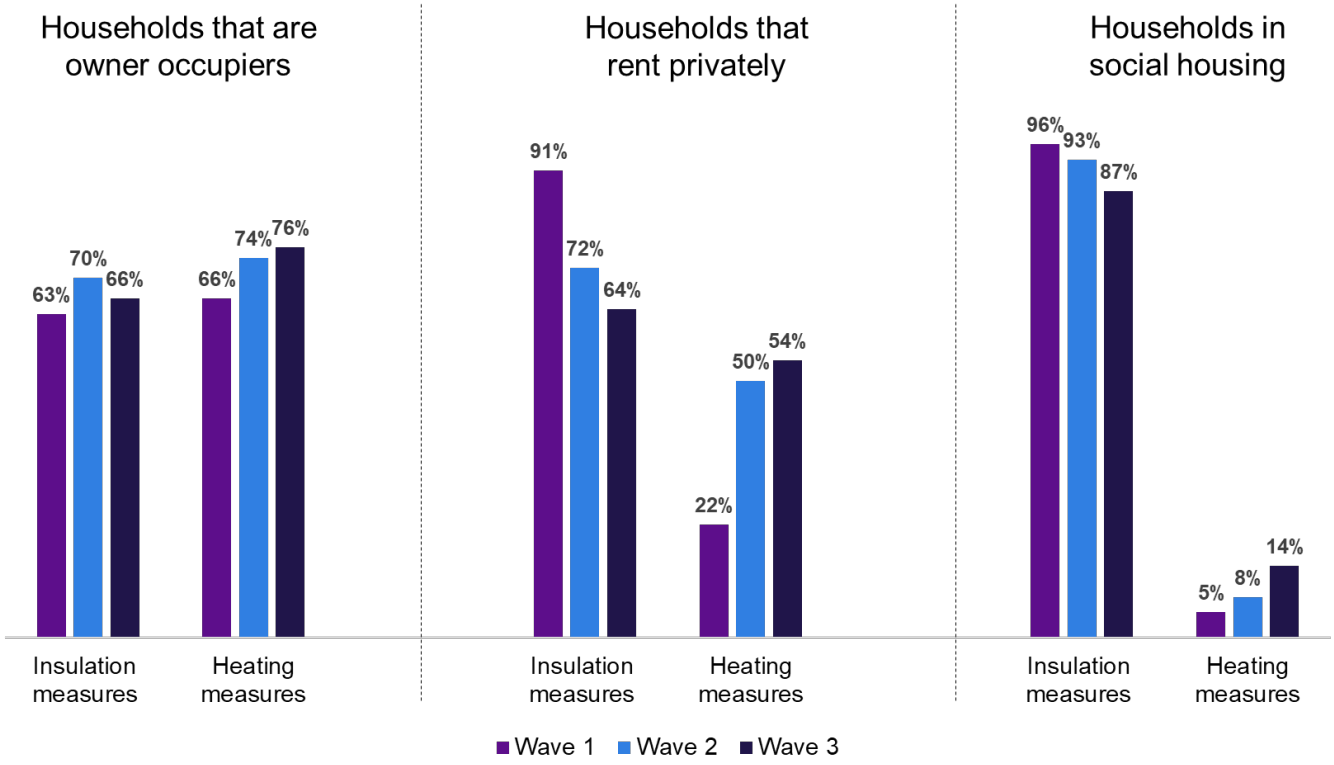
The proportion of households receiving heating measures through ECO3 has increased over time for owner occupiers, private renters and those in social housing. However, at all three

[23] Household Energy Efficiency Statistics release November 2022 shows 70% of households receiving measures were owner occupied, 16% were rented (social) and 14% were rented (privately). Household Energy Efficiency Statistics, headline release November 2022 - GOV.UK (www.gov.uk)
[24] Impact Assessment (publishing.service.gov.uk)

waves, households in social housing were less likely to have had heating measures installed compared with owner occupiers (14% of social housing households had heating measures installed at wave 3 compared with 76% of households that were owner occupiers and 54% of households that privately rented).

The proportion of private renters and those in social housing that received insulation measures decreased over time, falling from 91% of private renters at wave 1 to 64% at wave 3, and from 93% of those in social housing at wave 1 to 87% at wave 3.

Figure 2 The type and number of ECO3 measures installed by tenure, wave 1-3



Base: households that are owner occupiers (wave 1: 1,230, wave 2: 1,877, wave 3, 1,704), households that rent privately (wave 1: 100, wave 2: 157, wave 3: 132), households in social housing (wave 1: 93, wave 2: 187, wave 3: 163). Source: Do you (or your household) own or rent the home that you live in?

As well as variation by the type of measure, there was also variation by the number of measures installed. Owner occupiers were more likely to have had multiple measures installed (69%) compared with private renters (33%) or those in social housing (8%). Over time the proportion of owner occupiers that have received multiple measures have increased, from 57% at wave 1 to 69% at wave 3.

2.1.2 Income

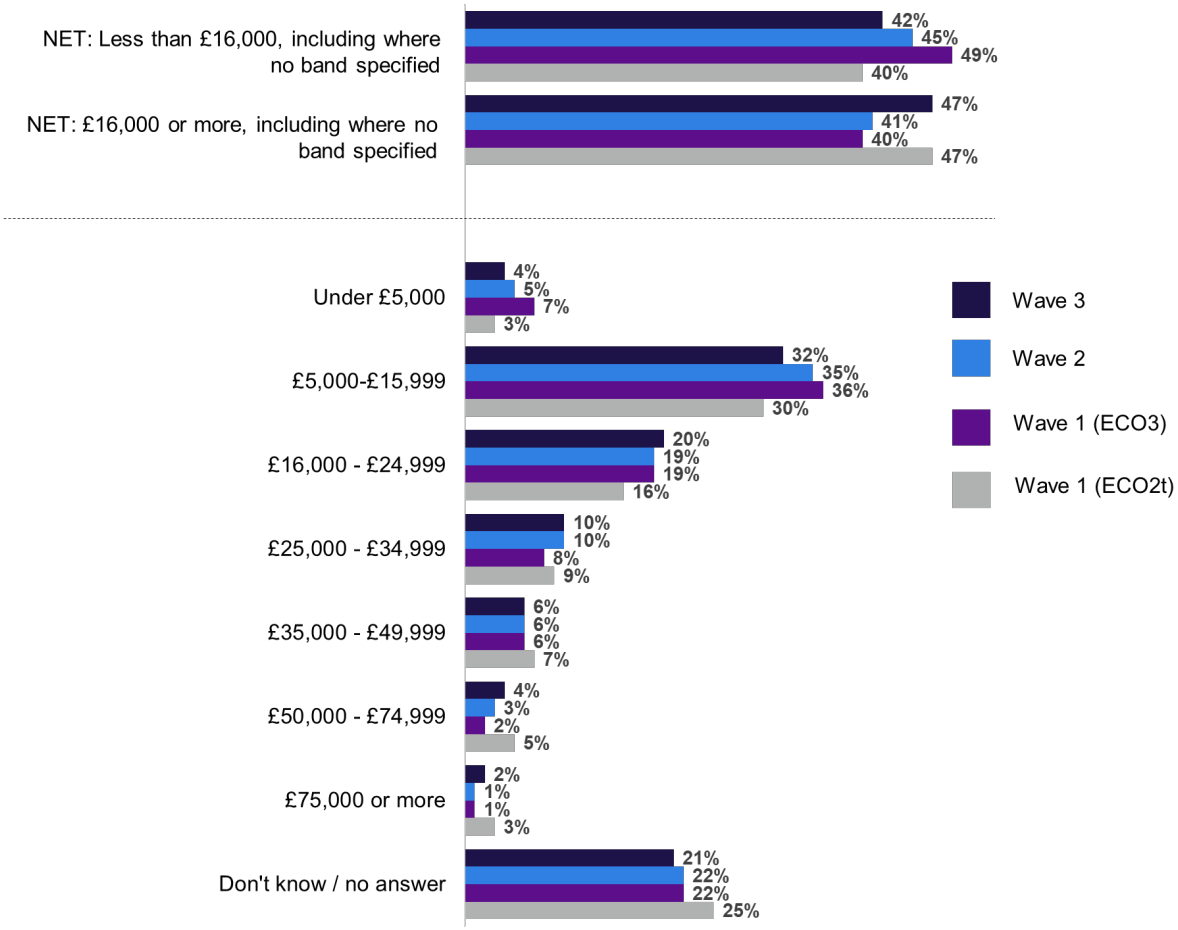
Surveyed households were asked about their pre-tax annual income. If they did not want to answer, there was the option to say whether their annual household income was less than £16,000, or £16,000 or more[25]. Figure 3 shows the banded responses given at each wave, as

[25] £16,000 was seen a benchmark for low income and at risk of fuel poverty when this research was developed.

well as the derived amount of whether the household's income was more or less than £16,000 a year.

Overall, 42% of those reached at wave 3 had a household pre-tax income of under £16,000 and 47% had an income of £16,000 or more. There was an increase in income among surveyed households reached by ECO3 over the research waves. The proportion with a household pre-tax income of under £16,000 fell from 49% at wave 1 to 45% at wave 2 and 42% at wave 3.

Figure 3 Household's annual income when ECO2t and ECO3 measures were installed, before taxes and other deductions, waves 1-3



Base: All respondents (wave 1 ECO2t: 1,468, wave 1 ECO3: 1,449, wave 2: 2,265, wave 3: 2,061). Source: Thinking back to when you had the measure(s) installed, which of these options best describes your household's total income, before taxes and any other deductions at that time? Is your household's total income, before taxes and any other deductions, £16,000 or more a year?

Households reached by AW Standard tended to have a lower income than households reached by AW Flexible. At wave 3, just under half (46%) of households reached by AW Standard had an income of less than £16,000 a year, compared with a quarter of households reached by AW Flexible (26%).

Income also varied by tenure and household type. The majority of owner occupiers had an income of at least £16,000 a year (53%), but this was lower among those renting privately and

those living in social housing (both 32%). Households made up only of people aged 65 and over were less likely to have an income of £16,000 a year or more (35%), compared with households containing working age adults and under-fives (57%) and mixed households (59%).

2.1.3 Health problems and disability

Surveyed households were asked if there was anyone within the household (including themselves) with a long-standing illness, disability or infirmity that limited their normal day to day activities. At wave 3, around half of households (49%) reported having a long-term illness, disability or infirmity, similar to previous waves of ECO3, but higher compared with households reached by ECO2t (32%). This is also higher than the national average in 2021, with 25% of households in England including at least one disabled member, and 30% in Wales[26].

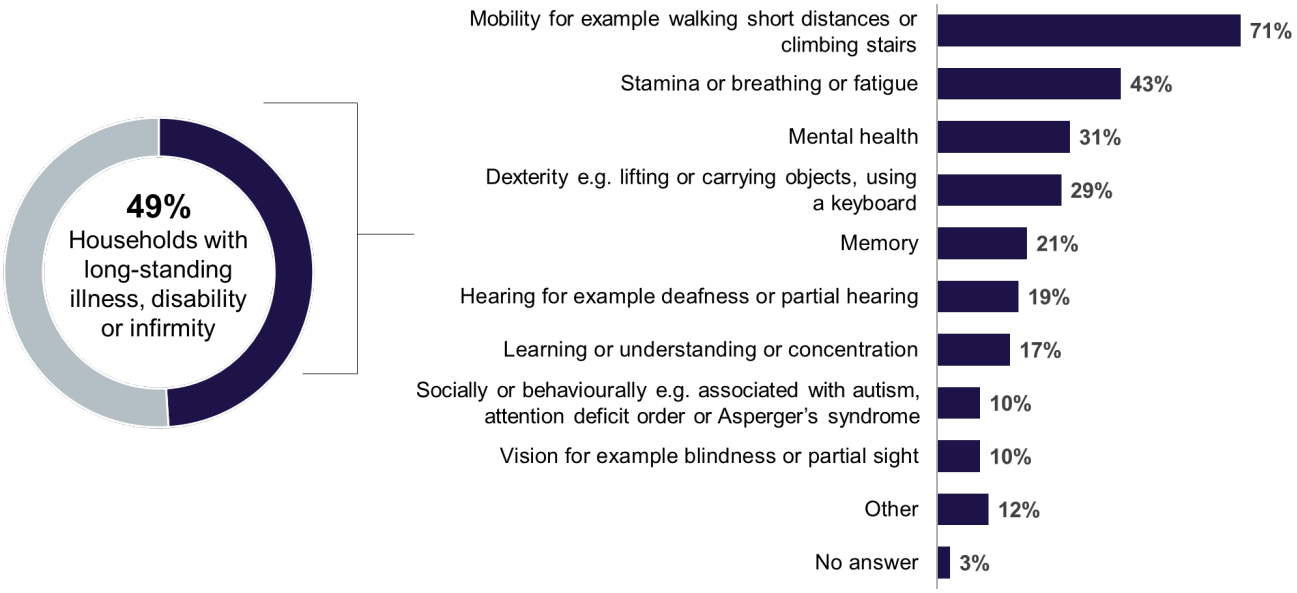
At wave 3 some households were more likely to have someone with a long-standing illness, disability or infirmity that limited normal day to day activities, including:

- households reached under AW Standard (55%) compared with households reached under AW Flexible (23%)
- households where all occupants were aged 65 or over (59%) compared with households with working age adults only (51%) or those with working age adults and under-fives (22%)
- households with an income of less than £16,000 a year (56%) compared with £16,000 or more (43%)

Among households that had someone with a long-standing illness, disability or infirmity, 63% said that it limited their activities all of the time, and 33% said it limited their activities some of the time. Conditions or illnesses most commonly affected were mobility (71%), followed by stamina, breathing or fatigue (43%) or mental health (31%). Three in ten said the condition or illness affected dexterity (29%) and one in five said it affected memory (21%), hearing (19%) or learning, understanding or concentration (17%). Further details are shown in Figure 4.

[26] Census data from 2021 on disability in England and Wales

Figure 4 Long-standing illness, disability or infirmity within the household, wave 3



Base: All respondents (2,061). Q63. Do any of these conditions or illnesses affect this person in any of the following areas? Base: All respondents where there is someone with a long-standing illness, disability or infirmity in the household (905). Source: Does anyone in your household have any long-standing illness, disability or infirmity that limits their normal day to day activities?

2.2 Other household characteristics

Other characteristics of surveyed households are summarised in this section. Full details of these characteristics can be found in Appendix A.

2.2.1 Age and size of household

Around three in ten (31%) surveyed households reached by ECO3 contained only adults aged 65 and over. Of these, three in five (58%) were single occupancy. This is similar to ONS estimates of households containing people aged 65 and over only (25% of all households), of which it is estimated that 59% are single occupancy[27]. Overall, more than two in five (44%) households had at least one person aged 65 or over living there. This is higher than the ONS population estimates (32%)[28].

Three in ten households (30%) contained only working age adults (aged between 18 and 64). Just under one in ten households (8%) contained working age adults and children under 5 years old.

[27] ONS estimates of the number of households (and people in households) by the mix of age groups and number of people aged 65 and over, UK, 2019
[28] ONS estimates of the number of households (and people in households) by the mix of age groups and number of people aged 65 and over, UK, 2019

2.2.2 Age of the home

The age of the properties that benefited from ECO was mixed. At wave 3, around one in ten surveyed properties (11%) were built pre-1919, compared with 21% nationally[29], while 13% of surveyed properties were built post-1990, compared with 17% nationally. One in five (20%) did not know when their home was built.

2.2.3 Working status

Among surveyed households, just under half (45%) of chief income earners worked in paid work. Around a third (34%) worked full-time (30 hours or more per week) and 11% worked part-time (under 30 hours per week). Two in five were retired (40%) and 12% were not working. These figures have remained consistent over the three waves of the survey.

2.2.4 Ethnicity

At wave 3, when asked to describe the ethnic group(s) of people within their household, three-quarters (77%) said they were from a white background, 13% from an Asian background, 2% from a black background, 2% from a mixed background or from multiple groups, and 1% from another background. This profile is slightly different to population estimates for England and Wales in the 2021 Census (82% of residents identified their ethnic group as white, nine percent as Asian and four percent as black) [30].

2.2.5 Help received with fuel bills

Around half (49%) of surveyed households received some sort of help towards paying for fuel bills. In households where all occupants were aged 65 or over, 90% received help, compared with 23% in households with only working age adults and 25% where occupants were working age adults with under-fives.

The most common help received was the Winter Fuel Payment (38%). More than one in ten (15%) received help from the Warm Home Discount Scheme, or the Cold Weather Payment (12%). One percent received help from the National Concessionary Fuel Scheme.

2.2.6 Benefits

At wave 3, two-thirds (67%) of surveyed households were receiving state benefits, and a quarter (25%) were not. Eight percent did not give an answer to this question. The proportion of surveyed households in receipt of state benefits was higher than the national average, where 52% of households are in receipt of state benefits[31]. Households reached under the AW Standard obligation were more likely to be receiving state benefits (78%), compared with around one in five (21%) reached by AW Flexible.

[29] The Housing Stock of The United Kingdom
[30] Ethnic group, England and Wales - Office for National Statistics (ons.gov.uk)
[31] Data from the Family Resources Survey: financial year 2020 to 2021. This data is not directly comparable with ECO households due to the differing data collection modes and different question wording.

3 The delivery of ECO

Summary of change over waves 1 to 3

Over time, the way surveyed households found out about ECO3 changed with fewer households being approached by a salesperson at wave 3 (23%) compared with wave 1 (27%) and finding out about it through friends, relatives or word of mouth (19%) compared with wave 1 (15%).

Across all waves, participants in the qualitative research were sceptical when they first learned about the scheme and for many, it seemed 'too good to be true'. Other concerns related to the level of disruption the installation might cause.

The qualitative research demonstrated varying levels of information given to participants, with those receiving less information less likely to have trust in the process. Some struggled to carry out their own research online as they did not know the name of the scheme.

Making the home more comfortable was the main motivation for having the measures installed at all three survey waves. However, saving money on energy bills became more important over time, with a six-percentage point increase in the proportion of households who cited this as motivating factor between wave 1 (51%) and wave 3 (57%).

The cost of improvements being too high was the most frequently mentioned reason why surveyed households had not previously made changes to their home to reduce heating costs, and this had become more important for households (48% at wave 1 compared with 54% at wave 3).

Overall, levels of satisfaction of the process of installation have remained consistent over time, however the proportion of households that said they were 'very satisfied' decreased between wave 1 (53%) and wave 3 (48%). Installations were also taking longer than surveyed households expected at wave 3 (16%) compared with wave 1 (12%).

A positive installation was often the result of good communication, friendly installers and limited mess, whereas a negative installation was related to poor quality work, damage to the home or a lack of aftercare.

3.1 Deciding to get the measures installed

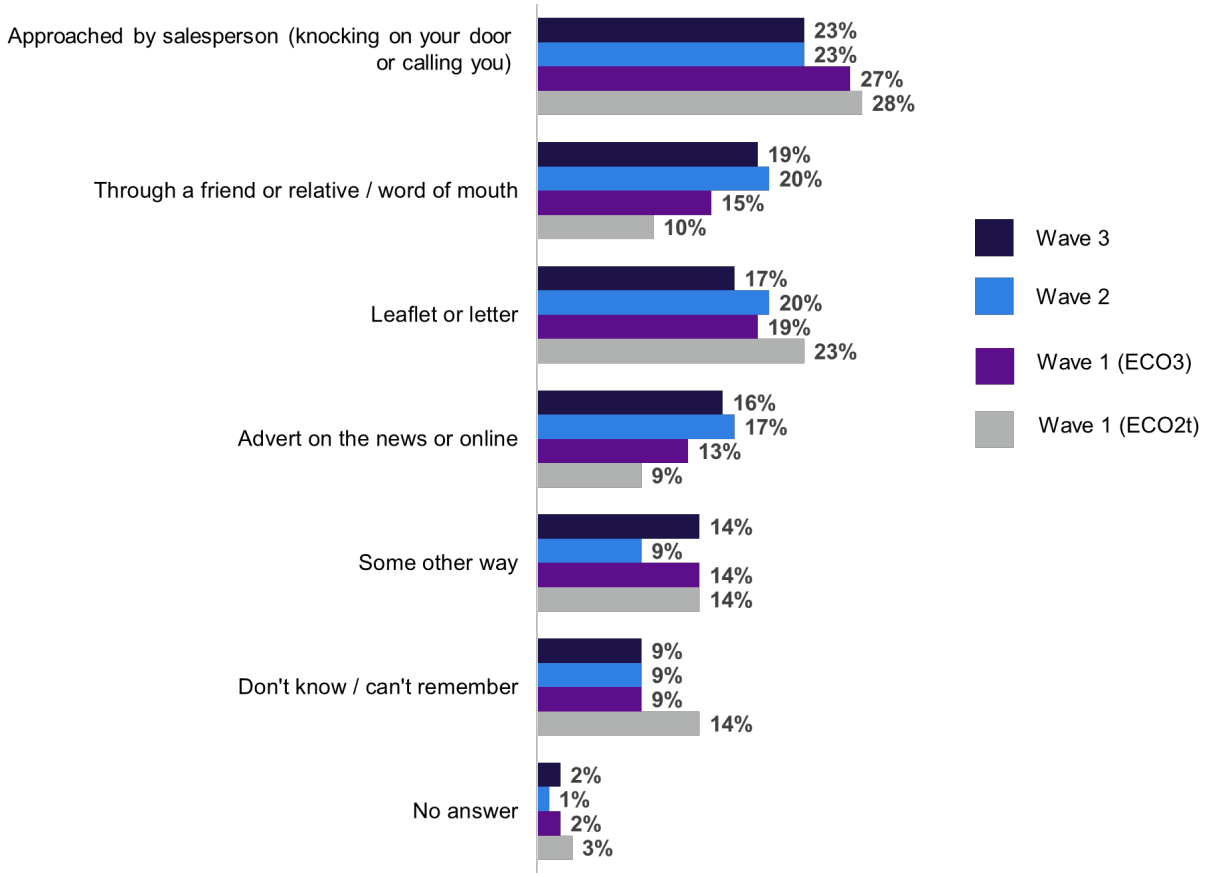
3.1.1 How households first found out about the scheme

Across all three waves, the most common way that surveyed households first found out that they could have the measures installed was by being approached by a salesperson knocking on their door or calling them (23%). Nearly one in five (19%) found out through a friend or

relative or word of mouth, and around one in six received a leaflet or letter (17%) or saw an advert on the news or online (16%). Around one in ten (9%) said they did not know or could not remember how they first found out about the scheme.

The proportion of surveyed households who first found out about ECO3 by being approached by a salesperson decreased between wave 1 (27%) and wave 3 (23%), whereas the proportion who found out about the scheme through friends, relatives or word of mouth increased between wave 1 (15%) and wave 3 (19%)[32].

Figure 5 How households first found out about having ECO2t and ECO3 measures installed, waves 1-3



Base: All households receiving ECO3 measures (wave 1 ECO2t: 1,468, wave 1 ECO3: 1,449, wave 2: 2,265, wave 3: 2,061). Source: How did you find out that you might be able to have measure(s) installed?

Surveyed households that were reached through AW Flexible were more likely to have found out about the scheme by being approached by a salesperson (43%), compared with households reached through the AW Standard obligation (17%). Households reached through AW Standard obligation were more likely to have found out about the scheme by seeing an advert on the news or online (19%, compared with 6% of households reached by AW Flexible).

[32] Compared with households reached by ECO2t, the proportion who found out through a friend, relative or word of mouth increased by ten percentage points (from 9% of ECO2t households surveyed at wave 1 to 19% of ECO3 households surveyed at wave 3).

3.1.2 Level of control in the decision-making process

The qualitative research findings suggested that for some, tenure was a factor in determining the level of control the household had in the decision-making process. Participants who were owner occupiers typically described having full control over the decision to have the measures installed and were able to negotiate with the installers. Some participants who were owner occupiers shared how they had long-term plans to have measures installed themselves and then found that they were eligible to have the measures done through the scheme.

“We were going to install the measure ourselves and then we received a letter to say that we were eligible for a free installation” (Male, 45-54, smart thermometer, wave 3)

Participants who were private renters described varying levels of control over the decision-making process, including those who did not have any control as it was not their property, through to those that were given the choice by their landlords and those who suggested the measures to the landlords. Those with no control tended not to mind as many thought it would improve the overall property.

“I didn’t mind at all, I wouldn’t have objected to it, I probably won’t always be living in that flat so somebody else may want it” (Female, 65+, cavity wall insulation, wave 2)

“I made the decision along with the landlord who had to be consulted as they'd have to pay if there were any extra costs.” (Female, 25-34, underfloor insulation, wave 2)

Many participants who lived in social housing described having experienced little or no consultation from the housing association to have a say in which measures they were receiving or how the measures might benefit them. Participants tended to receive a letter to inform them that installers would be coming on a certain day, and in one particular case a participant described how they did not know they were getting cavity wall insulation at all until they woke up to installers on cranes outside their window.

"The problem I've got because I live in a housing association is that you have to have what they say. You don't get the chance to say is there anything else available, you're just told when somebody is coming and that's that and they expect you to have it done. In a way it’s good but we should have been given the opportunity to have asked the questions: How is this going to affect me? Is this going to make my bungalow warmer? Is it going to cut down on my heating costs? There was none of that." (Female, 65+, cavity wall insulation, wave 3)

The case study below outlines one respondent’s experience who rented from a housing association. Her experience is not representative of all households in housing associations as only four households in social housing were interviewed as part of the qualitative interviews.

Akira's[33] experience – lack of control and information[34]

Akira lives alone in a two-bedroom flat which is rented from a housing association. She has a health condition which is affected by the cold and has been advised to keep warm to help with the condition.

She received a letter from the housing association which informed her that works were going to happen but did not receive information about what was going to happen or the benefits the insulation would bring[35].

"A standard letter was sent saying works were going to be carried out, they would be carried out outside the property, and it shouldn't affect us".

Akira was not told about what disruption the installation would cause or given an option to say no.

"The housing association is fully aware of what my [health] conditions were. They refused or they failed to feel that it was ideal for them to contact me to say that we're going to have this work, there's going to be chemicals, even though it's on the outside, don't open your windows."

"It annoys you because at the end of the day we pay the rent and surely we should have a say on it. They should discuss it with us and see what other energy efficient savings are available."

Akira experienced a lot of disruption within her home both during and after the installation of the cavity wall insulation. She said that dust was everywhere, and ball bearings used in the insulation clogged up vents and came in through the cooker hood and in the bathroom.

"It made my symptoms worse. I was coughing and wheezing.... If I'd known, I'd have stayed with a friend."

3.1.3 Eligibility to receive the measures

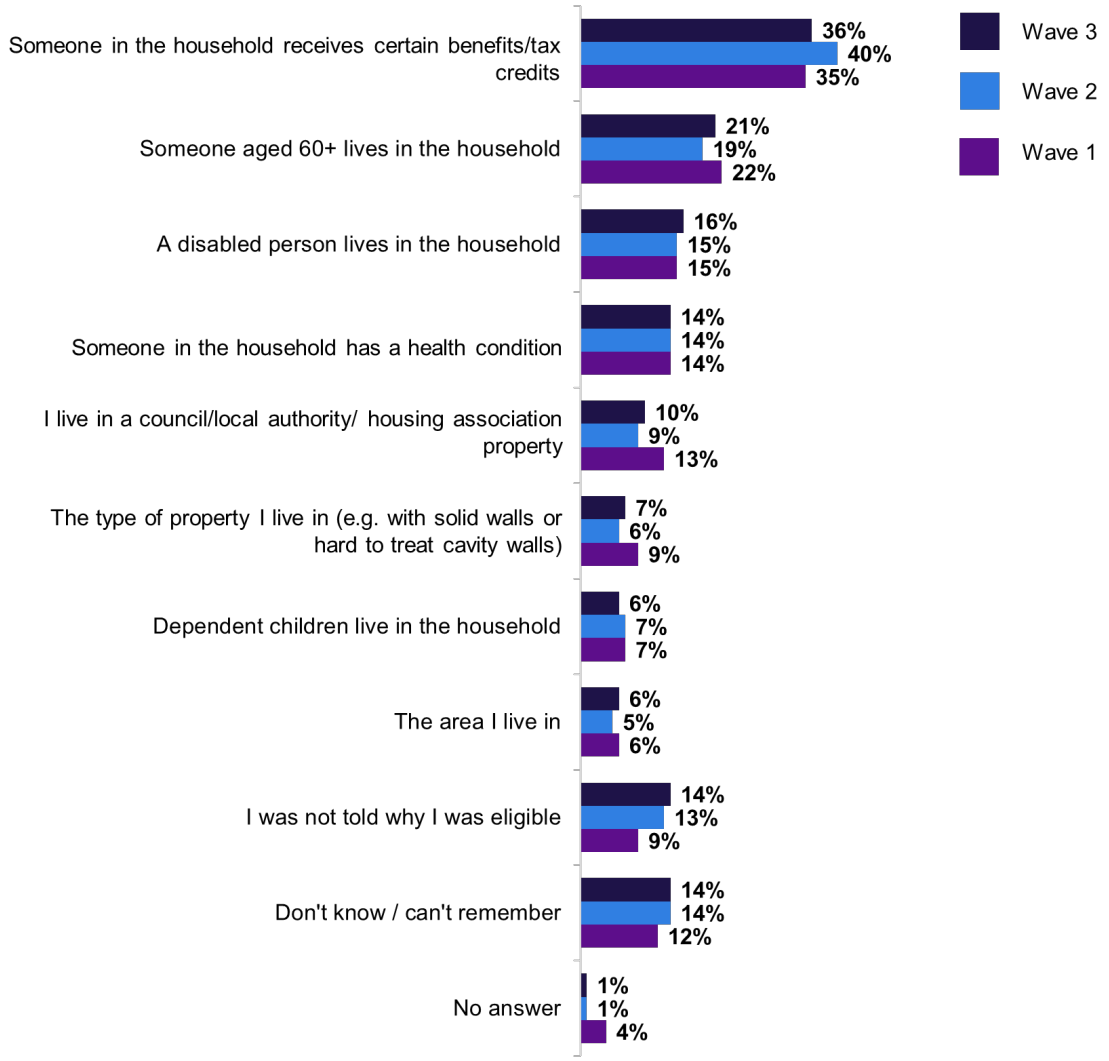
The eligibility criteria for ECO were wide-ranging, including household income, location or the demographic make-up of the household, and this was reflected in both the survey and the qualitative research.

As shown in Figure 6, the reasons households gave for being eligible were mixed. The most common reason being that someone in the household received benefits or tax credits (36%),

[33] Akira is a pseudo-name
[34] This installation took place after June 2021 (after PAS 2035 was mandatory). For more information on PAS 2035, please see section 3.4.
[35] Whilst this case study reflects the experience of Akira, this case study cannot be generalised to reflect the experience of all residents who live in housing associations.

someone aged 60 or more lived in the household (21%) or a disabled person living in the household (16%).

Figure 6 Why the household was eligible to receive ECO3 measures, waves 1-3



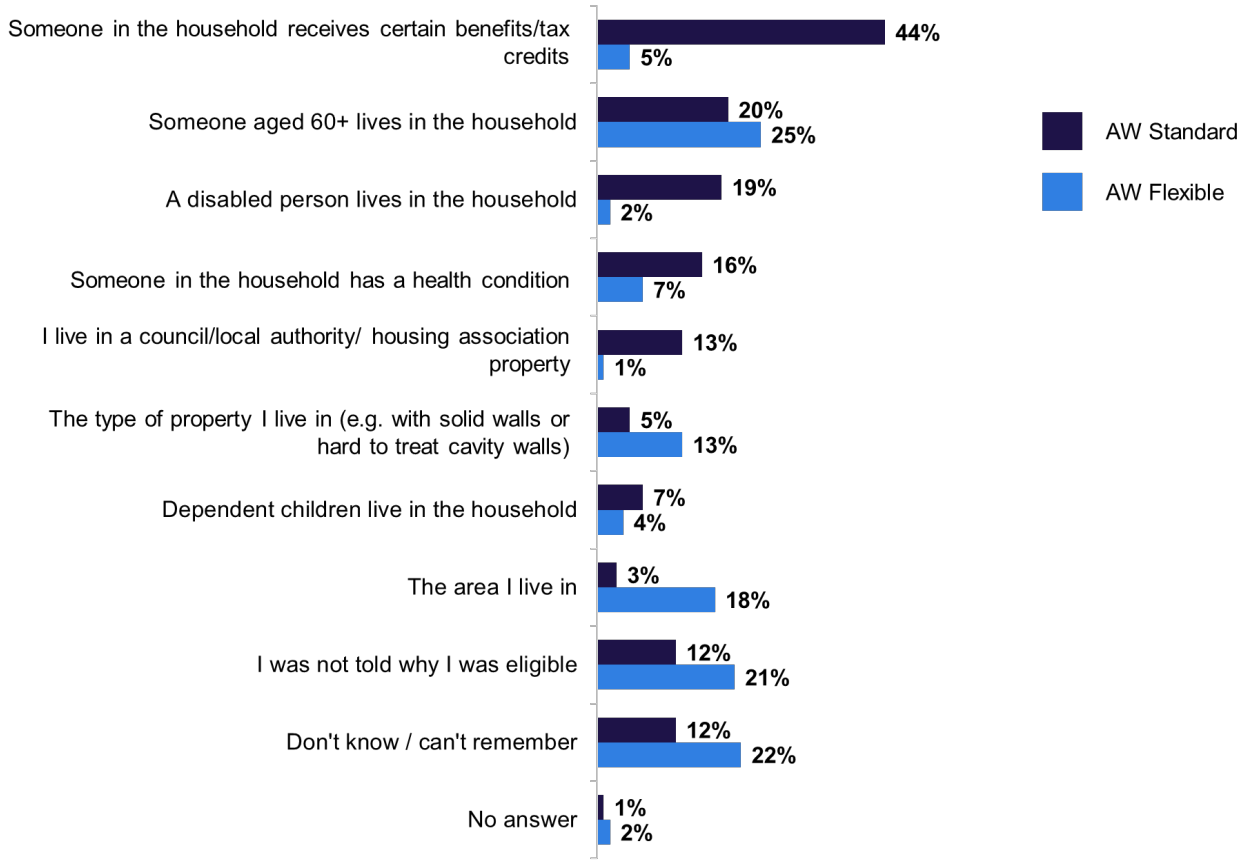
Base: All households receiving ECO3 measures (wave 1: 1,449, wave 2: 2,265, wave 3: 2061). Source: Were you ever told that you were eligible to have the measure(s) installed for any of the following reasons?

Households were able to receive measures through the AW Standard obligation if they met certain criteria, such as receiving certain benefits. This was reflected in the survey findings, with 44% of households reached by AW Standard eligible because someone in the household received certain benefits or tax credits (compared with 5% of households reached by AW Flexible).

The AW Flexible obligation was designed so that Local Authorities had flexibility to define the eligible households living in, or at risk of fuel poverty or who were vulnerable to the effect of cold homes. Again, this is reflected in the survey findings, with households reached by the AW Flexible obligation more likely to be eligible because of the presence of someone aged 60 or over (25% compared with 20% of AW Standard) or because of the area they live in (18% compared with 3% of AW standard). Households reached by AW Flexible were more likely to

say they were not told why they were eligible (21%, compared with 12% reached by AW Standard).

Figure 7 Why the household was eligible to receive the measures by obligation, wave 3



Base: Households receiving measures at wave 3 (AW Standard: 1,163, AW Flexible: 903). Source: Were you ever told that you were eligible to have the measure(s) installed for any of the following reasons?

3.1.4 Initial perceptions of the scheme when first approached

Across all waves, participants in the qualitative research were sceptical when they first learned about the scheme. For many, it seemed 'too good to be true', especially among participants reached by the AW Flexible scheme.

"I was under the impression that you don't get anything for nothing as such. I thought well I can't see this actually happening, I can't see somebody coming along and supplying us with a free heating system at no cost!" (Male, 55-64, solid wall insulation and boiler, wave 2)

"It seemed too good to be true and I was constantly researching if I was getting involved in a scam." (Male, 65+, solid wall insulation, loft insulation, roof insulation, heat pump, wave 3)

Some participants in the qualitative research were surprised to learn they were eligible for the scheme, especially where there were two working adults in the household, and they could have afforded to have the measures installed themselves. For some, this presented a moral dilemma over whether they should be taking advantage of the scheme.

“I felt uneasy as I see grants more for those in poverty and I'm not in that bracket, so there was a moral hurdle as I didn't want to take advantage of the system and take from those in more need.” (Male, 35-44, underfloor insulation, boiler, heating controls, wave 2)

“Saw my neighbour getting some works done and he told me about the scheme. I thought it was means tested so wouldn’t be eligible, but I applied on the local council’s website and got accepted.” (Female, 55-65, solid wall insulation, wave 3)

Once the legitimacy of the scheme had been verified, participants in the qualitative research were positive about the scheme and felt it presented an opportunity to make their home warmer, reduce the cost of their energy bills and to be more environmentally friendly.

“I think it's a very positive thing, before I contacted them, I didn't know anything about insulation and I didn't realise that our house didn't have any at all… they told me about the underfloor insulation and I hadn't even considered that until then…” (Female, 25-34, cavity wall insulation, underfloor insulation, wave 1)

3.1.5 Initial concerns around the scheme

As well as concerns around the legitimacy of the scheme discussed above, other concerns held by participants in the qualitative research related to the level of disruption the installation might cause, including health and safety concerns during the process of the installation.

“My husband and I were working from home at the time, and we were concerned about the potential noise.” (Female, 35-44, loft insulation, cavity wall insulation, wave 3)

“I just wanted to make sure and learn what the process actually entails to make sure if the children needed not be in the property.” (Female, 25-34, Solid wall insulation, wave 3)

Some participants who were receiving a new central heating system were also uncertain about the impact that the measures would have on their energy bills.

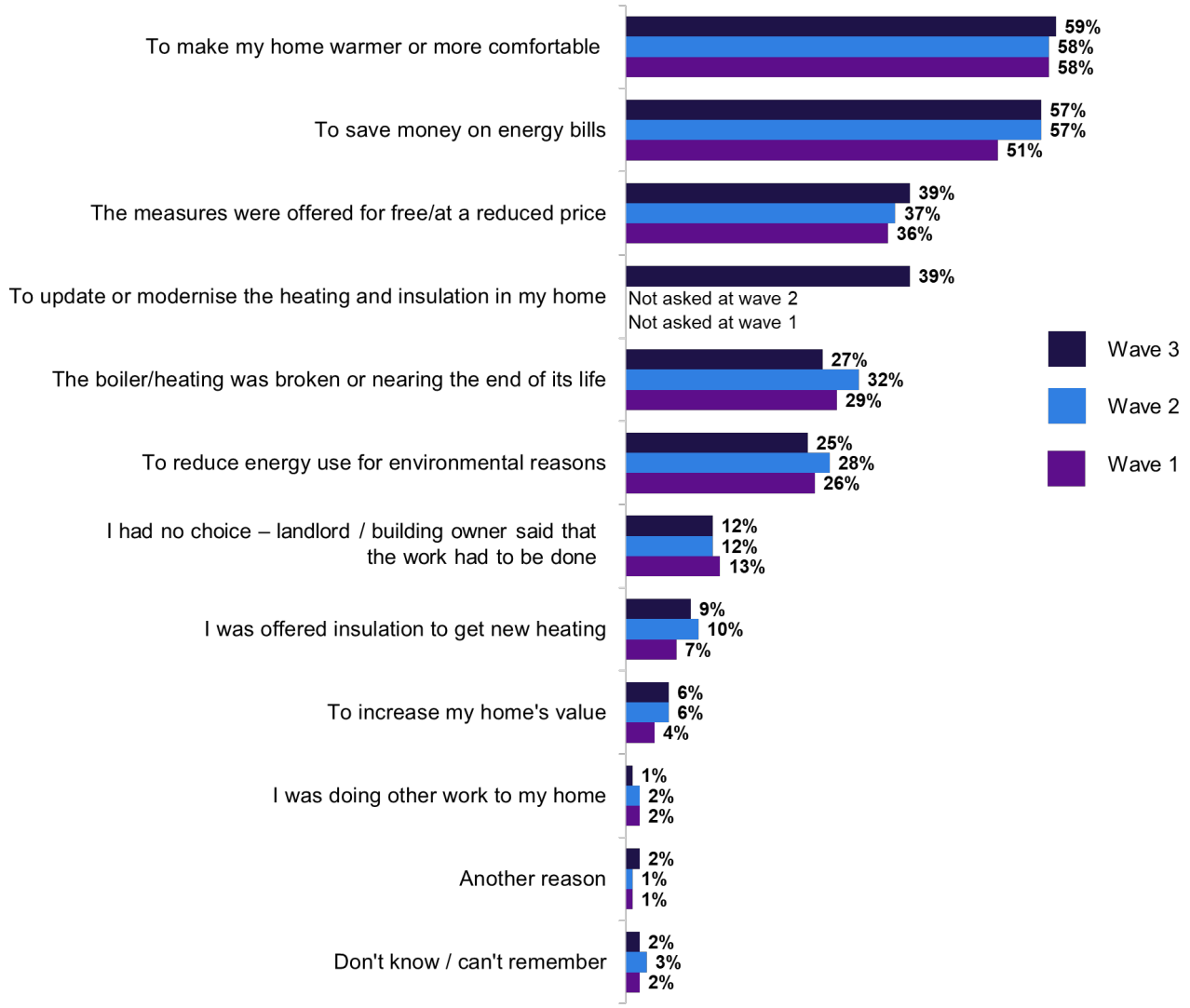
"Obviously going to central heating from not having it I knew the bills would go up but from research and what he said, the words they were using, the most economic way of doing it, so in my head I was thinking it's not going to be that much money." (Male, 35-44, heat pump, smart thermostat, thermostatic radiator valves, wave 3)

3.1.6 Reasons for having the measures installed

Comfort and cost remained the most common reasons for having energy saving measures installed across all three waves, with environmental reasons being a secondary reason.

Three in five (59%) surveyed households said that making their home warmer or more comfortable was a reason for having the measures installed, and 57% said it was to save money on energy bills. Two in five (39%) said it was because the measures were offered for free or at a reduced price. The full breakdown can be found in Figure 8.

Figure 8 Reasons for having the ECO3 measures installed, waves 1-3



Base: All households receiving ECO3 measures (wave 1: 1,449, wave 2: 2,265, wave 3: 2061). Source: What were your reasons for having the measure(s) installed?

There have been some changes over time; the proportion of surveyed households that said they had the measures installed to save money on energy bills increased from 51% at wave 1 to 57% at waves 2 and 3. The proportion of surveyed households that had the measures installed to increase their home's value, increased from 4% at wave 1 to 6% at wave 3 (which may relate to the higher proportion of owner occupiers reached after wave 1 as discussed earlier).

Comfort and cost were also cited as two key priorities among participants in the qualitative research with improving the comfort in the home often being the most important reason for having the measures installed for many participants.

"We just wanted to be warm. It was so cold we just needed heat in the property to dry the property out a bit." (Male 55-64, solid wall insulation and boiler, wave 2)

Cost was often discussed under the perceived importance of financial motivations. This varied from saving money on energy bills to upgrading the home.

“I suppose I would have to admit, the chance to get a boiler for free, having already had a shaky boiler, that was very attractive. But the fact we could potentially make savings on our monthly power bills, that was high on the agenda too. (Male, 55-64, boiler and underfloor insulation, wave 1)

"It was free, and it was going to improve the insulation of my home and therefore make it cheaper to keep my house warm." (Male, 55-64, cavity wall insulation, boiler, wave 3)

Participants did not know how long this offer would be in place which motivated them to get the measures installed then. Failing to take up the offer and it later expiring would have felt like a loss. Environmental reasons were less important for participants in the qualitative research across all three waves. Some participants hoped that the measures would mean they would use less energy and therefore benefit the environment but having a comfortable home and lower energy bills were prioritised over this.

"If it benefits us and the environment it's a win-win situation." (Male, 35-44, underfloor insulation, boiler and heating controls, wave 3)

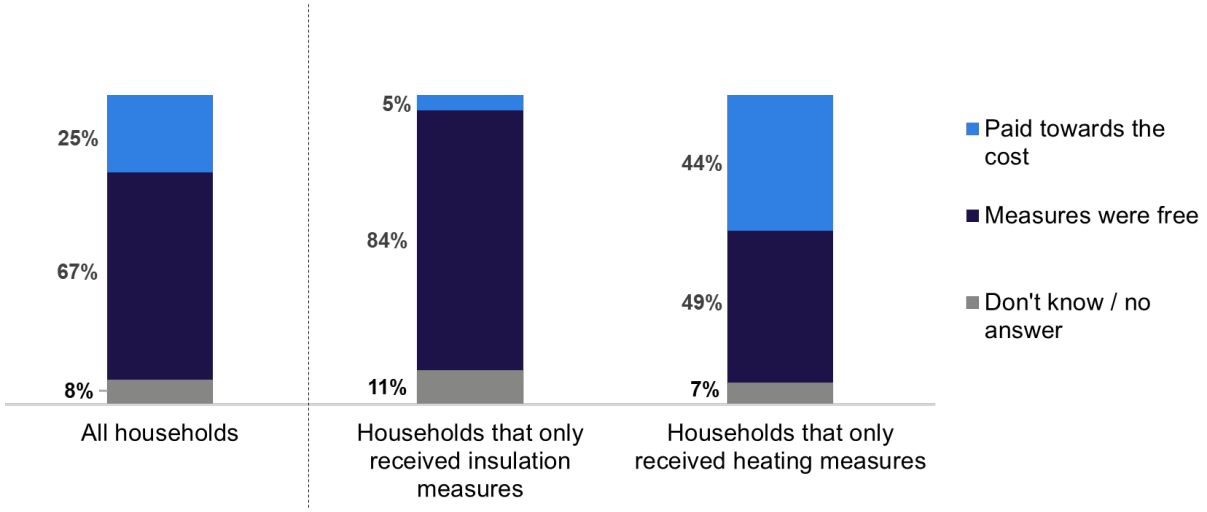
Some participants in the qualitative research cited necessity as their main reason for having the measures installed, which was most common where the household had an old or faulty boiler.

3.1.7 Whether households paid towards the cost of the measures

Households were asked whether they paid towards the cost of the measures or whether they received them for free. As discussed in section 1.3.2, there are some areas of the scheme that remain unknown, including how measures are presented to households, and how the contribution paid towards measures is calculated.

At wave 3, a quarter of surveyed households (25%) paid towards the cost of having the measures installed, while two-thirds (67%) received the measures for free. A small proportion of households (8%) said they did not know or did not answer. Among households that received only insulation measures (and no heating measures), 5% paid towards the cost of the measures and 84% received them for free, whereas among households that received only heating measures (and no insulation) 44% paid towards the cost and 49% received them for free (Figure 9).

Figure 9 Whether households received the measures for free or paid towards the cost, wave 3



Base: All households at wave 3 (2,061), household that only received insulation measures (765), households that only received heating measures (641). Source: Were the measure(s) installed for free, or did you pay towards the cost of installation?

The overall findings have remained stable over the three survey waves of ECO3 households. However, there were some changes by obligation. Under AW Standard, the proportion that paid towards the cost of measures remained consistent (at 25% or 26%). However, the proportion that paid towards costs under AW Flexible increased, from 17% at wave 1, to 23% at wave 2 and 26% at wave 3. Compared with ECO2t, the proportion of households receiving measures for free has decreased, from 76% at ECO2t, to 67% at wave 3 of ECO3 households.

All surveyed households that paid towards the cost of the measures were asked how much they had paid. Of the 25% that paid towards the cost of measures, the median cost paid was £500. Among the 44% households that received only heating measures (and no insulation) the median contribution was £733. Among the 5% of households that received only insulation measures (and no heating measures) the median cost paid was £500. However, these results should be treated with caution as only 78 households received only insulation and paid towards the cost.

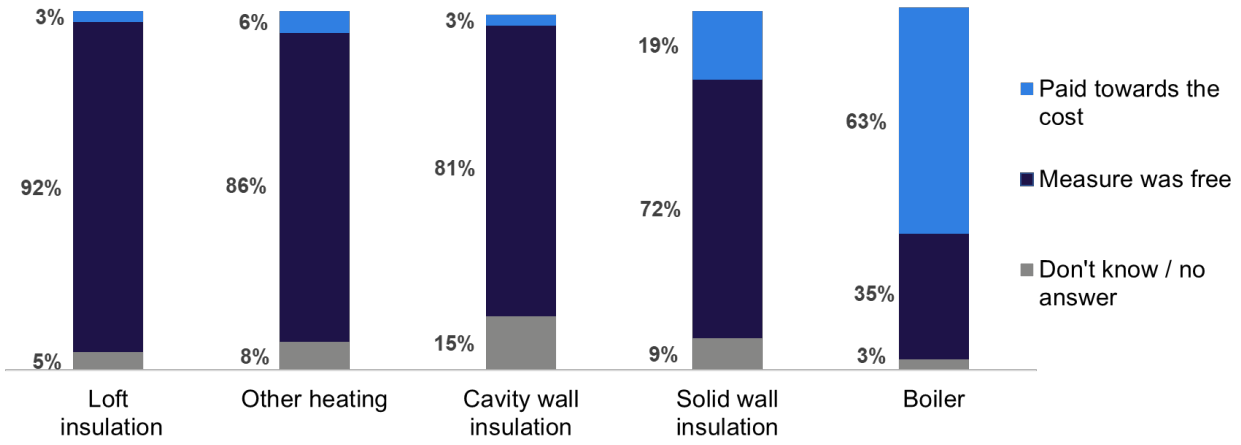
It was also possible to explore variation in customer contributions by the type of measure installed. When answering this question, households were asked to think about all the measures they had received and did not answer about each measure individually. Therefore, to avoid misreporting results for those who received more than one measure, only the 44% of surveyed households that received a single measure have been considered (n=955)[36].

Among the 44% who received a single measure, more than nine in ten households that received only loft insulation received it for free (92%) and 3% paid towards the cost (shown in Figure 10). More than four in five households that only received a heating measure (excluding

[36] The 44% is the weighted estimate, whereas the n=955 is the unweighted count

a boiler) received it for free[37] (86%) and a similar proportion of households that only received cavity wall insulation received it for free (81%). Only 63 households that received a single measure received a boiler, therefore these results should be treated with caution.

Figure 10 Whether the single measure received was installed for free or paid towards the cost of installation by measure type, wave 3[38]



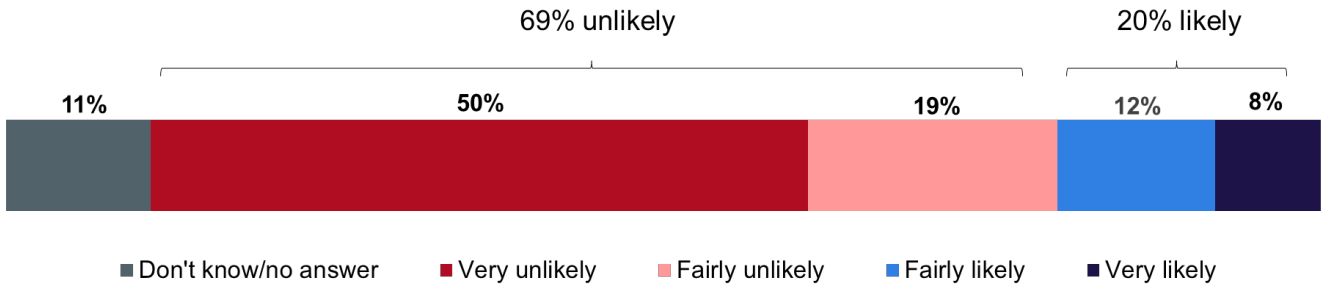
Base: All households at wave 3 that received a single measure: cavity wall insulation (336), loft insulation (204), solid wall insulation (130), boiler (63), other heating (201). Underfloor insulation is excluded from the chart due to a low base size (18). Source: Were the measure(s) installed for free, or did you pay towards the cost of installation?

3.1.8 Likelihood of having the measures installed if there had been no funding

One in five (20%) surveyed households said they would have been likely to have installed the measures if there had been no help with funding[39]. Over two-thirds (69%) said they would have been unlikely to do so (Figure 11). Findings were consistent across the three waves of the survey.

[37] This includes electric storage heaters, district heating systems, heating controls, smart thermostats and thermostatic radiator valves
[38] Only 63 households that received a single measure received a boiler, therefore results should be treated with caution
[39] As this was a hypothetical question, answers are unlikely to reflect real behaviour. Households may not have been aware of the full cost of the measures

Figure 11 Likelihood of having measures if there had been no help with funding, wave 3



Base: All respondents (2,061). Source: How likely would you have been to have the measure(s) installed, if there had been no help with funding?

The likelihood of having the measures installed without funding was higher among:

- owner occupiers (23%) compared with those in social housing (12%) or renting privately (12%)
- households that paid towards the cost of installation (31%) compared with those that did not pay (16%)
- households containing only those aged 65 or over (25%) compared with households with working age adults only (15%) or mixed households (18%)
- those who received multiple measures (23%) compared with those receiving a single measure (16%)

The likelihood of having the measures installed without funding varied by the type of measure installed. Surveyed households receiving a boiler were more likely to say they would have had it installed without the help from funding (25%), compared with 11% of those who received solid wall insulation and 15% of those who received cavity wall insulation. These may be related to perceptions of necessity identified in the qualitative interviews, where some participants saw boilers as something they could not live without, whereas insulation was not seen as a necessity.

Many participants in the qualitative interviews cited that cost was a barrier to making changes to their home before they found out they could get help with funding.

"We're working every hour God sends but we couldn't afford anything like that…." (Female, 45-54, solid wall insulation, storage heaters, roof insulation, wave 3)

"It's not something we would have done if we weren't offered it… Any opportunity to save money on these things is appreciated… at the moment we don't have a huge amount of disposable income to be making home improvements, and saving energy wasn't really a priority at that point" (Female, 35-44, loft insulation, cavity wall insulation, wave 3)

Some participants thought that the scheme helped to raise awareness of the measures available as they had not previously thought about making changes to their home despite cost not being perceived as barrier.

“I could have afforded it, I just hadn't thought about it before” (Male, 65+, cavity wall insulation, wave 2)

“They [the salespeople] came to me. I wouldn’t have gone looking for it myself” (Female, 35-44, underfloor insulation, wave 3)

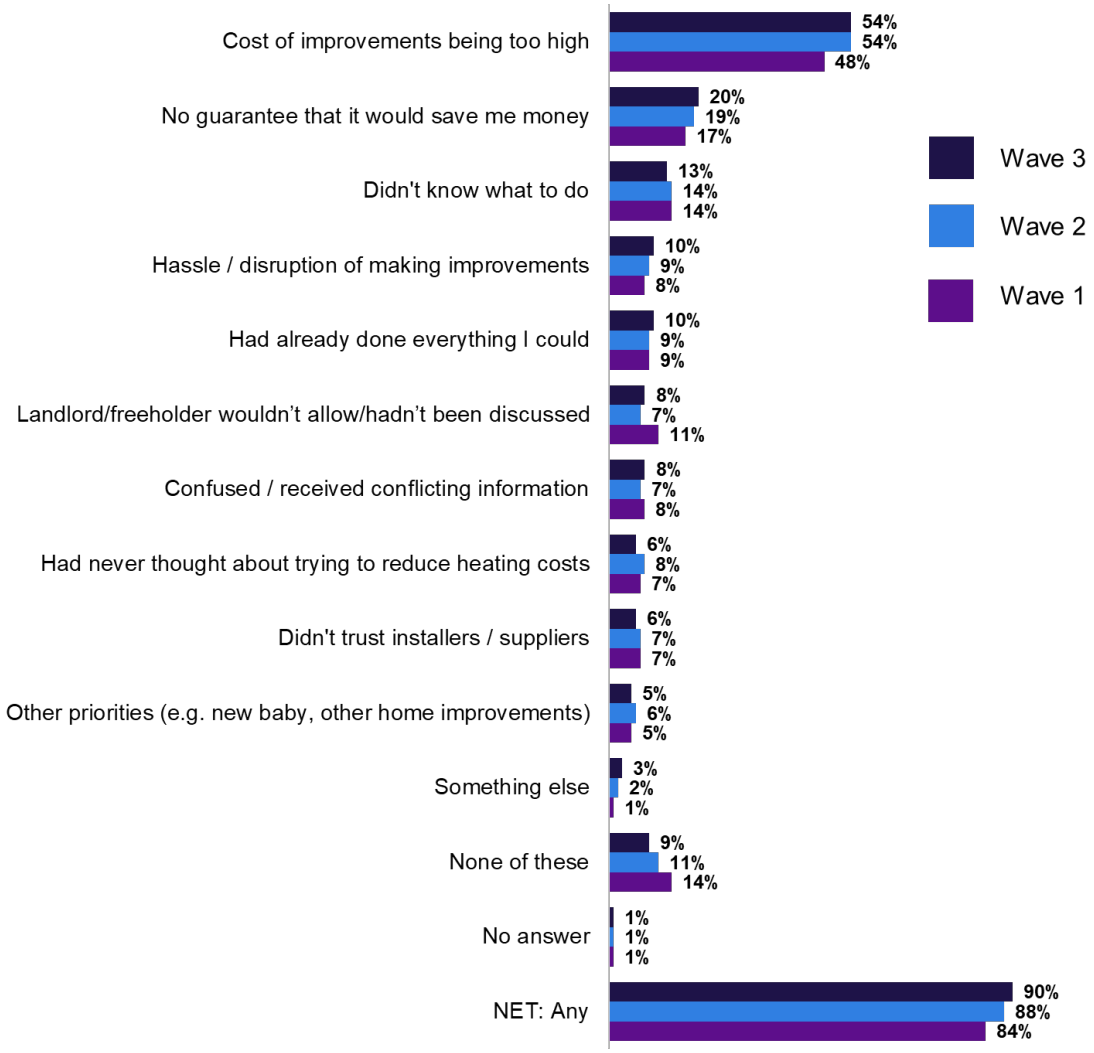
If surveyed households had more than one measure installed, they were asked what they would have done if there had been no help with funding. This question was only asked at wave 3. Among those with multiple measures (and who gave a response), 11% said they would have had all of the measures installed anyway, while 33% said they would have had some measures installed but not others. Just over half (56%) said they would not have had any of the measures installed.

3.1.9 Barriers to making changes within the home to reduce energy costs before receiving the measures

Surveyed households were asked what had previously stopped them from making changes to their home to reduce heating costs. The costs of improvements being too high was the most common barrier and between wave 1 and wave 3 the proportion of households citing this as a barrier increased, from 48% to 54%.

The second most common barrier was also financial, with one in five saying there was no guarantee that it would save them money (20%). Around one in ten said not knowing what to do was a barrier to making changes (13%), hassle or disruption of making improvements (10%) or they felt they had already done everything they could (10%). Fewer than one in ten (8%) said that the landlord or freeholder would not allow it, or it had not been discussed, a decrease from 11% at wave 1. A full breakdown can be found in Figure 12.

Figure 12 Barriers to making changes to the home to reduce energy costs before having the ECO3 measures, waves 1-3



Base: All households receiving ECO3 measures (wave 1: 1,449, wave 2: 2,265, wave 3: 2061). Source: Before you had the measure(s) installed, which, if any, of the following stopped you from making changes to your home to reduce heating costs?

There was variation by the type of measure installed. Households that received a boiler were more likely to cite the cost of improvements being too high as a barrier (65%), compared with households that received any insulation (54%).

Households that received multiple measures were more likely to give at least one barrier when asked what stopped them from making changes to reduce heating costs (93%, compared with 86% that received a single measure). This included the cost of improvements being too high (65%, compared with 42% that received a single measure), no guarantee it would save money (23%, compared with 17% that received a single measure) and the hassle and disruption of making improvements (11%, compared with 7% that received a single measure).

3.1.10 Whether the household was made aware of the range of different measures available

Around three in ten (31%) surveyed households that received measures through ECO3 said they were made aware of the range of different energy saving measures they could have had installed in their home, and 45% said they were not. Around a quarter (23%) said they did not know or could not remember. This has remained consistent over time. Compared with ECO2t, there was an increase in the proportion who said they were made aware of the range of measures available (20% at ECO2t, compared with 31% of households receiving ECO3 measures at wave 3).

At wave 3, households that were more likely to say they had been made aware of the range of measures included:

- households receiving measures under the AW Flexible obligation (40%) compared with households reached by AW Standard (29%)
- household in Wales (45%) or Scotland (43%), compared with households in England (29%)

  owner occupiers (35%) or private renters (30%), compared with social housing tenants (12%)

3.1.11 Interest in receiving more measures if they had been available

At waves 2 and 3, surveyed households were asked how much they agreed or disagreed that they would have been interested in receiving more measures installed if they had been available at the same time or shortly afterwards. Around three in five (59%) agreed and around one in twenty (6%) disagreed.

Certain groups were more likely to agree that they would have been interested in receiving more measures, including:

- households that had already received multiple measures (62%), compared with households that received a single measure (56%)
- owner occupiers (63%), compared with private renters (52%) or social housing tenants (47%)
- households in Wales (67%), compared with those in England (59%)

3.1.12 Reasons for not being interested in more measures

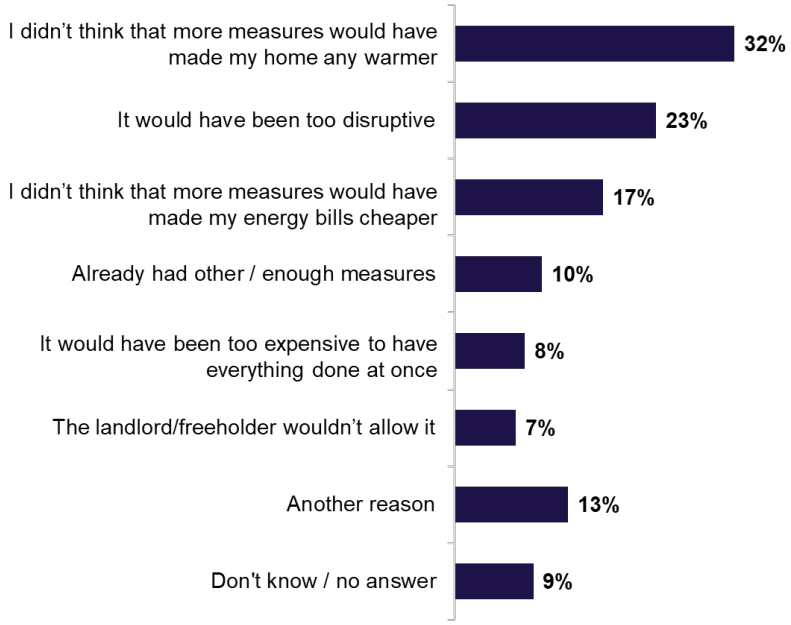
Surveyed households that said they would not have been interested in receiving more measures if they had been available at the same time or shortly afterwards were asked why. As shown in Figure 13, the most common reason was the perception that more measures would not make the home any warmer (32%), followed by the perception that it would have

been too disruptive (23%), and that more measures would not have made energy bills any cheaper (17%)[40].

At wave 2, some participants in the qualitative research felt that having more measures at the same time would be preferential as it would limit the disruption in the home to one time period. However, others felt that having more measures at the same time would cause too much disruption or mess.

"It's not always a good idea to get things done at the same time as it can be too disruptive, too much for people with disabilities, but others may prefer it." (Female, 45-54, underfloor insulation, wave 3)

Figure 13 Reasons for not being interested in having more measures if they had been available at the time or shortly afterwards, wave 3



Base: Households not interested in receiving more measures (wave 3: 136). Source: Why would you not have been interested in having more measures installed at the same time or shortly afterwards, if they had been available?

3.1.13 Whether households felt pressure to get measures installed

Around one in twenty surveyed households (6%) said they felt pressured into having the measures installed, whilst 89% said they did not and 5% did not know or did not provide an answer.

Surveyed households that were likely to say they had felt pressured into getting the measures included:

[40] This question was changed between wave 2 and wave 3 and so comparisons are not possible

- households receiving solid wall insulation (16%) compared with households that received cavity wall insulation (6%), loft insulation (4%), underfloor insulation (3%) or a boiler (3%)
- private renters (12%), compared with owner occupiers (4%)
- households in England (6%), compared with those in Scotland (1%)

3.2 Information, support and advice

3.2.1 Types and volume of information received

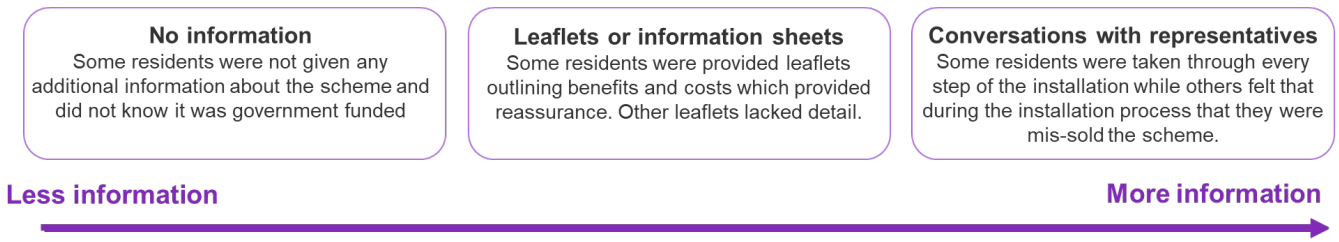
Participants in the qualitative research reported receiving varying levels of information about the scheme, and their trust in the process depended on the amount and type of information they received about the scheme (Figure 14). Some participants were not given any information about the scheme beyond the fact that energy saving measures were available and did not know it was government funded. Others received leaflets which varied in the amount of information they contained with some outlining benefits and costs which provided reassurance. Other leaflets were described as basic and lacked detail, leaving participants to do their own research before they felt confident to go ahead with the measures.

"Should there have been more measures on the information sheet we were given, we really think we would have taken them." (Female 25-34, solid wall insulation, wave 3)

Some participants reported receiving a lot of information via a salesperson or representative, and therefore had more trust in the scheme and process. However, variation in the quality of information meant that some participants felt that they were mis-sold the scheme.

"At the time the salesperson was very helpful... he said we could get insulation done, stairs installed, gas and electric radiators, and cavity walls all for free...and I thought it was great...but now I know he just lied to us... he probably worked out that he couldn't be making a profit." (Male, 25-34, underfloor insulation and loft insulation, wave 3)

Figure 14 Varying types and levels of information received by participants in the qualitative interviews



Most participants who took part in the qualitative interviews were not sign-posted to where they could find additional information about the scheme and had to carry out their own research.

This ranged from some carrying out a full internet search, speaking to friends, family or neighbours about their experiences.

Participants who were more sceptical tended to complete their own independent research which included verifying the legitimacy of the installation company. Some participants found it challenging to find information about the scheme which was hindered through not knowing the scheme was called ECO. Some participants also searched around what to expect from the installation of the measures, but this was generally seen as less important than verifying the legitimacy of the scheme.

"I did look online. You always go to the website of the person who is trying to sell you something. But there was nothing to say anything about the scheme... I went on the department of energy to find a list of businesses, the website was better, but I couldn't find anything" (Male, 24-53, underfloor insulation, loft insulation, wave 3)

Participants also reported speaking to friends, family or neighbours to verify the authenticity of the scheme, to check the reliability of the installation company and the quality of their work.

"My neighbour got it done and she said it's really quick and there was no mess left so I thought right I'm going to go for it." (Female, 45-54, underfloor insulation, wave 2)

Some participants felt reassured of the legitimacy of the measures as they were offered as part of a government scheme. Participants were also reassured by receiving brochures from their installer, which they felt verified their authenticity.

"As it was backed by the government, I assumed it could be trusted." (Male, 55-64, boiler, underfloor insulation, heating controls, wave 2)

3.2.2 Whether household received enough advice in advance of receiving the measures

Around two-thirds (65%) of surveyed households said that they received enough advice in advance about the measures they had installed. One in five (20%) said they did not, and 13% did not know or could not remember. These findings have remained consistent over time. Surveyed households that were more likely to say they had not received enough advice included:

- households receiving insulation measures (22%), compared with those receiving heating measures (18%)
- households receiving measures under the AW Standard obligation (22%), compared with the AW Flexible obligation (14%)
- social housing tenants (35%), compared with private renters (22%) or owner occupiers (18%)
- households in England (22%), compared with those in Scotland (11%) or Wales (11%)

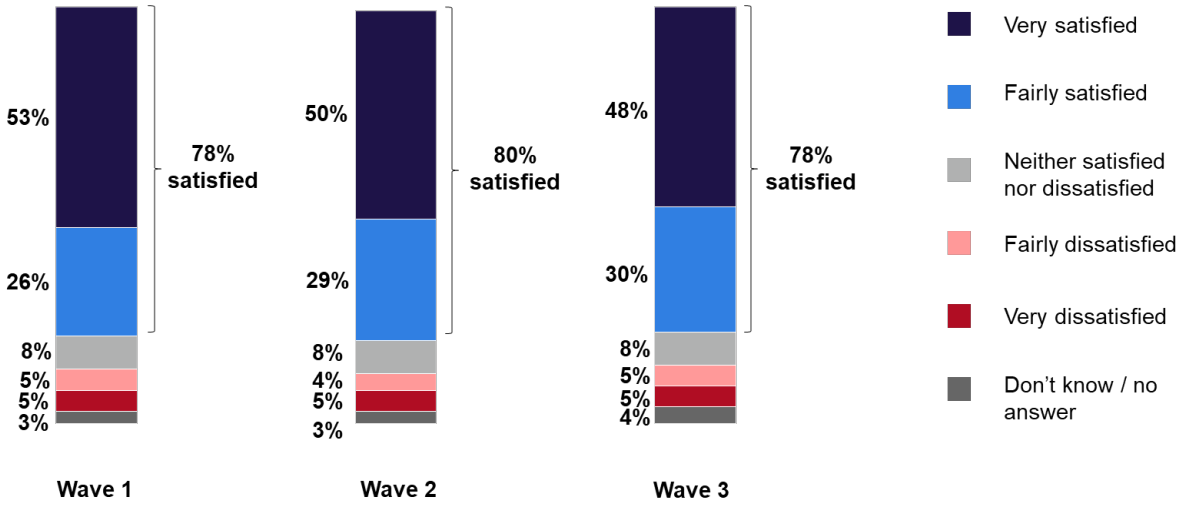
3.3. The experience of having the measures installed

3.3.1 Satisfaction with the process of having the measures installed

Around three-quarters (78%) of surveyed households said they were satisfied with the process of having the measures installed, with around half (48%) who said they were 'very satisfied' and three in ten (30%) who were 'fairly satisfied'. One in ten (10%) said they were dissatisfied, with 5% who said they were 'fairly dissatisfied' and 5% who said they were 'very dissatisfied'.

Levels of satisfaction have remained consistent over time, although the proportion of households who said they were 'very satisfied' decreased from 53% at wave 1, to 48% at wave 3, and the proportion who said they were 'fairly satisfied' increased, from 26% at wave 1, to 30% at wave 3.

Figure 15 Satisfaction with the process of having ECO3 measures installed, waves 1-3



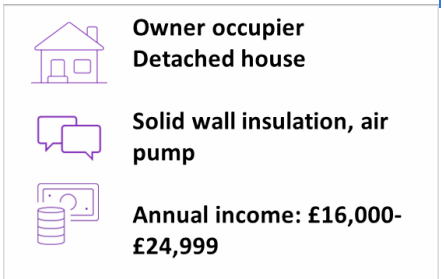
Base: All households receiving ECO3 measures (wave 1: 1,449, wave 2: 2,265, wave 3: 2061). Source: Overall, how satisfied or dissatisfied were you with the process of having the measure(s) installed?

Levels of satisfaction varied by the type of measure installed. Households that received a boiler were more likely to be satisfied (83%) compared with those that received insulation (77%), –particularly– solid wall insulation (65%). Households that received solid wall insulation were more likely to say they were dissatisfied with the process of insulation (20%), compared with those that received a boiler (9%) or other types of insulation, including cavity wall (10%), loft (10%) or underfloor (10%). This could perhaps be linked to the finding that a higher proportion of households receiving solid wall insulation said they felt pressured into having the measures installed (16%, compared with 3% that received a boiler or 6% that received cavity wall insulation), although we have no direct evidence of this. Some participants in the qualitative research described the installation process for solid wall insulation being messy and disruptive which caused dissatisfaction at the time, however many also commented that the disruption was worth it to achieve the end result.

"There was lots of brick dust and plaster on my brand-new carpet"…."I wasn't that bothered because I knew it would be worth it in the end." (Male, 65+, solid wall insulation and storage heaters, wave 3)

Beth's experience – disruptive installation but a positive impact[41]

Beth[42] and her husband are both 65+ and they own their home in rural Wales. Through the ECO scheme they received solid wall insulation and a heat pump describing the experience as a very disruptive and messy process. But overall, they are pleased they had the measures installed.



"We didn't expect the installation process to be as disruptive as it was, and it took months. The place was a mess".

The team handling the installation process told the couple that they don't usually work in houses.

"They said 'we normally work in warehouses and so it doesn't matter if we make a mess'."

"They wrecked the carpets, they damaged some of the furniture".

After the work was completed, Beth described that the measures have made a difference to their home as their house now retains heat better and their home feels warmer during the winter. Beth also believes that having the measures installed has caused their energy bills to decrease.

"Now it's done, we're really glad it's done… the measures are brilliant we're really pleased the disruption it was worth it in the end."

Despite the overall satisfaction of the measures, Beth believes that perceived disruption and workers coming into the home and creating a mess might put some people off from having measures installed in their home.

Other groups who were more likely to be satisfied with the process of installation included households that had received multiple measures (83%) compared with those that received a single measure (73%), and households in Wales (89%) or Scotland (87%) compared with those in England (77%).

Participants in the qualitative research often reported elements of the scheme that they were satisfied with and elements that they were dissatisfied rather than being completely satisfied or completely dissatisfied across all parts of the scheme. For example, one participant reported

[41] The installation took place after June 2021 (after PAS 2035 was mandatory). For more information on PAS 2035, please see section 3.4.
[42] Beth is a pseudo-name.

being very satisfied with the installation of new storage heaters but being dissatisfied with the installation of underfloor insulation.

(Referring to storage heaters) "They knew what they were doing, they cleaned up after themselves, and they were in and out.". (Referring to underfloor insulation) "Very disappointed with the underfloor insulation. It was poor workmanship." (Male, 65+, storage heaters, underfloor insulation, wave 3)

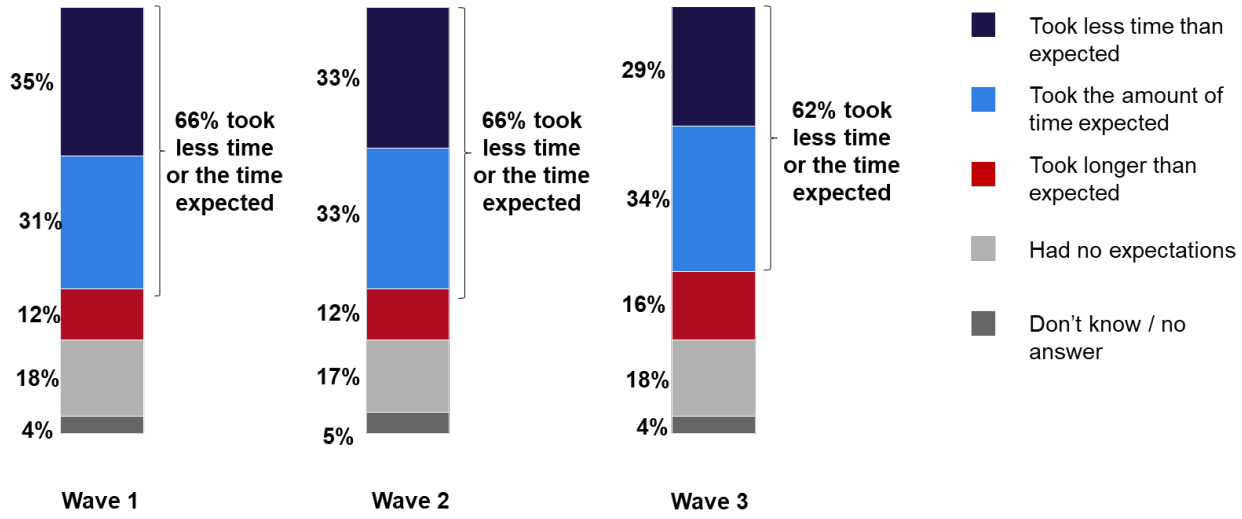
The following section discusses factors that contributed to a positive installation experience in more detail.

3.3.2 Time taken to have measures installed compared with expectations

Around three in five (62%) surveyed households said that the time taken to have the measures installed either met or exceeded their expectations, with 29% who said that it took less time than expected and 34% who said it took the amount of time they expected. One in six (16%) said that it took longer to install than expected.

Compared with previous waves, the proportion of surveyed households who said that the measures took longer to install increased, from 12% at wave 1 and wave 2, to 16% at wave 3, shown in Figure 16.

Figure 16 Time taken to have ECO3 measures installed compared with expectations, waves 1-3



Base: All households receiving ECO3 measures (wave 1: 1,449, wave 2: 2,265, wave 3: 2,061). Source: Thinking about the time it took to have the measure(s) installed, how did this compare with your expectations?

Surveyed households that received solid wall insulation were significantly more likely to say that the installation took longer than expected (45%), compared with those that received other measures such as a boiler (18%), underfloor insulation (17%), cavity wall insulation (12%), or loft insulation (11%).

Participants in the qualitative interviews who received underfloor insulation, or a new boiler generally mentioned that these measures were completed within a few hours. On the other hand, participants who received solid wall insulation said that the installation often took up to five days and the process was cited as noisy and disruptive.

Households receiving multiple measures were also more likely to say that the installation took longer than expected (18%) compared with those that received a single measure (13%).

In the qualitative research, participants who had multiple measures described having different contractors to install the different measures which often took happened over a period of time. Some participants felt surprised by this as they expected one contractor to fit the multiple measures.

3.3.3 Factors contributing towards a positive installation experience

For many participants who took part in the qualitative research, satisfaction was often the result of good communication and information during the installation process, receiving aftercare following the installation, friendly installers and limited mess.

Participants who said that good communication and information contributed towards a positive installation experience mentioned installers signposting them to further information online, receiving instructions about the measures, or being given a contact number if they experience problems after the installation.

"The follow-up calls, the boss coming out to check the work the local guys had done, and he'd come from Sheffield. It was just good how it all fitted together." (Female, 45-54, solid wall insulation and storage heaters, wave 3)

Friendly installers, and workers leaving the home clean and tidy also contributed towards a positive experience. Some participants said that some measures, particularly solid wall insulation, were disruptive but that they accepted a certain level of disruption was necessary in order to receive the measure.

"Plastering is a messy business, you'd expect it" (Female, 55-64, solid wall insulation, wave 3)

"Very clean and tidy… and it was all cleared up, hoovered up, spotless!" (Male, 45-54, solid wall insulation, wave 3)

3.3.4 Factors contributing towards a negative installation experience

Among participants in the qualitative research, a lack of information, a lack of aftercare, poor quality work, and damage to the home during installation caused dissatisfaction. Participants did not feel informed about what was involved in the installation itself, including how long it would take or the level of disruption, as well as not being informed about the measures themselves.

"Nobody gave us any form of information. Not even what walls had had the cavity installed. No-one gave us anything. We received a leaflet which explained the benefits of the scheme, but

no-one is actually telling you what they are doing." (Female, 25-34, solid wall insulation, wave 3)

In some cases, there were a number of different people involved in the installation of the measures which led to confusion and dissatisfied participants.

"I even suggested to the project manager at some point that the workers carry a pen. Because then they wouldn't have to constantly ring me to ask what needs to be done next... it was horrendous, I knew all the staff by Christian names by the end of it" (Male, 65+, Underfloor insulation and solid wall insulation, wave 3)

"Concerns were growing that nobody knew what they were doing…A utility company put the gas through the wall - that took all day, then the same company turned up again a week later to do the insulation and I reminded them that it had all been done and they didn't believe me ... then somebody else came to install a meter and said that the gas supply was in the wrong place so we got stuck with that so somebody came out and drew a diagram which bore no relation to the house once again it had stairs leading out into the street" (Male, 65+, solid wall insulation, wave 3)

Poor quality, unfinished work or leaving behind mess or damage also led to a negative installation experience. Damage and mess were most often reported by participants who had received the most disruptive measures, including solid wall insulation.

"They wrecked the carpets, they damaged some of the furniture" (Female, 65+, solid wall insulation and air pump, wave 3).

Carole's experience[43] - a negative installation experience[44]

Carole is a single mum living with her young son in a small 2 bed flat. Through the ECO scheme she received solid wall insulation and storage heaters and has been dissatisfied with the installation of both measures, describing the experience as traumatic.

"[It's been] a trauma.... because I had a baby and it's a small apartment."

The salesperson told Carole that the rooms would be redecorated after receiving the solid wall insulation, but this was initially not the case, and this was only done after complaining to the installation company. She also felt the job was rushed and completed to a poor standard. The sealant to the windows had not been redone properly causing draughts and condensation to appear, which led to mould inside the bedroom.

"When they were trying to sell it to me, they said they'd redecorate and everything, fully, but when they were doing it, the builder said they were only repainting the walls that they'd done."

"The plastering was really messy...there was a hole in the bedroom roof and there was just a lot of little bits left not done properly."

Carole was not shown how to use the storage heaters, leaving her unable to work them. She was given a manufacturer helpline number but has not been able to speak to anyone and has not been able to find a contact number for the installation company or salesperson. She's tried resolving the issue by watching videos online but at the time of the interview had not managed to get the heater to work.

"I dedicated a whole day to try and sort this radiator and [the manufacturer helpline] cut off when I was near the top of the queue.... it's been too stressful, and I've not had the time."

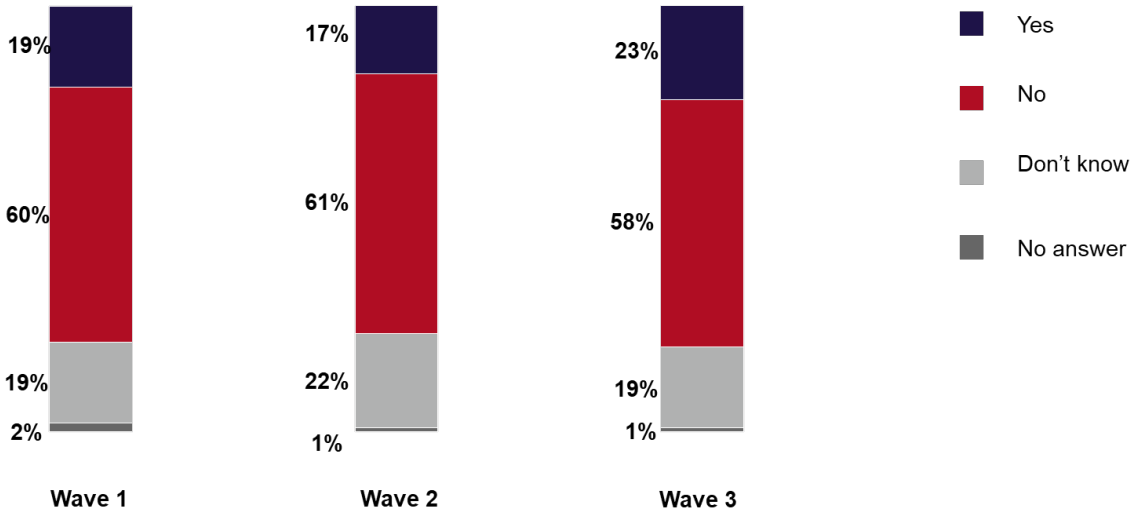
3.3.5 Discussions about ventilation, condensation, mould growth

Around a quarter (23%) of surveyed households said that someone involved in the installation discussed whether the measures would influence ventilation, condensation or mould growth with them, and 58% said that this did not happen. Around one in five (19%) said they did not know.

At wave 3, the proportion of surveyed households that said someone had discussed this with them had increased from 19% at wave 1 and 17% at wave 2, to 23% at wave 3.

[43] Carole is a pseudo-name.
[44] The installation took place before June 2021 (before PAS 2035 was mandatory). For more information on PAS 2035, please see section 3.4.

Figure 17 Whether anyone discussed if the EOC3 measure(s) would influence ventilation, condensation, mould growth, waves 1-3



Base: All households receiving ECO3 measures (wave 1: 1,449, wave 2: 2,265, wave 3: 2,061). Source: Did anyone involved in the installation discuss with you if the measure(s) might influence ventilation, condensation and/or mould growth in your home?

Surveyed households that had received cavity wall insulation were more likely to say that someone involved in the installation had discussed whether the measures might influence ventilation, condensation or mould growth in the home (27%), compared with households receiving heating measures (22%). Surveyed households that received internal solid wall insulation were particularly more likely to say this (41%), compared with household that received external solid wall insulation (14%)[45].

3.3.6 Whether the household was given a guarantee with instructions about what to do if there were problems with the measure

More than half (53%) of surveyed households said that they were given a guarantee with instructions about what to do if there were problems with the measure. Around a quarter (27%) said they were not given one and one in five (19%) did not know or could not remember. These findings remained consistent over time.

Surveyed households that received heating measures were more likely to say they had received a guarantee with instructions about what to do if something goes wrong (66%) compared with households that received insulation measures (45%).

This was consistent with the findings from the qualitative research, with participants who received heating measures likely to report receiving instructions. For example, some participants mentioned receiving an instruction manual and shown the settings on the boiler. Others said they were given a pack with a warranty, and later received certificates through the post.

[45] Only 70 surveyed households received internal solid wall insulation so findings should be treated with caution.

Case study 4 - Deena's[46] experience - the importance of aftercare[47]

Deena lives in a three-bedroom semi-detached house with her husband.

Deena received underfloor insulation, a new boiler and heating controls. She was suspicious that the underfloor insulation was installed so quickly and noticed almost straightaway that one of the rooms that had been insulated was a lot colder than another one. She thought that the installers had done what they could and maybe the older window was causing the room to be colder, or because the room was bigger.

"The front room is super warm, but I noticed that this room wasn't as warm as that room, but I didn't think anything of it."

As part of the aftercare received a specialist came to inspect the work and found that the insulation had only been installed in half of the room. This left Deena feeling disappointed initially but very pleased by the level aftercare provided.

"I was upset because I trusted them to do the job properly because there's no way I'm going to look underneath with a camera and see how far they've gone."

"The follow up was the brilliant bit. It was amazing because they noticed that a lot of things…there were a lot of flaws, let's put it this way. With the boiler system not so much, but with the underfloor insulation, quite a bit"

The insulation was later re-done with new contractors. Her neighbours had also received measures through ECO but through a different provider and did not receive the same level of aftercare, which Deena found very surprising.

[46] Deena is a pseudo-name
[47] These installations took place both before and after June 2021 (both before and after PAS 2035 was mandatory). For more information on PAS 2035, please see section 3.4.

3.4 PAS 2035

PAS 2035 is a British standard that was introduced to create a recognisable quality standard for the retrofit of energy efficiency measures in housing. It became mandatory for all installers and delivery partners who install energy efficiency measures under the ECO scheme from 30 June 2021. The standard aims to ensure that the right measures are installed in the right circumstances to a high-quality. It is designed to limit the chance of defects and unintended consequences such as damp and mould and give households a realistic picture of cost savings on their fuel bills, as well as a more comfortable and healthy living environment as a result of retrofit[48].

A small number of the survey questions were related to the PAS 2035 standard. Surveyed households that had installations after PAS 2035 became mandatory were more likely to say that someone involved in the installation discussed whether the measures would influence ventilation, condensation or mould growth (33%) compared with households that had installations before PAS 2035 became mandatory (18%). However, there were no differences in the experiences of households regarding the proportion who were made aware of the range of measures they could have had installed, or the amount of advice received when looking at installations that were carried out before and after PAS 2035 became mandatory.

[48] PAS 2035 requires retrofitters to consider the whole house rather than only individual measures, ensuring that unintended consequences such as condensation or mould are avoided (for example, insulation should not be installed without making sure there is adequate ventilation).

4 Perceived impacts of ECO

Summary of change over waves 1 to 3

More than half (58%) of surveyed households felt they had benefited a 'fair amount' or 'a great deal' from having the measures installed, a finding which remained consistent over the three survey waves.

Thermal comfort improved among households reached by ECO3. Around three-quarters of surveyed households (73%) said it was easy to heat the home to a comfortable temperature after receiving the measures, an increase of thirty percentage points compared with before the measures were installed. Some participants in the qualitative interviews described how new thermostats made it easier for them to control the temperature in the home.

The use of additional heating in the home fell, with 63% of households saying they used it less since having the measures were installed. Around three in five households said that their home felt generally warmer since having the energy saving measures installed (63%), a decrease from 69% at wave 1.

Nearly a quarter (24%) of surveyed households perceived a positive impact on the health of someone in their household, which was higher among households with someone with a long-standing illness or disability (31%). Health benefits cited by participants in the qualitative research included helping to regulate symptoms of asthma or other conditions such as ME, as well as feeling less anxious about the temperature of the home.

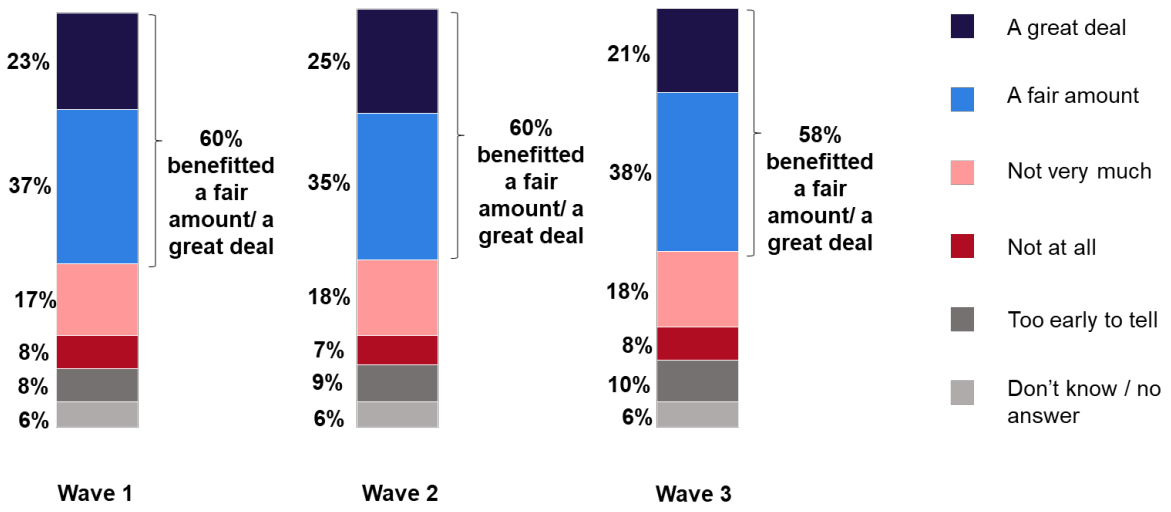
Over half (54%) of surveyed households said they thought their energy bills would be higher if they had not had the measures installed with 6% saying they would be lower.

Other impacts reported in the qualitative interviews included reduced draughts, as well as future proofing the home for older age.

4.1 Overall perception of benefit

More than half (58%) of surveyed households perceived that they had benefited a great deal or a fair amount from having measures installed, with around one in five (21%) saying they had benefitted 'a great deal' and around two in five (38%) saying they had benefitted 'a fair amount'. Around one in five (18%) said they had benefitted 'not very much' and fewer than one in ten (8%) said they had had not benefitted at all. One in ten said that it was 'too early to tell' (10%) and a small proportion said they did not know (6%) (Figure 18). These findings have remained consistent between survey waves.

Figure 18 Amount of perceived benefit from having ECO3 measures installed, waves 1-3



Base: All households receiving ECO3 measures (wave 1: 1,449, wave 2: 2,265, wave 3: 2,061). Source: How much have you benefitted from having the measure(s) installed in your home?

Households that received heating measures were more likely to report a great deal or a fair amount of benefit (66%) compared with households that received insulation (55%)[49]. Households that received underfloor insulation or loft insulation were more likely to report a great deal or fair amount of benefit (65% and 57% respectively) compared with households that received cavity wall insulation (48%).

Benefits cited in the qualitative interviews related to having more control over heating in the home, being able to heat up their home more quickly, needing to heat their home less often and having lower levels of damp or mould. Participants in the qualitative interviews who said that they had not benefitted typically said they had not noticed any discernible impact in relation to their heating use or bills. These findings are explored in more depth throughout this chapter.

Perception of benefit among surveyed households varied by the number of measures installed. Surveyed households that received multiple measures were more likely say they had benefited ‘a great deal’ or ‘a fair amount’ (67%) compared with those that received a single measure (47%). There was also variation by the type of measure installed. Surveyed households that received a new boiler were more likely say they had benefited ‘a great deal’ or ‘a fair amount’ (68%) compared with those that received any type of insulation (55%).

4.2 Perception of impact on energy use and bills

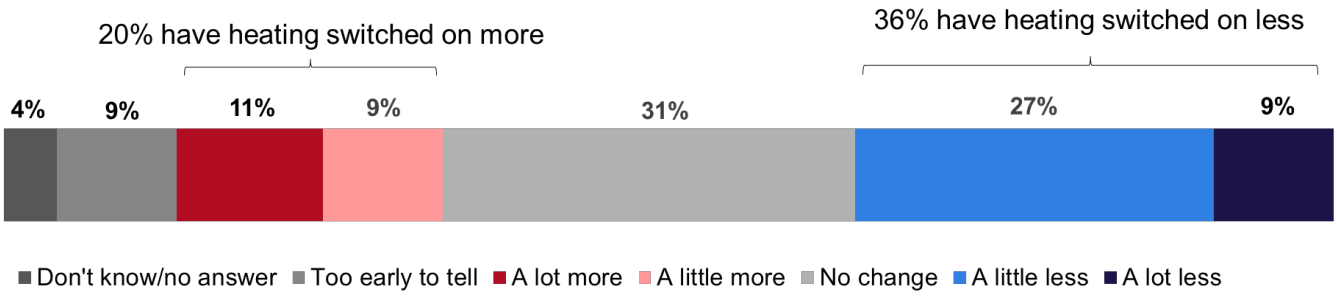
At waves 1 and 2, surveyed households were asked about how their energy bills had changed after having the measures installed. Wave 3 took place during a rapid increase in energy

[49] Some households received both heating and insulation measures but were asked to think about the overall impact in the survey. Therefore we cannot be certain which measure they were answering about.

bills[50], with seven in ten (71%) households saying that their energy bills had gone up since the energy price cap announced in February 2022. Therefore, surveyed households were not asked directly about their bills at wave 3, but instead focused on their energy use.

As shown in Figure 19, around one in three (36%) surveyed households reported that their heating was switched on less during the winter months since having measures installed. However, one in five (20%) reported that their heating is switched on more. Around one in three (31%) said that there had been no change in how they use their heating.

Figure 19 Reported heating use in the winter months after the ECO3 measures were installed, wave 3



Base: All households receiving ECO3 measures (wave 3: 2,061). Source: Since the measure(s) were installed, which of the following best describes how you use your heating during the winter months?

Surveyed households that received heating measures[51] were more likely to say that their heating was switched on 'a little' or 'a lot' more (25%) compared with those who had any type of insulation installed (16%). Surveyed households that received multiple measures were also more likely say their heating was switched on 'a little' or 'a lot' more (25%) compared with those who received a single measure (15%).

Some participants in the qualitative interviews described using their heating more because they can now afford it as a result of the measures. One participant felt that their old storage heaters *"ate electric" (Female, 45-54, solid wall insulation, storage heaters and roof insulation, wave 3)* whilst another described their new boiler as costing a lot less than their old storage heaters to run, and so they can afford to have the heating on for longer. One participant who received cavity wall insulation described how their heating is on more due to draughts and holes created by the poorly installed insulation.

Another participant who said their heating was on for longer since having the measures said it was due to having greater control. Their previous storage heating system was only on for set periods of time, whereas - since having the measures – they could put the heating on when it suits them.

[50] In April 2022 the energy price cap (now replaced by the Energy Price Guarantee) which set a maximum price that energy suppliers could charge consumers for each kWh of energy they used, rose from £1,277 to £1,971 per year

[51] Including boilers, electric storage heaters, district heating systems, heating controls, smart thermostats and thermostatic radiator valves

"The old ones only came on at 10 o'clock at night until 12 o'clock, then switched off…. I can put them on when I want so that's better." (Male, 35-44, storage heaters, solid wall insulation, wave 3)

Among participants in the qualitative interviews who said that their heating was switched on less, many felt that their home retained heat better and so they did not need to have the heating switched on for as long.

"It holds temperature and keep temperature. Once we've turned them on the room holds that temperature and previously it wouldn't, it was either really hot or really cold." (Female, 45-54, solid wall insulation, storage heaters, roof insulation, wave 3).

Others said that they had more control over the heating through smart thermostats and could manage the heating more effectively and heat their home more quickly. One participant who received new heating controls and a smart thermostat described being able to turn off radiators in rooms that they are not using to reduce heating use. Another described having better control of the new storage heaters over the previous ones that were difficult to regulate temperature.

A number of participants mentioned that they had their heating switched on less not because of the effectiveness of the measures but because of increases in the price of energy. This suggests that the effect of having the measures installed was difficult to separate from the wider context. In line with this, more than a third (36%) of surveyed respondents who said that their energy bills had increased since the price cap was increased said that they used their heating less in winter months now.

Some participants in the qualitative interviews said their heating use had not changed since having the measures installed. One participant said they tried to use the heating less after having the measures installed but found that the house was not as comfortable as they were used to. Others felt it was too early to tell, or had the thermostat set to an automatic timer so they were not aware of any change in their heating use.

"We did things based on what we were expecting, put it on later hoping we could do that, but the reality is we changed it back because it wasn't sufficient, providing the comfort we were used to." (Male, 35-44, underfloor insulation, boiler, heating controls, wave 3)

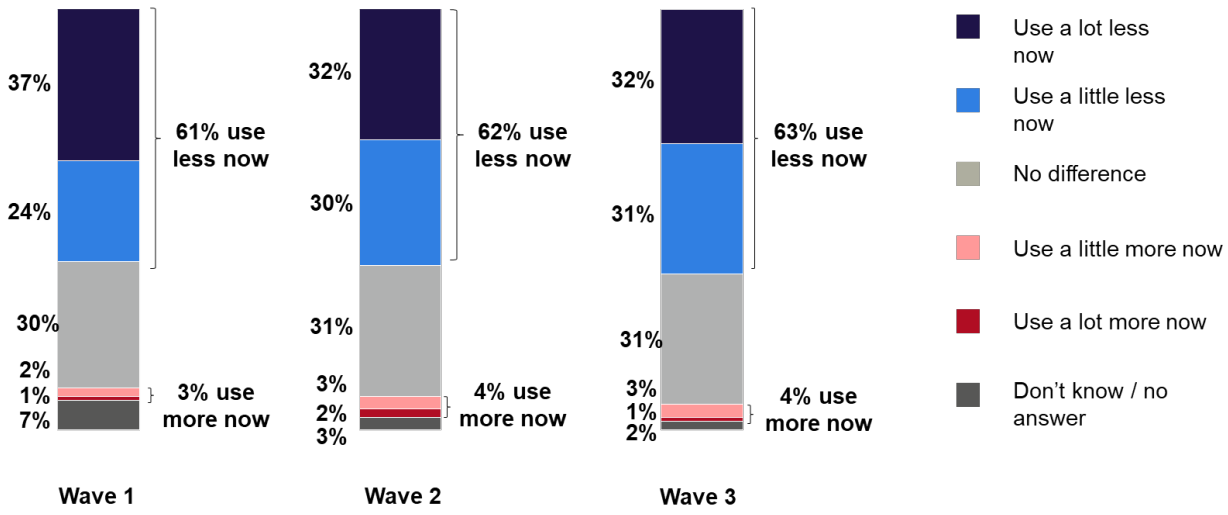
For many participants in the qualitative interviews who are regularly at home, had young children or had a health condition, being comfortable was often perceived as a driver when deciding to heat the home.

“Comfort is a big priority. Heating our home is a big part of our expenditure because I won’t tolerate being cold, especially if you’ve got little ones running around” (Female, 45-55, solid wall insulation, storage heaters, roof insulation, wave 3).

4.2.1 Perceived use of additional heating in the home

The use of additional heating[52] in the home has remained consistent over time. Around three in five (63%) surveyed households reported using additional heating less than they did before the measures were installed, including around one third (32%) who said they used additional heating 'a lot less now' and a similar proportion (31%) who said they used other types of heating 'a little less now'. A small proportion (4%) said they use additional heating more since having the measures installed.

Figure 20 Other forms of heating used in the home after the ECO3 measures were installed, waves 1-3



Base: All Respondents who use other types of heating (wave 1: 1,000, wave 2: 1,601, wave 3: 1,471). Source: Thinking about these other types of heater, overall, do you use them more or less often since installing the measure(s)?

Households that had solid wall insulation were more likely to say they used additional heating less after having the measure (81%) compared with those who received a boiler (64%), cavity wall insultation (58%), loft insulation (65%), underfloor insulation (60%) and other heating measures (66%).

4.2.2 Perceived impact on bills if households had not had the measures installed

At wave 3 surveyed households were asked whether they thought their energy bills would be higher, lower or no different if they had not received the measures. More than half (54%) of surveyed households said they thought their energy bills would be higher if they had not had the measures installed with 6% saying they thought their bills would be lower, shown in Figure 21.

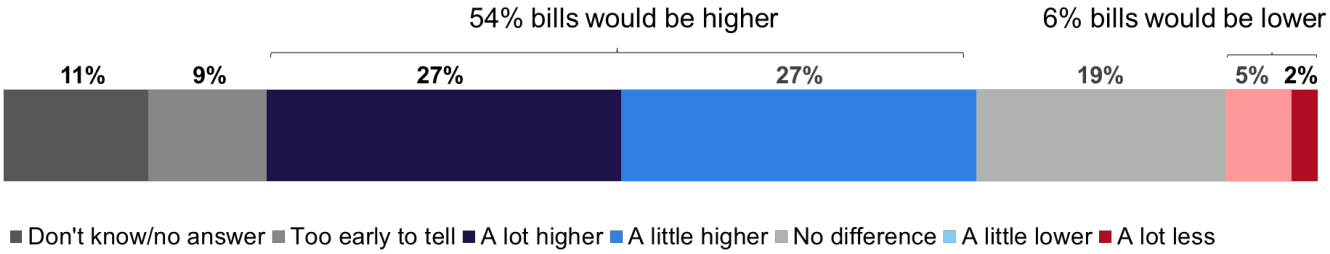
Households that received multiple measures were more likely say that they thought their energy bills would be higher if they had not received the measures (59%) compared with those

[52] Additional heating refers to other types of heaters used in the home other than the main source of heating e.g. electric plug-in room heaters, open fires, gas fires etc.

who received a single measure (48%). Households that received a boiler were also more likely to say that they thought their energy bills would be higher if they had not received the measures (58%) compared with households that received insulation (53%).

Qualitative findings from wave 1 suggest that this could be explained by the perception that heat radiating from a boiler is more noticeable or immediate to households. Participants who had boilers installed in wave 1 in the qualitative research described them as "*home essentials*" that could have a perceived negative impact on home comfort if they were to stop working. By comparison, insulation was considered as a measure without a perceived immediate impact that could be noticeable.

Figure 21 Suspected impact on bills if had not had the ECO3 measures installed, wave 3



Base: All households receiving ECO3 measures (wave 3: 2,061). Source: Had you not had the measure(s) installed, do you think your energy bills would be higher, lower or no different?

Participants in the qualitative research suggested that the impact of the ECO measures on their energy bills was difficult to estimate. In part, this was because the question was hypothetical, with fieldwork being conducted in the spring/summer when use of heating would typically be lower. A variety of other factors also made the impact harder to describe, including the ongoing sharp increases in the price of energy, participants changing energy providers and differing means of payment (for example direct debit and prepayment) impacting participants' ability to monitor changes. Despite this, some participants felt confident that the measures had reduced their energy bills.

"If the insulation hadn't been installed then I think our bills would definitely be higher as we would have had to have the heating on for longer" (Female, 65+, solid wall insulation and air pump, wave 3)

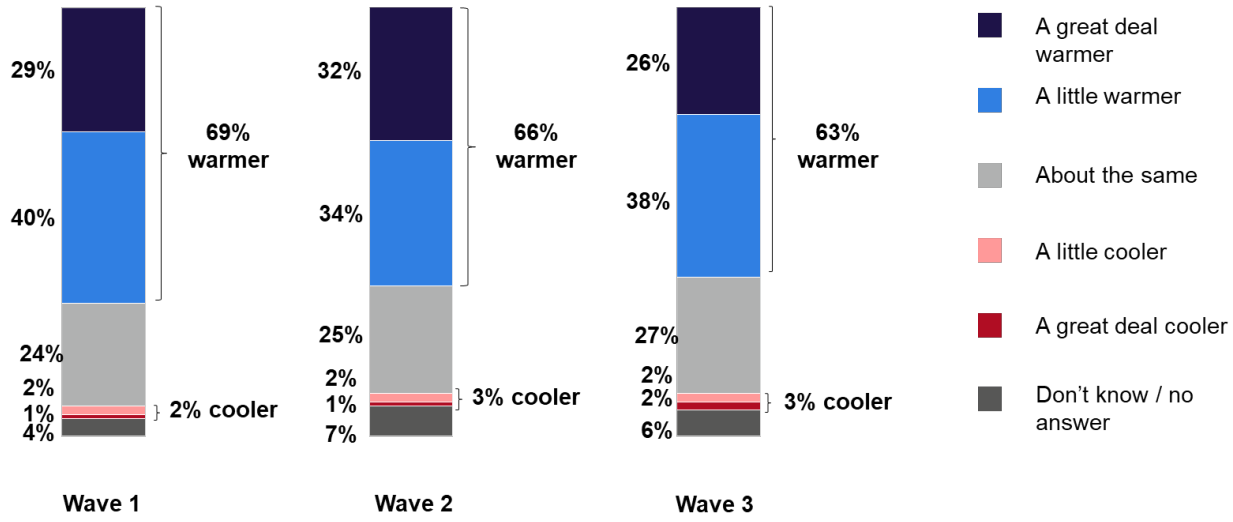
4.3 Perceived impact on temperature in the home

4.3.1 Perception of whether the home felt warmer or cooler generally

Just under two-thirds (63%) of surveyed households said that their home felt generally warmer since having the energy saving measures installed, including a quarter (26%) who said that their home was 'a great deal warmer' and 38% who said that their home was 'a little warmer'. There have been some changes over time, the proportion of households that said their home was generally warmer since having the energy saving measures installed decreasing from

69% at wave 1 to 63% at wave 3. While there is no direct evidence from this research, it is possible that this decrease relates to increases in energy prices between waves which may have led to some households using their heating less.

Figure 22 Perception of whether the home is generally warmer or cooler since having the ECO3 measures installed, wave 1-3



Base: All households receiving ECO3 measures (wave 1: 1,449, wave 2: 2,265, wave 3: 2,061). Source: Has your home generally felt warmer or cooler since the measure(s) were installed?

Households that received multiple measures were more likely to say that their home was warmer now (69%) compared with those who had received a single measure (57%). Households that received heating measures were also more likely to say that their home was warmer (67%) compared with those who had received any insulation (62%).

Across all three waves, around a quarter of households (27% at wave 3) reported that the temperature in their home was about the same after receiving the measures, and 3% reported that it was cooler after the measures.

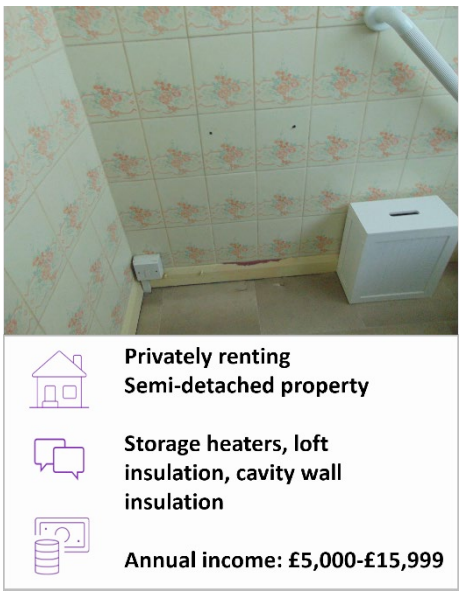
The qualitative findings followed the same trend as the survey findings with many participants reporting that the temperature in the home was about the same after receiving the measures. Only a small number of participants in the qualitative interviews felt that their home was cooler after having the measures installed and this was either referenced in the context of summer or attributed to having faulty measures installed.

"During the summer, the house remained comfortable and it didn't get above 24 degrees in the room with the insulation but the other rooms [without the insulation] were warmer" (Female, 55-64, solid wall insulation, wave 3).

"The attic room used to be very hot during the summer and very cold during the winter but this summer feels cooler than before. It's hot but not as excessive as before" (Female, 45-54, solid wall insulation, storage heaters, roof insulation, wave 3).

With reference to having faulty measures and the home feeling cooler as a result, some participants perceived heating the whole home as difficult. One participant described relying on an electric heater to heat the flat as the newly installed radiators were not powerful enough and another participant said that their new boiler is too small to heat the home effectively, meaning they cannot get hot water when they would like.

Emma's experience[53] - home feeling cooler after the measures[54]:



Emma lives in a semi-detached property with her husband which she rents from a private landlord. She uses the heating to keep warm which helps with her health issues. Through the ECO scheme she received storage heaters, cavity wall insulation and loft insulation.

Emma says their home is colder after receiving the measures because there is now an imbalance of temperature throughout the home. A heater from the bathroom was removed and not replaced (see image), which has now led to further issues.

"They haven't put one back in the bathroom. I don't know what we're going to do in there come winter, what it's going to be like."

"Since they've taken the heating out it's all mildew that's coming back again".

Emma complained about a heater being removed from their back room and this was eventually replaced but with a smaller heater which was not as good as the original one. Another new storage heater that was installed is permanently stuck on a high setting.

Emma doesn't know how to use the storage heaters and was given little explanation from the installers.

"They just left us a book and said get on with it."

"We've had to buy two gas fires, in case we can't get this heating on".

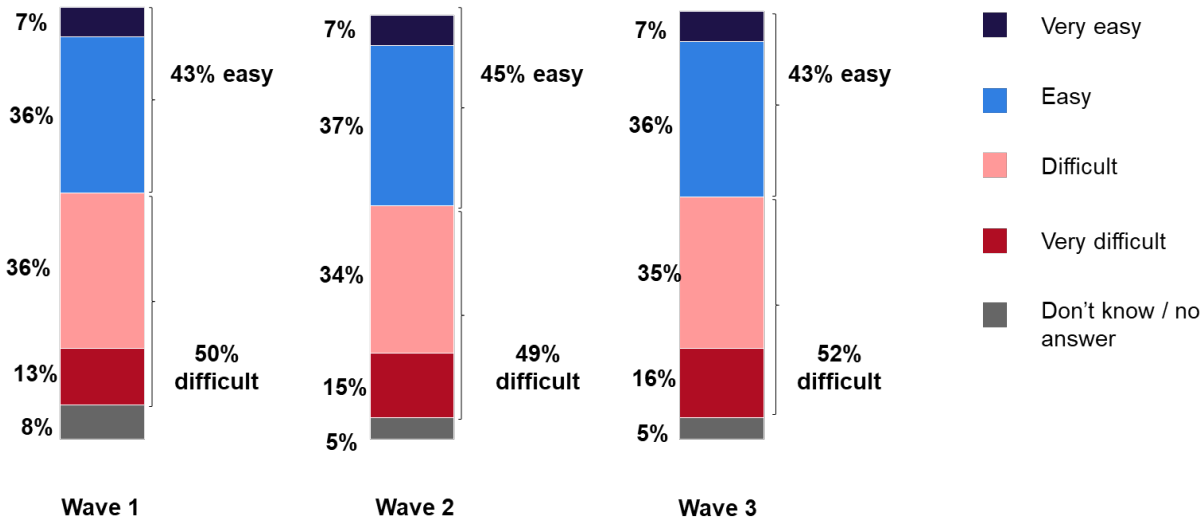
4.3.2 Perception of the ease of heating the home to a more comfortable temperature

Before the measures were installed, over half (52%) of surveyed households said that it was difficult to heat their home to a comfortable temperature, a figure comparable to wave 1 (50%) and wave 2 (49%). Around two in five (43%) said that it was easy to heat their home to a

[53] Emma is a pseudo-name.
[54] This installation took place before June 2021 (before PAS 2035 was mandatory).

comfortable temperature before receiving the measures (again comparable with waves 1 and 2).

Figure 23 Perception of how easy or difficult it was to heat home to a comfortable temperature before installation of ECO3 measures, waves 1-3

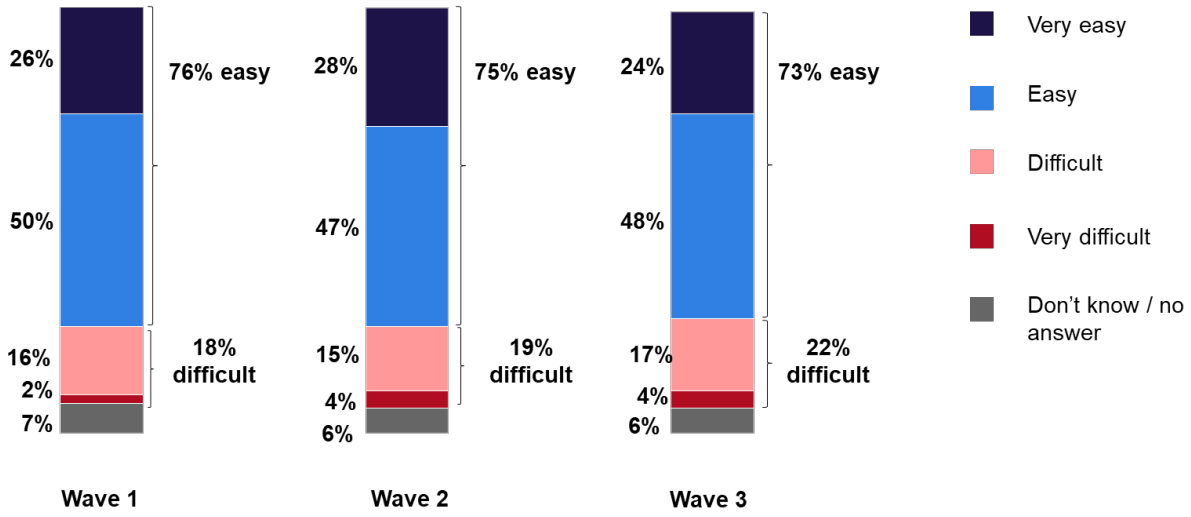


Base: All households receiving ECO3 measures (wave 1: 1,449, wave 2: 2,265, wave 3: 2,061). Source: Before the measure(s) were installed, how easy or difficult was it to heat your home to a comfortable temperature?

There was a big improvement in the ease of heating the home to a comfortable temperature before and after the measures were installed among surveyed households. After having the measures installed around three-quarters of surveyed households (73%) said it was easy to heat the home to a comfortable temperature, an increase of thirty percentage points compared with before the measures were installed.

However, more than one in five (22%) said that it was difficult to heat their home to a comfortable temperature after receiving the measures. Over time the proportion of surveyed households who said it was difficult to heat their home to a comfortable temperature after receiving the measures has increased, from 18% at wave 1, to 22% at wave 3.

Figure 24 How easy or difficult it was to heat home to a comfortable temperature after installation of ECO3 measures, waves 1-3



Base: All households receiving ECO3 measures (wave 1: 1,449, wave 2: 2,265, wave 3: 2,061). Source: After the measure(s) were installed, how easy or difficult was it to heat your home to a comfortable temperature?

Some surveyed households were more likely to say that it was easy to heat their home to a comfortable temperature after receiving the measures, including:

- households receiving heating measures (76%), compared with insulation (71%)
- households receiving multiple measures (77%), compared with a single measure (67%)
- households reached by AW Flexible (80%), compared with AW Standard (71%)
- owner occupiers (76%), compared with private renters (64%) or those in social housing (61%)
- households without anyone with a long-standing illness or disability (77%), compared with households with someone with a long-standing illness or disability (70%)

Looking at how individual households responded to these two survey questions, more than two in five (41%) cited no change in the level of difficulty of heating their home to a comfortable temperature compared with before and after the measures were installed. Around half (47%) said that it became easier, and one in twenty (5%) said it became more difficult[55].

Overall, around a third of surveyed households (31%) said their home had moved from being difficult to heat to a comfortable temperature to being easy. More than two in five (44%) thought their home was easy to heat to a comfortable temperature both before and after the measures.

A small proportion (3%) said that their home had moved from being easy to heat to a comfortable temperature before the measures, to difficult to heat to a comfortable temperature

[55] These figures include any change, for example, moving from being very easy before the measures were installed to easy after the measures were installed counts as a lower level of satisfaction.

after the measures. Fifteen percent thought their home was difficult to heat to a comfortable temperature both before and after the measures.

Surveyed households that had received solid wall insulation were more likely to say that their home had moved from being difficult to heat to a comfortable temperature before the measures to easy after the measures (41%), compared with households that had received cavity wall insulation (25%) or underfloor insulation (30%).

Participants in the qualitative research cited numerous reasons for their home being easier to heat to a comfortable temperature, including their home heating up more quickly and retaining heat better after having a measure installed.

Some participants mentioned positive benefits of smart thermostats, that help track energy usage of appliances across the household, allowing the participant to directly control the temperature of their house through their mobile phone. Some participants had new heating systems such as heat pumps installed which also gave them greater control.

"It's efficient and easy for me." (Female, 25-34, smart thermostat, wave 3)

"If I want heating, I just have to flick a switch whereas before I'd have to regulate it, de ash it and top it up then in 4 hours you might get a glimmer of heat out of it!" (Male, 65+, heat pump, solid wall insulation, loft insulation, roof insulation, wave 3)

There were a range of reasons why some participants said it was difficult to heat their home to a comfortable temperature after the measures were installed, including unresolved issues within the home. One participant described how heat continued to escape and draughts continued coming through loose windows. Another participant who had received cavity wall insulation and a smart meter described draughts coming through holes in her wall that were left unfilled, leaving them with more gaps than before.

"If you're only doing one bit and hoping one bit will make a difference, it's not. There are another six factors that need to be addressed." (Female, 55-64, cavity wall insulation, smart meter, wave 3)

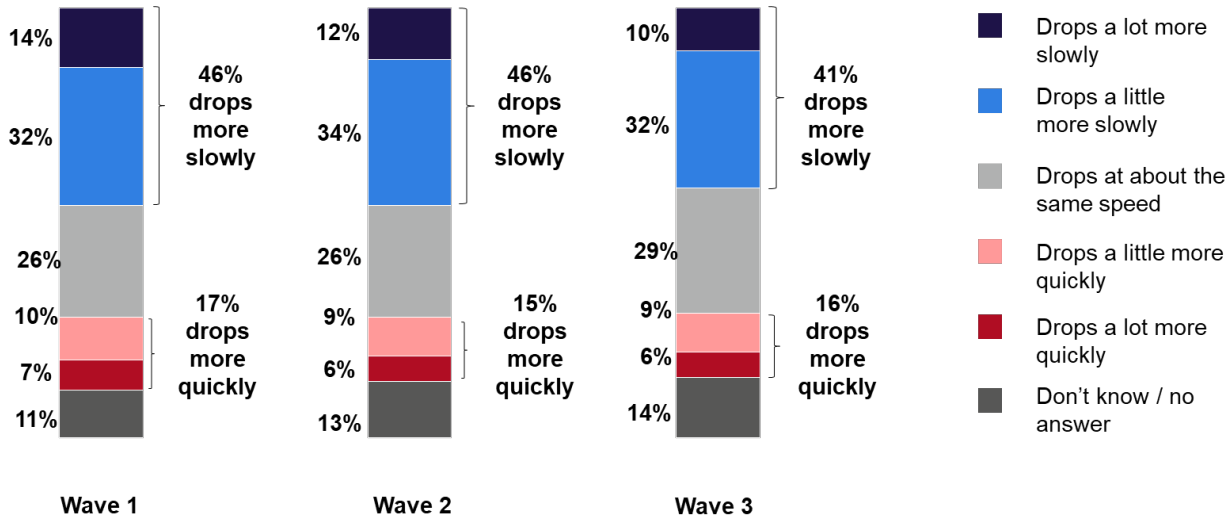
Reasons for households finding it more difficult to heat the home to a comfortable temperature included other unresolved issues in the home and the heating system being more difficult to use, for example now needing to adjust the temperature individually in each room, the heating system being slower to heat up and having faulty measures installed.

"All they have done is put loft insulation in and that was all… [the landlord] asked me if it was any warmer and I said no because the draught is coming through the windows and all they got up on the window is draught excluders and that's not doing any good. They're not double glazed or anything, they're just wooden framed and they're all sort of rotting." (Male, 65+, Loft insulation, wave 3)

4.3.3 Perceptions of the retention of heat in the home

Around two in five (41%) surveyed households said that the temperature in their home drops more slowly when the heating is switched off since having the measures installed. This represents a decrease from 46% in wave 1, which could be due to fewer households receiving insulation measures at wave 3 (69%) compared with wave 1 (73%). Around three in ten (29%) said it drops at about the same speed and around one in six (16%) said it drops more quickly.

Figure 25 Perceived speed that the temperature drops when the heating is switched off since having the ECO3 measures installed, wave 1-3



Base: All households receiving ECO3 measures (wave 1: 1,449, wave 2: 2,265, wave 3: 2,061). Source: Since the measure(s) were installed, which of the following best describes how the temperature drops when the heating is switched off?

Households that received insulation measures were more likely to say that the temperature drops more slowly since having the measures installed (45%) compared with households that received heating measures (41%). This was higher for solid wall insulation (63%) and loft insulation (52%) compared with boilers (42%), cavity wall insulation (42%) or underfloor insulation (44%).

This is consistent with the findings from the qualitative research, with participants who received solid wall insulation or loft insulation saying that their home retains heat better than it did before receiving the measures.

"I'm not worrying as much because the heating lasts a bit longer so we're having the heating on less so it's having a positive impact on us as a family." (Female, 25-34, solid wall insulation, wave 3)

"I used to put the electric heater on as a boost in the evenings and within half an hour the heat would have disappeared [...] whereas it stays a bit longer now"…."I feel less anxious and worried about the temperature because it's more stable" (Male, 18-24, loft insulation, wave 2)

4.4 Other perceived impacts within the home

4.4.1 Problems experienced in the home

Households were asked if they had experienced any problems since the measures had been installed from a pre-coded list. Since wave 1 the proportion of households experiencing issues before and after the measure was installed has remained consistent both at an overall level and for individual answer codes.

The proportion of surveyed households that experienced any condensation, draughts, mould or mildew, damp or rot more than halved, from 42% before the measures to 15% after the measures. Households that had solid wall insulation installed were most likely to say that they had experienced these issues before the measures but not after the measures (39%). This was higher than households that received cavity wall insulation (28%).

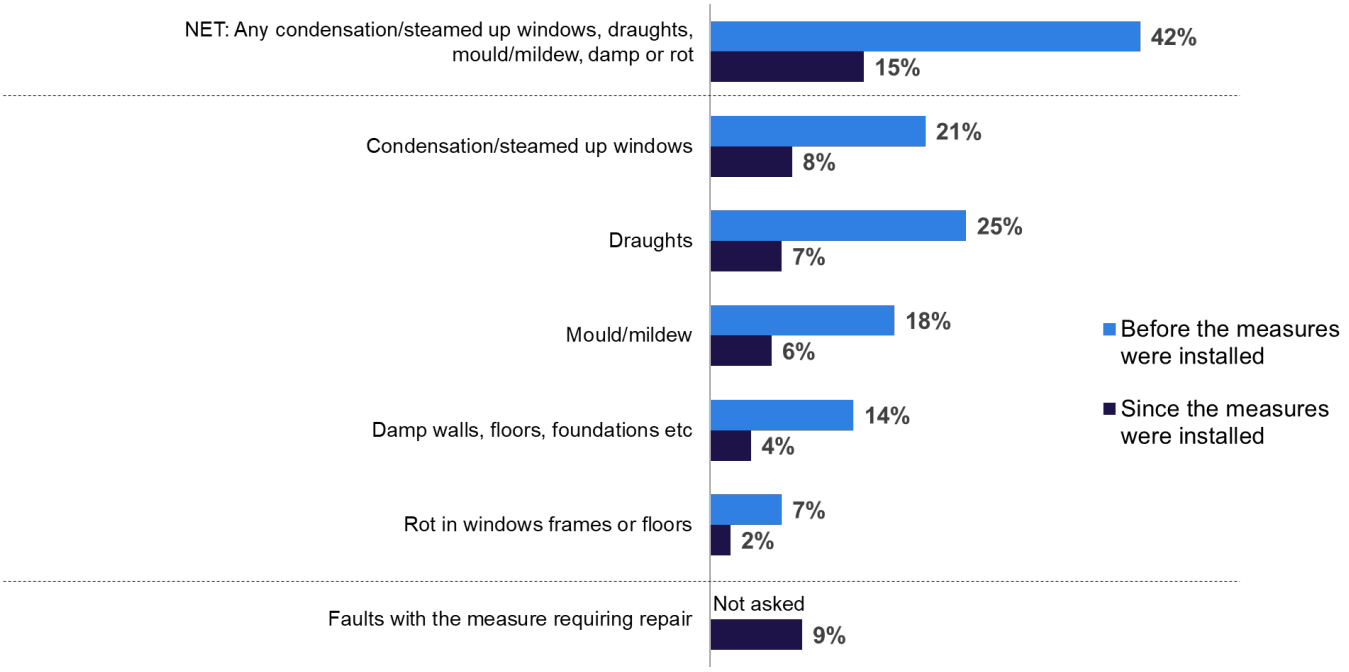
In line with the survey findings, the qualitative interviews indicated that a number of participants have observed less damp or mould in their homes since having the measures installed. Some participants reflected how they use certain sprays or dehumidifiers less frequently.

“There was a wall in the house that had damp constantly. Since the wall insulation, the damp on the wall has progressively reduced…we used to have to use a dehumidifier and now we use it much less. There’s also less mould in the wood in the house too” (Female, 55-64, solid wall insulation, wave 3).

In the qualitative interviews, the few participants who described experiencing mildew, damp or draught after the measures were installed tended to have had faulty measures and this typically resulted in those participants having their heating on more.

“The storage heaters don’t heat up properly and so the flat is still damp… there’s draughts because the cavity wall insulation was done poorly… there’s a vent with a guard put on top just to disguise it” (Female, 55-64, cavity wall insulation and smart meter, wave 3).

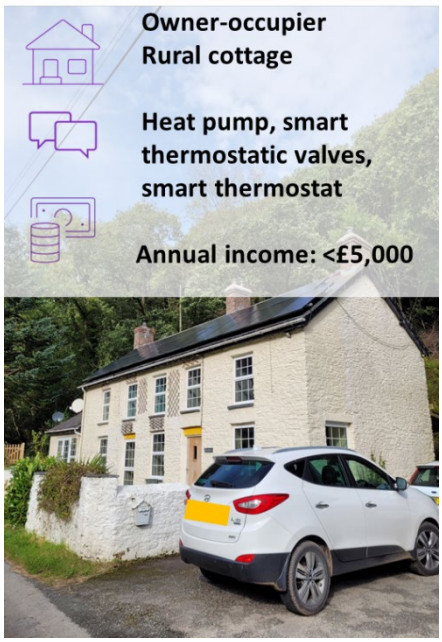
Figure 26 Problems experienced before and after the ECO3 measures were installed, wave 3



Base: All households receiving ECO3 measures at wave 3 (2,061). Source: And before you had your measure(s) installed did you have any of these problems with your home? Have you had any of the following problems since your measure(s) were installed?

Faults with the measure requiring repair were more likely to be experienced by households that had received heating measures (12%) compared with those who had received insulation (8%).

Frank's experience[56] - faulty measures being installed[57]



Frank lives alone in a cottage in Wales and regularly fosters children. His heating use revolves around the foster children to ensure that it's comfortable for them. Without a functioning heating system he wouldn't be allowed to foster. Through the ECO scheme he's had a heat pump installed. It worked for the first four months but soon stopped working.

"Mid-March, that's when it started cutting out…I think it started once every seven days and then it was once every three days, and then it was every day, and then it was literally every time I wanted hot water I'd have to go outside, whether it's nice weather or pouring rain, I'd have to go out and reset it. I've had times where I'd reset it and it'd start working and then after 15 minutes it would cut out again, so I'd have to go out and reset it again, and then I've had times where it would just totally stop working."

The faulty heat pump has meant there is not a reliable hot water supply.

"There were four days with no hot water, which I had a kid with me at the time, so it was taking me an hour to fill up two kettles and fill a bath for him."

The installers have been back to the property four or five times since the installation to try and find a solution. They found that some outside pipes were leaking which were replaced, but this has not fixed the problems. The manufacturer of the heat pump has also visited the property twice. At the time of interview the problem remained unresolved.

4.5 Perceived impact on health

Across all survey waves the reported impact on health remained consistent. Around a quarter (24%) of households said that the energy saving measures had had a positive impact on the health of someone in their household. One in five (21%) said it had a positive impact on physical health, 17% said it had a positive impact on mental health and 14% of households said that it had a positive impact on both physical and mental health.

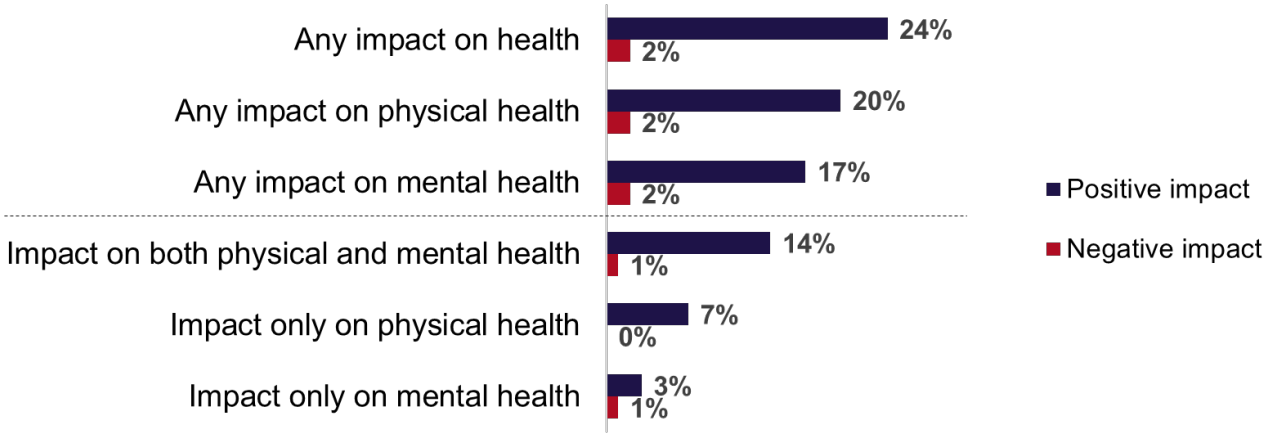
The impact on health was greater for households that had someone living there who had a long-standing illness, disability or infirmity; around three in ten of these households (31%) reported a positive impact compared with 16% of households who did not have anyone living there with a long-standing illness or disability.

[56] Frank is a pseudo-name.
[57] This installation took place after June 2021 (after PAS 2035 was mandatory).

Surveyed households who said their home was easier to heat to a comfortable temperature after the measures had been installed were more likely to report a positive impact on the health of someone (37%) compared with those who said there had been no change (13%). Households that reported issues with damp, rot, mould, condensation, or draughts before the measures but not after the measures were more likely to report a positive health impact (35%), compared with those who reported these issues both before and after the measures had been installed (22%).

Households that had received a heating measure were more likely to report a positive health impact (27%) compared with households that received any insulation (20%).

Figure 27 Impact of the energy saving measures on the health of anyone in the household, wave 3



Base: All households receiving ECO3 measures (wave 3: 2,061). Source: Would you say the measure(s) have had an impact on the health of you and/or other people in your household? What type of impact have the measure(s) had on the health of you and/or other people in your household?

In the qualitative research, some participants described a general positive impact on their wellbeing where they felt more relaxed after the measures were installed as the temperature in the home felt warmer. Other participants described receiving fewer complaints from family members feeling cold and this was perceived as a positive impact on the overall household. The qualitative research also found that some of the reported health impacts related to improved wellbeing and lower stress levels from knowing that their home is easier to heat. This was also the case for older participants who gained reassurance that their home was suitable for them in older age.

"Our home feels ready for retirement, when warmth and comfort will be more important…It might help prolong good or better health" (Male, 55-64, boiler, underfloor insulation, heating controls, wave 2)

"I'm not worrying as much because the heating lasts a bit longer so we're having it on less. Its having a positive impact on us as a family." (Female, 25-34, solid wall insulation, wave 3).

In line with the survey findings, physical health benefits were typically cited by participants in the qualitative research who had long-standing health issues. Some self-reported examples linked physical health benefits of the measures to having an improved and constant temperature in the home which they believed helped to regulate symptoms of asthma or other long-term conditions such as ME.

"I use my inhaler less because of it. I used to use it indoors quite a bit because of the temperatures but now I only really use it if I'm outside." (Female, 25-34, smart thermostat, wave 3)

Negative health outcomes were typically mentioned by participants in the qualitative research in relation to faulty measures or stressful installations. One participant who received a faulty boiler described how their mental wellbeing had decreased due to a faulty boiler being installed resulting in family not being able to stay over due to the cold. Another participant described how poor communication, long delays and problems during the installation led to high levels of stress.

"The first company did a cheap job and cut corners because I'm an old man. I complained to him, and his reply was you're getting it free what does it matter...thank goodness I had good friends. I had belated distress…It was horrendous. I have never been treated so badly in all of my life." (Male, 65+, solid wall insulation and underfloor insulation, wave 3)

5 Potential for longer term impact

Summary of change over waves 1 to 3

Participating in ECO3 has increased the likelihood of households considering further energy saving measures in the future, with two-thirds (65%) more likely to consider having other measures as a result of the scheme. This has increased over time from 60% at wave 1.

Some participants in the qualitative interviews felt as though receiving the measures through ECO was a trigger to them thinking more about saving energy in the home, however, this was typically thought about in terms of savings on energy bills, rather than from an environmental perspective.

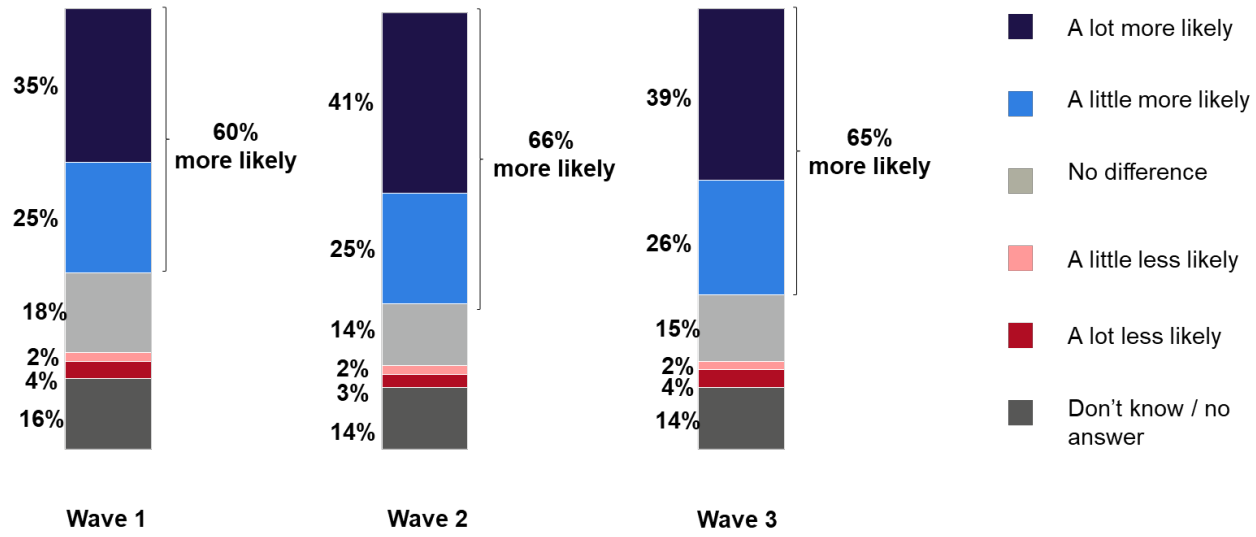
The proportion of surveyed households who had already recommended similar energy saving measures under this scheme or who said they would be likely to do so has remained consistent over time (76% at wave 3).

5.1 Likelihood to consider other energy saving measures in the future

Across all waves, more than three in five surveyed households said that they are more likely to consider other energy saving measures as a result of participating in ECO3. Over time this has increased to 65% at wave 3, from 60% at wave 1.

Some participants in the qualitative interviews described how taking part in the scheme helped them to become more aware of energy saving measures.

Figure 28 Likelihood to consider having other energy saving measures installed as a result of ECO3, waves 1-3



Base: All households receiving ECO3 measures (wave 1: 1,449, wave 2: 2,265, wave 3: 2,061). Source: As a result of having energy saving measures installed, would you say you are more or less likely to consider other energy saving installations in the future?

There was some variation by the type of measure received, with surveyed households receiving a boiler more likely to consider other energy saving measures in the future (72%) compared with households that received any insulation (64%). There was also some regional variation, with households in Wales more likely (74%) than those in England (64%) to consider future energy saving measures.

Other groups that were more likely to consider future energy saving measures included owner occupiers (72%, compared with 52% of private renters and 41% of those in social housing), those with a household income of more than £16,000 a year (72%, compared with 59% of those with a household income of £16,000 or less), and households who agreed they would have been interested in further measures if they had been available at the same time or shortly afterwards (77%, compared with 43% who disagreed) The main reasons for surveyed households to consider future energy saving measures was to save money on energy bills (88%), make the home warmer or more comfortable (68%) or reduce energy use for environmental reasons (44%). A third (34%) said it would be to update or modernise the heating and insulation system in the home, and one in five (19%) to increase the home's value.

Households with people with a long-standing illness or disability were more likely to say they would consider further measures to make the home warmer or more comfortable (72%) compared with households without people with a long-standing illness or disability (65%).

Among participants in the qualitative research, cost was a common barrier that prevented households from considering additional energy saving measures in future. Given the increase in the cost of living, many wave 3 participants said that investing in energy saving measures was not a priority for them, even if they wanted to.

"I don't think that in the current situation [cost of living] I would pay. My priority, as lovely as it is to retain heat, that money I would prefer to put food on the table for my children. I would have rather bought more blankets...prior to covid-19 and energy rising then it's something I would have considered but since everything has changed with the financial situation, definitely not." (Female, 25-34, solid wall insulation, wave 3)

"We've had a positive experience and that would make me more open to consider other energy saving ideas. With the environment itself no, because my concern is my children and providing the necessities for them. We don't have the luxury of considering the environment... my children will come first." (Female, 25-34, cavity wall insulation, wave 3)

Some participants said the positive impact on the environment would encourage them to look at getting other energy saving measures in the future, however this was seen as a luxury among those who could afford it.

"I think if you […] can afford to do it, you should do it […] and it will help the environment" (Male, 45-54, boiler, heating controls, thermostat, wave 3)

Other participants were unsure about what other energy saving measures there were and what would be suitable for their home in future. One participant was also unsure about the effectiveness of the measures and was not sure whether any installation cost would be worth any potential benefit.

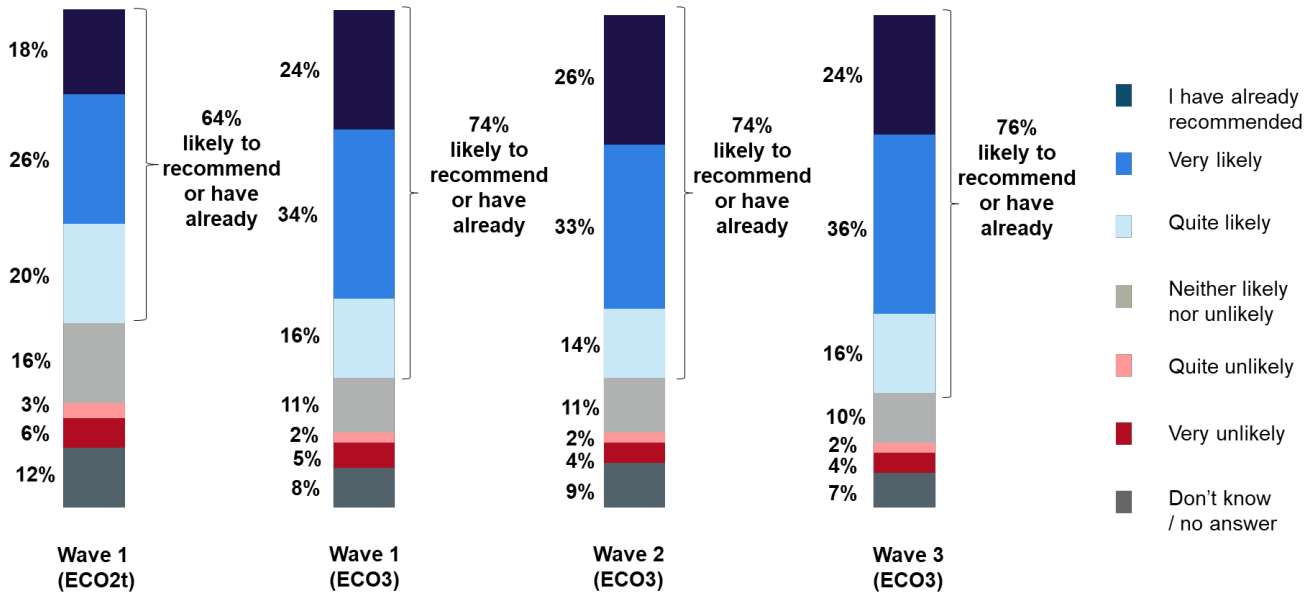
"I think if I was made more aware of what is around then yes, I think I would." (Female, 55-64, boiler and heating controls, wave 3)

5.2 Recommending similar energy saving measures under ECO to others

Three-quarters of surveyed households reached by ECO3 (76%) said they were either likely to recommend or had already recommended similar energy saving measures under this scheme to people they know, including a quarter (24%) who had already recommended these to others, 36% who were 'very likely' and 16% who were 'quite likely' (Figure 29). This was an increase compared with households reached by ECO2t (64%).

At all waves, fewer than one in ten said they were either quite unlikely or very unlikely to recommend similar energy saving measures under the scheme (7% at wave 3).

Figure 29 Likelihood of recommending similar energy saving measures under this scheme to others, waves 1-3



Base: All households receiving ECO measures (wave 1 ECO2t: 1,468, wave 1 ECO3: 1,449, wave 2: 2,265, wave 3: 2,061). Source: How likely are you to recommend similar energy saving measures under this scheme to people you know?

There was some variation by the measure type households received, with surveyed households receiving boilers (85%), loft insulation (85%) or underfloor insulation (85%)[58] more likely to say they had already recommended or were likely to recommend similar measures under the scheme to others compared with those who received solid wall insulation (59%) or cavity wall insulation (65%). Households receiving solid wall insulation or cavity wall insulation were more likely to say they were unlikely to recommend similar measures (17% and 9% respectively) compared with those receiving boilers (2%) or underfloor insulation (4%).

A higher proportion of private renters or those in social housing (14% and 16% respectively) said they were unlikely to recommend similar measures compared with owner occupiers (4%). More surveyed households in rural areas were unlikely to recommend similar measures (11%) compared with those in urban areas (6%), as were those who felt they had not benefitted very much or at all (18%, compared with 2% who felt they had benefitted a great deal or a fair amount).

Surveyed households who reported certain benefits from having the measures, such those who said it was easier to heat their home to a comfortable temperature (86%) or had issues such as condensation, steamed up windows, draughts, mould or damp before the measures but not afterwards (81%) were more likely to have already recommended or were likely to recommend similar measures (compared with 70% that reported no change in the ease of heating their home and 66% who still reported some issues after the measures).

[58] The qualitative interviews showed that some households were offered boilers and underfloor insulation as part of a package

Participants in the qualitative interviews were typically very satisfied with the scheme and said they would or already have recommended similar measures to people they know.

“The process was very, very easy from the leaflet guy coming round, checking documents, proving who they are […] it was a very easy process and I highly recommend it to other people.” (Male, 55-64, underfloor insulation, smart thermostat, new boiler, wave 2)

"I do tell people about the scheme and that it's free… it's making people's home's better, having the heating on less, basically which is good for the environment." (Male, 25-34, underfloor insulation, loft insulation, wave 3)

6 Conclusion

The ECO scheme was designed to drive uptake of energy efficiency measures in households that would not have occurred without the scheme. In particular, it was designed to benefit low income and vulnerable households in or at risk of fuel poverty. The intended effects of the scheme include reducing energy demand in the residential sector, lower energy bills, improving thermal comfort and subsequent health outcomes. This evaluation demonstrates the extent to which these outcomes have been reported by households, revealing the characteristics of those reached by the scheme and that experiences and outcomes vary significantly depending on the type of measures that are installed.

Overall, surveyed households that received measures under the ECO scheme were satisfied with both the process of installation (78% were satisfied) and the impact that the measures had on the temperature in their home (63% said their home felt warmer after receiving the measures). Generally, households that received heating measures tended to be more positive about the impacts of the scheme and more likely to say that their home was warmer after receiving the measures (67% compared with 62% receiving insulation). Households receiving heating measures were also more likely to say it was easier to heat their home to a comfortable temperature (76% compared with 71% of those that received insulation).

Households that had received a heating measure were also more likely to report a positive health impact (27%) compared with households that received any insulation (20%). It was only in relation to retention of heat that households that received insulation reported a more positive impact compared with those that received heating measures. Qualitative findings suggested that households found the impact of insulation less noticeable without an immediate comfort benefit to participants day-to-day.

Households that received multiple measures tended to report more positive impacts about thermal comfort in the home compared with those that received a single measure. This is likely linked to most single measure installations being insulation measures (73%) rather than heating measures (27%) and households receiving insulation less likely to report positive outcomes as discussed above. It could also be linked to tenure of households, with those receiving a single measure more likely to be private renters (68%) or in social housing (92%) compared with owner occupiers (31%).

Households that were renting privately or in social housing tended to have less positive experiences of the scheme. These households described having less control over the process, little information and often had little consultation with their landlord or housing association. This is also linked to the type of measures that were more frequently installed in privately rented accommodation or social housing with higher proportions receiving solid wall insulation, which households tended to have less positive experiences with.

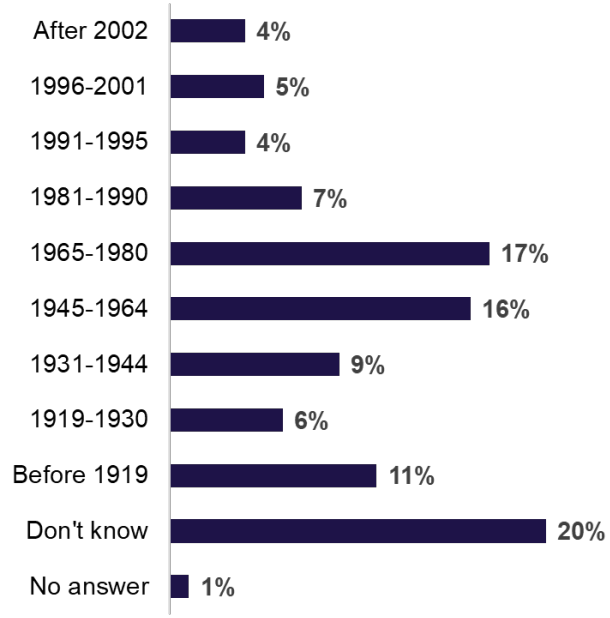
The evaluation has identified factors which have contributed towards a positive installation experience, including good communication with installers, clean and tidy workers, and high-quality aftercare. It has also identified areas which could be improved, including the quality and availability of information, not only about the scheme, but about energy efficiency measures themselves.

Appendix A: Other household characteristics

A.1 Age of home

The age of the properties that benefited from ECO was mixed. At wave 3, around one in ten surveyed properties (11%) were built pre-1919, compared with 21% nationally[59], while 13% of surveyed properties were built post-1990, compared with 17% nationally. One in five (20%) did not know when their home was built. A full breakdown is shown in Figure 30. Findings have remained consistent across the three waves of the survey.

Figure 30 Date the home was built, wave 3



Base: All respondents, wave 3 (2,061). Source: Roughly when was your home built?

A.2 Age and size of household

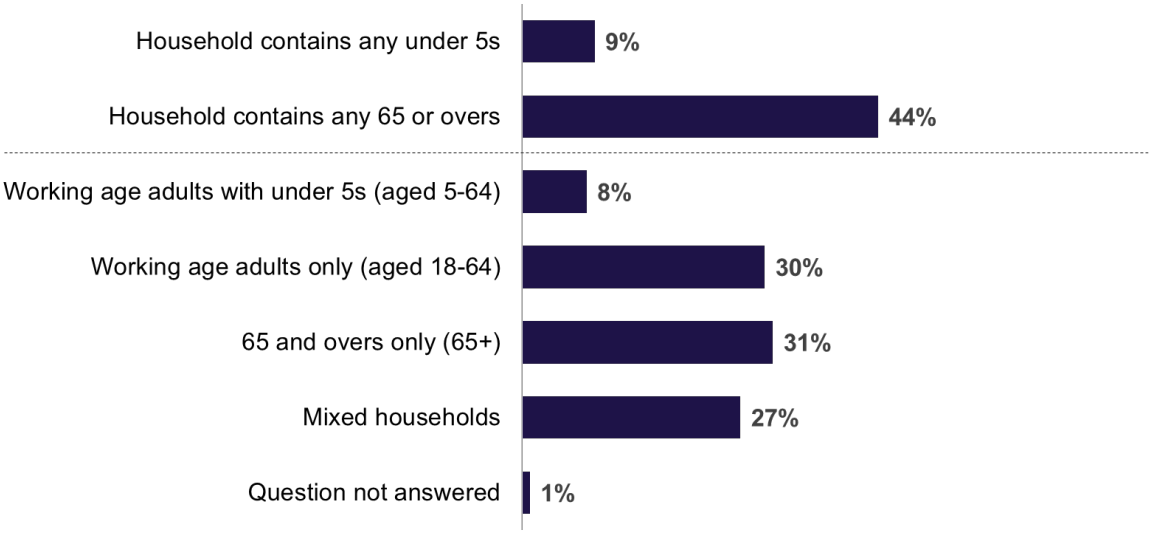
The age profile of surveyed households varied, as shown in Figure 31, however the profile has remained stable over the three waves of the survey. At wave 3:

- Three in ten households (30%) contained only working age adults (aged between 18 and 64). Almost half of these (46%) were single occupancy, while 31% had two adults and 23% had three or more adults.

[59] The Housing Stock of The United Kingdom

- Just under one in ten households (8%) contained working age adults and children under 5 years old. Six percent of these households had two occupants, 30% had three occupants, 33% had four occupants and 30% had five or more occupants.
- Around three in ten households (31%) were made up of only people aged 65 and over. Of these households, around three in five (58%)) were single occupancy (compared with 33% overall), and around two in five (40%) had two people living there (compared with 32% overall). This is similar to ONS estimates of households containing people aged 65 and over only (25% of all households), of which it is estimated that 59% are single occupancy[60].
- Households made up of people with a mix of ages[61] over a quarter (27%) of the households surveyed. Around three in ten (31%) of these households had two occupants, 24% had three occupants, 22% had four occupants and 23% had five or more occupants.
- Overall, more than two in five (44%) households had at least one person aged 65 or over living there. This is higher than the ONS population estimates (32%)[62]. Households reached by AW Flexible were more likely to have someone aged 65 or over in the household (55%) compared with AW Standard (41%).

Figure 31 Age of residents within the household, wave 3



Base: All respondents (2,061). Source: And how old is each person in your household? Again please include yourself and any children.

[60] ONS estimates of the number of households (and people in households) by the mix of age groups and number of people aged 65 and over, UK, 2019
[61] This includes households with under 5s and 65 and overs and households with children aged 6-17
[62] ONS estimates of the number of households (and people in households) by the mix of age groups and number of people aged 65 and over, UK, 2019

A.3 Ethnicity

At wave 3, when asked to describe the ethnic group(s) of people within their household, three-quarters (77%) said they were from a white background, 13% from an Asian background, 2% from a black background, 2% from a mixed background or from multiple groups, and 1% from another background.

This profile is slightly different to population estimates for England and Wales in the 2021 Census (82% of residents identified their ethnic group as white, nine percent as Asian and four percent as black) [63]. These differences likely reflect demographic differences between ethnic groups.

A.4 Working status

Among surveyed households, just under half (45%) of chief income earners worked in paid work. Around a third (34%) worked full-time (30 hours or more per week) and 11% worked part-time (under 30 hours per week). Two in five were retired (40%) and 12% were not working. These figures have remained consistent over the three waves of the survey.

Half of households reached by AW Flexible were retired (50%). This was higher than the proportion for AW Standard (37%). Households reached by AW Standard were more likely to be not working (15%) compared with AW Flexible (2%). While the overall proportions in paid work were similar, households reached by AW Flexible were more likely to be in full-time paid work (40%) compared with AW Standard (32%), whereas households reached by AW Standard were more likely to be in part-time work (12%) compared with AW Flexible (6%).

A.5 Benefits

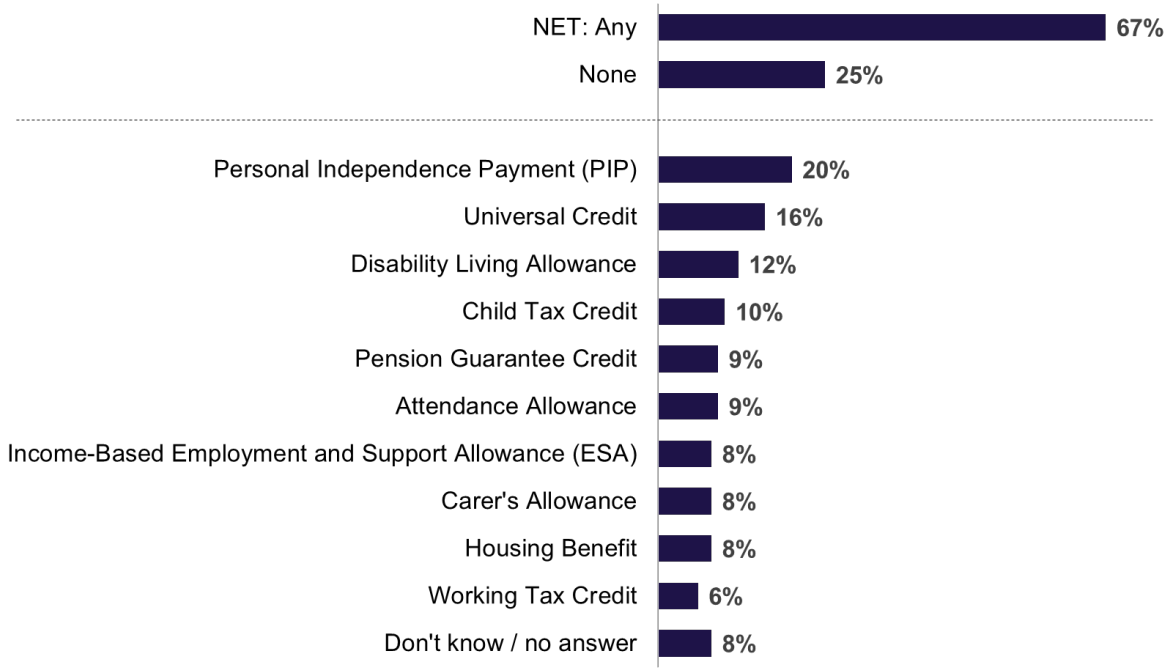
At wave 3, two-thirds (67%) of surveyed households were receiving state benefits, and a quarter (25%) were not. Eight percent did not give an answer to this question. This is higher than the national average, where 52% of households are in receipt of state benefits[64].

Households reached under the AW Standard obligation were more likely to be receiving any benefits (78%), compared with around one in five (21%) reached by AW Flexible. These findings are similar to those seen at wave 2[65].

Around one in five households were receiving Personal Independence Payment or PIP (20%) and one in six (16%) were receiving Universal Credit. A full breakdown of benefits received is shown in Figure 32.

[63] Ethnic group, England and Wales - Office for National Statistics (ons.gov.uk)
[64] Data from the Family Resources Survey: financial year 2020 to 2021. This data is not directly comparable with ECO households due to the differing data collection modes and different question wording.
[65] The list of benefits was changed after wave 1, and so findings are not comparable with the wave 1 survey.

Figure 32 Benefits received within the household, wave 3



Base: All respondents at wave 3 (2,061). Table only includes benefits received by more than 2% of households.
Source: Is anyone in your household, including yourself, currently receiving any of these benefits?

A.6 Help received with fuel bills

At wave 3, around half (49%) of surveyed households received some sort of help towards paying for fuel bills. In households where all occupants were aged 65 or over, 90% received help, compared with 23% in households with only working age adults and 25% where occupants were working age adults with under-fives.

The most common help received was the Winter Fuel Payment (38%). More than one in ten (15%) received help from the Warm Home Discount Scheme, or the Cold Weather Payment (12%). One percent received help from the National Concessionary Fuel Scheme.

Findings remained consistent over the three survey waves for ECO3 households, but the proportion receiving help with fuel bills was higher compared with ECO2t (under which 44% of surveyed households received help with fuel bills).

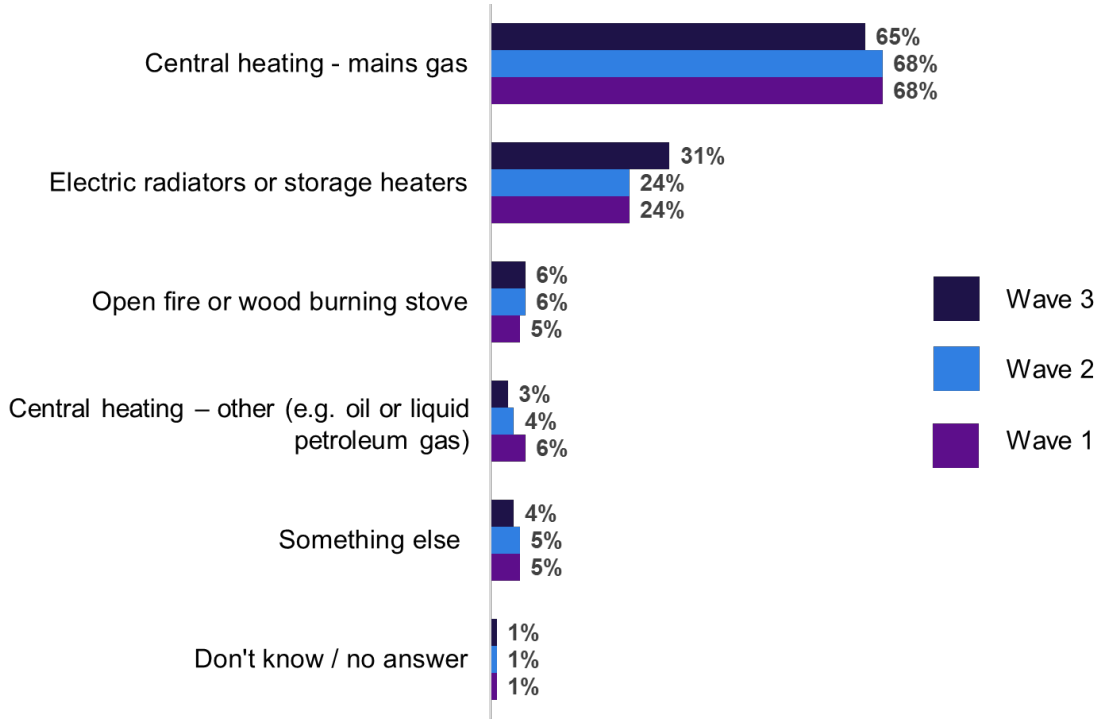
A.7 Types of heating used in the home

A.7.1 Main way of heating the home

Under ECO3, it was estimated that just under a fifth of the measures installed would be in households heated by non-gas fuels (14% electricity, 2% oil and 1% solid fuel), with around four in five (83%) installed in homes heated by mains gas.

The survey findings show that ECO3 has reached more households than estimated that were heated by non-gas fuels. Around three in ten (31%) used electric radiators or storage heaters as their main way of heating their home, an increase from 24% at waves 1 and 2, while six percent said they used an open fire or wood burning stove (Figure 33)[66]. Around two-thirds (65%) of households used mains gas central heating.

Figure 33 Main way of heating the home among ECO3 households, waves 1-3



Base: All respondents (wave 1: 1,449, wave 2: 2,265, wave 3: 2,061). Source: Which of these is the main way you heat your home?

Households reached by AW Standard were more likely to use electric radiators or storage heaters (34%) as their main heating, compared with AW Flexible (20%). Mains gas central heating was more common among households reached by AW Flexible (72%) than those reached by AW Standard (63%).

The use of main gas central heating was higher in the following groups:

- owner occupiers (78%) compared with those renting privately (11%) or in social housing (38%)
- properties built in 1919-1944 (87%) or 1945-1964 (78%), compared with those built before 1919 (56%) or after 1964 (64%)
- households in urban areas (70% compared with 38% in rural areas)

There were also differences by region, with households in Wales (49%) less likely to use main gas central heating than those in England (65%) or Scotland (67%). The use of main gas

[66] This question was changed at wave 3, so findings are not comparable with those from previous waves.

central heating was also lower in the South West (35%) and the East of England (46%) than in other English regions.

A.7.2 Use of additional heating in the home

Seven in ten surveyed households (70%) at wave 3 had used additional types of heating in their home before the installation of the ECO3 measures. This proportion was consistent across the three waves of the survey.

The types of additional heating most commonly used were electric plug-in room heaters (39%) and mains gas fires (26%). Smaller proportions said they had used other electric heaters, including towel rails or underfloor heating (10%), open fires burning coal, wood or smokeless fuel (4%) or enclosed fires or stoves burning coal, wood or smokeless fuel (4%).

There were differences by tenure: owner occupiers (74%) and private renters (73%) were more likely to have used additional heating before the measures were installed than those in social housing (51%). The use of additional heating was also more common in properties built before 1919 (84%), particularly when compared with properties built after 1990 (60%).

There were also regional differences. Homes in Scotland were less likely than those in Wales or England to have used any additional heating in the home before having the measures installed (54% in Scotland compared with 75% in Wales and 72% in England).

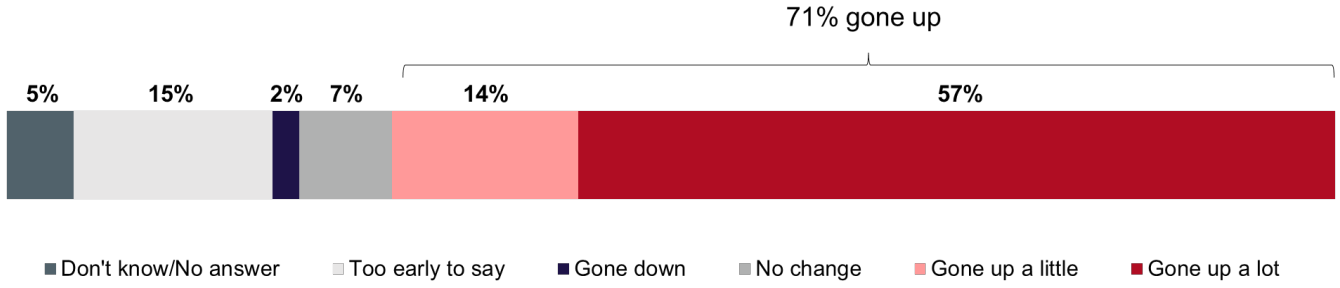
A.7.3 Impact of the change in energy price cap

Seven in ten surveyed households (71%) said that their energy bills had gone up since the energy price cap increase was announced in February 2022. This includes 57% who said their bills had gone up a lot and 14% who said they had gone up a little. Seven percent said there had been no change in their energy bills, while two percent said their bills had gone down (one percent down a lot and one percent a little). The remainder either said that it was too early to tell (15%) or did not know or gave no answer (5%). Figure 34 provides details. This question was only asked at wave 3.

Households reached by AW Standard were more likely to say their energy bills had gone up since the energy price cap increase was announced, compared with those reached by AW Flexible (72% compared with 66%).

Working age adults with under-fives were more likely than other types of households to have seen an increase in their energy bills (87%) compared with households with working age adults only (73%) or those with only people aged 65 or over (60%).

Figure 34 Impact on energy bills of energy price cap increase, wave 3



Base: All respondents (2,061). Source: The energy price cap is the maximum amount that energy suppliers can charge per unit for gas and electric. In February 2022 it was announced that the price cap will increase. Since the change in the energy price cap, have your energy bills changed?

Around three-quarters (76%) of households said they had reduced their energy use since the change in the energy price cap was announced. This includes 54% who used less energy in order to minimise costs, while 36% said they had used less energy due to the warmer weather. Just over one in ten (13%) had not reduced their energy use, while seven percent said it was too early to tell and three per cent did not know.

Private renters (63%) and owner occupiers (55%) were more likely than those in social housing (42%) to say they reduced their energy use in order to minimise costs.

A.8 Previous experience of energy saving measures

Households were asked about their knowledge and experience of energy saving measures before they found out about the scheme.

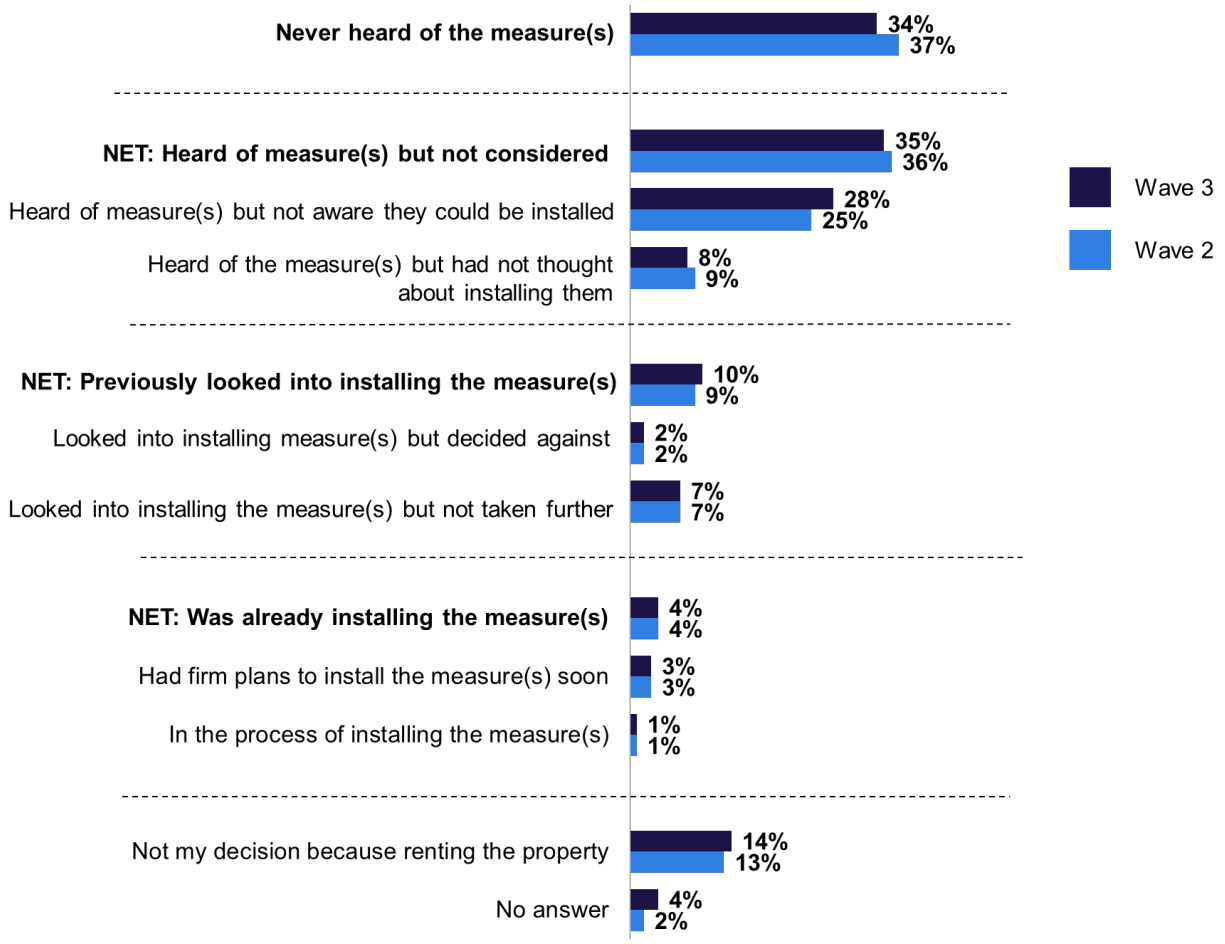
A.8.1 Prior knowledge of measures

Before they found out they could get help paying for the measures through ECO3, a third of households (34%) at wave 3 said they had never heard of the measures, while a further 28% said they had heard of the measures but were not aware they could be installed in their home. Eight percent said they had heard of the measures but had not thought of installing them in their home.

One in ten households (10%) had previously looked into installing the measures but had decided against it or not taken it any further and 4% had firm plans to install the measures soon, or were already in the process of installing the measures.

Around one in seven households (14%) said it was not their decision to make because they were renting the property. Findings are similar to those obtained at wave 2 (a comparable question was not asked at wave 1). Details are shown in Figure 35.

Figure 35 Prior knowledge of measures, waves 2-3



Base: All respondents (wave 2: 2,265, wave 3: 2,061). Source: Before you found out you could get help paying for the measure(s), which of these best applied to you?

Households living in older properties were more likely to say that they had heard of the measures but were not aware they could be installed in their home. This applied to 37% of households in properties built before 1945, compared with 26% in properties built in 1945 or later. Households that received underfloor insulation were also more likely to say that they had heard of the measures but were not aware they could be installed in their home (40%).

Some participants in the qualitative research knew a lot about different types of energy saving measures available and had done a lot of research but had come across barriers to installation, including the cost. Others were less familiar with the options available.

"I didn't know it was a real thing. I didn't even know it existed." (Female, 25-34, cavity wall insulation, wave 2)

If surveyed households had previously looked into installing the measures but had decided against it or had not taken it any further, they were asked why they decided not to have the measures installed. The most common reason at wave 3 was that households had researched the cost for the work but said it would have been too expensive (57%). Other reasons were that they did not know where to go for more information (17%), they didn't think there would be sufficient benefit from having the measures done (14%), that the work would have been too

disruptive (8%), they were put off by negative stories about energy efficiency measures (7%) and they did not have time (6%). Findings were similar at wave 2.

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