BEIS Electrification of Heat

Participant Recruitment Report

This report has been funded by BEIS on their behalf

CATAPULT Energy Systems
LCP Delta
Oxford Computer Consultants

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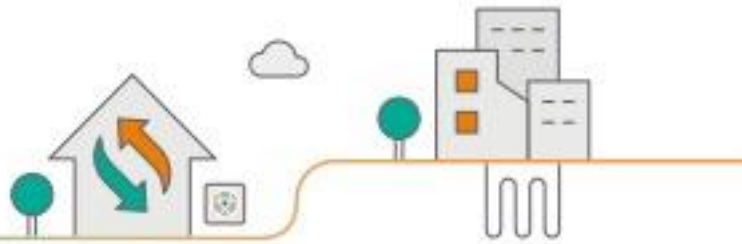

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Glossary

BEIS	Dept for Business, Energy and Industrial Strategy
DC	Delivery Contractor
DNO	Distribution Network Operator
EoH	Electrification of Heat
EPC	Energy Performance Certificate
EV	Electric vehicle
GDPR	General Data Protection Regulation
GSHP	Ground source heat pump (ground-to-water heat pump)
LA	Local authority
LPG	Liquified petroleum gas
MCS	Microgeneration Certification Scheme
NCC	Newcastle City Council
PV	Photovoltaic
QA	Quality assurance
SEO	Search engine optimization
SSE	Retail energy supplier bought by OVO in Jan 2020 (retail arm of SSE plc)
YHN	Your Homes Newcastle
AB, C1, C2, DE	Socio-economic status groupings (see Table 1)

1. Executive summary

1.1. Project background

The Electrification of Heat (EoH) demonstration project is funded by the Department for Business, Energy and Industrial Strategy (BEIS) and seeks to better understand the feasibility of a large-scale rollout of heat pumps across the UK. It aims to demonstrate that heat pumps can be installed in a wide variety of homes and deliver high customer satisfaction across a range of customer groups. It is also evaluating products and services that increase the appeal of heat pumps and identifying optimal solutions for a wide range of homes. The project is ongoing but the participant recruitment stage – to which this report refers – was completed in summer 2021. A report on the Home Surveys and Installation phases will be issued in due course.

The project is managed on behalf of the government by a consortium led by Energy Systems Catapult and including Delta-EE and Oxford Computer Consultants. Three Delivery Contractors (DCs) were appointed in June 2020 to recruit consumers, survey properties, install heat pump heating systems and monitor their performance. The DCs are:

- **E.ON:** working with Newcastle City Council and Your Homes Newcastle in the Newcastle area;
- **OVO Energy:** working with Kaluza, RetrofitWorks, Parity Projects and SunAmp in the South East of England; and
- **Warmworks:** working with Changeworks in the South East of Scotland.

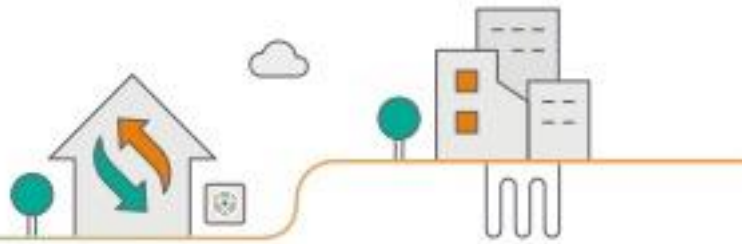
The project had a target to install heat pumps in up to 750 homes across Great Britain in a representative range of housing archetypes, with the majority on the gas grid. The project recruited participants from different social demographic groups through a customer journey including home survey and heat pump design. This process started in Autumn 2020 and was completed in Autumn 2021, with the delivery timeline severely impacted by COVID-19. The majority of recruited participants did not progress through to installation, because they either did not meet the project requirements or withdrew from the project. Overall, 742 heat pumps were installed as part of the project.

1.2. About this report

This report provides insights and data from the participant recruitment stage of the project, and insights into the participants' motivations and barriers for participating in the project.

The aims of this report are to provide a view of:

- Approaches to engaging and recruiting participants in the project,
- The reasons why participants did or did not decide to participate in the project,
- Differences in customer groups who were for / against heat pump installation,
- How customers can be better targeted for recruitment,
- What leads to greater customer satisfaction,



- Other lessons from the participant recruitment stage of the project.

A separate report will be produced by the project's Evaluation Contractor (ICF) which will consider how satisfied households were with each stage of the customer journey, including the recruitment stage, and to what extent the approaches used by contractors contributed to successful recruitment. This report will be based on direct research with participants and go into further detail on the participant experience.

1.3. Key findings

The report provides the following findings:

1.3.1. Level of interest in heat pumps

The project was very successful in generating high levels of interest from householders with 8,807 expressions of interest received. Whilst interest levels were likely influenced by the offer of a free heat pump, it indicates a potential high level of interest amongst householders for installing low carbon heating systems in their homes. About 40% (3,205) of those who expressed an interest were recruited to the project. The remaining 60% were 'triaged out' or dropped out before the home survey stage. In some cases, properties were only 'triaged out' for project specific reasons, e.g. recruitment quotas were met.

1.3.2. Targeting and recruiting customers

The three DCs in the project utilised different approaches to target and recruit customers. OVO focused recruitment on their own customer base whilst E.ON and Warmworks both targeted customers in geographical areas. All carried out housing stock analysis to identify areas of high potential and/or inform marketing campaigns.

The project was successful in recruiting a wide variety of customers across different tenures, ages and socioeconomic groups, and across a variety of property types. A wide variety of marketing approaches and channels were used to recruit households to the project. Social media and digital communications were dominant for OVO and Warmworks and were highly successful, accounting for over 30% of their project applications. E.ON also used these channels to recruit about a quarter of applicants, but due to the more targeted geographical focus of their project, they also relied heavily on traditional methods such as direct mail, which accounted for 35% of their project applications. The success of this route was partly due to content being endorsed by the Local Authority, who consumers perceived as a trusted local organisation to work with. Reaching a wide variety of customer groups required tailoring of marketing approaches – for example, using direct mail to reach customers who are less digitally engaged. Word of mouth was also found to be a key recruitment channel for at least one DC with over a third of their referrals stemming from this. Marketing costs per application varied widely. Working in partnership with other customer-facing organisations helped two DCs to minimise their marketing expenses.

Marketing materials to recruit customers focused messaging on the green, environmental, decarbonisation and clean benefits of heat pumps and this was found to resonate with the target audience. Secondary messaging in the project promoted the opportunity to receive a free heat pump and future proofing of homes. Potential fuel bill savings were not promoted to most customers given that these cannot currently be guaranteed for customers moving from mains gas to a heat pump, though this may change in future.

1.3.3. Motivations and awareness of heat pumps

Participants recruited to the project had varied levels of heat pump awareness prior to involvement in the project, from none to extremely knowledgeable.

The three most common reasons given for wanting to participate in the project were sustainability and low carbon heating (78%), interest in new technology (63%) and free heat pump installation (53%). It cannot be assumed that these motivations would be the same across the whole UK population as the recruitment messaging attracted certain groups or types of customers, for example those motivated by sustainability.

1.3.4. Customer barriers to proceeding with the project

The main barrier reported by participants to progressing to a heat pump installation was the disruption of having the heat pump installed. This was reported by 47% of participants who declined a heat pump installation. However, disruption was less often cited by participants motivated to join the trial because they needed a replacement heating system, suggesting that households needing a solution more urgently may be more tolerant. The second most common reason was potentially higher future heating costs, cited by 6% of participants who declined a heat pump installation[1]. Technical and practical barriers are explored in detail in the Home Surveys and Installation report, which will be issued in due course.

1.3.5. Managing a heat pump project

The project has provided insights into how to manage a large-scale heat pump installation project and useful lessons for a wider heat pump rollout. Firstly, recruiting, engaging and supporting customers was found to be resource intensive. Installing a heat pump can be a complex process and customers need the support to provide reassurance, and to ensure the design of the system meets their needs. Furthermore, customer dropouts should be expected at every stage of the journey and higher volumes of customers need to be recruited to account for this. In addition, external delays in progressing customers through to installation may need to be factored in – such as applying for planning permission and Distribution Network Operator (DNO) approvals.

1.4. Best practice and recommendations

Recommendations for organisations deploying heat pumps:

- **Targeting customers:**
  - Use a variety of marketing channels and approaches to recruit householders. This will enable a broad range of customers to be recruited.
  - Utilise existing customer relationships with organisations that customers trust. For example, OVO was successful in recruiting from existing energy supply customers, and E.ON utilised local authority endorsement to gain the confidence of customers who weren't necessarily supplied by E.ON.

[1] Heat pumps are more efficient than any other type of heating system, but the current cost disparities between electricity and gas mean that heat pumps can be more expensive to run than gas heating systems.

- Use environmental messaging to target customers around heat pumps. Be cautious about promoting fuel bill savings to customers where this cannot be guaranteed – this is especially important given the context of recent energy prices rises and the challenges of predicting future energy prices.

- **Early engagement** (i.e. initial contact prior to the home survey)**:**
  - Provide customers with an overview of the customer journey so they know the stages to anticipate and what the process will entail.
  - Set expectations with customers about what installing and living with a heat pump will entail, especially around the potential level of disruption during install.
  - However, on both of the above points, careful communication is required:
    - To ensure the right level of information is provided at each stage. It is recommended that customers are provided with high level information at the early stages of engagement, and much greater detail is given at a later stage – such as during the home survey. Heat pumps are a new technology for most UK consumers, and this would help to ensure customers are not unnecessarily overloaded with information and/or deterred from installing a heat pump.
    - Communication needs to come from an appropriate individual. The project found that early conversations are successful with a skilled customer service member of staff who can explain information to customers in accessible language and provide reassurance. More detailed information, which is inherently more technical, should however be provided by a heat pump surveyor or someone with greater technical knowledge.
  - Give customers a key contact who they can contact throughout the process for queries and questions – this can reduce the complexity and provide reassurance. This should be a person skilled in customer service.
  - Maximise the use of triaging at the start of the customer journey to identify issues (such as space constraints or presence of microbore piping) at an early stage and reduce customer dropout later, as this saves resource.
  - Accommodate customer preferences into the design process as early as possible to increase customer satisfaction with their installation process and their new heat pump system.

- **Managing the process:**
  - Consider the resources required to properly engage recruit and support customers.
  - Factor in dropouts at each stage of the customer journey.
  - Factor in delays in progressing customers to installation, such as planning permission or DNO connection request approval. This project experienced additional delays due to the impacts of the COVID-19 pandemic.

- **Upskilling contractors:** e.g. installers, surveyors, retrofit coordinators in relation to customer communications. Technical experts may not be the best people to have conversations with customers at an early stage of the process. Instead, contractors should ensure they have staff who have good customer service and communication skills, as well as a minimum level of technical knowledge, to successfully communicate with customers.

Recommendations for Government and industry:

- **DNO approvals:** approval processes to connect heat pumps to electricity networks needs to be more consistent, faster and have capacity for bulk applications. This is covered in greater detail in the Home Surveys and Installation report.
- **Planning permission**: there is a need for greater consistency of planning permission rules in different areas and an assessment of whether rules could be changed to deliver better consumer outcomes and to enable greater numbers of heat pumps to be installed. In the current situation, certain property types will not be able to be fitted with heat pumps due to noise and boundary issues related to planning permission, but there is a lack of evidence to say whether these rules are appropriate.
- **Technical solutions**: the key customer barrier to installing a heat pump was disruption and many of these cases related to existing microbore pipework in homes. Technical solutions to make a heat pump installation less disruptive could significantly help overcome this barrier. In some instances, it can also be that current guidance is not fit for purpose – for example, the Microgeneration Certification Scheme (MCS) guidance on microbore pipework is being amended.
- **Guidance to industry**: better guidance to industry (e.g., installers, surveyors, retrofit coordinators) on how to successfully engage with customers.

2. Introduction

2.1. Introduction

This report provides findings on the participant recruitment stages of BEIS' Electrification of Heat (EoH) demonstration project. The project aimed to install up to 750 heat pumps across the UK through three Delivery Contractors (DCs) to understand the feasibility of a mass rollout of heat pumps.

2.2. Aims

The aims of this report are to provide a view of:

- Approaches to engaging and recruiting participants in the project.
- The reasons why participants did or did not decide to participate in the project.
- Differences in customer groups who were for / against heat pump installation.
- How customers can be better targeted for recruitment.
- What leads to greater customer satisfaction.
- Other lessons from the participant recruitment stage of the project.

The report summarises approaches used across the project and highlights differences between DCs. Lessons learnt from this project are essential to understand how a wider heat pump rollout can take place across the UK. This report helps to understand how householders can be motivated, engaged and recruited to install heat pumps. It also considers how to ensure high customer satisfaction and reduce customer barriers.

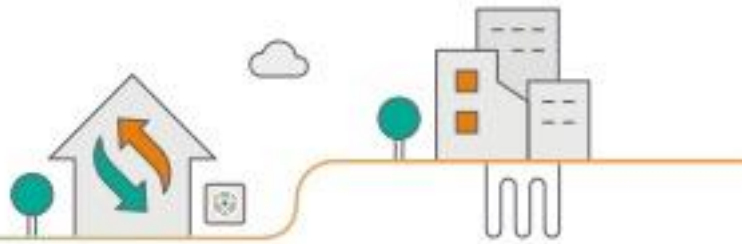
A separate report will be produced by the project's Evaluation Contractor (ICF) looking at how satisfied households were with each stage of the customer journey, including the recruitment stage, and to what extent the approaches used by contractors contributed to successful recruitment. The Evaluation Contractor report will be based on direct research with participants and go into further detail on the participant experience. More details on the property types involved in the project and heat pump types installed, as well as lessons from the survey and installation stages of the project, are contained within the Home Surveys and Installation report.

Contextual information about the project that is relevant for this report is provided in Section 3.1.

2.3. Sources of data used for this report

Data provided in this report derive from three sources:

- **The Electrification of Heat project Database** (stored in USmart): this is the central database used for the project where all participant, survey, design and installation data are held. Data was extracted for the purposes of this report in mid-December 2021. The findings in this report are based on 3,205 properties which had passed through the initial triage process to have a pre-recruitment survey (and may have proceeded to undergo a technical survey and design). An overview of which project stages the data in this report has been extracted from is given in Section 3.1 below.



- **Qualitative lessons arising from meetings with Delivery Contractors (DCs)** throughout the participant recruitment stage on emerging findings. Meetings included: initial structured interviews with DCs about their recruitment approach, monthly operation meetings throughout the recruitment period, and a final workshop focused on lessons from this stage of the project.
- **DC triage reports:** Reports were provided by each of the DCs detailing the results of their recruitment and triage stages of the project, including their recruitment strategies, triage processes, triage statistics and a discussion of how recruitment barriers could be overcome.

2.4. Caveats

All findings should be interpreted in the context of the design and structure of the project. Relevant contextual issues have been noted in the main body where required.

3. Project context

3.1. Project stages

Figure 1 below shows the key stages of the EoH demonstration project. Participants were recruited through a variety of means and eligible householders were taken through to a home survey to assess the feasibility of different heat pumps and any energy efficiency upgrades required to make the home 'heat pump ready'. Following a successful design, the heat pump system was installed. Once installed, the heat pump performance is being monitored in the ongoing monitoring phase.

The aims of the eligibility triage stage were:

- Ensuring participants and their properties met the project requirements e.g. target geographical area, tenure.
- Managing quotas, for example on property type and age.
- Assessing the likelihood of success based on property details, such as ensuring sufficient space for the heat pump unit.
- Discussing with the participant the process to set expectations.

Participants who were 'triaged out' at this initial stage were done so on the characteristics of their property or because quotas for certain types of householders had been met. They were not triaged out for social, motivational or awareness raising reasons. Further detail of the triaging stage is contained in the Home Surveys and Installation Report.

The boxes below the flow diagram show the key databases where data from the project has been captured. This report is based on the mass recruitment and eligibility triage process stages. Property data contained in this report is based on the home survey information database (as this is the stage at which property data is collected). Participants drop out at each stage of the journey and therefore the number of customers in the recruitment database is higher than the home survey database.

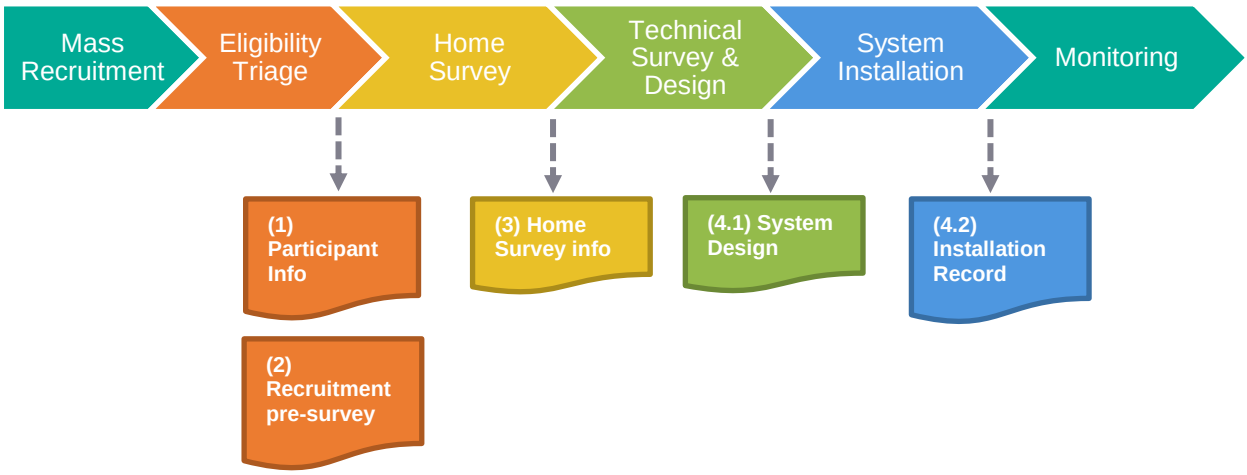
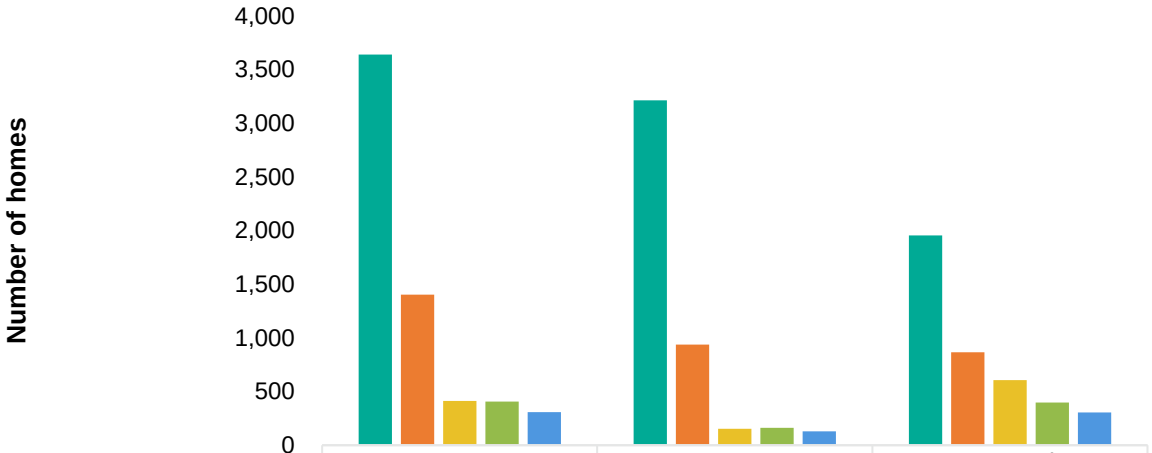


Figure 1: Flow chart of key project stages and databases

The number of participants involved at each stage of the customer journey is shown by Delivery Contractor (DC) in Figure 2. About 36% of those who expressed an interest were recruited to the project. The remaining 64% were 'triaged out' or opted out before the home survey stage. As highlighted above, many participants were triaged out at this stage due to project eligibility (e.g. quotas of property types reached, outside of geographical area), some due to the suitability of their property and others dropped out at this stage. OVO triaged out a higher proportion of interested customers because many were outside of the trial postcode area, whereas the other DCs marketing was more targeted at specific geographical areas.

Differences in DC approaches at the survey and design stages are explored in the Home Survey and Installation report.



	E.ON	OVO	Warmworks
Application received	3,639	3,214	1,954
Recruited	1,403	936	866
Heat pump recommended	412	153	605
Technical design done	406	162	397
Heat pump installed	309	128	305

Figure 2 Number of participants involved at each project stage

3.2. Definition of 'participant'

Participants in the EoH demonstration project are those who progressed past the initial 'eligibility triage' process to an initial recruitment pre-survey or home survey. It is important to note that customers who expressed interest in the project and *did not* progress past the initial eligibility check are *not* counted as participants. This is because data was not collected on these customers for GDPR reasons i.e. their data was not required for the project and so was not collected.

3.3. Target quotas

To achieve a mix of types of households and properties participating in the project, each DC had several quotas to achieve with their heat pump installations. This included a mix of

socioeconomic groups and property type and age. These are outlined in Table 1, along with the quotas achieved. On the whole, the targets were met within permitted variance, meaning the project was able to recruit a diverse set of customers and property types. The mix of homes and customers presented in this report should be taken in the context of the project design around target quotas. Recruitment approaches were planned, monitored and adapted to meet these quotas.

Table 1: Target quotas for property types to be recruited in the project and final installed mix

Criteria	Group	Target quota	Final installed mix	Within permitted variance
House Type	Detached	40%	41%	Yes
	Semi-detached / end terrace	40%	43%	Yes
	Mid terrace	15%	11%	Yes
	Flats	5%	6%	Yes
House Age	Pre-1919	10%	8%	Yes
	1919 to 1944	20%	14%	Yes
	1945 to 1964	20%	24%	Yes
	1965 to 1980	20%	22%	Yes
	1981 to 1990	10%	9%	Yes
	1991 to 2000	10%	10%	Yes
	2001+	10%	13%	Yes
Socio-economic status of the household reference point	AB. Higher and intermediate managerial, administrative or professional occupation	25%	25%	Yes
	C1. Supervisory, clerical and junior managerial, administrative or professional	30%	35%	Yes
	C2. Skilled manual workers	20%	17%	Yes
	DE. Semi and unskilled manual workers, state pensioners, casual or lowest grade workers, unemployed with state benefits only	25%	23%	Yes

In addition, the trial wanted to test a range of heat pumps and technologies so the DCs had quotas in terms of types of heat pump fitted and associated technologies. These are discussed in the Home Surveys and Installation report for the project.

3.4. Timelines and the impacts of the COVID-19 pandemic

An overview of timescales for the project and key recruitment stages are provided in Figure 3.

Figure 3 Project timescales

The COVID-19 pandemic had a major impact on the project given the recruitment of householders happened over 2020-2021. Restrictions on entering customer properties and social distancing measures were in place over autumn 2020 to spring 2021 – in some cases customers couldn't be visited unless it was essential. Even as restrictions lifted, some customers were uncomfortable with visitors in their home, creating delays on surveys and installs and some cancellations. Overall, the impact of the COVID-19 pandemic was to delay the recruitment, survey and installation stages of the project. Figure 4 below shows that over three quarters of installations took place between March and September 2021 when most COVID-19 restrictions were lifted.

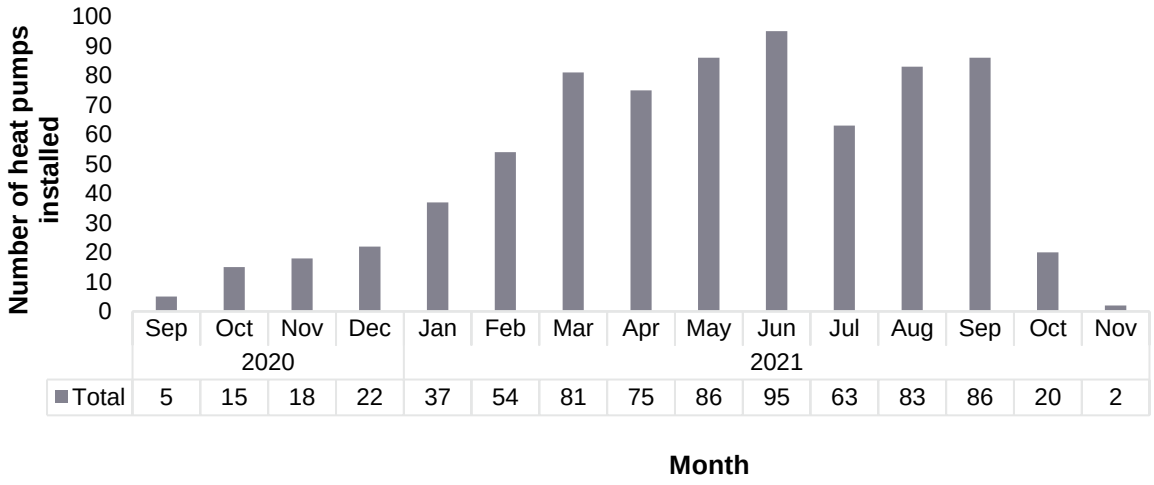


Figure 4 Number of heat pumps installed each month of the installation phase of the project

4. Recruitment approaches

This section provides an overview of the recruitment and marketing approaches taken within the project to initially engage customers. An overview of approaches is used, followed by a description of each DC's approach, and then lessons from this stage of the project.

4.1. Overview

Figure 5 provides a summary of the marketing and recruitment approaches taken by the DCs to obtain initial expressions of interest. Each DC used a different combination of approaches – and not necessarily all the methods outlined below. The approaches adopted by each DC are

detailed in the subsequent sections. Approaches evolved over the course of the project to meet recruitment targets and learning lessons from earlier project activity.

Overall lessons on recruitment and marketing strategies are provided at the end of this section (section 4.5).

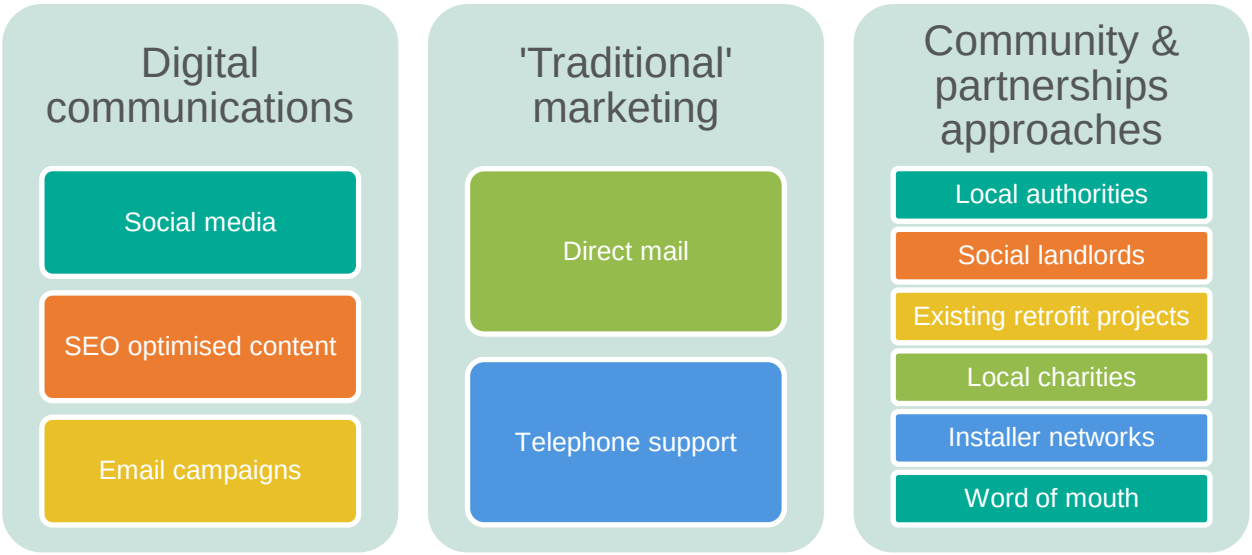


Figure 5: Overview of recruitment approaches used in the project

4.2. E.ON: description of recruitment approach

4.2.1. Geographical area

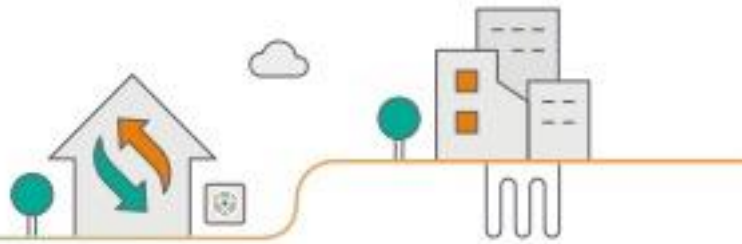
E.ON's trial focused in Newcastle and the surrounding area. Initially this was a largely urban area, but throughout the trial has expanded in to semi-urban and semi-rural areas within surrounding Northumberland, Gateshead and North Tyneside. The Newcastle City Council area contains approximately 138,000 homes[2], of which about half are owner-occupied and over a quarter are social housing. Of the three EoH trial areas, E.ON's was the smallest geographical area.

4.2.2. Customer journey

The process for E.ON's customers was as follows:

- Interested customers could express interest via the Council website, phone E.ON or go via various community groups. Customers would complete an initial application form and this would be sent to E.ON.
- E.ON would then undertake a pre-qualification call with the customer: a triage process to get all recruitment data and a decision on whether to progress to survey stage or not based on eligibility and suitability. Reasons for this are recorded at this stage.

[2] As of January 2020



- E.ON assessed the suitability in two stages following the receipt of a customer application – a desktop review to assess basic technical suitability criteria of the property (e.g. space for a heat pump) and a conversation with the customer to further assess suitability.

4.2.3. Targeting properties

To identify areas of the city to target for the project, E.ON carried out analysis of property types across the city using an in-house tool, ThermCERT. The tool uses a range of datasets for this analysis, including EPCs, UK Census, Index of Multiple Deprivation and thermal heat loss data. Additional data was provided from project partners Your Homes Newcastle (a social housing provider), and Newcastle City Council. The analysis enabled identification of areas within the city at Lower Super Output Area (LSOA)[3] with high density of required property types. This enabled E.ON to target their campaign in these areas and carry out specific targeted marketing activities.

The analysis also showed that detached properties were less prevalent in Newcastle than the UK average. Given E.ON had target quotas to recruit detached properties, this insight enabled E.ON to design a recruitment approach which prioritised this need.

E.ON's approach was targeted in very specific and defined areas within Newcastle. However, they expected to receive some interest from householders situated in surrounding areas too.

As the project progressed and E.ON monitored their recruitment targets, there were some property types which had been harder to progress to install. For this reason, E.ON broadened the geographical area as described above. Overall, approximately three quarters of participants were from within Newcastle City, and one quarter from the surrounding areas.

4.2.4. Targeting customers and messaging

Informed by previous experience of delivering heat pump projects in other areas, E.ON identified customer segments to target their marketing at. This included early adopters, those who are green minded, and those who were interested in the opportunity to get a free heat pump. A smaller segment of customers whose boilers had broken were also targeted.

Due to this target audience, marketing messaging focused on the green, clean and environmental benefits of heat pumps. This was in contrast to previous projects undertaken by E.ON in off-gas areas where E.ON had focused the message on reducing fuel bills; given the on-gas focus of this project, that message was not appropriate because bill savings were uncertain due to current differences between the price of gas and electricity. However, it was found that the green messaging worked well in recruiting enough customers for the project.

4.2.5. Marketing to potential customers

E.ON deployed a variety of communication methods to target potential customers. In contrast to the other DCs, E.ON's approach heavily relied on traditional forms of marketing (such as direct mail) as well as social media. This choice of marketing channel was chosen due to E.ON's close collaboration with Newcastle City Council. Having the endorsement of the local authority on the direct mail materials also helped give homeowners confidence in the scheme

[3] Output Areas are standard geographical areas used for the publication of place-based data. LSOAs have a population of between 1,000 and 3,000 people or 400-1,200 households.

An example of a web banner used in social media marketing is shown in Figure 6. Figure 7 shows the customer journey graphic shown to customers in the recruitment stages. A sample letter and leaflet are included in Appendix A.

Figure 6 Web banner used in EON recruitment marketing

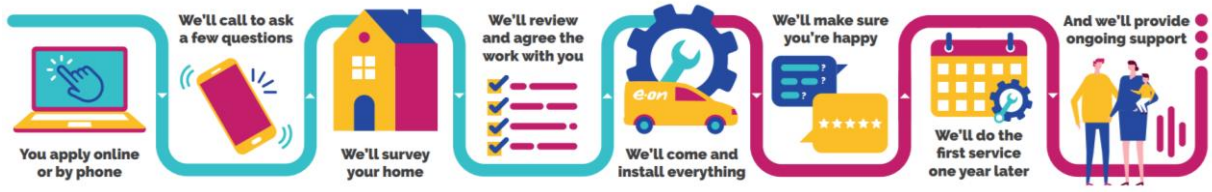


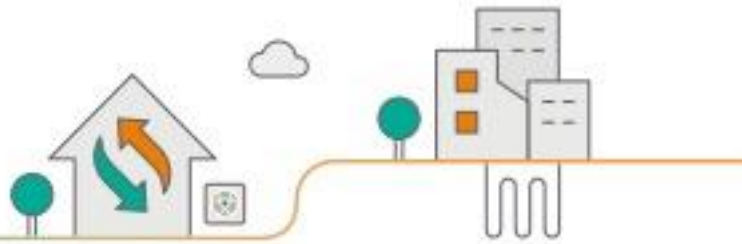
Figure 7 EON customer journey graphic presented to customers

Private homes

E.ON identified the geographical areas they wanted to focus their private home recruitment efforts on and used a multi-pronged approach to then target these households:

- A direct mail was sent to householders,
- Communications via email and phone also took place for specific LA led referrals,
- Building community awareness via Newcastle City social media accounts,
- A specific webpage on the LA's website.

Customer marketing materials were branded Newcastle City Council and the marketing activity was delivered by them. This is an approach that E.ON have found to be successful in previous projects based on the level of trust in the local Council. This also avoided customer confusion of receiving a letter from E.ON if this is not their energy supplier.



E.ON supplemented this with digital marketing, including social media (i.e. social media adverts) and email campaigns to E.ON customers. A digital marketing agency led this element of the work and were able to carry out campaigns at a very targeted and specific geographical level. The digital marketing could run 'in the background' whilst other marketing approaches were ongoing, and were successful in generating leads.

Throughout the project, the LA website had a core hub of information where householders could find out more about the project. This provided all the information customers would need to know about the project, basic information about heat pumps, FAQs and links to further information. E.ON were careful to pitch the content appropriately to the audience and not overwhelm customers with information.

Social housing

To recruit social housing tenants (which was intended to be a relatively small proportion of customers in the project), E.ON worked with Newcastle City Council (NCC) and the Registered Social Landlord 'Your Homes Newcastle' (YHN) – this partnership working was essential to the success of their project. They developed a 'rapid response' marketing plan, allowing for immediate sign-ups of social housing tenants to the project whilst the private sector scheme was launched through various channels.

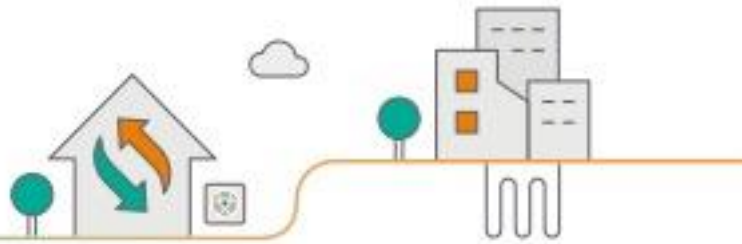
E.ON worked closely with Resident Liaison Officers at NCC and YHN to engage tenants. YHN identified properties in their stock which would be suitable for heat pumps, especially where there were long standing tenants, and carried out the initial contact with tenants before passing their contact details to E.ON.

E.ON were very careful to ensure any tenants would not be negatively impacted by higher fuel bills with a heat pump – they carried out detailed running costs calculations for the first customers to ensure the project was affordable before rolling out to other tenants. National Energy Action was also a partner in the project – they supported E.ON to design the customer journey and provided energy advice to participants.

4.2.6. Recruitment outcomes

Overall about a third of E.ON's leads came from direct mail (35%). A further 18% came through digital lead generation and 11% were through word of mouth. Email campaigns, the Local Authority website and social media each generated approximately 9% of leads. The remaining 10% came through a mix of sources such as magazine adverts, installer lead generation and staff briefings. E.ON reported that the more targeted direct mail campaign yielded better quality applicants than digital channel applicants, who tended to be more likely to drop out.

The costs per lead were approximately £17 for direct mail (including brand and collateral design costs), £10 for email campaigns with E.ON customers, and £38 for digital lead generation through an external agency. The direct mail costs were minimised by working with the Local Authority's own internal delivery teams rather than a marketing agency. E.ON found that the cost per lead from digital marketing ended up being higher than budgeted. This was because social media adverts needed to be refreshed more frequently than anticipated to avoid negative reactions and comments about heat pumps from some social media users who may be 'anti' heat pumps.



4.2.7. Managing recruitment

At the recruitment stage of the project, one of the key challenges was knowing what the drop-out rate of participants would likely be and therefore how many homes needed to be recruited to the early stages of the process. Whilst E.ON have a lot of experience in delivering heat pump projects in off-gas areas, few projects have been carried out in on-gas areas, making it hard to predict likely interest levels.

E.ON monitored their progress with recruiting against quotas weekly. They intentionally phased their recruitment approach to target the groups they thought would be most difficult to recruit first. Once it was evident that some groups were harder to reach than others, the focus of marketing campaigns centred on these groups e.g. detached properties. Social housing tenants were particularly difficult to recruit during the period impacted by the COVID-19 pandemic.

4.2.8. Customer journey

The process for E.ON's customers was as follows:

- Interested customers could express interest via the Council website, phone E.ON or go via various community groups. Customers would complete an initial application form and this would be sent to E.ON.
- E.ON would then undertake a pre-qualification call with the customer: a triage process to get all recruitment data and a decision on whether to progress to survey stage or not based on eligibility and suitability. Reasons for this are recorded at this stage.
- E.ON assessed the suitability in two stages following the receipt of a customer application – a desktop review to assess basic technical suitability criteria of the property (e.g. space for a heat pump) and a conversation with the customer to further assess suitability.

4.3. OVO: description of recruitment approach

4.3.1. Geographical area

OVO's EoH trial area was the South East of England, as defined by NUTS1 regions[4]. This large area totaling 3.7 million homes covers both rural and urban areas but excludes London. Households from across the area were eligible for the OVO trial (although the main target for recruitment was OVO customers) and recruitment activity took place across the region. OVO's main recruitment approach was digital, and they did not concentrate this on specific geographical areas. However, mapping of the region identified areas of population density and where specific property types will be. Use of Parity Project's CROHM (Carbon Reduction Options for Housing Managers) tool – a bespoke housing stock modelling tool – helped OVO to understand property types across the region.

[4] The counties in this region are: Buckinghamshire, East Sussex, Hampshire, the Isle of Wight, Kent, Oxfordshire, Berkshire, Surrey and West Sussex.

4.3.2. Project partners

OVO was the lead partner and provided access to a large customer base to make the recruitment of a range of house and customer types possible. They were responsible for marketing, recruitment and key point of customer contact throughout the project.

Key partners working with OVO were:

- Parity Projects – they develop cost-effective retrofit programmes that meet customers' cost, comfort and carbon goal using data science, software and analysis. Their role in the project was to model housing stock in the region.
- RetrofitWorks – they operate a cooperative of installers across a range of skill sets and trades. In the project they used 'Retrofit Coordinators' who build the property specification, liaise with the installer network and coordinate the job. They also recruited and trained surveyors to review the remote surveys and produce a final specification for each house.
- Partners for installation, maintenance, hardware and monitoring elements of the project.

4.3.3. Customer journey

Key steps in the OVO customer journey were:

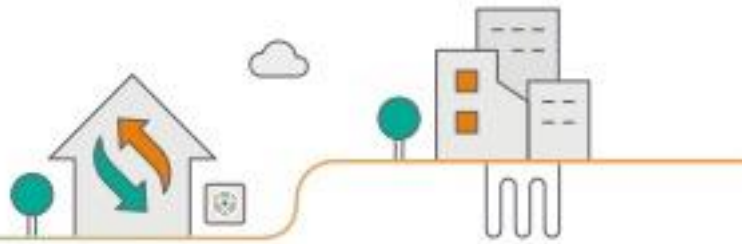
- Initial recruitment and marketing (carried out by OVO),
- Initial expression of interest by customer and eligibility check,
- Remote survey carried out over the phone,
- Customer is passed to Retrofit Works,
- A Whole House Plan survey is carried out (by RetrofitWorks),
- The customer signs the T&Cs,
- Technical survey in-house is then completed,
- Installation through a variety of partners.

OVO are the main point of contact for customers throughout the project with Retrofit Works coordinating the installation phase specifically.

4.3.4. Target customers

At the start of the project, OVO anticipated the need to contact 60,000 customers to recruit a sufficient number and mix of householders. OVO drew on their own customer base in order to find this large volume of customers and this was the main target group.

OVO began recruitment by reaching out to their OVO Beyond customers base- a group of engaged members who pay a monthly premium to benefit from greener energy (100% carbon neutral) and extra tree-planting. This group of customers were felt to be a prime audience for being interested in decarbonising their home further, and potentially be interested in fitting a heat pump. Secondary target audiences within OVO's customer base included those on EV or



solar PV tariffs – again, it was assumed that this audience would be motivated to decarbonise their home heating system.
Despite the focus of OVO's recruitment approaches being their own customers, the campaign was open to any eligible households in the target geographical area. A webpage on OVO's website provided information to potential participants, and it was made clear through other communication channels that participants for the trial did not need to be OVO customers.

In addition to target OVO customers, there were other target audiences to ensure all recruitment quotas were met:

- OVO employees, especially their heating engineers – this helped to reach other socioeconomic groups.
- Customers on CORGI's database requiring a boiler replacement (a project partner).

  Customers from SSE's customer base (who OVO are taking on as customers).

OVO felt there were several benefits of targeting their own customers in the project:

- It was a captive target audience likely to be interested in a heat pump given their green credentials.
- OVO were able to provide additional support service to these customers given they purchase energy from OVO – such as advice on energy tariffs.
- It was interesting from a project demonstration perspective as it allowed the project to explore how successful an energy supplier might be as a vehicle to engage customers with heat decarbonisation.

OVO customers represent a mix of demographics, which was beneficial given OVO needed to recruit a wide variety of customers. However, OVO hold limited information on customers' properties which means they could not target customers with specific properties.

4.3.5. Marketing approaches

To reach potential customers, OVO used a variety of marketing channels but focused on digital communication.

An email campaign to their own customers – starting with the 'OVO Beyond'[5] customers – was a very successful route to engagement, resulting in over 2,000 leads. OVO had planned to test the appeal of different messaging e.g. the appeal of 'a brand new heating system' vs. 'new technology for your home', but after receiving so much interest following their initial email campaign they elected not to run the follow on campaigns.

They also used SEO (Search Engine Optimisation) content. OVO were able to monitor traffic volumes on their website and observed a large increase following the SEO content. Alongside this, the OVO Brand team launched a paid media campaign which included: YouTube,

[5] 'OVO Beyond' is an add-on service to OVO Energy tariffs. Customers pay a fixed monthly fee to offset the carbon emissions from their energy supply, receive energy efficiency advice, and support the planting of trees and preservation efforts.

Facebook, Instagram, as well as advertorials with home improvement media partners. This resulted in a large volume of non-OVO customers registering their interest in the trial.

4.3.6. Recruitment outcomes

Of the over 3,200 participants that registered an interest in the scheme, 25% came through internal communications to OVO and SSE staff, about 33% came from email campaigns, and the other 42% came from a mix of other sources including brand activity and blog content.

Example marketing materials from OVO are shown in Figure 8 below and in Appendix A.

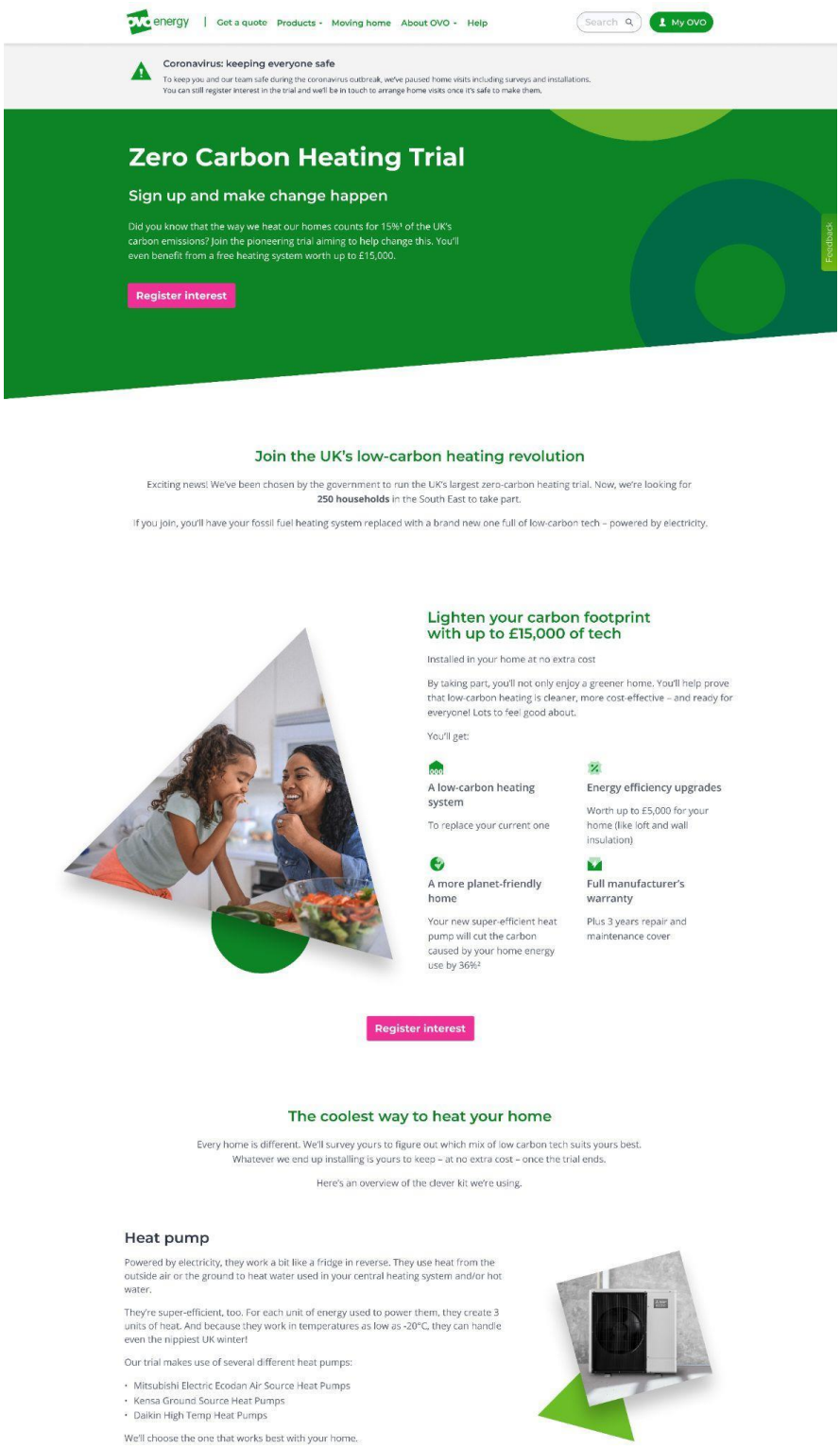
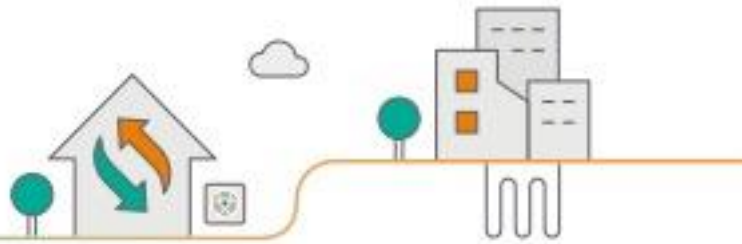


Figure 8: OVO landing page for customer registration



4.3.7. Messaging

The key messages OVO used in their marketing materials were around decarbonisation and the environmental benefits of heat pumps, as well as the offer of a free heat pump system. Content was designed to be as engaging and appealing as possible based on OVO's experience of running campaigns in the past, behavioural analysis and click through rate engagement Comparative testing of different messages with different audience segments was planned initially but proved unnecessary after the success of the first email campaign.

OVO worked with a variety of partners who had contact with customers, but it was made clear to customers throughout that the project is run by OVO – to ensure customers have clarity and are able to reach out to OVO if required.

4.4. Warmworks: description of recruitment approach

4.4.1. Background

Warmworks is a Scottish delivery organisation who have managed several energy efficiency and heating upgrade projects, including Warmer Homes Scotland, prior to the Electrification of Heat demonstration project. Previous programmes Warmworks ran had focused on replacing broken heating systems for householders in fuel poverty, as well as the installation of insulation and renewable measures. One of the biggest differences with the EoH project was recruiting householders in the 'able to pay' group.

Warmworks worked closely with Changeworks, a joint venture partner. Changeworks is an environmental charity based in Scotland who work with households, including vulnerable households, to improve energy efficiency and reduce fuel poverty.

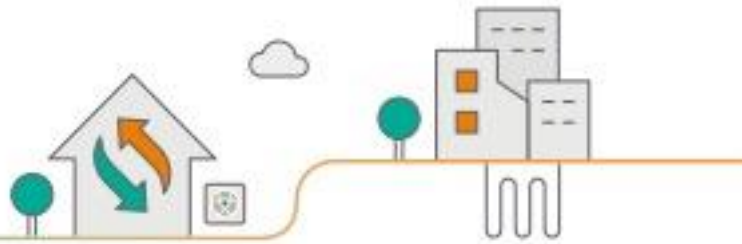
4.4.2. Geographical area

Warmworks' trial area was the Southeast of Scotland. This area spans five local authority areas (Fife, Edinburgh City, Midlothian, East Lothian and the Scottish Borders) and encompasses a broad range of urban and rural areas. This geographically targeted approach helped Warmworks to identify suitable properties and focus marketing approaches in these geographical areas.

4.4.3. Customer journey

The Warmworks customer journey involved the following steps:

- Initial recruitment was carried out by Changeworks, an environmental charity and partner of the project with Warmworks,
- Applicant records expression of interest,
- The initial triage of applicants was carried out by Changeworks. Householders would speak to an advisor and an initial screening would take place. The customer was then passed to Warmworks,
- Warmworks carried out an initial home survey,
- Following this, a contractor carried out an in-depth home survey to design the system.



- Offer was made,
- The installation then took place,
- An independent QA check of the installation was carried out by Warmworks, and
- Aftercare advice and customer satisfaction survey.
- Throughout the customer journey, Warmworks had contact with the customer.

Warmworks found that a lot of properties were screened out at the initial triaging stage because a heat pump was not judged to be feasible within the project constraints. Whilst some customers cancelled during the process – often because of the disruption of installation – Warmworks re-contacted a small number of participants towards the end of the project and found that some customers were interested in progressing after time to think about it.

4.4.4. Identifying suitable properties

The first stage of the recruitment process was to identify geographical areas of high potential. Changeworks carried out analysis of the housing stock in the target region with the following steps:

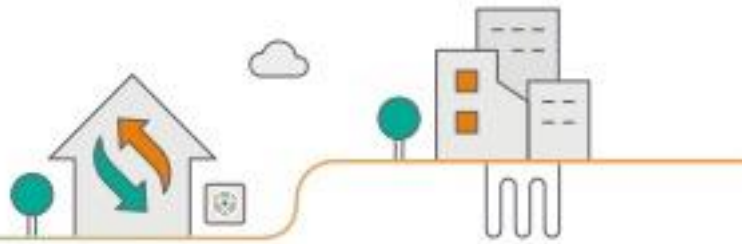
- Drew on a wide variety of housing data including the Energy Saving Trust's Home Analytics, Scottish House Condition Survey, Heat Map, data from social landlords and local authorities,
- Identified properties more likely to be suitable for a heat pump based on energy efficiency data and age of existing heating system,
- Excluded properties with other characteristics which may have reduced their feasibility for a heat pump e.g. listed building status,
- Aggregated data to provide overall data for geographical areas,
- Merged property data with socioeconomic data,
- Mapped data to provide visual representation of areas with high potential for a heat pump campaign.

The data and maps identified specific geographical areas to target for campaigns and marketing and provided confidence that the required quotas could be met.

4.4.5. Marketing channels

Marketing of the project to potential applicants was led by Changeworks. They deployed a range of marketing channels to recruit householders:

- Email campaigns,
- Social media,
- Landing page on their website,
- Direct mail in targeted geographical areas,



- Local press.

Example social media posts by Changeworks are included in Appendix A.

Of the almost 2,000 expressions of interest Warmworks had in the project, 37% came through social media, 34% through word of mouth, 13% through website and the remainder through a variety of channels.

Changeworks and Warmworks also built on existing relationships with communities and local authorities, and co-branded materials where possible, providing credibility and trust for householders. Both organisations have led and been involved with many community level energy retrofit programmes and were able to leverage on this. For example, Changeworks run a local energy efficiency hub in Peebles and through this were able to send an email campaign to local householders who had previously expressed interest in low carbon heating. Other Energy Efficient Scotland projects were used as a starting point for promoting and referring householders. Warmworks also used word of mouth by encouraging the promotion of the project through personal networks.

Warmworks aimed to target roughly 5,000 householders for the project to generate sufficient interest levels. In total, they received 1,854 applications. The expectation was that 350 of these would be taken forwards for a home survey to reach 250 installs. It was quickly found that more households than anticipated were screened out at the survey and design stages, so in total 866 were progressed to the home survey stage in order to meet the final (altered) installation target of 305 heat pumps.

4.4.6. Recruitment outcomes

Of the almost 2,000 expressions of interest Warmworks had in the project, 37% came through social media, 34% through word of mouth, 13% through website and the remainder through a variety of channels.

Overall engagement and marketing costs worked out to be about £32 per project application and £206 per heat pump installation. Social media proved to be more cost competitive than direct mail, costing under £4 per application from the social media campaign versus almost £52 per application from targeted letters.

Changeworks reported that social media users responded well to social media ads at the launch of the project, but like E.ON they found that negative comments did become more regular as the campaign progressed.

4.4.7. Customer journey

The Warmworks customer journey involved the following steps:

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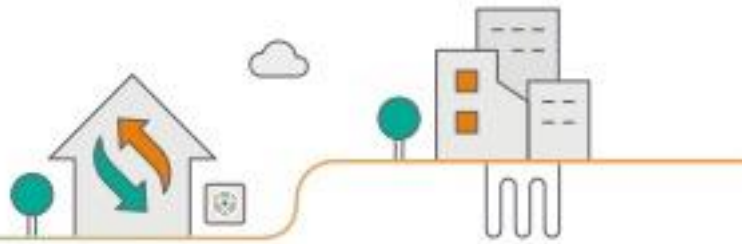

- Warmworks carried out an initial home survey,
- Following this, a contractor carried out an in-depth home survey to design the system.
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4.4.8. Messaging

The messaging Warmworks used to target householders focused on saving carbon and becoming greener, since they expected that environmental benefits would be a motivation for the target audience. Messaging around fuel bills was considered carefully since the impact on fuel bills would vary between households and Warmworks wanted to be clear on expectations.

It was found that adverts mentioning words such as “sustainably”, “renewable technology” and “free heat pump” generated the most unique click throughs and post engagements. Messaging towards the end of the campaign saying that many homes had already signed up was also thought to have contributed to the success of later adverts.

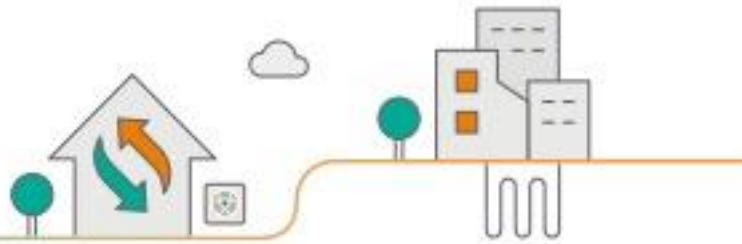
Overall, the customers that responded most to Warmworks’ recruitment were those already taking action to reduce their carbon emissions, social media users and whose who were ready to upgrade their home heating system.

4.5. Lessons from marketing and recruitment approaches

This section provides lessons on which recruitment and marketing techniques worked well within the project, and which worked less.

4.5.1. Overall interest

Overall interest in the project was high with 8,807 expressions of interest in the project registered, and exceeding DC expectation on the level of interest they would get. It should, however, be remembered that customers were offered a free heat pump, meaning levels of interest are likely to be higher than where customers receive a discounted or full price heat pump.



4.5.2. Housing stock analysis

As a first step in the recruitment approach, all three DCs undertook housing stock analysis across their area using third party or specially designed tools, which helped to:

- Confirm prevalence of property types and/or demographics.
- Enable them to identify areas with high potential for heat pumps.
- Target campaigns on very focused geographical areas.

This type of analysis could be rolled out to further areas in a larger heat pump rollout to identify areas of high potential for heat pumps and focus marketing campaigns.

4.5.3. Marketing channels

The project deployed a range of marketing approaches, and this multi-pronged approach worked well.

Digital channels

All three DCs utilised digital marketing channels, including email campaigns, social media, SEO optimised content and websites. These were the dominant approaches for Warmworks and OVO, whilst it supported other marketing channels for E.ON. Digital approaches were highly successful, allowing campaigns to be targeted in specific areas or at specific groups. However, this approach did not reach all customer groups (as detailed later in the report) and other routes – such as direct mail – helped to reach other customers. One DC also reported that customers recruited through digital channels were more often just wanting to find out more about the offer and tended to be less likely to proceed to the next stage of the customer journey.

'Traditional marketing' methods

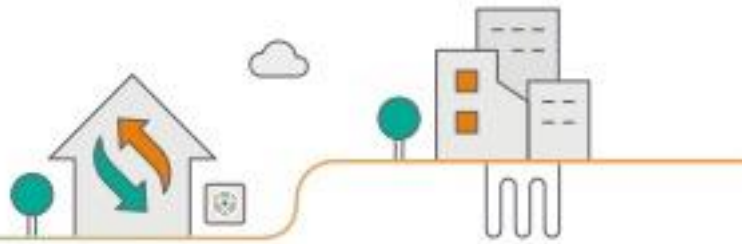
E.ON, and to a lesser extent, Warmworks, utilised traditional methods of direct mail and telephone. This was also a successful approach but largely amongst specific sociodemographic groups. It was found that direct mail appealed to a broad set of customers, and it was particularly successful with LA endorsed content. Warmworks used direct mail in a targeted way where it was found that C2 and DE social groups were not responding to social media campaigns as well as other socioeconomic groups.

Partnership and community approaches

All three DCs worked with social housing providers to recruit social housing tenants and these partnerships were critical. Local authority branding was utilised in communications as a way of building trust and credibility. Warmworks also utilised relationships with local communities and existing energy retrofit projects.

Other routes

Another recruitment route which proved to be successful for at least one DC was 'word of mouth'. Approximately one third of Warmworks' referrals came through this route showing the potential strength of this route. Anecdotally it is suggested that these referrals stem from the DC's – and their partner's – presence in the local areas for environmental and energy industry.



OVO were able to recruit householders from their customer base; this was successful given the large customer base and environmentally minded customers OVO has. This highlights a potential role for energy utilities as a vehicle to engage customers with heat pumps.

Adaptation of marketing approaches

Recruitment approaches had to adapt as the project progressed, although this was largely as a function of needing to meet target quotas which were a project-specific element. This included:

- Warmworks: engaged with Councillors and carried out direct mail to reach groups they were struggling to recruit (as highlighted above).
- E.ON: widened their geographical area to reach more rural areas in order to recruit more detached homes.

Further information about recruiting a broad range of property types and customer groups is provided in Section 5.

4.6. Messaging of marketing materials

Environmental

All three DCs focused their messaging on the environmental benefits of heat pumps and emphasised heat pumps as green, clean and a route to decarbonisation. A smaller target audience was interested in the opportunity of getting a free heat pump and some marketing messages reflected this motivation. These messages were successful and resonated with the target audience.

Fuel bill savings

DCs did not use fuel bill savings as a key message in their marketing materials and communications. This was because they could not guarantee customers would save money converting to a heat pump especially when the majority of customers would be moving from a gas boiler which has comparable or in some cases, lower fuel bills. Some DCs started using this messaging at the start of the project but moved away from this as the project progressed so as to not raise customer expectations. However, this messaging was used as secondary messaging in targeted marketing at specific customers – such as those in off-gas properties and converting to GSHPs.

In fact, DCs were very careful to not raise customer expectations about saving money throughout customer journey and advised customers at all stages of the risks of their bills going up. However, DCs did report a general customer expectation that converting to a green, low carbon technology *would* save them money and this expectation was difficult to shift.

5. About the participants

This section provides an overview of the properties and participants involved in the EoH demonstration project. It provides a summary of the property types, age, size, whether properties were on or off gas, and their existing heating system (prior to the heat pump installation). It also provides a summary of household sizes, tenure type and length, and socio-economic group of the participants. Charts showing participation in the trial, broken down by property and household attribute, are included in the appendices (section 12.1).

The data presented in this section should be interpreted in the context of this project. A key aim of the project is to demonstrate the breadth of house types that heat pumps can be installed in, as well as the wide range of occupant types who choose to have a heat pump installed in their property. The target quotas for each DC are shown in Table 1 in section 3.3 for house type, year of construction and socio-economic status of the household. Some amendments were made to the quotas between different DCs in the project. However, as Table 1 shows, all of the quotas were met within the permitted variance.

Data shown in this section is for the homes of participants who have progressed through the initial triage process to the initial survey (recruitment pre-survey or home survey), accounting for 3,205 homes in total[6].

5.1. Property type

All homes recruited to the project were existing buildings, as new builds were out of scope. Almost all homes (95%) in the trial are houses rather than flats, as shown in Figure 18 in Appendix B. Detached (42%) and semi-detached (34%) houses are the most common house form, as shown in Figure 19 in Appendix B. Terrace houses account for 20% of homes in the trial, and 4% of homes are flats[7]. These figures closely reflect target numbers (although targets are for installations, not just for those progressed to survey as shown here). Compared to national averages[8,9], this trial recruited a significantly higher proportion of detached and semi-detached properties and a much lower proportion of flats.

DCs reported particular challenges in progressing mid-terraced homes from initial interest to detailed survey (12% compared to 15% target for installations), especially for Warmworks, reporting that this house type is not common in Scotland.

This ties into lessons reported by DCs throughout the project:

- Semi-detached properties were considered ‘easy’ to recruit to the project.

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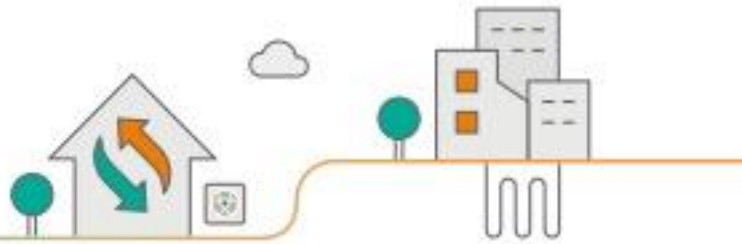
[6] Property data has not been logged for all participants who didn’t progress to a full house survey, and so these properties may not appear in the charts in this section.

[7] Note that the number of flats involved in the project is different between Figure 18 and Figure 19 because some of the flats are counted as mid-terraced or end-terraced properties where they exist within a tenement building or large converted house.

[8] DLUHC and MHCLG, English Housing Survey Data on stock profile, 2021. In England, 26% of properties are detached houses (including bungalows), 25% are semi-detached, 28% are terraced properties and 21% are flats.

[9] Scottish Government, Scottish house condition survey: 2019 key findings, 2020. In Scotland, 23% of properties are detached houses, 20% are semi-detached, 21% are terrace properties and 37% are flats (including tenement buildings).



- Detached housing was relatively easily recruited to the project, except for E.ON due to their focus on an urban area. E.ON had to extend their geographical reach to suburban and rural areas to find sufficient numbers of detached housing.
- Terraced housing: there were no issues for DCs recruiting customers in terraced housing. However, progressing terraced housing to survey stage was more challenging. Installing heat pumps in mid-terraced housing required careful consideration due to lack of garden space for the heat pump unit and proximity to neighbouring properties which could give rise to noise, and therefore, planning permission implications. End-terrace properties also required careful consideration because of a lack of space or lack of access around the side of the property e.g. on occasions end terrace properties will have a footpath across them.
- Flats: E.ON and OVO reached their target quotas through the installation of a shared loop GSHP system in a social housing scheme, whereas Warmworks recruited flats for individual heat pump installations.

5.2. Property age

A broad range of property age bandsare represented in the homes in the trial (Figure 20 in Appendix B), in line with targets set for year of construction (Table 1). These were closely aligned with national averages for England and Scotland[10,11] , though the proportion of pre-1919 homes recruited (13%) was slightly below the national proportion (20%).

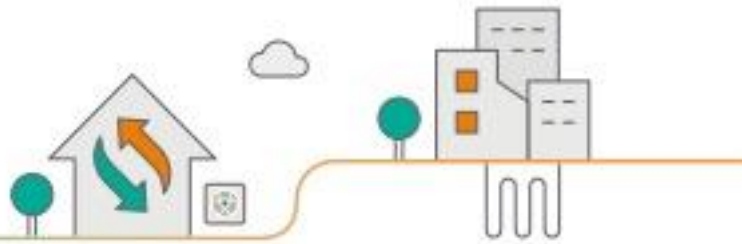
Throughout the project, DCs reported that gaining interest from customers living in properties of a range of ages was not difficult. However, progressing properties from some age bands to survey stage was challenging due to a range of technical issues:

- Older properties (pre-1919) were challenging because of the energy efficiency upgrades that are often needed in these property types, even for the installation of a high temperature heat pump. In addition, the disruption or impact on aesthetics in these properties (such as the impact of internal wall insulation on an older property) or listed building/conservation area status were barriers.
- In contrast, modern properties (post-2001 construction) posed the biggest challenge for some DCs as there were a high proportion of dropouts. This was largely reported to be due to the need to replace microbore pipework[12] , matched with a customer

[10] DLUHC and MHCLG, English Housing Survey Data on stock profile, 2021. In England, 20% of all properties were built before 1919, 15% were built between 1919-1944, 18% were built between 1945-1964, 20% were built between 1965-1980, 8% were built between 1981-1990, and 19% were built after 1990.

[11] Scottish Government, Scottish house condition survey:2019 key findings, 2020. In Scotland, 19% of all occupied dwellings were built before 1919, 11% were built between 1919-1944, 21% were built between 1945-1964, 22% were built between 1965-1982, and 27% were built after 1982.

[12] The Microgeneration Certification Scheme guidance currently advises against the use of microbore pipework as the smaller pipe diameters result in higher temperature drops through the heat distribution system, which can negatively impact the heat pump performance. This guidance is subject to an ongoing review.



expectation that these properties would be suitable for a heat pump in the project context and less tolerance to accept disruptive work.

- One DC, OVO, also found of the 'middle' age bands (e.g. 1980s and 1990s construction) slightly harder to recruit. This is likely due to the specific housing stock in the areas targeted by OVO.

5.3. Existing heating system

A majority of homes were heated by a gas boiler at time of recruitment (86%) (Figure 21 in Appendix B) and similarly 89% of homes reported having a gas connection (Figure 22 in Appendix B). 7% of homes had electric heating (almost all with direct electric or storage heaters) and 4% of homes had oil or LPG heating. The other 3% of properties had either a warm air heating system (gas powered), a fireplace (mostly coal or wood) or a biomass boiler. These proportions were approximately in line with national averages[13,14].

5.4. Property size

When considering house size, most homes recruited to the trial had 3 (43%) or 4 (29%) bedrooms (Figure 23 in Appendix B). The trial recruited a higher proportion of 4 bedroom homes and a lower proportion of 1 and 2 bedroom homes compared to national averages[15,16]. The average floor area of homes recruited to the project (around 115 m^2) was also higher than national averages[17,18]. 30% of homes recruited had a floor area of between 65-95 m^2. 44% had a floor area of between 95-155 m^2. 19% of homes were larger than 155 m^2 and only 7% were smaller than 65 m^2. The relationship between number of bedrooms and total floor area is shown in Figure 25 in Appendix B.

5.5. Participant socio-economic group

Figure 30 in Appendix B shows that 35% of lead participants at the initial survey stage were classified in the AB socio-economic group. The hardest socio-economic group to reach was C2

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[13] Office for National Statistics, Energy efficiency of housing in England and Wales: 2021. In England, 79% of dwellings used mains gas to fuel central heating, 12% used electricity, and less than 4% used oil. Combined, other heating fuels were used in less than 5% of all dwellings.

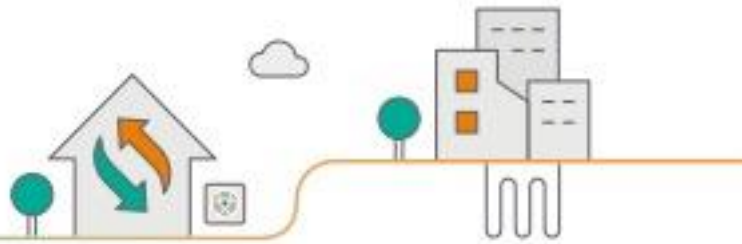
[14] Scottish Government, Scottish house conditions survey: 2019 key findings, 2020. In Scotland, 81% of households used mains gas to fuel central heating, 11% used electricity and 5% used oil. Biomass, solid mineral fuel, LPG and communal heating are each used in 1% of households.

[15] Office for National Statistics. Number of rooms by number of bedrooms – Merged local authorities, 2018. In England, 12% of homes have 1 bedroom, 28% have 2 bedrooms, 41% have 3 bedrooms, 14% have 4 bedrooms and 5% have 5 or more bedrooms.

[16] Scottish Government, Scottish House Condition Survey: 2017-2019 Local Authority Tables. In Scotland, 50% of homes have 1 or 2 bedrooms and 50% have 3 or more bedrooms.

[17] English Housing Survey data on stock profile, 2021. In England, 9% of all properties had a usable floor area below 50 m^2, 22% had a floor area between 50-69 m^2, 29% had a floor area between 70-89 m^2, 15% had a floor area between 90-109 m^2, and 25% had a floor area above 110 m^2.

[18] Scottish Government. Scottish house condition survey: 2019 key findings, 2020. In Scotland, old dwellings (pre-1919) have an average floor area of 107 m^2. Properties built between 1919-1982 have an average floor area of 88 m^2. New dwellings (built from 1982-onward) have an average floor area of 102 m^2.



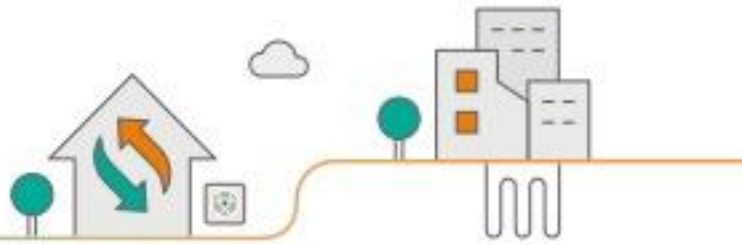
households, representing 13% of those recruited to the initial survey. Overall though the final installation targets for each socio-economic group were met within permitted variance. Compared to national averages, the proportion of AB participants recruited to the project was higher and the proportion of C2 participants was lower [19,20].

Challenges in recruiting target socio-economic demographics were often as a result of the target geographical area, customer base targeted and/or marketing approaches utilised. There were some differences between DCs within this:

- E.ON: C2 was the hardest group to recruit, and this was a function of the focused geographical targeting within Newcastle. They found that even targeting pockets of the city with a high prevalence of these customer groups did not elicit high volumes of applications. Expanding the geographical area to more suburban areas enabled them to recruit more of this demographic. E.ON did find that their marketing approaches were successful in reaching a wide variety of socio-economic groups – for example, direct mail and community partnerships reached a wide variety of groups.
- OVO: the nature of OVO's marketing – with a social media focus - meant they had fewer applications from some socioeconomic groups, particularly C2 ad DE. They reached their DE target through a social housing project. They also targeted OVO employees – especially heating engineers – to recruit more of this group, though this had relatively limited impact. OVO's C2 participants were mainly found through filtering initial registrants as well as through referrals from installer partners. Email campaigns to their customer base gave a better spread than social media (which was skewed to younger and more affluent households) as they have a diverse energy customer base.
- Warmworks: did not find any customer group challenging to recruit and they were oversubscribed in all groups. However, their social media dominated approach was most successful in reaching AB and C1 groups. They deployed non-digital marketing approaches to reach DE and C2 groups. DE groups came largely from social housing projects, which again was an intentional recruitment strategy.

[19] Office for National Statistics, Approximated Social Grade, 2013. In England, 22% of the household reference persons aged 16 to 64 fall into social grade AB, 31% fall into social grade C1, 21% fall into social grade C2, and 26% fall into social grade DE.

[20] Scotland's Census, Scottish Council Area 2011 by Social Grade (approximated) by Term-time Address (Indicator), Age, Residence Type and Household Reference Person, 2013. In Scotland, 18% of the household reference persons aged 16 to 64 fall into social grade AB, 32% fall into social grade C1, 22% fall into social grade C2, and 28% fall into social grade DE.



5.6. Participant age and employment

The most common age band of the principal decision maker was between 40-59 years (47%), as shown in Figure 28 in Appendix B. Participants were older on average compared to national averages[21],[22].

About half of participants had a combined annual household income of over £50,000 per year and the other half were below £50,000 (Figure 29 in Appendix B). Participant incomes were therefore higher than the national average for the UK, where only about 29% of households earn over £50,000 per year before tax[23]. Most of the main participants were employed full time (66% - Figure 32 in Appendix B). They were mainly employed in professional (41%) or manager (20%) roles (Figure 31 in Appendix B). Approximately 15% of participants were retired.

5.7. Participant tenure and number of occupants

Almost all trial participants (96%) were owner-occupiers, as shown in Figure 33 in Appendix B. This is a significantly higher proportion than the national average[24],[25]. This is not surprising given the intention was to recruit a majority of private homes. Only a small number of private renters expressed an interest in the trial, some of which were triaged out by DCs due to concerns about obtaining landlord consent. A broad range of tenure length was reported (Figure 34 in Appendix B), with the most common being 5 - 10 years (18%) and 2-5 years (19%). DCs reported that, where possible, they were targeting social housing tenants who were settled in their homes and unlikely to move in the near future. However, social housing recruitment was less targeted in instances where quotas were met with shared GSHP systems, and so overall there was a broad spread of tenure length of participants in this group as shown in Figure 35 in Appendix B (however, this sample size is small).

The average number of occupants per property was 2.8. This is slightly higher than the national average of 2.4 people per household[26]. A third (36%) of households recruited to the initial survey of the trial had 2 occupants, and 25% had 4 occupants (83% of these households were composed of 2 adults and 2 children). The relationship between number of adults and children in these households is shown in Figure 25 in Appendix B. Compared to the national average, this trial recruited a higher proportion of 3 and 4 person households and a lower proportion of 1 person households.

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[21] Office for National Statistics, Population estimates by marital status and living arrangements, England, 2021. In England, in the population over 16 years of age, 13% were 16-24 years old, 32% were 25-44, 32% were 45-64, and 23% were 65+.

[22] Scotland's Census, Scottish Council Area 2011 by Age by Term-time Address (Indicator), 2013. In Scotland, in the population over 18 years of age, 12% were 18-24 years old, 33% were between 25-44%, 34% were between 45-64, and 21% were 65 or older.

[23] Ethnicity facts and figures, Household income, 2021

[24] English Housing Survey data on tenure trends and cross tenure analysis, FA1221 (S108): household type by tenure, 2019-2020. In England, 64% of all households are owner occupiers, 17% are social renters and 19% are private renters.

[25] Scottish Government, Housing statistics: Stock by tenure, 2018. In Scotland, 59% of all dwellings are owner-occupied, 14% are privately rented and 23% are social rented dwellings.

[26] Office for National Statistics, Families and Households in the UK: 2020. In the UK, 28% of households have 1 occupant, 35% of households have 2 occupants, 16% have 3 occupants, 15% have 4 occupants and 8% have 5 or more occupants.

6. Awareness of heat pumps and customer motivations

6.1. Awareness of heat pumps

During the initial recruitment stages, participants were asked to rate their existing level of heat pump awareness (prior to the project). They were asked to respond based on a 5-point heat pump awareness scale, as defined as in Table 2.

Table 2 Description of 5-point scale of heat pump awareness

Heat pump awareness level	Description
1	No prior awareness of heat pumps at all
2	Had heard of heat pumps but no real understanding of what they are or how they work
3	Aware of heat pumps as a potential heating system, may have some awareness of how they work
4	Reasonable understanding of heat pumps and how they work and the implications of having one as a home heating system
5	Extremely knowledgeable and understands heat pump systems well and how they work. Good understanding of their operation and implications for a home. May have prior experience of living with and operating such systems

When asked about their level of awareness of a heat pump, the response across all participants (shown in Figure 9 below) is fairly evenly spread, from no prior awareness (1) to extremely knowledgeable (5). 35% of participants reported having little or no awareness of what a heat pump is or how they work. 37% of participants reported a reasonable or very good knowledge of heat pumps, how they work, and the implications of having one as a home heating system. Trial participants were much more knowledgeable about heat pumps than the average consumer – Wave 36 of the BEIS Public Attitudes Tracker found that 77% of consumers had little or no awareness of heat pumps, and only 4% felt they knew a lot about them[27].

In Figure 10 below, this is broken down by delivery contractor (DC). OVO participants are the most knowledgeable, with almost half (46%) reporting a reasonable or very good understanding of heat pumps, compared to 18% with little or no awareness. This is expected given that OVO's main source of customer recruitment was "OVO Beyond" customers who are engaged with environmental issues and therefore may be more likely to have heard about heat pumps. Differences in prior awareness of heat pumps might partly explain why a higher proportion of heat pumps installed by E.ON were hybrids, as well as a lower proportion of E.ON's participants expressing environmental motivations (as shown in Figure 49 in the appendix). It was anecdotally noted by contractors that some customers with high environmental drivers were keen to move to a 'full' heat pump instead of hybrid as to maximise environmental benefits. Other factors that may also have contributed to the differences in proportions of hybrids installed- such as property types - are explored further in the Home Surveys and Installation report).

[27] DBEIS, BEIS Public Attitudes Tracker: Wave 36, 2021

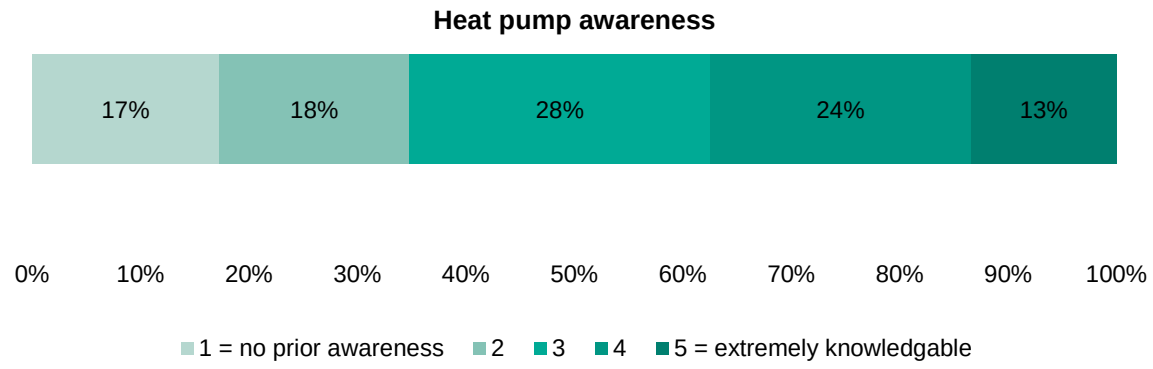


Figure 9 Reported level of awareness a household has of heat pump systems at the start of this project, across all project participants (n=3205). Description of 5-point awareness scale levels is given in Table 2.

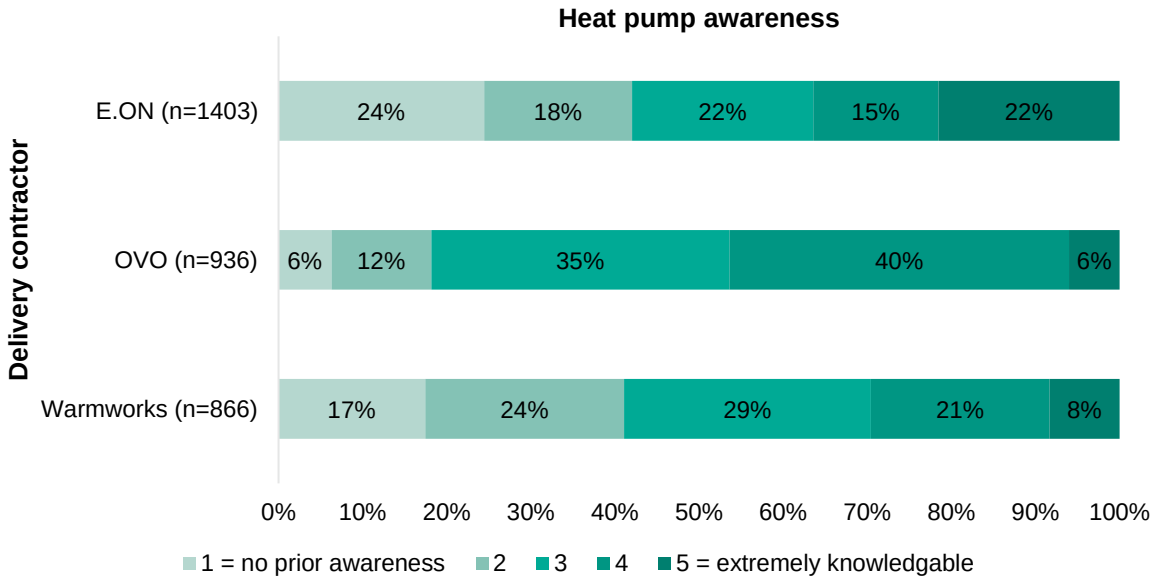


Figure 10 Reported level of awareness a household has of heat pump systems at the start of this project, broken down by DC. Description of 5-point awareness scale levels is given in Table 2.

Charts showing how heat pump awareness varies by dwelling attributes and household attributes are included in Appendix B (Section 12.2).

The results show that reported prior knowledge of heat pumps was greater for participants living in detached homes and larger homes. 46% of participants living in detached homes reported reasonable or very good understanding of heat pumps, as did 80% of the participants living in homes with 6 or more bedrooms (although the sample size of these participants is low). Conversely, participants more frequently reported little or no awareness of heat pumps if they were living in a flat (78%) or in a 1-bedroom property (81%). When considering the effect of

property age (year of construction), as shown in Figure 38 in Appendix B, participants, were most likely to report better prior awareness of heat pumps in the newest (2001+) and oldest (pre-1919) homes, whereas participants in homes built mid-century (1945-1980) had the lowest prior awareness.

Heat pump awareness also appears to vary based on the primary heating system being replaced. Over two thirds (72%) of participants with an oil or LPG boiler reported reasonable or very good prior awareness or knowledge of heat pumps. This compares to 20% of participants with electric heating who had reasonable or very good awareness and where 61% reported little or no awareness. Participants with electric heating were more likely to be in the DE social group and living in flats, whereas participants with oil or LPG were more likely to be living in larger properties with four or more bedrooms and unable to connect to the gas network. This could suggest that customers with higher energy bills are exploring alternative heating solutions – or have potentially become aware of heat pumps through other initiatives.

A greater proportion of participants in the AB socio-economic group (46%) reported reasonable or very good knowledge of heat pumps than those in other socio-economic groups (29 – 36%), as shown in Figure 40 in Appendix B. Participant age had no evident impact on awareness, except for being slightly lower among the few participants aged over 80 (Figure 43 in Appendix B). Awareness appears to be positively correlated with total household income, as illustrated in Figure 44 in Appendix B. Figure 41 shows that the majority (88%) of participants living in rented (social) housing reported little or no prior awareness of heat pumps. Awareness was also low amongst those in rented (private) housing (67% reported little or no prior awareness of heat pumps), although there is a small sample size for this group. The length of time a household has lived in their home appears to have little correlation with reported awareness of heat pumps, as shown in Figure 42 in Appendix B.

6.2. Motivations / reasons for proceeding

Participants were asked their reasons for wanting to take part in the project and the answers across all participants are shown in Figure 11 below. The most commonly given reason for participating in the project was that the participant was interested or keen to take action to reduce their environmental impact and/or to move to a greener/renewable heating system, given by over three quarters (78%) of participants. The next most common reasons were an interest to adopt a new technology (63%) and attraction of a new heating system provided free of charge (53%).

The least reported reasons (other than the option of ‘other’) were that the participant was already planning building or refurbishment work and saw this as a good time to take advantage of a new heat pump installation (11%), that the participant was already planning to install a heat pump (12%) and that the existing heating system was in need of replacement, so this was seen as an opportunity to achieve that aim (17%). On average, around 7% of UK households replace their heating system each year, so it is to be expected that that the number of participants needing an existing heating system replacement would be of this order of magnitude.

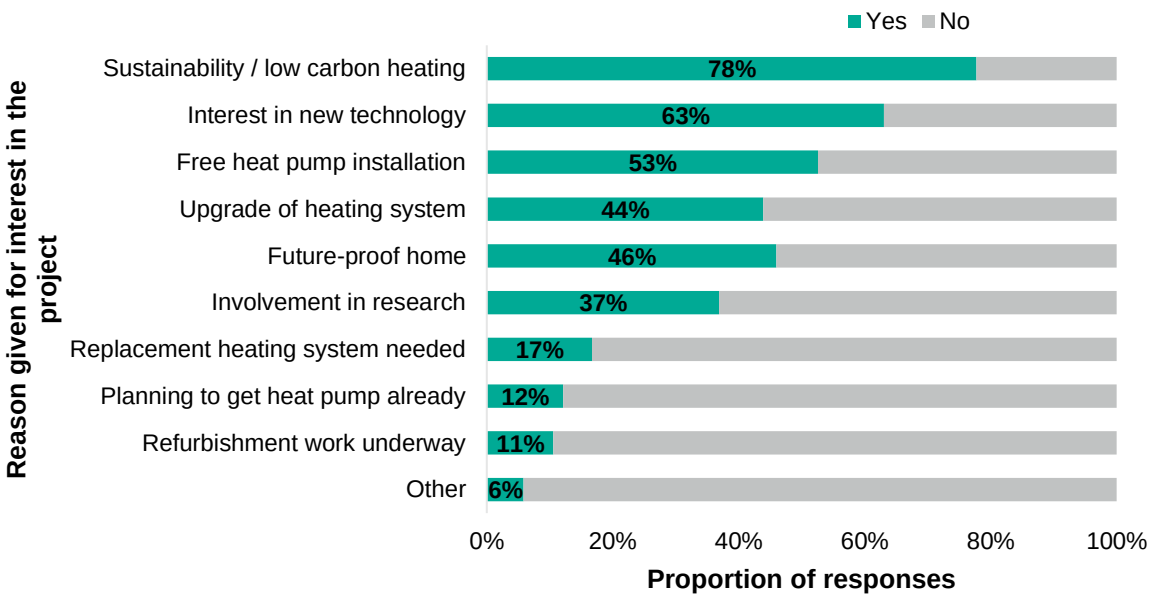


Figure 11 Reason given for wanting to participate in the project across all participants (n=3205). Participants were able to give multiple reasons, depending on the approach of the DC. Participants recruited by OVO and EON (n=2339) were asked about each reason and gave an answer of 'yes' or 'no' depending on whether this was a motivation for them. Participants recruited by Warmworks (n=866) were asked to name three reasons for joining the trial; these three reasons have been coded 'yes' and all other reasons have been coded 'no'.

Further breakdown of motivations by participant and dwelling attributes are shown in the appendix (12.3). Figure 46 in Appendix B shows participants' motivations for joining the trial, broken down by primary heating system being replaced. Sustainability was the biggest motivator for participants with existing gas boiler to want to join the trial (82%). For customers with an oil or LPG boiler, sustainability was also the biggest motivation (86%), but other reasons were more common than for customers with a gas boiler, including interest in new technology (75%) and wanting to futureproof their home (75%). For households with electric heating, the biggest motivators to join the trial were upgrade of heating system (68%) and free heat pump installation (67%).

Reasons for involvement in the project, broken down by socio-economic group, are shown in Figure 47 in Appendix B. Overall, this indicator does not appear to have a strong effect on participants wanting to join the trial.

Figure 48 in Appendix B shows the motivations for joining the project broken down by DC. Across all DCs, the biggest motivator was sustainability / low carbon heating. Participants recruited by OVO gave the most positive responses across all reasons, and the majority of participants reported being motivated by the top 6 reasons. Participants recruited by E.ON were almost entirely motivated by sustainability, interest in new technology, free heating system and a desire to upgrade their existing heating system. Towards the end of the recruitment phase Warmworks re-contacted participants who had dropped out of the project earlier inviting them to re-join – for those that did it was thought that fear of missing out on the opportunity to participate played a role in their decision.

6.3. Effect on decision to proceed

At various stages throughout the project, participants opted not to proceed further. Reasons for this were recorded at these different stages and are discussed in the following section. Participant drop out is typical for trials of this nature – heat pumps are a new technology for most UK consumers and many participants had limited knowledge of what to expect of a heat pump installation when they initially expressed an interest in the trial. Some participants only dropped out because of the project constraints, such as the timescales in which the heat pump had to be installed. The COVID-19 pandemic also deterred some participants from proceeding further – this was explicitly given as a reason for eight participants and may have been a reason for some of those who were uncontactable.

Figure 12 below shows that greater prior knowledge of heat pumps is not a good indicator as to whether a participant would make the decision to proceed with a heat pump installation later in the engagement journey. The results show that those participants who chose to proceed had a slightly higher prior awareness (39% reported reasonable or very good understanding compared to 31% who chose not to proceed).

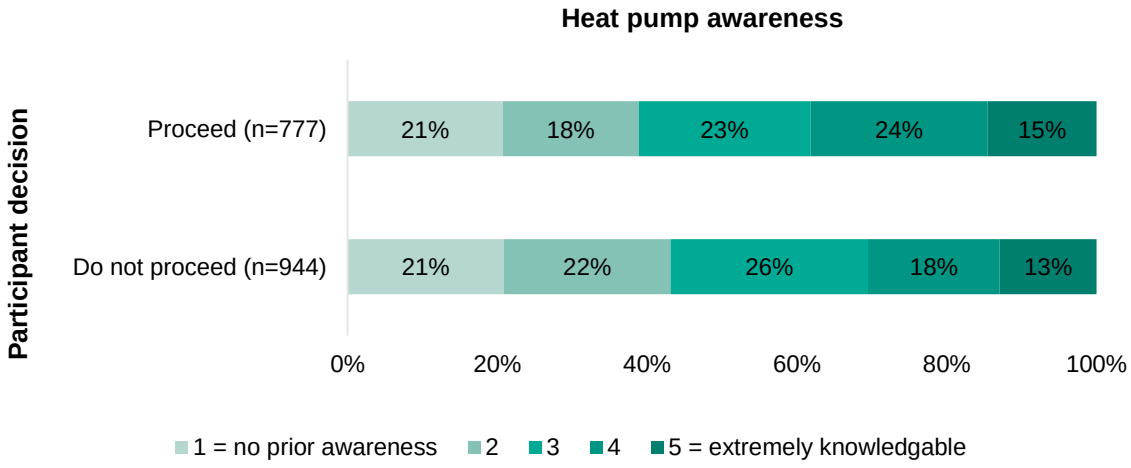


Figure 12 Reported level of awareness a household has of heat pump systems at the start of this project, broken down by later decision by participant to proceed with an installation of a heat pump or not. Description of 5-point awareness scale levels is given in Table 2.

Figure 38 in Appendix B and Figure 13 below show how motivation to join the project may have affected the decision to continue to a heat pump installation. Over three quarters (77%) of the 135 eligible participants who were already planning to get a heat pump installed chose to proceed with an installation – the 23% that did not proceed were often for project timescale reasons, e.g. a new system was needed sooner or the participant did not respond in time. Relatively more participants who did choose to proceed to heat pump installation were motivated by future-proofing their home, involvement in research and needing a new heating system. Sustainability was the most cited reason for participants being attracted to the project, but only 44% of those who gave this reason went on to decide to have a heat pump installed.

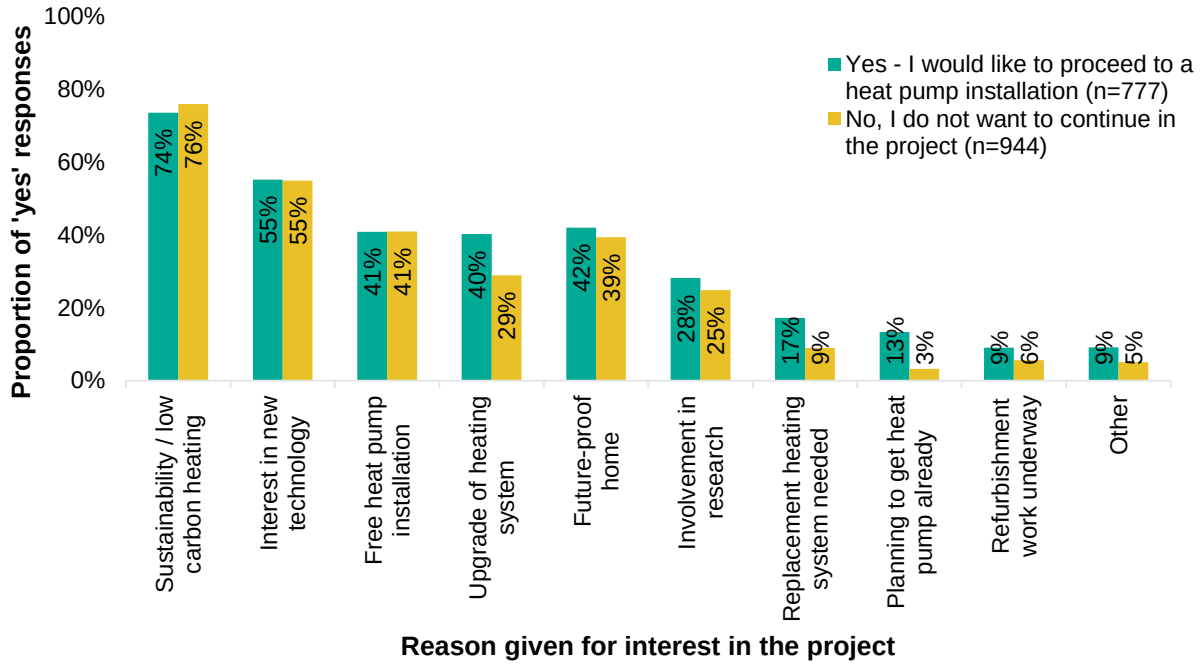


Figure 13 Reason given for wanting to participate in the project, broken down by later decision by participant to proceed with an installation of a heat pump or not. Participants were able to give multiple reasons, depending on the approach of the DC as described in caption to Figure 11. Note, this is based on participant decision and not the final outcome of whether a heat pump was installed or not.

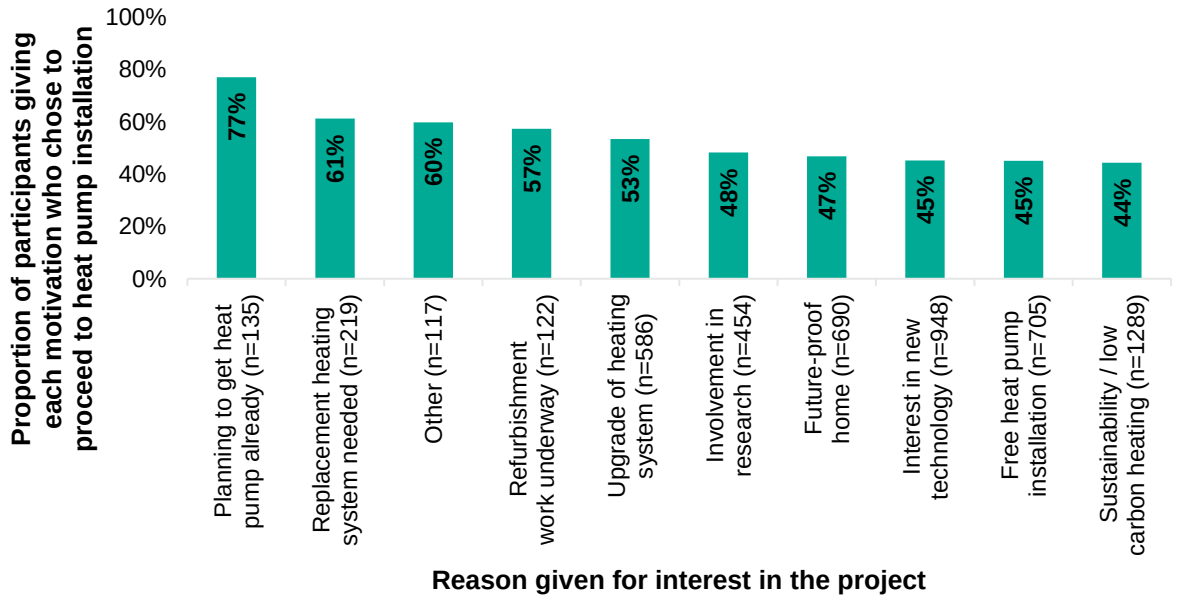


Figure 14 Proportion of participants who chose to proceed with heat pump installation, broken down by reason given for interest in project (participants were able to give multiple reasons for interest). Note, this is based on participant decision and not the final outcome of whether a heat pump was installed or not.

7. Participant barriers

7.1. Barriers to households joining the trial

This section covers barriers reported by participants as reasons for them not wanting to proceed to a heat pump installation. These may have been given before a home survey was undertaken, or afterwards. Technical barriers to the home being suitable for a heat pump in the context of the project are covered in the Home Survey and Installation report. It should be noted that it is common for participants to drop out in a trial of this nature and the DCs intentionally aimed to recruit a far larger volume of participants to the trial than required for this reason.

Figure 15 shows the top 9 reasons for participants not wanting to proceed to a heat pump installation, across all participants who chose not to proceed. Participants were able to give up to two reasons for this question, although most participants only gave one answer. In total, 999 reasons were given by 943 participants. By far the most common response (reported by 47% of participants) was that people were put off by the potential disruption of the installation work. In total, 61% of participants were put off by a practical barrier.

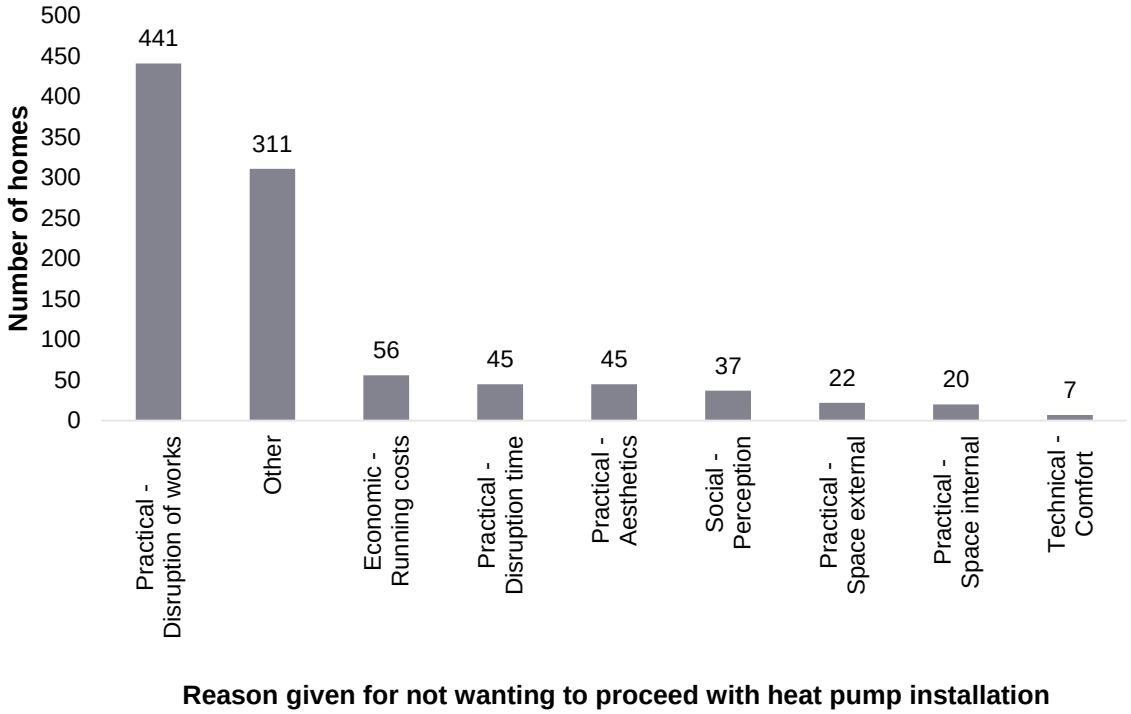
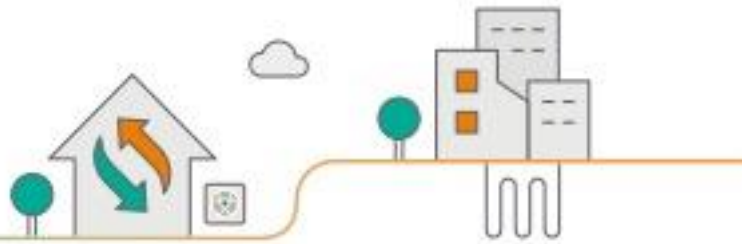


Figure 15 Reason given by participant for not wanting to proceed with heat pump installation (reasons with fewer than 5 occurrences are not shown). Participants were able to give up to two reasons[28].

These data are backed up by barriers reported by DCs. They reported finding that the potential disruption of installation work was the overwhelming reason for participants not wanting to

[28] Disruption time is the time taken for the heat pump installation. These are precoded categories used by the DCs for recording barriers.



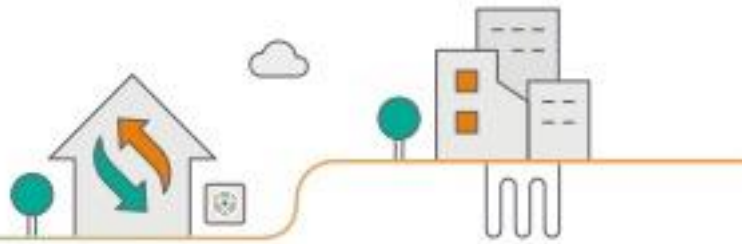
proceed. This was especially the case for properties with microbore piping, where the thought of having floors lifted for piping to be replaced throughout the whole house was off putting to customers. It was not a project requirement to collect data on the presence of microbore piping. However, microbore piping was given as a reason in the data entries for 52 properties that did not proceed to the next stage of the customer journey. Some of the DCs started triaging out properties with microbore pipework near the start of the project due to the significant barriers presented by these properties.

The disruption barrier may also have been higher due to the timing of the recruitment relative to the COVID-19 pandemic. With many households having been restricted for over a year to spending more time in their homes and working from home, disruption may be less tolerable than in previous years. At least one DC got the impression that due to the overwhelming barrier posed by potential disruption for many householders, they may not have given a second reason, having not got to the point of receiving more details (e.g. a detailed cost breakdown). This may mean other barriers, such as running costs, are under-reported and therefore lower than in reality. Conversely, in some cases, the perceived level of upheaval lead to participant cancellation at a late stage in the process (after a full design had been made and technical issues had been resolved) resulting in a large waste of costs associated with this for the delivery contractors.

Other customer barriers reported by DCs were:

- Customer concerns about the impact of a heat pump on the saleability and value of their home i.e. would it deter potential buyers? Whilst not a widespread concern, it did exist in a small minority of customers.
- Some households were facing an increase in the price of electricity of around 4p/kWh when their fixed price contract came to an end due to the volatility of prices over the preceding year. For some, this change came during the journey through surveys and design, and they eventually declined a heat pump installation because the cost at the higher electricity price would be too high.
- DCs also reported that many customers said they had been interested in purchasing a heat pump in the past, but had previously been put off by the upfront cost or inability to find a trusted installer.

The time between initial engagement and installation ranged between under two weeks to over a year in some cases, with an average of around five months. None of the DCs felt that delays in the customer journey contributed to customer dropouts, as customers generally remained committed after taking the decision to proceed. The COVID-19 pandemic caused delays through all stages of the project. The main reasons DCs gave for installations not going ahead after design stage were supply chain issues (the required heat pump product not being available) or DNO approval (either not granted, not granted in time for the project, or upgrade costs were prohibitively high). These are discussed further in the Home Surveys and Installation report.



7.2. Barriers broken down by property type and customer groups

Charts showing the reported barriers broken down by property and household attributes are included in the appendix. For clarity, the top four reasons are shown, and other reported reasons are grouped into 'other reason'.

7.2.1. Property type, age, size and heating system

Reasons given for not proceeding with a heat pump installation were quite similar for participants living in a detached or semi-detached house. Participants living in a terraced house more often cited disruption as a barrier to continuing in the trial. The most common reason that participants living in a flat decided not to participate was because of the financial barrier of higher fuel bills after installation (21%) (although the sample size of this group is small).

Disruption was the most commonly reported barrier for households across all ages of property (shown in Figure 50 in Appendix B). Concerns about the aesthetics of the heat pump unit or supporting measures were highest amongst those with the newest homes (8%).

Figure 51 in Appendix B shows the reported barriers to heat pump adoption broken down by number of bedrooms, representing property size. Concerns future energy costs appear to increase as the size of the property decreases, and concern about aesthetics is greatest for the larger (5 bedroom) homes.

Figure 52 in Appendix B shows reasons given not to proceed broken down by heating system being replaced. The sample size is very small in all categories other than gas boiler, but disruption was given by almost two thirds (64%) of respondents with electric heating, and this could be explained by the large amount of work required to put in a wet radiator system to these homes.

7.2.2. Socio-economic groups, number of occupants and motivation

Socio-economic group is not shown to have a very large influence on reasons given for not wanting to proceed, as shown in Figure 53 in the Appendix. Participants in the AB group were the least likely to cite the barrier of future running cost increase (3%), but this was fairly consistent across other groups (7–8%). Further charts are provided in Appendix B (showing the breakdown by number of children in household (Figure 54) and DC (Figure 55).

Figure 16 below shows an analysis of barriers to heat pump installation, broken down by initial motivation to be involved in the project (bars do not reach 100% as only the most common reasons are shown in the chart). The results show that disruption of installation was the biggest barrier to involvement even amongst those motivated by sustainability of the heat pump and those motivated by a free heat pump installation. Disruption was less often cited by those motivated because they needed a replacement heating system; 5 out of 12 of this group who gave an 'other' reason explained that they had already installed a new heating system before they could progress within the trial. This suggests that a 'distress purchase' may result in higher tolerance of disruption, but if the heat pump takes an extended period to be installed, then households may be unwilling to wait this long (though this analysis is based on a small sample size).

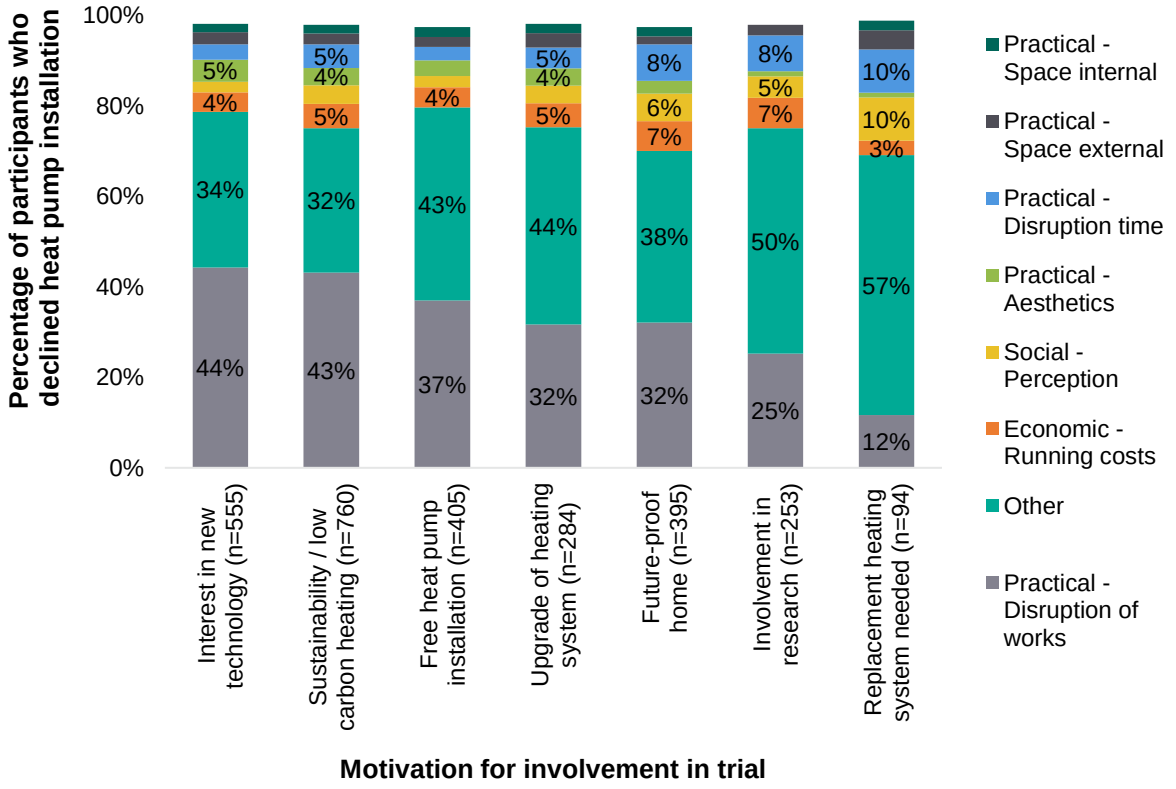


Figure 16 Analysis of barrier to participation in trial, broken down by motivation given for wanting to participate initially. Each bar represents those participants who stated the motivation for involvement in trial, but subsequently declined a heat pump installation. The colours show the proportion of each reason given for making this decision not to have a heat pump installation. For clarity of chart, data labels are not shown where the value is less than 5%.

7.3. Overcoming barriers

7.3.1. Disruption in the home

The most common customer barrier in this project was disruption of installation. Within the project, there was relatively little DCs could do to overcome this barrier.

One way of managing this barrier was to set customer expectations around the level of disruption they can expect with the heat pump installation. DCs tried to introduce this into customer conversations early in the process, without overwhelming customers with too much information that might deter them. Instead, DCs found a better approach was to 'drip feed' information – for example, citing that an installation 'may need you to upgrade radiators in your home' at the start of the project and providing further detail of what this might require once the customer is more committed.

Overcoming this barrier may need technical solutions where heat pumps can work with microbore piping, although the MCS guidance regarding microbore piping is currently being reviewd.

One DC, Warmworks, re-contacted customers at a later stage in the project, who had initially dropped out due to concerns about disruption. Some responded positively, although this was

only a small handful of customers. It is possible that customers may be willing to tolerate this level of disruption at a later date, for example when undergoing a property renovation.

7.3.2. Innovation measures

Innovation measures were included in the project as a way of overcoming potential householder barriers. These are outlined in Table 3 below.

Table 3: Innovation measures in the project

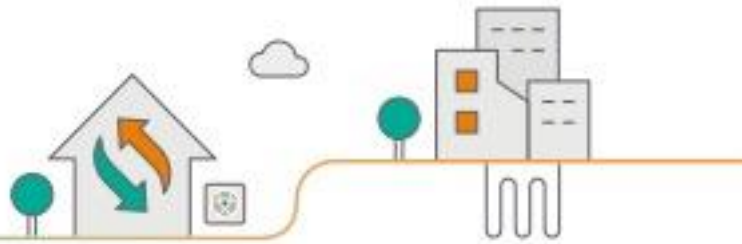
Measure	Description	Original target quota	Final installed mix
Heat emitters	Where required, new heat emitters should be installed such as fan-assisted or other innovative heat emitters	Min 10% homes (with fan assisted)	18 homes (2%) were fitted with fan assisted heat emitters
Cooling system and components	Additional components required to provide cooling, to include necessary pipework insulation to avoid condensation issues	Min 6% homes	Installed for 1 property
Noise reduction technology or components	Innovative application of noise reduction technology to reduce external and/or internal noise levels	Min 6% homes	27 homes (4%) were fitted with noise enclosures or barriers. 46% of heat pumps (342) installed were low noise models – generally this was by default based on the product rather than to comply with planning regulations.
Aesthetic impact reduction technology or components	Additional components required to improve the visual impact of the heat pump system such as the use of internal and/or external ducting, visual camouflage or enclosures	Min 6% homes	Installed for 1 property
Innovative thermal storage	Innovative space-saving thermal store, with equivalent capacity to a standard hot water tank, capable of delivering instantaneous hot water	Min 10% homes	33 homes (4%) were fitted with phase change material thermal storage batteries

The intention was to introduce these measures where it would enable or encourage a customer to install a heat pump and overcome a barrier. For example, if a customer was concerned about potential noise from a heat pump, then a noise reduction component could be offered as a solution to alleviate their concerns and increase the likelihood that they proceed to install.

However, only a small number of these measures have been required as DCs reported that customers have not commonly cited the barriers that these solutions relate to. Fan assisted heat emitters were installed in a few properties, but in the majority of cases it was deemed at the design stage that these were not required. DCs did not actively promote measures such as fan assisted radiators or cooling. DCs also reported that customers did not engage with conversations about heat pumps for cooling as there was not perceived to be a need for this. This may have been influenced by the fact that many installations were planned or took place over the autumn, winter and spring, when cooling requirements were not on customers' minds.

On noise, DCs chose the latest heat pump products for the project, which are often low noise models (Quiet Mark Certified) and look more visually appealing than older models. This explains why almost half of customers were recorded as receiving noise reduction technology. On the other hand, noise enclosures and aesthetic impact reduction technology (for the heat pump units) were required by only a small number of households (4%) – sometimes noise enclosures helped meet permitted development under planning regulations.

Further detail about the feasibility of different property types for different heat pump types, and uptake of innovation measures, is provided in the Home Surveys and Installation report.



8. Lessons from customer engagement

This section outlines lessons for successfully engaging customers and ensuring high levels of customer satisfaction throughout the customer journey. This is based on DC feedback within the project and not direct feedback or data from customers. Customer feedback is being collected by the Evaluation Contractor for the project and will be reported on separately.

8.1. Customer journey

8.1.1. Importance of key contacts and touch points

The customer journey to install a heat pump can be a complex one and could appear fragmented from the customer perspective where a large number of organisations are involved e.g. initial recruitment organisation, surveyor, multiple individuals required for installation. DCs provided customers with one clear point of contact in order to ensure customers:

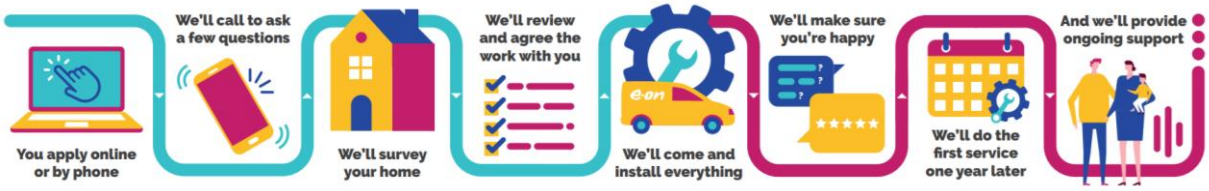
- Feel supported,
- Have queries quickly resolved,
- Have a ‘go to’ contact for questions,
- Are provided with a ‘personal touch’, and
- Have a more consistent and joined-up experience.

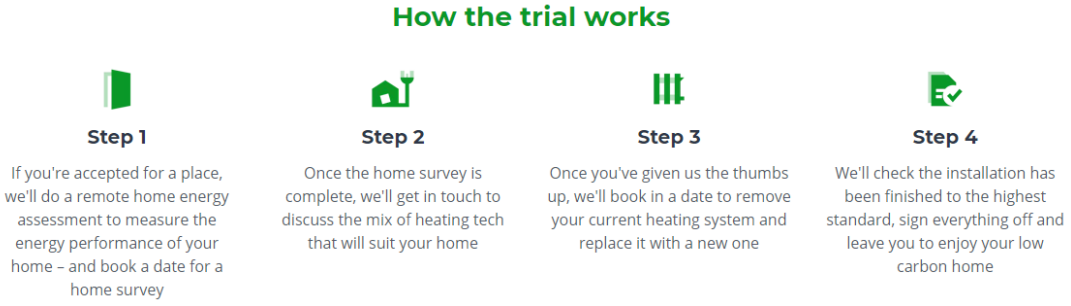
Some DCs provided a named contact to customers for this purpose. Another provided contact details for a small support team who would handle queries; the size of the team meant a personalised service was still provided. DCs reported a reduction in the number of participants dropping out at a later stage in the project after they introduced and improved these customer support capabilities.

Ensuring the customer service staff are equipped and skilled to handle customer queries is important. DCs ensured staff had a good level of technical knowledge to be able to answer questions appropriately, but also sufficient ‘people skills’ to be able to explain concepts in layman’s terms and provide confidence and reassurance to customers. The exact skills needed to handle queries may differ at different stages of the project. For example, E.ON found that questions at the later stages of the project are likely to be more technical and therefore changed the key contact customers had at survey stage to ensure the relevant staff member had the right level of technical expertise required at each stage.

Each DC also outlined a clear customer journey and touchpoints with the customer at the start of their engagement to provide an understanding and expectations around the key stages. Examples from each of the DCs are shown in Figure 17. Providing a diagram of this to customers helped them know what to expect along the journey. Identifying key touchpoints along the customer journey can help to provide regular communication.

Lastly, ensuring customers have an escalation contact and route is important so that issues are resolved, and customers have reassurance this process exists.





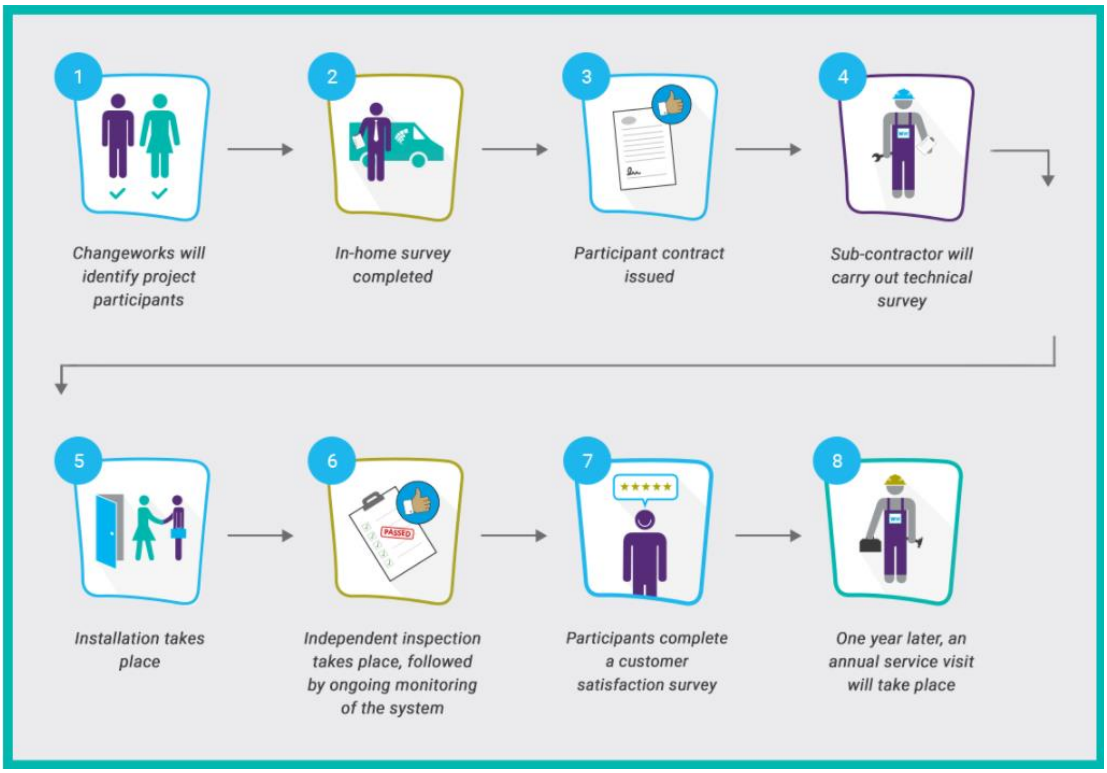


Figure 17 DC customer journey graphics presented to customers: E.ON, OVO and Warmworks

8.1.2. Other

Other aspects that can aid the customer journey are:

- Partner organisations can provide further support to customers around energy advice, tariff switching, etc. This can help to provide customers with a holistic support service and reassurance.

- Independent QA checks of the installation can provide customers with confidence and reassurance.
- Using customer feedback to refine and improve processes or messaging within the customer journey. For example, identifying common concerns at certain stages of the journey can help the contractor to add in pieces of information to early customer communications to pre-empt and alleviate such concerns.
- OVO found that most customers were willing and able to provide basic technical information about their property in an online form. This helped to speed up customer journeys and allow customers to proceed to the next stage faster. It had been anticipated that this stage could be a deterrent to customers – either if they did not have the necessary information or were deterred by the efforts involved. This did not appear to be the case given the large volumes of customers who applied, though these customers may have been more willing because they tended to be green early adopters.

8.2. Reducing customer drop out

Reducing customer drop out throughout the journey was important in the project – conversion rates from initial interest to install were lower than anticipated and it is resource intensive to support large numbers of customers who do not proceed to install.

8.2.1. Setting customer expectations

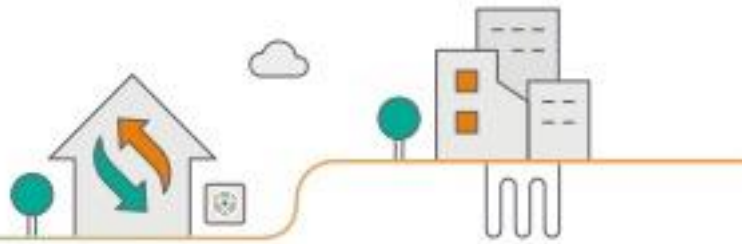
The journey to installation can be complex and lengthy, so it is important to set customer expectations at the start of the process by including clear details of stages in the journey. Also, it is important to set customer expectations about the implications of having – and installing – a heat pump, so customers know what to expect in terms of level of disruption, practical changes to their home, etc. However, it is also important to ensure that the customer is not overwhelmed with information at this stage or unnecessarily deterred. There is, therefore, a balance to be struck with communications regarding informing customers but not overwhelming them.

8.2.2. Maximising the triaging stage

The triage stage at the start of the customer journey was really important in reducing customer dropouts at later stages, when more effort has been spent on surveying on designing the heat pump system. Ensuring a specific and robust triaging process can help identify issues at an early stage and means only customers and properties likely to proceed are taken forwards for more detailed survey work. Common problems experienced during the home survey stage were fed into the design of the triaging stage to identify these issues earlier. Not only does this improve efficiency for the contractor, but it improves customer satisfaction by not ‘wasting’ their time.

8.2.3. Accommodating customer considerations and preferences

Building customer considerations into the design process early in the design – as far as possible – is important to get customer buy-in and reduce dropout. This can be as simple as getting input on the type, size or siting of heat emitters. Aesthetics are important for customers and need their input. However, on the other hand it was found that this could be a time-



consuming process as customers can request multiple designs and change their minds on what is required.

8.2.4. Gaining customer buy-in

Gaining customer buy-in to getting a heat pump early in the journey can reduce drop-out. One option for ensuring this was to get customers to sign T&Cs earlier in the process – this provided a commitment from customers.

8.3. Managing a programme

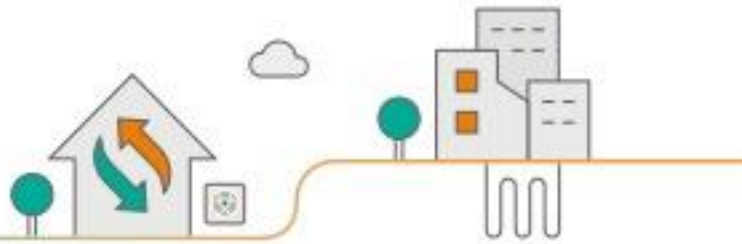
Lessons for contractors on managing customer engagement are as follows:

- Anticipate customer drop-out at every stage of the project, including up to the day of installation.
- Anticipate delays, potentially significant, in progressing customer applications. This includes delay with planning permission applications and DNO approvals (up to 28 days). Keeping customer interest during these processes is important.
- Customer engagement is time consuming as the solutions and communications are bespoke to each customer, and there can be concerns to alleviate at each step of the process. In particular:
    - Very engaged customers can require extra customer engagement time as customers can be curious to understand more about the heat pump.
    - Engagement with social landlords can be time consuming and some staff may have limited technical knowledge about heat pumps. Therefore, considerable efforts can go into supporting social housing projects.

8.4. Other lessons

Other lessons from this stage of the project are as follows:

- Changing prices of electricity could impact fuel bill estimations provided to customers in a short timescale. For example, electricity prices could have risen substantially between the customer being provided with an initial cost estimation and signing up to installation. This can prove to be the difference between a household accepting a heat pump or not.
- Heat pump brand / product selection: some DCs reported, anecdotally, that customers prefer knowing they are getting a good quality or premium product and potentially prefer heat pump brands / manufacturers they are familiar with. However, customers are likely to be less familiar with heat pump manufacturers, compared to, for example, gas boiler manufacturers. Without direct feedback from customers, it is hard to ascertain whether this is a factor in customer's decision-making.



9. Conclusions

This report provides findings from the participant recruitment stage of the EoH demonstration project.

9.1. Level of interest in heat pumps

The project was very successful in generating high levels of interest from householders with over 8,807 expressions of interest received. Whilst interest levels were likely influenced by the offer of a free heat pump, it indicates a potential high level of interest amongst householders for installing low carbon heating systems in their homes. About 40% (3,205) of those who expressed an interest were recruited to the project. The remaining 60% were 'triaged out' or dropped out before the home survey stage. In some cases, properties were only 'triaged out' for project specific reasons, e.g. recruitment quotas were met. Of the 3,205 homes deemed eligible for an initial survey at the triage stage, 23% had a heat pump installed.

9.2. Targeting and recruiting customers

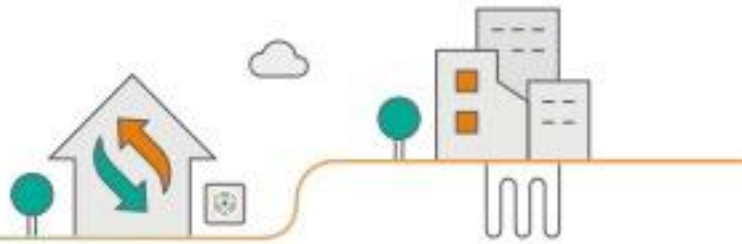
9.2.1. Targeting customers

The three DCs in the project utilised different approaches to target customers. OVO, for example, focused recruitment on their own customer base and targeted specific groups of customers known to be environmentally aware and engaged. E.ON and Warmworks both targeted customers in geographical areas, although E.ON focused on one urban area (Newcastle) whilst Warmworks' recruitment was across a wider geographical area.

All three DCs undertook analysis and mapping of local housing stock to identify geographical areas of high potential for heat pumps, and to focus marketing campaigns. Different tools and approaches were used to carry out this analysis.

9.2.2. Marketing approaches

A wide variety of marketing approaches and channels were used to recruit households to the project. Social media and digital communications were dominant for OVO and Warmworks and were highly successful, accounting for over 30% of their project applications. E.ON also used these channels to recruit about a quarter of applicants, but due to the more targeted geographical focus of their project, they also relied heavily on traditional methods such as direct mail, which accounted for 35% of their project applications. The success of this route was partly due to content being endorsed by the Local Authority, who consumers perceived as a trusted local organisation to work with. Reaching a wide variety of customer groups required tailoring of marketing approaches – for example, using direct mail to reach customers who are less digitally engaged. Word of mouth was also found to be a key recruitment channel for at least one DC with over a third of their referrals stemming from this. Marketing costs per application varied widely. Working in partnership with other customer-facing organisations helped two DCs to minimise their marketing expenses. Social media was very cost-effective for one DC, but another reported unexpectedly high social media marketing costs due to 'anti' heat pump comments from some social media users.



9.2.3. Messaging in marketing materials

Marketing materials to recruit customers focused messaging on the green, environmental benefits, decarbonisation and clean benefits of heat pumps and this was found to resonate with the target audience. Secondary messaging in the project (i.e. used less often) promoted the opportunity to receive a free heat pump and future proofing people's homes. This is reflected in the motivations customers stated in joining the project (see below).

Potential fuel bill savings were not promoted to the majority of customers – only for pockets of customers where savings could be guaranteed e.g. off-gas areas. Fuel bill savings cannot currently be guaranteed for many on-gas customers and therefore DCs were careful not to set unrealistic expectations. This contrasts with many retrofit projects that have focused on fuel bill savings (particularly those targeting fuel poor customers) and appeal to customers based on this rationale. However, there was anecdotal feedback that customers generally expect to realise fuel bill savings from the adoption of low carbon technology.

Trust of messaging was also very important and DCs achieved this mainly through local authority branding of letters or partnerships with local groups/projects.

9.2.4. Customer groups

The project was successful in recruiting a wide variety of customers across different tenures, ages and socioeconomic groups, and across a variety of property types. Reaching a wide variety of customer groups – especially all socio-economic groups – required a variety of marketing approaches. For example, direct mail was more successful than digital approaches to reach DE customers (this group is defined as 'semi-skilled and unskilled manual occupations, unemployed and lowest grade occupations'). The project was also successful in recruiting householders with a wide range of existing awareness of heat pumps, including those who had never heard of heat pumps before.

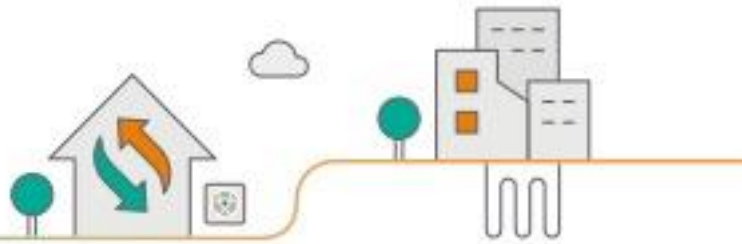
9.3. Motivations, awareness and barriers

9.3.1. Awareness of heat pumps

Across all participants, there was an even spread of awareness of heat pumps from none to extremely knowledgeable. Households recruited by OVO reported the highest level of prior knowledge, and this is explained by OVO targeting customers known to be environmentally aware and engaged. Reported awareness was lowest amongst those living in flats, and with existing electric heating (majority direct electric and storage heaters).Reported awareness was highest in customers living in larger homes and with off-gas fuels such as LPG and oil. There was found to be no differences in the proportions of customers who proceeded to install between different levels of prior awareness.

9.3.2. Motivations for taking part in the project

The three most common reasons given for wanting to participate in the project were sustainability and low carbon heating (78%), interest in new technology (63%) and free heat pump installation (53%). It cannot be assumed that these motivations would be the same across the whole UK population as the recruitment messaging may have attracted certain groups or types of customers, for example those motivated by sustainability.



Existing heating system appeared to have an influence on motivation. Although sustainability was the largest motivation in all heating system groups, interest in new technology and wanting to futureproof their home were strong motivators amongst those with an oil or LPG boiler, and upgrade of heating system and free heat pump installation were strong amongst those with existing electric heating.

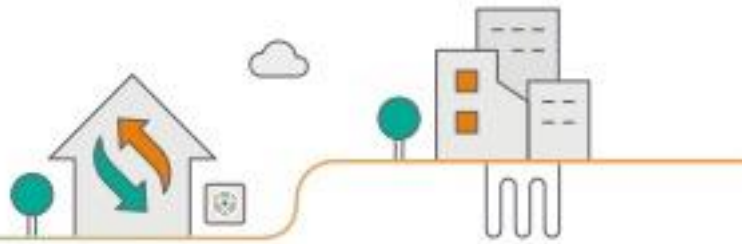
9.3.3. Customer barriers to proceeding in project

The main barrier reported was the disruption of having a heat pump installed; reported by 47% of participants who declined a heat pump installation. The second most common reason was higher future heating costs, cited by 6% of participants who declined a heat pump installation. Disruption was most cited by participants living in smaller properties (fewer bedrooms, terraced houses compared to detached or semi-detached). It was the biggest barrier to involvement even amongst those motivated by sustainability of the heat pump and those motivated by a free heat pump installation. However, disruption was less often cited by participants motivated to join the trial because they needed a replacement heating system, suggesting that households needing a solution more urgently may be more tolerant.

9.4. Managing a heat pump project

The project has provided insights into how to manage a heat pump installation project that are useful for wider rollout. These include:

- It is resource intensive to carry out customer engagement, given the project provided bespoke solutions for customers.
- It should be anticipated that customers will drop out at every stage of the project, even at very late stages – for example, when the installer has arrived at the home.
- Having a dedicated touch point or small team of customer service staff can help customers feel supported through the process of getting a heat pump and provide a more consistent and joined-up experience.
- There can be delays in progressing customer installations, for example:
    - Planning permission: whilst few customers in the project required planning permission, this was partly due to the DCs designing systems to meet permitted development – or did not progress properties where it was likely that planning permission would be required. Planning permission related both to noise and boundary issues for homes.
    - DNO approvals process: gaining approvals could be a lengthy process and there were inconsistencies with how applications were dealt with. This is covered in greater detail in the Home Surveys and Installation report.



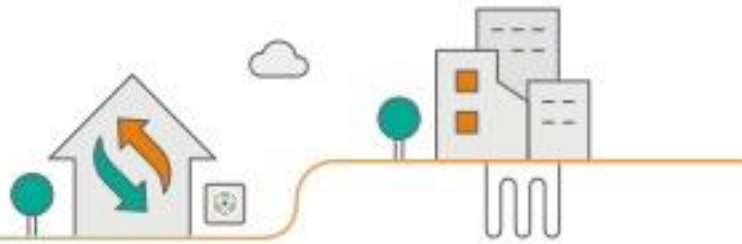
10. Best practice and recommendations

Best practice processes that emerged from the recruitment stage of the project are provided below.

10.1. Best practice for contractors managing heat pump programmes

Recommendations for contractors managing heat pump projects:

- **Targeting customers:**
  - Use a variety of marketing channels and approaches to recruit householders. This will enable a broad range of customers to be recruited.
  - Utilise existing customer relationships with organisations that customers trust. For example, OVO was successful in recruiting from existing energy supply customers, and E.ON utilised local authority endorsement to gain the confidence of customers who weren't necessarily supplied by E.ON.
  - Use environmental messaging to target customers around heat pumps. Be cautious about promoting fuel bill savings to customers where this cannot be guaranteed – this is especially important given the context of recent energy prices rises and the challenges of predicting future energy prices.
- **Early engagement** (i.e. initial contact prior to the home survey)**:**
  - Provide customers with an overview of the customer journey so they know the stages to anticipate and what the process will entail.
  - Set expectations with customers about what installing and living with a heat pump will entail, especially around the potential level of disruption during install.
  - However, on both of the above points, careful communication is required:
    - To ensure the right level of information is provided at each stage. It is recommended that customers are provided with high level information at the early stages of engagement, and much greater detail is given at a later stage – such as during the home survey. Heat pumps are a new technology for most UK consumers and this would help to ensure customers are not unnecessarily overloaded with information and/or deterred from installing a heat pump.
    - Communication needs to come from an appropriate individual. The project found that early conversations are successful with a skilled customer service member of staff who can explain information to customers in accessible language and provide reassurance. More detailed information, which is inherently more technical, should however be provided by a heat pump surveyor or someone with greater technical knowledge.



- Give customers a key contact who they can contact throughout the process for queries and questions – this can reduce the complexity and provide reassurance. This should be a person skilled in customer service.
- Maximise the use of triaging at the start of the customer journey to identify issues (such as space constraints or presence of microbore piping) at an early stage and reduce customer dropout later, as this saves resource.
- Accommodate customer preferences into the design process as early as possible to increase customer satisfaction with their installation process and their new heat pump system.

- **Managing the process:**
  - Consider the resources required to properly engage recruit and support customers.
  - Factor in dropouts at each stage of the customer journey.
  - Factor in delays in progressing customers to installation, such as planning permission or DNO connection request approval. This project experienced additional delays due to the impacts of the COVID-19 pandemic.

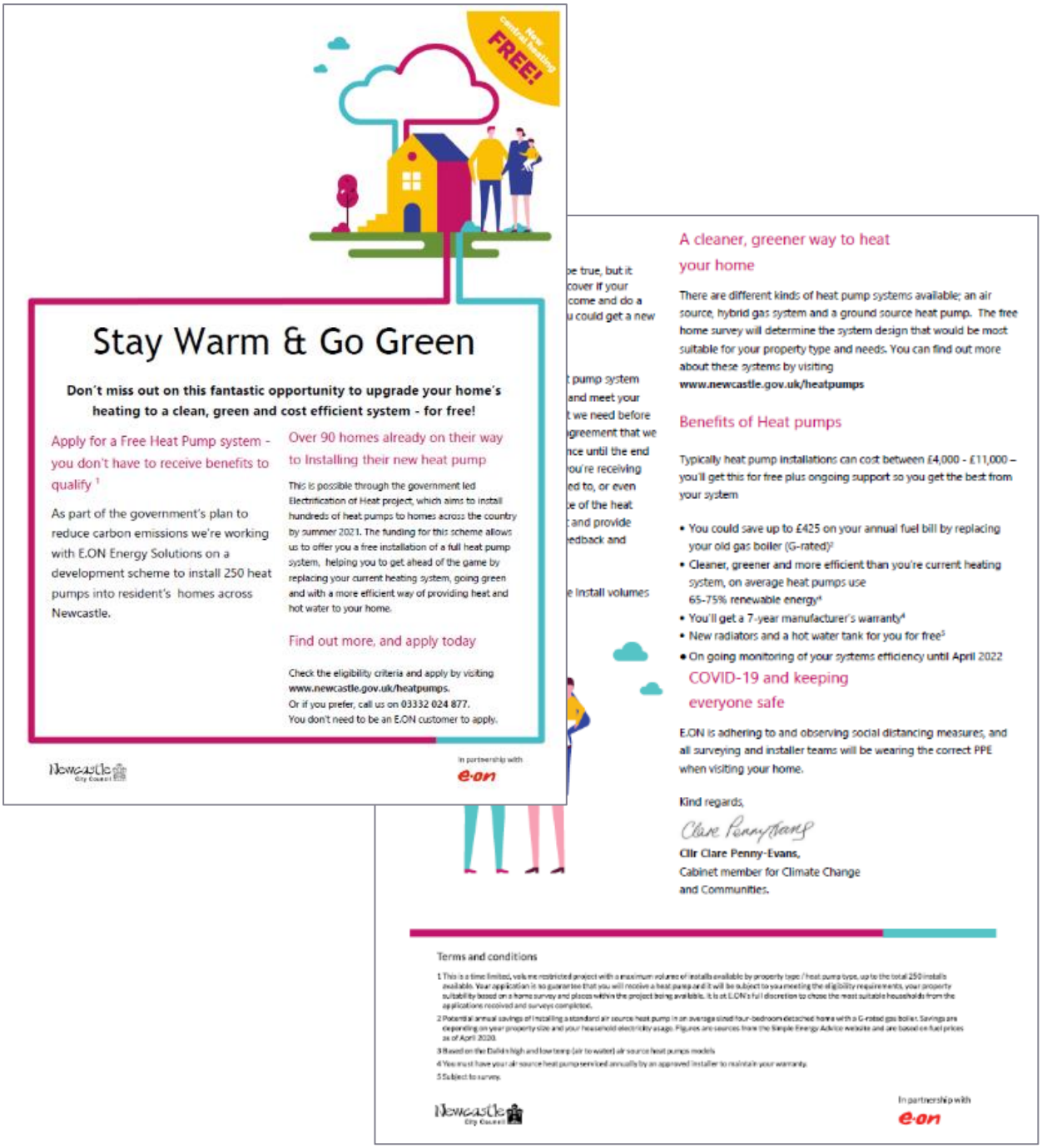
- **Upskilling contractors** e.g. installers, surveyors, retrofit coordinators in relation to customer communications. Technical experts may not be the best people to be having conversations with customers at an early stage of the process. Instead, contractors should ensure they have staff who have good customer service and communication skills, as well as a minimum level of technical knowledge, to successfully communicate with customers.

10.2. Recommendations for industry and Government

- **DNO approvals:** approval processes to connect heat pumps to electricity networks needs to be more consistent, faster and have capacity for bulk applications. This is covered in greater detail in the Home Surveys and Installation report.
- **Planning permission**: there is a need for greater consistency of planning permission rules in different areas and an assessment of whether rules could be could be changed to deliver better consumer outcomes and to enable greater numbers of heat pumps to be installed. In the current situation, certain property types will not be able to be fitted with heat pumps due to noise and boundary issues related to planning permission, but there is a lack of evidence to say whether these rules are appropriate
- **Technical solutions**: the key customer barrier to installing a heat pump was disruption and many of these cases related to existing microbore pipework in homes. Technical solutions to avoid the need to replace this pipework could significantly help overcome this barrier to make a heat pump installation less disruptive could significantly help overcome this barrier. In some instances, it can also be that current guidance is not fit for purpose – for example, the Microgeneration Certification Scheme (MCS) guidance on microbore pipework is being amended.
- **Guidance to industry**: better guidance to industry (e.g., installers, surveyors, retrofit coordinators) on how to successfully engage with customers.

11. Appendix A: Customer recruitment materials

E.ON example letter



FREE!

Stay Warm & Go Green

Don't miss out on this fantastic opportunity to upgrade your home's heating to a clean, green and cost efficient system - for free!

Apply for a Free Heat Pump system - you don't have to receive benefits to qualify [1]

As part of the government's plan to reduce carbon emissions we're working with E.ON Energy Solutions on a development scheme to install 250 heat pumps into resident's homes across Newcastle.

Over 90 homes already on their way to Installing their new heat pump

This is possible through the government led Electrification of Heat project, which aims to install hundreds of heat pumps to homes across the country by summer 2021. The funding for this scheme allows us to offer you a free installation of a full heat pump system, helping you to get ahead of the game by replacing your current heating system, going green and with a more efficient way of providing heat and hot water to your home.

Find out more, and apply today

Check the eligibility criteria and apply by visiting **www.newcastle.gov.uk/heatpumps.**
Or if you prefer, call us on 03332 024 877.
You don't need to be an E.ON customer to apply.

Newcastle City Council

In partnership with e·on

be true, but it
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A cleaner, greener way to heat your home

There are different kinds of heat pump systems available; an air source, hybrid gas system and a ground source heat pump. The free home survey will determine the system design that would be most suitable for your property type and needs. You can find out more about these systems by visiting **www.newcastle.gov.uk/heatpumps**

Benefits of Heat pumps

Typically heat pump installations can cost between £4,000 - £11,000 – you'll get this for free plus ongoing support so you get the best from your system

- You could save up to £425 on your annual fuel bill by replacing your old gas boiler (G-rated)[2]
- Cleaner, greener and more efficient than you're current heating system, on average heat pumps use 65-75% renewable energy[4]
- You'll get a 7-year manufacturer's warranty[4]
- New radiators and a hot water tank for you for free[5]
- On going monitoring of your systems efficiency until April 2022

COVID-19 and keeping everyone safe

E.ON is adhering to and observing social distancing measures, and all surveying and installer teams will be wearing the correct PPE when visiting your home.

Kind regards,

Clare Penny-Evans

Cllr Clare Penny-Evans,
Cabinet member for Climate Change and Communities.

Terms and conditions

1 This is a time limited, voluntary restricted project with a maximum volume of installs available by property type / heat pump type, up to the total 250 installs available. Your application is no guarantee that you will receive a heat pump and it will be subject to you meeting the eligibility requirements, your property suitability based on a home survey and places within the project being available. It is at E.ON's full discretion to chose the most suitable households from the applications received and surveys completed.

2 Potential annual savings of installing a standard air source heat pump in an average sized four-bedroom detached home with a G-rated gas boiler. Savings are depending on your property size and your household electricity usage. Figures are sources from the Simple Energy Advice website and are based on fuel prices as of April 2020.

3 Based on the Daikin high and low temp (air to water) air source heat pumps models

4 You must have your air source heat pump serviced annually by an approved installer to maintain your warranty.

5 Subject to survey.

Newcastle City Council

In partnership with e·on

E.ON example leaflet

Upgrade your home heating system for free[1]

As part of the Government's plan to reduce carbon emissions we're working with E.ON on a development scheme to install 250 Heat pumps into people's homes across Newcastle City, replacing current heating systems such as gas, oil, LPG, solid fuels or electric storage heating.

This is possible through the government led Electrification of Heat project, which aims to install hundreds of heat pumps to homes, across the county by Jan 2021. The funding for this scheme allows us to offer you free installation of a full heat pump system1, helping you to get ahead of the game by replacing your current heating system, going green and adopting a more cost-efficient way of providing heat and hot water to your home.

Terms and conditions

1 This is a time limited, volume restricted project with a maximum volume of installs available by property type / heat pump type, up to the total 250 installs available. Your application is no guarantee that you will receive a heat pump and it will be subject to you meeting the eligibility requirements, your property suitability based on a home survey and places within the project being available. It is at E.ON's full discretion to chose the most suitable households from the applications received and surveys completed.

2 Potential annual savings of installing a standard air source heat pump in an average sized four-bedroom detached home with a G-rated gas boiler. Savings are depending on your property size and your household electricity usage. Figures are sources from the Energy Saving Trust website and are based on fuel prices as of April 2020

3 Potential annual savings of installing a standard air source heat pump in an average sized four-bedroom detached home with a G-rated oil boiler. And is dependent on the current oil system used, it's age and your household electricity usage. Figures are sources from the Energy Saving Trust website and are based on fuel prices as of April 2020.

4 Based on the Daikin high and low temp (air to water) air source heat pumps models

5 You must have your air source heat pump serviced annually by an approved installer to maintain your warranty.

6 Subject to survey.

Newcastle City Council

In partnership with e·on

New central heating FREE!

Stay Warm & Go Green

We can upgrade your home's heating to a clean, green and cost efficient system - for free!

Apply now to see if your house is suitable.

Newcastle City Council

In partnership with e·on

It's free, yes really!

We know this sounds too good to be true, but it really is free. To get started and discover if your home is suitable, E.ON will need to come and do a free no obligation survey. And if we think it is, you could get a new system installed for nothing.

Am I eligible?

If your property is suitable, the heat pump system will be designed to suit your home and meet your heating and hot water needs. What we need before the installation takes place is your agreement that we can monitor your system performance until the end of April 2022. This is to make sure you're receiving the same level of comfort you're used to, or even better, and monitor the performance of the heat pump. This will support the project and provide valuable learnings based on your feedback and experience.

A cleaner, greener way to heat your home

There are three different kinds of heat pump systems available; an Air Source and a Ground Source Heat Pump. The free home survey will determine the system design that would be most suitable for your property type and needs. You can find out more about these systems by visiting [insert URL].

Benefits of Heat pumps

- Typically heat pump installations can cost between £4,000 - £11,000 – you'll get this for free plus ongoing support so you get the best from your system
- You could save up to £425 on your annual fuel bill by replacing your old gas boiler (G-rated)[2]
- You could save up to £1,000 on your annual fuel bill when you replace your old electric storage heaters, and up to £560 if you replace new electric storage heaters with a new air source heat pump[3]
- You could save up to £550 on your annual fuel bill by replacing your old oil boiler (G-rated)[3]
- Cleaner, greener and more efficient than you're current heating system, on average heat pumps use 65-75% renewable energy[4]
- You'll get a 7-year manufacturer's warranty[5]
- Hassle free - there's no need to buy oil or LPG any more
- New radiators and a hot water tank for you for free[6]

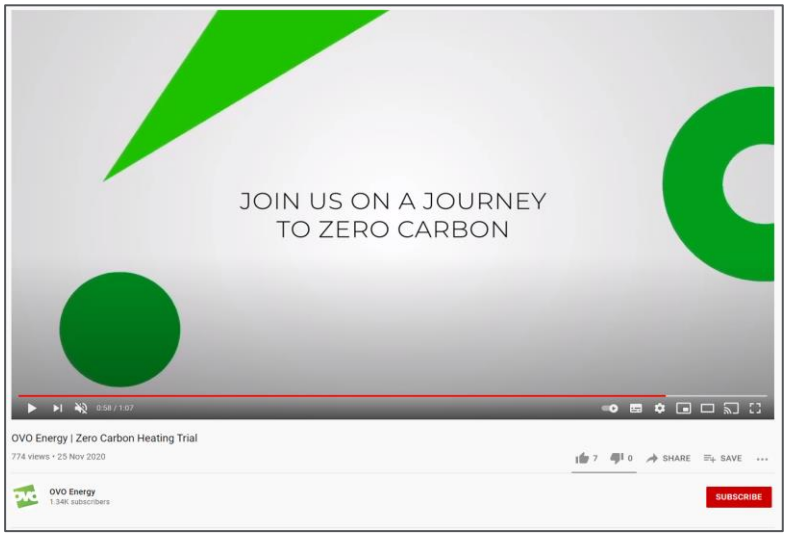
COVID-19 and keeping everyone safe

E.ON is adhering to and observing social distancing measures, and all surveying and installer teams will be wearing the correct PPE when visiting your home.

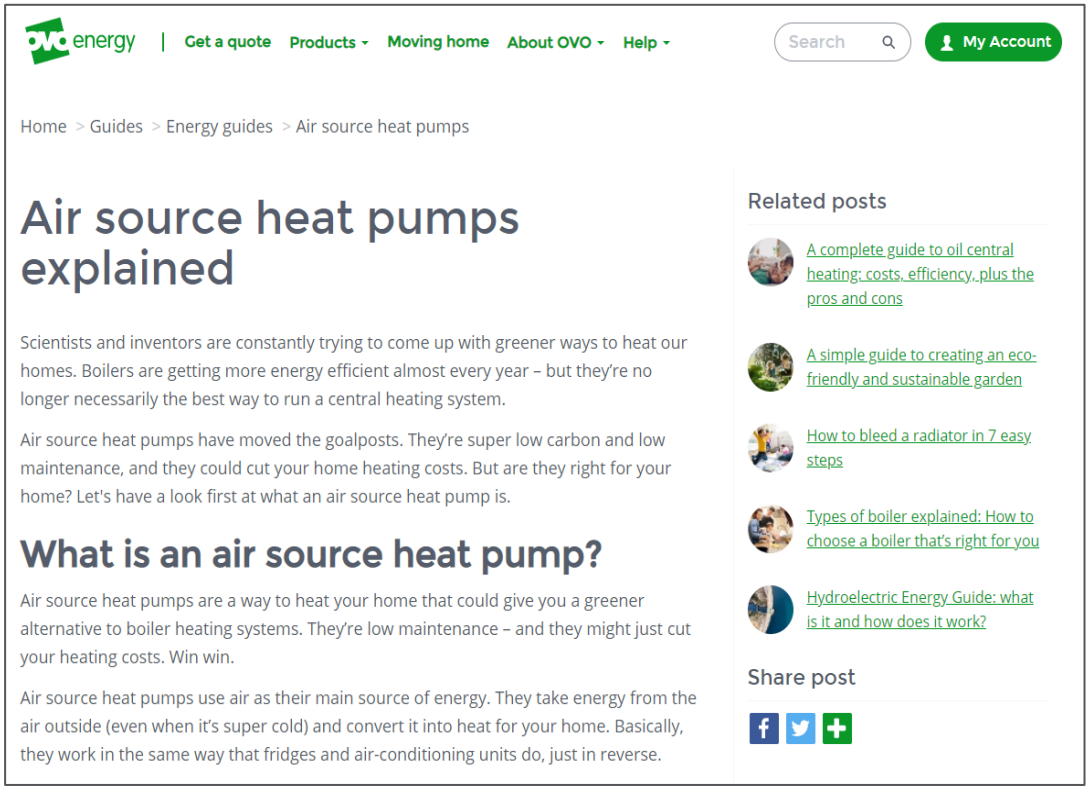
Find out more, and apply today

This is a great opportunity so find out more today. You can check the eligibility criteria and apply by visiting XXXXXX. Or if you prefer, call us on **03332 024 877**. You don't need to be an E.ON customer to apply.

OVO example video content

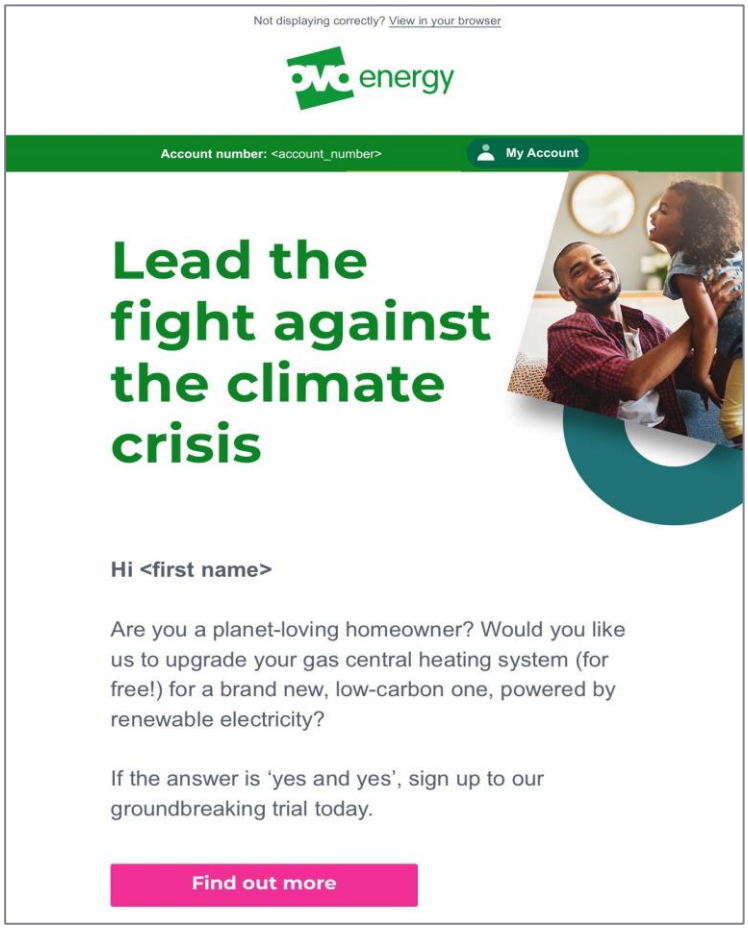


OVO example SEO-optimised blog content



OVO Introductory paragraph of direct email

CATAPULT Energy Systems LCPDelta Oxford Computer Consultants


Not displaying correctly? View in your browser
energy
Account number: <account_number>
My Account
Lead the fight against the climate crisis
Hi <first name>
Are you a planet-loving homeowner? Would you like us to upgrade your gas central heating system (for free!) for a brand new, low-carbon one, powered by renewable electricity?
If the answer is 'yes and yes', sign up to our groundbreaking trial today.
Find out more

Warmworks example social media post

Changeworks
29 June 2020 ·

🎉 Exciting new project! If you live in South East Scotland you have the chance to get a heat pump installed in your home for free.

We're working with Warmworks, and funded by Department for Business, Energy and Industrial Strategy to install heat pumps in 250 homes across South East Scotland. Heat pumps are a great solution for future-proofing your home, and making it more energy efficient, all while reducing your impact on the environment.

Find out more and apply here 👉 https://www.warmworks.co.uk/electrification-of-heat/

Warmworks example social media post

Changeworks
4 August 2020 ·

Take part in our exciting new heat pump project for South East Scotland! 250 properties will be selected following a suitability survey, as part of the Electrification of Heat Demonstration Project, which will determine the most suitable heat pump technology for your home.

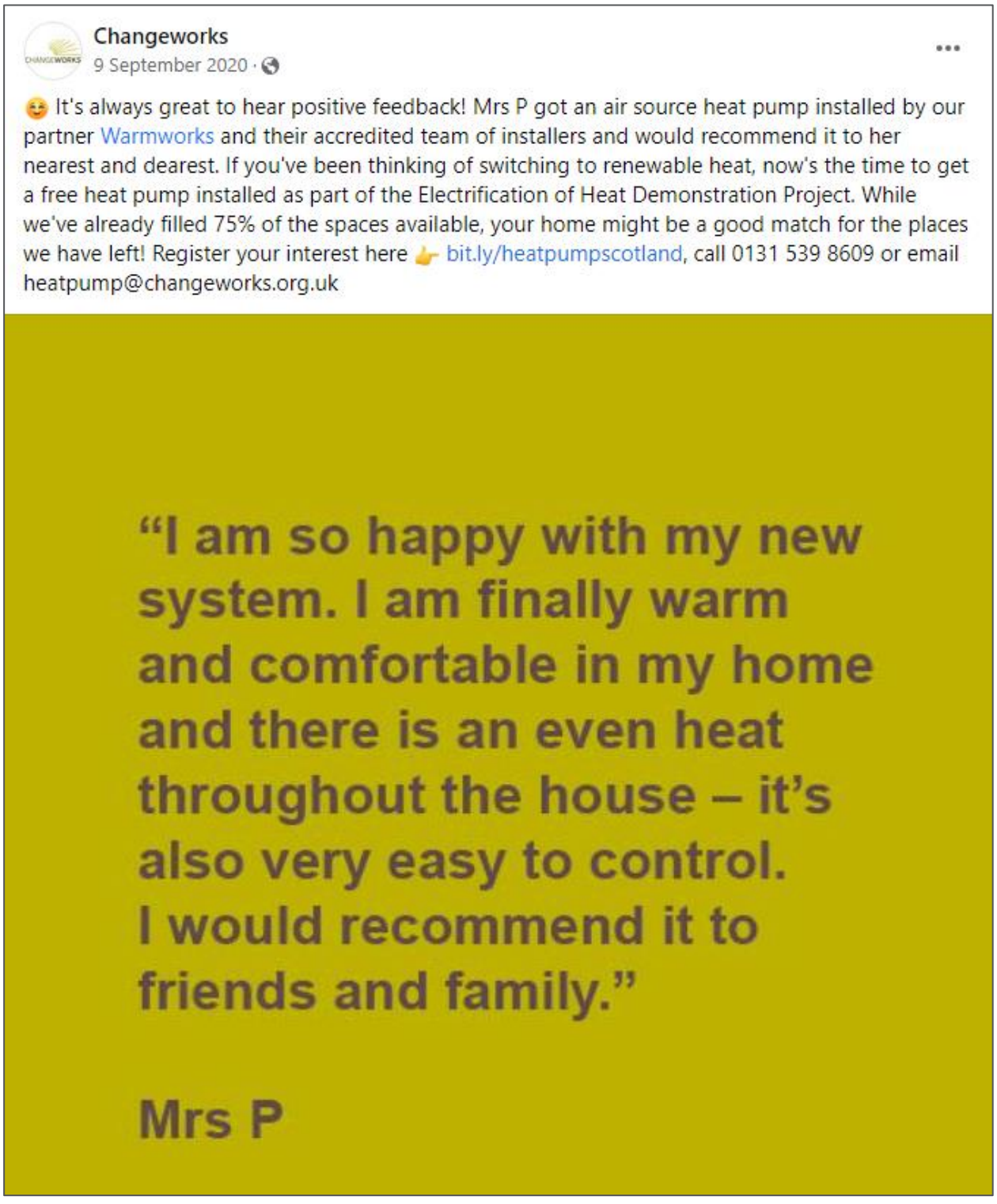
You won't have to pay anything becuase the cost of the heat pump and installation is covered by the Department for Business, Energy and Industrial Strategy, Find out more and register your interest here bit.ly/heatpumpscotland, call us on 0131 539 8609 or email heatpump@changeworks.org.uk.

Heat pumps are a great solution for future proofing your home over the long term as well as lowering your carbon emissions.

Electrification Of Heat - Warmworks
Electrification of Heat Demonstration ProjectA...

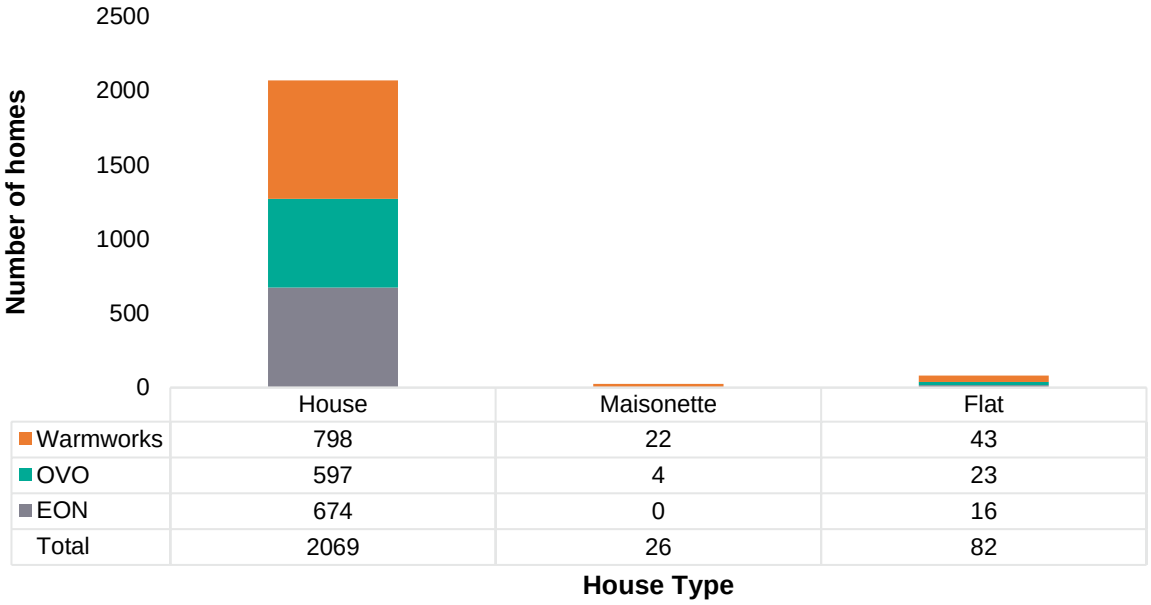
Electrification Of Heat - Warmworks
Electrification of Heat Demonstration ProjectA...

Warmworks example social media post



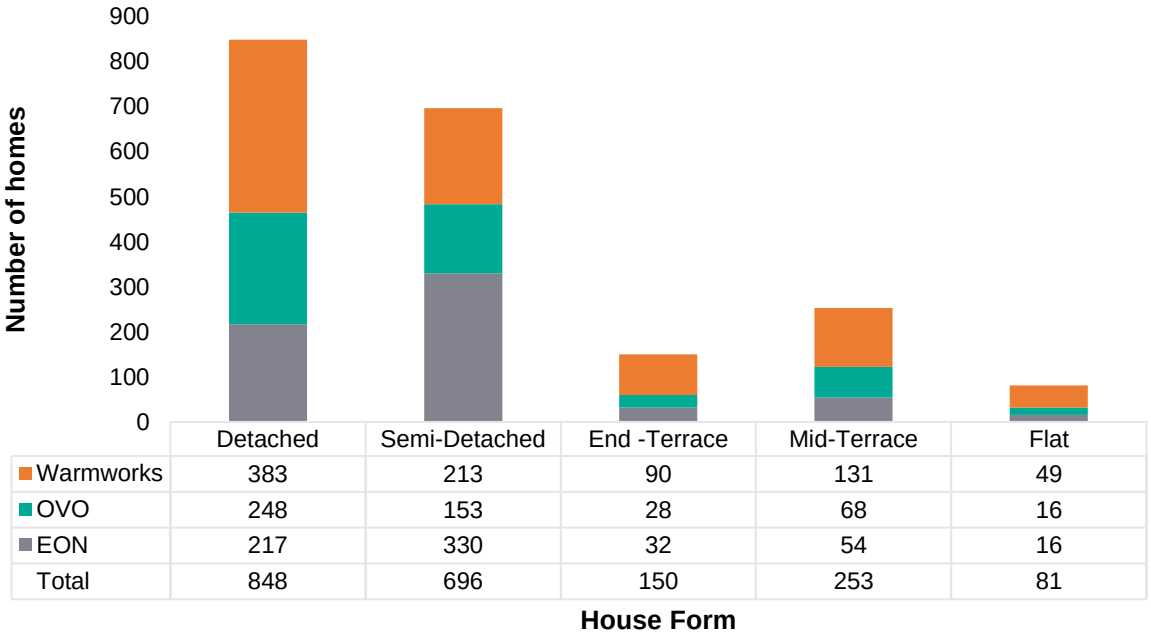
12. Appendix B: Additional charts

12.1. About the participants



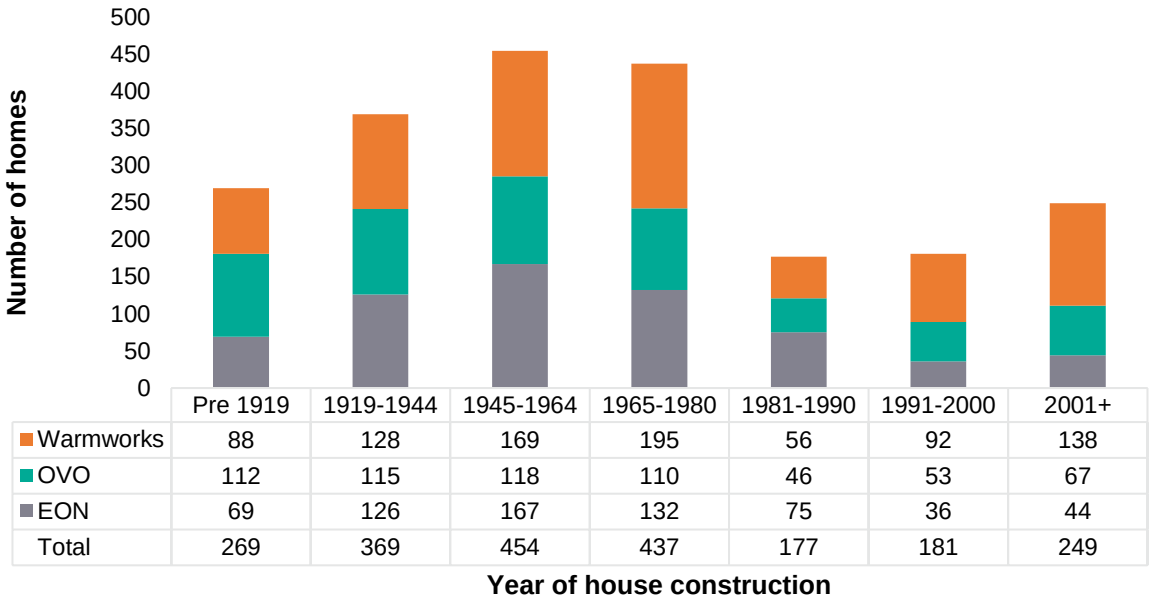
	House	Maisonette	Flat
Warmworks	798	22	43
OVO	597	4	23
EON	674	0	16
Total	2069	26	82

Figure 18 Homes involved in trial, broken down by house type



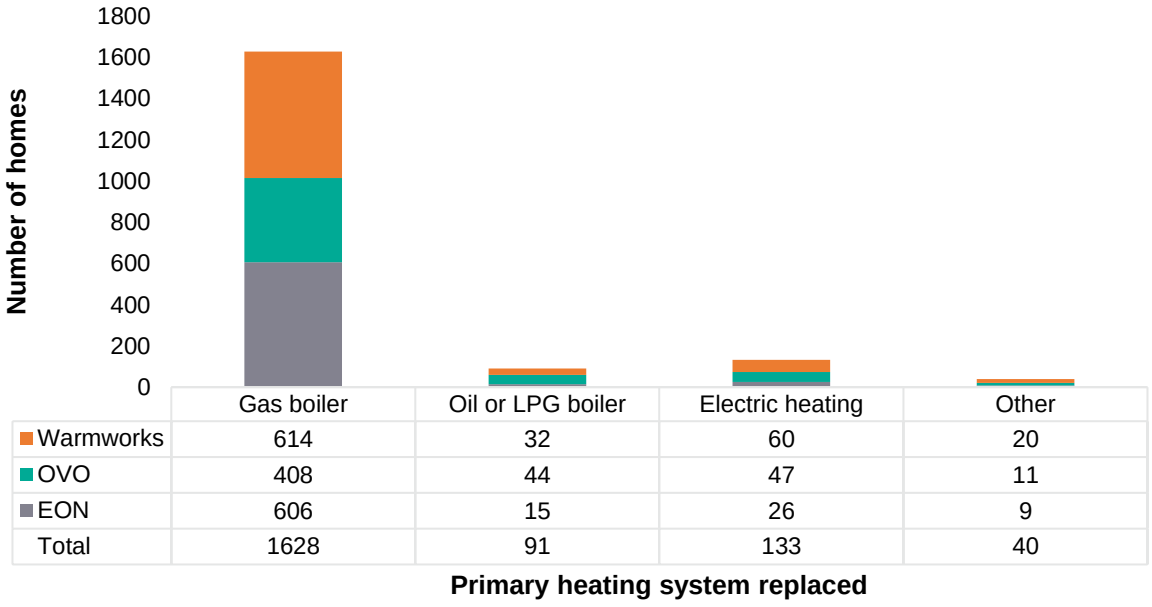
	Detached	Semi-Detached	End -Terrace	Mid-Terrace	Flat
Warmworks	383	213	90	131	49
OVO	248	153	28	68	16
EON	217	330	32	54	16
Total	848	696	150	253	81

Figure 19 Homes involved in trial, broken down by house form



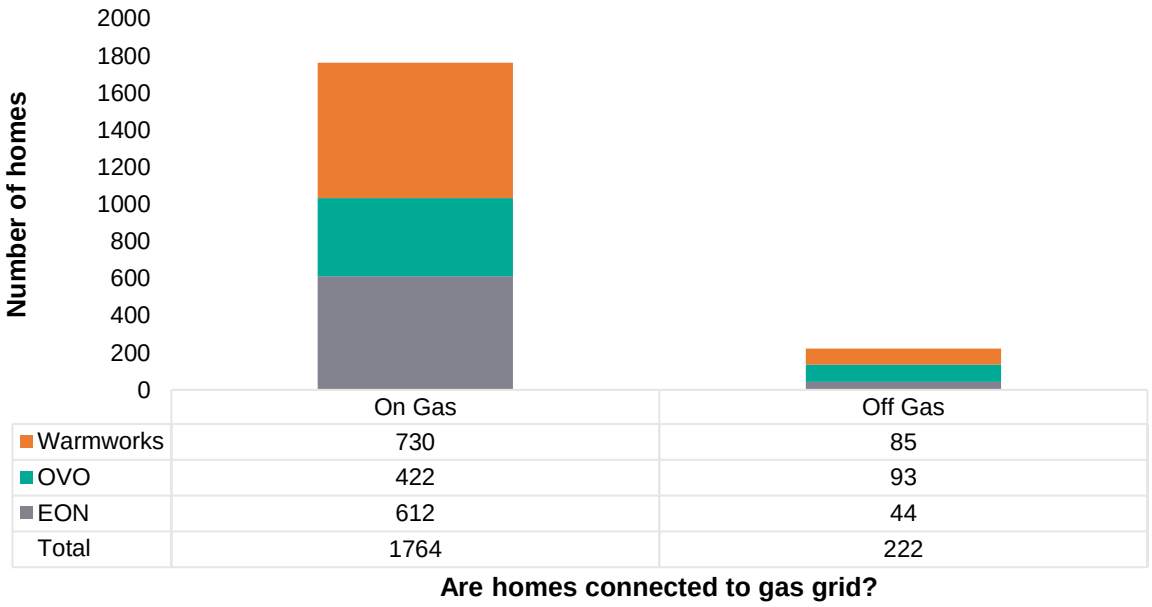
	Pre 1919	1919-1944	1945-1964	1965-1980	1981-1990	1991-2000	2001+
Warmworks	88	128	169	195	56	92	138
OVO	112	115	118	110	46	53	67
EON	69	126	167	132	75	36	44
Total	269	369	454	437	177	181	249

Figure 20 Homes involved in trial, broken down by year of construction



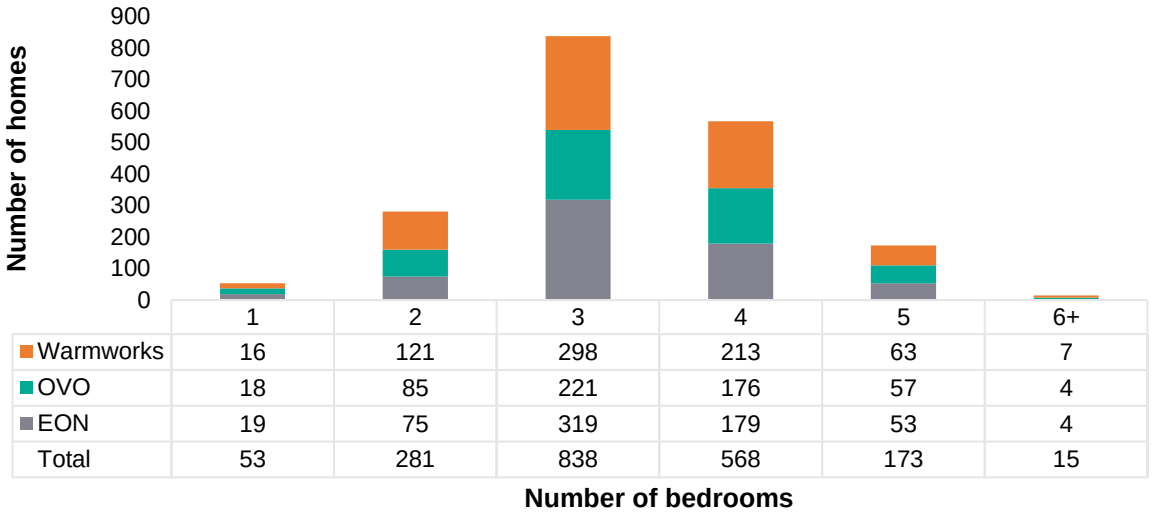
	Gas boiler	Oil or LPG boiler	Electric heating	Other
Warmworks	614	32	60	20
OVO	408	44	47	11
EON	606	15	26	9
Total	1628	91	133	40

Figure 21 Homes involved in trial, broken down by primary heating system being replaced



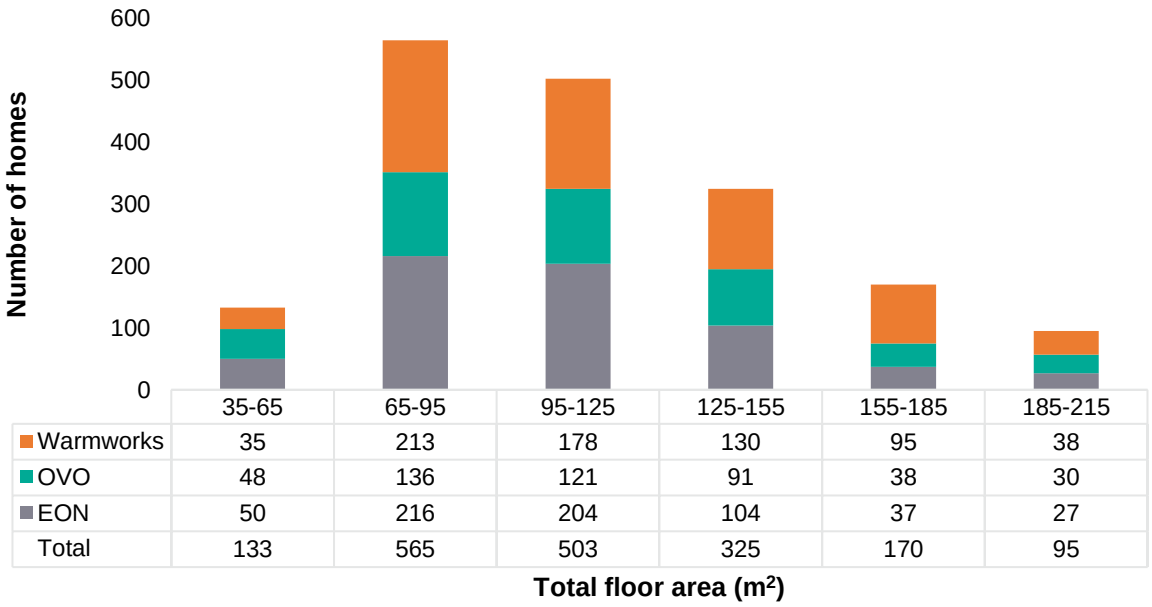
	On Gas	Off Gas
Warmworks	730	85
OVO	422	93
EON	612	44
Total	1764	222

Figure 22 Homes involved in trial, broken down by whether or not they are connected to the gas grid



	1	2	3	4	5	6+
Warmworks	16	121	298	213	63	7
OVO	18	85	221	176	57	4
EON	19	75	319	179	53	4
Total	53	281	838	568	173	15

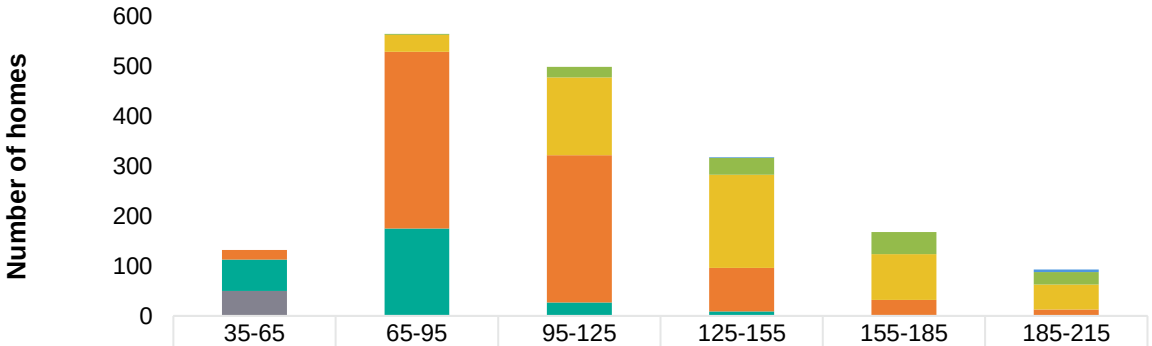
Figure 23 Homes involved in trial, broken down by number of bedrooms



	35-65	65-95	95-125	125-155	155-185	185-215
Warmworks	35	213	178	130	95	38
OVO	48	136	121	91	38	30
EON	50	216	204	104	37	27
Total	133	565	503	325	170	95

Total floor area (m^2)

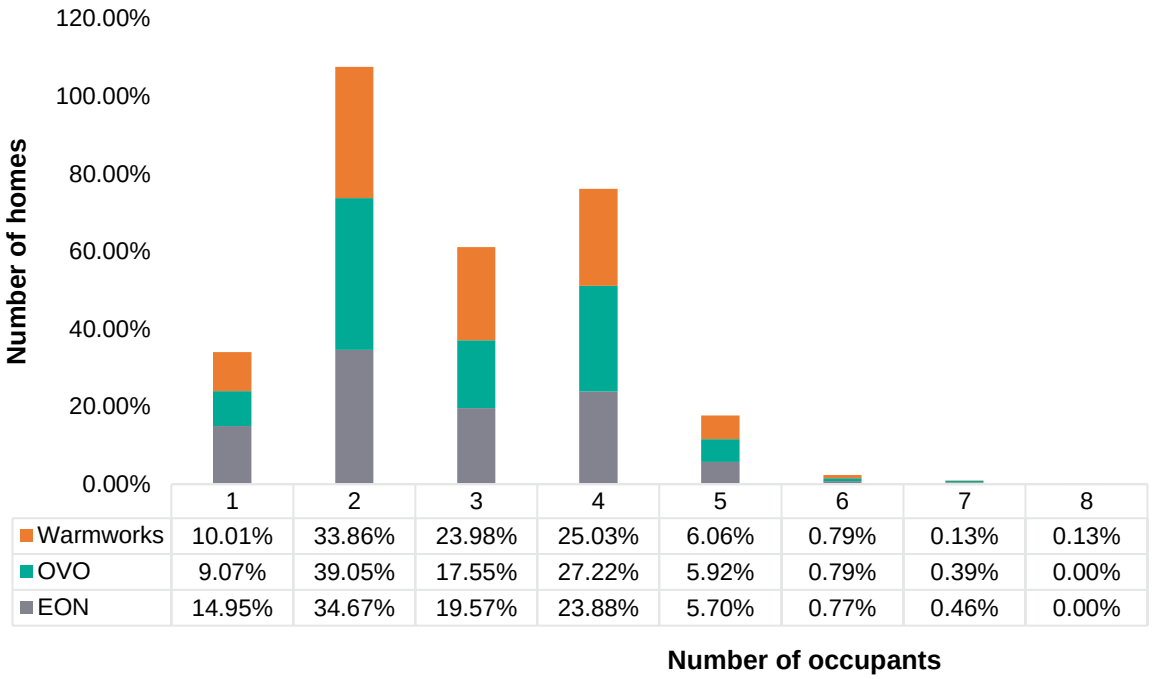
Figure 24 Homes involved in trial, broken down by total floor area



	35-65	65-95	95-125	125-155	155-185	185-215
6+ bedroom	0	0	0	1	0	5
5 bedroom	0	2	21	34	44	25
4 bedroom	0	34	156	187	92	50
3 bedroom	19	354	295	87	30	13
2 bedroom	63	173	27	9	2	0
1 bedroom	50	2	0	0	0	0

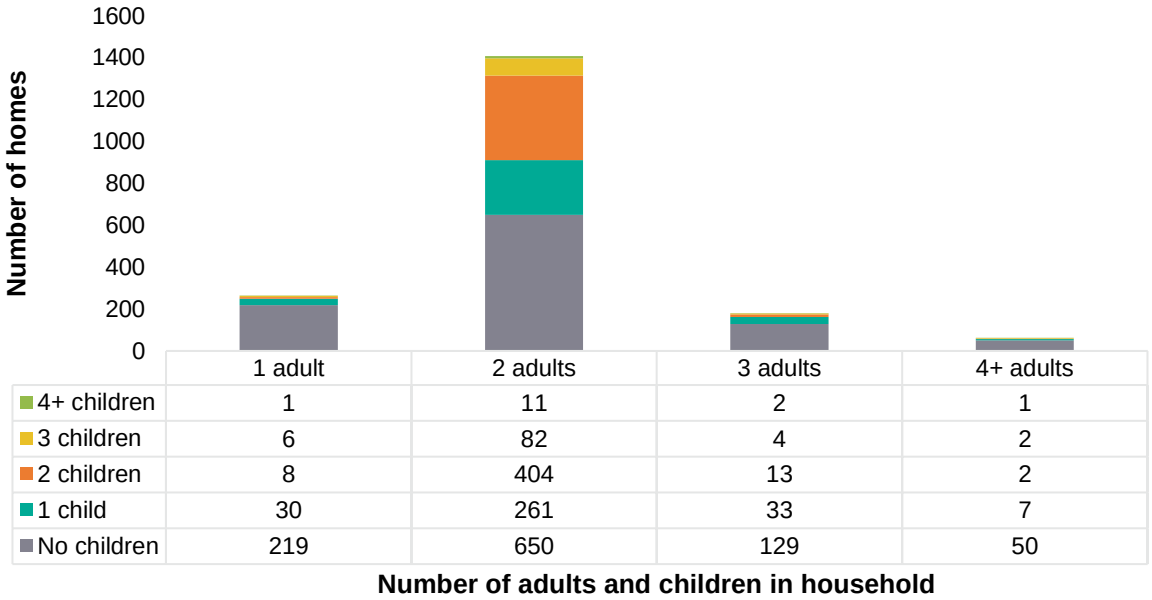
Total floor area of dwelling (m^2), compared to number of bedrooms

Figure 25 Comparison of total floor area and number of bedrooms to verify if number of bedrooms is a good indicator of house size



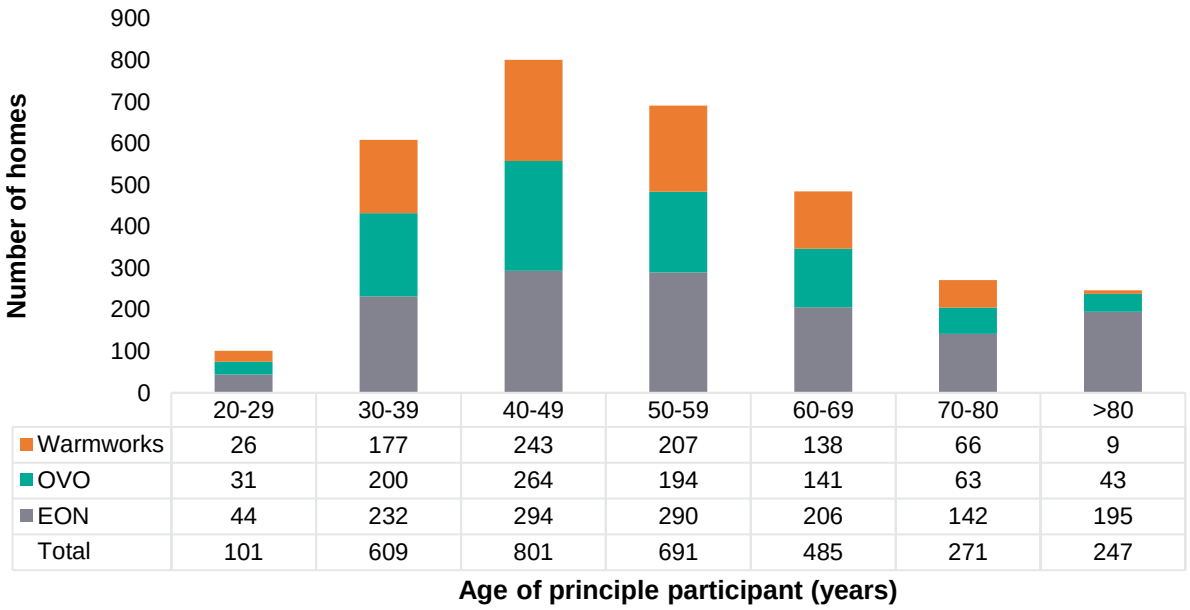
	1	2	3	4	5	6	7	8
Warmworks	10.01%	33.86%	23.98%	25.03%	6.06%	0.79%	0.13%	0.13%
OVO	9.07%	39.05%	17.55%	27.22%	5.92%	0.79%	0.39%	0.00%
EON	14.95%	34.67%	19.57%	23.88%	5.70%	0.77%	0.46%	0.00%

Figure 26 Homes involved in trial, broken down by number of occupants



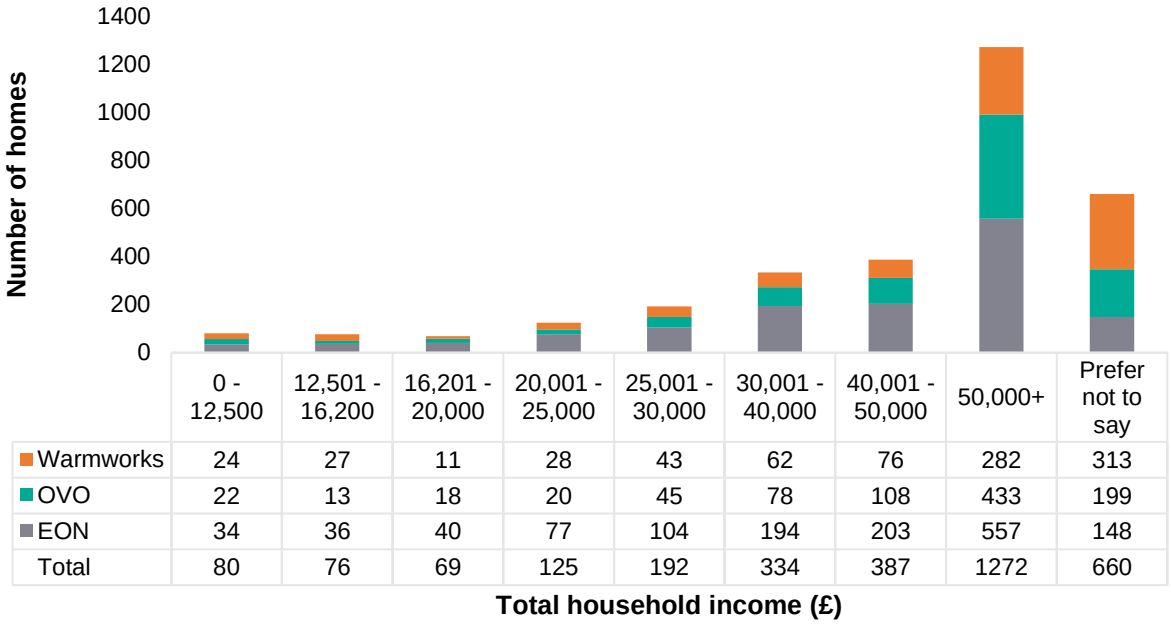
	1 adult	2 adults	3 adults	4+ adults
4+ children	1	11	2	1
3 children	6	82	4	2
2 children	8	404	13	2
1 child	30	261	33	7
No children	219	650	129	50

Figure 27 Size of households in trial, broken down by number of adults and number of children



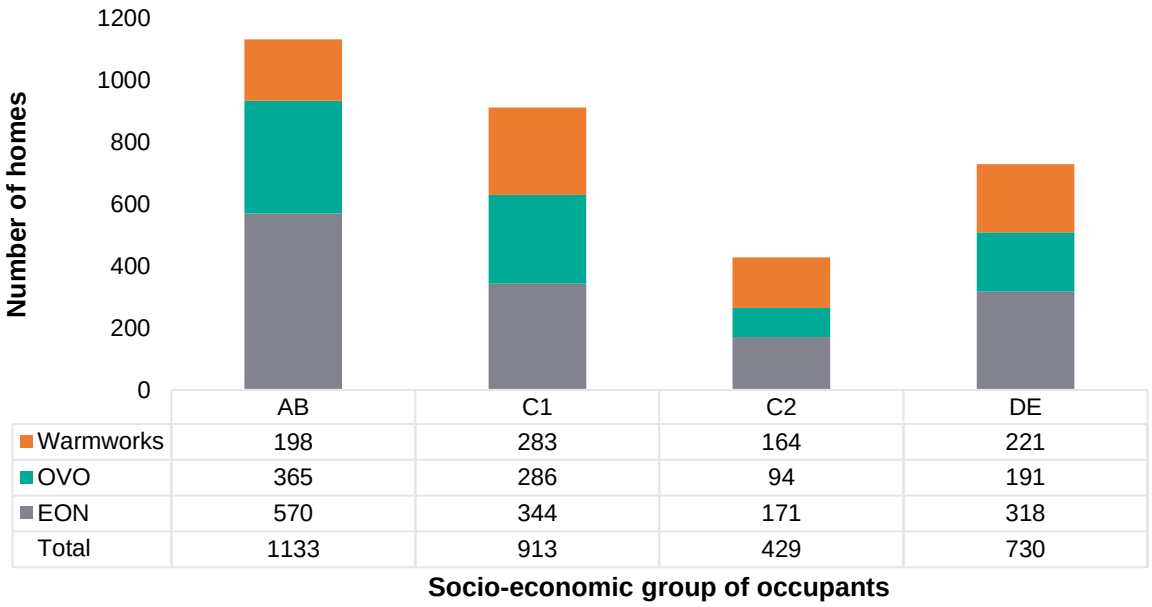
	20-29	30-39	40-49	50-59	60-69	70-80	>80
Warmworks	26	177	243	207	138	66	9
OVO	31	200	264	194	141	63	43
EON	44	232	294	290	206	142	195
Total	101	609	801	691	485	271	247

Figure 28 Participants involved in trial, broken down by age of principle participant when first contacted about the trial



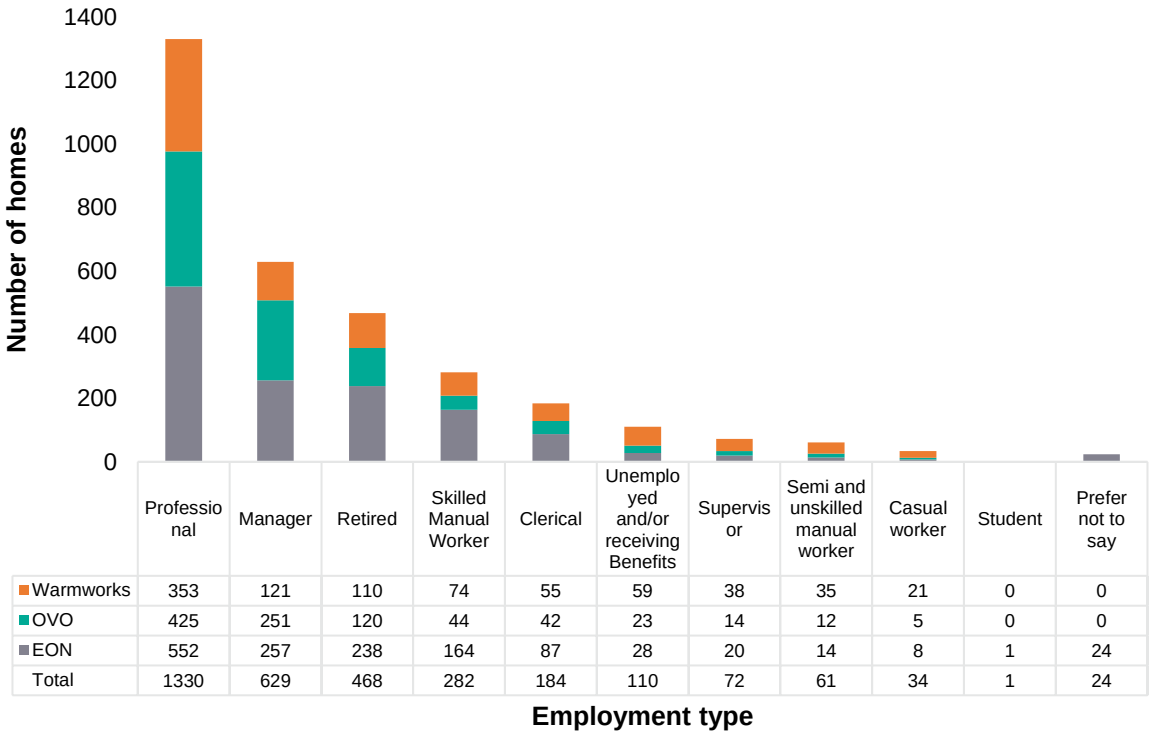
	0 - 12,500	12,501 - 16,200	16,201 - 20,000	20,001 - 25,000	25,001 - 30,000	30,001 - 40,000	40,001 - 50,000	50,000+	Prefer not to say
Warmworks	24	27	11	28	43	62	76	282	313
OVO	22	13	18	20	45	78	108	433	199
EON	34	36	40	77	104	194	203	557	148
Total	80	76	69	125	192	334	387	1272	660

Figure 29 Participants involved in trial, broken down by total household annual income



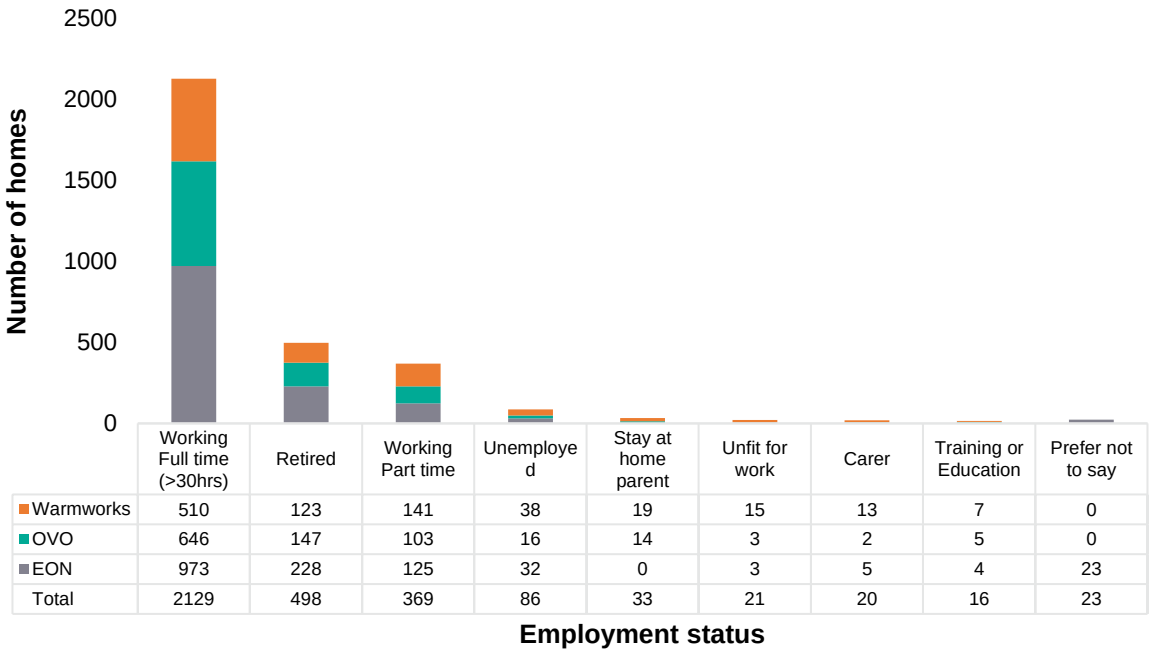
	AB	C1	C2	DE
Warmworks	198	283	164	221
OVO	365	286	94	191
EON	570	344	171	318
Total	1133	913	429	730

Figure 30 Participants involved in trial, broken down by socio-economic group (of main participant)



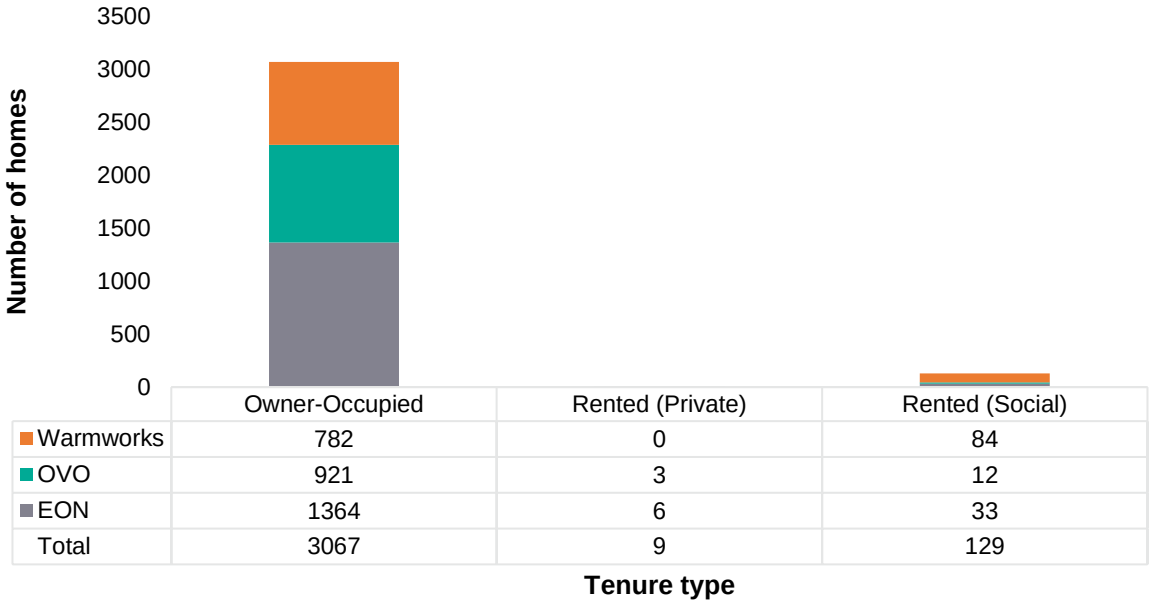
	Professional	Manager	Retired	Skilled Manual Worker	Clerical	Unemployed and/or receiving Benefits	Supervisor	Semi and unskilled manual worker	Casual worker	Student	Prefer not to say
Warmworks	353	121	110	74	55	59	38	35	21	0	0
OVO	425	251	120	44	42	23	14	12	5	0	0
EON	552	257	238	164	87	28	20	14	8	1	24
Total	1330	629	468	282	184	110	72	61	34	1	24

Figure 31 Participants involved in trial, broken down by employment type (of main participant)



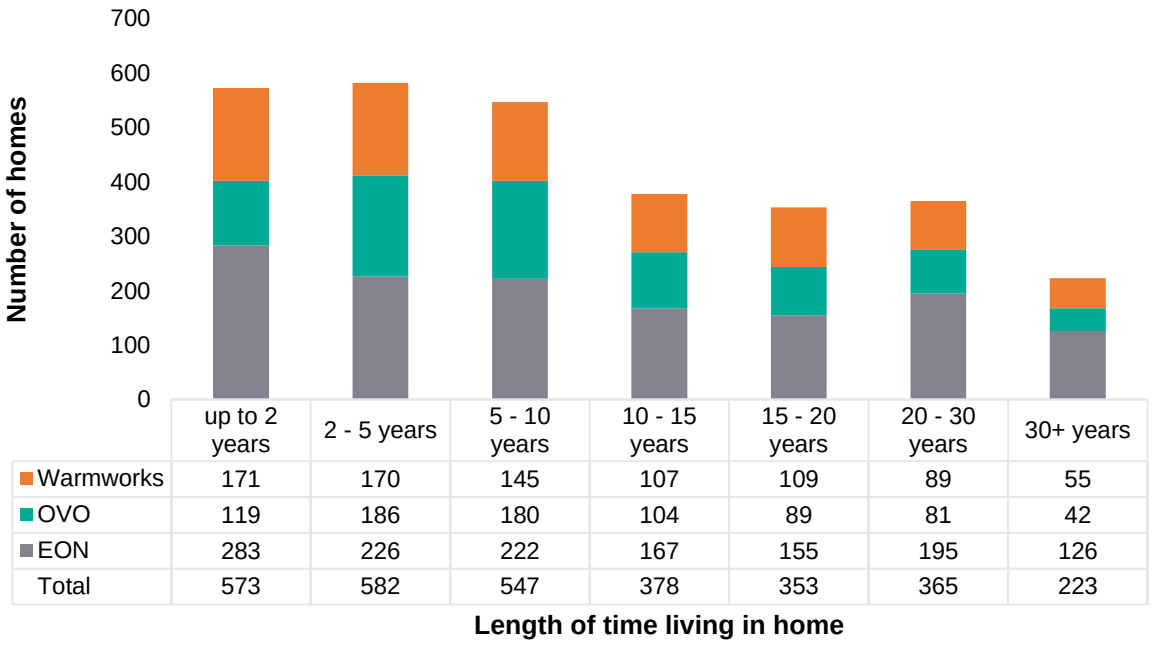
	Working Full time (>30hrs)	Retired	Working Part time	Unemployed	Stay at home parent	Unfit for work	Carer	Training or Education	Prefer not to say
Warmworks	510	123	141	38	19	15	13	7	0
OVO	646	147	103	16	14	3	2	5	0
EON	973	228	125	32	0	3	5	4	23
Total	2129	498	369	86	33	21	20	16	23

Figure 32 Homes involved in trial, broken down by employment status of main participant



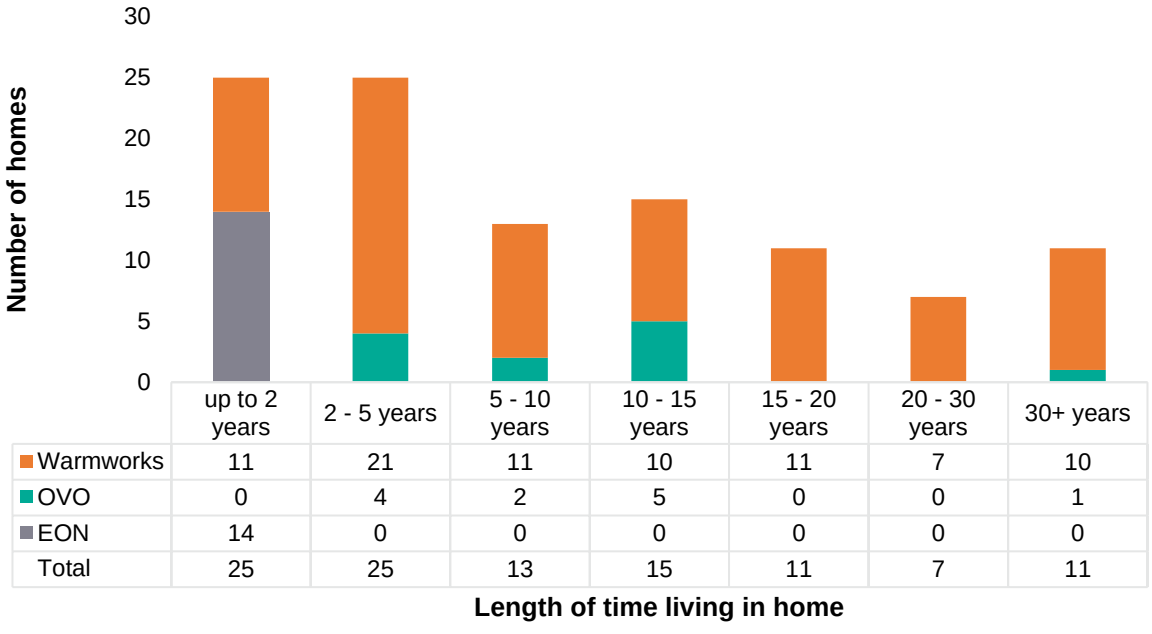
	Owner-Occupied	Rented (Private)	Rented (Social)
Warmworks	782	0	84
OVO	921	3	12
EON	1364	6	33
Total	3067	9	129

Figure 33 Homes involved in trial, broken down by current tenure type



	up to 2 years	2 - 5 years	5 - 10 years	10 - 15 years	15 - 20 years	20 - 30 years	30+ years
Warmworks	171	170	145	107	109	89	55
OVO	119	186	180	104	89	81	42
EON	283	226	222	167	155	195	126
Total	573	582	547	378	353	365	223

Figure 34 Homes involved in trial, broken down by length of time household have been living in their current home



	up to 2 years	2 - 5 years	5 - 10 years	10 - 15 years	15 - 20 years	20 - 30 years	30+ years
Warmworks	11	21	11	10	11	7	10
OVO	0	4	2	5	0	0	1
EON	14	0	0	0	0	0	0
Total	25	25	13	15	11	7	11

Figure 35 For social rented sector homes only: length of time household have been living in their current home

12.2. Awareness of heat pumps

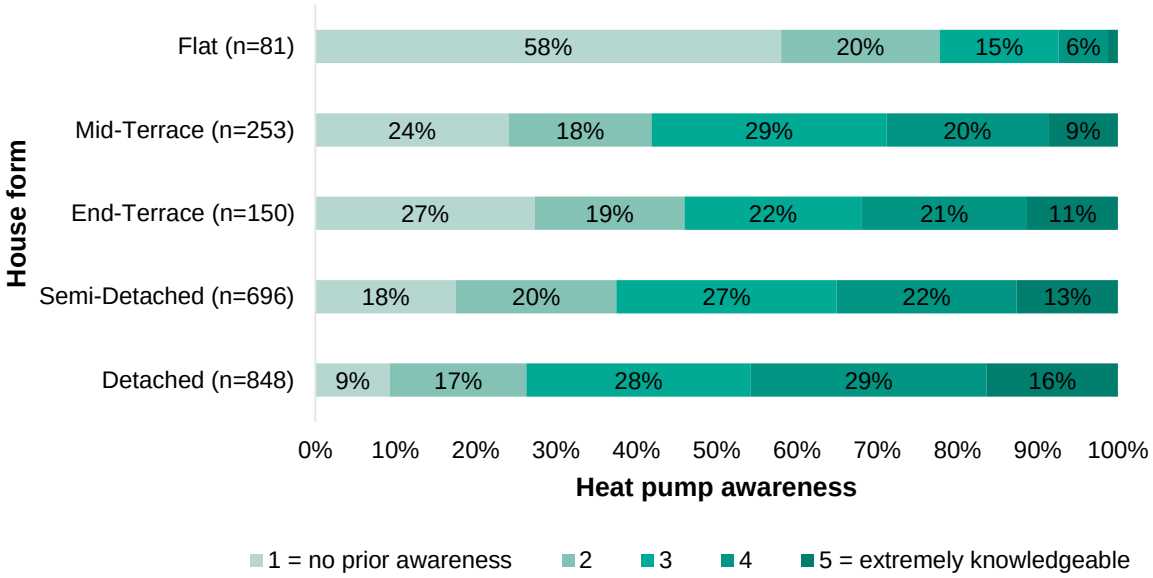


Figure 36 Reported level of awareness a household has of heat pump systems at the start of this project, broken down by house form. Description of 5-point awareness scale levels is given in Table 2.

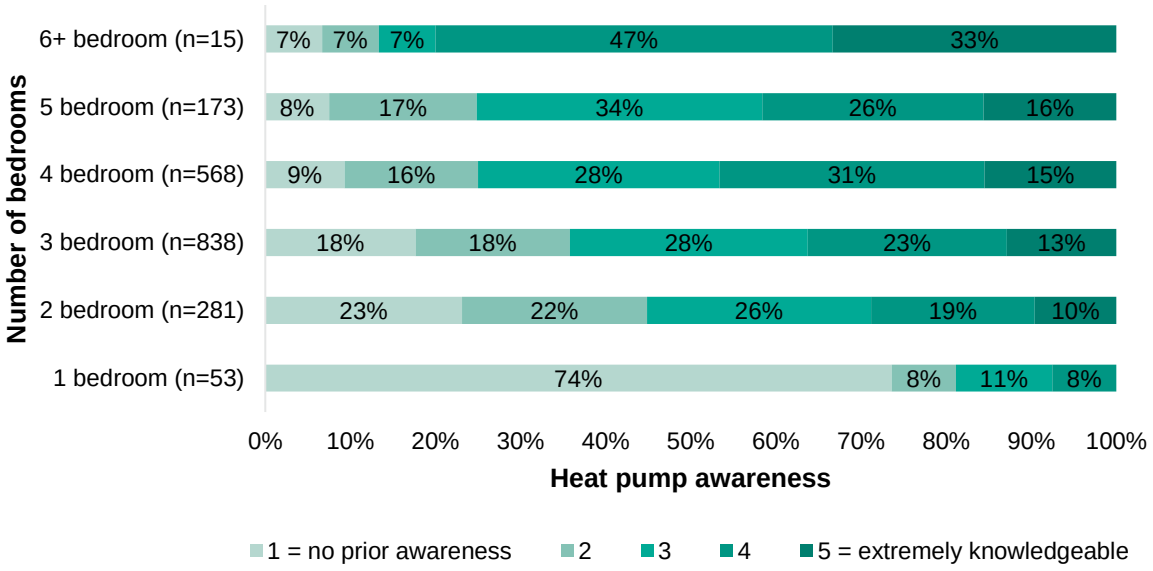


Figure 37 Reported level of awareness a household has of heat pump systems at the start of this project, broken down by house size, represented by number of bedrooms. Description of 5-point awareness scale levels is given in Table 2

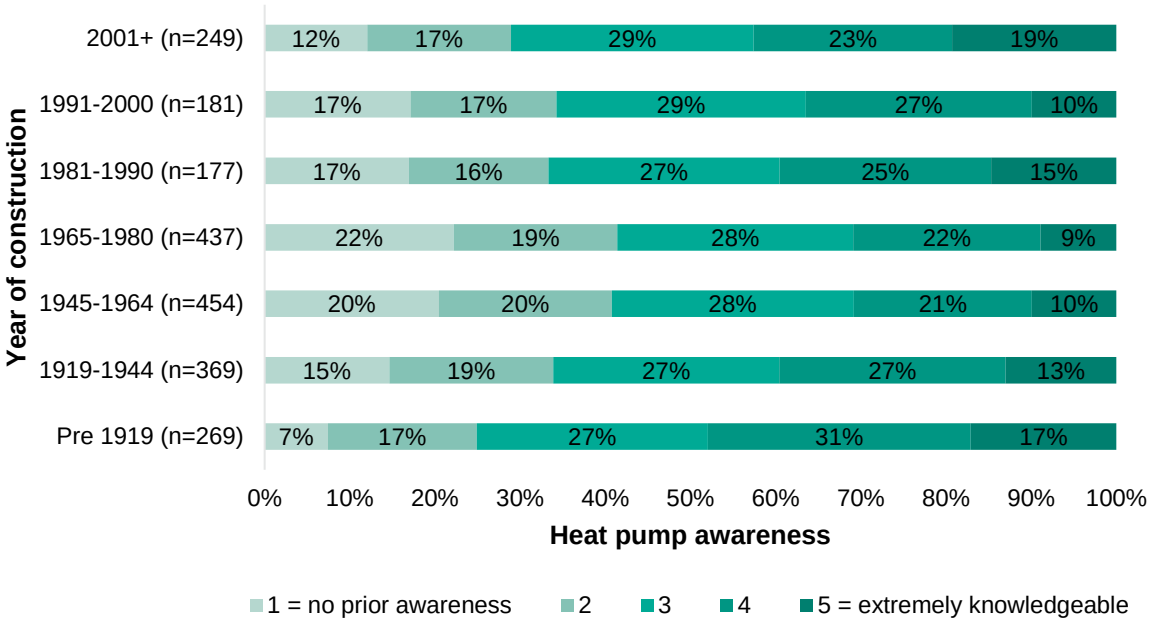


Figure 38 Reported level of awareness a household has of heat pump systems at the start of this project, broken down by estimated year of construction ((NB age bands are approximate for EON participants as different age bands were used in their data capture). Description of 5-point awareness scale levels is given in Table 2.

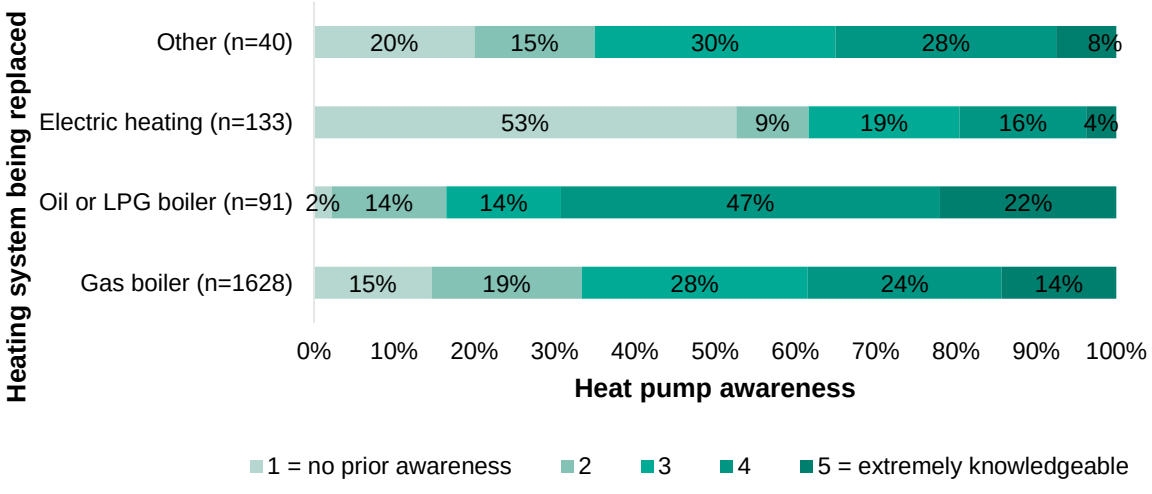


Figure 39 Reported level of awareness a household has of heat pump systems at the start of this project, broken down by heating system being replaced. Description of 5-point awareness scale levels is given in Table 2

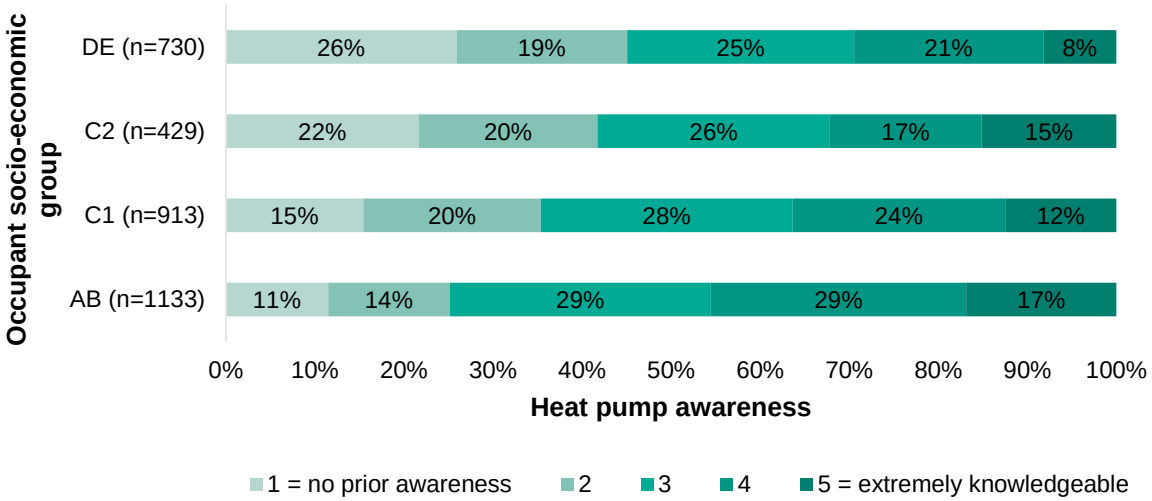


Figure 40 Reported level of awareness a household has of heat pump systems at the start of this project, broken down by occupant socio-economic group. Description of 5-point awareness scale levels is given in Table 2.

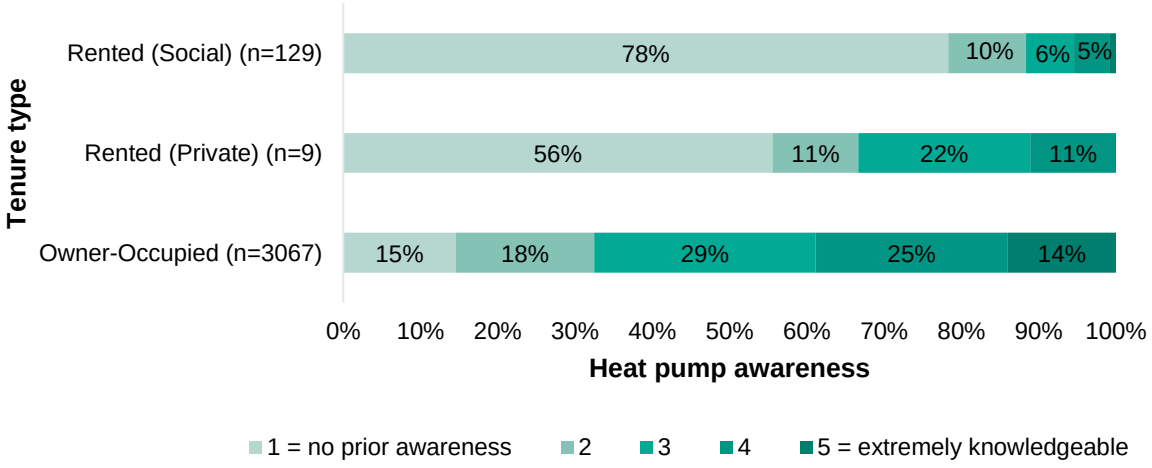


Figure 41 Reported level of awareness a household has of heat pump systems at the start of this project, broken down by tenure type. Description of 5-point awareness scale levels is given in Table 2.

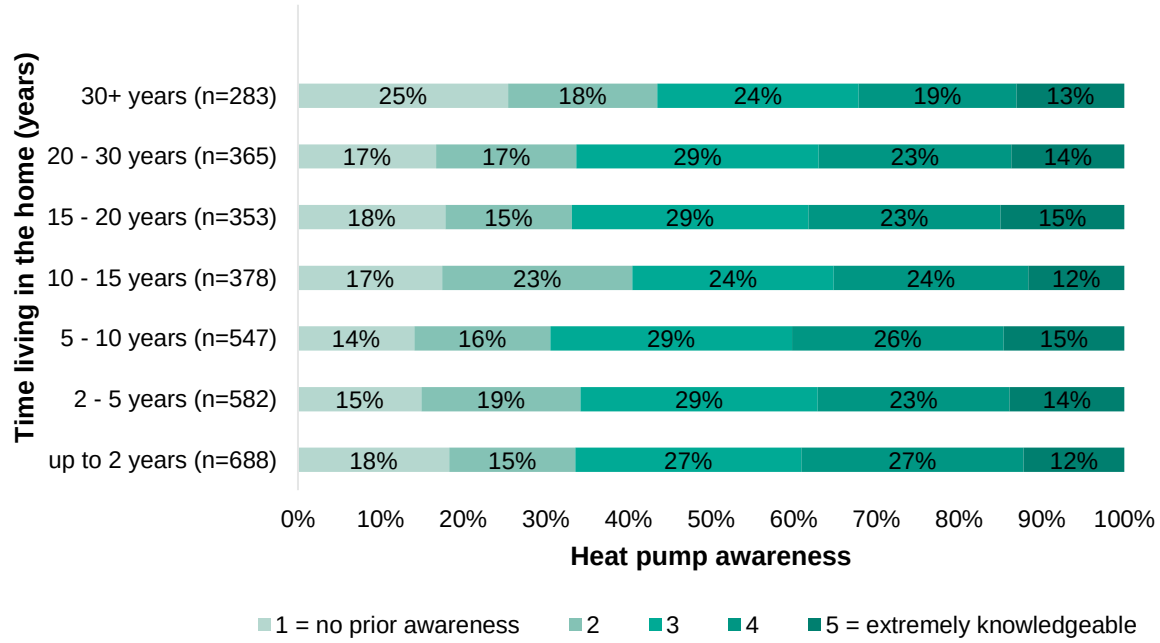


Figure 42 Reported level of awareness a household has of heat pump systems at the start of this project, broken down by length of time participants have lived in their current house. Description of 5-point awareness scale levels is given in Table 2.

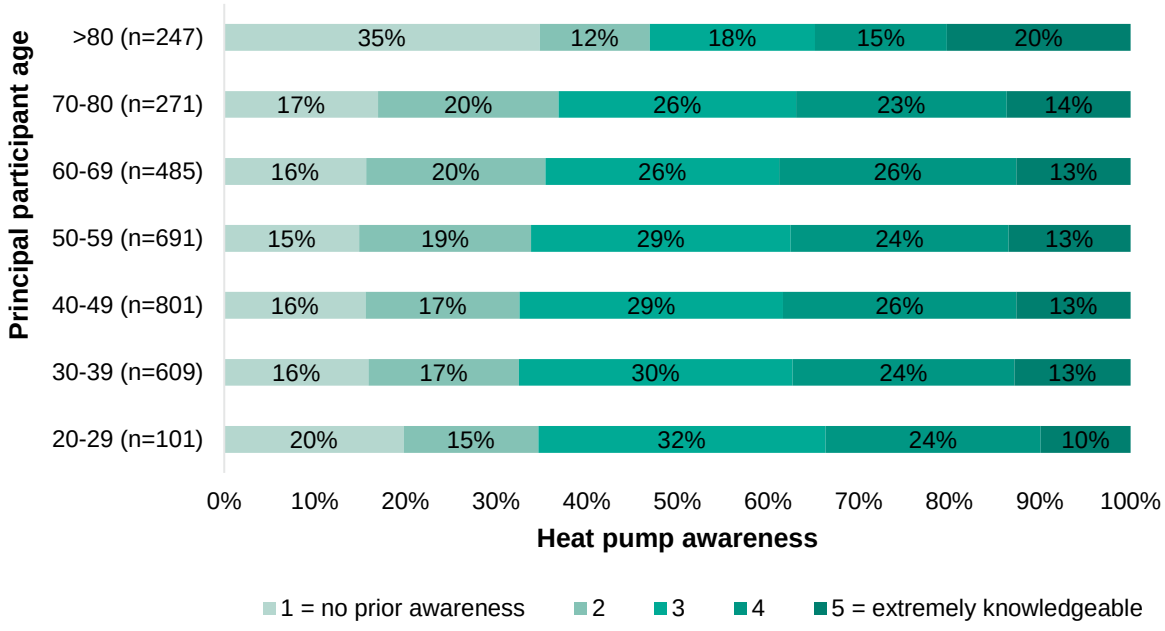


Figure 43 Reported level of awareness a household has of heat pump systems at the start of this project, broken down by main participant's age when first contacted about the trial. Description of 5-point awareness scale levels is given in Table 2.

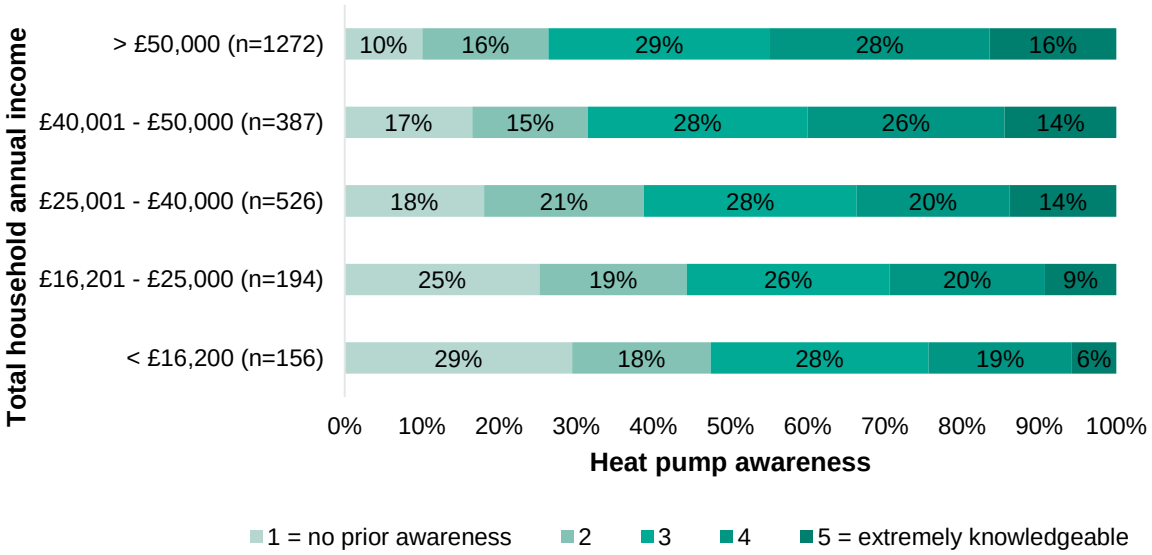


Figure 44 Reported level of awareness a household has of heat pump systems at the start of this project, broken down by total household annual income. Description of 5-point awareness scale levels is given in Table 2.

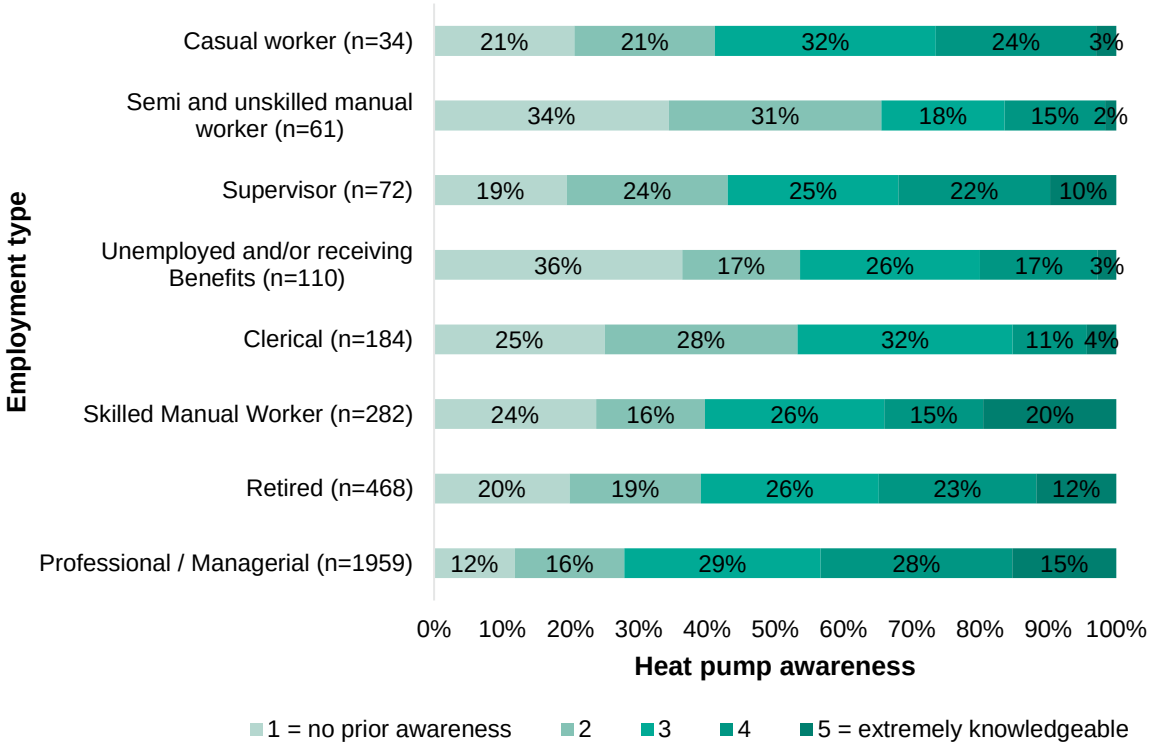


Figure 45 Reported level of awareness a household has of heat pump systems at the start of this project, broken down by employment type of main participant. Description of 5-point awareness scale levels is given in Table 2.

12.3. Motivations for involvement in project

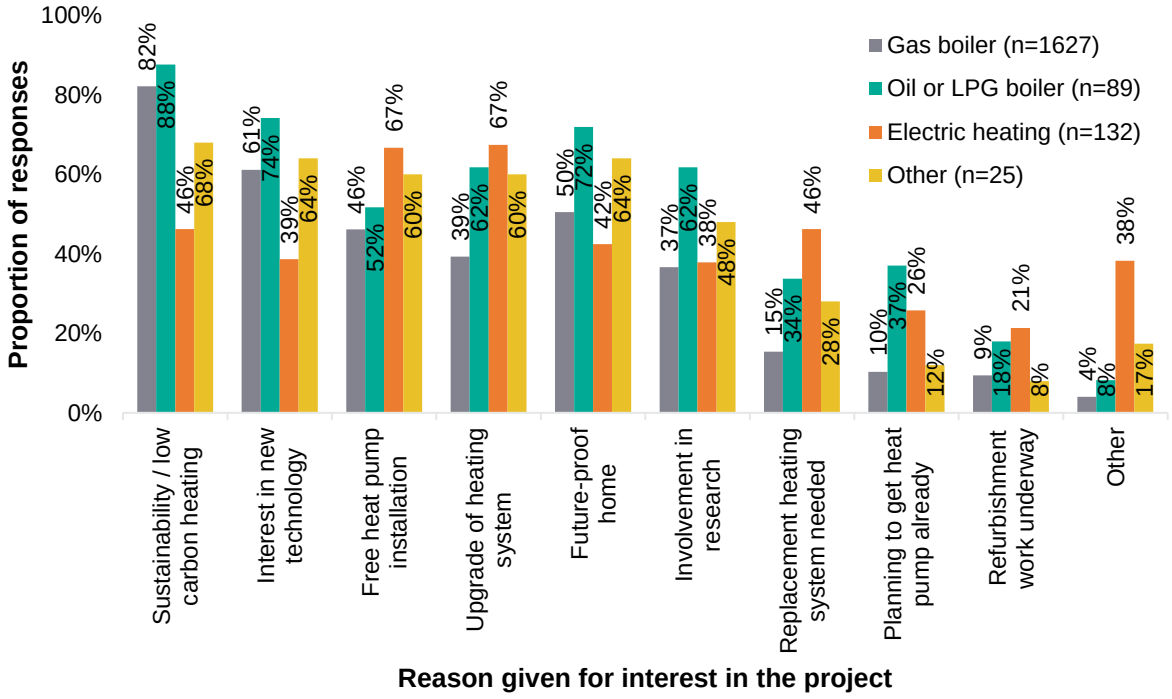


Figure 46 Reason given for wanting to participate in the project, broken down by primary heating system being replaced. Participants were able to give multiple reasons, depending on the approach of the DC as described caption in the caption to Figure 11.

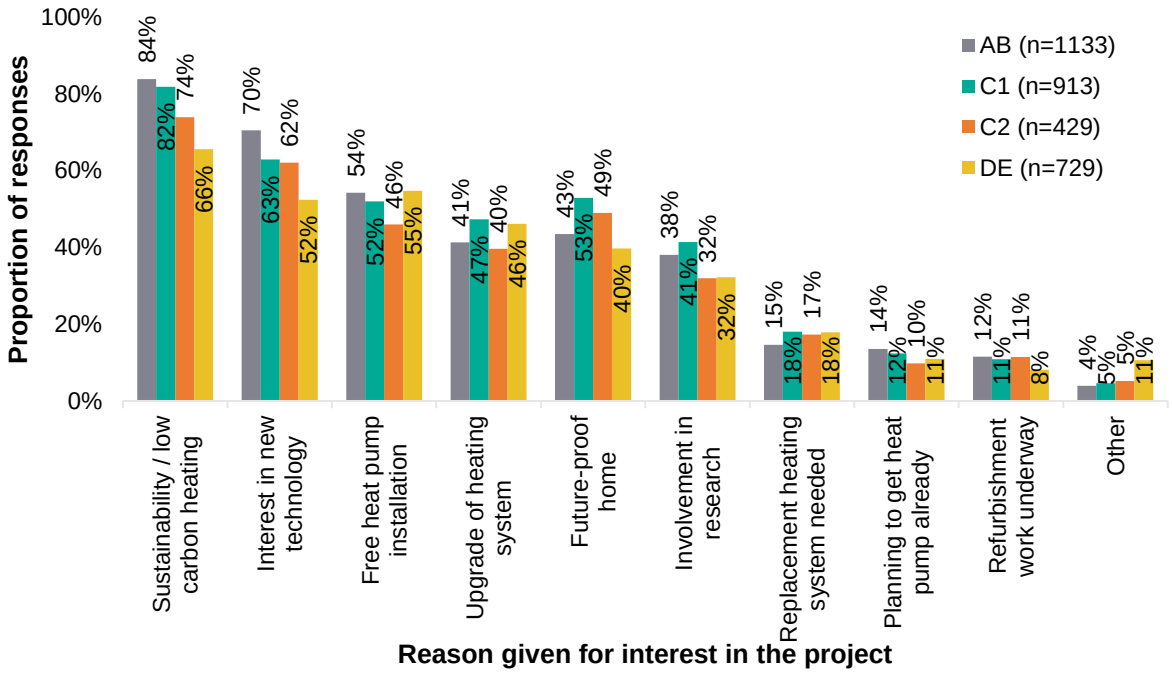


Figure 47 Reason given for wanting to participate in the project, broken down by socio-economic group. Participants were able to give multiple reasons, depending on the approach of the DC as described in the caption to Figure 11.

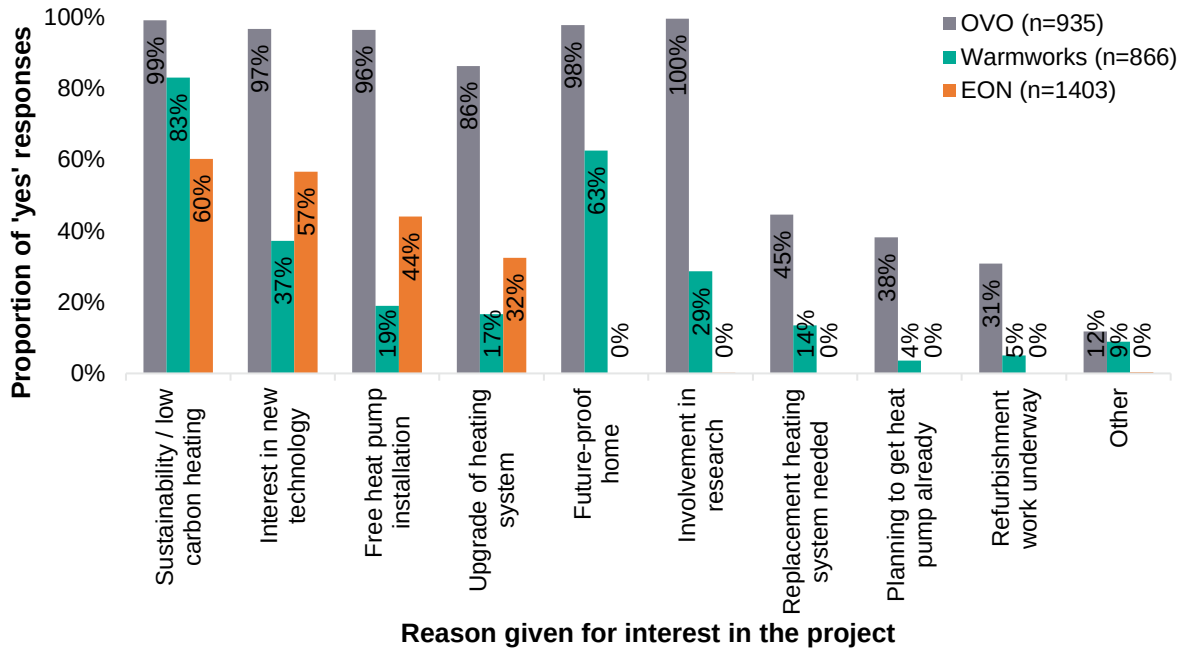


Figure 48 Reason given for wanting to participate in the project, broken down by delivery contractor. Participants were able to give multiple reasons, depending on the approach of the DC. Participants recruited by OVO and EON (n=2080) were asked about each reason and gave an answer of 'yes' or 'no' depending on whether this was a motivation for them. Participants recruited by Warmworks were asked to name three reasons for joining the trial; these three reasons have been coded 'yes' and all other reasons have been coded 'no'.

12.4. Barriers

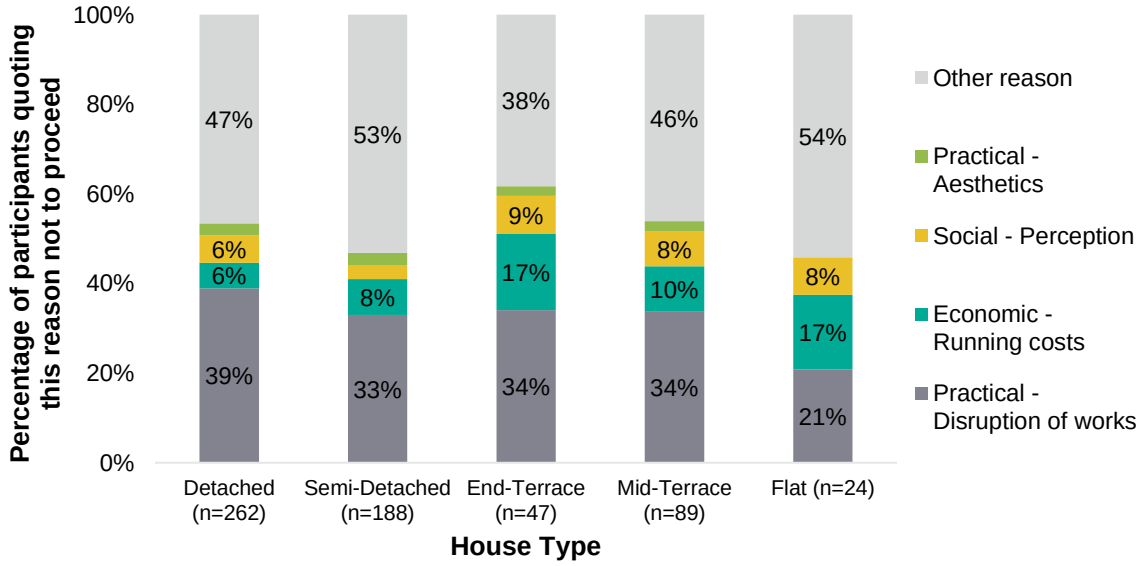


Figure 49 Breakdown of four most common reasons given by participant for not wanting to proceed with heat pump installation, broken down by house form. Participants were able to give up to two reasons. Data labels are omitted if less than 5% of sample for clarity of charts.

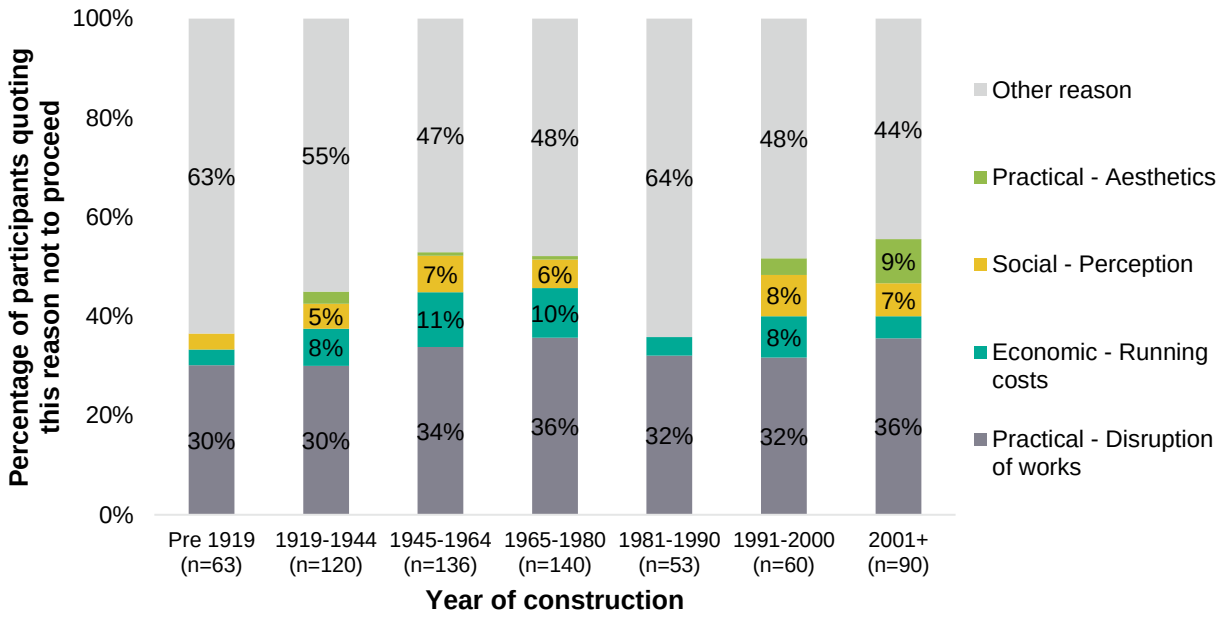


Figure 50 Reason given by participant for not wanting to proceed with heat pump installation, broken down by construction year of the dwelling. Participants were able to give up to two reasons. Data labels are omitted if less than 5% of sample for clarity of charts.

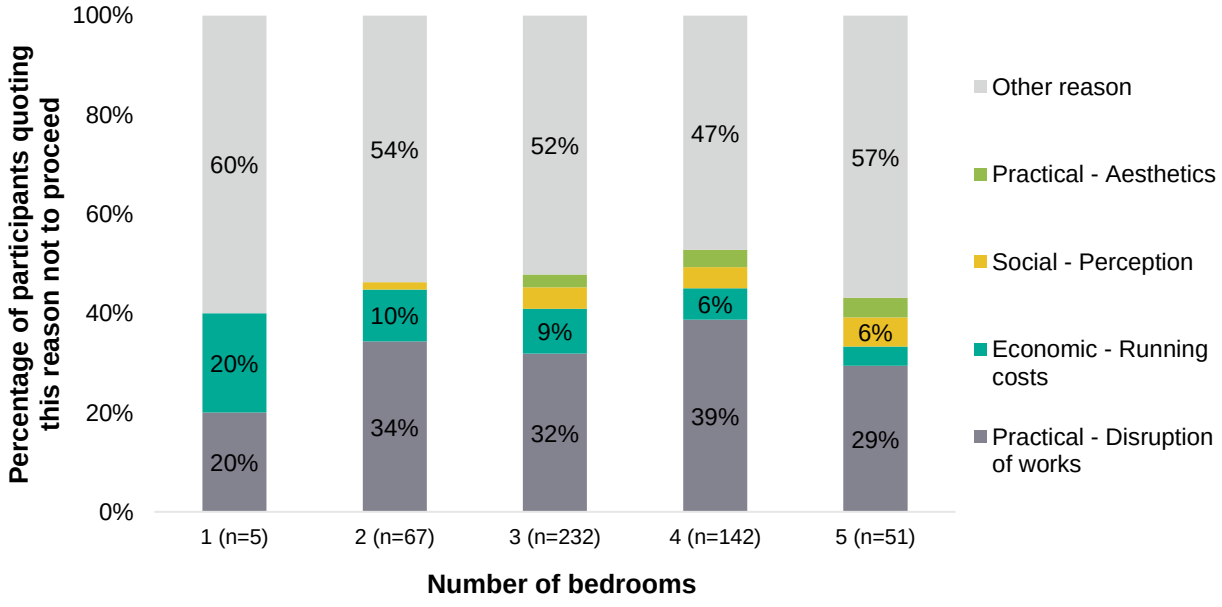


Figure 51 Breakdown of four most common reasons given by participant for not wanting to proceed with heat pump installation, broken down by number of bedrooms in their home (1 bedroom and 6+ bedrooms are omitted due to small sample size). Participants were able to give up to two reasons. Data labels are omitted if less than 5% of sample for clarity of charts.

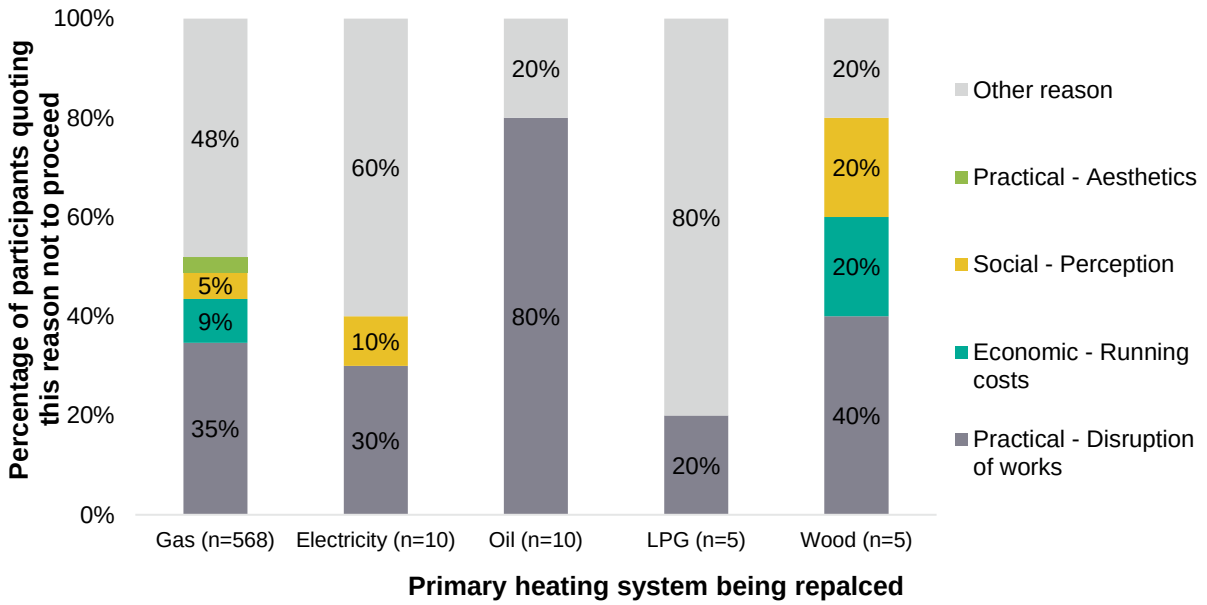


Figure 52 Breakdown of four most common reasons given by participant for not wanting to proceed with heat pump installation, broken down by primary heating system being. Participants were able to give up to two reasons. Data labels are omitted if less than 5% of sample for clarity of charts.

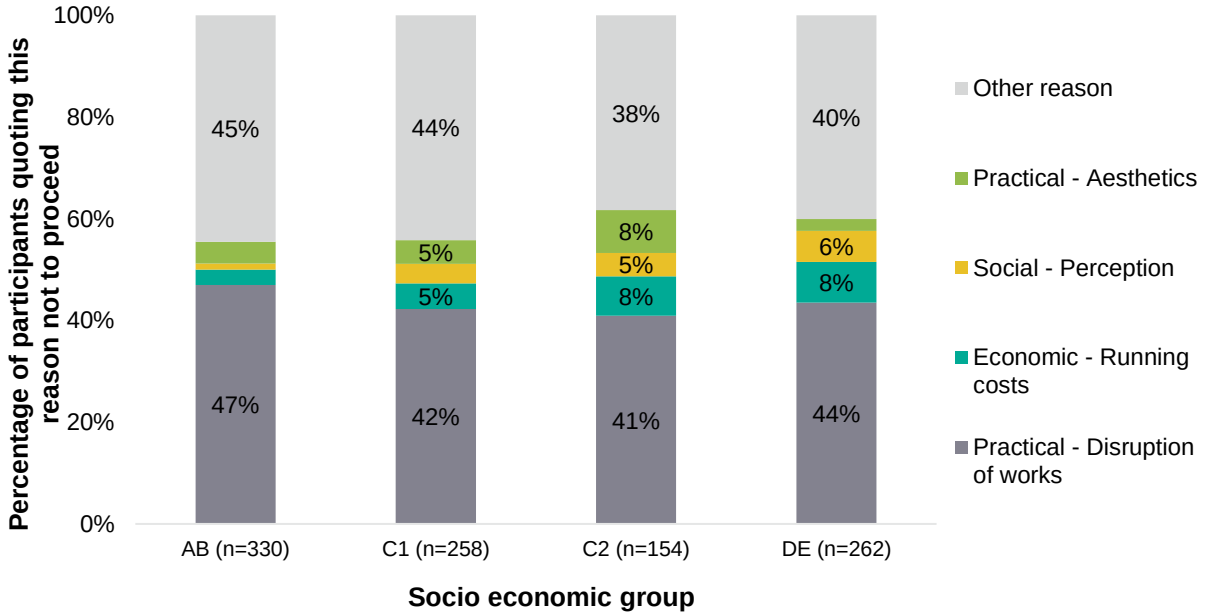


Figure 53 Reason given by participant for not wanting to proceed with heat pump installation, broken down by socio-economic group. Participants were able to give up to two reasons. Data labels are omitted if less than 5% of sample for clarity of charts.

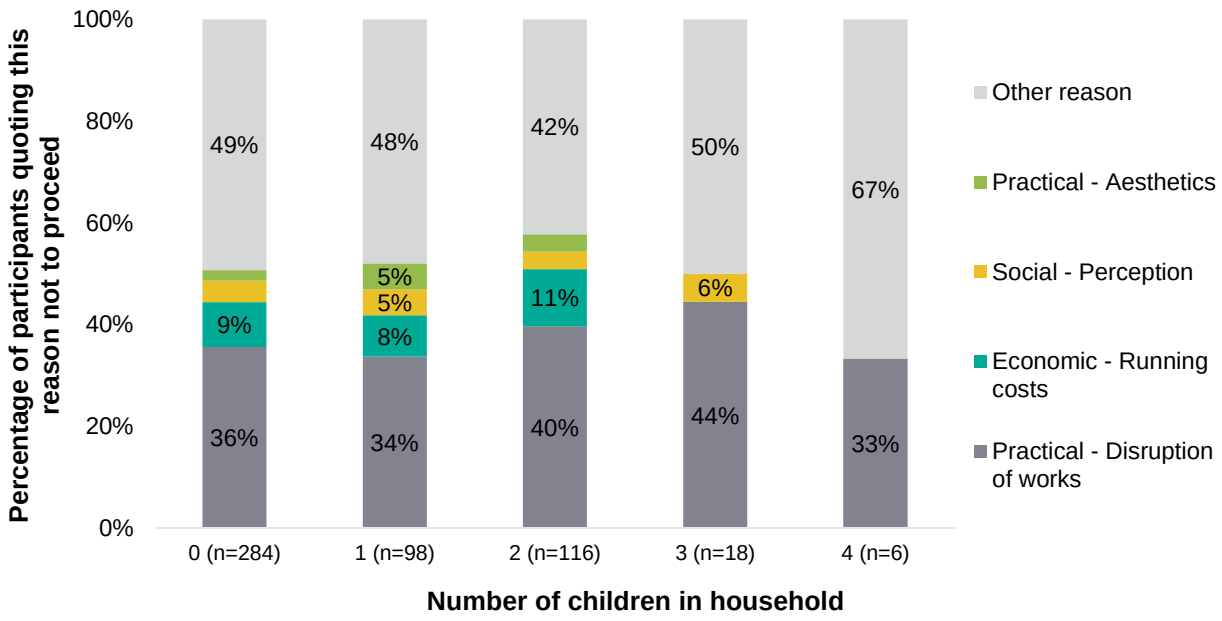


Figure 54 Breakdown of four most common reasons given by participant for not wanting to proceed with heat pump installation, broken down number of children in the household. Participants were able to give up to two reasons. Data labels are omitted if less than 5% of sample for clarity of charts.

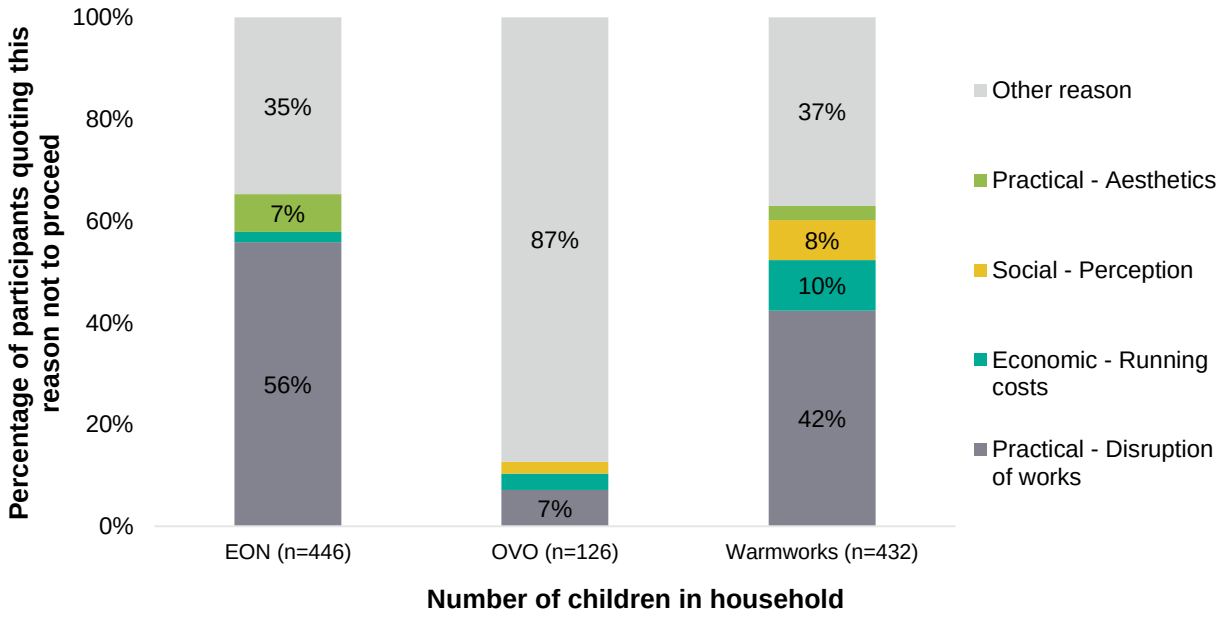


Figure 55 Reason given by participant for not wanting to proceed with heat pump installation, broken down by delivery contractor. Participants were able to give up to two reasons. Data labels are omitted if less than 5% of sample for clarity of charts

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