# RAF061/2223 Impact of Heat Pump Costs on Uptake: A Discrete Choice Experiment

## Technical Annex

ICF Consulting Services Limited (2024)

Completed by ICF Consulting Services Limited in association with The Behaviouralist and Moonlight Research for the Department for Energy Security and Net Zero prior to the general election in the United Kingdom in July 2024.

As such, any references to government policies, commitments, or initiatives may reflect the stance of the previous administration and were accurate at the time of fieldwork and writing.

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Views expressed in this report are from the relevant research agencies, based on data collected from research participants and other evidence, and not necessarily those of the UK government.

# Contents

# Annex 1 Detailed methodology

*This annex describes the delivery of the study methodology. It firstly discusses the approach to the pilot, then explains how the mainstage survey was delivered.*

## Pilot

### Background

The overarching purpose of the pilot stage was to develop the survey and experimental design, and to test this with a small sample of respondents quickly and robustly. We used findings from the pilot phase to refine the study methodology and ensure the clarity and effectiveness of the survey in advance of the main experiment, where we delivered it to a wider audience.

### Sampling

The pilot sample was not designed to be representative of British owner-occupiers, as its aim was to test whether the survey questionnaire was working as intended. Consequently, we drew the sample from an online panel, which provided easy access to respondents, making testing the appropriateness of the survey in limited time more feasible. We drew upon two online panels for the pilot: (1) a panel run by Latch Media, (2) a panel run through PanelBase. We engaged PanelBase due to lower than anticipated response rates from Latch Media's panel, to recruit the additional respondents required to reach targets within the determined time frame.

We used quotas to ensure a spread of respondent types (e.g., across regions, heating system types) within the sample. Target respondents included homeowners in Great Britain that were on oil or mains gas heating systems and did not live in high-rise buildings. We excluded tenants and those living in high rise buildings since it was assumed this group would not be likely to take up an ASHP (e.g., in high rise buildings heat networks are a more feasible option), or would not be the ones making such decisions (e.g., typically home heating installations fall to landlords to finance). We excluded heating systems other than oil or mains gas from the sample to ensure each sub-group included within the analysis would be large enough to avoid under-powered results (i.e., homes with certain off-gas grid heating systems make up a relatively small share of the overall housing stock, and therefore it would be challenging to receive sufficient survey responses from such a group to enable a robust analysis).

### Distribution approach

We conducted the online survey distribution in several stages, adapting based on response rates. First, we recruited participants for cognitive interviews, then the online survey. We contacted the Latch Media sample via email [1]in two batches of ~600 participants each. We sent reminders to the first batch of participants. The second were recruited to the cognitive interviews since the online survey was then handed over to Panelbase. PanelBase managed the distribution of the online survey with their panel participants, using a target of 50 responses and quotas for respondents with gas (30) and oil-based (20) heating systems. The survey closed once agreed quotas were filled.

As with the online survey, we distributed and delivered the cognitive interviews in several stages to allow us to tailor our approach in line with the number and characteristics of the people agreeing to take part. First Move contacted participants via email, in batches of ~200.

As an incentive to participate in this research, we offered participants a £10 voucher for completing the survey or a £25 voucher for completing the survey and cognitive interview. Initially we offered participants a £5 incentive for the survey, as opposed to £10, and £20 for the interviews, but this was raised after the initial low response rate. The higher incentive payment was given to all those who had completed the survey, including those who had been originally offered the lower amount.

## Delivery of the cognitive interviews

The cognitive interviews aimed to test respondent understanding of the survey questions asked. The interviews aimed to generate rich learning, including from picking up on non-verbal cues and testing where respondents misunderstood or misinterpreted questions without themselves realising. We delivered these as semi-structured interviews, guided by a topic guide and facilitated by a member of the research team. We conducted them either over the phone or on MS Teams. Where respondents could access MS Teams and provided their consent, we recorded interviews. Where technically possible, we asked participants to share their screen whilst completing the survey, so that the interviewer could observe answers, and which sections took longer to complete.

The interview duration was around 20 minutes (with a further 20 allowed for survey completion/observation) and we designed the topic guide to gather feedback around the clarity of the survey and respondents' comprehension of the questions. The interviews covered: how easy or difficult participants found it to complete the survey, their initial knowledge of heat pumps, feedback on the explanations provided about heat pumps, the choice environment and understanding how the DCE was interpreted, how realistic they were when making choices, and the clarity/understanding of the key post-experiment questions. Interview topic guides are available in Annex 6.

## Experiment design

We designed the experiment iteratively in close collaboration with the Department for Energy Security and Net Zero (DESNZ). The design process began with a document review and initial scoping interviews with the DESNZ project team, which helped define the study's aim,

[1] First Move was the study partner responsible for delivering communications materials (e.g., email invitations and posting letters) throughout the pilot and main stage experiment.

requirements, and the expected use of the study findings. During the design phase, we determined the general scenario for the DCE, the number of options to include in each choice-set, the number of attributes and levels to test throughout the DCE, and the total number of choice sets to ensure sufficient statistical power. In this context we tested the following key design elements at the pilot stage:

- Regarding the number of options to include in a choice set: on the one hand, asking participants to choose between two options would be cognitively less demanding than choosing between three options. It could also be more representative of the choice environment citizens are likely to face in real life. On the other hand, asking participants to choose between three options within a choice set would provide more statistical power as participants are required to account for more trade-offs when making a decision. Further, having three options in a given choice set would reduce the number of choice sets participants must complete, reducing survey fatigue. For this reason, we tested both choice environments in the pilot to understand which alternative would generate the most reliable results. The first choice environment included two options: to renew their current heating system or to install a heat pump. The second choice environment had three options: renewing their current heating system or taking up one of two heat pump options. Each choice set also included a question designed to elicit respondents' level of confidence in their choice. We included this additional feature in order to recalibrate demand estimates based on respondents' stated level of confidence. We also discussed confidence further in the cognitive interviews.
- Regarding the number of choice sets to present to participants: the pilot DCE tested five attribute levels for upfront costs and five levels for running costs. Based on this, we generated 16 choice sets for the three-option choice set version and 24 for the two-option choice set version. The literature suggests that 18 choice sets are the maximum number respondents can respond to in a meaningful way[2]. We therefore divided the number of choice sets into two blocks of 8 choice sets for the three-option version and 12 choice sets for the two-option version. As stated above, we tested the choice sets with 3 options and those with 2 options in the pilot to identify the version that generated the 'best' data (e.g., the version where participants make the more internally consistent choices). In parallel, we drafted screening questions, post-experiment questions, pilot feedback questions and a final randomised controlled trial to test the effect of messaging on heat pump adoption. Following the DCE, we asked respondents questions to understand the main factors that influenced their decision to choose heat pumps over a fossil-fuel heating system. This section also included sensitivity questions about expected housing tenure, renovations, and energy price projections. Respondents were also asked to complete socio-demographic questions and questions to elicit their general feedback on the survey experiment.

An online survey questionnaire was then developed, as set out in Annex 6.

[2] For example: Eysenbach (2021), Understanding Uptake of Digital Health Products: Methodology Tutorial for a Discrete Choice Experiment Using the Bayesian Efficient Design, available here: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8546533/

## Response rates

In total, we contacted 1,547 participants to participate in the pilot online survey (371 from the PanelBase sample, and 1,176 from the Latch Media Sample). We asked 1,373 participants to participate in cognitive interviews. 412 individuals accessed the online survey experiment, and 25 initial responses were received from cognitive interview contacts. Final response rates based on these figures are presented in Table 1 below.

**Table 1: Response rates from the pilot**

| Group | Response rate |
|---|---|
| Online survey – all | 4.8% |
| Online survey – Panelbase | 15.6% |
| Online survey – Latch Media | 0.3% |
| Cognitive interviews | 0.9% |

A total of 69 respondents (17% of those that opened the survey) were screened out. Among them, 47 were screened out because of their heating system, 20 because they did not own their property, and 2 because they completed the survey in under 5 minutes (which was set as the threshold for having completed the survey too fast to have paid sufficient attention). Most respondents that were screened out due to their heating system had electric heating systems. Those that selected 'Other' generally had wood burners or a combination of different systems (e.g., gas, electric, biomass).

The drop-out rates and the key drop-out points within the survey differed significantly across the different recruitment channels[3]. For First Move respondents, the first page (i.e., the introduction to the survey) was the main drop-out point (56% of respondents)[4], while for PanelBase respondents, the main drop-out point was the screening questionnaire (21% of respondents)[5]. We considered options for streamlining sections with the highest drop-out rates for the main experiment, as highlighted in sub-section below.

### Key lessons learned from the pilot and changes made to the main experiment

The findings gathered from the pilot generated learnings that informed the design and delivery of the main experiment. Specifically, these highlighted aspects of the proposed methodology that needed to be refined and updated to improve the clarity of the survey and/or the quality and robustness of the results gathered, as well as aspects that were deemed suitable for the main experiment.

[3] 83% of respondents that were recruited via email by FirstMove dropped out during the survey, compared to 28% of respondents that were recruited via PanelBase.
[4] Followed by the DCE (13%), the RCT (9%) and the socio-demographic questionnaire (4%).
[5] Followed by the DCE (4%) and the pilot feedback questionnaire (3%).

The main learnings from the pilot study were that:

- For most respondents, the DCE was easy to interpret and complete, and the survey generated a robust set of data. Respondents identified several adjustments that would help to clarify this further.
- The survey length was deemed to be acceptable and feasible, since it fell between 10-15 minutes. However, participants identified some areas where the survey could be shortened.

Following the pilot study, we conducted power calculations to assess the minimum sample sizes required to conduct the study's planned analyses (including regressions testing main effects and two-way interaction effects) robustly. This minimum sample size varied depending on several factors, including the DCE design itself (e.g., how many attribute levels were tested, the number of choice sets presented) as well as the type of analysis to be conducted.

Table 2 below outlines five different DCE designs and the associated estimated sample required for sufficient power.[6] Proposals 1-4 require a target sample size of 1,500 for the off-gas grid sub-sample, and 2,500 for the on-gas grid subsample. Proposal 5, which is the two-option choice set design that was piloted, is likely to be more suitable for a sample size of 2,000 for each of the off-gas gird and on-gas grid groups (i.e., a 50-50 split).

A 3-option DCE design would have allowed for a lower minimum sample size. However, based on the pilot results, we deemed the two-option choice set with 5 levels for upfront costs, 4 levels for running costs and 13 choice sets in total (i.e., proposal 3 below) more suitable than a three-option choice set. This was because participants generally found it easier to complete, were more confident they would make the same choices in real life and provided more consistent preferences. This option also produced results that fit better with the analyses DESNZ expected to conduct using the results from this study. Power calculations suggested that this option would be feasible, since it required a minimum sample size of 1,500 per group, which fell within the initial targets set for the off-, and on-gas grid samples.

**Table 2: Power calculations**

| Proposal | No. of options | No. of attributes | Upfront cost attribute levels | Running cost attribute levels | No. of choice-sets per block | Est. required sample |
|---|---|---|---|---|---|---|

[6] These calculations were made prior to the delivery of the main survey, with the aim of estimating the minimum number of responses required for each sub-group of analysis to enable results to be sufficiently powered. These calculations were made assuming that the analysis would be conducted using a mixed logit regression model. Therefore, they may not generalise to analysis conducted through other multivariate regression models (e.g., OLS/LMP, for which there is no standard recommended method to check for power ex-ante in this context). To mitigate this risk for the main analysis reported in this study, a mixed logit regression model was run as a robustness check.

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|---|---|---|---|---|---|---|
| 3-option DCE with 8 choice-sets per block | 3 | 2 | 5 | 5 | 8 | 312 (main effects); 1,562 (two-way interaction effects) |
| 2-option DCE with 16 choice-sets per block | 2 | 2 | 5 | 5 | 16 | 312 (main effects); 1,562 (two-way interaction effects) |
| 2-option DCE with 13 choice-sets per block | 2 | 2 | 5 | 4 | 13 | 307 (main effects); 1,538 (two-way interaction effects) |
| 2-option DCE with 11 choice-sets per block | 2 | 2 | 4 | 4 | 11 | 307 (main effects); 1,230 (two-way interaction effects) |
| 2-option DCE with 12 choice-sets per block | 2 | 2 | 5 | 5 | 12 | 417 (main effects); 2,083 (two-way interaction effects) |

Notes: These power calculations were conducted assuming that the main outcome would be the choice that participants made and that the analytical method would be a Mixed Logit model.

The key changes that were made to the main experiment based on the findings from the pilot survey are summarised in Table 3.

**Table 3: Key changes made to the main experiment**

| Proposed changes to the survey questionnaire or method | Changes implemented |
|---|---|
| Highlighting the environmental benefits of ASHPs within their definition and/or the DCE cards the environmental impact of ASHPs vs existing system (gas boilers or oil boilers). | Information on the environmental benefits of ASHPs versus the counterfactual technology were added to both their definition and DCE cards. |

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| Adding pictures and/or explanations to allow participants to visualise what ASHPs look like and what the process of installing one looks like. | Pictures of a new model ASHP as well as the installation process were included and will be considered further. |
| Adding more information on ASHPs, including the EPC ratings required. | Further emphasis was placed on the fact that most homes are 'heat pump ready' given there is no specific EPC rating that a home must be for heat pump installation. |
| Adding more information on ASHPs, including the levels of noise they produce. | There is no clear evidence available for this, so it was not included. |
| Adding more information on ASHPs including how they perform under the demands of a family household (i.e., hot water demands). | This was not included – the Electrification of Heat evaluation study found that participants were overwhelmingly satisfied with the amount of hot water provided by their heat pump. |
| Potentially adding in case studies as reference for the participant and additional context (although this might not be realistic). | Case studies were not included as these would be too long, and could affect answers. |
| Adding in more information surrounding the costs of ASHPs including: Estimates for the long-term cost trends for oil, gas and electricity; Radiator replacement costs, Total lifetime cost. | Estimates would be unreliable for long-term cost trends for oil/gas/electricity as well as for a total lifetime costs. Therefore, these costs were excluded.<br>Radiator replacement costs were already included within the upfront cost estimates included in the survey. This was made clearer within instructions. |
| Checking the definition of ASHPs for plain English and to avoid wordiness. | The definition was updated. |
| Keeping a definition of ASHPs handy to participants to refer to throughout the survey. | A pop-up was added throughout the questionnaire. |
| Removing from the survey or shortening:<br>The pilot feedback questionnaire,<br>The post-experiment question block,<br>The socio-demographic question section,<br>The data protection notice,<br>The question testing knowledge of ASHPs. | The pilot feedback questionnaire was removed. Suggestions on ways of shortening/removing other sections are provided in the survey questionnaire and data protection notice in the Annexes of this report.<br>The question testing ASHP knowledge was retained. |
| Adding an audio option to read out the survey questions and instructions. | Qualtrics does not provide an inbuilt function for this. Where possible, text was shortened and written in plain English. |

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| Checking the main experiment is clear regarding the expectation from respondents' time. | References to the expectation on respondents' time were added and highlighted in the survey landing page and invitation letter. |
| Making the information about incentives and completion time more salient. | This was amended, this information was placed upfront and highlighted in bold text where possible. |
| Including only one checkbox confirming that respondents have read the data privacy notice and are over 18 years old. | This was amended. |
| Adding additional time indicators throughout the survey. | This was amended. |
| Removing or providing more explanation around the practice question. | This was amended – instructions were broken out into a step-by-step guide explaining what participants are expected to do in each choice set. |
| Highlighting key DCE instructions (to be more visually salient) and adding a more detailed explanation of which variable in the DCE choice page would vary and how/where (in the instructions and/or practice choice sets). | This was amended. |
| Making the upfront and running costs more visually salient, and visually distinguishing static and dynamic content within each choice set. E.g., Putting key messages and/or highlighting changing variables in a larger font or different colour. | These elements were made more salient through font sizes and colour. |
| Highlighting/clarifying the hypothetical nature of the scenario (to mitigate the risk that participants would be influenced by personal circumstances). | This was amended. |
| Revising the DCE to include only two choices, changing attribute levels included. | A two-option design with 5 levels for upfront costs and 4 levels for running costs and 13 choice sets in total was selected, based on the benefits described above. |
| Rounding the monthly running costs (due to the indication that that respondents do not notice the difference between intermediate running cost levels). | Running cost levels were rounded to the nearest 5 since they are monthly values with a relatively narrow range. Upfront cost levels were rounded to the nearest 50. |
| Including the RCT "trial" messaging to all respondents in a salient way/imitating the visual | This was updated. |

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|---|---|
| design adopted in the pilot, to encourage future planning/take-up of ASHPs. | |
| Increasing the survey response time cut-off from five to seven minutes (or 2 standard deviations (SDs) below average). | 2 SDs below the median based on pilot results, is equivalent to 5 minutes (assuming the main experiment will be 2 minutes shorter than the pilot). However, given the fact that the main experiment survey would include fewer questions than the pilot, it was decided that the cut-off time would remain at 5 minutes, in line with the median completion time for the questions being removed relative to the pilot. |
| Updating/refining the financing options presented. | These were reviewed and updated to remove less necessary options. |
| Including a large free prize draw award for one participant – testing this at the soft launch phase. | A one-off £250 free prize draw was included within the offer. |

# Main experiment

## Sampling and stratification

### Data

A key requirement for the main experiment was that it gathered responses from a nationally representative sample of owner-occupiers in Great Britain. To achieve this, participants were identified through publicly available address data and recruited by letter.[7]

The basic sampling frame was the Postcode Address File (PAF), supplemented by information on the database of Energy Performance Certificates (EPC). We supplemented PAF with EPC data since EPCs contain a large amount of relevant information (e.g., heating system, owner-occupation). Approximately two-thirds of all GB addresses have EPC certificates, meaning additional information was not available for some addresses. Further, some appear on the EPC register more than once, caused by EPCs being updated at the same address. In these cases, only the most recent data point was used. A sample could have been drawn more efficiently if only addresses with an EPC were used. However, doing so would have risked introducing bias as the only addresses without an EPC are (or at least should be) homes not put on the market since 2007, and homes occupied by people who have not moved for at least

[7] One of the aims of the study was to gather data from a nationally representative sample of owner occupiers in Great Britain. To achieve this aim, we randomly sampled postcodes and recruited participants by letter. This approach was preferable to recruiting through a panel provider since it avoided potential biases associated with participants having self-selecting to participate in an online panel. However, as discussed in Annex 2 in more detail, the final sample of respondents was not fully representative of the population of owner occupiers in Great Britain in several ways (i.e., on several characteristics). To correct for this, weighting was applied on three key variables, that were assumed to interact most with the effect of price on heat pump demand.

15 years are likely to be different in terms of both property type and occupier demographics. We also gathered census data and data from the Index of Multiple Deprivation (IMD) for sample stratification purposes, as described further in the following subsection. We used the ONS Postcode Directory (August 2022, Open Geography Portal) to identify on and off-gas grid properties.

Census data for England and Wales is from 2021, and for Scotland it is from 2011. IMD data for Scotland is from 2020, while for England and Wales it is from 2019. Both PAF and the EPC databases were live, and so the sample was drawn from the most recent available at the time.

### Process

The universe covered for the experiment was all owner-occupied addresses in Great Britain that use gas or oil as their main heating source. We conducted the experiment across two distinct sub-samples – those in areas connected to the gas grid (target sample size 2,500), and those in off-grid areas (target sample size 1,500). We maintained the target sample sizes estimated at the proposal stage given we estimated these would be suitable to enable the study to achieve sufficient statistical power within the DCE design selected (see Table 2). Overall, there were five stages in the sampling process:

- First, we matched the entire PAF database with EPC records. Because the address identifiers were slightly different in the two lists this was not a perfect process. However, we successfully matched 91% of EPC addresses to PAF, and 94% of all owner-occupied EPC addresses. The total number of properties with an EPC represented 69% of all GB addresses (as enumerated on PAF), while 63% of all PAF addresses could be matched to an EPC[8]. For the purpose of sampling, the overall ratio of 69% of the sample being drawn from the EPC matched universe and 31% from the non-matched universe was used. Sampling the whole universe based on the proportion of matched addresses avoided under-sampling non-matched addresses. This would not have been a concern in England or Wales, but in Scotland it would lead to under-sampling tenements, which are a distinct housing segment.
- Next, we excluded from the sample all addresses identified, using EPC data, as not being owner-occupied or not having oil or gas as their main heating source. This was only possible for addresses that had an EPC. For addresses not on the EPC register, we made assumptions to account for participants being screened out of the survey due to tenure when estimating sample size.
- We used a list of off-grid postcodes from the ONS Postcode Directory to split the sample into its on-grid and off-grid components.
- To ensure national geographic coverage, we then stratified the sample by region.

[8] This is mostly due to differences in address labelling/detail across the two datasets e.g., EPC records include Flat numbers, whereas PAF records do not. In Scotland, this is also due to the way that tenements are recorded across different databases.

- We then assessed further stratification variables.[9] We did not implement a rural/urban stratification in this case, as we already had separate samples for on-grid and off-grid properties. We stratified by IMD but chose not to over-recruit lower deciles. This was because we screened out those who are not owner-occupiers, and there is a high correlation between IMD and owner-occupation (83% of homes in the top IMD quintile are owner-occupied, compared with 41% in the bottom quintile). It is possible that many owner-occupiers in the lowest quintile may be asset-rich but income-poor, and this provides a good reason for stratifying by IMD. Further, other surveys have shown a lower propensity to respond among addresses in the lower IMD areas. To mitigate this and reduce the need for weighting, some push to web surveys have adopted the approach of oversampling lower quintiles. However, in this case we prioritised sample efficiency: screening by IMD would make the sample less efficient by increasing the number of invitations sent to people who do not qualify for the survey.

For addresses not on the EPC register, screening was necessary to exclude respondents who are not owner-occupiers, or who do not have oil or gas as their main heating source. Non-EPC addresses have been occupied since 2008 and were therefore more likely to be owner-occupied than rented, although some long-term renters would need screening out. We applied the following assumptions to the non-EPC sample:

- 20% drop-out for not being owner-occupiers.[10]
- We assumed 43% of all off-grid owner occupied households have oil as a primary heating system (allowing for 57% of the sub-sample to drop out because of this).[11]
- We assumed 92% of all on-gas grid owner occupied households are on gas (allowing for 8% of the sub-sample to drop out because of this).[12].

Table 4 sets out our estimates for the total number of participants who would need to be contacted as part of this study, assuming a range of four different response rates (10%-25%), for the on-grid sample, whilst Table 5 set out these estimates for the off-grid sample. Table 6 summarises the total estimated sample size required across each group. In these tables, the “eligible households invited” is the number of households that fit both tenure and fuel requirements, that would need to be invited to achieve the required sample for each of the four response rates. The figures for “Number accounting for screening for owner occupiers” and “Number accounting for screening for homes heated by oil or gas” set out how the sample increases when accounting for the households contacted that would be screened out for these variables.

[9] It is quite common in surveys to stratify by some urban/rural measure, and also by the Index of Multiple Deprivation (IMD).
[10] Family Resources Survey data for people living in their current home for 20+ years was used to estimate that 80% of addresses would be owner-occupied.
[11] To estimate the proportion of the non-EPC sample on oil-based systems, the proportion on oil within the EPC data was estimated (43%) and assumed to be the same for the non-EPC sample. This estimate also included the EPC flag "for backwards compatibility - not to be used" as agreed with DESNZ.
[12] To estimate the proportion of the non-EPC sample on gas-based heating systems, the proportion on gas within the EPC data was estimated (92%) and assumed to be the same for the non-EPC sample. This estimate also included the EPC flag "for backwards compatibility - not to be used" as agreed with DESNZ.

Our sample estimates identified that the required sample was just over 56,038 in total. In total we contacted 48,459 households, due to higher than anticipated response rates in our first two rounds of recruitment.

**Table 4: Estimated sample sizes required at different response rates - on grid**

| Sample group | 10% response rate EPC | 10% response rate non-EPC | 15% response rate EPC | 15% response rate non-EPC | 20% response rate EPC | 20% response rate non-EPC | 25% response rate EPC | 25% response rate non-EPC |
|---|---|---|---|---|---|---|---|---|
| Universe | 16,986,420 | 7,631,580 | 16,986,420 | 7,631,580 | 16,986,420 | 7,631,580 | 16,986,420 | 7,631,580 |
| Required sample | 1,575 | 925 | 1,575 | 925 | 1,575 | 925 | 1,575 | 925 |
| Eligible household invited | 15,750 | 9,250 | 10,500 | 8,167 | 7,875 | 4,625 | 6,300 | 3,700 |
| Number accounting for screening for owner occupiers | 16,237 | 11,563 | 10,825 | 7,708 | 8,119 | 5,781 | 6,495 | 4,625 |
| Number accounting for screening for being heated by oil or gas | 16,738 | 12,568 | 11,160 | 8,379 | 8,370 | 6,284 | 6,696 | 5,027 |

Note: The universe includes the 63% of addresses where EPC and PAF can be matched. Key assumptions include that: for EPC addresses, a 3% error rate has been allowed for screening for owner occupation and for heating type. For non-EPC addresses, Family Resources Survey data for people living in their current home for 20+ years was used to estimate that 80% of addresses would be owner-occupied. To estimate the proportion of the non-EPC sample on gas-based heating systems, the proportion on gas within the EPC data was estimated (92%) and assumed to be the same for the EPC sample. This estimate also included the EPC flag "for backwards compatibility - not to be used" as agreed with DESNZ.

**Table 5: Estimated sample sizes required at different response rates - off grid**

| Sample group | 10% response | 10% response rate | 15% response | 15% response rate | 20% response | 20% response rate | 25% response | 25% response rate |
|---|---|---|---|---|---|---|---|---|

| | rate EPC | non-EPC | rate EPC | non-EPC | rate EPC | non-EPC | rate EPC | non-EPC |
|---|---|---|---|---|---|---|---|---|
| Universe | 2,723,660 | 1,669,340 | 2,723,660 | 634,349 | 2,723,660 | 241,053 | 2,723,660 | 91,600 |
| Required sample | 945 | 545 | 945 | 555 | 945 | 555 | 945 | 555 |
| Eligible household invited | 9,450 | 5,550 | 6,300 | 3,700 | 4,725 | 2,775 | 3,780 | 2,220 |
| Number accounting for screening for owner occupiers | 9,742 | 6,938 | 6,495 | 4,625 | 4,871 | 3,459 | 3,897 | 2,775 |
| Number accounting for screening for being heated by oil or gas | 10,044 | 16,134 | 6,696 | 10,756 | 5,022 | 6,545 | 4,017 | 6,453 |

Note: The universe included the 63% of addresses where EPC and PAF can be matched. Key assumptions include that: for EPC addresses, a 3% error rate has been allowed for screening for owner occupation and for heating type. For non-EPC addresses, Family Resources Survey data for people living in their current home for 20+ years was used to estimate that 80% of addresses would be owner-occupied. To estimate the proportion of the non-EPC sample on oil-based systems, the proportion on oil within the EPC data was estimated (43%) and assumed to be the same for the EPC sample. This estimate also included the EPC flag "for backwards compatibility - not to be used" as agreed with DESNZ.

**Table 6: Total figures for estimated sample size required across each group**

| Group | Assuming a 10% response rate | Assuming a 15% response rate | Assuming a 20% response rate | Assuming a 25% response rate |
|---|---|---|---|---|
| On-grid | 29,307 | 19,538 | 14,654 | 11,723 |
| Off-grid | 26,117 | 17,452 | 11,567 | 10,471 |
| Total | 56,038 | 37,359 | 26,415 | 22,415 |

## Distribution approach

We implemented three measures to mitigate the uncertainties and assumptions made in the sample size calculations outlined above through our distribution approach. First, we drew a larger sample than expected to be necessary, to allow for lower-than-expected response rates and/or higher than expected screen-out rates (see above). The total sample was randomly allocated into an initial sample (that would be contacted in the first instance), and a reserve sample (that would be contacted if required to boost responses) so that each could be identical, and no bias would emerge from issuing or not issuing the reserve sample. Secondly, we introduced a “soft launch” of the survey (as discussed above), which enabled the team to get an initial sense of response rates and revise the sample size accordingly. Thirdly, we divided the remainder of the sample into two batches (as mentioned above), to revise the second batch size as necessary, according to response and screen-out rates.

For both the soft launch and the main part of the sample, we sent invitation letters addressed to the “Resident”. To mitigate the risk of respondents not opening letters without a named recipient, or not choosing to complete the survey, we:

- Overprinted envelopes with ‘The Department for Energy Security and Net Zero’, to encourage recipients to open the letter.
- Printed letters on DESNZ headed paper and signed these by a senior member of staff from the department, to emphasise the survey’s legitimacy and importance.
- Explained in our letter the purpose of the survey, that participants have been selected at random and cannot be replaced, and the incentive, to encourage participants to feel participating was worthwhile.
- Ensured that the letters were short, concise and personalised as far as possible, so they were more engaging.
- Also ensured that these highlight the compensation offered (a conditional £5, with an additional £250 prize draw) clearly as well as the call to action to access the online survey and the survey deadline.
- Ensured the survey was as easily accessible as possible by including both a link and a QR code (the survey was developed to be mobile and tablet friendly).

We sent two reminder letters to participants, both in the form of a postcard. For the soft launch, we sent the reminders two working days after the first letter to quickly gauge likely response rates, and to make necessary sample size estimations ahead of launching the next wave. For the two following batches, we sent reminders after one week each. The second batch did not receive a second reminder due to the high number of responses that had already been recorded by that point, to avoid over-sampling. We checked and corrected for any potential bias introduced by this (see Annex 2). All participants had until 25 June to respond to the survey.

We offered a conditional incentive of £5 per completed survey. We asked respondents whether they would prefer to receive this by email or post. We also agreed following the pilot study to include a £250 free prize draw incentive alongside the £5 for all respondents. In line with

Market Research Society Regulations[13], any participant that took part in the survey was eligible for the prize draw – completion of the survey was a pre-condition only for receipt of the £5 incentive.

## Experiment design

### Scenario and choice environment

We presented all participants with the same hypothetical scenario. They were asked to imagine that they are considering replacing their current heating system within the next two years. Presenting participants with a hypothetical scenario was the most appropriate way to frame the DCE, so that the findings can be used to make projections of demand for heat pumps. We presented them with two options within each choice set: (1) to renew their current heating system or (2) to install a heat pump. We asked participants to assume that they would be renewing the same heating system they currently have (for example, those with a gas heating system were presented with the option to install a new gas boiler). After selecting their preferred heating system, we asked participants in each choice set to state how confident they are that they would make a similar choice in real life.

### Attributes and attribute levels

The DCE included two main attributes: upfront and running costs (monthly). We customised both running and upfront costs to account for differences in heating and housing characteristics, and therefore any differences in the upfront and running costs they would likely face for both heat pumps and fossil-fuel replacements (i.e., the status quo option) by assigning participants to either a low-energy or high-energy group. Based on the number of rooms in their property and/or whether it was on or off the electricity grid, respondents were assigned to either a low or high-energy demand groups and presented with different ranges of upfront and running cost levels. While dividing the sample into energy-demand groups reduced statistical power, it ensured that costs displayed in the DCE were more realistic to participants, meaning the data collected was more robust. We mitigated the power implications of customising the DCE by allowing some attribute levels to overlap across energy-demand groups.

The main DCE included five attribute levels for the upfront cost attribute and four attribute levels for the running cost attribute. We computed running cost levels by varying heating costs by +10%, -10% and -25% with respect to current estimated total energy bills (including heating and electricity costs) for both low and high-energy demand groups. We computed upfront cost levels using a similar approach to that applied in the pilot (described above). Costs did not include VAT as heat pumps would be VAT free until at least 2025. We rounded both upfront and running cost levels to make it easier for participants to review. Table 7 through Table 10 set out the upfront and running cost attribute levels and status quo options used in the main experiment:

[13] MRS Regulations for Administering Incentives and Free Prize Draws (2015), Available at: https://www.mrs.org.uk/pdf/Regulations%2520for%2520Incentives%2520and%2520Prize%2520Draws%2520July%25202015.pdf .

**Table 7: Upfront cost attribute levels**

| Attribute level number | Upfront cost (low heat demand households) | Upfront cost (high heat demand households) |
|---|---|---|
| 1 | £10,000 | £15,000 |
| 2 | £8,000 | £10,000 |
| 3 | £6,000 | £6,900 |
| 4 | £3,600 | £5,000 |
| 5 | £3,000 | £3,600 |

**Table 8: Running cost attribute levels**

| Attribute level number | Monthly running cost (low heat demand households) | Monthly running cost (high heat demand households) |
|---|---|---|
| 1 | £165 | £195 |
| 2 | £180 | £215 |
| 3 | £190 | £230 |
| 4 | £200 | £240 |
| 5 | £165 | £195 |

**Table 9: Status quo upfront costs – average upfront costs incl. VAT**

| Status quo level | Gas boiler | Oil boiler |
|---|---|---|
| Low-energy demand | £3,000 | £6,000 |
| High-energy demand | £3,600 | £6,900 |

**Table 10: Status quo running costs – average running costs (monthly)**

| Status quo level | Monthly running cost |
|---|---|
| Low-energy demand | £200 |
| High-energy demand | £240 |

### Generating choice sets

We generated choice sets by applying a D-efficient design using the "dcreate" code in Stata (Hole, 2016). This method optimises the number of choice sets displayed in the DCE by simultaneously satisfying four design properties: level balance, orthogonality, minimal overlap and utility balance. It avoids presenting choice sets with "dominated" options (i.e., where one option is worse on all dimensions). We generated 26 choice sets, and then divided these into two blocks of 13 to reduce the number of choice tasks we asked participants to complete.

### RCT design

We included a final randomised control trial (RCT) element in the survey to test the effectiveness of different interventions on the adoption of heat pumps. We randomly assigned respondents to one of three experimental conditions:

1. **Control:** Participants were told how much a heat pump was likely to cost to install and run given the information they provided about their property characteristics. They were also presented with links to government websites that let the participant 1) check if a heat pump is suitable for their home, 2) find a heat pump installer, or 3) apply to the Boiler Upgrade Scheme.

2. **Treatment 1:** In addition to being shown the same information as those in the control group, those in treatment group 1 were told that fossil fuel-based boilers would be phased out[14] (the precise statement varied for those on and off the gas grid).

3. **Treatment 2:** Participants received the same information as those allocated to treatment 1 in addition to a prompt to plan ahead regarding the replacement of their heating system.

As RCT outcome measures, we asked participants to state the likelihood that they would install a heat pump in the next two years. Originally, we intended to also record whether participants clicked the links in the three groups. However, a coding error prevented us from collecting this data.

## Response rates

The survey remained open from the 2nd of May – 25th of June 2023 for all participants. Overall, out of the 48,459 participants contacted, we received 6,086 completed responses, representing 12.5% of the total sample. When accounting for participants that were screened out, the effective response rate is 18.1%.

All surveys are subject to a number of potential errors and biases, principally sampling error, measurement error, and response error. With what is close to a stratified simple random sample, and well-tested questionnaire, we believe we have minimised the first two, but with an effective response rate of 18.1% there is clearly a risk of response bias. What matters is not the level of response but the extent to which those who responded are different from the

[14] Note that this research was conducted in 2023 and is reflective of the previous Government's policy direction, which announced plans to phase-out the installation of fossil-fuel boilers off the gas grid from 2035.

universe from which they were selected. We have examined the composition of the sample and reweighted the sample based on the overrepresentation of off-grid households, the property size of households, and the regional distribution of households as robustness checks. Results from these analyses were similar to those from the main regression specification, which confirmed the robustness of these findings to these differences in sample composition.

# Supplementary experiment

## Background

In the main experiment, the status quo running cost was set at a value that was 10% higher than our best estimates at the time. This resulted in participants being presented with an option to renew their current fossil fuel boiler that included a slightly higher running cost than those reflected in real-life. Furthermore, due to the elevated status quo running cost, respondents were not given a scenario in which they could choose between an Air Source Heat Pump (ASHP) with higher running costs relative to the option of renewing their fossil fuel boiler.

To address this limitation, the study team conducted a supplementary experiment. The objective of the experiment was two-fold: firstly, to assess the impact of the assigning higher status quo running cost on ASHP demand, and secondly, to estimate demand when ASHP running costs are greater than or equal to those of fossil fuel boilers.

## Sampling and stratification

The supplementary experiment utilised the same sampling methodology as the main experiment. This involved gathering responses from a nationally representative sample of British owner-occupiers who primarily use gas or oil for heating. Participants were selected based on publicly available postcode data from the Postcode Address File, supplemented by information from the Energy Performance Certificates (EPC) database.

The sample was stratified by region, primary heating system (gas or oil), and Index of Multiple Deprivation (IMD) to ensure comprehensive geographical coverage, a balanced representation of households on and off the gas grid, and to prevent over-recruitment from higher income deciles.

## Distribution approach

The sample consisted of 10,000 households, evenly divided between respondents using gas heating systems (5,000 households) and those using oil heating systems (5,000 households). The study team assumed a response rate of 10-12%.

Similarly to the main experiment, participants were offered a conditional incentive of £5 upon completing the survey, along with the chance to win a £250 prize in a lottery draw (open to all households that opened the survey). Respondents had the option to receive the incentive and/or enter the lottery via email or post.

Recruitment followed a process akin to the main experiment, involving initial contact via letter containing a URL and unique login ID for survey access. A reminder postcard was dispatched 10 days after the initial launch. Participants were given a four-week deadline from the initial launch date, clearly indicated in the letters, to complete the survey. Unlike the main experiment, a second reminder postcard was not sent.

## Experimental Design

### Scenario and Choice Environment

As in the main experiment, participants in this additional study were presented with a hypothetical scenario, asking them to envision replacing their current heating system within the next two years. Each choice set comprised two options: (1) renewing their existing heating system or (2) installing a heat pump.

### Attributes and Attribute Levels

This Discrete Choice Experiment (DCE) focuses on two primary attributes: upfront costs and monthly running costs. Unlike the main experiment's DCE design, which featured five levels for upfront costs and four for running costs, this revised DCE has two levels for upfront costs and three for running costs. This adjustment aims to capture the scenario omitted in the main experiment, and therefore the impact of reducing ASHP running costs to equal those of the current status quo running costs. Similarly to the main experiment, upfront and running costs for both the heat pump option and the status quo fossil fuel boiler option are tailored to better match cost differences experienced by on-gas and off-gas grid households.

For upfront costs, the first level presented to participants is equal to the status quo upfront cost, while the second level is higher. The status quo upfront cost for both on-gas and off-gas grid groups is derived from the average boiler installation cost (inclusive of VAT). Running cost levels either match the status quo running cost or are 15% higher or lower than the status quo running cost. The status quo running cost is determined by computing the average monthly running cost based on heating and electricity bills from 2022 to April 2023. All upfront and running costs are rounded for user-friendliness.

In contrast to the main experiment, where participants were categorised into four different energy demand groups based on property size and heating system type, participants in this study are only categorised into two different groups based on their heating system type (i.e., depending on whether they are connected or not to the gas grid). Estimated upfront and running costs are, however, computed using averages that are weighted to account for property size distribution, to offer participants with more realistic costs.

**Table 11: ASHP upfront cost attribute levels**

| Attribute level number | On-gas grid | Off-gas grid |
|---|---|---|
| 1 | £3,150 | £6,000 |
| 2 | £6,200 | £10,000 |

**Table 12: ASHP running cost attribute levels**

| Attribute level number | On-gas grid | Off-gas grid |
|---|---|---|
| 1 | £165 | £170 |
| 2 | £195 | £200 |
| 3 | £225 | £230 |

**Table 13: Status quo upfront and running costs**

| Attribute level number | On-gas grid | Off-gas grid |
|---|---|---|
| Upfront cost | £3,150 | £6,200 |
| Running cost | £195 | £200 |

**Table 14: Status quo upfront and running costs (for the additional two choice sets that serve to test the effect of having a higher status quo running cost)**

| Attribute level number | On-gas grid | Off-gas grid |
|---|---|---|
| Upfront cost | £3,150 | £6,200 |
| Running cost | £225 | £230 |

## Creating Choice Sets

Given that the supplementary experiment design incorporates only two upfront cost levels and three running cost levels, we employed a full factorial design. This means that all permutations of upfront and running costs were presented to every respondent, resulting in a total of 6 choice sets. In the main experiment, we employed a D-efficient design because it included a greater number of attribute levels. Using a full factorial design in this scenario would have resulted in 20 choice sets, which we deemed excessive for respondents to complete.

Additionally, we included 2 extra choice sets where the status quo running cost is increased by 15%, aligning with the highest running cost attribute level of the ASHPs (see Table 14). Meanwhile, the costs of the ASHP remains fixed at par or higher or lower than the status quo for running costs and upfront costs, respectively. These additional choice sets enable us to investigate whether assigning a status quo running cost 15% higher (and 10% higher, assuming a linear effect) than the average has an impact on demand estimates.

## Response rates

The survey remained open from the 12th of January– 12th of February 2024 for all participants. Overall, out of the 10,000 participants contacted, we received 1,123 completed responses, representing 11.2% of the total sample.

# Analysis

## Data cleaning

We cleaned the survey data collected from both the main experiment and the supplementary experiment by removing participants that: dropped out from the survey, were screened out and had completed the survey experiment too quickly (under two standard deviations from the median completion time in the pilot experiment, which corresponded to 5 minutes).

## Descriptive statistics

We computed descriptive statistics to summarise socio-demographics, heating system characteristics, housing characteristics and energy efficiency, underlying motivations for heating system preferences and preferences for financing options overall and by subgroups. The findings from this analysis are reported in the descriptive statistics section in Annex 2 for the main experiment and Annex 3 for the supplementary experiment.

## Discrete choice experiment analyses

### Regression specification

We analysed the discrete choice experiment data from both the main experiment and supplementary experiment by running several multivariate regression models. We conducted the main analysis using Linear Probability Models, as these models produce the most easily accessible and interpretable coefficients for the average effects of different variables.

The main dependent variable in the regressions was whether the participant chose a heat pump in a given choice set. The main independent variables in the regression analyses were the upfront and running costs associated with the heat pump option. We measured the cost variables in single units of GBP and they are treated as continuous variables (although the variables can, in reality, only take on the values presented on participants in the discrete choice experiment).[15]

To account for possible non-linearities in the relationship between costs and demand, the regression also included:

- The upfront cost of installing a heat pump (squared) in the choice set (a continuous variable).

[15] Participants were exposed to five different levels of upfront heat pump costs and four different levels of heat pump running costs in the experiment.

- The running cost of a heat pump (squared) in the choice set (a continuous variable).
- The upfront cost of installing a heat pump (cubed) in the choice set (a continuous variable).
- The running cost of a heat pump (cubed) in the choice set (a continuous variable).

In addition, to make more refined predictions about household-level adoption of heat pumps across the UK, we included the following observable variables:

- Whether the participant is on or off the gas grid (a binary variable).
- The participant's annual household income (a categorical variable).
- The participant's property type (a categorical variable).
- The number of bedrooms in the participant's property (a continuous variable).
- When the participant's property was built (a categorical variable).

Finally, we included an interaction term for upfront and running costs, which accounts for the possibility that the effect of upfront costs depends on the level of running costs, and vice versa.

We ran the regressions using the entire sample (referred to as a 'pooled' regression) and for on and off gas grid groups. In the main experiment, the sample was further broken down based on energy consumption (i.e., high and low energy demand groups for both on and off gas grid groups). More specifically, we ran the regressions for four energy demand groups separately, as these groups faced different status quo and heat pump costs[16]. The regression covering the entire sample also controls for on and off gas grid status in addition to participants' status quo heating costs (these are unnecessary to control for in the other regressions, as participants in the respective groups have the same status quo costs and grid status by definition). The findings discussed in the main report focus primarily on the results derived for the four energy demand groups separately for the main experiment and for on and off gas grid groups separately for the supplementary experiment. These results are more reliable than those from the pooled regression because participants were presented with different costs depending on their energy demand and whether their property is connected to the gas grid or not. Additionally, results from the four energy demand groups and on and off gas gird groups already account for discrepancies in grid status distribution.

## Limitations to the regression analysis

It is important to note that while the pooled regression has greater statistical power for both the main experiment and the supplementary experiment, the results from the pooled regression cannot be used to construct a classic demand curve. These types of curves are usually estimated in settings where all participants are presented with the same costs. In this case,

[16] In the main experiment, the discrete choice experiment (DCE) was tailored based on households' heating systems (i.e., on or off the gas grid) and energy demand, using property size as a proxy. This allowed us to offer survey respondents cost values more reflective of real-life scenarios. The study sample was divided into four groups: high energy demand on the gas grid, high energy demand off the gas grid, low energy demand on the gas grid, and low energy demand off the gas grid, due to our larger sample size. In contrast, the supplementary experiment, with a narrower focus, recruited a smaller sample. Consequently, it only differentiated between two groups based on heating system, without considering energy demand.

estimates obtained using the pooled sample use data from different types of participants for different costs levels (e.g., when estimating the effect of higher levels of upfront costs, the regression only uses data from high energy demand households, as low energy demand households are not shown these costs). The same issue is, however, not encountered when examining the regressions for the four demand groups in the main experiment and for on and off gas grid groups in the supplementary experiment.

Similarly, the estimated effects of costs on demand across all five regressions need to be interpreted carefully. This is because these estimates represent the average effects of, for example, upfront costs at many different levels of running costs (and vice versa).

### Additional analysis and robustness checks

In addition to the regression analyses, we constructed demand curves for ASHPs by plotting raw choice data at different levels of upfront and running costs.

We computed mixed logit models as a robustness check. This methodology is often used when analysing discrete choice experiments (Hole & Kolstad, 2011, Cornelissen et al., 2019), to output preference parameters for each attribute level and estimate the relative importance of attributes overall and by relevant subgroups. We also conducted the main regressions using standard Logit models to study how the model specification influences the results.

Finally, we conducted a series of regression analyses that included different independent variables, in addition to conducting regressions where certain population sub-groups were excluded from the analysis, to test the sensitivity of the main results. These analyses can be found in Annex 2 for the main experiment and Annex 3 for the supplementary experiment.

### Sample representativeness and reweighting

While the report primarily presents results from the main specification (without weights on region, property size and gas grid status), we report on the results of the four energy demand groups in the main experiment and on and off gas grid groups in the supplementary experiment separately, which means that discrepancies in grid status distribution are already accounted for and thus do not need to be further reweighted by grid status. We then assess the robustness of the results found for the sub-groups throughout the report by comparing estimates against those generated using the weighted regressions (i.e., weights on region and property size).

To verify their robustness, we also re-ran all our other key multivariate regression specifications with weights to account for discrepancies identified between the study sample and universe of homeowners living in Great Britain in terms of regional distribution, property size, and grid status (the main specification with weights on grid status is only relevant for the pooled regression results and not for the four energy demand group repressions as these already account for grid status).

Discrepancies identified between the study sample and universe are due to: a conscious decision to over-sample the off-gas grid group (to ensure sufficient statistical power for planned group-level analyses) as well as differences in response rates and drop-out rates across participant groups (both the main experiment and the supplementary experiment did not include quotas on key sampling variables to avoid screening out eligible respondents). The results of this analyses are presented in the Annex 2 (Table 41 - Table 43) and Annex 3 (Table 74 and Table 75). We conducted these checks to mitigate the risk of response bias where those who responded to the survey were different from the universe from which they were selected.

The descriptive statistics section in Annex 2 and Annex 3 provides more information about the precise distribution of respondent characteristics and analyses of how these differ to the overall population. We compared average values for our sample on relevant characteristics (i.e., regions, property size and gas grid status) to the average values for the overall population of homeowners provided by DESNZ and used the difference to reweight the main regression specification. Overall, the findings from the reweighted regression specifications produced similar results to those found in the main specifications, confirming their robustness for both the main experiment and the supplementary experiment.

We considered weighting according to income. From crosschecking income distributions across our sample we found that there was no clear data source to weight our sample against, due to population differences (i.e., owner occupiers across GB with either gas or oil heating systems). Weighting was further complicated by the different subgroups we analysed (high energy demand on gas grid, low energy demand on gas grid, high energy demand off gas grid, low energy demand off gas grid).

We found some data sources which met some of these criteria (see Table 17 and Table 18), which we compared with our income distribution. This showed that:

Our sample had broadly similar income distribution to wider sources overall, although it appears our sample may have a disproportionate number of very high income households.

Where there was variation between our sample's income distribution and wider sources, this was not consistent between all sources - for some where our sample appears to be skewed high against one income level for one sample, it appears accurate for another. We could not compare precisely due to different variable parameters, and not having access to the raw data which underpinned it.

As a result, there was no group to robustly weight our sample against, particularly at subgroup level, so we chose to not weight according to income. Findings should therefore be interpreted with some caution.

**Table 15: Annual household income distribution for study sample (main experiment), financial year 2021/2023**

| Gross income | % |
|---|---|
| less than £10k | 2.4% |
| £10k-£15k | 4.7% |

| | |
|---|---|
| £15k-£20k | 5.9% |
| £20k-£30k | 11.5% |
| £30k-£40k | 13.4% |
| £40k-£50k | 11.5% |
| £50k-£60k | 11.2% |
| £60k-£100k | 23.4% |
| £100k or more | 15.8% |

**Table 16: Annual household income distribution for study sample (supplementary experiment), financial year 2021/2023**

| Gross income | % |
|---|---|
| less than £10k | 2.8% |
| £10k-£15k | 3.2% |
| £15k-£20k | 5.9% |
| £20k-£30k | 13.9% |
| £30k-£40k | 11.8% |
| £40k-£50k | 11.5% |
| £50k-£60k | 9.9% |
| £60k-£100k | 22.2% |
| £100k or more | 18.8% |

**Table 17: Annual household income distribution – across Great Britain, financial year 2021/22[17]**

| Gross income | % |
|---|---|
| Under £11,151 | 10% |

[17] The Effects of Taxes and Benefits on Household Income, UK, 2021/22: Reference Tables, Table 13: https://www.ons.gov.uk/peoplepopulationandcommunity/personalandhouseholdfinances/incomeandwealth/datasets/householddisposableincomeandinequality

| | |
|---|---|
| £11,152-£20,755 | 10% |
| £20,756-£28,042 | 10% |
| £28,043-£35,739 | 10% |
| £35,740-£44,232 | 10% |
| £44,233-£52,433 | 10% |
| £52,434-£62,154 | 10% |
| £62,154-£75,246 | 10% |
| £75,247-£97,009 | 10% |
| £97,010 or more | 10% |

**Table 18: Weekly household income distribution – owner occupiers, England only, financial year 2021/22**[18]

| Gross income | % |
|---|---|
| under £100 | 0.2% |
| £100 - £199 | 3.4% |
| £200 - £299 | 7.3% |
| £300 - £399 | 7.2% |
| £400 - £499 | 8.6% |
| £500 - £599 | 7.8% |
| £600 - £699 | 7.1% |
| £700 or more | 58.4% |

## Correlational analyses

We conducted correlational analyses to understand associations between:

[18] English Housing Survey data on tenure trends and cross tenure, gross weekly income of household by tenure: https://www.gov.uk/government/statistical-data-sets/tenure-trends-and-cross-tenure-analysis

- Heat pump uptake intentions and environmental attitudes,
- Heat-pump uptake intentions and knowledge about heat pumps as well as factors that influence peoples' choice of heating system,
- Heat pump uptake intentions with relevant socio-demographic and housing characteristics.

The findings from this analysis are reported in Annex 2 and 3 below.

### RCT analysis

We estimated the main effect of the RCT by investigating differences in means across the three experimental conditions against participants' intention to install a heat pump. We also conducted segment analyses to estimate differential effects across relevant subgroups. The findings from this analysis are reported in the Randomised Controlled Trial (RCT) section below. The RCT analysis was conducted in the main experiment but was not included in the supplementary experiment

### Financing options

To understand how the availability different financing options influence heat pump adoption, we asked participants in the main experiment whether the different options would make them more likely to install a heat pump in the near future. The outcome was measured on a 5-point Likert scale. The findings from this analysis are reported in the financing options and heat hump demand section below.

### Assessing the effect of assigning a higher status quo running cost level on demand

A survey code error occurred in the main experiment, leading to participants being assigned a status quo running cost value that was 10% higher than intended. Consequently, the supplementary experiment addressed this issue by introducing two additional choice sets with inflated status quo running costs. To understand the impact of assigning a higher status quo running cost level on ASHP demand, we compare the ASHP demand between these inflated choice sets and specific choice sets without inflated status quo running costs. Through these comparisons, we can understand how increasing the status quo running costs by 10% influences demand across different levels of ASHP upfront costs, and whether this effect changes at different upfront cost levels.

# Limitations

There are several limitations to the design of the research methodology that are important to consider when interpreting the results.

Firstly, it is important to note that the study took place during a cost-of-living and energy cost crisis, in which energy costs have been highly volatile and have reached unprecedented levels. The effect of this crisis on households depends on several factors, including the energy source used (e.g., oil, gas, or electricity) for heating. This context may affect how participants make (hypothetical) decisions that affect their longer term running costs, and could affect the long-term validity of the results of this study. To mitigate these potential issues, we verified the robustness of the main results by examining how the effect of costs of ASHPs depend on participant income and savings. Participants were asked to consider a hypothetical scenario where they had to choose between renewing their current heating system or installing a heat pump within the next two years' time. Upfront costs and running costs were assumed to be fixed at their current levels within this time frame (i.e., the scenario did take into account price volatility, to encourage participants to think of their decision in the medium-longer term in an environment without high price volatility).

The crises also had ethical implications for the study. To address ethical concerns around conducting a study on energy costs while prices are volatile, we provided participants with clear communications on the hypothetical nature of the experiment and the fact that they would be showed information about costs (which may be sensitive). We also shared links to the Government's Help for Households campaign.

While hypothetical decision-making is commonly used as a proxy for real life decisions in similar studies, the fact that it is not a real-life decision is an inherent limitation of the methodology. For example, people would spend more time deciding between a heat pump and their existing heating system in real life (it is, however, unclear whether this would make participants more or less price sensitive). Real-life decisions may also, for some households, be made under pressure, for example if their current heating system has just broken down (which is likely to bias them toward the easier and quicker option, which is typically to replace their existing heating system). Moreover, participants may have concluded that the experimenters were in favour of heat pumps being installed, resulting in experimenter demand effects (i.e., making participants more likely to choose heat pumps at different cost levels). Another potential issue is that some participants may feel fatigued as a result of making many choices between heat pumps and their status quo heating system, which may in turn reduce their response quality toward the end of the DCE.

To mitigate risks associated with the hypothetical nature of the experiment, we conducted cognitive testing and posed additional survey questions when piloting the survey to assess the extent to which choices made in the survey were reflective of real-life decisions. This suggested that participants overall felt they were making realistic choices.[19] We also asked participants in the main experiment how confident they were when choosing a heat pump. Using this data, we conducted additional analyses where we re-coded participants who claimed that they were uncertain about choosing a heat pump as not choosing one in that particular choice set (see Table 44 in the Annex 2 and Table 76 in Annex 3). Findings from these analyses produce similar results to those found in the main regression specification, suggesting that the main regression specification used throughout the main report is robust.

A related limitation of this study is that the choice scenarios do not fully reflect choice scenarios in real-life. For example, the choices presented may be over-simplified, and did not include

[19] The pilot was, however, conducted with a smaller, and non-representative sample.

positive marketing-based messaging or formats that might be expected from an offer from an energy supplier. To mitigate this risk, the online survey included as much information as feasible regarding non-cost related considerations of ASHP uptake that people would face in real-life when making this type of decision (e.g., required home modifications, time taken for installation relative to fossil fuel-based systems). In addition, we tailored costs presented to respondents depending on the number of bedrooms in their household. This meant that we presented households with more realistic costs when making decisions, since these were more aligned with their level of energy consumption.

Additionally, the survey was distributed through an online-only platform, which means that some households that were eligible to participate may have been excluded. A postal survey was not feasible in this case due to the amount of tailoring inherent in the design of the survey questionnaire (i.e., questions were in several cases dependent on answers provided to previous questions). Relatedly, several participants reported difficulties in accessing the survey link, and not being able to respond to the survey due to lack of access to a smartphone or computer. Whereas we addressed all queries received, some respondents may not have contacted the team, and may therefore have been excluded from participation. Though it is reasonable to suggest that more elderly, and/or less technologically adept participants were less likely to access the survey, it is unclear whether these groups would have responded differently, and therefore if and how this may affect the findings.

Finally, due to the higher than anticipated response rates, a second reminder was not distributed to the final subsample of survey respondents. Any potential bias introduced by this was checked for and corrected (see Table 45 in Annex 2).

# Annex 2: Detailed analysis of main experiment results

*This annex contains details of the method and results of the analysis of the main experiment results.*

## Descriptive analysis

### Survey engagement

After receiving the invitation to participate in the study, 10,850 individuals opened the survey. Of these, 6,086 successfully completed the survey, 2,059 dropped out before reaching the end, and 2,705 were screened out. Respondents were screened out due to not being the homeowner (48%), not having a gas or oil boiler as their current heating system (37%), living in a high rise flat (13%), or due to answering the survey in seven minutes or less (1%).

Among participants who successfully completed the survey, the median survey completion time was 16.5 minutes while the mean was 108.1 minutes[20]. The median completion time for the different sections of the survey were:

[20] The large difference between median and mean completion time is caused by a small percentage of respondents who presumably left the survey open for a long time before returning to it.

- Screening and demographic questions: 3 minutes 12 seconds.
- Instructions and DCE practice round: 1 minute 30 seconds.
- DCE: 4 minutes 15 seconds.
- Post-DCE questions: 2 minutes 30 seconds.
- RCT: 32 seconds.

## Participant characteristics

The tables in this section present the results from the descriptive analysis of the study sample. We performed this analysis to describe the socio-economic characteristics of the study sample as well as the characteristics of their housing, heating systems, and environmental attitudes, among other characteristics. Average characteristics are presented for all participants as well as for the main study segments: those with high energy consumption homes who are on the gas grid, those with high energy consumption homes who are off the gas grid, those with low energy consumption homes who are on the gas grid, and those with low energy consumption homes who are off the gas grid. Data on property size (i.e., the number of bedrooms), the regional distribution of households, and (for pooled analyses) grid status were used to reweight the main results, which serve to test the robustness of the main regression specification throughout the main report.[21] While the main specification may not be weighted, the main report focuses on the four energy demand groups separately, which account for discrepancies in grid status distribution. This means that the results from the four energy demand groups do not need to be further weighted by grid status.

Table 19 presents the socio-demographic characteristics and environmental attitudes of the study sample. Both tables present average characteristics for the entire sample as well as for the four key household segments: high energy consumption (gas), high energy consumption (oil), low energy consumption (gas), and low energy consumption (oil).

Overall, our sample was fairly balanced on most socio-demographic characteristics. Table 19 shows that the sample closely matches the age distribution among homeowners in England[22], with 55-64 being the only meaningfully overrepresented age band (at 23% rather than 20%) and 65+ begin the only meaningfully underrepresented age band (at 33% rather than 36%). The sample is also largely representative of the UK homeowning population in terms of its regional distribution, with the exception of London and Northern Scotland being underrepresented, while the South West was overrepresented.[23]

[21] The study sample is not perfectly representative of the population of owner-occupiers in Great Britain on more variables than those that were reweighted. However, it was necessary to be selective about which variables to re-weight on. These characteristics were selected for weighting in close collaboration with DESNZ, since they were believed to be those that were more closely related to the effects of price on demand.
[22] Data showing the age distribution of home owners in England in 2022, published by Statista Research Department in 2023, available here: https://www.statista.com/statistics/321065/uk-england-home-owners-age-groups/
[23] Data showing the age distribution of home owners in England in 2022, published by Statista Research Department in 2023, available here: https://www.statista.com/statistics/321065/uk-england-home-owners-age-groups/

In terms of environmental attitudes, the sample overall appear to be generally quite concerned about climate change, with 77% being moderately or very concerned. However, when asked about factors that influence heating system choices, 62% and 73% chose saving money for monthly and upfront costs, respectively, while only 36% selected minimizing the environmental impact.

**Table 19: Characteristics of respondents as a percentage of the total sample of respondents**

| Characteristic | All | High energy demand (gas) | High energy demand (oil) | Low energy demand (gas) | Low energy demand (oil) |
|---|---|---|---|---|---|
| Gender: Female | 40% | 36% | 37% | 44% | 43% |
| Gender: Male | 57% | 62% | 59% | 53% | 54% |
| Age: 18 - 34 | 8% | 5% | 4% | 13% | 6% |
| Age: 35 - 44 | 15% | 19% | 10% | 18% | 6% |
| Age: 45 - 54 | 19% | 24% | 18% | 16% | 12% |
| Age: 55 - 64 | 23% | 23% | 27% | 20% | 23% |
| Age: 65 - 74 | 20% | 17% | 25% | 18% | 29% |
| Age: 75 - 84 | 11% | 9% | 12% | 10% | 17% |
| Age: 85 or older | 2% | 1% | 2% | 2% | 5% |
| GB Region: East Midlands | 8% | 8% | 7% | 8% | 6% |
| GB Region: East of England | 11% | 9% | 17% | 6% | 17% |
| GB Region: Eastern Scotland | 4% | 3% | 4% | 4% | 7% |
| GB Region: London | 5% | 9% | 0% | 8% | 0% |
| GB Region: Northeast | 4% | 4% | 3% | 5% | 3% |
| GB Region: Northern Scotland | 3% | 1% | 5% | 1% | 8% |
| GB Region: Northwest | 9% | 11% | 5% | 12% | 2% |
| GB Region: Southeast | 16% | 21% | 13% | 17% | 10% |
| GB Region: Southwest | 16% | 13% | 22% | 11% | 20% |

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|---|---|---|---|---|---|
| GB Region: Wales | 6% | 3% | 9% | 6% | 6% |
| GB Region: West Midlands | 8% | 8% | 7% | 9% | 9% |
| GB Region: Western Scotland | 4% | 3% | 4% | 4% | 6% |
| GB Region: Yorkshire and Humber | 8% | 9% | 5% | 9% | 5% |
| Income: Less than £20k | 10% | 5% | 7% | 15% | 20% |
| Income: £20k-£40k | 19% | 12% | 18% | 23% | 35% |
| Income: £40k-£60k | 17% | 18% | 15% | 20% | 13% |
| Income: £60k-£100k | 18% | 23% | 19% | 15% | 8% |
| Income: £100k or more | 12% | 21% | 15% | 5% | 3% |
| Has £10k or more in savings | 40% | 47% | 43% | 35% | 37% |
| Struggles to pay a household bill (at least sometimes) | 18% | 14% | 16% | 23% | 21% |
| Moderately or very concerned about climate change | 77% | 80% | 79% | 75% | 75% |
| Expects general energy prices to increase in the next 2 years | 50% | 42% | 53% | 52% | 60% |
| Expects own home energy prices to increase in the next 2 years | 52% | 46% | 52% | 54% | 55% |
| Factors that influence heating system choices: Minimising environmental impact | 36% | 35% | 38% | 36% | 34% |
| Factors that influence heating system choices: Saving money on monthly bills | 62% | 62% | 61% | 64% | 63% |
| Factors that influence heating system choices: Saving money on upfront costs | 73% | 75% | 66% | 79% | 72% |
| Number of observations | 6,086 | 1,453 | 2,087 | 2,328 | 218 |
| Observations as a % of the total sample | 12.5% | 3.0% | 4.3% | 4.8% | 0.4% |

Notes: This table presents average characteristics of the study sample as well as of subsets of the sample: A) those with high energy consumption homes who are on the gas grid, B) those with high energy consumption homes who are off the gas grid, C) those with low energy consumption homes who are on the gas grid, and D) those with low energy consumption homes who are off the gas grid. Each variable in this table is a binary variable and the numbers represent the percent of the sample that match the given variable.

Table 20 presents the housing characteristics of the sample as well as that of the key study segments. Overall, the sample was composed of a range of housing types, with the most represented including older, detached houses. The most frequently occurring property type in the sample was detached houses (62% of the sample), followed by semi-detached houses (26%). The largest group of respondents (41%) claimed to own properties built between 1930 and 1982, while 4% owned properties built in 2012 and onwards. The modal number of bedrooms was three, which aligns with Census[24] data on average housing characteristics. Most of the respondents (52%) had owned their home for over 10 years, and 51% expect to own the property for 10 more years or more. Just under half (45%) currently had a mortgage on the property.

**Table 20: Housing characteristics as a percentage of the total sample of respondents**

| Characteristic | All participants | High energy demand (gas) | High energy demand (oil) | Low energy demand (gas) | Low energy demand (oil) |
|---|---|---|---|---|---|
| Property type: Bungalow | 12% | 4% | 14% | 13% | 37% |
| Property type: Detached | 43% | 62% | 65% | 14% | 25% |
| Property type: End-terrace house | 6% | 4% | 2% | 11% | 6% |
| Property type: Flat (ground floor/basement) | 2% | 0% | 0% | 5% | 1% |
| Property type: Mid-terrace house | 11% | 8% | 3% | 20% | 5% |
| Property type: Semi-detached house | 26% | 22% | 16% | 38% | 26% |
| Property built in: Pre 1900 | 20% | 13% | 34% | 12% | 35% |
| Property built in: 1900-1929 | 11% | 13% | 7% | 12% | 12% |

[24] Housing, England and Wales: Census 2021, Accommodation type, tenure, rooms and bedrooms, central heating and car or van availability in England and Wales, Census 2021 data, January 2023, available here: https://www.ons.gov.uk/peoplepopulationandcommunity/housing/bulletins/housingenglandandwales/census2021

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|---|---|---|---|---|---|
| Property built in: 1930-1982 | 41% | 38% | 30% | 53% | 38% |
| Property built in: 1983-2011 | 23% | 30% | 25% | 18% | 12% |
| Property built in: 2012 onwards | 4% | 5% | 3% | 4% | 3% |
| Number of bedrooms (average) | 3.43 | 4.24 | 3.81 | 2.71 | 1.95 |
| Has a mortgage on current property | 45% | 49% | 38% | 50% | 24% |
| Has owned property for 10 or more years | 53% | 56% | 55% | 49% | 52% |
| Expects to own property for 10 or more years | 51% | 54% | 54% | 46% | 50% |
| N | 6086 | 1453 | 2087 | 2328 | 218 |

Notes: This table presents average characteristics of the study sample as well as of subsets of the sample. All variables in this table, except for 'Number of bedrooms' are binary variables and the numbers represent the share of the sample that match the given variable. The variable 'Number of bedrooms' is a continuous variable and represents the mean number of bedrooms contained in the properties in the sample.

Table 21 presents the characteristics of respondents' heating systems for the whole sample as well as the key study segments. This table also describes the sample's baseline knowledge related to heat pumps.

Of the study sample, 62% were on the gas grid and 38% were off the gas grid and heated their homes with an oil heating system. This distribution differs to that of the UK homeowning population, where around 12% are off the gas grid[25]. As discussed in the methodologysection above, we purposefully oversampled off-grid households to make it possible to obtain statistically meaningful estimates of the effects of costs on off-grid households.

A large share of the sample (57% of respondents) were planning to renovate their home in the near future (defined as either large or small home improvements). However, a smaller proportion (26%) were planning to improve the energy efficiency of their home in the near future. Further, a relatively small share of the sample (26%) reported having a heating system that was 15 years old or older (though a similar share, 27% of the sample had heating systems that were four years old or less). There is, however, a larger share of off-gas grid participants that have 15 years old or older boilers compared to on-gas grid participants (39% and 17%, respectively). When asked, around 10% of the sample believed that their heating system will

[25] Distribution of owner occupiers by heating type in England in 2022, published by Statista Research Department in 2023, available here: https://www.statista.com/statistics/321065/uk-england-home-owners-age-groups/

need replacing within the next two years(see Table 21 below), which was the amount of time in which we were asking them to imagine making decisions in the choice set (this suggests that the scenario presented in the DCE was relevant to 10% of the sample as they took the survey, while the scenario may become relevant to others as time passes).

Findings from the survey suggest that there is a high degree of general awareness about heat pumps among respondents, but relatively low confidence in this awareness. In total, 81% of participants correctly answered a multiple-choice question that measured their understanding of what a heat pump is. Moreover, only 12% of the total sample reported to know a lot about heat pumps before participating in this study. 50% reported knowing a little about them, 30% reported being aware of them but not really knowing what they are, and 8% reported not knowing about heat pumps at all. The Spring 2023 BEIS Public Attitudes Tracker found that 69% of respondents were aware of air source heat pumps,[26] suggesting the sample within this study has a higher than average degree of awareness of heat pumps. This may influence the demand analysis by making our estimates less representative, if baseline knowledge about heat pumps is correlated with (unobservable) factors that determine price sensitivity.

**Table 21: Heating system characteristics and knowledge of heat pumps**

| | All participants | High energy demand (gas) | High energy demand (oil) | Low energy demand (gas) | Low energy demand (oil) |
|---|---|---|---|---|---|
| Gas central heating system | 62% | 100% | 0% | 100% | 0% |
| Oil heating system | 38% | 0% | 100% | 0% | 100% |
| Age of heating system: 4 years old or less | 27% | 31% | 20% | 32% | 18% |
| Age of heating system: 5-9 years old | 24% | 28% | 18% | 27% | 22% |
| Age of heating system: 10-14 years old | 18% | 18% | 16% | 18% | 19% |
| Age of heating system: 15 years old or more | 26% | 20% | 40% | 16% | 33% |
| Heating system will need replacing within 2 years | 10% | 9% | 12% | 10% | 10% |

[26] The Public Tracker can be found here: https://www.gov.uk/government/statistics/desnz-public-attitudes-tracker-spring-2023

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|---|---|---|---|---|---|
| Planning to renovate home in near future | 57% | 57% | 58% | 56% | 55% |
| Planning to improve energy efficiency in near future | 26% | 26% | 29% | 23% | 23% |
| Previous heat pump knowledge: Hadn’t previously heard of them | 8% | 7% | 3% | 15% | 4% |
| Previous heat pump knowledge: Aware of them but don't really know what they are | 30% | 29% | 22% | 37% | 30% |
| Previous heat pump knowledge: Know a little about them | 50% | 53% | 59% | 41% | 56% |
| Previous heat pump knowledge: Know a lot about them | 12% | 11% | 17% | 8% | 11% |
| Accurately described a heat pump | 81% | 83% | 91% | 70% | 88% |
| Property has wall insulation | 53% | 59% | 52% | 49% | 51% |
| Property has a smart-meter | 59% | 66% | 51% | 62% | 50% |
| Property has a solar panels | 12% | 13% | 18% | 7% | 13% |
| Property has double/triple glazing | 90% | 91% | 88% | 89% | 89% |
| Property has loft insulation | 87% | 91% | 91% | 81% | 84% |
| Property has underfloor insulation | 13% | 16% | 17% | 8% | 12% |

| | | | | | |
|---|---|---|---|---|---|
| Owns an electric vehicle | 13% | 16% | 15% | 9% | 9% |
| N | 6086 | 1453 | 2087 | 2328 | 218 |

Notes: This table presents average characteristics of the study sample as well as of subsets of the sample. All variables in this table are binary variables and the numbers represent the share of the sample that match the given variable.

## Multivariate regressions results

This section displays supplementary tables from the multivariate regression analyses, which we conducted in order to estimate the effects of upfront and running costs of heat pumps on demand for heat pumps. We conducted the analyses using choice-level DCE data, to study the robustness of the main results presented in the report. Table 39 is the analysis that we recommend using to understand heat pump demand.

When comparing the tables in this section to Table 39 (i.e., the main specification), it is most relevant to look at the coefficients in the rows for “upfront cost of heat pump” and “running cost of heat pump”. These rows show whether the coefficients are of a similar magnitude, whether the directions of the effects are the same, and whether the effects remain significant at a 5%-level. As the tables below show (i.e., Table 22- Table 38 and Table 40-Table 47), the results in this section are qualitatively similar to those in Table 39. The effects of heat pump costs have the same sign (i.e., stay positive or negative) and remain significant across most specifications. The precise magnitudes of the estimated effects do, however, vary slightly from specification to specification. The main difference between Table 39 and the analyses in this section that is worth noting is that the effects of running costs on heat pump demand are consistently significant in the linear specifications (i.e., those where exponential terms are not included), while this is not the case in Table 39 (running costs are only significant for the pooled sample in this exponential specification).

Overall, however, it is clear that the additional regressions conducted in this section verify the robustness of the main results, as the results remain qualitatively similar when the sample is restricted to certain sub-sets of the population, when the results are reweighted, and when a different model is used (i.e., ordinary least squares (OLS)/linear probability model (LPM) or Logit).

Across all tables in this section, the main outcome is whether the participant chose a heat pump in a given choice set. Running costs are always measured as monthly running costs in units of £1. Similarly, upfront costs are measured in units of £1.

Across all regression tables in this section, the figures in the second column onwards that are on the same rows as variable names represent the coefficient value for that variable. For example, in Table 22, the coefficient “-0.0001” which is in the second column on the same row as “upfront cost of heat pump” represents the change in the probability that a participant chose a heat pump when the upfront cost of the heat pump goes up by £1. In other words, the figure shows that participants become 0.01 percentage points less likely to buy a heat pump for every £1 increase in the upfront cost of the heat pump (on average, and all else held equal). The figures shown in parentheses beneath the coefficients represent the standard errors. Moreover, all independent variables used in this sub-section are binary with the exception of the cost variables, which are continuous. The statistical significant of coefficients in all regression tables in Annex 2 are indicated by stars (* p<0.05 and ** p<0.001 – note that we do not specifically report p<0.0001 with asterisks, these would be included within **p<0.001).

Table 22 presents the results from five LPM regressions that estimate the relationship between upfront costs, running costs, and heat pump demand. This analysis does not include any control variables, interaction terms or non-linear terms. It therefore estimates the average linear relationship between heat pump costs and demand. It is often good practice to start an analysis with a simple model and then to amend it to allow for more flexibility (i.e. include non-linear terms, interaction term, control variables. See following tables). Starting from a simple linear model and then amending it step by step ensures that the results of the main specification (Table 39 in the Technical Annex) are not an artifact of the model itself. When comparing the results from Table 22 we find that they have similar effects to the main specifications, with the exception that the effect of running costs on demand appear to be statistically significant.

**Table 22: The relationship between heat pump costs and demand (no control variables)**

| Independent variables | Chose heat pump (Full sample) | Chose heat pump (High energy – gas) | Chose heat pump (High energy – oil) | Chose heat pump (Low energy – gas) | Chose heat pump (Low energy – oil) |
|---|---|---|---|---|---|
| Upfront cost of heat pump coefficient | -0.0001** | -0.0001** | -0.0001** | -0.0001** | -0.0001** |
| Upfront cost of heat pump standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| Running costs of heat pump coefficient | -0.0024** | -0.0030** | -0.0018** | -0.0026** | -0.0014** |
| Running costs of heat pump standard error | (0.0001) | (0.0001) | (0.0001) | (0.0001) | (0.0004) |
| Upfront cost of current heating system coefficient | 0.0000** | - | - | - | - |

| | | | | | |
|---|---|---|---|---|---|
| Upfront cost of current heating system standard error | (0.0000) | - | - | - | - |
| Running cost of current heating system coefficient | 0.0044** | - | - | - | - |
| Running cost of current heating system standard error | (0.0003) | - | - | - | - |
| Constant coefficient | 0.1345** | 1.4098** | 1.3210** | 1.3257** | 1.1677** |
| Constant standard error | (0.0475) | (0.0346) | (0.0268) | (0.0265) | (0.0878) |
| Observations | 79118 | 18889 | 27131 | 30264 | 2834 |
| R-squared | 0.238 | 0.224 | 0.230 | 0.246 | 0.166 |

Notes: This table presents the results from five multivariate regressions. All regressions are run using Linear Probability Models (i.e., OLS models with binary outcomes). The dependent variable is, in each case, whether participants chose to install a heat pump (rather than renew their existing heating system). The dependent variables are presented in the top row, and the independent variables are presented in the leftmost column. Each observation in the dataset represents a choice between participants' existing heating system or a heat pump, and each participant makes multiple choices. The upfront and/or the running costs of the heat pump are varied each time participants' make a choice, while the upfront and running costs of their existing heating system depends on the characteristics of their home and whether they are on or off the gas grid, and remains the same across choice sets for participants. The first regression (column 1) is conducted using the full study sample. The following four regressions (columns 2-5) are conducted on subsets of the sample: A) those with high energy consumption homes who are on the gas grid, B) those with high energy consumption homes who are off the gas grid, C) those with low energy consumption homes who are on the gas grid, and D) those with low energy consumption homes who are off the gas grid. The regressions presented in columns 2-5 lack coefficients for the upfront and running costs of their existing heating systems as the participants placed in each regression all, by construction, have the same costs. Regression coefficient estimates are displayed without brackets, and standard errors for the estimates are presented beneath each respective estimate. Standard errors are clustered on a participant level. Statistical significance is indicated by stars: * p<0.05, **p<0.01.

Table 23 utilises the same specification as Table 22, and presents the results from five Logit regressions that estimate the relationship between heat pump costs and uptake. The coefficients displayed in the table are log-odds ratios. We ran this model to test the robustness of the specification used in Table 22. We find similar results to those in Table 22.

**Table 23: The relationship between heat pump costs and demand using Logit regressions (no control variables)**

| Independent variables | Chose heat pump (Full sample) | Chose heat pump (High energy – gas) | Chose heat pump (High energy – oil) | Chose heat pump (Low energy – gas) | Chose heat pump (Low energy – oil) |
|---|---|---|---|---|---|
| Upfront cost of heat pump coefficient | -0.0004** | -0.0004** | -0.0003** | -0.0005** | -0.0003** |
| Upfront cost of heat pump standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| Running costs of heat pump coefficient | -0.0118** | -0.0155** | -0.0084** | -0.0141** | -0.0066** |
| Running costs of heat pump standard error | (0.0004) | (0.0008) | (0.0005) | (0.0008) | (0.0019) |
| Upfront cost of current heating system coefficient | 0.0002** | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Upfront cost of current heating system standard error | (0.0000) | - | - | - | - |
| Running cost of current heating system coefficient | 0.0186** | - | - | - | - |
| Running cost of current heating system standard error | (0.0014) | - | - | - | - |
| Constant coefficient | -0.9433** | 5.2865** | 3.9483** | 4.6533** | 3.0211** |

| | | | | | |
|---|---|---|---|---|---|
| Constant standard error | (0.2650) | (0.2098) | (0.1459) | (0.1617) | (0.4233) |
| Observations | 79118 | 18889 | 27131 | 30264 | 2834 |

Notes: This table presents the results from five multivariate regressions. All regressions are run using Logit. The dependent variable is, in each case, whether participants chose to install a heat pump (rather than renew their existing heating system). The dependent variables are presented in the top row, and the independent variables are presented in the leftmost column. The first regression (column 1) is conducted using the full study sample. The following four regressions (columns 2-5) are conducted on subsets of the sample: A) those with high energy consumption homes who are on the gas grid, B) those with high energy consumption homes who are off the gas grid, C) those with low energy consumption homes who are on the gas grid, and D) those with low energy consumption homes who are off the gas grid. The regressions presented in columns 2-5 lack coefficients for the upfront and running costs of their existing heating systems as the participants placed in each regression all, by construction, have the same costs. Regression coefficient estimates are displayed without brackets, and standard errors for the estimates are presented beneath each respective estimate. Standard errors are clustered on a participant level. Statistical significance is indicated by stars: * p<0.05, **p<0.01.

Table 24 presents a multivariate LPM regression that estimates the effects of heat pump costs on heat pump demand, controlling for a range of household characteristics like income and property type. The analysis does not include any exponential terms, which means that the model estimates the average linear effects of heat pump costs on demand. Overall, we find similar results in terms of the effects of upfront and running costs on demand to those found in the previous tables, however, we also find that there is a statistically significant relationship between income and demand for heat pumps.

**Table 24: Multivariate LPM with control variables**

| Independent variables | Chose heat pump (Full sample) | Chose heat pump (High energy – gas) | Chose heat pump (High energy – oil) | Chose heat pump (Low energy – gas) | Chose heat pump (Low energy – oil) |
|---|---|---|---|---|---|
| Upfront cost of heat pump coefficient | -0.0001** | -0.0001** | -0.0001** | -0.0001** | -0.0001** |
| Upfront cost of heat pump standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| Running costs of heat pump coefficient | -0.0024** | -0.0030*** | -0.0018** | -0.0026** | -0.0015** |

| | | | | | |
|---|---|---|---|---|---|
| Running costs of heat pump standard error | (0.0001) | (0.0001) | (0.0001) | (0.0001) | (0.0004) |
| Upfront cost of current heating system coefficient | 0.0001 | - | - | - | - |
| Upfront cost of current heating system standard error | (0.0001) | - | - | - | - |
| Running cost of current heating system coefficient | 0.0035* | - | - | - | - |
| Running cost of current heating system standard error | (0.0014) | - | - | - | - |
| Not on the gas grid (on gas omitted category) coefficient | -0.0120 | - | - | - | - |
| Not on the gas grid (on gas omitted category) standard error | (0.2941) | - | - | - | - |
| Income < £10k (DK omitted category) coefficient | 0.0466 | 0.0530 | 0.0458 | 0.0248 | 0.3748** |
| Income < £10k (DK omitted category) standard error | (0.0290) | (0.0815) | (0.0611) | (0.0346) | (0.1101) |
| Income £10k-£15k (DK omitted category) coefficient | 0.0495* | 0.0173 | 0.1434** | 0.0211 | -0.0262 |
| Income £10k-£15k (DK omitted category) standard error | (0.0211) | (0.0431) | (0.0483) | (0.0274) | (0.1050) |

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|---|---|---|---|---|---|
| Income £15k-£20k (DK omitted category) coefficient | 0.0699* | -0.0238 | 0.1011 | 0.0659* | 0.0848 |
| Income £15k-£20k (DK omitted category) standard error | (0.0201) | (0.0456) | (0.0429) | (0.0265) | (0.0908) |
| Income £20k-£30k (DK omitted category) coefficient | 0.0641** | 0.0428 | 0.1256** | 0.0408 | 0.0181 |
| Income £20k-£30k (DK omitted category) standard error | (0.0152) | (0.0302) | (0.0298) | (0.0219) | (0.0705) |
| Income £30k-£40k (DK omitted category) coefficient | 0.0672** | -0.0158 | 0.0913** | 0.0774** | 0.0425 |
| Income £30k-£40k (DK omitted category) standard error | (0.0143) | (0.0283) | (0.0256) | (0.0213) | (0.0852) |
| Income £40k-£50k (DK omitted category) coefficient | 0.0986** | 0.0623* | 0.0938** | 0.1058** | 0.1308 |
| Income £40k-£50k (DK omitted category) standard error | (0.0147) | (0.0286) | (0.0290) | (0.0212) | (0.0983) |
| Income £50k-£60k (DK omitted category) coefficient | 0.1229** | 0.0884** | 0.1687** | 0.1008** | 0.1938 |
| Income £50k-£60k (DK omitted category) standard error | (0.0144) | (0.0261) | (0.0278) | (0.0218) | (0.1390) |
| Income £60k-£100k (DK omitted category) coefficient | 0.1399** | 0.0983** | 0.1896** | 0.1126** | 0.1711* |

| | | | | | |
|---|---|---|---|---|---|
| Income £60k-£100k (DK omitted category) standard error | (0.0116) | (0.0203) | (0.0210) | (0.0183) | (0.0847) |
| Income > £100k (DK omitted category) coefficient | 0.1482** | 0.1179** | 0.1397** | 0.2109** | -0.1030 |
| Income > £100k (DK omitted category) standard error | (0.0139) | (0.0213) | (0.0236) | (0.0277) | (0.1654) |
| Property type:  Bungalow (detached house omitted category) coefficient | -0.0163 | -0.0547 | -0.0212 | -0.0643** | 0.1020 |
| Property type:  Bungalow (detached house omitted category) standard error coefficient | (0.0139) | (0.0338) | (0.0225) | (0.0237) | (0.0715) |
| Property type: End-terrace house (detached house omitted category) coefficient | 0.0037 | 0.0996* | 0.0015 | -0.0528* | 0.1176 |
| Property type: End-terrace house (detached house omitted category) standard error | (0.0172) | (0.0422) | (0.0462) | (0.0232) | (0.1082) |
| Property type: Flat (ground floor/basement) (detached house omitted category) coefficient | 0.0339 | -0.0412 | -0.5210*** | -0.0275 | 0.5183** |
| Property type; Flat (ground floor/basement) (detached house omitted category) standard error | (0.0288) | (0.2620) | (0.0286) | (0.0330) | (0.1671) |

| | | | | | |
|---|---|---|---|---|---|
| Property type: Mid-terrace house (detached house omitted category) coefficient | 0.0202 | 0.0377 | 0.0540 | -0.0282 | -0.0373 |
| Property type: Mid-terrace house (detached house omitted category) standard error | (0.0141) | (0.0276) | (0.0433) | (0.0209) | (0.1148) |
| Property type; Semi-detached house (detached house omitted category) coefficient | 0.0163 | 0.0067 | 0.0111 | -0.0116 | 0.1534* |
| Property type: Semi-detached house (detached house omitted category) standard error | (0.0102) | (0.0172) | (0.0196) | (0.0182) | (0.0727) |
| Number of bedrooms coefficient | 0.0093 | 0.0255 | 0.0197* | -0.0152 | 0.0258 |
| Number of bedrooms standard error | (0.0075) | (0.0174) | (0.0109) | (0.0133) | (0.0910) |
| Property built before 1900 (DK omitted category) coefficient | -0.0830* | -0.0301 | -0.0685 | -0.0723 | -0.1995** |
| Property built before 1900 (DK omitted category) standard error | (0.0323) | (0.0879) | (0.0487) | (0.0522) | (0.0750) |
| Property built between 1900-1929 (DK omitted category) coefficient | -0.0537 | 0.0068 | -0.0191 | -0.0857 | -0.2061* |
| Property built between 1900-1929 (DK omitted category) standard error | (0.0330) | (0.0880) | (0.0539) | (0.0516) | (0.0875) |

| | | | | | |
|---|---|---|---|---|---|
| Property built between (DK omitted category) 1930-1982 coefficient | -0.0557 | -0.0172 | -0.0106 | -0.0866* | -0.1351* |
| Property built between (DK omitted category) 1930-1982 standard error | (0.0317) | (0.0863) | (0.0489) | (0.0501) | (0.0627) |
| Property built between (DK omitted category) 1983-2011 coefficient | -0.0464 | -0.0122 | -0.0242 | -0.0687 | -0.0630 |
| Property built between (DK omitted category) 1983-2011 standard error | (0.0322) | (0.0866) | (0.0494) | (0.0511) | (0.1010) |
| Property built after 2012 (DK omitted category) coefficient | -0.0563 | -0.0202 | -0.0522 | -0.0500 | -0.3450** |
| Property built after 2012 (DK omitted category) standard error | (0.0364) | (0.0897) | (0.0640) | (0.0583) | (0.1209) |
| Constant (intercept) coefficient | 0.2281** | 1.2473** | 1.1793** | 1.4025** | 1.1426** |
| Constant (intercept) standard error | (0.0713) | (0.1207) | (0.0704) | (0.0686) | (0.2328) |
| Observations | 79118 | 18889 | 27131 | 30264 | 2834 |
| R-squared | 0.252 | 0.240 | 0.253 | 0.262 | 0.232 |

Notes: This table presents the results from five multivariate regressions. All regressions are run using Linear Probability Models (i.e., OLS models with binary outcomes). The dependent variable is, in each case, whether participants chose to install a heat pump (rather than renew their existing heating system). The dependent variables are presented in the top row, and the independent variables are presented in the leftmost column. Each observation in the dataset represents a choice between participants' existing heating system or a heat pump, and each participant makes multiple choices. The upfront and/or the running costs of the heat pump are varied each time participants' make a choice, while the upfront and running costs of their existing heating system depends on the characteristics of their home and whether they are on or off the gas grid. The first regression (column 1) is conducted using the full study sample. The following four regressions (columns 2-5) are conducted on subsets of the sample: A) those with high energy consumption homes who are on the gas grid, B) those with high energy consumption homes who are off the gas grid, C) those with low energy consumption homes who are on the gas grid, and D) those with low energy consumption homes who are off the gas grid. The regressions presented in columns 2-5 do not have coefficients for on/off gas grid status as participants in these regressions are, by definition, either all on or off the gas grid. Moreover, they lack coefficients for the upfront and running costs of their existing heating systems as the participants placed in each regression all, by construction, have the same costs. In places where categorial variables are used, there is an indication for which variable was omitted (and should be used as the reference point). Regression coefficient estimates are displayed without brackets, and standard errors for the estimates are presented beneath each respective estimate. Standard errors are clustered on a participant level. Statistical significance is indicated by stars: * p<0.05, **p<0.01.

Table 25 presents a multivariate LPM analysis of the relationship between heat pump costs and demand that includes exponential terms. These exponential terms (squared and cubed terms of the two respective costs) enable the estimation of a more flexible (non-linear) relationship between costs and demand. The exponential terms suggests that there is indeed a non-linear relationship between costs and demand for heat pumps.

**Table 25: Multivariate LPM with control variables and exponential terms**

| Independent variables | Chose heat pump (Full sample) | Chose heat pump (High energy – gas) | Chose heat pump (High energy – oil) | Chose heat pump (Low energy – gas) | Chose heat pump (Low energy – oil) |
|---|---|---|---|---|---|
| Upfront cost of heat pump coefficient | -0.0003** | -0.0005** | 0.0002** | -0.0005** | 0.0004** |
| Upfront cost of heat pump standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0001) |
| Running costs of heat pump coefficient | -0.0290* | 0.1220 | 0.1317 | 0.0588 | -0.1253 |
| Running costs of heat pump standard error | (0.0127) | (0.1223) | (0.1120) | (0.1536) | (0.4926) |
| Upfront cost of heat pump (squared) coefficient | 0.0000** | 0.0000** | -0.0000** | 0.0000** | -0.0000** |
| Upfront cost of heat pump (squared) standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |

| | | | | | |
|---|---|---|---|---|---|
| Running costs of heat pump (squared) coefficient | 0.0001* | -0.0006 | -0.0006 | -0.0004 | 0.0007 |
| Running costs of heat pump (squared) standard error | (0.0001) | (0.0006) | (0.0005) | (0.0008) | (0.0027) |
| Upfront cost of heat pump (cubed) coefficient | -0.0000** | -0.0000** | 0.0000** | -0.0000** | 0.0000** |
| Upfront cost of heat pump (cubed) standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| Running costs of heat pump (cubed) coefficient | -0.0000* | 0.0000 | 0.0000 | 0.0000 | -0.0000 |
| Running costs of heat pump (cubed) standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| Upfront cost of current heating system coefficient | 0.0001 | - | - | - | - |
| Upfront cost of current heating system standard error | (0.0001) | - | - | - | - |
| Running cost of current heating system coefficient | 0.0029* | - | - | - | - |
| Running cost of current heating system standard error | (0.0014) | - | - | - | - |
| Not on the gas grid (on gas omitted category) coefficient | -0.0019 | - | - | - | - |

| | | | | | |
|---|---|---|---|---|---|
| Not on the gas grid (on gas omitted category) standard error | (0.2929) | - | - | - | - |
| Income < £10k (DK omitted category) coefficient | 0.0472 | 0.0546 | 0.0478 | 0.0254 | 0.3724** |
| Income < £10k (DK omitted category) standard error | (0.0289) | (0.0814) | (0.0612) | (0.0346) | (0.1102) |
| Income £10k-£15k (DK omitted category) coefficient | 0.0502* | 0.0167 | 0.1434** | 0.0212 | -0.0257 |
| Income £10k-£15k (DK omitted category) standard error | (0.0212) | (0.0430) | (0.0483) | (0.0275) | (0.1049) |
| Income £15k-£20k (DK omitted category) coefficient | 0.0702** | -0.0240 | 0.1005* | 0.0659** | 0.0852 |
| Income £15k-£20k (DK omitted category) standard error | (0.0201) | (0.0456) | (0.0429) | (0.0265) | (0.0909) |
| Income £20k-£30k (DK omitted category) coefficient | 0.0643** | 0.0429 | 0.1250** | 0.0409 | 0.0183 |
| Income £20k-£30k (DK omitted category) standard error | (0.0153) | (0.0303) | (0.0299) | (0.0220) | (0.0705) |

| | | | | | |
|---|---|---|---|---|---|
| Income £30k-£40k (DK omitted category) coefficient | 0.0668** | -0.0159 | 0.0919** | 0.0774** | 0.0416 |
| Income £30k-£40k (DK omitted category) standard error | (0.0143) | (0.0284) | (0.0256) | (0.0213) | (0.0851) |
| Income £40k-£50k (DK omitted category) coefficient | 0.0988** | 0.0627* | 0.0946** | 0.1061** | 0.1305 |
| Income £40k-£50k (DK omitted category) standard error | (0.0147) | (0.0286) | (0.0290) | (0.0212) | (0.0984) |
| Income £50k-£60k (DK omitted category) coefficient | 0.1225** | 0.0887** | 0.1688** | 0.1006** | 0.1939 |
| Income £50k-£60k (DK omitted category) standard error | (0.0144) | (0.0261) | (0.0277) | (0.0219) | (0.1386) |
| Income £60k-£100k (DK omitted category) coefficient | 0.1402** | 0.0982** | 0.1897** | 0.1127** | 0.1721* |
| Income £60k-£100k (DK omitted category) standard error | (0.0116) | (0.0203) | (0.0211) | (0.0183) | (0.0848) |
| Income > £100k (DK omitted category) coefficient | 0.1480** | 0.1181** | 0.1400** | 0.2107** | -0.1015 |

| | | | | | |
|---|---|---|---|---|---|
| Income > £100k (DK omitted category) standard error | (0.0138) | (0.0213) | (0.0236) | (0.0277) | (0.1657) |
| Property type:  Bungalow (detached house omitted category) coefficient | -0.0171 | -0.0550 | -0.0209 | -0.0647*** | 0.1020 |
| Property type: Bungalow (detached house omitted category) standard error | (0.0139) | (0.0337) | (0.0225) | (0.0237) | (0.0715) |
| Property type: End-terrace house (detached house omitted category) coefficient | 0.0047 | 0.0996* | 0.0027 | -0.0526* | 0.1185 |
| Property type:  End-terrace house (detached house omitted category) standard error | (0.0172) | (0.0423) | (0.0461) | (0.0232) | (0.1084) |
| Property type: Flat (ground floor/basement) (detached house omitted category) coefficient | 0.0345 | -0.0445 | -0.5277*** | -0.0275 | 0.5205** |
| Property type; Flat (ground floor/basement) (detached house omitted category) standard error | (0.0287) | (0.2613) | (0.0285) | (0.0330) | (0.1668) |

| | | | | | |
|---|---|---|---|---|---|
| Property type: Mid-terrace house (detached house omitted category) coefficient | 0.0200 | 0.0376 | 0.0542 | -0.0283 | -0.0376 |
| Property type: Mid-terrace house (detached house omitted category) standard error | (0.0141) | (0.0276) | (0.0433) | (0.0209) | (0.1146) |
| Property type: Semi-detached house (detached house omitted category) coefficient | 0.0161 | 0.0065 | 0.0116 | -0.0117 | 0.1531* |
| Property type: Semi-detached house (detached house omitted category) standard error | (0.0102) | (0.0173) | (0.0196) | (0.0181) | (0.0727) |
| Number of bedrooms coefficient | 0.0094 | 0.0254 | 0.0197* | -0.0152 | 0.0259 |
| Number of bedrooms standard error | (0.0075) | (0.0174) | (0.0109) | (0.0133) | (0.0911) |
| Property built before 1900 (DK omitted category) coefficient | -0.0823* | -0.0324 | -0.0683 | -0.0720 | -0.2000** |
| Property built before 1900 (DK omitted category) standard error | (0.0324) | (0.0879) | (0.0489) | (0.0523) | (0.0747) |

| | | | | | |
|---|---|---|---|---|---|
| Property built between 1900-1929 (DK omitted category) coefficient | -0.0529 | 0.0047 | -0.0194 | -0.0855 | -0.2063* |
| Property built between 1900-1929 (DK omitted category) standard error | (0.0331) | (0.0880) | (0.0540) | (0.0516) | (0.0873) |
| Property built between 1930-1982 (DK omitted category) coefficient | -0.0552 | -0.0195 | -0.0101 | -0.0865* | -0.1357* |
| Property built between 1930-1982 (DK omitted category) standard error | (0.0317) | (0.0863) | (0.0491) | (0.0502) | (0.0623) |
| Property built between 1983-2011 (DK omitted category) coefficient | -0.0456 | -0.0144 | -0.0243 | -0.0685 | -0.0631 |
| Property built between 1983-2011 (DK omitted category) standard error | (0.0322) | (0.0866) | (0.0496) | (0.0512) | (0.1007) |
| Property built after 2012 (DK omitted category) coefficient | -0.0560 | -0.0228 | -0.0513 | -0.0500 | -0.3457** |
| Property built after 2012 (DK omitted category) standard error | (0.0365) | (0.0897) | (0.0641) | (0.0584) | (0.1209) |

| | | | | | |
|---|---|---|---|---|---|
| Constant (intercept) coefficient | 2.6735** | -6.7400 | -8.9822 | -1.2093 | 7.7736 |
| Constant (intercept) standard error | (0.8501) | (8.8447) | (8.0636) | (9.3495) | (29.8078) |
| Observations | 79118 | 18889 | 27131 | 30264 | 2834 |
| R-squared | 0.278 | 0.309 | 0.266 | 0.295 | 0.236 |

Notes: This table presents the results from five multivariate regressions. All regressions are run using Linear Probability Models (i.e., OLS models with binary outcomes). The dependent variable is, in each case, whether participants chose to install a heat pump (rather than renew their existing heating system). The dependent variables are presented in the top row, and the independent variables are presented in the leftmost column. Each observation in the dataset represents a choice between participants' existing heating system or a heat pump, and each participant makes multiple choices. The upfront and/or the running costs of the heat pump are varied each time participants' make a choice, while the upfront and running costs of their existing heating system depends on the characteristics of their home and whether they are on or off the gas grid. The first regression (column 1) is conducted using the full study sample. The following four regressions (columns 2-5) are conducted on subsets of the sample: A) those with high energy consumption homes who are on the gas grid, B) those with high energy consumption homes who are off the gas grid, C) those with low energy consumption homes who are on the gas grid, and D) those with low energy consumption homes who are off the gas grid. The regressions presented in columns 2-5 do not have coefficients for on/off gas grid status as participants in these regressions are, by definition, either all on or off the gas grid. Moreover, they lack coefficients for the upfront and running costs of their existing heating systems as the participants placed in each regression all, by construction, have the same costs. In places where categorial variables are used, there is an indication for which variable was omitted (and should be used as the reference point). Regression coefficient estimates are displayed without brackets, and standard errors for the estimates are presented beneath each respective estimate. Standard errors are clustered on a participant level. Statistical significance is indicated by stars: * p<0.05, **p<0.01.

Table 26 presents an estimation of the relationship between heat pump costs and demand that allows for a non-linear relationship. Instead of using exponential terms, however, these regressions involve using binary variables that indicate whether a particular choice set included a given cost level. While this model more faithfully captures the non-linearity present in the choice data, it is less suited for making projections outside of the cost ranges used in the experiment than the model with exponential terms. Results from this table show that there is indeed a non-linear relationship between costs and demand across the four energy demand group. These findings confirm the robustness of those found in Table 25, where non-linearity is modelled using exponential terms.

**Table 26: Multivariate LPM with binary cost variables**

| Independent variables | Chose heat pump (Full sample) | Chose heat pump (High energy – gas) | Chose heat pump (High energy – oil) | Chose heat pump (Low energy – gas) | Chose heat pump (Low energy – oil) |
|---|---|---|---|---|---|
| Upfront cost of heat pump = £3000 coefficient | - | - | - | - | - |
| Upfront cost of heat pump = £3000 standard error | - | - | - | - | - |
| Upfront cost of heat pump = £3600 coefficient | -0.0754** | - | - | -0.1035** | 0.0191 |
| Upfront cost of heat pump = £3600 standard error | (0.0068) | - | - | (0.0080) | (0.0217) |
| Upfront cost of heat pump = £5000 coefficient | -0.2168** | -0.2716** | -0.0688** | - | - |
| Upfront cost of heat pump = £5000 standard error | (0.0097) | (0.0123) | (0.0079) | - | - |

| | | | | | |
|---|---|---|---|---|---|
| Upfront cost of heat pump = £6000 coefficient | -0.4476** | - | - | -0.4751** | -0.1454** |
| Upfront cost of heat pump = £6000 standard error | (0.0089) | - | - | (0.0093) | (0.0208) |
| Upfront cost of heat pump = £6900 coefficient | -0.3549** | -0.4870** | -0.1526** | - | - |
| Upfront cost of heat pump = £6900 standard error | (0.0085) | (0.0116) | (0.0071) | - | - |
| Upfront cost of heat pump = £8000 coefficient | -0.5301** | - | - | -0.5454** | -0.3692** |
| Upfront cost of heat pump = £8000 standard error | (0.0091) | - | - | (0.0094) | (0.0300) |
| Upfront cost of heat pump = £10000 coefficient | -0.5910** | -0.6045** | -0.4920** | -0.5814** | -0.4929** |
| Upfront cost of heat pump = £10000 standard error | (0.0075) | (0.0116) | (0.0101) | (0.0094) | (0.0317) |
| Upfront cost of heat pump = £15000 coefficient | -0.6963** | -0.6512** | -0.6173** | - | - |
| ‘Upfront cost of heat pump = £15000 standard error | (0.0082) | (0.0116) | (0.0101) | - | - |
| Running costs of heat pump = £165 coefficient | - | - | - | - | - |

| | | | | | |
|---|---|---|---|---|---|
| Running costs of heat pump = £165 standard error | - | - | - | - | - |
| Running costs of heat pump = £180 coefficient | -0.0327** | - | - | -0.0367** | -0.0244 |
| Running costs of heat pump = £180 standard error | (0.0050) | - | - | (0.0053) | (0.0132) |
| Running costs of heat pump = £190 coefficient | -0.0578** | - | - | -0.0600** | -0.0364* |
| Running costs of heat pump = £190 standard error | (0.0044) | - | - | (0.0046) | (0.0147) |
| Running costs of heat pump = £195 coefficient | -0.0043 | - | - | - | - |
| Running costs of heat pump = £195 coefficient standard error | (0.0577) | - | - | - | - |
| Running costs of heat pump = £200 coefficient | -0.0818** | - | - | -0.0821** | -0.0543** |
| Running costs of heat pump = £200 standard error | (0.0043) | - | - | (0.0045) | (0.0129) |
| Running costs of heat pump = £215 coefficient | -0.0425 | -0.0414** | -0.0332** | - | - |
| Running costs of heat pump = £215 standard error | (0.0577) | (0.0060) | (0.0040) | - | - |

| | | | | | |
|---|---|---|---|---|---|
| Running costs of heat pump = £230 coefficient | -0.0724 | -0.0814** | -0.0588** | - | - |
| Running costs of heat pump = £230 standard error | (0.0577) | (0.0058) | (0.0049) | - | - |
| Running costs of heat pump = £240 coefficient | -0.0862 | -0.1025** | -0.0614** | - | - |
| Running costs of heat pump = £240 standard error | (0.0576) | (0.0056) | (0.0043) | - | - |
| Upfront cost of current heating system coefficient | 0.0001 | - | - | - | - |
| Upfront cost of current heating system standard error | (0.0001) | - | - | - | - |
| Running cost of current heating system coefficient | 0.0000 | - | - | - | - |
| Running cost of current heating system standard error | - | - | - | - | - |
| Not on the gas grid (on gas omitted category) coefficient | 0.0011 | - | - | - | - |
| Not on the gas grid (on gas omitted category) standard error | (0.2926) | - | - | - | - |

| | | | | | |
|---|---|---|---|---|---|
| Income < £10k (DK omitted category) coefficient | 0.0477 | 0.0544 | 0.0468 | 0.0258 | 0.3719** |
| Income < £10k (DK omitted category) standard error | (0.0289) | (0.0814) | (0.0611) | (0.0346) | (0.1102) |
| Income £10k-£15k (DK omitted category) coefficient | 0.0503* | 0.0168 | 0.1434** | 0.0213 | -0.0257 |
| Income £10k-£15k (DK omitted category) standard error | (0.0212) | (0.0430) | (0.0483) | (0.0275) | (0.1049) |
| Income £15k-£20k (DK omitted category) coefficient | 0.0702** | -0.0240 | 0.1008* | 0.0659* | 0.0853 |
| Income £15k-£20k (DK omitted category) standard error | (0.0201) | (0.0456) | (0.0429) | (0.0265) | (0.0909) |
| Income £20k-£30k (DK omitted category) coefficient | 0.0643** | 0.0429 | 0.1253** | 0.0409* | 0.0183 |
| Income £20k-£30k (DK omitted category) standard error | (0.0153) | (0.0303) | (0.0298) | (0.0220) | (0.0705) |
| Income £30k-£40k (DK omitted category) coefficient | 0.0667** | -0.0159 | 0.0916** | 0.0773** | 0.0414 |
| Income £30k-£40k (DK omitted category) standard error | (0.0143) | (0.0284) | (0.0256) | (0.0213) | (0.0851) |

| | | | | | |
|---|---|---|---|---|---|
| Income £40k-£50k (DK omitted category) coefficient | 0.0989** | 0.0627* | 0.0942** | 0.1062** | 0.1304 |
| Income £40k-£50k (DK omitted category) standard error | (0.0147) | (0.0286) | (0.0290) | (0.0212) | (0.0985) |
| Income £50k-£60k (DK omitted category) coefficient | 0.1225** | 0.0887** | 0.1688** | 0.1005** | 0.1939 |
| Income £50k-£60k (DK omitted category) standard error | (0.0144) | (0.0261) | (0.0277) | (0.0219) | (0.1385) |
| Income £60k-£100k (DK omitted category) coefficient | 0.1402** | 0.0982** | 0.1897** | 0.1127** | 0.1723* |
| Income £60k-£100k (DK omitted category) standard error | (0.0116) | (0.0203) | (0.0210) | (0.0183) | (0.0848) |
| Income > £100k (DK omitted category) coefficient | 0.1480** | 0.1181** | 0.1399** | 0.2106** | -0.1012 |
| Income > £100k (DK omitted category) standard error | (0.0138) | (0.0213) | (0.0236) | (0.0277) | (0.1658) |
| Property type: Bungalow (detached house omitted category) coefficient | -0.0174 | -0.0550 | -0.0211 | -0.0650** | 0.1020 |
| Property type: Bungalow (detached house omitted category) standard error | (0.0139) | (0.0337) | (0.0225) | (0.0237) | (0.0715) |

| | | | | | |
|---|---|---|---|---|---|
| Property type: End-terrace house (detached house omitted category) coefficient | 0.0050 | 0.0996* | 0.0021 | -0.0524* | 0.1186 |
| Property type: End-terrace house (detached house omitted category) standard error | (0.0172) | (0.0423) | (0.0461) | (0.0232) | (0.1085) |
| Property type: Flat (ground floor/basement) (detached house omitted category) coefficient | 0.0346 | -0.0442 | -0.5243*** | -0.0275 | 0.5209** |
| Property type: Flat (ground floor/basement) (detached house omitted category) standard error | (0.0287) | (0.2614) | (0.0286) | (0.0330) | (0.1669) |
| Property type: Mid-terrace house (detached house omitted category) coefficient | 0.0200 | 0.0376 | 0.0541 | -0.0284 | -0.0376 |
| Property type: Mid-terrace house (detached house omitted category) standard error | (0.0141) | (0.0276) | (0.0433) | (0.0209) | (0.1145) |
| Property type: Semi-detached house (detached house omitted category) coefficient | 0.0161 | 0.0066 | 0.0113 | -0.0118 | 0.1530* |

| | | | | | |
|---|---|---|---|---|---|
| Property type: Semi-detached house (detached house omitted category) standard error | (0.0102) | (0.0173) | (0.0196) | (0.0181) | (0.0727) |
| Number of bedrooms coefficient | 0.0094 | 0.0254 | 0.0197* | -0.0151 | 0.0259 |
| Number of bedrooms standard error | (0.0075) | (0.0174) | (0.0109) | (0.0134) | (0.0911) |
| Property built before 1900 (DK omitted category) coefficient | -0.0823* | -0.0321 | -0.0684 | -0.0718 | -0.2001** |
| Property built before 1900 (DK omitted category) standard error | (0.0324) | (0.0879) | (0.0488) | (0.0524) | (0.0746) |
| Property built between 1900-1929 (DK omitted category) coefficient | -0.0529 | 0.0050 | -0.0192 | -0.0853 | -0.2063* |
| Property built between 1900-1929 (DK omitted category) standard error | (0.0331) | (0.0880) | (0.0539) | (0.0517) | (0.0873) |
| Property built between 1930-1982 (DK omitted category) coefficient | -0.0552 | -0.0193 | -0.0104 | -0.0864 | -0.1358* |

| | | | | | |
|---|---|---|---|---|---|
| Property built between 1930-1982 (DK omitted category) standard error | (0.0318) | (0.0863) | (0.0490) | (0.0502) | (0.0622) |
| Property built between 1983-2011 (DK omitted category) coefficient | -0.0455 | -0.0141 | -0.0242 | -0.0683 | -0.0631 |
| Property built between 1983-2011 (DK omitted category) standard error | (0.0322) | (0.0866) | (0.0495) | (0.0513) | (0.1006) |
| Property built after 2012 (DK omitted category) coefficient | -0.0560 | -0.0225 | -0.0518 | -0.0500 | -0.3458** |
| Property built after 2012 (DK omitted category) standard error | (0.0365) | (0.0897) | (0.0641) | (0.0584) | (0.1209) |
| Constant coefficient | 0.4778 | 0.6061** | 0.6202** | 0.7789** | 0.6419** |
| Constant standard error | (0.2671) | (0.1149) | (0.0656) | (0.0646) | (0.2139) |
| Observations | 79118 | 18889 | 27131 | 30264 | 2834 |
| R-squared | 0.282 | 0.309 | 0.267 | 0.295 | 0.236 |

Notes: This table presents the results from five multivariate regressions. All regressions are run using Linear Probability Models (i.e., OLS models with binary outcomes). The dependent variable is, in each case, whether participants chose to install a heat pump (rather than renew their existing heating system). The dependent variables are presented in the top row, and the independent variables are presented in the leftmost column. Each observation in the dataset represents a choice between participants' existing heating system or a heat pump, and each participant makes multiple choices. The upfront and/or the running costs of the heat pump are varied each time participants' make a choice, while the upfront and running costs of their existing heating system depends on the characteristics of their home and whether they are on or off the gas grid. The first regression (column 1) is conducted using the full study sample. The following four regressions (columns 2-5) are conducted on subsets of the sample: A) those with high energy consumption homes who are on the gas grid, B) those with high energy consumption homes who are off the gas grid, C) those with low energy consumption homes who are on the gas grid, and D) those with low energy consumption homes who are off the gas grid. The regressions presented in columns 2-5 do not have coefficients for on/off gas grid status as participants in these regressions are, by definition, either all on or off the gas grid. Moreover, they lack coefficients for the upfront and running costs of their existing heating systems as the participants placed in each regression all, by construction, have the same costs. In places where categorial variables are used, there is an indication for which variable was omitted (and should be used as the reference point). Regression coefficient estimates are displayed without brackets, and standard errors for the estimates are presented beneath each respective estimate. Standard errors are clustered on a participant level. Statistical significance is indicated by stars: * p<0.05, **p<0.01.

Table 27 examines the interactive relationship between the upfront and running costs of heat pumps. The regressions were conducted using a multivariate LPM model. This model allows us to estimate if the level of upfront costs influences the effect of running costs on demand, and vice versa. The model is, aside from the inclusion of the interaction effect, the same as the one presented in Table 22. Similarly to the main specification (see Table 39), we do find that there is a statistically significant positive interaction effect between upfront and running costs for on-gas grid groups. In contrast to the main specification, we do also find a statistically significant negative interaction effect between upfront and running costs for off-gas grid groups.

**Table 27: Multivariate LPM with cost interaction effects**

| Independent variables | Chose heat pump (Full sample) | Chose heat pump (High energy – gas) | Chose heat pump (High energy – oil) | Chose heat pump (Low energy – gas) | Chose heat pump (Low energy – oil) |
|---|---|---|---|---|---|
| Upfront cost of heat pump coefficient | -0.0002** | -0.0001** | -0.0000** | -0.0001** | 0.0000 |
| Upfront cost of heat pump standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| Running costs of heat pump coefficient | -0.0054** | -0.0049** | -0.0009** | -0.0044** | 0.0015 |
| Running costs of heat pump standard error | (0.0002) | (0.0003) | (0.0002) | (0.0004) | (0.0009) |
| Interaction: upfront x running costs coefficient | 0.0000** | 0.0000** | -0.0000** | 0.0000** | -0.0000** |
| Interaction: upfront x running costs standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |

| | | | | | |
|---|---|---|---|---|---|
| Upfront cost of current heating system coefficient | 0.0001 | - | - | - | - |
| Upfront cost of current heating system standard error | (0.0001) | - | - | - | - |
| Running cost of current heating system coefficient | 0.0037* | - | - | - | - |
| Running cost of current heating system standard error | (0.0014) | - | - | - | - |
| Not on the gas grid (on gas omitted category) coefficient | -0.0099 | - | - | - | - |
| Not on the gas grid (on gas omitted category) standard error | (0.2938) | - | - | - | - |
| Income < £10k (DK omitted category) coefficient | 0.0455 | 0.0508 | 0.0463 | 0.0245 | 0.3721** |
| Income < £10k (DK omitted category) standard error | (0.0290) | (0.0815) | (0.0611) | (0.0347) | (0.1101) |
| Income £10k-£15k (DK omitted category) coefficient | 0.0498* | 0.0182 | 0.1434** | 0.0211 | -0.0257 |
| Income £10k-£15k (DK omitted category) standard error | (0.0211) | (0.0431) | (0.0483) | (0.0274) | (0.1049) |
| Income £15k-£20k (DK omitted category) coefficient | 0.0701** | -0.0234 | 0.1010* | 0.0659* | 0.0853 |

| | | | | | |
|---|---|---|---|---|---|
| Income £15k-£20k (DK omitted category) standard error | (0.0201) | (0.0456) | (0.0429) | (0.0265) | (0.0908) |
| Income £20k-£30k (DK omitted category) coefficient | 0.0642** | 0.0425 | 0.1255** | 0.0408 | 0.0183 |
| Income £20k-£30k (DK omitted category) standard error | (0.0152) | (0.0302) | (0.0298) | (0.0219) | (0.0704) |
| Income £30k-£40k (DK omitted category) coefficient | 0.0669** | -0.0158 | 0.0915** | 0.0774** | 0.0415 |
| Income £30k-£40k (DK omitted category) standard error | (0.0143) | (0.0283) | (0.0256) | (0.0213) | (0.0850) |
| Income £40k-£50k (DK omitted category) coefficient | 0.0981** | 0.0617* | 0.0940** | 0.1057** | 0.1304 |
| Income £40k-£50k (DK omitted category) standard error | (0.0147) | (0.0285) | (0.0290) | (0.0212) | (0.0984) |
| Income £50k-£60k (DK omitted category) coefficient | 0.1226** | 0.0881** | 0.1687** | 0.1008** | 0.1939 |
| Income £50k-£60k (DK omitted category) standard error | (0.0144) | (0.0261) | (0.0278) | (0.0218) | (0.1384) |
| Income £60k-£100k (DK omitted category) coefficient | 0.1400** | 0.0984** | 0.1896** | 0.1126** | 0.1722* |
| Income £60k-£100k (DK omitted category) standard error | (0.0116) | (0.0203) | (0.0210) | (0.0183) | (0.0848) |

| | | | | | |
|---|---|---|---|---|---|
| Income > £100k (DK omitted category) coefficient | 0.1479** | 0.1177** | 0.1398** | 0.2110** | -0.1012 |
| Income > £100k (DK omitted category) standard error | (0.0138) | (0.0213) | (0.0236) | (0.0278) | (0.1657) |
| Property type Bungalow (detached house omitted category) coefficient | -0.0164 | -0.0542 | -0.0211 | -0.0641** | 0.1020 |
| Property type: Bungalow (detached house omitted category) standard error | (0.0139) | (0.0338) | (0.0225) | (0.0237) | (0.0715) |
| Property type: End-terrace house (detached house omitted category) coefficient | 0.0037 | 0.0996* | 0.0017 | -0.0529* | 0.1186 |
| Property type: End-terrace house (detached house omitted category) standard error | (0.0172) | (0.0422) | (0.0461) | (0.0232) | (0.1083) |
| Property type: Flat (ground floor/basement) (detached house omitted category) coefficient | 0.0343 | -0.0365 | -0.5225** | -0.0275 | 0.5208** |
| Property type: Flat (ground floor/basement) (detached house omitted category) standard error | (0.0287) | (0.2631) | (0.0286) | (0.0330) | (0.1666) |
| Property type: Mid-terrace house (detached house omitted category) coefficient | 0.0201 | 0.0377 | 0.0541 | -0.0281 | -0.0376 |
| Property type: Mid-terrace house (detached house omitted category) standard error | (0.0141) | (0.0275) | (0.0433) | (0.0209) | (0.1145) |

| | | | | | |
|---|---|---|---|---|---|
| Property type: Semi-detached house (detached house omitted category) coefficient | 0.0162 | 0.0069 | 0.0112 | -0.0116 | 0.1530* |
| Property type: Semi-detached house (detached house omitted category) standard error | (0.0102) | (0.0172) | (0.0196) | (0.0182) | (0.0727) |
| Number of bedrooms coefficient | 0.0095 | 0.0256 | 0.0197 | -0.0153 | 0.0259 |
| Number of bedrooms standard error | (0.0075) | (0.0174) | (0.0109) | (0.0133) | (0.0911) |
| Property built before 1900 (DK omitted category) coefficient | -0.0821* | -0.0269 | -0.0685 | -0.0725 | -0.2001** |
| Property built before 1900 (DK omitted category) standard error | (0.0323) | (0.0879) | (0.0488) | (0.0522) | (0.0746) |
| Property built between 1900-1929 (DK omitted category)coefficient | -0.0529 | 0.0098 | -0.0192 | -0.0858 | -0.2063* |
| Property built between 1900-1929 (DK omitted category) standard error | (0.0330) | (0.0881) | (0.0539) | (0.0516) | (0.0873) |
| Property built between 1930-1982 (DK omitted category) coefficient | -0.0550 | -0.0140 | -0.0105 | -0.0867 | -0.1357** |
| Property built between 1930-1982 (DK omitted category) standard error | (0.0317) | (0.0863) | (0.0489) | (0.0501) | (0.0622) |
| Property built between 1983-2011 (DK omitted category) coefficient | -0.0455 | -0.0091 | -0.0242 | -0.0688 | -0.0631 |

| | | | | | |
|---|---|---|---|---|---|
| Property built between 1983-2011 (DK omitted category) standard error | (0.0322) | (0.0866) | (0.0494) | (0.0511) | (0.1006) |
| Property built after 2012 (DK omitted category) coefficient | -0.0555 | -0.0167 | -0.0520 | -0.0500 | -0.3458** |
| Property built after 2012 (DK omitted category) standard error | (0.0364) | (0.0897) | (0.0640) | (0.0583) | (0.1208) |
| Constant (intercept) coefficient | 0.8120** | 1.6411** | 0.9790** | 1.7385** | 0.6088* |
| Constant (intercept) standard error | (0.0837) | (0.1311) | (0.0812) | (0.0904) | (0.2714) |
| Observations | 79118 | 18889 | 27131 | 30264 | 2834 |
| R-squared | 0.257 | 0.241 | 0.254 | 0.263 | 0.233 |

Notes: This table presents the results from five multivariate regressions. All regressions are run using Linear Probability Models (i.e., OLS models with binary outcomes). The dependent variable is, in each case, whether participants chose to install a heat pump (rather than renew their existing heating system). The dependent variables are presented in the top row, and the independent variables are presented in the leftmost column. Each observation in the dataset represents a choice between participants' existing heating system or a heat pump, and each participant makes multiple choices. The upfront and/or the running costs of the heat pump are varied each time participants' make a choice, while the upfront and running costs of their existing heating system depends on the characteristics of their home and whether they are on or off the gas grid. The first regression (column 1) is conducted using the full study sample. The following four regressions (columns 2-5) are conducted on subsets of the sample: A) those with high energy consumption homes who are on the gas grid, B) those with high energy consumption homes who are off the gas grid, C) those with low energy consumption homes who are on the gas grid, and D) those with low energy consumption homes who are off the gas grid. The regressions presented in columns 2-5 do not have coefficients for on/off gas grid status as participants in these regressions are, by definition, either all on or off the gas grid. Moreover, they lack coefficients for the upfront and running costs of their existing heating systems as the participants placed in each regression all, by construction, have the same costs. In places where categorial variables are used, there is an indication for which variable was omitted (and should be used as the reference point). Regression coefficient estimates are displayed without brackets, and standard errors for the estimates are presented beneath each respective estimate. Standard errors are clustered on a participant level. Statistical significance is indicated by stars: * $p<0.05$, ** $p<0.01$.

Table 28 presents a heterogeneity analysis using the main multivariate regression specification, but for four different subsets of the population: those on the gas grid, those off the gas grid, those in the high energy demand group, and those in the low energy demand group. The specification used is the same as in Table 22 (i.e., the regressions capture the average linear effects of heat pump costs on demand). We find that upfront costs have similar effects on demand in terms of magnitude, direction and statistical significance across gas grid status and energy demand group. We also find, however, that running costs appear to have a slightly greater effect on demand for on gas grid households compared to their off-gas grid counterparts.

**Table 28: Multivariate LPM heterogeneity analysis (1) – main specification on gas, oil, high demand, and low demand households**

| Independent variables | Chose heat pump (On gas grid) | Chose heat pump (Off gas grid) | Chose heat pump (High energy) | Chose heat pump (Low energy) |
|---|---|---|---|---|
| Upfront cost of heat pump coefficient | -0.0001** | -0.0001** | -0.0001** | -0.0001** |
| Upfront cost of heat pump standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| Running costs of heat pump coefficient | -0.0028** | -0.0018** | -0.0023** | -0.0025** |
| Running costs of heat pump standard error | (0.0001) | (0.0001) | (0.0001) | (0.0001) |
| Upfront cost of current heating system coefficient | 0.0003** | 0.0002** | 0.0001** | 0.0000** |
| Upfront cost of current heating system standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| Income < £10k (DK omitted category) coefficient | 0.0231 | 0.0816 | 0.0442 | 0.0432 |
| Income < £10k (DK omitted category) standard error | (0.0317) | (0.0597) | (0.0499) | (0.0350) |
| Income £10k-£15k (DK omitted category) coefficient | 0.0146 | 0.1160** | 0.0988** | 0.0212 |
| Income £10k-£15k (DK omitted category) standard error | (0.0233) | (0.0436) | (0.0350) | (0.0268) |
| Income £15k-£20k (DK omitted category) coefficient | 0.0451* | 0.1078** | 0.0607 | 0.0717** |
| Income £15k-£20k (DK omitted category) standard error | (0.0231) | (0.0383) | (0.0332) | (0.0256) |

| | | | | |
|---|---|---|---|---|
| Income £20k-£30k (DK omitted category) coefficient | 0.0365* | 0.1030** | 0.0975** | 0.0380 |
| Income £20k-£30k (DK omitted category) standard error | (0.0180) | (0.0274) | (0.0222) | (0.0212) |
| Income £30k-£40k (DK omitted category) coefficient | 0.0492** | 0.0907** | 0.0563** | 0.0780** |
| Income £30k-£40k (DK omitted category) standard error | (0.0172) | (0.0246) | (0.0196) | (0.0208) |
| Income £40k-£50k (DK omitted category) coefficient | 0.0897** | 0.1023** | 0.0842** | 0.1118** |
| Income £40k-£50k (DK omitted category) standard error | (0.0170) | (0.0280) | (0.0207) | (0.0209) |
| Income £50k-£60k (DK omitted category) coefficient | 0.0960** | 0.1688** | 0.1348** | 0.1083** |
| Income £50k-£60k (DK omitted category) standard error | (0.0167) | (0.0272) | (0.0194) | (0.0216) |
| Income £60k-£100k (DK omitted category) coefficient | 0.1074** | 0.1878** | 0.1517** | 0.1183** |
| Income £60k-£100k (DK omitted category) standard error | (0.0136) | (0.0204) | (0.0149) | (0.0180) |
| Income > £100k (DK omitted category) coefficient | 0.1576** | 0.1355** | 0.1363** | 0.1999** |
| Income > £100k (DK omitted category) standard error | (0.0167) | (0.0233) | (0.0162) | (0.0282) |
| Property type: Bungalow (detached house omitted category) coefficient | -0.0430* | -0.0079 | -0.0190 | -0.0300 |

| | | | | |
|---|---|---|---|---|
| Property type: Bungalow (detached house omitted category) standard error | (0.0183) | (0.0212) | (0.0188) | (0.0225) |
| Property type: End-terrace house (detached house omitted category)coefficient | -0.0121 | 0.0122 | 0.0559 | -0.0275 |
| Property type: End-terrace house (detached house omitted category)standard error | (0.0191) | (0.0429) | (0.0315) | (0.0228) |
| Property type: Flat (ground floor/basement) (detached house omitted category)coefficient | 0.0079 | -0.0144 | -0.1750 | 0.0041 |
| Property type: Flat (ground floor/basement) (detached house omitted category)standard error | (0.0298) | (0.3561) | (0.2154) | (0.0326) |
| Property type Mid-terrace house (detached house omitted category)coefficient | -0.0002 | 0.0298 | 0.0489* | -0.0063 |
| Property type: Mid-terrace house (detached house omitted category)standard error | (0.0157) | (0.0413) | (0.0228) | (0.0206) |
| Property type: Semi-detached house (detached house omitted category)coefficient | 0.0044 | 0.0246 | 0.0120 | 0.0114 |
| Property type: Semi-detached house (detached house omitted category)standard error | (0.0122) | (0.0190) | (0.0131) | (0.0178) |
| Number of bedrooms coefficient | 0.0002 | 0.0218* | 0.0209* | -0.0117 |
| Number of bedrooms standard error | (0.0104) | (0.0108) | (0.0092) | (0.0131) |

| | | | | |
|---|---|---|---|---|
| Property built before 1900 (DK omitted category) coefficient | -0.0664 | -0.0850* | -0.0580 | -0.0973* |
| Property built before 1900 (DK omitted category) standard error | (0.0447) | (0.0456) | (0.0426) | (0.0487) |
| Property built between 1900-1929 (DK omitted category) coefficient | -0.0634 | -0.0431 | -0.0061 | -0.0987* |
| Property built between 1900-1929 (DK omitted category) standard error | (0.0443) | (0.0502) | (0.0444) | (0.0484) |
| Property built between 1930-1982 (DK omitted category) coefficient | -0.0771 | -0.0228 | -0.0141 | -0.0933* |
| Property built between 1930-1982 (DK omitted category) standard error | (0.0432) | (0.0456) | (0.0423) | (0.0468) |
| Property built between 1983-2011 (DK omitted category) coefficient | -0.0620 | -0.0345 | -0.0168 | -0.0709 |
| Property built between 1983-2011 (DK omitted category) standard error | (0.0438) | (0.0463) | (0.0426) | (0.0479) |
| Property built after 2012 (DK omitted category) coefficient | -0.0587 | -0.0832 | -0.0308 | -0.0752 |
| Property built after 2012 (DK omitted category) standard error | (0.0475) | (0.0602) | (0.0479) | (0.0552) |
| Constant coefficient | 0.2940** | 0.0482 | 0.9005** | 1.2204** |

| | | | | |
|---|---|---|---|---|
| Constant standard error | (0.0864) | (0.2231) | (0.0678) | (0.0777) |
| Observations | 49153 | 29965 | 46020 | 33098 |
| R-squared | 0.237 | 0.245 | 0.261 | 0.256 |

Notes: This table presents the results from five multivariate regressions. All regressions are run using Linear Probability Models (i.e., OLS models with binary outcomes). The dependent variable is, in each case, whether participants chose to install a heat pump (rather than renew their existing heating system). The dependent variables are presented in the top row, and the independent variables are presented in the leftmost column. Each observation in the dataset represents a choice between participants' existing heating system or a heat pump, and each participant makes multiple choices. The upfront and/or the running costs of the heat pump are varied each time participants' make a choice, while the upfront and running costs of their existing heating system depends on the characteristics of their home and whether they are on or off the gas grid. The first regression (column 1) is conducted using those on the gas grid, the second regression (column 2) is conducted using those off the gas grid, the third regression (column 3) is conducted using those in the high energy demand group, and the fourth regression (column 4) is conducted using those in the low demand group. Everybody who belongs to these four respective groups are pooled together in the regressions (e.g., those on the gas grid in column 1 can either be in the low or high energy demand groups). In places where categorial variables are used, there is an indication for which variable was omitted (and should be used as the reference point). Regression coefficient estimates are displayed without brackets, and standard errors for the estimates are presented beneath each respective estimate. Standard errors are clustered on a participant level. Statistical significance is indicated by stars: * p<0.05, **p<0.01.

Table 29 presents the same analysis as in Table 28, but with the regressions instead being estimated on respondents residing in different types of properties. We find that upfront costs have similar effects on demand in terms of magnitude, direction, and statistical significance across property types. We also find that running costs appear to have a slightly greater effect on demand for mid-terrace and semi-detached houses compared to other property types.

**Table 29: Multivariate LPM heterogeneity analysis (2) – property types**

| Independent variables | Chose heat pump (Bungalow) | Chose heat pump (Detached house) | Chose heat pump (End-of-terrace house) | Chose heat pump (Flat ground / basement) | Chose heat pump (mid-terrace) | Chose heat pump (Semi-detached house) |
|---|---|---|---|---|---|---|
| Upfront cost of heat pump coefficient | -0.0001** | -0.0001** | -0.0001** | -0.0001** | -0.0001** | -0.0001** |
| Upfront cost of heat pump standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |

| | | | | | | |
|---|---|---|---|---|---|---|
| Running costs of heat pump coefficient | -0.0021** | -0.0023** | -0.0021** | -0.0024** | -0.0026** | -0.0026** |
| Running costs of heat pump standard error | (0.0002) | (0.0001) | (0.0003) | (0.0006) | (0.0002) | (0.0002) |
| Upfront cost of current heating system coefficient | 0.0000 | 0.0005** | -0.0005 | -0.0024** | 0.0007 | -0.0001 |
| Upfront cost of current heating system standard error | (0.0002) | (0.0002) | (0.0004) | (0.0005) | (0.0004) | (0.0002) |
| Running cost of current heating system coefficient | 0.0022 | -0.0046 | 0.0135* | 0.0368** | -0.0029 | 0.0059* |
| Running cost of current heating system standard error | (0.0037) | (0.0027) | (0.0063) | (0.0124) | (0.0058) | (0.0028) |
| Off the gas grid (on-gas grid omitted) coefficient | 0.1700 | -1.5277** | 1.5729 | 7.8680** | -2.0574 | 0.4641 |
| Off the gas grid (on-gas grid omitted) standard error | (0.6018) | (0.5465) | (1.2187) | (1.5661) | (1.1963) | (0.5723) |
| Income < £10k (DK omitted category) coefficient | 0.2039** | -0.0180 | 0.1811 | 0.1443 | -0.0116 | -0.0172 |
| Income < £10k (DK omitted category) standard error | (0.0641) | (0.0576) | (0.1510) | (0.1058) | (0.0714) | (0.0524) |
| Income £10k-£15k (DK omitted category) coefficient | 0.1349** | 0.0760 | 0.0535 | 0.1181 | -0.0411 | 0.0061 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Income £10k-£15k (DK omitted category) standard error | (0.0455) | (0.0408) | (0.0640) | (0.0989) | (0.0626) | (0.0424) |
| Income £15k-£20k (DK omitted category) coefficient | 0.1153* | 0.0798* | 0.0640 | 0.1247 | -0.0037 | 0.0559 |
| Income £15k-£20k (DK omitted category) standard error | (0.0454) | (0.0403) | (0.0623) | (0.1177) | (0.0585) | (0.0378) |
| Income £20k-£30k (DK omitted category) coefficient | 0.1320** | 0.0810** | 0.0260 | 0.1155 | 0.0057 | 0.0454 |
| Income £20k-£30k (DK omitted category) standard error | (0.0373) | (0.0269) | (0.0524) | (0.0878) | (0.0450) | (0.0288) |
| Income £30k-£40k (DK omitted category) coefficient | 0.1336** | 0.0670** | 0.0638 | 0.1200 | 0.0298 | 0.0321 |
| Income £30k-£40k (DK omitted category) standard error | (0.0406) | (0.0232) | (0.0613) | (0.0930) | (0.0411) | (0.0264) |
| Income £40k-£50k (DK omitted category) coefficient | 0.1670** | 0.0619** | 0.1055* | 0.2209 | 0.0815* | 0.0975** |
| Income £40k-£50k (DK omitted category) standard error | (0.0464) | (0.0239) | (0.0530) | (0.1382) | (0.0411) | (0.0264) |
| Income £50k-£60k (DK omitted category) coefficient | 0.1348** | 0.1381** | 0.1623** | 0.2150** | 0.0680 | 0.0948** |
| Income £50k-£60k (DK omitted category) standard error | (0.0497) | (0.0229) | (0.0557) | (0.0894) | (0.0446) | (0.0260) |

| | | | | | | |
|---|---|---|---|---|---|---|
| Income £60k-£100k (DK omitted category) coefficient | 0.2149** | 0.1384** | 0.1769** | 0.2657** | 0.0599 | 0.1222** |
| Income £60k-£100k (DK omitted category) standard error | (0.0369) | (0.0170) | (0.0482) | (0.1125) | (0.0390) | (0.0214) |
| Income > £100k (DK omitted category) coefficient | 0.2405** | 0.1272** | 0.0990 | 0.2937** | 0.1833** | 0.1336** |
| Income > £100k (DK omitted category) standard error | (0.0614) | (0.0188) | (0.0785) | (0.1040) | (0.0431) | (0.0284) |
| Number of bedrooms coefficient | 0.0282 | 0.0128 | 0.0212 | -0.0236 | -0.0379 | 0.0077 |
| Number of bedrooms coefficient standard error | (0.0235) | (0.0111) | (0.0316) | (0.0443) | (0.0230) | (0.0162) |
| Property built before 1900 (DK omitted category) coefficient | -0.0225 | -0.0822 | -0.1014 | -0.5334** | 0.0348 | -0.0909 |
| Property built before 1900 (DK omitted category) standard error | (0.1093) | (0.0694) | (0.0769) | (0.1321) | (0.0582) | (0.0603) |
| Property built between 1900-1929 (DK omitted category) coefficient | -0.0815 | -0.0307 | -0.0165 | -0.5007** | 0.0582 | -0.0822 |
| Property built between 1900-1929 (DK omitted category) standard error | (0.0884) | (0.0722) | (0.0821) | (0.1378) | (0.0592) | (0.0605) |
| Property built between 1930-1982 (DK omitted category) coefficient | 0.1031 | -0.0457 | -0.1005 | -0.5288** | 0.0392 | -0.0895 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Property built between 1930-1982 (DK omitted category) standard error | (0.0776) | (0.0690) | (0.0773) | (0.1396) | (0.0576) | (0.0582) |
| Property built between 1983-2011 (DK omitted category) coefficient | 0.0755 | -0.0397 | -0.0734 | -0.3962** | 0.0834 | -0.0771 |
| Property built between 1983-2011 (DK omitted category) standard error | (0.0790) | (0.0690) | (0.0791) | (0.1461) | (0.0611) | (0.0606) |
| Property built after 2012 (DK omitted category) coefficient | 0.0753 | -0.0613 | 0.0165 | -0.6285** | 0.0169 | -0.0275 |
| Property built after 2012 coefficient (DK omitted category) Standard error | (0.0980) | (0.0729) | (0.1071) | (0.1957) | (0.0874) | (0.0684) |
| Constant coefficient | 0.2412 | 0.4229** | -0.2974 | 1.6450 | -0.1367 | 0.3259** |
| Constant standard error | (0.2393) | (0.1287) | (0.3009) | (0.9831) | (0.1906) | (0.1251) |
| Observations | 9438 | 34268 | 4680 | 1456 | 8541 | 20735 |
| R-squared | 0.248 | 0.249 | 0.270 | 0.345 | 0.277 | 0.272 |

Notes: This table presents the results from five multivariate regressions. All regressions are run using Linear Probability Models (i.e., OLS models with binary outcomes). The dependent variable is, in each case, whether participants chose to install a heat pump (rather than renew their existing heating system). The dependent variables are presented in the top row, and the independent variables are presented in the leftmost column. Each observation in the dataset represents a choice between participants' existing heating system or a heat pump, and each participant makes multiple choices. The upfront and/or the running costs of the heat pump are varied each time participants' make a choice, while the upfront and running costs of their existing heating system depends on the characteristics of their home and whether they are on or off the gas grid. Each column presents the same regression run on a different property type, which is displayed in the "Sample" row. Everybody who belongs to these four respective groups are pooled together in the regressions. In places where categorial variables are used, there is an indication for which variable was omitted (and should be used as the reference point). Regression coefficient estimates are displayed without brackets, and standard errors for the estimates are presented beneath each respective estimate. Standard errors are clustered on a participant level. Statistical significance is indicated by stars: * p<0.05, **p<0.01.

Table 30 presents the same analyses as in Table 28 and Table 29, but with the regressions instead being estimated on respondents in different income brackets. While the effect of upfront costs on the demand of heat pumps appears to be same across income brackets, the effect of running costs on demand is slightly larger the greater the income bracket.

**Table 30: Multivariate LPM heterogeneity analysis (3) – income brackets**

| Independent variables | Chose heat pump (Less than £20k) | Chose heat pump (£20k-£40k) | Chose heat pump (£40k-£60k) | Chose heat pump (£60k-£100k) | Chose heat pump (£100k+) |
|---|---|---|---|---|---|
| Upfront cost of heat pump coefficient | -0.0000** | -0.0001** | -0.0001** | -0.0001** | -0.0001** |
| Upfront cost of heat pump standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| Running costs of heat pump coefficient | -0.0021** | -0.0022** | -0.0023** | -0.0023** | -0.0026** |
| Running costs of heat pump standard error | (0.0001) | (0.0002) | (0.0002) | (0.0002) | (0.0002) |
| Upfront cost of current heating system coefficient | -0.0001 | 0.0000 | 0.0003* | -0.0002 | 0.0001 |
| Upfront cost of current heating system standard error | (0.0002) | (0.0002) | (0.0002) | (0.0002) | (0.0003) |
| Running cost of current heating system coefficient | 0.0048 | 0.0049 | -0.0018 | 0.0068* | 0.0035 |
| Running cost of current heating system standard error | (0.0030) | (0.0040) | (0.0029) | (0.0038) | (0.0041) |
| Off the gas grid (on-gas grid omitted) coefficient | 0.3454 | 0.1237 | -0.8656 | 0.8553 | -0.0099 |
| Off the gas grid (on-gas grid omitted) standard error | (0.6132) | (0.7504) | (0.5476) | (0.7812) | (0.8672) |
| Property type: Bungalow (detached house omitted category) coefficient | -0.0692* | -0.0147 | -0.0045 | 0.0033 | 0.0085 |

| | | | | | |
|---|---|---|---|---|---|
| Property type: Bungalow (detached house omitted category) standard error | (0.0263) | (0.0404) | (0.0308) | (0.0365) | (0.0345) |
| Property type: End-terrace house (detached house omitted category) coefficient | -0.0226 | -0.0074 | -0.0376 | 0.0336 | 0.0622 |
| Property type: End-terrace house (detached house omitted category) standard error | (0.0399) | (0.0477) | (0.0394) | (0.0360) | (0.0373) |
| Property type: Flat (ground floor/basement) (detached house omitted category) coefficient | -0.0763 | 0.0297 | -0.0176 | 0.0842 | 0.1232 |
| Property type: Flat (ground floor/basement) (detached house omitted category) standard error | (0.0736) | (0.0664) | (0.0540) | (0.0692) | (0.0913) |
| Property type: Mid-terrace house (detached house omitted category) coefficient | 0.0344 | -0.0219 | -0.0105 | 0.0304 | 0.0004 |
| Property type: Mid-terrace house (detached house omitted category) standard error | (0.0357) | (0.0440) | (0.0312) | (0.0319) | (0.0309) |
| Property type: Semi-detached house (detached house omitted category) coefficient | 0.0188 | -0.0085 | -0.0075 | 0.0398 | 0.0329 |
| Property type: Semi-detached house (detached house omitted category) standard error | (0.0219) | (0.0362) | (0.0252) | (0.0244) | (0.0214) |
| Number of bedrooms coefficient | 0.0125 | -0.0243 | 0.0159 | 0.0336* | 0.0295 |
| Number of bedrooms standard error | (0.0158) | (0.0252) | (0.0169) | (0.0181) | (0.0184) |

| | | | | | |
|---|---|---|---|---|---|
| Property built before 1900 (DK omitted category) coefficient | -0.0757 | -0.0365 | -0.0490 | -0.1878** | -0.0709 |
| Property built before 1900 (DK omitted category) standard error | (0.0648) | (0.0908) | (0.0574) | (0.0637) | (0.0849) |
| Property built between 1900-1929 (DK omitted category) coefficient | -0.0686 | -0.0215 | 0.0153 | -0.1950** | -0.0473 |
| ‘’ Standard error | (0.0670) | (0.0909) | (0.0605) | (0.0659) | (0.0875) |
| Property built between 1930-1982 (DK omitted category) coefficient | -0.0606 | 0.0018 | -0.0207 | -0.2154** | -0.0713 |
| Property built between 1930-1982 (DK omitted category) standard error | (0.0638) | (0.0856) | (0.0557) | (0.0613) | (0.0838) |
| Property built between 1983-2011 (DK omitted category) coefficient | -0.0719 | -0.0458 | -0.0100 | -0.1516* | -0.0466 |
| Property built between 1983-2011 (DK omitted category) standard error | (0.0647) | (0.0880) | (0.0577) | (0.0630) | (0.0844) |
| Property built after 2012 (DK omitted category) coefficient | -0.0634 | -0.0250 | -0.0314 | -0.1853** | -0.0392 |
| Property built after 2012 (DK omitted category) standard error | (0.0793) | (0.1195) | (0.0743) | (0.0714) | (0.0901) |
| Constant coefficient | 0.2265 | 0.1330 | 0.4961** | 0.5254** | 0.3333* |
| Constant standard error | (0.1533) | (0.2236) | (0.1617) | (0.1576) | (0.1616) |

| | | | | | |
|---|---|---|---|---|---|
| Observations | 18499 | 7904 | 15119 | 13793 | 14196 |
| R-squared | 0.174 | 0.221 | 0.238 | 0.284 | 0.318 |

Notes: This table presents the results from five multivariate regressions. All regressions are run using Linear Probability Models (i.e., OLS models with binary outcomes). The dependent variable is, in each case, whether participants chose to install a heat pump (rather than renew their existing heating system). The dependent variables are presented in the top row, and the independent variables are presented in the leftmost column. Each observation in the dataset represents a choice between participants' existing heating system or a heat pump, and each participant makes multiple choices. The upfront and/or the running costs of the heat pump are varied each time participants' make a choice, while the upfront and running costs of their existing heating system depends on the characteristics of their home and whether they are on or off the gas grid. Each column presents the same regression run on a different income bracket, which is displayed in the "Sample" row. Everybody who belongs to these four respective groups are pooled together in the regressions. In places where categorial variables are used, there is an indication for which variable was omitted (and should be used as the reference point). Regression coefficient estimates are displayed without brackets, and standard errors for the estimates are presented beneath each respective estimate. Standard errors are clustered on a participant level. Statistical significance is indicated by stars: * p<0.05, **p<0.01.

Table 31 also presents a version of the multivariate specification used in Table 22, but conducted on participants who have a higher amount of wealth (measured in terms of their income and/or savings). Columns 1–5 present regression results for this cohort, but for different subsets: either the entire sample of wealthy participants, or for those who are wealthy and are in the gas/high energy demand group, oil/high energy demand group, gas/low energy demand group, or oil/low energy demand group. Overall, we find similar results to those found in Table 22 in terms of the effects of upfront costs and running costs on heat pump demand across energy demand groups. Table 32 through to Table 41 do the same, but for other participant characteristics (these are presented in the table titles).

**Table 31: Multivariate LPM robustness check (1) – only with participants who have more than £10k in savings or £40k in annual household income**

| Independent variables | Chose heat pump (Full sample) | Chose heat pump (High energy – gas) | Chose heat pump (High energy – oil) | Chose heat pump (Low energy – gas) | Chose heat pump (Low energy – oil) |
|---|---|---|---|---|---|
| Upfront cost of heat pump coefficient | -0.0001** | -0.0001** | -0.0001** | -0.0001** | -0.0001** |
| ‘’ Standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |

| | | | | | |
|---|---|---|---|---|---|
| Running costs of heat pump coefficient | -0.0025** | -0.0030** | -0.0019** | -0.0026** | -0.0021** |
| Running costs of heat pump standard error | (0.0001) | (0.0002) | (0.0001) | (0.0002) | (0.0006) |
| Upfront cost of current heating system coefficient | 0.0000 | - | - | - | - |
| Upfront cost of current heating system standard error | (0.0001) | - | - | - | - |
| Running cost of current heating system coefficient | 0.0041* | - | - | - | - |
| Running cost of current heating system standard error | (0.0021) | - | - | - | - |
| Off the gas grid (on-gas grid omitted) coefficient | 0.0972 | - | - | - | - |
| Off the gas grid (on-gas grid omitted) standard error | (0.4337) | - | - | - | - |
| Income < £10k (DK omitted category) coefficient | 0.0617 | -0.2341 | 0.2501* | 0.1115 | - |
| Income < £10k (DK omitted category) standard error | (0.0844) | (0.1317) | (0.1230) | (0.1328) | - |
| Income £10k-£15k (DK omitted category) coefficient | -0.0079 | -0.3549** | 0.0963 | 0.0944 | 0.0000 |
| Income £10k-£15k (DK omitted category) standard error | (0.0783) | (0.1303) | (0.1190) | (0.1290) | - |
| Income £15k-£20k (DK omitted category) coefficient | -0.0433 | -0.3806** | -0.0052 | 0.0943 | -0.2252 |

| | | | | | |
|---|---|---|---|---|---|
| Income £15k-£20k (DK omitted category) standard error | (0.0772) | (0.1465) | (0.1088) | (0.1280) | (0.1936) |
| Income £20k-£30k (DK omitted category) coefficient | -0.0412 | -0.3465** | 0.0272 | 0.0529 | -0.1577 |
| Income £20k-£30k (DK omitted category) standard error | (0.0724) | (0.1288) | (0.0914) | (0.1235) | (0.1820) |
| Income £30k-£40k (DK omitted category) coefficient | -0.0282 | -0.3438** | 0.0246 | 0.0834 | -0.2103 |
| Income £30k-£40k (DK omitted category) standard error | (0.0724) | (0.1302) | (0.0905) | (0.1243) | (0.2044) |
| Income £40k-£50k (DK omitted category) coefficient | 0.0015 | -0.2962* | 0.0084 | 0.1394 | -0.0802 |
| Income £40k-£50k (DK omitted category) standard error | (0.0706) | (0.1267) | (0.0876) | (0.1207) | (0.1946) |
| Income £50k-£60k (DK omitted category) coefficient | 0.0257 | -0.2700* | 0.0824 | 0.1341 | -0.0362 |
| Income £50k-£60k (DK omitted category) standard error | (0.0705) | (0.1262) | (0.0871) | (0.1208) | (0.2118) |
| Income £60k-£100k (DK omitted category) coefficient | 0.0426 | -0.2602* | 0.1036 | 0.1467 | -0.0518 |
| Income £60k-£100k (DK omitted category) standard error | (0.0700) | (0.1253) | (0.0853) | (0.1206) | (0.2028) |

| | | | | | |
|---|---|---|---|---|---|
| Income > £100k (DK omitted category) coefficient | 0.0498 | -0.2394* | 0.0559 | 0.2398* | -0.3078 |
| Income > £100k (DK omitted category) standard error | (0.0702) | (0.1252) | (0.0855) | (0.1223) | (0.2261) |
| Property type: Bungalow (detached house omitted category) coefficient | 0.0059 | -0.0709 | 0.0185 | -0.0514 | 0.0837 |
| Property type Bungalow (detached house omitted category) standard error | (0.0200) | (0.0503) | (0.0310) | (0.0353) | (0.1268) |
| Property type: End-terrace house (detached house omitted category) coefficient | 0.0181 | 0.1348** | -0.0190 | -0.0635* | 0.2241 |
| Property type: End-terrace house (detached house omitted category) standard error | (0.0226) | (0.0481) | (0.0551) | (0.0307) | (0.1667) |
| Property type: Flat (ground floor/basement) (detached house omitted category) coefficient | 0.0611 | -0.4062** | -0.5131** | -0.0040 | 0.6426** |
| Property type: Flat (ground floor/basement) (detached house omitted category) standard error | (0.0409) | (0.0330) | (0.0310) | (0.0444) | (0.2082) |
| Property type: Mid-terrace house (detached house omitted category) coefficient | 0.0248 | 0.0468 | 0.0393 | -0.0423 | 0.0207 |
| Property type: Mid-terrace house (detached house omitted category) standard error | (0.0178) | (0.0325) | (0.0540) | (0.0273) | (0.1539) |
| Property type: Semi-detached (detached house omitted category) house coefficient | 0.0172 | 0.0141 | 0.0253 | -0.0263 | 0.1331 |

| | | | | | |
|---|---|---|---|---|---|
| Property type: Semi-detached house (detached house omitted category) standard error | (0.0129) | (0.0208) | (0.0248) | (0.0237) | (0.1132) |
| Number of bedrooms coefficient | 0.0139 | 0.0226 | 0.0224 | -0.0044 | 0.1032 |
| Number of bedrooms standard error | (0.0098) | (0.0213) | (0.0140) | (0.0190) | (0.1367) |
| Property built before 1900 (DK omitted category) coefficient | -0.1301** | 0.0093 | -0.1459* | -0.1267 | -0.2476* |
| Property built before 1900 (DK omitted category) standard error | (0.0459) | (0.1082) | (0.0701) | (0.0820) | (0.0994) |
| Property built between 1900-1929 (DK omitted category) coefficient | -0.0918* | 0.0470 | -0.1205 | -0.1419 | -0.0331 |
| Property built between 1900-1929 (DK omitted category) standard error | (0.0468) | (0.1084) | (0.0754) | (0.0817) | (0.1060) |
| Property built between 1930-1982 (DK omitted category) coefficient | -0.1016* | 0.0165 | -0.0934 | -0.1454 | -0.1270 |
| Property built between 1930-1982 (DK omitted category) standard error | (0.0453) | (0.1064) | (0.0703) | (0.0796) | (0.0805) |
| Property built between 1983-2011 (DK omitted category) coefficient | -0.0803 | 0.0282 | -0.0857 | -0.1096 | -0.0705 |
| Property built between 1983-2011 (DK omitted category) standard error | (0.0459) | (0.1066) | (0.0711) | (0.0807) | (0.1521) |

| | | | | | |
|---|---|---|---|---|---|
| Property built after 2012 (DK omitted category) coefficient | -0.1039* | 0.0152 | -0.1213 | -0.1417 | 0.0125 |
| Property built after 2012 (DK omitted category) standard error | (0.0494) | (0.1096) | (0.0837) | (0.0867) | (0.1486) |
| Constant coefficient | 0.3507** | 1.6117** | 1.3890** | 1.4704** | 1.3203** |
| Constant standard error | (0.1146) | (0.1949) | (0.1215) | (0.1583) | (0.3827) |
| Observations | 46124 | 13000 | 16016 | 15847 | 1261 |
| R-squared | 0.283 | 0.262 | 0.283 | 0.316 | 0.232 |

Notes: This table presents the results from five multivariate regressions. All regressions are run using Linear Probability Models (i.e., OLS models with binary outcomes). The dependent variable is, in each case, whether participants chose to install a heat pump (rather than renew their existing heating system). The dependent variables are presented in the top row, and the independent variables are presented in the leftmost column. Each observation in the dataset represents a choice between participants' existing heating system or a heat pump, and each participant makes multiple choices. The upfront and/or the running costs of the heat pump are varied each time participants' make a choice, while the upfront and running costs of their existing heating system depends on the characteristics of their home and whether they are on or off the gas grid. In places where categorial variables are used, there is an indication for which variable was omitted (and should be used as the reference point). Regression coefficient estimates are displayed without brackets, and standard errors for the estimates are presented beneath each respective estimate. Standard errors are clustered on a participant level. Statistical significance is indicated by stars: * p<0.05, **p<0.01

Table 32 shows that we find similar results to those found in Table 22 in terms of the effects of upfront costs and running costs on heat pump demand across energy demand groups when limiting the sample only to participants that are planning renovations, suggesting that there are no significant differences in the effects of costs on heat pump demand among different participant segments.

**Table 32: Multivariate LPM robustness check (2) – only with participants planning renovations**

| Independent variables | Chose heat pump (Full sample) | Chose heat pump (High energy – gas) | Chose heat pump (High energy – oil) | Chose heat pump (Low energy – gas) | Chose heat pump (Low energy – oil) |
|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| Upfront cost of heat pump coefficient | -0.0001** | -0.0001** | -0.0001** | -0.0001** | -0.0001** |
| Upfront cost of heat pump standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| Running costs of heat pump coefficient | -0.0025** | -0.0031** | -0.0019** | -0.0028** | -0.0017** |
| Running costs of heat pump standard error | (0.0001) | (0.0002) | (0.0001) | (0.0002) | (0.0006) |
| Upfront cost of current heating system coefficient | 0.0001 | - | - | - | - |
| Upfront cost of current heating system standard error | (0.0001) | - | - | - | - |
| Running cost of current heating system coefficient | 0.0031* | - | - | - | - |
| Running cost of current heating system standard error | (0.0019) | - | - | - | - |
| Off the gas grid (on-gas grid omitted) coefficient | -0.1014 | - | - | - | - |
| Off the gas grid (on-gas grid omitted) standard error | (0.3806) | - | - | - | - |
| Income < £10k (DK omitted category) coefficient | 0.0429 | -0.0977* | 0.0842 | 0.0238 | -0.0764 |
| Income < £10k (DK omitted category) standard error | (0.0413) | (0.0472) | (0.0743) | (0.0543) | (0.1968) |
| Income £10k-£15k (DK omitted category) coefficient | 0.0666* | 0.0677 | 0.1575* | 0.0456 | -0.1326 |
| Income £10k-£15k (DK omitted category) standard error | (0.0328) | (0.0632) | (0.0694) | (0.0432) | (0.1369) |

| | | | | | |
|---|---|---|---|---|---|
| Income £15k-£20k (DK omitted category) coefficient | 0.0345 | 0.0797 | 0.0466 | 0.0140 | -0.0466 |
| Income £15k-£20k (DK omitted category) standard error | (0.0272) | (0.0549) | (0.0666) | (0.0341) | (0.1177) |
| Income £20k-£30k (DK omitted category) coefficient | 0.0462* | 0.0487 | 0.1040* | 0.0169 | -0.1215 |
| Income £20k-£30k (DK omitted category) standard error | (0.0217) | (0.0408) | (0.0440) | (0.0319) | (0.0871) |
| Income £30k-£40k (DK omitted category) coefficient | 0.0379 | 0.0277 | 0.0537 | 0.0404 | -0.1613 |
| Income £30k-£40k (DK omitted category) standard error | (0.0196) | (0.0391) | (0.0360) | (0.0289) | (0.1016) |
| Income £40k-£50k (DK omitted category) coefficient | 0.0720** | 0.0591 | 0.0734 | 0.0785** | -0.1699 |
| Income £40k-£50k (DK omitted category) standard error | (0.0199) | (0.0353) | (0.0424) | (0.0278) | (0.1426) |
| Income £50k-£60k (DK omitted category) coefficient | 0.1031** | 0.0757* | 0.1556** | 0.0774** | 0.0425 |
| Income £50k-£60k (DK omitted category) standard error | (0.0187) | (0.0338) | (0.0351) | (0.0291) | (0.1188) |
| Income £60k-£100k (DK omitted category) coefficient | 0.1104** | 0.1216** | 0.1321** | 0.0861** | -0.0588 |

| | | | | | |
|---|---|---|---|---|---|
| Income £60k-£100k (DK omitted category) standard error | (0.0153) | (0.0264) | (0.0277) | (0.0247) | (0.0977) |
| Income > £100k (DK omitted category) coefficient | 0.1361** | 0.1308** | 0.1198** | 0.2146** | -0.2283 |
| Income > £100k (DK omitted category) standard error | (0.0178) | (0.0281) | (0.0295) | (0.0347) | (0.2092) |
| Property type: Bungalow (detached house omitted category) coefficient | -0.0170 | -0.1344** | -0.0199 | -0.0263 | 0.0350 |
| Property type: Bungalow (detached house omitted category) standard error | (0.0198) | (0.0441) | (0.0320) | (0.0338) | (0.0996) |
| Property type: End-terrace house (detached house omitted category) coefficient | 0.0003 | 0.1465** | -0.0854 | -0.0244 | 0.0455 |
| Property type: End-terrace house (detached house omitted category) standard error | (0.0218) | (0.0543) | (0.0515) | (0.0294) | (0.1235) |
| Property type: Flat (ground floor/basement) (detached house omitted category) coefficient | 0.0414 | -0.3973** | 0.0000 | 0.0125 | 0.3483** |
| Property type: Flat (ground floor/basement) (detached house omitted category) standard error | (0.0392) | (0.0353) | - | (0.0458) | (0.1665) |
| Property type: Mid-terrace house (detached house omitted category) coefficient | 0.0138 | 0.0164 | -0.0108 | -0.0064 | 0.0593 |
| Property type: Mid-terrace house (detached house omitted category) standard error | (0.0183) | (0.0340) | (0.0595) | (0.0274) | (0.1489) |

| | | | | | |
|---|---|---|---|---|---|
| Property type: Semi-detached house (detached house omitted category) coefficient | 0.0071 | 0.0197 | -0.0497* | 0.0067 | 0.2628** |
| Property type: Semi-detached house (detached house omitted category) standard error | (0.0135) | (0.0220) | (0.0259) | (0.0239) | (0.0969) |
| Number of bedrooms coefficient | 0.0018 | 0.0213 | 0.0011 | -0.0046 | -0.1563 |
| Number of bedrooms standard error | (0.0101) | (0.0230) | (0.0145) | (0.0185) | (0.1322) |
| Property built before 1900 (DK omitted category) coefficient | -0.0891* | 0.0403 | -0.0866 | -0.0513 | -0.2599* |
| Property built before 1900 (DK omitted category) standard error | (0.0429) | (0.1115) | (0.0630) | (0.0763) | (0.1090) |
| Property built between 1900-1929 (DK omitted category) coefficient | -0.0444 | 0.0912 | -0.0056 | -0.0893 | -0.2213* |
| Property built between 1900-1929 (DK omitted category) standard error | (0.0437) | (0.1123) | (0.0686) | (0.0751) | (0.1023) |
| Property built between 1930-1982 (DK omitted category) coefficient | -0.0459 | 0.0677 | -0.0012 | -0.0844 | -0.1626* |
| Property built between 1930-1982 (DK omitted category) standard error | (0.0421) | (0.1100) | (0.0633) | (0.0736) | (0.0728) |
| Property built between 1983-2011 (DK omitted category) coefficient | -0.0332 | 0.0623 | -0.0144 | -0.0405 | -0.1437 |

| | | | | | |
|---|---|---|---|---|---|
| Property built between 1983-2011 (DK omitted category) standard error | (0.0427) | (0.1102) | (0.0640) | (0.0747) | (0.1294) |
| Property built after 2012 (DK omitted category) coefficient | -0.0313 | 0.0818 | -0.0596 | -0.0351 | - |
| Property built after 2012 (DK omitted category) standard error | (0.0488) | (0.1174) | (0.0840) | (0.0822) | - |
| Constant coefficient | 0.3000** | 1.2106** | 1.3352** | 1.4548** | 1.8237** |
| Constant standard error | (0.0934) | (0.1579) | (0.0932) | (0.0971) | (0.3278) |
| Observations | 44954 | 10803 | 15652 | 16952 | 1547 |
| R-squared | 0.267 | 0.258 | 0.262 | 0.291 | 0.297 |

Notes: This table presents the results from five multivariate regressions. All regressions are run using Linear Probability Models (i.e., OLS models with binary outcomes). The dependent variable is, in each case, whether participants chose to install a heat pump (rather than renew their existing heating system). The dependent variables are presented in the top row, and the independent variables are presented in the leftmost column. Each observation in the dataset represents a choice between participants' existing heating system or a heat pump, and each participant makes multiple choices. The upfront and/or the running costs of the heat pump are varied each time participants' make a choice, while the upfront and running costs of their existing heating system depends on the characteristics of their home and whether they are on or off the gas grid. In places where categorial variables are used, there is an indication for which variable was omitted (and should be used as the reference point). Regression coefficient estimates are displayed without brackets, and standard errors for the estimates are presented beneath each respective estimate. Standard errors are clustered on a participant level. Statistical significance is indicated by stars: * p<0.05, **p<0.01.

Table 33 shows that we find similar results to those found in Table 22 in terms of the effects of upfront costs and running costs on heat pump demand across energy demand groups when limiting the sample only to participants that are planning energy efficiency improvements, suggesting that there are no significant differences in the effects of costs on heat pump demand among different participant segments.

**Table 33: Multivariate LPM robustness check (3) – only with participants planning energy efficiency improvements**

| Independent variables | Chose heat pump (Full sample) | Chose heat pump (High energy – gas) | Chose heat pump (High energy – oil) | Chose heat pump (Low energy – gas) | Chose heat pump (Low energy – oil) |
|---|---|---|---|---|---|
| Upfront cost of heat pump coefficient | -0.0001** | -0.0001** | -0.0001** | -0.0001** | -0.0001** |
| Upfront cost of heat pump standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| Running costs of heat pump coefficient | -0.0025** | -0.0030** | -0.0018** | -0.0031** | -0.0018** |
| Running costs of heat pump standard error | (0.0001) | (0.0003) | (0.0002) | (0.0003) | (0.0008) |
| Upfront cost of current heating system coefficient | 0.0002 | - | - | - | - |
| Upfront cost of current heating system standard error | (0.0002) | - | - | - | - |
| Running cost of current heating system coefficient | 0.0014 | - | - | - | - |
| Running cost of current heating system standard error | (0.0031) | - | - | - | - |
| Off the gas grid (on-gas grid omitted) coefficient | -0.5832 | - | - | - | - |
| Off the gas grid (on-gas grid omitted) standard error | (0.6242) | - | - | - | - |
| Income < £10k (DK omitted category) coefficient | -0.0810 | 0.2679 | -0.0147 | -0.2379** | - |
| Income < £10k (DK omitted category) standard error | (0.0653) | (0.2779) | (0.1046) | (0.0641) | - |

| | | | | | |
|---|---|---|---|---|---|
| Income £10k-£15k (DK omitted category) coefficient | 0.0719 | 0.0406 | 0.2418** | -0.0390 | 0.2950 |
| Income £10k-£15k (DK omitted category) standard error | (0.0512) | (0.0787) | (0.0787) | (0.0729) | (0.3214) |
| Income £15k-£20k (DK omitted category) coefficient | 0.0294 | 0.0730 | 0.0368 | -0.0734 | 0.5910** |
| Income £15k-£20k (DK omitted category) standard error | (0.0543) | (0.0725) | (0.1021) | (0.0818) | (0.2178) |
| Income £20k-£30k (DK omitted category) coefficient | 0.0621 | 0.1084 | 0.1144 | -0.0280 | 0.1603 |
| Income £20k-£30k (DK omitted category) standard error | (0.0389) | (0.0834) | (0.0670) | (0.0644) | (0.2185) |
| Income £30k-£40k (DK omitted category) coefficient | 0.0141 | 0.0215 | 0.0359 | -0.0403 | 0.2868 |
| Income £30k-£40k (DK omitted category) standard error | (0.0336) | (0.0647) | (0.0563) | (0.0528) | (0.2553) |
| Income £40k-£50k (DK omitted category) coefficient | 0.0913** | 0.0727 | 0.1228* | 0.0425 | 0.3181 |
| Income £40k-£50k (DK omitted category) standard error | (0.0323) | (0.0670) | (0.0591) | (0.0492) | (0.2714) |
| Income £50k-£60k (DK omitted category) coefficient | 0.0683* | 0.0255 | 0.1338** | 0.0038 | 0.7932** |

| | | | | | |
|---|---|---|---|---|---|
| Income £50k-£60k (DK omitted category) standard error | (0.0311) | (0.0554) | (0.0532) | (0.0521) | (0.2164) |
| Income £60k-£100k (DK omitted category) coefficient | 0.0974** | 0.1030* | 0.1620** | 0.0005 | 0.1035 |
| Income £60k-£100k (DK omitted category) standard error | (0.0257) | (0.0428) | (0.0425) | (0.0461) | (0.2184) |
| Income > £100k (DK omitted category) coefficient | 0.1298** | 0.1367** | 0.1534** | 0.1029* | 0.1454 |
| Income > £100k (DK omitted category) standard error | (0.0271) | (0.0440) | (0.0417) | (0.0536) | (0.3308) |
| Property type: Bungalow (detached house omitted category) coefficient | -0.0306 | -0.1006 | -0.0609 | -0.0331 | -0.4601* |
| Property = Bungalow (detached house omitted category) (detached house omitted category)standard error | (0.0314) | (0.0907) | (0.0468) | (0.0584) | (0.1757) |
| Property type:  End-terrace house (detached house omitted category) coefficient | -0.0326 | 0.1318 | -0.2944** | -0.0666 | 0.0489 |
| Property type: End-terrace house (detached house omitted category) standard error | (0.0397) | (0.0909) | (0.0824) | (0.0541) | (0.1004) |
| Property type: Flat (ground floor/basement) (detached house omitted category) coefficient | 0.0867 | 0.0000 | 0.0000 | 0.0295 | 0.0000 |
| Property = Flat (ground floor/basement) (detached house omitted category) standard error | (0.0740) | - | - | (0.0911) | - |

| | | | | | |
|---|---|---|---|---|---|
| Property = Mid-terrace house (detached house omitted category) coefficient | 0.0062 | 0.1073 | 0.0298 | -0.0548 | 0.0051 |
| Property = Mid-terrace house (detached house omitted category) standard error | (0.0310) | (0.0625) | (0.0838) | (0.0486) | (0.2669) |
| Property = Semi-detached house (detached house omitted category) coefficient | 0.0311 | 0.0468 | -0.0170 | 0.0007 | 0.1107 |
| Property = Semi-detached house (detached house omitted category) standard error | (0.0219) | (0.0356) | (0.0417) | (0.0421) | (0.1152) |
| Number of bedrooms (detached house omitted category) coefficient | -0.0085 | 0.0249 | -0.0211 | -0.0263 | 0.0274 |
| Number of bedrooms (detached house omitted category) standard error | (0.0153) | (0.0361) | (0.0207) | (0.0328) | (0.1010) |
| Property built before 1900 (DK omitted category) coefficient | -0.1422 | 0.0175 | -0.1775* | -0.1881 | -0.1062 |
| Property built before 1900 (DK omitted category) standard error | (0.0800) | (0.1509) | (0.0812) | (0.1990) | (0.1452) |
| Property built between 1900-1929 (DK omitted category) coefficient | -0.0649 | 0.0946 | -0.1164 | -0.1505 | 0.1873 |
| Property built between 1900-1929 (DK omitted category) standard error | (0.0817) | (0.1505) | (0.0965) | (0.1972) | (0.2018) |
| Property built between 1930-1982 (DK omitted category) coefficient | -0.0818 | 0.0480 | -0.0811 | -0.1591 | 0.2245 |

| | | | | | |
|---|---|---|---|---|---|
| Property built between 1930-1982 (DK omitted category) standard error | (0.0793) | (0.1471) | (0.0814) | (0.1945) | (0.1480) |
| Property built between 1983-2011 (DK omitted category) coefficient | -0.0666 | 0.0533 | -0.0823 | -0.1194 | -0.1414 |
| Property built between 1983-2011 (DK omitted category) standard error | (0.0806) | (0.1480) | (0.0845) | (0.1969) | (0.2253) |
| Property built after 2012 (DK omitted category) coefficient | -0.0411 | 0.0886 | -0.1034 | -0.0712 | - |
| Property built after 2012 (DK omitted category) standard error | (0.0873) | (0.1564) | (0.1045) | (0.2063) | - |
| Constant coefficient | 0.3259* | 1.2700** | 1.4998** | 1.7811** | 0.9984* |
| Constant standard error | (0.1623) | (0.2234) | (0.1256) | (0.2218) | (0.3912) |
| Observations | 20189 | 4862 | 7735 | 6929 | 663 |
| R-squared | 0.249 | 0.270 | 0.256 | 0.258 | 0.327 |

Notes: This table presents the results from five multivariate regressions. All regressions are run using Linear Probability Models (i.e., OLS models with binary outcomes). The dependent variable is, in each case, whether participants chose to install a heat pump (rather than renew their existing heating system). The dependent variables are presented in the top row, and the independent variables are presented in the leftmost column. Each observation in the dataset represents a choice between participants' existing heating system or a heat pump, and each participant makes multiple choices. The upfront and/or the running costs of the heat pump are varied each time participants' make a choice, while the upfront and running costs of their existing heating system depends on the characteristics of their home and whether they are on or off the gas grid. In places where categorial variables are used, there is an indication for which variable was omitted (and should be used as the reference point). Regression coefficient estimates are displayed without brackets, and standard errors for the estimates are presented beneath each respective estimate. Standard errors are clustered on a participant level. Statistical significance is indicated by stars: * p<0.05, **p<0.01

Table 34 shows that we find similar results to those found in Table 22 in terms of the effects of upfront costs and running costs on heat pump demand across energy demand groups when limiting the sample only to participants who believe fossil fuels will increase in price, suggesting that there are no significant differences in the effects of costs on heat pump demand among different participant segments.

**Table 34: Multivariate LPM robustness check (4) – only with participants who believe fossil fuels will increase in price**

| Independent variables | Chose heat pump (Full sample) | Chose heat pump (High energy – gas) | Chose heat pump (High energy – oil) | Chose heat pump (Low energy – gas) | Chose heat pump (Low energy – oil) |
|---|---|---|---|---|---|
| Upfront cost of heat pump coefficient | -0.0001** | -0.0001** | -0.0001** | -0.0001** | -0.0001** |
| Upfront cost of heat pump standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| Running costs of heat pump coefficient | -0.0022** | -0.0027** | -0.0016** | -0.0026** | -0.0017** |
| Running costs of heat pump standard error | (0.0001) | (0.0002) | (0.0001) | (0.0002) | (0.0005) |
| Upfront cost of current heating system coefficient | 0.0001 | - | - | - | - |
| Upfront cost of current heating system standard error | (0.0001) | - | - | - | - |
| Running cost of current heating system coefficient | 0.0019 | - | - | - | - |
| Running cost of current heating system standard error | (0.0020) | - | - | - | - |
| Off the gas grid (on-gas grid omitted) coefficient | -0.2458 | - | - | - | - |
| Off the gas grid (on-gas grid omitted) standard error | (0.4019) | - | - | - | - |
| Income < £10k (DK omitted category) coefficient | 0.0585 | -0.0531 | 0.0174 | 0.0706 | 0.3562** |

| | | | | | |
|---|---|---|---|---|---|
| Income < £10k (DK omitted category) standard error | (0.0382) | (0.0729) | (0.0713) | (0.0478) | (0.1194) |
| Income £10k-£15k (DK omitted category) coefficient | 0.0564* | 0.0593 | 0.1608** | 0.0213 | -0.0359 |
| Income £10k-£15k (DK omitted category) standard error | (0.0274) | (0.0621) | (0.0549) | (0.0358) | (0.1503) |
| Income £15k-£20k (DK omitted category) coefficient | 0.0961** | -0.0332 | 0.1295* | 0.1063** | 0.0445 |
| Income £15k-£20k (DK omitted category) standard error | (0.0288) | (0.0676) | (0.0558) | (0.0391) | (0.1235) |
| Income £20k-£30k (DK omitted category) coefficient | 0.0671** | 0.1101** | 0.1147** | 0.0530* | -0.0181 |
| Income £20k-£30k (DK omitted category) standard error | (0.0213) | (0.0459) | (0.0408) | (0.0293) | (0.0918) |
| Income £30k-£40k (DK omitted category) coefficient | 0.0859** | -0.0334 | 0.0984** | 0.1067** | 0.2089* |
| Income £30k-£40k (DK omitted category) standard error | (0.0190) | (0.0408) | (0.0345) | (0.0272) | (0.1079) |
| Income £40k-£50k (DK omitted category) coefficient | 0.1308** | 0.0662 | 0.1607** | 0.1262** | 0.1632 |
| Income £40k-£50k (DK omitted category) standard error | (0.0195) | (0.0412) | (0.0351) | (0.0283) | (0.1363) |

| | | | | | |
|---|---|---|---|---|---|
| Income £50k-£60k (DK omitted category) coefficient | 0.1336** | 0.0717 | 0.2023** | 0.1037** | 0.0457 |
| Income £50k-£60k (DK omitted category) standard error | (0.0207) | (0.0367) | (0.0368) | (0.0330) | (0.2401) |
| Income £60k-£100k (DK omitted category) coefficient | 0.1588** | 0.1139** | 0.2174** | 0.1217** | 0.3062* |
| Income £60k-£100k (DK omitted category) standard error | (0.0165) | (0.0310) | (0.0290) | (0.0260) | (0.1185) |
| Income > £100k (DK omitted category) coefficient | 0.1681** | 0.1187** | 0.1583** | 0.2522** | -0.0348 |
| Income > £100k (DK omitted category) standard error | (0.0207) | (0.0332) | (0.0357) | (0.0347) | (0.2532) |
| Property type: Bungalow (detached house omitted category) coefficient | -0.0017 | -0.0034 | -0.0120 | -0.0840* | 0.1170 |
| Property type Bungalow (detached omitted category) (detached house omitted category) standard error | (0.0190) | (0.0509) | (0.0291) | (0.0336) | (0.1048) |
| Property type: End-terrace house (detached house omitted category) coefficient | 0.0098 | 0.1297* | -0.0223 | -0.0512 | -0.1406 |
| Property type: End-terrace house (detached house omitted category) standard error | (0.0234) | (0.0532) | (0.0599) | (0.0327) | (0.1272) |
| Property type: Flat (ground floor/basement) (detached house omitted category) coefficient | 0.0021 | 0.3706** | 0.0000 | -0.0919* | 0.7230** |

| | | | | | |
|---|---|---|---|---|---|
| Property type: Flat (ground floor/basement) (detached house omitted category) standard error | (0.0366) | (0.1264) | - | (0.0441) | (0.2487) |
| Property type: Mid-terrace house (detached house omitted category) coefficient | 0.0203 | 0.0362 | 0.0652 | -0.0355 | -0.0590 |
| Property type: Mid-terrace house (detached house omitted category) standard error | (0.0201) | (0.0461) | (0.0595) | (0.0291) | (0.1386) |
| Property type: Semi-detached house (detached house omitted category) coefficient | 0.0166 | 0.0004 | 0.0211 | -0.0298 | 0.1004 |
| Property type: Semi-detached house (detached house omitted category) standard error | (0.0145) | (0.0268) | (0.0263) | (0.0258) | (0.1122) |
| Number of bedrooms coefficient | 0.0074 | 0.0117 | 0.0227 | -0.0252 | 0.1039 |
| Number of bedrooms standard error | (0.0106) | (0.0271) | (0.0155) | (0.0180) | (0.0919) |
| Property built before 1900 (DK omitted category) coefficient | -0.1009* | 0.0453 | -0.1034 | -0.1038 | -0.4388** |
| Property built before 1900 (DK omitted category) standard error | (0.0408) | (0.1291) | (0.0558) | (0.0686) | (0.1310) |
| Property built between 1900-1929 (DK omitted category) coefficient | -0.0523 | 0.0917 | 0.0009 | -0.0942 | -0.4935** |
| Property built between 1900-1929 (DK omitted category) standard error | (0.0421) | (0.1291) | (0.0654) | (0.0675) | (0.1831) |

| | | | | | |
|---|---|---|---|---|---|
| Property built between 1930-1982 (DK omitted category) coefficient | -0.0830* | 0.0103 | -0.0441 | -0.1080 | -0.3561** |
| Property built between 1930-1982 (DK omitted category) standard error | (0.0401) | (0.1264) | (0.0568) | (0.0656) | (0.1291) |
| Property built between 1983-2011 (DK omitted category) coefficient | -0.0772 | 0.0190 | -0.0781 | -0.0826 | -0.2907* |
| Property built between 1983-2011 (DK omitted category) standard error | (0.0407) | (0.1270) | (0.0574) | (0.0669) | (0.1666) |
| Property built after 2012 (DK omitted category) coefficient | -0.0894 | 0.0394 | -0.1791* | -0.0593 | -0.6164** |
| Property built after 2012 (DK omitted category) standard error | (0.0471) | (0.1306) | (0.0759) | (0.0764) | (0.1605) |
| Constant coefficient | 0.3125** | 1.1700** | 1.1709** | 1.4688** | 1.2806** |
| Constant standard error | (0.1002) | (0.1762) | (0.0920) | (0.0917) | (0.2787) |
| Observations | 40833 | 8697 | 14118 | 16458 | 1560 |
| R-squared | 0.254 | 0.234 | 0.266 | 0.264 | 0.279 |

Notes: This table presents the results from five multivariate regressions. All regressions are run using Linear Probability Models (i.e., OLS models with binary outcomes). The dependent variable is, in each case, whether participants chose to install a heat pump (rather than renew their existing heating system). The dependent variables are presented in the top row, and the independent variables are presented in the leftmost column. Each observation in the dataset represents a choice between participants' existing heating system or a heat pump, and each participant makes multiple choices. The upfront and/or the running costs of the heat pump are varied each time participants' make a choice, while the upfront and running costs of their existing heating system depends on the characteristics of their home and whether they are on or off the gas grid. In places where categorial variables are used, there is an indication for which variable was omitted (and should be used as the reference point). Regression coefficient estimates are displayed without brackets, and standard errors for the estimates are presented beneath each respective estimate. Standard errors are clustered on a participant level. Statistical significance is indicated by stars: * p<0.05, **p<0.01.

Table 35 shows that we find similar results to those found in Table 22 in terms of the effects of upfront costs and running costs on heat pump demand across energy demand groups when limiting the sample only to participants without a mortgage, suggesting that there are no significant differences in the effects of costs on heat pump demand among different participant segments.

**Table 35: Multivariate LPM robustness check (5) – only with participants without a mortgage**

| Independent variables | Chose heat pump (Full sample) | Chose heat pump (High energy – gas) | Chose heat pump (High energy – oil) | Chose heat pump (Low energy – gas) | Chose heat pump (Low energy – oil) |
|---|---|---|---|---|---|
| Upfront cost of heat pump coefficient | -0.0001** | -0.0000** | -0.0001** | -0.0001** | -0.0001** |
| Upfront cost of heat pump standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| Running costs of heat pump coefficient | -0.0021** | -0.0028** | -0.0017** | -0.0021** | -0.0017** |
| Running costs of heat pump standard error | (0.0001) | (0.0002) | (0.0001) | (0.0002) | (0.0004) |
| Upfront cost of current heating system coefficient | -0.0000 | - | - | - | - |
| Upfront cost of current heating system standard error | (0.0001) | - | - | - | - |
| Running cost of current heating system coefficient | 0.0037* | - | - | - | - |
| Running cost of current heating system standard error | (0.0018) | - | - | - | - |
| Off the gas grid (on-gas grid omitted) coefficient | 0.2020 | - | - | - | - |

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|---|---|---|---|---|---|
| Off the gas grid (on-gas grid omitted) standard error | (0.3546) | - | - | - | - |
| Income < £10k (DK omitted category) coefficient | 0.1017** | 0.0306 | 0.1163 | 0.0796 | 0.3720** |
| Income < £10k (DK omitted category) standard error | (0.0338) | (0.0837) | (0.0696) | (0.0421) | (0.1241) |
| Income £10k-£15k (DK omitted category) coefficient | 0.0783** | 0.0004 | 0.1794** | 0.0569 | -0.0248 |
| Income £10k-£15k (DK omitted category) standard error | (0.0227) | (0.0400) | (0.0504) | (0.0306) | (0.1055) |
| Income £15k-£20k (DK omitted category) coefficient | 0.0954** | -0.0422 | 0.1288** | 0.1005** | 0.0918 |
| Income £15k-£20k (DK omitted category) standard error | (0.0225) | (0.0522) | (0.0465) | (0.0301) | (0.0922) |
| Income £20k-£30k (DK omitted category) coefficient | 0.0888** | 0.0441 | 0.1500** | 0.0679* | 0.0537 |
| Income £20k-£30k (DK omitted category) standard error | (0.0180) | (0.0324) | (0.0333) | (0.0272) | (0.0778) |
| Income £30k-£40k (DK omitted category) coefficient | 0.0879** | 0.0194 | 0.1275** | 0.0723* | 0.0885 |
| Income £30k-£40k (DK omitted category) standard error | (0.0184) | (0.0352) | (0.0297) | (0.0307) | (0.0942) |

| | | | | | |
|---|---|---|---|---|---|
| Income £40k-£50k (DK omitted category) coefficient | 0.1026** | 0.0885* | 0.0803* | 0.1165** | 0.1180 |
| Income £40k-£50k (DK omitted category) standard error | (0.0219) | (0.0380) | (0.0390) | (0.0374) | (0.1148) |
| Income £50k-£60k (DK omitted category) coefficient | 0.1179** | 0.0677* | 0.1523** | 0.1081** | 0.4057 |
| Income £50k-£60k (DK omitted category) standard error | (0.0221) | (0.0337) | (0.0411) | (0.0386) | (0.2185) |
| Income £60k-£100k (DK omitted category) coefficient | 0.1670** | 0.0667 | 0.2196** | 0.1542** | 0.2977* |
| Income £60k-£100k(DK omitted category) standard error | (0.0192) | (0.0342) | (0.0298) | (0.0360) | (0.1226) |
| Income > £100k (DK omitted category) coefficient | 0.1574** | 0.1787** | 0.1161** | 0.2028** | -0.2676* |
| Income > £100k (DK omitted category) standard error | (0.0255) | (0.0382) | (0.0401) | (0.0642) | (0.1488) |
| Property type: Bungalow (detached house omitted category) coefficient | -0.0082 | -0.0203 | -0.0210 | -0.0781* | 0.1240 |
| Property type: Bungalow (detached house omitted category) standard error | (0.0172) | (0.0431) | (0.0272) | (0.0304) | (0.0781) |
| Property type: End-terrace house (detached house omitted category) coefficient | -0.0084 | 0.1732** | 0.0344 | -0.1211** | 0.2225 |

| | | | | | |
|---|---|---|---|---|---|
| Property type: End-terrace house (detached house omitted category) standard error | (0.0256) | (0.0775) | (0.0614) | (0.0327) | (0.1236) |
| Property type: Flat (ground floor/basement) (detached house omitted category) coefficient | 0.0359 | 0.4552** | -0.4721** | -0.0684 | 0.3297 |
| Property type: Flat (ground floor/basement) (detached house omitted category) standard error | (0.0434) | (0.0938) | (0.0430) | (0.0493) | (0.2522) |
| Property type: Mid-terrace house(detached house omitted category) coefficient | -0.0199 | 0.0462 | 0.0083 | -0.0941** | -0.1848 |
| Property type: Mid-terrace house (detached house omitted category) standard error | (0.0223) | (0.0449) | (0.0720) | (0.0316) | (0.1126) |
| Property type: Semi-detached house (detached house omitted category) coefficient | 0.0124 | -0.0008 | 0.0128 | -0.0301 | 0.1430 |
| Property type: Semi-detached house (detached house omitted category) standard error | (0.0155) | (0.0292) | (0.0290) | (0.0269) | (0.0874) |
| Number of bedrooms coefficient | 0.0181* | 0.0161 | 0.0343* | -0.0261 | 0.0206 |
| Number of bedrooms standard error | (0.0107) | (0.0254) | (0.0146) | (0.0205) | (0.1241) |
| Property built before 1900 (DK omitted category) coefficient | -0.0732 | 0.0576 | -0.0887 | -0.0293 | -0.2344* |
| Property built before 1900 (DK omitted category) standard error | (0.0471) | (0.0936) | (0.0654) | (0.0812) | (0.0945) |

| | | | | | |
|---|---|---|---|---|---|
| Property built between 1900-1929 DK omitted category) coefficient | -0.0399 | 0.1246 | -0.0323 | -0.0399 | -0.3000** |
| Property built between 1900-1929 DK omitted category) standard error | (0.0486) | (0.0946) | (0.0729) | (0.0812) | (0.1084) |
| Property built between 1930-1982 DK omitted category) coefficient | -0.0541 | 0.0824 | -0.0457 | -0.0516 | -0.1819* |
| Property built between 1930-1982 DK omitted category) standard error | (0.0465) | (0.0925) | (0.0659) | (0.0787) | (0.0703) |
| Property built between 1983-2011 DK omitted category) coefficient | -0.0538 | 0.1008 | -0.0646 | -0.0630 | -0.0564 |
| Property built between 1983-2011 DK omitted category) standard error | (0.0472) | (0.0933) | (0.0664) | (0.0806) | (0.1047) |
| Property built after 2012 DK omitted category) coefficient | -0.0454 | 0.1375 | -0.0886 | -0.0146 | -0.3647** |
| Property built after 2012 DK omitted category) standard error | (0.0569) | (0.1010) | (0.0923) | (0.0970) | (0.1293) |
| Constant coefficient | 0.2060 | 1.0372** | 1.0529** | 1.1910** | 1.1885** |
| Constant standard error | (0.1061) | (0.1533) | (0.0917) | (0.1060) | (0.2955) |
| Observations | 43784 | 9633 | 16861 | 15145 | 2145 |
| R-squared | 0.211 | 0.203 | 0.217 | 0.192 | 0.251 |

Notes: This table presents the results from five multivariate regressions. All regressions are run using Linear Probability Models (i.e., OLS models with binary outcomes). The dependent variable is, in each case, whether participants chose to install a heat pump (rather than renew their existing heating system). The dependent variables are presented in the top row, and the independent variables are presented in the leftmost column. Each observation in the dataset represents a choice between participants' existing heating system or a heat pump, and each participant makes multiple choices. The upfront and/or the running costs of the heat pump are varied each time participants' make a choice, while the upfront and running costs of their existing heating system depends on the characteristics of their home and whether they are on or off the gas grid. In places where categorial variables are used, there is an indication for which variable was omitted (and should be used as the reference point). Regression coefficient estimates are displayed without brackets, and standard errors for the estimates are presented beneath each respective estimate. Standard errors are clustered on a participant level. Statistical significance is indicated by stars: * p<0.05, **p<0.01.

Table 36 shows that we find similar results to those found in Table 22 in terms of the effects of upfront costs and running costs on heat pump demand across energy demand groups when limiting the sample only to participants that expect to own their property for the next 10 years or more, suggesting that there are no significant differences in the effects of costs on heat pump demand among different participant segments.

**Table 36: Multivariate LPM robustness check (6) – only with participants with planned home ownership > 10 years**

| Independent variables | Chose heat pump (Full sample) | Chose heat pump (High energy – gas) | Chose heat pump (High energy – oil) | Chose heat pump (Low energy – gas) | Chose heat pump (Low energy – oil) |
|---|---|---|---|---|---|
| Upfront cost of heat pump coefficient | -0.0001** | -0.0001** | -0.0001** | -0.0001** | -0.0001** |
| Upfront cost of heat pump standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| Running costs of heat pump coefficient | -0.0025** | -0.0032** | -0.0018** | -0.0027** | -0.0018** |
| Running costs of heat pump standard error | (0.0001) | (0.0002) | (0.0001) | (0.0002) | (0.0005) |
| Upfront cost of current heating system coefficient | 0.0001 | - | - | - | - |
| Upfront cost of current heating system standard error | (0.0001) | - | - | - | - |
| Running cost of current heating system coefficient | 0.0031 | - | - | - | - |

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|---|---|---|---|---|---|
| Running cost of current heating system standard error | (0.0021) | - | - | - | - |
| Off the gas grid (on-gas grid omitted) coefficient | -0.0987 | - | - | - | - |
| Off the gas grid (on-gas grid omitted) standard error | (0.4209) | - | - | - | - |
| Income < £10k (DK omitted category) coefficient | 0.0561 | 0.1291 | 0.0225 | 0.0013 | 0.4433** |
| Income < £10k (DK omitted category) standard error | (0.0418) | (0.1505) | (0.0902) | (0.0467) | (0.1416) |
| Income £10k-£15k (DK omitted category) coefficient | 0.1028** | 0.1228 | 0.2011** | 0.0413 | 0.2510 |
| Income £10k-£15k (DK omitted category) standard error | (0.0299) | (0.0803) | (0.0756) | (0.0373) | (0.1561) |
| Income £15k-£20k (DK omitted category) coefficient | 0.1112** | 0.0676 | 0.1452* | 0.0914* | 0.1357 |
| Income £15k-£20k (DK omitted category) standard error | (0.0273) | (0.0605) | (0.0621) | (0.0355) | (0.1361) |
| Income £20k-£30k (DK omitted category) coefficient | 0.0824** | 0.1627** | 0.1159** | 0.0393 | 0.0634 |
| Income £20k-£30k (DK omitted category) standard error | (0.0230) | (0.0540) | (0.0449) | (0.0317) | (0.1098) |

| | | | | | |
|---|---|---|---|---|---|
| Income £30k-£40k (DK omitted category) coefficient | 0.0674** | 0.0163 | 0.0844* | 0.0764* | -0.0636 |
| Income £30k-£40k (DK omitted category) standard error | (0.0199) | (0.0375) | (0.0346) | (0.0305) | (0.1325) |
| Income £40k-£50k (DK omitted category) coefficient | 0.1040** | 0.0863** | 0.1122** | 0.0906** | 0.2022 |
| Income £40k-£50k (DK omitted category) standard error | (0.0198) | (0.0332) | (0.0391) | (0.0294) | (0.1345) |
| Income £50k-£60k (DK omitted category) coefficient | 0.1491** | 0.1392** | 0.1809** | 0.1141** | 0.1363 |
| Income £50k-£60k (DK omitted category) standard error | (0.0217) | (0.0382) | (0.0405) | (0.0343) | (0.2096) |
| Income £60k-£100k (DK omitted category) coefficient | 0.1461** | 0.1302** | 0.1960** | 0.1000** | 0.1814 |
| Income £60k-£100k (DK omitted category) standard error | (0.0162) | (0.0256) | (0.0287) | (0.0280) | (0.1670) |
| Income > £100k (DK omitted category) coefficient | 0.1557** | 0.1603** | 0.1567** | 0.1947** | -0.0429 |
| Income > £100k (DK omitted category) standard error | (0.0193) | (0.0289) | (0.0316) | (0.0436) | (0.1707) |
| Property type: Bungalow (detached house omitted category) coefficient | -0.0308 | -0.0756 | -0.0324 | -0.0611 | 0.0219 |

| | | | | | |
|---|---|---|---|---|---|
| Property type: Bungalow (detached house omitted category) standard error | (0.0193) | (0.0427) | (0.0320) | (0.0339) | (0.1077) |
| Property type: End-terrace house (detached house omitted category) coefficient | -0.0240 | 0.0950 | -0.0837 | -0.0742* | 0.0559 |
| Property type: End-terrace house (detached house omitted category) standard error | (0.0254) | (0.0651) | (0.0731) | (0.0340) | (0.1657) |
| Property type: Flat (ground floor/basement) (detached house omitted category) coefficient | 0.0303 | -0.4261** | 0.0000 | -0.0319 | 0.4133 |
| Property type: Flat (ground floor/basement) (detached house omitted category) standard error | (0.0456) | (0.0382) | (.) | (0.0535) | (0.2255) |
| Property type: Mid-terrace house (detached house omitted category) coefficient | -0.0003 | -0.0017 | 0.1025 | -0.0347 | -0.1242 |
| Property type: Mid-terrace house (detached house omitted category) standard error | (0.0208) | (0.0385) | (0.0612) | (0.0320) | (0.1511) |
| Property type: Semi-detached house (detached house omitted category) coefficient | 0.0167 | -0.0048 | 0.0262 | 0.0071 | 0.0888 |
| Property type: Semi-detached house (detached house omitted category) standard error | (0.0144) | (0.0234) | (0.0271) | (0.0271) | (0.1160) |
| Number of bedrooms coefficient | 0.0066 | 0.0456 | 0.0201 | -0.0302 | -0.0870 |
| Number of bedrooms standard error | (0.0108) | (0.0238) | (0.0155) | (0.0211) | (0.0916) |

| | | | | | |
|---|---|---|---|---|---|
| Property built before 1900 (DK omitted category) coefficient | -0.0514 | 0.0267 | -0.0013 | -0.0588 | 0.0000 |
| Property built before 1900 (DK omitted category) standard error | (0.0531) | (0.1187) | (0.0926) | (0.0754) | - |
| Property built between 1900-1929 (DK omitted category) coefficient | 0.0011 | 0.0582 | 0.0997 | -0.0452 | 0.0604 |
| Property built between 1900-1929 (DK omitted category) standard error | (0.0540) | (0.1198) | (0.0975) | (0.0748) | (0.1382) |
| Property built between 1930-1982 (DK omitted category) coefficient | -0.0188 | 0.0383 | 0.0776 | -0.0673 | 0.0036 |
| Property built between 1930-1982 (DK omitted category)standard error | (0.0520) | (0.1175) | (0.0924) | (0.0716) | (0.0913) |
| Property built between 1983-2011 (DK omitted category) coefficient | -0.0222 | 0.0510 | 0.0236 | -0.0536 | -0.0221 |
| Property built between 1983-2011 (DK omitted category) standard error | (0.0529) | (0.1179) | (0.0932) | (0.0738) | (0.1216) |
| Property built after 2012 (DK omitted category) coefficient | -0.0114 | 0.0392 | 0.0641 | -0.0195 | -0.1083 |
| Property built after 2012 (DK omitted category) standard error | (0.0588) | (0.1219) | (0.1090) | (0.0908) | (0.1462) |
| Constant coefficient | 0.1729 | 1.1014** | 1.1061** | 1.4038** | 1.2748** |

| | | | | | |
|---|---|---|---|---|---|
| Constant standard error | (0.1037) | (0.1650) | (0.1197) | (0.1030) | (0.2382) |
| Observations | 40079 | 10101 | 14534 | 14027 | 1417 |
| R-squared | 0.251 | 0.242 | 0.257 | 0.248 | 0.239 |

Notes: This table presents the results from five multivariate regressions. All regressions are run using Linear Probability Models (i.e., OLS models with binary outcomes). The dependent variable is, in each case, whether participants chose to install a heat pump (rather than renew their existing heating system). The dependent variables are presented in the top row, and the independent variables are presented in the leftmost column. Each observation in the dataset represents a choice between participants' existing heating system or a heat pump, and each participant makes multiple choices. The upfront and/or the running costs of the heat pump are varied each time participants' make a choice, while the upfront and running costs of their existing heating system depends on the characteristics of their home and whether they are on or off the gas grid. In places where categorial variables are used, there is an indication for which variable was omitted (and should be used as the reference point). Regression coefficient estimates are displayed without brackets, and standard errors for the estimates are presented beneath each respective estimate. Standard errors are clustered on a participant level. Statistical significance is indicated by stars: * p<0.05, **p<0.01.

Table 37 and Table 38 present the main multivariate regression results reweighted by 1) the UK-wide distribution of on and off gas grid households and 2) the regional split of UK households. The specification used is the same as in Table 22. We find similar results in terms of the effect of upfront costs and running costs on heat pump demand compared to those found in Table 22, which suggest that results are robust.

**Table 37: Reweighted LPM regressions (1) – matching population-level on/off gas grid distribution**

| Independent variables | Chose heat pump (Full sample) | Chose heat pump (High energy- gas) | Chose heat pump (High energy – oil) | Chose heat pump (Low energy – gas) | Chose heat pump (Low energy – oil) |
|---|---|---|---|---|---|
| Upfront cost of heat pump coefficient | -0.0001** | -0.0001** | -0.0001** | -0.0001** | -0.0001** |
| Upfront cost of heat pump standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| Running costs of heat pump coefficient | -0.0026** | -0.0030** | -0.0018** | -0.0026** | -0.0015** |
| Running costs of heat pump standard error | (0.0001) | (0.0001) | (0.0001) | (0.0001) | (0.0004) |
| Upfront cost of current heating system coefficient | 0.0001 | - | - | - | - |

| | | | | | |
|---|---|---|---|---|---|
| Upfront cost of current heating system  standard error | (0.0001) | - | - | - | - |
| Running cost of current heating system coefficient | 0.0037* | - | - | - | - |
| Running cost of current heating system standard error | (0.0015) | - | - | - | - |
| Off the gas grid (on-gas grid omitted) coefficient | -0.0436 | - | - | - | - |
| Off the gas grid (on-gas grid omitted) standard error | (0.2955) | - | - | - | - |
| Income < £10k (DK omitted category) coefficient | 0.0337 | 0.0530 | 0.0458 | 0.0248 | 0.3748** |
| Income < £10k (DK omitted category) standard error | (0.0285) | (0.0815) | (0.0611) | (0.0346) | (0.1101) |
| Income £10k-£15k (DK omitted category)coefficient | 0.0296 | 0.0173 | 0.1434** | 0.0211 | -0.0262 |
| Income £10k-£15k (DK omitted category) standard error | (0.0210) | (0.0431) | (0.0483) | (0.0274) | (0.1050) |
| Income £15k-£20k (DK omitted category) coefficient | 0.0562** | -0.0238 | 0.1011* | 0.0659* | 0.0848 |
| Income £15k-£20k (DK omitted category) standard error | (0.0205) | (0.0456) | (0.0429) | (0.0265) | (0.0908) |
| Income £20k-£30k (DK omitted category) coefficient | 0.0491** | 0.0428 | 0.1256** | 0.0408 | 0.0181 |

| | | | | | |
|---|---|---|---|---|---|
| Income £20k-£30k (DK omitted category) standard error | (0.0157) | (0.0302) | (0.0298) | (0.0219) | (0.0705) |
| Income £30k-£40k (DK omitted category) coefficient | 0.0575** | -0.0158 | 0.0913** | 0.0774** | 0.0425 |
| Income £30k-£40k (DK omitted category) standard error | (0.0147) | (0.0283) | (0.0256) | (0.0213) | (0.0852) |
| Income £40k-£50k (DK omitted category) coefficient | 0.0943** | 0.0623* | 0.0938** | 0.1058** | 0.1308 |
| Income £40k-£50k (DK omitted category) standard error | (0.0151) | (0.0286) | (0.0290) | (0.0212) | (0.0983) |
| Income £50k-£60k (DK omitted category) coefficient | 0.1078** | 0.0884** | 0.1687** | 0.1008** | 0.1938 |
| Income £50k-£60k (DK omitted category) standard error | (0.0148) | (0.0261) | (0.0278) | (0.0218) | (0.1390) |
| Income £60k-£100k (DK omitted category) coefficient | 0.1221** | 0.0983** | 0.1896** | 0.1126** | 0.1711* |
| Income £60k-£100k (DK omitted category) standard error | (0.0118) | (0.0203) | (0.0210) | (0.0183) | (0.0847) |
| Income > £100k (DK omitted category) coefficient | 0.1533** | 0.1179** | 0.1397** | 0.2109** | -0.1030 |
| Income > £100k (DK omitted category) standard error | (0.0141) | (0.0213) | (0.0236) | (0.0277) | (0.1654) |

| | | | | | |
|---|---|---|---|---|---|
| Property type: Bungalow (detached house omitted category) coefficient | -0.0273 | -0.0547 | -0.0212 | -0.0643** | 0.1020 |
| Property type: Bungalow (detached house omitted category) standard error | (0.0145) | (0.0338) | (0.0225) | (0.0237) | (0.0715) |
| Property type: End-terrace house (detached house omitted category) coefficient | -0.0030 | 0.0996* | 0.0015 | -0.0528* | 0.1176 |
| Property type: End-terrace house (detached house omitted category) standard error | (0.0174) | (0.0422) | (0.0462) | (0.0232) | (0.1082) |
| Property type Flat (ground floor/basement) (detached house omitted category) coefficient | 0.0219 | -0.0412 | -0.5210** | -0.0275 | 0.5183*** |
| Property type: Flat (ground floor/basement) (detached house omitted category) standard error | (0.0285) | (0.2620) | (0.0286) | (0.0330) | (0.1671) |
| Property type: Mid-terrace house (detached house omitted category) coefficient | 0.0113 | 0.0377 | 0.0540 | -0.0282 | -0.0373 |
| Property type: Mid-terrace house (detached house omitted category) standard error | (0.0143) | (0.0276) | (0.0433) | (0.0209) | (0.1148) |
| Property type: Semi-detached (detached house omitted category) house coefficient | 0.0112 | 0.0067 | 0.0111 | -0.0116 | 0.1534* |
| Property type: Semi-detached house standard error | (0.0105) | (0.0172) | (0.0196) | (0.0182) | (0.0727) |
| Number of bedrooms coefficient | 0.0043 | 0.0255 | 0.0197* | -0.0152 | 0.0258 |

| | | | | | |
|---|---|---|---|---|---|
| Number of bedrooms standard error | (0.0078) | (0.0174) | (0.0109) | (0.0133) | (0.0910) |
| Property built before 1900 (DK omitted category) coefficient | -0.0771* | -0.0301 | -0.0685 | -0.0723 | -0.1995** |
| Property built before 1900 (DK omitted category) standard error | (0.0367) | (0.0879) | (0.0487) | (0.0522) | (0.0750) |
| Property built between 1900-1929 (DK omitted category)  coefficient | -0.0592 | 0.0068 | -0.0191 | -0.0857* | -0.2061* |
| Property built between 1900-1929 (DK omitted category)  standard error | (0.0372) | (0.0880) | (0.0539) | (0.0516) | (0.0875) |
| Property built between 1930-1982 (DK omitted category)  coefficient | -0.0674* | -0.0172 | -0.0106 | -0.0866* | -0.1351* |
| Property built between 1930-1982 (DK omitted category)  standard error | (0.0360) | (0.0863) | (0.0489) | (0.0501) | (0.0627) |
| Property built between 1983-2011(DK omitted category)   coefficient | -0.0540 | -0.0122 | -0.0242 | -0.0687 | -0.0630 |
| Property built between 1983-2011 (DK omitted category)  standard error | (0.0364) | (0.0866) | (0.0494) | (0.0511) | (0.1010) |
| Property built after 2012 (DK omitted category) coefficient | -0.0562 | -0.0202 | -0.0522 | -0.0500 | -0.3450** |
| Property built after 2012 (DK omitted category) standard error | (0.0403) | (0.0897) | (0.0640) | (0.0583) | (0.1209) |

| | | | | | |
|---|---|---|---|---|---|
| Constant coefficient | 0.2580** | 1.2473** | 1.1793** | 1.4025** | 1.1426** |
| Constant standard error | (0.0740) | (0.1207) | (0.0704) | (0.0686) | (0.2328) |
| Observations | 79118 | 18889 | 27131 | 30264 | 2834 |
| R-squared | 0.246 | 0.240 | 0.253 | 0.262 | 0.232 |

Notes: This table presents the results from five multivariate regressions. All regressions are run using Linear Probability Models (i.e., OLS models with binary outcomes). The dependent variable is, in each case, whether participants chose to install a heat pump (rather than renew their existing heating system). The dependent variables are presented in the top row, and the independent variables are presented in the leftmost column. Each observation in the dataset represents a choice between participants' existing heating system or a heat pump, and each participant makes multiple choices. The upfront and/or the running costs of the heat pump are varied each time participants' make a choice, while the upfront and running costs of their existing heating system depends on the characteristics of their home and whether they are on or off the gas grid. In places where categorial variables are used, there is an indication for which variable was omitted (and should be used as the reference point). Regression coefficient estimates are displayed without brackets, and standard errors for the estimates are presented beneath each respective estimate. Standard errors are clustered on a participant level. Statistical significance is indicated by stars: * p<0.05, **p<0.01.

**Table 38: Reweighted LPM regressions (2) – matching the population by region**

| Independent variables | Chose heat pump (Full sample) | Chose heat pump (High energy – gas) | Chose heat pump (High energy – oil) | Chose heat pump (Low energy – gas) | Chose heat pump (Low energy – oil) |
|---|---|---|---|---|---|
| Upfront cost of heat pump coefficient | -0.0001** | -0.0001** | -0.0001** | -0.0001** | -0.0001** |
| Upfront cost of heat pump standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| Running costs of heat pump coefficient | -0.0024** | -0.0031** | -0.0018** | -0.0026** | -0.0014** |
| Running costs of heat pump standard error | (0.0001) | (0.0002) | (0.0001) | (0.0001) | (0.0004) |
| Upfront cost of current heating system coefficient | 0.0000 | - | - | - | - |
| Upfront cost of current heating system standard error | (0.0001) | - | - | - | - |

| | | | | | |
|---|---|---|---|---|---|
| Running cost of current heating system coefficient | 0.0044** | - | - | - | - |
| Running cost of current heating system standard error | (0.0015) | - | - | - | - |
| Off the gas grid (on-gas grid omitted) coefficient | 0.1287 | - | - | - | - |
| Off the gas grid (on-gas grid omitted) standard error | (0.3063) | - | - | - | - |
| Income < £10k (DK omitted category) coefficient | 0.0481 | 0.0273 | 0.0538 | 0.0395 | 0.3803** |
| Income < £10k (DK omitted category) standard error | (0.0284) | (0.0888) | (0.0625) | (0.0337) | (0.0999) |
| Income £10k-£15k (DK omitted category) coefficient | 0.0456* | 0.0324 | 0.1467** | 0.0240 | -0.0473 |
| Income £10k-£15k (DK omitted category) standard error | (0.0216) | (0.0505) | (0.0464) | (0.0283) | (0.1015) |
| Income £15k-£20k (DK omitted category) coefficient | 0.0658** | -0.0156 | 0.1031* | 0.0637* | 0.0722 |
| Income £15k-£20k (DK omitted category) standard error | (0.0208) | (0.0524) | (0.0436) | (0.0283) | (0.0939) |
| (DK omitted category) | 0.0611** | 0.0329 | 0.1229** | 0.0519* | -0.0022 |
| Income £20k-£30k (DK omitted category) standard error | (0.0165) | (0.0317) | (0.0303) | (0.0249) | (0.0711) |

| | | | | | |
|---|---|---|---|---|---|
| Income £30k-£40k (DK omitted category) coefficient | 0.0596** | -0.0323 | 0.0909** | 0.0783** | 0.0157 |
| Income £30k-£40k (DK omitted category) standard error | (0.0151) | (0.0308) | (0.0265) | (0.0230) | (0.0905) |
| Income £40k-£50k (DK omitted category) coefficient | 0.0996** | 0.0572 | 0.0832** | 0.1189** | 0.1304 |
| Income £40k-£50k (DK omitted category) standard error | (0.0157) | (0.0319) | (0.0299) | (0.0227) | (0.1034) |
| Income £50k-£60k (DK omitted category) coefficient | 0.1155** | 0.0932** | 0.1541** | 0.1066** | 0.1846 |
| Income £50k-£60k (DK omitted category) standard error | (0.0155) | (0.0303) | (0.0284) | (0.0235) | (0.1513) |
| Income £60k-£100k (DK omitted category) coefficient | 0.1347** | 0.0981** | 0.1854** | 0.1193** | 0.1705 |
| Income £60k-£100k (DK omitted category) standard error | (0.0124) | (0.0235) | (0.0215) | (0.0201) | (0.0881) |
| Income > £100k (DK omitted category) coefficient | 0.1606** | 0.1313** | 0.1351** | 0.2210** | -0.0723 |
| Income > £100k (DK omitted category) standard error | (0.0152) | (0.0262) | (0.0241) | (0.0316) | (0.1828) |
| Property type: Bungalow (detached house omitted category) coefficient | -0.0178 | -0.0542 | -0.0235 | -0.0662** | 0.0959 |

| | | | | | |
|---|---|---|---|---|---|
| Property type: Bungalow (detached house omitted category standard error | (0.0144) | (0.0340) | (0.0232) | (0.0248) | (0.0709) |
| Property type: End-terrace house (detached house omitted category) coefficient | 0.0144 | 0.0839 | 0.0087 | -0.0341 | 0.1586 |
| Property type: End-terrace house (detached house omitted category) standard error | (0.0192) | (0.0542) | (0.0459) | (0.0242) | (0.1092) |
| Property type: Flat (ground floor/basement) (detached house omitted category) coefficient | 0.0812* | 0.1502 | -0.5135** | 0.0244 | 0.5482** |
| Property type: Flat (ground floor/basement) (detached house omitted category) standard error | (0.0316) | (0.2084) | (0.0294) | (0.0359) | (0.1782) |
| Property type: Mid-terrace house (detached house omitted category) coefficient | 0.0319* | 0.0389 | 0.0421 | -0.0078 | -0.0373 |
| Property type: Mid-terrace house (detached house omitted category) standard error | (0.0157) | (0.0328) | (0.0429) | (0.0228) | (0.1149) |
| Property type: Semi-detached house (detached house omitted category) coefficient | 0.0226* | 0.0146 | 0.0085 | -0.0017 | 0.1521** |
| Property type: Semi-detached house (detached house omitted category)standard error | (0.0111) | (0.0205) | (0.0206) | (0.0193) | (0.0738) |
| Number of bedrooms coefficient | 0.0112 | 0.0344 | 0.0163 | -0.0111 | 0.0652 |
| Number of bedrooms standard error | (0.0079) | (0.0207) | (0.0111) | (0.0142) | (0.0996) |

| | | | | | |
|---|---|---|---|---|---|
| Property built before 1900 (DK omitted category) coefficient | -0.1042* | -0.0142 | -0.0650 | -0.1146 | -0.1804* |
| Property built before 1900 (DK omitted category) standard error | (0.0405) | (0.0712) | (0.0480) | (0.0666) | (0.0778) |
| Property built between 1900-1929 (DK omitted category) coefficient | -0.0756 | 0.0128 | -0.0091 | -0.1206 | -0.2124* |
| Property built between 1900-1929 (DK omitted category) standard error | (0.0414) | (0.0716) | (0.0535) | (0.0663) | (0.0915) |
| Property built between 1930-1982 (DK omitted category) coefficient | -0.0811* | -0.0238 | -0.0085 | -0.1126* | -0.1201 |
| Property built between 1930-1982 (DK omitted category) standard error | (0.0402) | (0.0680) | (0.0480) | (0.0653) | (0.0672) |
| Property built between 1983-2011 (DK omitted category) coefficient | -0.0692 | -0.0126 | -0.0199 | -0.0960 | -0.0338 |
| Property built between 1983-2011 (DK omitted category) standard error | (0.0404) | (0.0685) | (0.0486) | (0.0660) | (0.1025) |
| Property built after 2012 (DK omitted category) coefficient | -0.0767 | -0.0142 | -0.0534 | -0.0803 | -0.3166* |
| Property built after 2012 (DK omitted category) standard error | (0.0441) | (0.0725) | (0.0658) | (0.0717) | (0.1247) |
| Constant coefficient | 0.1988* | 1.2163** | 1.1961** | 1.4077** | 1.0510** |

| | | | | | |
|---|---|---|---|---|---|
| Constant standard error | (0.0833) | (0.1222) | (0.0707) | (0.0804) | (0.2435) |
| Observations | 79118 | 18889 | 27131 | 30264 | 2834 |
| R-squared | 0.252 | 0.243 | 0.253 | 0.268 | 0.226 |

Notes: This table presents the results from five multivariate regressions. All regressions are run using Linear Probability Models (i.e., OLS models with binary outcomes). The dependent variable is, in each case, whether participants chose to install a heat pump (rather than renew their existing heating system). The dependent variables are presented in the top row, and the independent variables are presented in the leftmost column. Each observation in the dataset represents a choice between participants' existing heating system or a heat pump, and each participant makes multiple choices. The upfront and/or the running costs of the heat pump are varied each time participants' make a choice, while the upfront and running costs of their existing heating system depends on the characteristics of their home and whether they are on or off the gas grid. In places where categorial variables are used, there is an indication for which variable was omitted (and should be used as the reference point). Regression coefficient estimates are displayed without brackets, and standard errors for the estimates are presented beneath each respective estimate. Standard errors are clustered on a participant level. Statistical significance is indicated by stars: *p<0.05, **p<0.01

Table 39 presents the same specification as Table 3 in the main report, but is included here to facilitate comparison between analyses. This model includes interactive effects between upfront and running costs, which helps us estimate how the levels of one costs influences the effects of the other cost on demand. Moreover, the model includes a series of independent variables (e.g., the income of participants), and exponential terms (which allow us to capture a non-linear relationship between costs and demand).

The analyses presented in Table 40 are the same as those in Table 39, but the regressions are conducted using Logit. Table 41 runs the same model as Table 39 but with the samples reweighted to account for the size of properties within each of the four demand groups in the actual population. Similarly, Table 42 contains the same analyses reweighted to account for discrepancies in the geographical distribution of households across different energy demand groups. Table 43 contains the same analyses as those in Table 39, but reweighted to account for discrepancies in the on gas grid and off gas grid distribution (this discrepancy was achieved voluntarily to ensure statistical power in off gas grid estimates). The analyses in Table 44 are the same as those in Table 39, but those who were not confident when choosing a heat pump in the DCE were coded as not choosing a heat pump for that given choice. Table 45 contains the same analyses reweighted to account for discrepancies in the sample distribution batch (the size of the distribution batch two was reduced due to higher than expected response rates). Table 46 is the same as Table 39, but with income quintiles replacing income brackets. Table 47 is the same as Table 46, but run using Logit. Overall, we find similar results to those found in the main specification (i.e., Table 39), which confirm the robustness of the model.

**Table 39: Main specification (LPM)**

| Independent variable coefficient / SE | Chose heat pump - full sample | Chose heat pump - high demand: gas | Chose heat pump - high demand: oil | Chose heat pump - low demand: gas | Chose heat pump - low demand: oil |
|---|---|---|---|---|---|
| Upfront cost of heat pump coefficient | -0.0003** | -0.0005** | 0.0002** | -0.0006** | 0.0005** |
| Upfront cost of heat pump standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0001) |
| Running costs of heat pump coefficient | -0.0293* | 0.1060 | 0.1340 | 0.0572 | -0.1384 |
| Running costs of heat pump standard error | (0.0127) | (0.1220) | (0.1120) | (0.1533) | (0.4934) |
| Upfront cost of heat pump squared coefficient | 0.0000** | 0.0000** | -0.0000** | 0.0000** | -0.0000** |
| Upfront cost of heat pump squared standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| Running costs of heat pump squared coefficient | 0.0001* | -0.0005 | -0.0006 | -0.0003 | 0.0008 |
| Running costs of heat pump squared standard error | (0.0001) | (0.0006) | (0.0005) | (0.0008) | (0.0027) |
| Upfront cost of heat pump cubed coefficient | -0.0000** | -0.0000** | 0.0000** | -0.0000** | 0.0000** |
| Upfront cost of heat pump cubed standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |

| | | | | | |
|---|---|---|---|---|---|
| Running costs of heat pump cubed coefficient | -0.0000* | 0.0000 | 0.0000 | 0.0000 | -0.0000 |
| Running costs of heat pump cubed standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| Running x upfront interaction coefficient | -0.0000 | 0.0000** | -0.0000 | 0.0000** | -0.0000** |
| Running x upfront interaction standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| Status quo upfront cost coefficient | 0.0001 | - | - | - | - |
| Status quo upfront cost standard error | (0.0001) | - | - | - | - |
| Status quo running cost coefficient | 0.0030* | - | - | - | - |
| Status quo running cost standard error | (0.0014) | - | - | - | - |
| On gas grid (off gas grid omitted) coefficient | 0.0448 | - | - | - | - |
| On gas grid (off gas grid omitted ) standard error | (0.2906) | - | - | - | - |
| Income £10k-14.9k (£0-10k omitted) coefficient | 0.0033 | -0.0333 | 0.0961 | -0.0037 | -0.3880** |
| Income £10k-14.9k (£0-10k omitted) standard error | (0.0337) | (0.0898) | (0.0750) | (0.0403) | (0.1293) |
| Income £15k-19.9k (£0-10k omitted) coefficient | 0.0239 | -0.0746 | 0.0535 | 0.0390 | -0.2774** |

| | | | | | |
|---|---|---|---|---|---|
| Income £15k-19.9k (£0-10k omitted) standard error | (0.0330) | (0.0904) | (0.0713) | (0.0397) | (0.1236) |
| Income £20k-29.9k (£0-10k omitted) coefficient | 0.0178 | -0.0085 | 0.0789 | 0.0151 | -0.3422*** |
| Income £20k-29.9k (£0-10k omitted) standard error | (0.0303) | (0.0839) | (0.0644) | (0.0366) | (0.1170) |
| Income £30k-39.9k (£0-10k omitted) coefficient | 0.0211 | -0.0644 | 0.0482 | 0.0508 | -0.3225** |
| Income £30k-39.9k (£0-10k omitted) standard error | (0.0299) | (0.0833) | (0.0628) | (0.0363) | (0.1217) |
| Income £40k-49.9k (£0-10k omitted) coefficient | 0.0534 | 0.0136 | 0.0511 | 0.0784* | -0.2317 |
| Income £40k-49.9k (£0-10k omitted) standard error | (0.0302) | (0.0835) | (0.0641) | (0.0364) | (0.1342) |
| Income £50k-59.9k (£0-10k omitted) coefficient | 0.0773* | 0.0404 | 0.1265* | 0.0732* | -0.1660 |
| Income £50k-59.9k (£0-10k omitted) standard error | (0.0300) | (0.0827) | (0.0636) | (0.0366) | (0.1652) |
| Income £60k-99.9k (£0-10k omitted) coefficient | 0.0952** | 0.0492 | 0.1491* | 0.0848* | -0.1900 |
| Income £60k-99.9k (£0-10k omitted) standard error | (0.0289) | (0.0810) | (0.0610) | (0.0347) | (0.1301) |

| | | | | | |
|---|---|---|---|---|---|
| Income £100k+ (£0-10k omitted) coefficient | 0.1051** | 0.0733 | 0.1050 | 0.1830** | -0.4604* |
| Income £100k+(£0-10k omitted) standard error | (0.0299) | (0.0813) | (0.0620) | (0.0403) | (0.1880) |
| Income: don't know (£0-10k omitted) coefficient | -0.0452 | -0.0474 | -0.0422 | -0.0272 | -0.3614** |
| Income: don't know (£0-10k omitted) standard error | (0.0288) | (0.0808) | (0.0609) | (0.0347) | (0.1153) |
| Property type: bungalow (detached house omitted ) coefficient | -0.0212 | -0.0582 | -0.0305 | -0.0574* | 0.1032 |
| Property type: bungalow (detached house omitted ) standard error | (0.0136) | (0.0337) | (0.0219) | (0.0228) | (0.0718) |
| Property type: End-terrace house (detached house omitted ) coefficient | 0.0020 | 0.0974* | -0.0081 | -0.0495* | 0.1172 |
| Property type: End-terrace house (detached house omitted ) standard error | (0.0170) | (0.0425) | (0.0454) | (0.0229) | (0.1073) |
| Property type: Flat (ground floor/basement) (detached house omitted) coefficient | 0.0237 | -0.0370 | -0.5478** | -0.0114 | 0.4968** |
| Property type: Flat (ground floor/basement) (detached house omitted) standard error | (0.0275) | (0.2569) | (0.0266) | (0.0303) | (0.1414) |

| | | | | | |
|---|---|---|---|---|---|
| Property type: Mid-terrace house (detached house omitted) coefficient | 0.0167 | 0.0332 | 0.0408 | -0.0243 | -0.0392 |
| Property type: Mid-terrace house (detached house omitted) standard error | (0.0139) | (0.0275) | (0.0426) | (0.0207) | (0.1134) |
| Property type: Semi-detached house (detached house omitted) coefficient | 0.0141 | 0.0047 | 0.0024 | -0.0099 | 0.1529* |
| Property type: Semi-detached house (detached house omitted) standard error | (0.0101) | (0.0172) | (0.0190) | (0.0181) | (0.0726) |
| Built 1900-1929 (pre 1900 omitted) coefficient | 0.0294* | 0.0361 | 0.0474 | -0.0151 | -0.0040 |
| Built 1900-1929 (pre 1900 omitted) standard error | (0.0148) | (0.0286) | (0.0295) | (0.0236) | (0.0844) |
| Built 1930-1982 (pre 1900 omitted) coefficient | 0.0267* | 0.0072 | 0.0555*** | -0.0171 | 0.0649 |
| Built 1930-1982 (pre 1900 omitted) standard error | (0.0115) | (0.0246) | (0.0186) | (0.0202) | (0.0622) |
| Built 1983-2011 (pre 1900 omitted) coefficient | 0.0363** | 0.0125 | 0.0439* | 0.0023 | 0.1385 |
| Built 1983-2011 (pre 1900 omitted) standard error | (0.0125) | (0.0257) | (0.0190) | (0.0226) | (0.0899) |
| Built 2012 onwards (pre 1900 omitted) coefficient | 0.0251 | 0.0024 | 0.0150 | 0.0215 | -0.1444 |

| | | | | | |
|---|---|---|---|---|---|
| Built 2012 onwards (pre 1900 omitted) standard error | (0.0211) | (0.0343) | (0.0447) | (0.0359) | (0.1104) |
| Built: don't know (pre 1900 omitted) coefficient | 0.0818* | 0.0221 | 0.0676 | 0.0711 | 0.2021*** |
| Built: don't know (pre 1900 omitted) standard error | (0.0324) | (0.0872) | (0.0492) | (0.0525) | (0.0731) |
| Constant coefficient | 2.5777** | -5.2936 | -9.1184 | -1.0776 | 8.6200 |
| Constant standard error | (0.8975) | (8.8228) | (8.0601) | (9.3282) | (29.8429) |
| Observations | 79118 | 18889 | 27131 | 30264 | 2834 |
| R-squared | 0.278 | 0.309 | 0.265 | 0.295 | 0.237 |
| | | | | | |

Notes: This table presents the results from five multivariate regressions. All regressions are run using Linear Probability Models (i.e., OLS models with binary outcomes). The dependent variable is, in each case, whether participants chose to install a heat pump (rather than renew their existing heating system). The dependent variables are presented in the top row, and the independent variables are presented in the leftmost column. The first regression (column 1) is conducted using the full study sample. The following four regressions (columns 2-5) are conducted on subsets of the sample: A) those with high energy consumption homes who are on the gas grid, B) those with high energy consumption homes who are off the gas grid, C) those with low energy consumption homes who are on the gas grid, and D) those with low energy consumption homes who are off the gas grid. The regressions presented in columns 2-5 lack coefficients for the upfront and running costs of their existing heating systems as the participants placed in each regression all, by construction, have the same costs. Regression coefficient estimates are displayed without brackets, and standard errors for the estimates are presented beneath each respective estimate. Standard errors are clustered on a participant level. Statistical significance is indicated by stars: * p<0.05, **p<0.01.

**Table 40: Main specification (Logit)**

| Independent variable coefficient / SE | Chose heat pump (Full sample) | Chose heat pump (High demand: gas) | Chose heat pump (High demand: oil) | Chose heat pump (Low demand: gas) | Chose heat pump (Low demand: oil) |
|---|---|---|---|---|---|
| Upfront cost of heat pump coefficient | -0.0011** | -0.0017** | 0.0010** | -0.0014** | 0.0021** |
| Upfront cost of heat pump standard error | (0.0001) | (0.0002) | (0.0001) | (0.0002) | (0.0006) |
| Running costs of heat pump coefficient | -0.1583* | 0.7803 | 0.8639 | 0.3852 | -0.3697 |
| Running costs of heat pump standard error | (0.0737) | (0.8223) | (0.6137) | (1.0120) | (2.6547) |
| Upfront cost of heat pump squared coefficient | 0.0000** | 0.0000** | -0.0000** | 0.0000** | -0.0000** |
| Upfront cost of heat pump squared standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| Running costs of heat pump squared coefficient | 0.0007 | -0.0036 | -0.0040 | -0.0022 | 0.0020 |
| Running costs of heat pump squared standard error | (0.0004) | (0.0038) | (0.0028) | (0.0055) | (0.0146) |

| | | | | | |
|---|---|---|---|---|---|
| Upfront cost of heat pump cubed coefficient | -0.0000** | -0.0000** | 0.0000** | -0.0000 | 0.0000* |
| Upfront cost of heat pump cubed standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| Running costs of heat pump cubed coefficient | -0.0000 | 0.0000 | 0.0000 | 0.0000 | -0.0000 |
| Running costs of heat pump cubed standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| Running x upfront interaction coefficient | 0.0000* | 0.0000 | -0.0000** | -0.0000 | -0.0000** |
| Running x upfront interaction standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| Status quo upfront cost coefficient | 0.0004 | - | - | - | - |
| Status quo upfront cost standard error | (0.0005) | - | - | - | - |
| Status quo running cost coefficient | 0.0153* | - | - | - | - |
| Status quo running cost standard error | (0.0083) | - | - | - | - |
| On gas grid (off gas grid omitted) coefficient | 0.3285 | - | - | - | - |

| | | | | | |
|---|---|---|---|---|---|
| On gas grid (off gas grid omitted) standard error | (1.6569) | - | - | - | - |
| Income £10k-14.9k (£0-10k omitted) coefficient | 0.0279 | -0.2269 | 0.5216 | -0.0248 | -2.3344** |
| Income £10k-14.9k (£0-10k omitted) standard error | (0.2067) | (0.6375) | (0.4091) | (0.2758) | (0.8905) |
| Income £15k-19.9k (£0-10k omitted) coefficient | 0.1503 | -0.5261 | 0.2915 | 0.2590 | -1.7499* |
| Income £15k-19.9k (£0-10k omitted) standard error | (0.2013) | (0.6526) | (0.3869) | (0.2672) | (0.8599) |
| Income £20k-29.9k (£0-10k omitted) coefficient | 0.1130 | -0.0575 | 0.4282 | 0.1050 | -2.0759* |
| Income £20k-29.9k (£0-10k omitted) standard error | (0.1864) | (0.5982) | (0.3504) | (0.2493) | (0.8350) |
| Income £30k-39.9k (£0-10k omitted) coefficient | 0.1330 | -0.4577 | 0.2622 | 0.3353 | -1.9826* |
| Income £30k-39.9k (£0-10k omitted) standard error | (0.1839) | (0.5984) | (0.3416) | (0.2457) | (0.8468) |
| Income £40k-49.9k (£0-10k omitted) coefficient | 0.3222 | 0.0904 | 0.2772 | 0.5085* | -1.5063 |
| Income £40k-49.9k (£0-10k omitted) standard error | (0.1851) | (0.5947) | (0.3489) | (0.2453) | (0.9057) |

| | | | | | |
|---|---|---|---|---|---|
| Income £50k-59.9k (£0-10k omitted) coefficient | 0.4616* | 0.2652 | 0.6894* | 0.4727 | -1.1351 |
| Income £50k-59.9k (£0-10k omitted) standard error | (0.1838) | (0.5884) | (0.3478) | (0.2463) | (1.0539) |
| Income £60k-99.9k (£0-10k omitted) coefficient | 0.5641** | 0.3182 | 0.8159* | 0.5475* | -1.2823 |
| Income £60k-99.9k (£0-10k omitted) standard error | (0.1775) | (0.5787) | (0.3334) | (0.2358) | (0.8886) |
| Income £100k+ coefficient | 0.6209** | 0.4722 | 0.5707 | 1.1317** | -2.7480* |
| Income £100k+ (£0-10k omitted) standard error | (0.1834) | (0.5804) | (0.3379) | (0.2637) | (1.2232) |
| Income: don't know (£0-10k omitted) coefficient | -0.2717 | -0.3343 | -0.2241 | -0.1833 | -2.1847** |
| Income: don't know (£0-10k omitted) standard error | (0.1784) | (0.5792) | (0.3315) | (0.2393) | (0.8259) |
| Property type: bungalow (detached house omitted) coefficient | -0.1232 | -0.4119 | -0.1667 | -0.3748* | 0.5507 |
| Property type: bungalow (detached house omitted) standard error | (0.0806) | (0.2456) | (0.1195) | (0.1498) | (0.3865) |

| | | | | | |
|---|---|---|---|---|---|
| Property type: End-terrace house (detached house omitted) coefficient | 0.0104 | 0.6324* | -0.0493 | -0.3262* | 0.6182 |
| Property type: End-terrace house (detached house omitted) standard error | (0.1028) | (0.2625) | (0.2510) | (0.1499) | (0.5593) |
| Property type: Flat (ground floor/basement) (detached house omitted) coefficient | 0.1441 | -0.2378 | 0.0000 | -0.0777 | 3.3460** |
| Property type: Flat (ground floor/basement) (detached house omitted) standard error | (0.1624) | (1.6465) | - | (0.1921) | (0.7646) |
| Property type: Mid-terrace house (detached house omitted) coefficient | 0.1024 | 0.2212 | 0.2223 | -0.1564 | -0.2435 |
| Property =type:Mid-terrace house (detached house omitted) standard error | (0.0824) | (0.1778) | (0.2364) | (0.1319) | (0.6439) |
| Property type: Semi-detached house (detached house omitted) coefficient | 0.0864 | 0.0356 | 0.0116 | -0.0637 | 0.8002** |
| Property type: Semi-detached house (detached | (0.0600) | (0.1145) | (0.1047) | (0.1144) | (0.3856) |

| | | | | | |
|---|---|---|---|---|---|
| house omitted) standard error | | | | | |
| Built 1900-1929 (pre 1900 omitted) coefficient | 0.1732* | 0.2386 | 0.2595 | -0.1017 | -0.0204 |
| Built 1900-1929 (pre 1900 omitted) standard error | (0.0878) | (0.1861) | (0.1620) | (0.1513) | (0.4434) |
| Built 1930-1982 (pre 1900 omitted) coefficient | 0.1575* | 0.0498 | 0.3047** | -0.1165 | 0.3320 |
| Built 1930-1982 (pre 1900 omitted) standard error | (0.0683) | (0.1634) | (0.1020) | (0.1300) | (0.3279) |
| Built 1983-2011 (pre 1900 omitted) coefficient | 0.2130** | 0.0858 | 0.2419* | 0.0136 | 0.7328 |
| Built 1983-2011 (pre 1900 omitted) standard error | (0.0735) | (0.1711) | (0.1041) | (0.1448) | (0.4827) |
| Built 2012 (pre 1900 omitted) onwards coefficient | 0.1499 | 0.0200 | 0.0828 | 0.1245 | -0.9035 |
| Built 2012 (pre 1900 omitted) onwards standard error | (0.1247) | (0.2262) | (0.2447) | (0.2256) | (0.7936) |
| Built: don't know (pre 1900 omitted) coefficient | 0.4813* | 0.1703 | 0.3712 | 0.4348 | 1.0507*** |

| | | | | | |
|---|---|---|---|---|---|
| Built: don't know (pre 1900 omitted) standard error | (0.1877) | (0.6001) | (0.2698) | (0.3246) | (0.3856) |
| Constant coefficient | 10.4062* | -49.9754 | -62.2802 | -16.8954 | 21.4580 |
| Constant standard error | (5.2605) | (59.4669) | (44.2052) | (61.5875) | (160.5474) |
| Observations | 79118 | 18889 | 27131 | 30264 | 2834 |
| R-squared | - | - | - | - | - |

Notes: This table presents the results from five multivariate regressions. All regressions are run using Logit. The dependent variable is, in each case, whether participants chose to install a heat pump (rather than renew their existing heating system). The dependent variables are presented in the top row, and the independent variables are presented in the leftmost column. The first regression (column 1) is conducted using the full study sample. The following four regressions (columns 2-5) are conducted on subsets of the sample: A) those with high energy consumption homes who are on the gas grid, B) those with high energy consumption homes who are off the gas grid, C) those with low energy consumption homes who are on the gas grid, and D) those with low energy consumption homes who are off the gas grid. The regressions presented in columns 2-5 lack coefficients for the upfront and running costs of their existing heating systems as the participants placed in each regression all, by construction, have the same costs. Regression coefficient estimates are displayed without brackets, and standard errors for the estimates are presented beneath each respective estimate. Standard errors are clustered on a participant level. Statistical significance is indicated by stars: * p<0.05, **p<0.01..

**Table 41: Main specification (LPM) – reweighted by property size**

| Independent variable coefficient / SE | Chose heat pump (High demand: gas) | Chose heat pump (High demand: oil) | Chose heat pump (Low demand: gas) | Chose heat pump (Low demand: oil) |
|---|---|---|---|---|
| Upfront cost of heat pump coefficient | -0.0005** | 0.0002** | -0.0006** | 0.0005** |
| Upfront cost of heat pump standard error | (0.0000) | (0.0000) | (0.0000) | (0.0001) |
| Running costs of heat pump coefficient | 0.1037 | 0.1276 | 0.0706 | -0.1345 |

| | | | | |
|---|---|---|---|---|
| Running costs of heat pump standard error | (0.1218) | (0.1151) | (0.1547) | (0.4929) |
| Upfront cost of heat pump squared coefficient | 0.0000** | -0.0000** | 0.0000** | -0.0000** |
| Upfront cost of heat pump squared standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| Running costs of heat pump squared coefficient | -0.0005 | -0.0006 | -0.0004 | 0.0007 |
| Running costs of heat pump squared standard error | (0.0006) | (0.0005) | (0.0008) | (0.0027) |
| Upfront cost of heat pump cubed coefficient | -0.0000** | 0.0000** | -0.0000** | 0.0000** |
| Upfront cost of heat pump cubed standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| Running costs of heat pump cubed coefficient | 0.0000 | 0.0000 | 0.0000 | -0.0000 |
| Running costs of heat pump cubed standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| Running x upfront interaction coefficient | 0.0000** | -0.0000 | 0.0000** | -0.0000** |
| Running x upfront interaction standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) |

| | | | | |
|---|---|---|---|---|
| Income £10k-14.9k (£0-10k omitted) coefficient | -0.0354 | 0.0887 | -0.0112 | -0.3914** |
| Income £10k-14.9k (£0-10k omitted) standard error | (0.0896) | (0.0755) | (0.0406) | (0.1285) |
| Income £15k-19.9k (£0-10k omitted) coefficient | -0.0745 | 0.0501 | 0.0417 | -0.2826* |
| Income £15k-19.9k (£0-10k omitted) standard error | (0.0904) | (0.0720) | (0.0407) | (0.1226) |
| Income £20k-29.9k (£0-10k omitted) coefficient | -0.0093 | 0.0721 | 0.0066 | -0.3463** |
| Income £20k-29.9k (£0-10k omitted) standard error | (0.0839) | (0.0648) | (0.0369) | (0.1157) |
| Income £30k-39.9k (£0-10k omitted) coefficient | -0.0655 | 0.0373 | 0.0476 | -0.3258** |
| Income £30k-39.9k (£0-10k omitted) standard error | (0.0833) | (0.0633) | (0.0368) | (0.1205) |
| Income £40k-49.9k (£0-10k omitted) coefficient | 0.0130 | 0.0408 | 0.0746* | -0.2362* |
| Income £40k-49.9k (£0-10k omitted) standard error | (0.0835) | (0.0645) | (0.0368) | (0.1331) |
| Income £50k-59.9k (£0-10k omitted) coefficient | 0.0391 | 0.1188* | 0.0653 | -0.1702 |

| | | | | |
|---|---|---|---|---|
| Income £50k-59.9k (£0-10k omitted) standard error | (0.0827) | (0.0640) | (0.0370) | (0.1645) |
| Income £60k-99.9k (£0-10k omitted) coefficient | 0.0478 | 0.1430* | 0.0844* | -0.1941 |
| Income £60k-99.9k (£0-10k omitted) standard error | (0.0810) | (0.0615) | (0.0354) | (0.1291) |
| Income £100k+ (£0-10k omitted) coefficient | 0.0724 | 0.0987 | 0.1783** | -0.4645* |
| Income £100k+ (£0-10k omitted) standard error | (0.0813) | (0.0624) | (0.0406) | (0.1874) |
| Income: don't know (£0-10k omitted) coefficient | -0.0486 | -0.0486 | -0.0308 | -0.3658** |
| Income: don't know (£0-10k omitted) standard error | (0.0808) | (0.0613) | (0.0352) | (0.1141) |
| Property type: bungalow (detached house omitted) coefficient | -0.0579 | -0.0320 | -0.0596** | 0.1029 |
| Property type: bungalow (detached house omitted) standard error | (0.0337) | (0.0222) | (0.0231) | (0.0718) |
| Property type: End-terrace house (detached house omitted) coefficient | 0.0960* | -0.0119 | -0.0505* | 0.1183 |

| | | | | |
|---|---|---|---|---|
| Property type: End-terrace house (detached house omitted) standard error | (0.0424) | (0.0455) | (0.0230) | (0.1078) |
| Property =type:Flat (ground floor/basement) (detached house omitted) coefficient | -0.0298 | -0.5445** | -0.0038 | 0.4975** |
| Property type: Flat (ground floor/basement) (detached house omitted) standard error | (0.2570) | (0.0268) | (0.0323) | (0.1415) |
| Property type Mid-terrace house (detached house omitted) coefficient | 0.0331 | 0.0483 | -0.0218 | -0.0389 |
| Property type: Mid-terrace house (detached house omitted) standard error | (0.0275) | (0.0435) | (0.0209) | (0.1138) |
| Property type: Semi-detached house (detached house omitted) coefficient | 0.0047 | 0.0016 | -0.0108 | 0.1533* |
| Property type: Semi-detached house (detached house omitted) standard error | (0.0172) | (0.0194) | (0.0181) | (0.0727) |

| | | | | |
|---|---|---|---|---|
| Built 1900-1929 (pre 1900 omitted) coefficient | 0.0362 | 0.0462 | -0.0118 | -0.0035 |
| Built 1900-1929 (pre 1900 omitted) standard error | (0.0285) | (0.0300) | (0.0239) | (0.0844) |
| Built 1930-1982 pre 1900 omitted) coefficient | 0.0072 | 0.0557** | -0.0141 | 0.0660 |
| Built 1930-1982 pre 1900 omitted) standard error | (0.0246) | (0.0190) | (0.0202) | (0.0623) |
| Built 1983-2011 pre 1900 omitted) coefficient | 0.0125 | 0.0448* | 0.0070 | 0.1396 |
| Built 1983-2011 pre 1900 omitted) standard error | (0.0257) | (0.0194) | (0.0228) | (0.0900) |
| Built 2012 pre 1900 omitted) onwards coefficient | 0.0034 | 0.0112 | 0.0189 | -0.1433 |
| Built 2012 pre 1900 omitted) onwards standard error | (0.0343) | (0.0433) | (0.0368) | (0.1104) |
| Built: don't know pre 1900 omitted)coefficient | 0.0228 | 0.0579 | 0.0803 | 0.2024** |
| Built: don't know pre 1900 omitted)standard error | (0.0872) | (0.0489) | (0.0510) | (0.0733) |
| Constant coefficient | -5.1199 | -8.6388 | -1.8843 | 8.3971 |

| | | | | |
|---|---|---|---|---|
| Constant standard error | (8.8114) | (8.2830) | (9.4209) | (29.8162) |
| Observations | 18889 | 27131 | 30264 | 2834 |
| R-squared | 0.309 | 0.263 | 0.294 | 0.236 |

Notes: This table presents the results from four multivariate regressions. All regressions are run using Linear Probability Models (i.e., OLS models with binary outcomes). The dependent variable is, in each case, whether participants chose to install a heat pump (rather than renew their existing heating system). The dependent variables are presented in the top row, and the independent variables are presented in the leftmost column. The first regression (column 1) is conducted using the full study sample. The following four regressions (columns 1-4) are conducted on subsets of the sample: A) those with high energy consumption homes who are on the gas grid, B) those with high energy consumption homes who are off the gas grid, C) those with low energy consumption homes who are on the gas grid, and D) those with low energy consumption homes who are off the gas grid. Regression coefficient estimates are displayed without brackets, and standard errors for the estimates are presented beneath each respective estimate. The sample was reweighted to account for misalignment in the distribution of property sizes within the four demand groups. Standard errors are clustered on a participant level. Statistical significance is indicated by stars: * p<0.05, **p<0.01.

### Table 42: Main specification (LPM) – reweighted by region

| Independent variable coefficient / SE | Chose heat pump (High demand: gas) | Chose heat pump (High demand: oil) | Chose heat pump (Low demand: gas) | Chose heat pump (Low demand: oil) |
|---|---|---|---|---|
| Upfront cost of heat pump coefficient | -0.0005** | 0.0002** | -0.0006** | 0.0005** |
| Upfront cost of heat pump standard error | (0.0000) | (0.0000) | (0.0000) | (0.0001) |
| Running costs of heat pump coefficient | 0.1247 | 0.1201 | 0.0292 | -0.0802 |
| Running costs of heat pump standard error | (0.1266) | (0.1178) | (0.1543) | (0.6231) |
| Upfront cost of heat pump squared coefficient | 0.0000** | -0.0000** | 0.0000** | -0.0000** |

| | | | | |
|---|---|---|---|---|
| Upfront cost of heat pump squared standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| Running costs of heat pump squared coefficient | -0.0006 | -0.0006 | -0.0002 | 0.0004 |
| Running costs of heat pump squared standard error | (0.0006) | (0.0005) | (0.0008) | (0.0034) |
| Upfront cost of heat pump cubed coefficient | -0.0000** | 0.0000** | -0.0000** | 0.0000** |
| Upfront cost of heat pump cubed standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| Running costs of heat pump cubed coefficient | 0.0000 | 0.0000 | 0.0000 | -0.0000 |
| Running costs of heat pump cubed standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| Running x upfront interaction coefficient | 0.0000** | -0.0000 | 0.0000** | -0.0000* |
| Running x upfront interaction standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| Income £10k-14.9k (£0-10k omitted) coefficient | -0.0129 | 0.0564 | 0.0015 | -0.4216** |
| Income £10k-14.9k (£0-10k omitted) standard error | (0.0909) | (0.0770) | (0.0402) | (0.1002) |

| | | | | |
|---|---|---|---|---|
| Income £15k-19.9k (£0-10k omitted) coefficient | -0.0617 | 0.0306 | 0.0488 | -0.2933* |
| Income £15k-19.9k(£0-10k omitted) standard error | (0.0928) | (0.0719) | (0.0397) | (0.1138) |
| Income £20k-29.9k (£0-10k omitted) coefficient | 0.0017 | 0.0512 | 0.0168 | -0.4778** |
| Income £20k-29.9k (£0-10k omitted) standard error | (0.0837) | (0.0667) | (0.0363) | (0.0959) |
| Income £30k-39.9k (£0-10k omitted) coefficient | -0.0626 | 0.0169 | 0.0530 | -0.4209** |
| Income £30k-39.9k (£0-10k omitted) standard error | (0.0833) | (0.0648) | (0.0362) | (0.1090) |
| Income £40k-49.9k (£0-10k omitted) coefficient | 0.0185 | 0.0342 | 0.0747* | -0.2958* |
| Income £40k-49.9k (£0-10k omitted) standard error | (0.0839) | (0.0659) | (0.0361) | (0.1457) |
| Income £50k-59.9k (£0-10k omitted) coefficient | 0.0488 | 0.0932 | 0.0690 | -0.0334 |
| Income £50k-59.9k (£0-10k omitted) standard error | (0.0832) | (0.0656) | (0.0361) | (0.1403) |
| Income £60k-99.9k (£0-10k omitted) coefficient | 0.0522 | 0.1124 | 0.0814* | -0.2604 |

| | | | | |
|---|---|---|---|---|
| Income £60k-99.9k (£0-10k omitted) standard error | (0.0813) | (0.0630) | (0.0344) | (0.1376) |
| Income £100k+ (£0-10k omitted) coefficient | 0.0854 | 0.0685 | 0.1791** | -0.5964** |
| Income £100k+ (£0-10k omitted) standard error | (0.0816) | (0.0638) | (0.0403) | (0.1641) |
| Income:  don't know (£0-10k omitted) coefficient | -0.0443 | -0.0688 | -0.0289 | -0.4092** |
| Income: don't know (£0-10k omitted) standard error | (0.0810) | (0.0628) | (0.0344) | (0.1001) |
| Property type: bungalow (detached house omitted) coefficient | -0.0545 | -0.0265 | -0.0602** | 0.0163 |
| Property type: bungalow (detached house omitted) standard error | (0.0344) | (0.0229) | (0.0230) | (0.0798) |
| Property type: End-terrace house (detached house omitted) coefficient | 0.0998* | 0.0075 | -0.0420 | 0.1821 |
| Property type: End-terrace house (detached house omitted) standard error | (0.0463) | (0.0463) | (0.0234) | (0.1286) |

| | | | | |
|---|---|---|---|---|
| Property type: Flat (ground floor/basement) (detached house omitted) coefficient | -0.0125 | -0.5460** | -0.0012 | 0.2521 |
| Property type: Flat (ground floor/basement) (detached house omitted) standard error | (0.2649) | (0.0274) | (0.0307) | (0.1327) |
| Property type: Mid-terrace house (detached house omitted) coefficient | 0.0293 | 0.0482 | -0.0196 | -0.0286 |
| Property type: Mid-terrace house (detached house omitted) standard error | (0.0294) | (0.0422) | (0.0210) | (0.1229) |
| Property type: Semi-detached house (detached house omitted) coefficient | 0.0106 | 0.0032 | -0.0069 | 0.0663 |
| Property type: Semi-detached house (detached house omitted) standard error | (0.0179) | (0.0195) | (0.0183) | (0.0869) |
| Built 1900-1929 (pre 1900 omitted) coefficient | 0.0370 | 0.0475 | -0.0155 | -0.0529 |
| Built 1900-1929 (pre 1900 omitted) standard error | (0.0302) | (0.0310) | (0.0241) | (0.0928) |

| | | | | |
|---|---|---|---|---|
| Built 1930-1982 (pre 1900 omitted) coefficient | -0.0034 | 0.0525** | -0.0179 | 0.1077 |
| Built 1930-1982 (pre 1900 omitted) standard error | (0.0263) | (0.0192) | (0.0208) | (0.0704) |
| Built 1983-2011 (pre 1900 omitted) coefficient | 0.0050 | 0.0409* | 0.0047 | 0.1457 |
| Built 1983-2011 (pre 1900 omitted) standard error | (0.0270) | (0.0197) | (0.0231) | (0.1104) |
| Built 2012 (pre 1900 omitted) onwards coefficient | 0.0012 | 0.0314 | 0.0235 | -0.1324 |
| Built 2012 (pre 1900 omitted) onwards standard error | (0.0356) | (0.0445) | (0.0358) | (0.1246) |
| Built = don't know (pre 1900 omitted) coefficient | 0.0086 | 0.0706 | 0.0746 | 0.2626*** |
| Built = don't know (pre 1900 omitted) standard error | (0.0837) | (0.0466) | (0.0550) | (0.1005) |
| Constant coefficient | -6.6369 | -8.0678 | 0.6572 | 5.1269 |
| Constant standard error | (9.1523) | (8.4743) | (9.3910) | (37.6696) |
| Observations | 18889 | 27131 | 30264 | 2834 |
| R-squared | 0.307 | 0.264 | 0.297 | 0.249 |

Notes: This table presents the results from four multivariate regressions. All regressions are run using Linear Probability Models (i.e., OLS models with binary outcomes). The dependent variable is, in each case, whether participants chose to install a heat pump (rather than renew their existing heating system). The dependent variables are presented in the top row, and the independent variables are presented in the leftmost column. The first regression (column 1) is conducted using the full study sample. The following four regressions (columns 1-4) are conducted on subsets of the sample: A) those with high energy consumption homes who are on the gas grid, B) those with high energy consumption homes who are off the gas grid, C) those with low energy consumption homes who are on the gas grid, and D) those with low energy consumption homes who are off the gas grid. Regression coefficient estimates are displayed without brackets, and standard errors for the estimates are presented beneath each respective estimate. The sample was reweighted to account for misalignment in the distribution of households across the UK within the four demand groups. Standard errors are clustered on a participant level. Statistical significance is indicated by stars: * p<0.05, **p<0.01.

**Table 43: Main specification (LPM) – reweighted by heating system fuel type (i.e., off and on gas grid groups)**

| Independent variable coefficient / SE | Chose heat pump - full sample | Chose heat pump - high demand: gas | Chose heat pump - high demand: oil | Chose heat pump - low demand: gas | Chose heat pump - low demand: oil |
|---|---|---|---|---|---|
| Upfront cost coefficient | -0.0004** | -0.0005** | 0.0002** | -0.0006** | 0.0005** |
| Upfront cost standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0001) |
| Running costs coefficient | -0.0248 | 0.1060 | 0.1340 | 0.0572 | -0.1384 |
| Running costs standard error | (0.0145) | (0.1220) | (0.1120) | (0.1533) | (0.4934) |
| Squared upfront cost coefficient | 0.0000** | 0.0000** | -0.0000** | 0.0000** | -0.0000** |
| Squared upfront cost standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| Squared run cost coefficient | 0.0001 | -0.0005 | -0.0006 | -0.0003 | 0.0008 |
| Squared run cost standard error | (0.0001) | (0.0006) | (0.0005) | (0.0008) | (0.0027) |

| | | | | | |
|---|---|---|---|---|---|
| Cubed upfront cost coefficient | -0.0000** | -0.0000** | 0.0000** | -0.0000** | 0.0000** |
| Cubed upfront cost standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| Cubed run cost coefficient | -0.0000 | 0.0000 | 0.0000 | 0.0000 | -0.0000 |
| Cubed run cost standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| Interaction: upfront x running costs coefficient | -0.0000** | 0.0000** | -0.0000 | 0.0000** | -0.0000** |
| Interaction: upfront x running costs standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| Status quo upfront cost coefficient | 0.0001 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Status quo upfront cost standard error | (0.0001) | - | - | - | - |
| Status quo upfront cost coefficient | 0.0030** | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Status quo upfront cost standard error | (0.0014) | - | - | - | - |
| Status quo fuel type: Gas coefficient | 0.0514 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

| | | | | | |
|---|---|---|---|---|---|
| Status quo fuel type: Gas standard error | (0.2918) | - | - | - | - |
| Income: less than 10000 (£0-10k omitted) coefficient | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Income: less than 10000 (£0-10k omitted) standard error | - | - | - | - | - |
| Income: 10000-14999 (£0-10k omitted) coefficient | -0.0042 | -0.0333 | 0.0961 | -0.0037 | -0.3880** |
| Income: 10000-14999 (£0-10k omitted) standard error | (0.0332) | (0.0898) | (0.0750) | (0.0403) | (0.1293) |
| Income: 15000-19999 (£0-10k omitted) coefficient | 0.0221 | -0.0746 | 0.0535 | 0.0390 | -0.2774* |
| Income: 15000-19999 (£0-10k omitted) standard error | (0.0328) | (0.0904) | (0.0713) | (0.0397) | (0.1236) |
| Income: 20000-29999 (£0-10k omitted) coefficient | 0.0147 | -0.0085 | 0.0789 | 0.0151 | -0.3422** |
| Income: 20000-29999 (£0-10k omitted) standard error | (0.0300) | (0.0839) | (0.0644) | (0.0366) | (0.1170) |
| Income: 30000-39999 (£0-10k omitted) coefficient | 0.0230 | -0.0644 | 0.0482 | 0.0508 | -0.3225** |

| | | | | | |
|---|---|---|---|---|---|
| Income: 30000-39999 (£0-10k omitted) standard error | (0.0296) | (0.0833) | (0.0628) | (0.0363) | (0.1217) |
| Income: 40000-49999 (£0-10k omitted) coefficient | 0.0605* | 0.0136 | 0.0511 | 0.0784** | -0.2317* |
| Income: 40000-49999 (£0-10k omitted) standard error | (0.0298) | (0.0835) | (0.0641) | (0.0364) | (0.1342) |
| Income: 50000-59999 (£0-10k omitted) coefficient | 0.0732* | 0.0404 | 0.1265** | 0.0732* | -0.1660 |
| Income: 50000-59999 (£0-10k omitted) standard error | (0.0297) | (0.0827) | (0.0636) | (0.0366) | (0.1652) |
| Income: 60000-99999 (£0-10k omitted) coefficient | 0.0885** | 0.0492 | 0.1491* | 0.0848* | -0.1900 |
| Income: 60000-99999 (£0-10k omitted) standard error | (0.0284) | (0.0810) | (0.0610) | (0.0347) | (0.1301) |
| Income: 100000 or more (£0-10k omitted) coefficient | 0.1197** | 0.0733 | 0.1050* | 0.1830** | -0.4604* |
| Income: 100000 or more (£0-10k omitted) standard error | (0.0295) | (0.0813) | (0.0620) | (0.0403) | (0.1880) |
| Income: Don't know or prefer not to say (£0-10k omitted) coefficient | -0.0339 | -0.0474 | -0.0422 | -0.0272 | -0.3614** |

| | | | | | |
|---|---|---|---|---|---|
| Income: Don't know or prefer not to say (£0-10k omitted) standard error | (0.0283) | (0.0808) | (0.0609) | (0.0347) | (0.1153) |
| Property type: Bungalow (£0-10k omitted) coefficient | -0.0302* | -0.0582 | -0.0305 | -0.0574* | 0.1032 |
| Property type: Bungalow (£0-10k omitted) standard error | (0.0142) | (0.0337) | (0.0219) | (0.0228) | (0.0718) |
| Property type: End-terrace house (£0-10k omitted) coefficient | -0.0029 | 0.0974* | -0.0081 | -0.0495** | 0.1172 |
| Property type: End-terrace house (£0-10k omitted) standard error | (0.0173) | (0.0425) | (0.0454) | (0.0229) | (0.1073) |
| Property type: Flat (ground floor/basement) (£0-10k omitted) coefficient | 0.0177 | -0.0370 | -0.5478** | -0.0114 | 0.4968** |
| Property type: Flat (ground floor/basement) (£0-10k omitted) standard error | (0.0272) | (0.2569) | (0.0266) | (0.0303) | (0.1414) |
| Property type: Mid-terrace house (£0-10k omitted) coefficient | 0.0099 | 0.0332 | 0.0408 | -0.0243 | -0.0392 |

| | | | | | |
|---|---|---|---|---|---|
| Property type: Mid-terrace house (£0-10k omitted) standard error | (0.0141) | (0.0275) | (0.0426) | (0.0207) | (0.1134) |
| Property type: Semi-detached house (£0-10k omitted) coefficient | 0.0105 | 0.0047 | 0.0024 | -0.0099 | 0.1529* |
| Property type: Semi-detached house (£0-10k omitted) standard error | (0.0104) | (0.0172) | (0.0190) | (0.0181) | (0.0726) |
| Age of property: Pre 1900 (Pre 1900 omitted) coefficient | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Age of property: Pre 1900 (Pre 1900 omitted) standard error | - | - | - | - | - |
| Age of property: 1900-1929 (Pre 1900 omitted) coefficient | 0.0180 | 0.0361 | 0.0474 | -0.0151 | -0.0040 |
| Age of property: 1900-1929 (Pre 1900 omitted) standard error | (0.0153) | (0.0286) | (0.0295) | (0.0236) | (0.0844) |
| Age of property: 1930-1982 (Pre 1900 omitted) coefficient | 0.0093 | 0.0072 | 0.0555** | -0.0171 | 0.0649 |

| | | | | | |
|---|---|---|---|---|---|
| Age of property: 1930-1982 (Pre 1900 omitted) standard error | (0.0122) | (0.0246) | (0.0186) | (0.0202) | (0.0622) |
| Age of property: 1983-2011 (Pre 1900 omitted) coefficient | 0.0229* | 0.0125 | 0.0439* | 0.0023 | 0.1385 |
| Age of property: 1983-2011 (Pre 1900 omitted) standard error | (0.0130) | (0.0257) | (0.0190) | (0.0226) | (0.0899) |
| Age of property: 2012 onwards (Pre 1900 omitted) coefficient | 0.0201 | 0.0024 | 0.0150 | 0.0215 | -0.1444 |
| Age of property: 2012 onwards (Pre 1900 omitted) standard error | (0.0216) | (0.0343) | (0.0447) | (0.0359) | (0.1104) |
| Age of property: I don't know (Pre 1900 omitted) coefficient | 0.0752* | 0.0221 | 0.0676 | 0.0711 | 0.2021** |
| Age of property: I don't know (Pre 1900 omitted) standard error | (0.0368) | (0.0872) | (0.0492) | (0.0525) | (0.0731) |
| Constant coefficient | 2.4739* | -5.2936 | -9.1184 | -1.0776 | 8.6200 |
| Constant standard error | (1.0155) | (8.8228) | (8.0601) | (9.3282) | (29.8429) |

| | | | | | |
|---|---|---|---|---|---|
| Observations | 79118 | 18889 | 27131 | 30264 | 2834 |
| R-squared | 0.287 | 0.309 | 0.265 | 0.295 | 0.237 |

Notes: This table presents the results from four multivariate regressions. All regressions are run using Linear Probability Models (i.e., OLS models with binary outcomes). The dependent variable is, in each case, whether participants chose to install a heat pump (rather than renew their existing heating system). The dependent variables are presented in the top row, and the independent variables are presented in the leftmost column. The first regression (column 1) is conducted using the full study sample. The following four regressions (columns 1-4) are conducted on subsets of the sample: A) those with high energy consumption homes who are on the gas grid, B) those with high energy consumption homes who are off the gas grid, C) those with low energy consumption homes who are on the gas grid, and D) those with low energy consumption homes who are off the gas grid. Regression coefficient estimates are displayed without brackets, and standard errors for the estimates are presented beneath each respective estimate. The sample was reweighted to account for discrepancies in the distribution of on gas grid and off gas grid participants. Standard errors are clustered on a participant level. Statistical significance is indicated by stars: * p<0.05, **p<0.01.

**Table 44: Main specification (LPM) – recoding those who are not confident in their decision to choose a heat pump**

| Independent variable coefficient / SE | Chose heat pump (Full sample) | Chose heat pup (High demand: gas) | Chose heat pump (High demand: oil) | Chose heat pump (Low demand: gas) | Chose heat pump (Low demand: oil) |
|---|---|---|---|---|---|
| Upfront cost of heat pump coefficient | -0.0003** | -0.0005** | 0.0002** | -0.0005** | 0.0005** |
| Upfront cost of heat pump standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0001) |
| Running costs of heat pump coefficient | -0.0253* | 0.1233 | 0.1723 | 0.0487 | -0.0949 |
| Running costs of heat pump standard error | (0.0125) | (0.1206) | (0.1104) | (0.1507) | (0.4840) |
| Upfront cost of heat pump squared coefficient | 0.0000** | 0.0000** | -0.0000** | 0.0000** | -0.0000** |
| Upfront cost of heat pump squared standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| Running costs of heat pump squared coefficient | 0.0001 | -0.0006 | -0.0008 | -0.0003 | 0.0005 |

| | | | | | |
|---|---|---|---|---|---|
| Running costs of heat pump squared standard error | (0.0001) | (0.0006) | (0.0005) | (0.0008) | (0.0027) |
| Upfront cost of heat pump cubed coefficient | -0.0000** | -0.0000** | 0.0000** | -0.0000** | 0.0000** |
| Upfront cost of heat pump cubed standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| Running costs of heat pump cubed coefficient | -0.0000 | 0.0000 | 0.0000 | 0.0000 | -0.0000 |
| Running costs of heat pump cubed standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| Running x upfront interaction coefficient | -0.0000 | 0.0000** | -0.0000 | 0.0000** | -0.0000** |
| Running x upfront interaction standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| Status quo upfront cost coefficient | 0.0001 | - | - | - | - |
| Status quo upfront cost standard error | (0.0001) | - | - | - | - |
| Status quo running cost coefficient | 0.0027 | - | - | - | - |
| Status quo running cost standard error | (0.0014) | - | - | - | - |
| On gas grid (omitted = off grid) coefficient | 0.0955 | - | - | - | - |
| On gas grid (omitted = off grid) standard error | (0.2903) | - | - | - | - |
| Income £10k-14.9k (£0-10k omitted) coefficient | -0.0255 | -0.0319 | 0.0416 | -0.0295 | -0.4503** |

| | | | | | |
|---|---|---|---|---|---|
| Income £10k-14.9k (£0-10k omitted) standard error | (0.0337) | (0.0903) | (0.0774) | (0.0396) | (0.1289) |
| Income £15k-19.9k (£0-10k omitted) coefficient | 0.0256 | -0.0743 | 0.0645 | 0.0340 | -0.3126* |
| Income £15k-19.9k (£0-10k omitted) standard error | (0.0334) | (0.0906) | (0.0730) | (0.0399) | (0.1218) |
| Income £20k-29.9k (£0-10k omitted) coefficient | 0.0104 | -0.0246 | 0.0925 | -0.0027 | -0.3957** |
| Income £20k-29.9k (£0-10k omitted) standard error | (0.0307) | (0.0838) | (0.0661) | (0.0364) | (0.1148) |
| Income £30k-39.9k (£0-10k omitted) coefficient | 0.0146 | -0.0633 | 0.0481 | 0.0439 | -0.4135** |
| Income £30k-39.9k (£0-10k omitted) standard error | (0.0303) | (0.0837) | (0.0645) | (0.0364) | (0.1173) |
| Income £40k-49.9k (£0-10k omitted) coefficient | 0.0456 | -0.0024 | 0.0584 | 0.0702 | -0.3327* |
| Income £40k-49.9k (£0-10k omitted) standard error | (0.0306) | (0.0838) | (0.0659) | (0.0365) | (0.1333) |
| Income £50k-59.9k (£0-10k omitted) coefficient | 0.0656* | 0.0226 | 0.1228 | 0.0619 | -0.2274 |
| Income £50k-59.9k (£0-10k omitted) standard error | (0.0304) | (0.0829) | (0.0655) | (0.0366) | (0.1655) |

| | | | | | |
|---|---|---|---|---|---|
| Income £60k-99.9k (£0-10k omitted) coefficient | 0.0893** | 0.0453 | 0.1459* | 0.0783* | -0.2470 |
| Income £60k-99.9k (£0-10k omitted) standard error | (0.0293) | (0.0815) | (0.0628) | (0.0349) | (0.1281) |
| Income £100k+ (£0-10k omitted) coefficient | 0.0968** | 0.0680 | 0.0984 | 0.1765** | -0.5030** |
| Income £100k+ (£0-10k omitted) standard error | (0.0303) | (0.0817) | (0.0637) | (0.0405) | (0.1839) |
| Income = don't know (£0-10k omitted) coefficient | -0.0562 | -0.0508 | -0.0517 | -0.0401 | -0.4179** |
| Income = don't know (£0-10k omitted) standard error | (0.0292) | (0.0812) | (0.0626) | (0.0347) | (0.1138) |
| Property = bungalow (detached house omitted) coefficient | -0.0263 | -0.0459 | -0.0359 | -0.0649** | 0.0361 |
| Property = bungalow (detached house omitted) standard error | (0.0136) | (0.0337) | (0.0219) | (0.0228) | (0.0702) |
| Property = End-terrace house (detached house omitted) coefficient | -0.0024 | 0.1075* | -0.0053 | -0.0603** | 0.0464 |
| Property = End-terrace house (detached house omitted) standard error | (0.0169) | (0.0423) | (0.0457) | (0.0227) | (0.1031) |
| Property = Flat (ground floor/basement) detached house omitted) coefficient | 0.0177 | -0.3252** | -0.5332** | -0.0185 | 0.5094** |

| | | | | | |
|---|---|---|---|---|---|
| Property = Flat (ground floor/basement) detached house omitted) standard error | (0.0279) | (0.0642) | (0.0271) | (0.0307) | (0.1433) |
| Property = Mid-terrace house (detached house omitted) coefficient | 0.0188 | 0.0417 | 0.0422 | -0.0298 | -0.0338 |
| Property = Mid-terrace house (detached house omitted) standard error | (0.0139) | (0.0275) | (0.0436) | (0.0207) | (0.1139) |
| Property = Semi-detached house (detached house omitted) coefficient | 0.0134 | 0.0107 | -0.0005 | -0.0178 | 0.1487* |
| Property = Semi-detached house (detached house omitted) standard error | (0.0101) | (0.0170) | (0.0192) | (0.0180) | (0.0725) |
| Built 1900-1929 (pre 1900 omitted) coefficient | 0.0289* | 0.0275 | 0.0312 | -0.0043 | 0.0116 |
| Built 1900-1929 (pre 1900 omitted) standard error | (0.0148) | (0.0285) | (0.0297) | (0.0233) | (0.0827) |
| Built 1930-1982 (pre 1900 omitted) coefficient | 0.0254* | -0.0034 | 0.0552** | -0.0148 | 0.1071* |
| Built 1930-1982 (pre 1900 omitted) standard error | (0.0115) | (0.0245) | (0.0188) | (0.0199) | (0.0598) |
| Built 1983-2011 (pre 1900 omitted) coefficient | 0.0381** | 0.0078 | 0.0451* | 0.0089 | 0.1554* |
| Built 1983-2011 (pre 1900 omitted) standard error | (0.0125) | (0.0256) | (0.0192) | (0.0223) | (0.0922) |

| | | | | | |
|---|---|---|---|---|---|
| Built 2012 onwards (pre 1900 omitted) coefficient | 0.0286 | 0.0041 | 0.0323 | 0.0151 | -0.1177 |
| Built 2012 onwards (pre 1900 omitted) standard error | (0.0211) | (0.0342) | (0.0444) | (0.0360) | (0.1096) |
| Built = don't know (pre 1900 omitted) coefficient | 0.0561* | -0.0138 | 0.0214 | 0.0726 | 0.2704** |
| Built = don't know (pre 1900 omitted) standard error | (0.0339) | (0.0816) | (0.0519) | (0.0536) | (0.0718) |
| Constant coefficient | 2.2528* | -6.5178 | -11.8756 | -0.5862 | 6.0580 |
| Constant standard error | (0.8853) | (8.7206) | (7.9459) | (9.1730) | (29.2862) |
| Observations | 79118 | 18889 | 27131 | 30264 | 2834 |
| R-squared | 0.273 | 0.309 | 0.258 | 0.294 | 0.235 |

Notes: This table presents the results from five multivariate regressions. All regressions are run using LPM. The dependent variable is, in each case, whether participants chose to install a heat pump (rather than renew their existing heating system). The dependent variables are presented in the top row, and the independent variables are presented in the leftmost column. The first regression (column 1) is conducted using the full study sample. The following four regressions (columns 2-5) are conducted on subsets of the sample: A) those with high energy consumption homes who are on the gas grid, B) those with high energy consumption homes who are off the gas grid, C) those with low energy consumption homes who are on the gas grid, and D) those with low energy consumption homes who are off the gas grid. The regressions presented in columns 2-5 lack coefficients for the upfront and running costs of their existing heating systems as the participants placed in each regression all, by construction, have the same costs. Regression coefficient estimates are displayed without brackets, and standard errors for the estimates are presented beneath each respective estimate. Standard errors are clustered on a participant level. Participants who chose a heat pump but who stated that they were not confident in their choice were coded as not choosing a heat pump. Statistical significance is indicated by stars: * p<0.05, **p<0.01.

**Table 45: Main specification (LPM) – reweighted by sample distribution batch**

| Independent variable / SE | Chose heat pump (Full sample) | Chose heat pump (High demand: gas) | Chose heat pump (High demand: oil) | Chose heat pump (Low demand: gas) | Chose heat pump (Low demand: oil) |
|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| Upfront cost coefficient | -0.0002** | -0.0005** | 0.0002** | -0.0006** | 0.0004** |
| Upfront cost standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0001) |
| Running costs coefficient | -0.0331** | 0.1060 | 0.1340 | 0.0870 | -0.0975 |
| Running costs standard error | (0.0128) | (0.1220) | (0.1120) | (0.1538) | (0.5064) |
| Squared upfront cost coefficient | 0.0000** | 0.0000** | -0.0000** | 0.0000** | -0.0000** |
| Squared upfront cost standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| Squared run cost coefficient | 0.0001* | -0.0005 | -0.0006 | -0.0005 | 0.0005 |
| Squared run cost standard error | (0.0001) | (0.0006) | (0.0005) | (0.0008) | (0.0028) |
| Cubed upfront cost coefficient | -0.0000* | -0.0000** | 0.0000** | -0.0000** | 0.0000** |
| Cubed upfront cost standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| Cubed run cost coefficient | -0.0000* | 0.0000 | 0.0000 | 0.0000 | -0.0000 |

| | | | | | |
|---|---|---|---|---|---|
| Cubed run cost standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| Interaction: upfront x run costs coefficient | 0.0000 | 0.0000** | -0.0000 | 0.0000** | -0.0000* |
| Interaction: upfront x run costs standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| Status quo upfront cost coefficient | 0.0001 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Status quo upfront cost standard error | (0.0001) | - | - | - | - |
| Status quo upfront cost coefficient | 0.0031* | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Status quo upfront cost standard error | (0.0015) | - | - | - | - |
| Status quo fuel type: Gas (off gas grid omitted) coefficient | 0.0008 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Status quo fuel type: Gas (off gas grid omitted) standard error | (0.3003) | - | - | - | - |

| | | | | | |
|---|---|---|---|---|---|
| Income: less than 10000 (£0-10k omitted) coefficient | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Income: less than 10000 (£0-10k omitted) standard error | - | - | - | - | - |
| Income: 10000-14999 (£0-10k omitted) coefficient | 0.0180 | -0.0333 | 0.0961 | -0.0002 | -0.4134** |
| Income: 10000-14999 (£0-10k omitted) standard error | (0.0382) | (0.0898) | (0.0750) | (0.0393) | (0.1216) |
| Income: 15000-19999 (£0-10k omitted) coefficient | 0.0291 | -0.0746 | 0.0535 | 0.0440 | -0.3313*** |
| Income: 15000-19999 (£0-10k omitted) standard error | (0.0374) | (0.0904) | (0.0713) | (0.0388) | (0.1236) |
| Income: 20000-29999 (£0-10k omitted) coefficient | 0.0276 | -0.0085 | 0.0789 | 0.0186 | -0.3918** |

| | | | | | |
|---|---|---|---|---|---|
| Income: 20000-29999 (£0-10k omitted) standard error | (0.0344) | (0.0839) | (0.0644) | (0.0355) | (0.1073) |
| Income: 30000-39999 (£0-10k omitted) coefficient | 0.0271 | -0.0644 | 0.0482 | 0.0557 | -0.3442** |
| Income: 30000-39999 (£0-10k omitted) standard error | (0.0341) | (0.0833) | (0.0628) | (0.0352) | (0.1150) |
| Income: 40000-49999 (£0-10k omitted) coefficient | 0.0516 | 0.0136 | 0.0511 | 0.0850* | -0.3146* |
| Income: 40000-49999 (£0-10k omitted) standard error | (0.0343) | (0.0835) | (0.0641) | (0.0353) | (0.1250) |
| Income: 50000-59999 (£0-10k omitted) (£0-10k omitted) coefficient | 0.0860* | 0.0404 | 0.1265* | 0.0765* | -0.1947 |
| Income: 50000-59999 (£0-10k | (0.0341) | (0.0827) | (0.0636) | (0.0354) | (0.1496) |

| | | | | | |
|---|---|---|---|---|---|
| omitted) standard error | | | | | |
| Income: 60000-99999 (£0-10k omitted) coefficient | 0.1066** | 0.0492 | 0.1491* | 0.0899** | -0.2394 |
| Income: 60000-99999 (£0-10k omitted) standard error | (0.0329) | (0.0810) | (0.0610) | (0.0335) | (0.1235) |
| Income: 100000 or more (£0-10k omitted) coefficient | 0.1007** | 0.0733 | 0.1050* | 0.1889** | -0.5297** |
| Income: 100000 or more (£0-10k omitted) standard error | (0.0341) | (0.0813) | (0.0620) | (0.0395) | (0.1689) |
| Income: Don't know or prefer not to say (£0-10k omitted) coefficient | -0.0473 | -0.0474 | -0.0422 | -0.0216 | -0.3840** |
| Income: Don't know or prefer not to say (£0-10k omitted) standard error | (0.0329) | (0.0808) | (0.0609) | (0.0336) | (0.1077) |

| | | | | | |
|---|---|---|---|---|---|
| Property type: Bungalow (detached house omitted) coefficient | -0.0214 | -0.0582* | -0.0305 | -0.0578* | 0.0949 |
| Property type: Bungalow (detached house omitted) standard error | (0.0148) | (0.0337) | (0.0219) | (0.0228) | (0.0765) |
| Property type: End-terrace house (detached house omitted) coefficient | 0.0006 | 0.0974* | -0.0081 | -0.0508* | 0.1609 |
| Property type: End-terrace house (detached house omitted) standard error | (0.0186) | (0.0425) | (0.0454) | (0.0231) | (0.1140) |
| Property type: Flat (ground floor/basement) (detached house omitted) coefficient | 0.0207 | -0.0370 | -0.5478** | -0.0114 | 0.5134** |
| Property type: Flat (ground floor/basement) (detached house | (0.0287) | (0.2569) | (0.0266) | (0.0302) | (0.1283) |

| | | | | | |
|---|---|---|---|---|---|
| omitted) standard error | | | | | |
| Property type: Mid-terrace house (detached house omitted) coefficient | 0.0202 | 0.0332 | 0.0408 | -0.0236 | 0.0317 |
| Property type: Mid-terrace house (detached house omitted) standard error | (0.0150) | (0.0275) | (0.0426) | (0.0210) | (0.1165) |
| Property type: Semi-detached house (detached house omitted) coefficient | 0.0133 | 0.0047 | 0.0024 | -0.0093 | 0.1586* |
| Property type: Semi-detached house (detached house omitted) standard error | (0.0113) | (0.0172) | (0.0190) | (0.0182) | (0.0755) |
| Age of property: Pre 1900 (Pre 1900 omitted) coefficient | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Age of property: Pre 1900 (Pre 1900 | - | - | - | - | - |

| | | | | | |
|---|---|---|---|---|---|
| omitted) standard error | | | | | |
| Age of property: 1900-1929 (Pre 1900 omitted) coefficient | 0.0368* | 0.0361 | 0.0474 | -0.0146 | 0.0377 |
| Age of property: 1900-1929 (Pre 1900 omitted) standard error | (0.0165) | (0.0286) | (0.0295) | (0.0237) | (0.0916) |
| Age of property: 1930-1982 (Pre 1900 omitted) coefficient | 0.0384** | 0.0072 | 0.0555** | -0.0160 | 0.1100 |
| Age of property: 1930-1982 (Pre 1900 omitted) standard error | (0.0126) | (0.0246) | (0.0186) | (0.0203) | (0.0646) |
| Age of property: 1983-2011 (Pre 1900 omitted) coefficient | 0.0424** | 0.0125 | 0.0439* | 0.0033 | 0.1631 |
| Age of property: 1983-2011 (Pre | (0.0137) | (0.0257) | (0.0190) | (0.0228) | (0.0923) |

| | | | | | |
|---|---|---|---|---|---|
| 1900 omitted) standard error | | | | | |
| Age of property: 2012 (Pre 1900 omitted) onwards coefficient | 0.0294 | 0.0024 | 0.0150 | 0.0236 | -0.0811 |
| Age of property: 2012 (Pre 1900 omitted) onwards standard error | (0.0237) | (0.0343) | (0.0447) | (0.0366) | (0.1242) |
| I don't know (Pre 1900 omitted) coefficient | 0.0814* | 0.0221 | 0.0676 | 0.0623 | 0.2490** |
| I don't know (Pre 1900 omitted) standard error | (0.0333) | (0.0872) | (0.0492) | (0.0521) | (0.0759) |
| Constant coefficient | 2.7034** | -5.2936 | -9.1184 | -2.9183 | 6.1681 |
| Constant standard error | (0.9088) | (8.8228) | (8.0601) | (9.3617) | (30.6159) |
| Observations | 79118 | 18889 | 27131 | 30264 | 2834 |
| R-squared | 0.273 | 0.309 | 0.265 | 0.294 | 0.242 |

Notes: This table presents the results from five multivariate regressions. All regressions are run using Linear Probability Models (i.e., OLS models with binary outcomes). The dependent variable is, in each case, whether participants chose to install a heat pump (rather than renew their existing heating system). The dependent variables are presented in the top row, and the independent variables are presented in the leftmost column. The first regression (column 1) is conducted using the full study sample. The following four regressions (columns 3-6) are conducted on subsets of the sample: A) those with high energy consumption homes who are on the gas grid, B) those with high energy consumption homes who are off the gas grid, C) those with low energy consumption homes who are on the gas grid, and D) those with low energy consumption homes who are off the gas grid. Regression coefficient estimates are displayed without brackets, and standard errors for the estimates are presented beneath each respective estimate. The sample was reweighted to account for discrepancies between sample distribution batches (distribution batch 2 was reduced due to a higher than expected response rate). Standard errors are clustered on a participant level. Statistical significance is indicated by stars: * p<0.05, **p<0.01.

**Table 46: Main specification (LPM) – income quintiles instead of brackets**

| Independent variable coefficient / SE | Chose heat pump (Full sample) | Chose heat pump (High demand: gas) | Chose heat pump (High demand: oil) | Chose heat pump (Low demand: gas) | Chose heat pump (Low demand: oil) |
|---|---|---|---|---|---|
| Upfront cost of heat pump coefficient | -0.0003** | -0.0005** | 0.0002** | -0.0006** | 0.0005** |
| Upfront cost of heat pump standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0001) |
| Running costs of heat pump coefficient | -0.0293* | 0.1059 | 0.1341 | 0.0568 | -0.1461 |
| Running costs of heat pump standard error | (0.0127) | (0.1220) | (0.1120) | (0.1533) | (0.4932) |
| Upfront cost of heat pump squared coefficient | 0.0000** | 0.0000** | -0.0000** | 0.0000** | -0.0000** |
| Upfront cost of heat pump squared standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |

| | | | | | |
|---|---|---|---|---|---|
| Running costs of heat pump squared coefficient | 0.0001* | -0.0005 | -0.0006 | -0.0003 | 0.0008 |
| Running costs of heat pump squared standard error | (0.0001) | (0.0006) | (0.0005) | (0.0008) | (0.0027) |
| Upfront cost of heat pump cubed coefficient | -0.0000** | -0.0000** | 0.0000** | -0.0000** | 0.0000** |
| Upfront cost of heat pump cubed standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| Running costs of heat pump cubed coefficient | -0.0000* | 0.0000 | 0.0000 | 0.0000 | -0.0000 |
| Running costs of heat pump cubed standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| Running x upfront interaction coefficient | -0.0000 | 0.0000** | -0.0000 | 0.0000*** | -0.0000** |
| Running x upfront interaction standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |

| | | | | | |
|---|---|---|---|---|---|
| Status quo upfront cost coefficient | 0.0001 | - | - | - | - |
| Status quo upfront cost standard error | (0.0001) | - | - | - | - |
| Status quo running cost coefficient | 0.0031* | - | - | - | - |
| Status quo running cost standard error | (0.0014) | - | - | - | - |
| On gas grid (omitted = off grid) coefficient | 0.0349 | - | - | - | - |
| On gas grid (omitted = off grid) standard error | (0.2902) | - | - | - | - |
| Quintile 2 (quintile 1 omitted) coefficient | 0.0063 | -0.0383 | -0.0185 | 0.0354 | -0.0017 |
| Quintile 2 (quintile 1 omitted) standard error | (0.0147) | (0.0315) | (0.0284) | (0.0203) | (0.0784) |
| Quintile 3 (quintile 1 omitted)coefficient | 0.0386* | 0.0400 | -0.0158 | 0.0632** | 0.0928 |
| Quintile 3 (quintile 1 omitted) standard error | (0.0152) | (0.0314) | (0.0315) | (0.0203) | (0.0905) |

| | | | | | |
|---|---|---|---|---|---|
| Quintile 4 (quintile 1 omitted) coefficient | 0.0625** | 0.0667* | 0.0599* | 0.0580** | 0.1603 |
| Quintile 4 (quintile 1 omitted) standard error | (0.0149) | (0.0295) | (0.0305) | (0.0209) | (0.1347) |
| Quintile 5 (quintile 1 omitted) coefficient | 0.0842** | 0.0867** | 0.0630** | 0.0936** | 0.0633 |
| Quintile 5 (quintile 1 omitted) standard error | (0.0114) | (0.0224) | (0.0226) | (0.0164) | (0.0816) |
| Income = don't know (quintile 1 omitted) coefficient | -0.0601** | -0.0213 | -0.1087** | -0.0422* | -0.0401 |
| Income = don't know (quintile 1 omitted) standard error | (0.0121) | (0.0242) | (0.0240) | (0.0173) | (0.0619) |
| Property = bungalow (detached house omitted) coefficient | -0.0217 | -0.0595 | -0.0276 | -0.0565* | 0.1019 |
| Property = bungalow (detached house omitted) standard error | (0.0136) | (0.0340) | (0.0218) | (0.0229) | (0.0702) |

| | | | | | |
|---|---|---|---|---|---|
| Property = End-terrace house (detached house omitted) coefficient | 0.0018 | 0.0954** | -0.0059 | -0.0503* | 0.1144 |
| Property = End-terrace house (detached house omitted) standard error | (0.0170) | (0.0423) | (0.0458) | (0.0230) | (0.1084) |
| Property = Flat (ground floor/basement) (detached house omitted) coefficient | 0.0236 | -0.0296 | -0.5459** | -0.0057 | 0.4890** |
| Property = Flat (ground floor/basement) (detached house omitted) standard error | (0.0275) | (0.2547) | (0.0266) | (0.0303) | (0.1427) |
| Property = Mid-terrace house (detached house omitted) coefficient | 0.0166 | 0.0314 | 0.0398 | -0.0224 | -0.0657 |
| Property = Mid-terrace house | (0.0139) | (0.0277) | (0.0425) | (0.0208) | (0.1077) |

| | | | | | |
|---|---|---|---|---|---|
| (detached house omitted) standard error | | | | | |
| Property = Semi-detached house (detached house omitted) coefficient | 0.0139 | 0.0040 | 0.0033 | -0.0102 | 0.1531* |
| Property = Semi-detached house (detached house omitted) standard error | (0.0101) | (0.0172) | (0.0190) | (0.0181) | (0.0723) |
| Built 1900-1929 (pre 1900 omitted) coefficient | 0.0295* | 0.0359 | 0.0489* | -0.0152 | -0.0063 |
| Built 1900-1929 (pre 1900 omitted) standard error | (0.0148) | (0.0285) | (0.0295) | (0.0236) | (0.0834) |
| Built 1930-1982 pre 1900 omitted) coefficient | 0.0264* | 0.0045 | 0.0580** | -0.0190 | 0.0617 |
| Built 1930-1982 pre 1900 omitted) standard error | (0.0115) | (0.0246) | (0.0186) | (0.0202) | (0.0630) |

| | | | | | |
|---|---|---|---|---|---|
| Built 1983-2011 pre 1900 omitted) coefficient | 0.0359** | 0.0093 | 0.0460* | 0.0017 | 0.1322 |
| Built 1983-2011 pre 1900 omitted) standard error | (0.0125) | (0.0257) | (0.0191) | (0.0226) | (0.0886) |
| Built 2012 onwards pre 1900 omitted) coefficient | 0.0247 | 0.0005 | 0.0184 | 0.0158 | -0.1435 |
| Built 2012 onwards pre 1900 omitted) standard error | (0.0211) | (0.0341) | (0.0448) | (0.0360) | (0.1151) |
| Built = don't know pre 1900 omitted) coefficient | 0.0823* | 0.0150 | 0.0691 | 0.0749 | 0.1852** |
| Built = don't know pre 1900 omitted) standard error | (0.0324) | (0.0859) | (0.0494) | (0.0528) | (0.0669) |
| Constant coefficient | 2.5994** | -5.3150 | -9.0555 | -1.0357 | 8.7779 |
| Constant standard error | (0.8963) | (8.8200) | (8.0606) | (9.3270) | (29.8398) |
| Observations | 79118 | 18889 | 27131 | 30264 | 2834 |
| R-squared | 0.278 | 0.309 | 0.264 | 0.293 | 0.222 |

Notes: This table presents the results from five multivariate regressions. All regressions are run using LPM. The dependent variable is, in each case, whether participants chose to install a heat pump (rather than renew their existing heating system). The dependent variables are presented in the top row, and the independent variables are presented in the leftmost column. The first regression (column 1) is conducted using the full study sample. The following four regressions (columns 2-5) are conducted on subsets of the sample: A) those with high energy consumption homes who are on the gas grid, B) those with high energy consumption homes who are off the gas grid, C) those with low energy consumption homes who are on the gas grid, and D) those with low energy consumption homes who are off the gas grid. The regressions presented in columns 2-5 lack coefficients for the upfront and running costs of their existing heating systems as the participants placed in each regression all, by construction, have the same costs. Regression coefficient estimates are displayed without brackets, and standard errors for the estimates are presented beneath each respective estimate. Standard errors are clustered on a participant level. Statistical significance is indicated by stars: * p<0.05, **p<0.01.

**Table 47: Main specification (Logit) – income quintiles instead of brackets**

| Independent variable coefficient / SE | Chose heat pump (Full sample) | Chose heat pump (High demand: gas) | Chose heat pump (High demand: oil) | Chose heat pump (Low demand: gas) | Chose heat pump (Low demand: oil) |
|---|---|---|---|---|---|
| Upfront cost of heat pump coefficient | -0.0011** | -0.0017** | 0.0010** | -0.0014** | 0.0021** |
| Upfront cost of heat pump standard error | (0.0001) | (0.0002) | (0.0001) | (0.0002) | (0.0006) |
| Running costs of heat pump coefficient | -0.1581* | 0.8041 | 0.8488 | 0.3591 | -0.4931 |
| Running costs of heat pump standard error | (0.0737) | (0.8212) | (0.6133) | (1.0097) | (2.5973) |
| Upfront cost of heat pump squared coefficient | 0.0000** | 0.0000** | -0.0000** | 0.0000* | -0.0000** |

| | | | | | |
|---|---|---|---|---|---|
| Upfront cost of heat pump squared standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| Running costs of heat pump squared coefficient | 0.0007 | -0.0037 | -0.0040 | -0.0021 | 0.0027 |
| Running costs of heat pump squared standard error | (0.0004) | (0.0038) | (0.0028) | (0.0055) | (0.0142) |
| Upfront cost of heat pump cubed coefficient | -0.0000** | -0.0000** | 0.0000** | -0.0000 | 0.0000** |
| Upfront cost of heat pump cubed standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| Running costs of heat pump cubed coefficient | -0.0000 | 0.0000 | 0.0000 | 0.0000 | -0.0000 |
| Running costs of heat pump cubed standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| Running x upfront interaction coefficient | 0.0000* | 0.0000 | -0.0000** | -0.0000 | -0.0000*** |

| | | | | | |
|---|---|---|---|---|---|
| Running x upfront interaction standard error | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| Status quo upfront cost coefficient | 0.0004 | - | - | - | - |
| Status quo upfront cost standard error | (0.0005) | - | - | - | - |
| Status quo running cost coefficient | 0.0156 | - | - | - | - |
| Status quo running cost standard error | (0.0083) | - | - | - | - |
| On gas grid (omitted = off grid) coefficient | 0.2679 | - | - | - | - |
| On gas grid (omitted = off grid) standard error | (1.6543) | - | - | - | - |
| Quintile 2 (quintile 1 omitted) coefficient | 0.0377 | -0.2767 | -0.1005 | 0.2291 | -0.0084 |
| Quintile 2 (quintile 1 omitted) standard error | (0.0870) | (0.2271) | (0.1533) | (0.1302) | (0.3933) |
| Quintile 3 2 (quintile 1 omitted) coefficient | 0.2269** | 0.2723 | -0.0859 | 0.4032** | 0.4829 |

| | | | | | |
|---|---|---|---|---|---|
| Quintile 3 2 (quintile 1 omitted) standard error | (0.0894) | (0.2132) | (0.1702) | (0.1297) | (0.4693) |
| Quintile 4 2 (quintile 1 omitted) coefficient | 0.3661** | 0.4466* | 0.3279* | 0.3675** | 0.8578 |
| Quintile 4 2 (quintile 1 omitted) standard error | (0.0869) | (0.1975) | (0.1672) | (0.1322) | (0.7288) |
| Quintile 5 2 (quintile 1 omitted) coefficient | 0.4906** | 0.5714** | 0.3443** | 0.5880** | 0.3273 |
| Quintile 5 2 (quintile 1 omitted) standard error | (0.0672) | (0.1528) | (0.1233) | (0.1050) | (0.4235) |
| Income = don't know 2 (quintile 1 omitted) coefficient | -0.3675** | -0.1535 | -0.5849** | -0.2861* | -0.2091 |
| Income = don't know 2 (quintile 1 omitted) standard error | (0.0741) | (0.1705) | (0.1304) | (0.1178) | (0.3230) |
| Property = bungalow (detached home omitted) coefficient | -0.1263 | -0.4203* | -0.1510 | -0.3687* | 0.5329 |
| Property = bungalow (detached home | (0.0806) | (0.2478) | (0.1187) | (0.1501) | (0.3687) |

| | | | | | |
|---|---|---|---|---|---|
| omitted) standard error | | | | | |
| Property = End-terrace house (detached home omitted) coefficient | 0.0092 | 0.6174* | -0.0372 | -0.3305* | 0.5936 |
| Property = End-terrace house (detached home omitted) standard error | (0.1026) | (0.2608) | (0.2531) | (0.1497) | (0.5556) |
| Property = Flat (ground floor/basement) (detached home omitted) coefficient | 0.1442 | -0.1893 | 0.0000 | -0.0409 | 3.2757** |
| Property = Flat (ground floor/basement) (detached home omitted) standard error | (0.1623) | (1.6309) | - | (0.1911) | (0.7650) |
| Property = Mid-terrace house (detached home omitted) coefficient | 0.1015 | 0.2087 | 0.2168 | -0.1444 | -0.3669 |

| | | | | | |
|---|---|---|---|---|---|
| Property = Mid-terrace house (detached home omitted) standard error | (0.0825) | (0.1783) | (0.2350) | (0.1323) | (0.6094) |
| Property = Semi-detached house (detached home omitted) coefficient | 0.0850 | 0.0311 | 0.0165 | -0.0655 | 0.7896* |
| Property = Semi-detached house (detached home omitted) standard error | (0.0600) | (0.1142) | (0.1045) | (0.1146) | (0.3760) |
| Built 1900-1929 (pre 1900 omitted) coefficient | 0.1739* | 0.2379 | 0.2676 | -0.1029 | -0.0306 |
| Built 1900-1929 (pre 1900 omitted) standard error | (0.0878) | (0.1855) | (0.1620) | (0.1506) | (0.4323) |
| Built 1930-1982 pre 1900 omitted) coefficient | 0.1558* | 0.0324 | 0.3175** | -0.1282 | 0.3102 |

| | | | | | |
|---|---|---|---|---|---|
| Built 1930-1982 pre 1900 omitted) standard error | (0.0683) | (0.1633) | (0.1019) | (0.1292) | (0.3248) |
| Built 1983-2011 pre 1900 omitted) coefficient | 0.2109** | 0.0642 | 0.2531* | 0.0098 | 0.6793 |
| Built 1983-2011 pre 1900 omitted) standard error | (0.0735) | (0.1709) | (0.1043) | (0.1438) | (0.4576) |
| Built 2012 onwards pre 1900 omitted) coefficient | 0.1477 | 0.0070 | 0.1010 | 0.0875 | -0.8951 |
| Built 2012 onwards pre 1900 omitted) standard error | (0.1249) | (0.2250) | (0.2446) | (0.2256) | (0.8141) |
| Built = don't know pre 1900 omitted) coefficient | 0.4848** | 0.1237 | 0.3794 | 0.4591 | 0.9573** |
| Built = don't know pre 1900 omitted) standard error | (0.1877) | (0.5910) | (0.2705) | (0.3252) | (0.3473) |
| Constant coefficient | 10.5320* | -51.8497 | -60.8271 | -15.2329 | 27.1792 |
| Constant standard error | (5.2534) | (59.3665) | (44.1793) | (61.4360) | (157.0920) |

| | | | | | |
|---|---|---|---|---|---|
| Observations | 79118 | 18889 | 27118 | 30264 | 2834 |
| R-squared | - | - | - | - | - |

Notes: This table presents the results from five multivariate regressions. All regressions are run using Logit. The dependent variable is, in each case, whether participants chose to install a heat pump (rather than renew their existing heating system). The dependent variables are presented in the top row, and the independent variables are presented in the leftmost column. The first regression (column 1) is conducted using the full study sample. The following four regressions (columns 2-5) are conducted on subsets of the sample: A) those with high energy consumption homes who are on the gas grid, B) those with high energy consumption homes who are off the gas grid, C) those with low energy consumption homes who are on the gas grid, and D) those with low energy consumption homes who are off the gas grid. The regressions presented in columns 2-5 lack coefficients for the upfront and running costs of their existing heating systems as the participants placed in each regression all, by construction, have the same costs. Regression coefficient estimates are displayed without brackets, and standard errors for the estimates are presented beneath each respective estimate. Standard errors are clustered on a participant level. Statistical significance is indicated by stars: * $p<0.05$, ** $p<0.01$

## Mixed logit results

This section presents the results from the mixed logistical regression analysis of the DCE. We performed this analysis to understand how the different attributes impact the uptake of heat pumps while accounting for unobserved preference heterogeneity (i.e., individual-level differences in heat pump preferences that we do not directly see in the data). The tables in this section present results of different variations of the main model. The main benefit of the mixed logit regressions is that they have higher statistical power than the multivariate results.

Table 48 presents results for the main segments of the sample where upfront and running costs are modelled as continuous variables. Additionally, the results of two different models are displayed for each segment: in the first, the attributes included are upfront and running costs; and in the second, the attributes included are upfront cost, running costs, and an indicator for heat pump installation (which differentiates the options between the heat pump and the status quo heating system). Including an indicator for heat pump installation allows us to treat heat pumps qualitatively differently to fossil fuel boilers, and thus account for other factors that may influence participants when choosing between a heat pump or renewing their current heating system (e.g., lower emissions, installation time ect.)

**Table 48: Mixed logistical regression – continuous upfront and running costs (all segments)**

| Independent variables | Chose heat pump (High demand on gas grid controlling for heat pump installation) | Chose heat pump (High demand on gas grid) | Chose heat pump (High demand off gas grid controlling for heat pump installation) | Chose heat pump (High demand off gas grid) | Chose heat pump (Low demand on gas grid controlling for heat pump installation) | Chose heat pump (Low demand on gas grid) | Chose heat pump (Low demand off gas grid controlling for heat pump installation) | Chose heat pump (Low demand off gas grid) |
|---|---|---|---|---|---|---|---|---|

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Upfront cost of heat pump coefficient | -0.0015** | -0.0026** | -0.0008** | -0.0016** | -0.0019** | -0.0027** | -0.0007** | -0.0018** |
| Upfront cost of heat pump standard error | (0.0001) | (0.0001) | (0.0000) | (0.0001) | (0.0001) | (0.0001) | (0.0001) | (0.0002) |
| Running costs of heat pump coefficient | -0.0572** | -0.0582** | -0.0108** | -0.0466** | -0.0601** | -0.0541** | 0.0269 | -0.0498** |
| Running costs of heat pump standard error | (0.0031) | (0.0034) | (0.0041) | (0.0027) | (0.0035) | (0.0028) | (0.0172) | (0.0092) |
| Heat pump installation coefficient | - | 1.8084** | - | -0.8726** | - | 1.2594** | - | -2.9248** |
| Heat pump installation standard error | - | (0.1783) | - | (0.1900) | - | (0.1407) | - | (0.6390) |
| Observations | 1,453 | 1,453 | 2,087 | 2,087 | 2,328 | 2,328 | 218 | 218 |

Notes: This table displays the attribute level coefficients as log odd ratios estimated using the mixed logit model with panel data to account for unobserved preference heterogeneity. The model was estimated using the mixlogit command with 500 random Halton draws in Stata 15. The dependent variable is, in each case, whether participants chose to install a heat pump (rather than renew their existing heating system). The dependent variables are presented in the top row, and the independent variables are presented in the leftmost column. Each observation in the dataset represents a choice between participants' existing heating system or a heat pump, and each participant makes multiple choices. The upfront and/or the running costs of the heat pump are varied each time participants' make a choice, while the upfront and running costs of their existing heating system depends on the characteristics of their home and whether they are on or off the gas grid. Models presented in this table are ran on the following subsets of the sample: A) those with high energy consumption homes who are on the gas grid, B) those with high energy consumption homes who are off the gas grid, C) those with low energy consumption homes who are on the gas grid, and D) those with low energy consumption homes who are off the gas grid. Results of two models are presented for each sample, the first only includes upfront and running costs as attributes and the second also includes an attribute for installation of heat pump, which differentiates the option from the status quo heating system. In both columns, cost attributes are modelled as continuous variables. Regression coefficient estimates are displayed without parenthesis, and standard errors for the estimates are presented beneath each respective estimate. Statistical significance is indicated by stars: * p<0.05, **p<0.01.

Table 49 and Table 50 present results for the main segments of the sample where upfront and running costs are modelled as categorical variables.

Table 49 presents results for those with high energy consumption homes who are on the gas grid, and for those with high energy consumption homes who are off the gas grid Table 54 presents results for those with low energy consumption homes who are on the gas grid, and those with low energy consumption homes who are off the gas grid.

Additionally, the results of two different models are displayed for each segment: in the first, the attributes included are upfront and running costs; and in the second, the attributes included are upfront cost, running costs, and an indicator for heat pump installation (which differentiates the options between the heat pump and the status quo heating system).

**Table 49: Mixed logistical regression – categorical upfront and running costs (high energy consumption, upfront costs reference £3,600, running costs reference £190)**

| Independent variables | Chose heat pump (High demand on gas grid controlling for heat pump installation) | Chose heat pump (High demand on gas grid) | Chose heat pump (High demand off gas grid controlling for heat pump installation) | Chose heat pump (High demand off gas grid) |
|---|---|---|---|---|
| Upfront cost = £5000 coefficient | -2.0409** | -4.1696** | -2.2696** | -1.7754** |
| Upfront cost = £5000 standard error | (0.1787) | (0.1867) | (0.1995) | (0.1258) |
| Upfront cost = £6900 coefficient | -6.8981** | -7.8946** | -5.0624** | -3.7275** |

| | | | | |
|---|---|---|---|---|
| Upfront cost = £6900 standard error | (0.3191) | (0.2701) | (0.2415) | (0.1462) |
| Upfront cost = £10000 coefficient | -9.9814** | -11.4278** | -11.9812** | -11.0570** |
| Upfront cost = £10000 standard error | (0.5133) | (0.4100) | (0.4079) | (0.3320) |
| Upfront cost = £15000 coefficient | -16.6809** | -14.3829** | -18.7514** | -16.8051** |
| Upfront cost = £15000 standard error | (1.0116) | (0.6154) | (0.6534) | (0.5607) |
| Running cost = £215 coefficient | -1.2544** | -0.9460** | -0.9372** | -0.9347** |
| Running cost = £215 standard error | (0.1332) | (0.1246) | (0.1161) | (0.1058) |
| Running cost = £230 coefficient | -1.7539** | -1.9010** | -1.4545** | -1.5995** |
| Running cost = £230 standard error | (0.1230) | (0.1272) | (0.1073) | (0.1093) |
| Running cost = £240 coefficient | -3.4176** | -2.4464** | -1.7538** | -1.7338** |
| Running cost = £240 standard error | (0.1740) | (0.1433) | (0.1373) | (0.1165) |

| | | | | |
|---|---|---|---|---|
| Heat pump installation coefficient | - | 1.9494** | - | 0.6733** |
| Heat pump installation standard error | - | (0.1946) | - | (0.1971) |
| Observations | 1,453 | 1,453 | 2,087 | 2,087 |

Notes: This table displays the attribute level coefficients as log odd ratios estimated using the mixed logit model with panel data to account for unobserved preference heterogeneity. The model was estimated using the mixlogit command with 500 random Halton draws in Stata 15. The dependent variable is, in each case, whether participants chose to install a heat pump (rather than renew their existing heating system). The dependent variables are presented in the top row, and the independent variables are presented in the leftmost column. Each observation in the dataset represents a choice between participants' existing heating system or a heat pump, and each participant makes multiple choices. The upfront and/or the running costs of the heat pump are varied each time participants' make a choice, while the upfront and running costs of their existing heating system depends on the characteristics of their home and whether they are on or off the gas grid. Models presented in this table are ran on the following subsets of the sample: a) those with high energy consumption homes who are on the gas grid, and b) those with high energy consumption homes who are off the gas grid. Results of two models are presented for each sample, the first only includes upfront and running costs as attributes and the second also includes an attribute for installation of heat pump, which differentiates the option from the status quo heating system. In both columns, cost attributes are modelled as categorical variables. Regression coefficient estimates are displayed without parenthesis, and standard errors for the estimates are presented beneath each respective estimate. Statistical significance is indicated by stars: * p<0.05, **p<0.01.

**Table 50: Mixed logistical regression – categorical upfront and running costs (low energy consumption, upfront cost reference £3,000, running cost reference £165)**

| Independent variables | Chose heat pump (Low demand on gas grid controlling for heat pump installation) | Chose heat pump (Low demand on gas grid) | Chose heat pump (Low demand off gas grid controlling for heat pump installation) | Chose heat pump (Low demand off gas grid) |
|---|---|---|---|---|
| Upfront cost = £3600 coefficient | -0.0697 | -1.3714** | -0.5865 | -0.2666 |
| Upfront cost = £3600 standard error | (0.1121) | (0.1042) | (0.5009) | (0.3664) |

| | | | | |
|---|---|---|---|---|
| Upfront cost = £6000 coefficient | -7.4971** | -7.6168** | -3.0241** | -3.4509** |
| Upfront cost = £6000 standard error | (0.2866) | (0.2033) | (0.7456) | (0.4048) |
| Upfront cost = £8000 coefficient | -8.7651** | -9.2579** | -9.1985** | -8.6975** |
| Upfront cost = £8000 standard error | (0.3554) | (0.2573) | (1.0499) | (0.8487) |
| Upfront cost = £10000 coefficient | -11.9703** | -11.3534** | -14.3095** | -12.8830** |
| Upfront cost = £10000 standard error | (0.6248) | (0.3450) | (1.6580) | (1.3542) |
| Running cost = £180 coefficient | -1.0650** | -0.7459** | -0.8626** | -0.6349* |
| Running cost = £180 standard error | (0.1002) | (0.0939) | (0.3643) | (0.3206) |
| Running cost = £190 coefficient | -1.2577** | -1.2891** | -1.1187** | -1.2274** |
| Running cost = £190 standard error | (0.0908) | (0.0907) | (0.3243) | (0.3319) |
| Running cost = £200 coefficient | -2.6703** | -1.8737** | -1.1389* | -1.4926** |

| | | | | |
|---|---|---|---|---|
| Running cost = £200 standard error | (0.1422) | (0.0989) | (0.4455) | (0.3467) |
| Heat pump installation coefficient | - | 1.3426** | - | -0.6871 |
| Heat pump installation standard error | - | (0.1491) | - | (0.7066) |
| Observations | 2,328 | 2,328 | 218 | 218 |

Notes: This table displays the attribute level coefficients as log odd ratios estimated using the mixed logit model with panel data to account for unobserved preference heterogeneity. The model was estimated using the mixlogit command with 500 random Halton draws in Stata 15. The dependent variable is, in each case, whether participants chose to install a heat pump (rather than renew their existing heating system). The dependent variables are presented in the top row, and the independent variables are presented in the leftmost column. Each observation in the dataset represents a choice between participants' existing heating system or a heat pump, and each participant makes multiple choices. The upfront and/or the running costs of the heat pump are varied each time participants' make a choice, while the upfront and running costs of their existing heating system depends on the characteristics of their home and whether they are on or off the gas grid. Models presented in this table are ran on the following subsets of the sample: a) those with low energy consumption homes who are on the gas grid, and b) those with low energy consumption homes who are off the gas grid. Results of two models are presented for each sample, the first only includes upfront and running costs as attributes and the second also includes an attribute for installation of heat pump, which differentiates the option from the status quo heating system. In both columns, cost attributes are modelled as categorical variables. Regression coefficient estimates are displayed without parenthesis, and standard errors for the estimates are presented beneath each respective estimate. Statistical significance is indicated by stars: * p<0.05, **p<0.01.

## Plotting participants' choice data

The figures presented in this section plot participants choice data, with linear projections made between choice sets. Each figure presents a demand curve for a different type of cost (either upfront costs or running costs) and a different group (high gas, high oil, low gas, and low oil). Within each figure, the relationship between that given cost and demand is plotted while the omitted cost is held fixed at a different level for each curve. The figures all plot the share of participants who chose the heat pump option in the hypothetical scenarios they were presented with at different cost levels. These figures are useful to observe how upfront costs and running costs interact with one another and how that affects demand for heat pumps[27]. These figures can be used to complement the results found in the main regression specification, which test whether the relationships we observe in the figures are indeed statistically significant.

For example, in Figure 1 we see a slight downward sloping running cost demand curve for those in the high energy demand on gas grid group when upfront costs are fixed at £3,600. More specifically, it seems like around 75% of participants in this group chose a heat pump when the running cost of the heat pump was £195 and the upfront cost was £3,600, and that the share who chose a heat pump went down to around 68% when the running cost rose to £240 (holding the upfront cost constant). This suggests that there is a positive interaction effect between running costs and upfront costs. More specifically, that the effect of upfront costs on demand is lower when running costs increase. As we can see in Figure 3, the same relationship seems to be true. In other words, that the effect of running costs on demand is lower the greater the upfront cost. It is important to note, however, that participants were presented with a hypothetical scenario in the study. As such, while we do find that there is indeed a statistically significant positive interaction effect between upfront and running costs (see Table 39 in the Technical Annex), the magnitude of the effect observed in the figures should be interpreted with caution.

[27] It's important to note that monthly running costs were presented to participants as total energy bills (i.e., combining gas and electricity costs), calculated based on average prices from 2022-2023, representing peak billing costs.

**Figure 1: The relationship between running costs and demand at different levels of upfront costs – high energy demand on gas grid group (cost of status quo: £3,600 upfront and £200 running)**

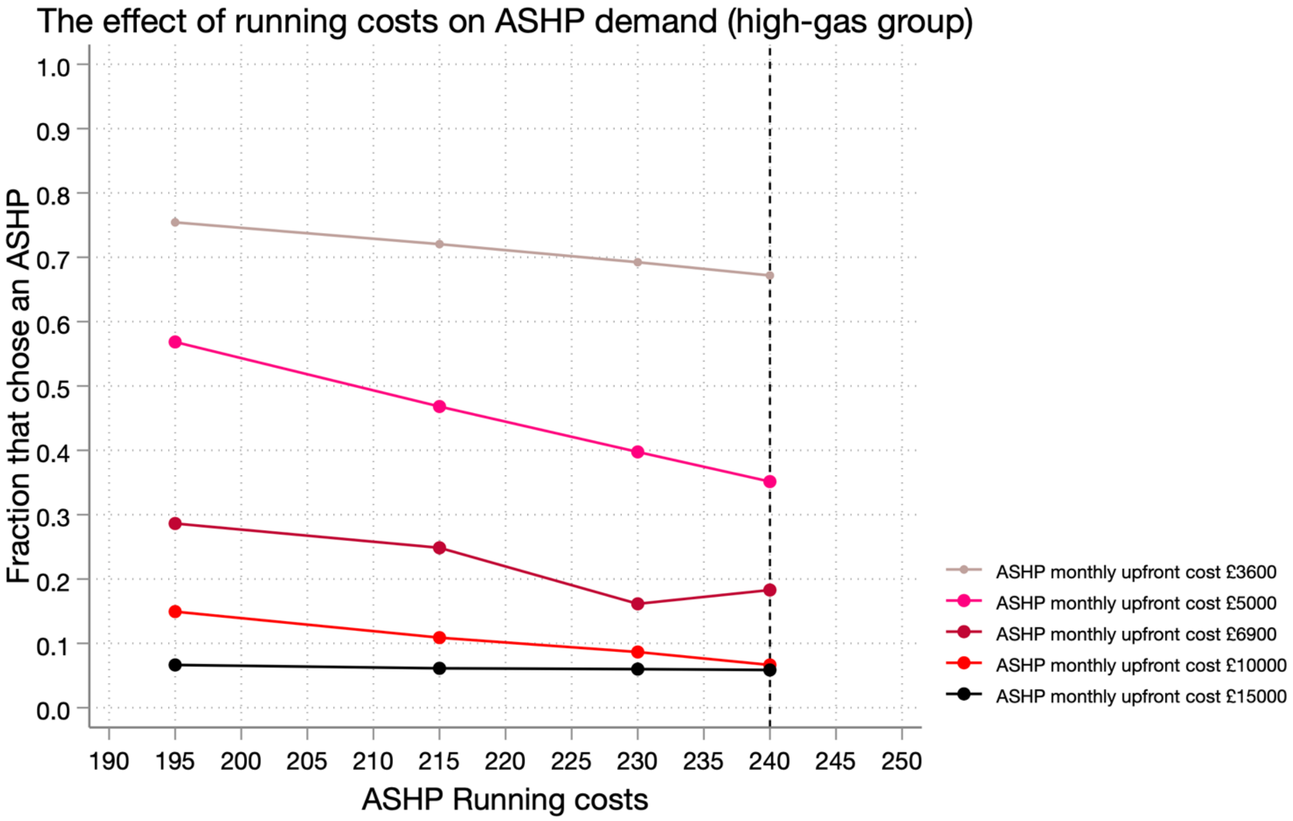


**Figure 2: The relationship between upfront costs and demand at different levels of running costs – high energy demand on gas grid group (cost of status quo: £3,600 upfront and £200 running)**

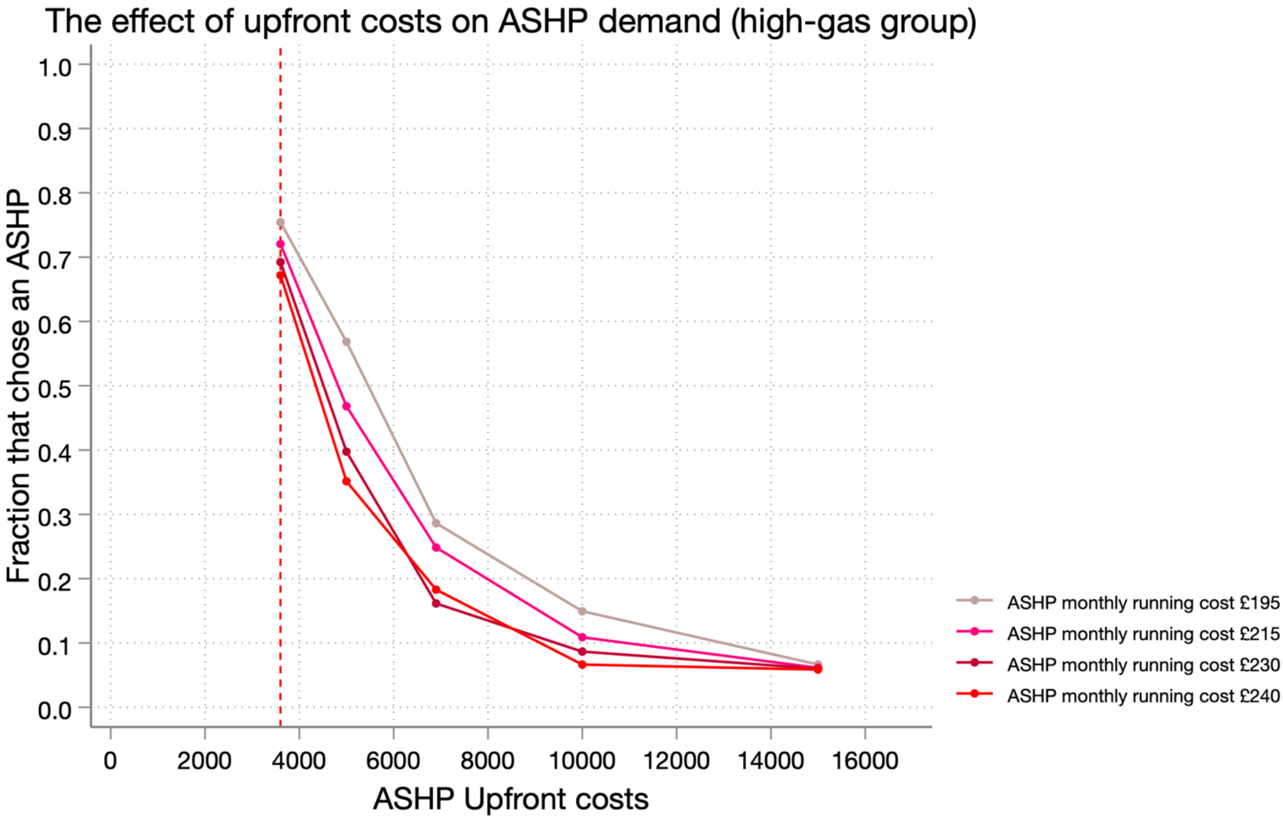


**Figure 3: The relationship between running costs and demand at different levels of upfront costs – high energy demand off gas grid group (cost of status quo: £6,900 upfront and £240 running)**

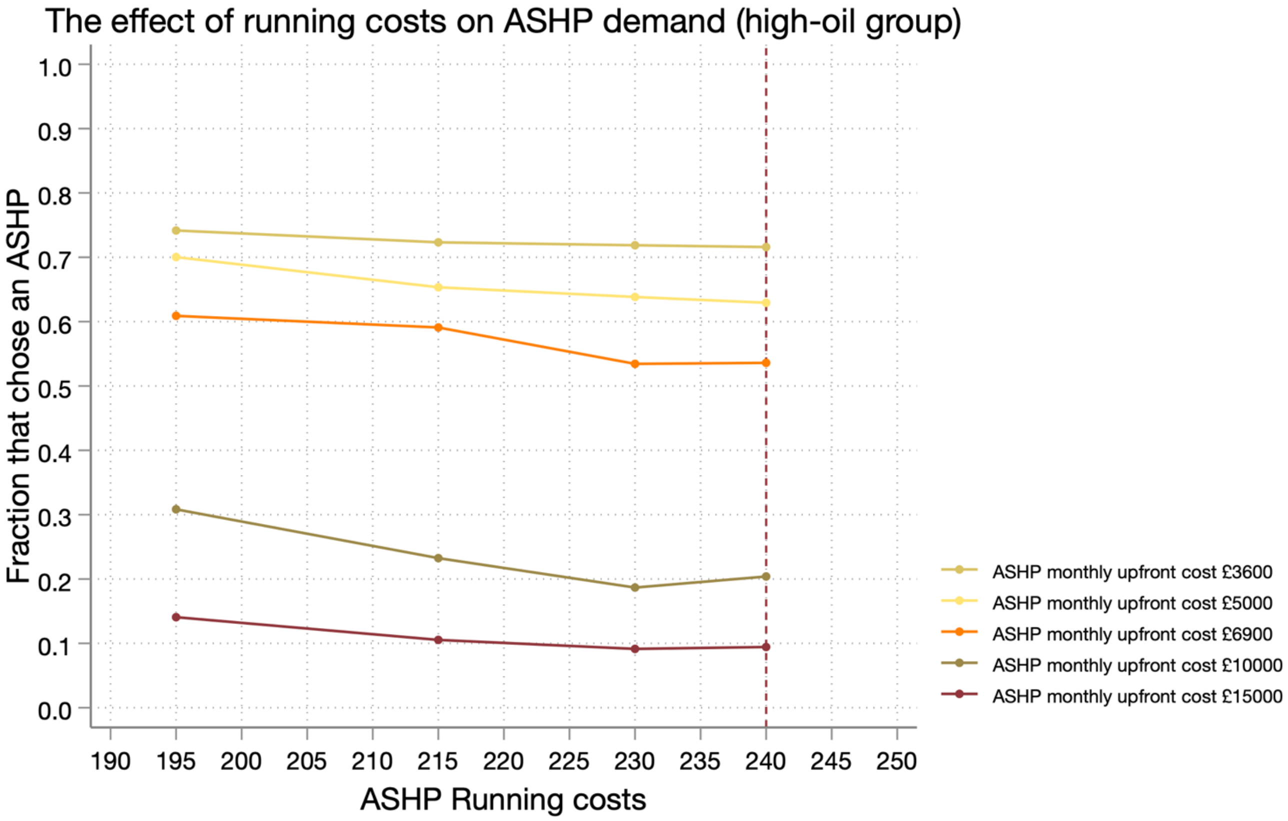


**Figure 4: The relationship between upfront costs and demand at different levels of running costs – high energy demand off gas grid group (cost of status quo: £6,900 upfront and £240 running)**

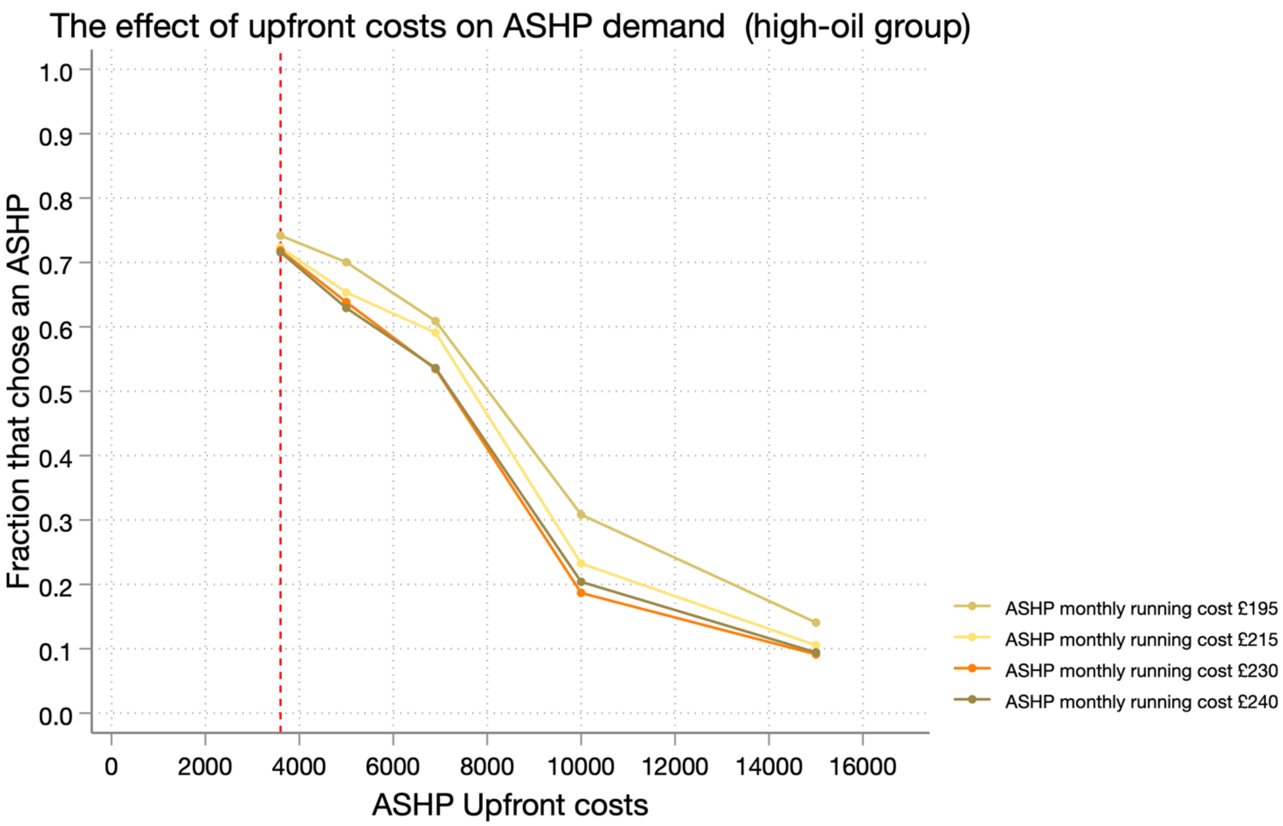


**Figure 5: The relationship between running costs and demand at different levels of upfront costs – low energy demand on gas grid group (cost of status quo: £3,000 upfront and £200 running)**

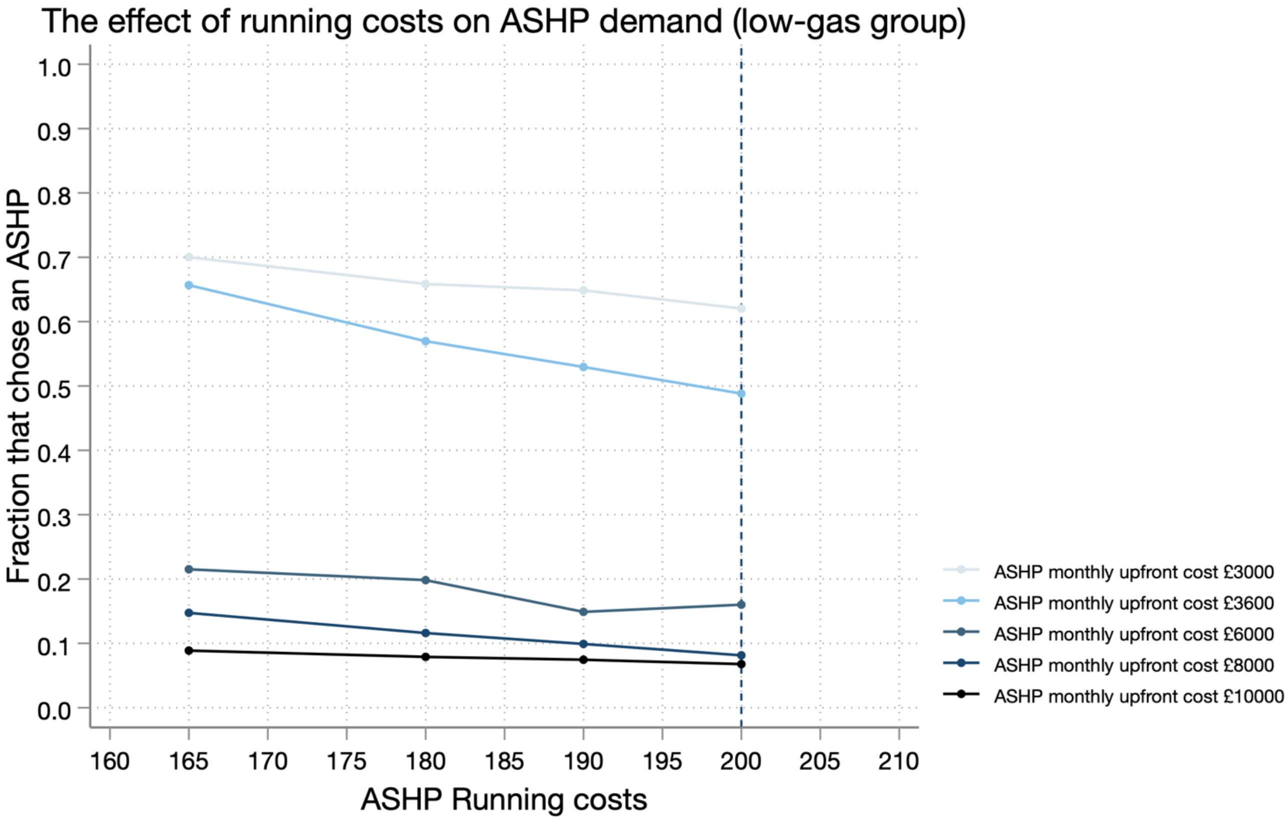


**Figure 6: The relationship between upfront costs and demand at different levels of running costs – low energy demand on gas grid group (cost of status quo: £6,000 upfront and £200 running)**

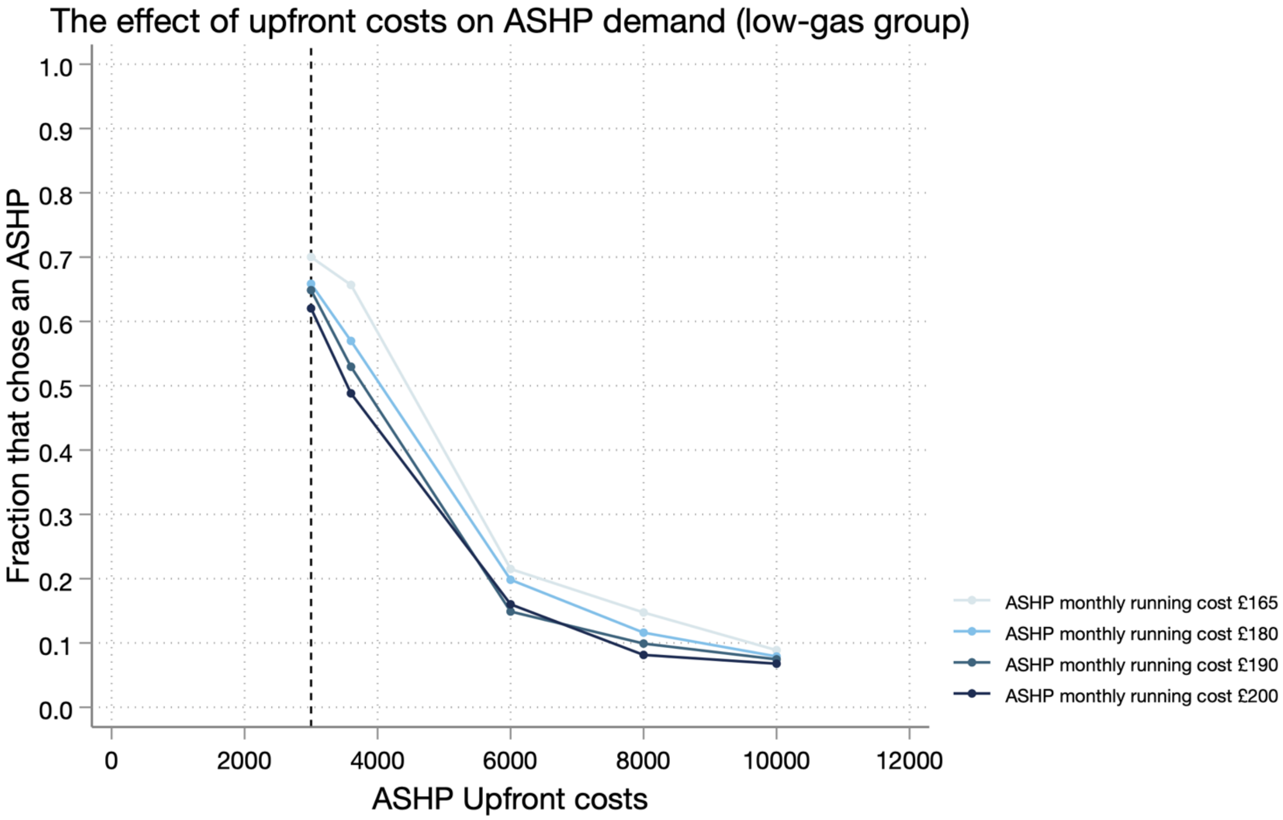


**Figure 7: The relationship between running costs and demand at different levels of upfront costs – low energy demand off gas grid group (cost of status quo: £6,900 upfront and £240 running)**

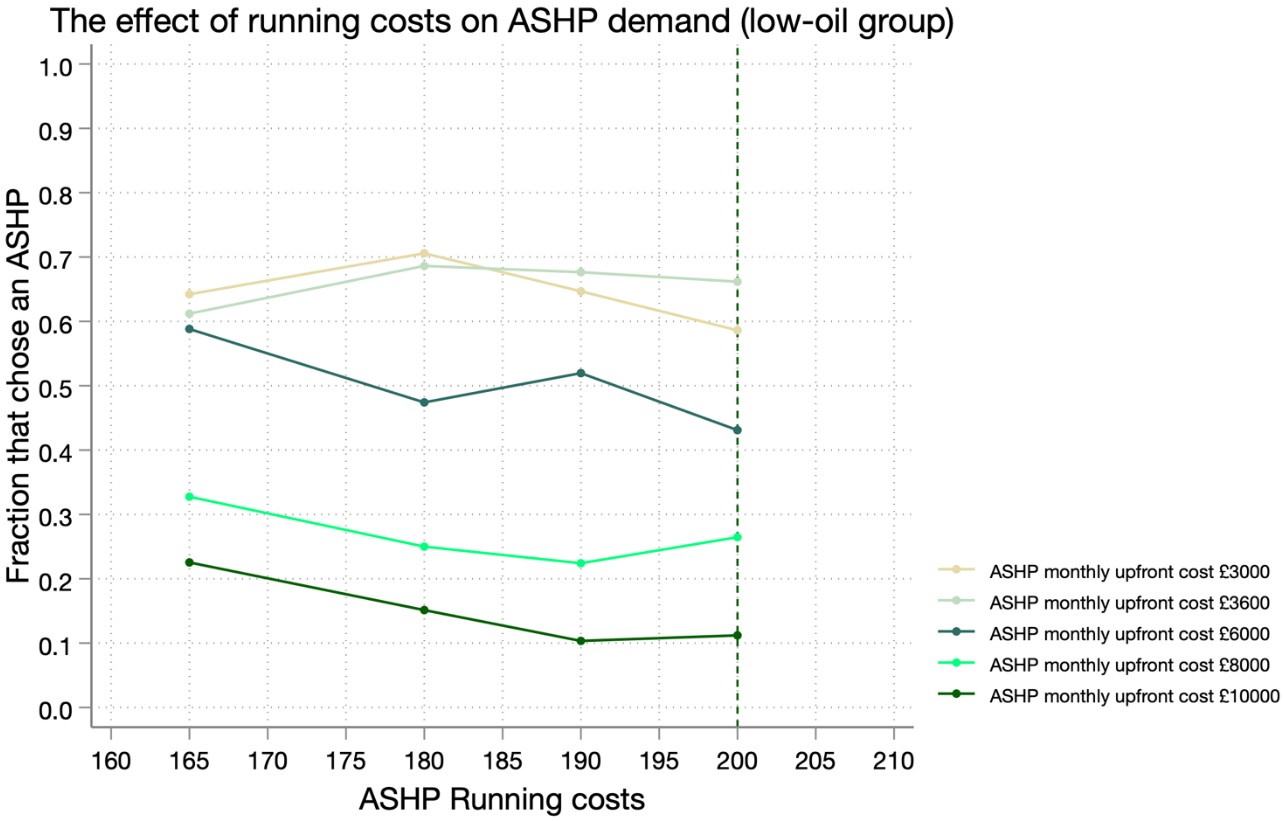


**Figure 8: The relationship between upfront costs and demand at different levels of running costs – low energy demand off gas grid group (cost of status quo: £6,000 upfront and £200 running)**

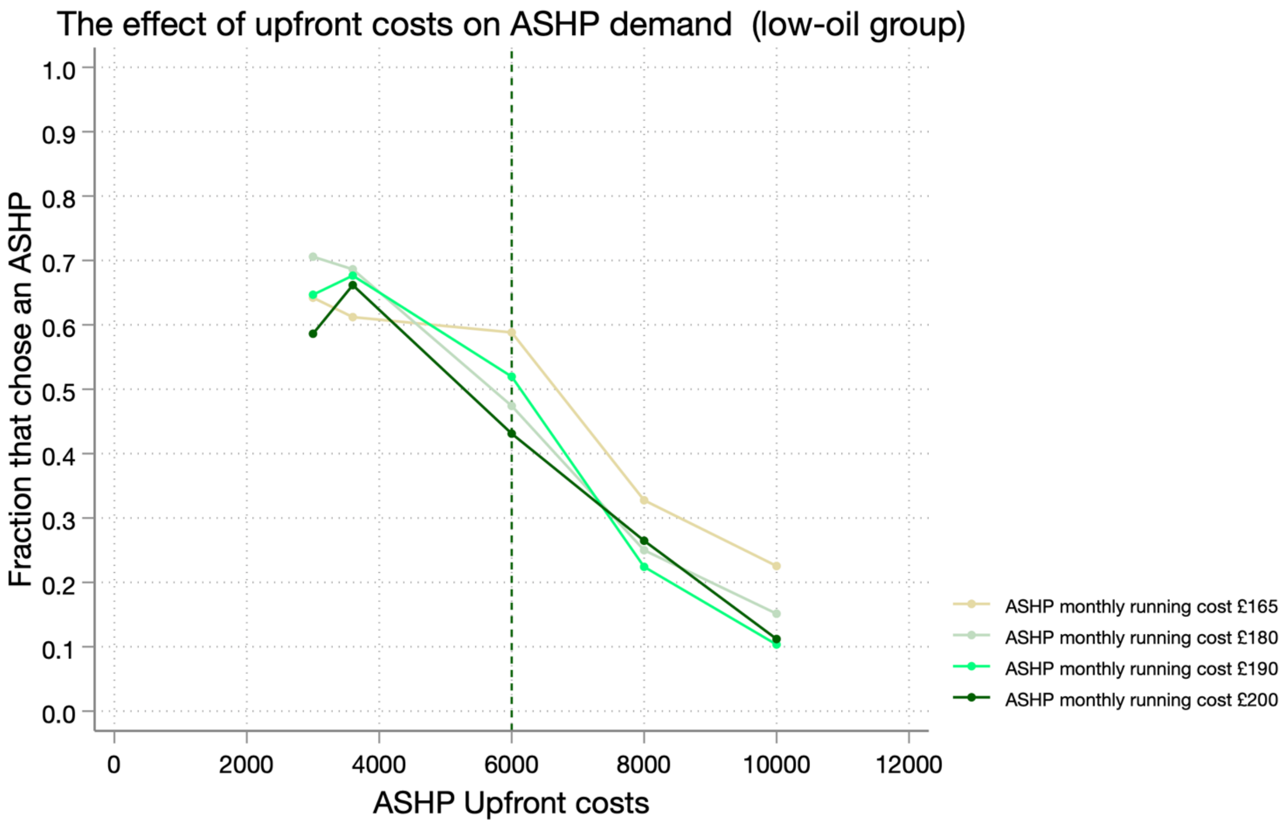



**Table 51: Percentage of participants that chose a heat pump at different upfront and running cost levels - high energy demand on gas grid group (cost of status quo: upfront £3,600 and £200 running)**

| Choice Set | Upfront Cost | Running Cost | percentage that chose a heat Pump | N |
|---|---|---|---|---|
| 13 | 3600 | 195 | 76% | 737 |
| 26 | 3600 | 195 | 75% | 716 |
| 1 | 3600 | 215 | 72% | 737 |
| 2 | 3600 | 230 | 68% | 716 |
| 5 | 3600 | 230 | 70% | 737 |
| 6 | 3600 | 240 | 67% | 716 |

| | | | | |
|---|---|---|---|---|
| 18 | 5000 | 195 | 57% | 716 |
| 25 | 5000 | 215 | 47% | 737 |
| 3 | 5000 | 230 | 40% | 737 |
| 19 | 5000 | 240 | 35% | 737 |
| 21 | 5000 | 240 | 35% | 737 |
| 17 | 6900 | 195 | 29% | 737 |
| 12 | 6900 | 215 | 25% | 716 |
| 14 | 6900 | 215 | 25% | 716 |
| 11 | 6900 | 230 | 16% | 737 |
| 16 | 6900 | 240 | 18% | 716 |
| 24 | 10000 | 195 | 15% | 716 |
| 10 | 10000 | 215 | 11% | 716 |
| 20 | 10000 | 230 | 9% | 716 |
| 23 | 10000 | 240 | 7% | 737 |
| 15 | 10000 | 240 | 7% | 737 |
| 9 | 15000 | 195 | 7% | 737 |
| 7 | 15000 | 215 | 6% | 737 |
| 8 | 15000 | 215 | 6% | 716 |
| 4 | 15000 | 230 | 6% | 716 |
| 22 | 15000 | 240 | 6% | 716 |

**Table 52: Percentage of participants that chose a heat pump at different upfront and running cost levels - High energy demand off gas grid group (cost of status quo: upfront £6,900 and £240 running)**

| Choice Set | Upfront Cost | Running Cost | Percentage that chose a heat Pump | N |
|---|---|---|---|---|
| 26 | 3600 | 195 | 75% | 1028 |
| 13 | 3600 | 195 | 74% | 1059 |
| 1 | 3600 | 215 | 72% | 1059 |
| 5 | 3600 | 230 | 71% | 1059 |
| 2 | 3600 | 230 | 73% | 1028 |
| 6 | 3600 | 240 | 72% | 1028 |
| 18 | 5000 | 195 | 70% | 1028 |
| 25 | 5000 | 215 | 65% | 1059 |
| 3 | 5000 | 230 | 64% | 1059 |
| 21 | 5000 | 240 | 63% | 1059 |
| 19 | 5000 | 240 | 63% | 1059 |
| 17 | 6900 | 195 | 61% | 1059 |
| 14 | 6900 | 215 | 60% | 1028 |
| 12 | 6900 | 215 | 59% | 1028 |
| 11 | 6900 | 230 | 53% | 1059 |
| 16 | 6900 | 240 | 54% | 1028 |
| 24 | 10000 | 195 | 31% | 1028 |
| 10 | 10000 | 215 | 23% | 1028 |
| 20 | 10000 | 230 | 19% | 1028 |
| 15 | 10000 | 240 | 20% | 1059 |
| 23 | 10000 | 240 | 20% | 1059 |
| 9 | 15000 | 195 | 14% | 1059 |
| 7 | 15000 | 215 | 11% | 1059 |

| | | | | |
|---|---|---|---|---|
| 8 | 15000 | 215 | 10% | 1028 |
| 4 | 15000 | 230 | 9% | 1028 |
| 22 | 15000 | 240 | 9% | 1028 |

**Table 53:** Percentage of participants that chose a heat pump at different upfront and running cost levels - low energy demand on gas grid group (cost of status quo: upfront £3,000 and £200 running)

| Choice Set | Upfront Cost | Running Cost | Percentage that chose a heat Pump | N |
|---|---|---|---|---|
| 26 | 3000 | 165 | 71% | 1180 |
| 13 | 3000 | 165 | 69% | 1148 |
| 1 | 3000 | 180 | 66% | 1148 |
| 2 | 3000 | 190 | 66% | 1180 |
| 5 | 3000 | 190 | 64% | 1148 |
| 6 | 3000 | 200 | 62% | 1180 |
| 18 | 3600 | 165 | 66% | 1180 |
| 25 | 3600 | 180 | 57% | 1148 |
| 3 | 3600 | 190 | 53% | 1148 |
| 19 | 3600 | 200 | 49% | 1148 |
| 21 | 3600 | 200 | 48% | 1148 |
| 17 | 6000 | 165 | 22% | 1148 |
| 12 | 6000 | 180 | 20% | 1180 |
| 14 | 6000 | 180 | 20% | 1180 |

| | | | | |
|---|---|---|---|---|
| 11 | 6000 | 190 | 15% | 1148 |
| 16 | 6000 | 200 | 16% | 1180 |
| 24 | 8000 | 165 | 15% | 1180 |
| 10 | 8000 | 180 | 12% | 1180 |
| 20 | 8000 | 190 | 10% | 1180 |
| 23 | 8000 | 200 | 8% | 1148 |
| 15 | 8000 | 200 | 8% | 1148 |
| 9 | 10000 | 165 | 9% | 1148 |
| 7 | 10000 | 180 | 7% | 1148 |
| 8 | 10000 | 180 | 9% | 1180 |
| 4 | 10000 | 190 | 7% | 1180 |
| 22 | 10000 | 200 | 7% | 1180 |

**Table 54: Percentage of participants that chose a heat pump at different upfront and running cost levels - low energy demand off gas grid group (cost of status quo: upfront £6,000 and £200 running)**

| Choice Set | Upfront Cost | Running Cost | Percentage that chose a heat Pump | N |
|---|---|---|---|---|
| 26 | 3000 | 165 | 58% | 116 |
| 13 | 3000 | 165 | 72% | 102 |
| 1 | 3000 | 180 | 71% | 102 |
| 2 | 3000 | 190 | 61% | 116 |
| 5 | 3000 | 190 | 69% | 102 |

| | | | | |
|---|---|---|---|---|
| 6 | 3000 | 200 | 59% | 116 |
| 18 | 3600 | 165 | 61% | 116 |
| 25 | 3600 | 180 | 69% | 102 |
| 3 | 3600 | 190 | 68% | 102 |
| 19 | 3600 | 200 | 67% | 102 |
| 21 | 3600 | 200 | 66% | 102 |
| 17 | 6000 | 165 | 59% | 102 |
| 14 | 6000 | 180 | 46% | 116 |
| 12 | 6000 | 180 | 49% | 116 |
| 11 | 6000 | 190 | 52% | 102 |
| 16 | 6000 | 200 | 43% | 116 |
| 24 | 8000 | 165 | 33% | 116 |
| 10 | 8000 | 180 | 25% | 116 |
| 20 | 8000 | 190 | 22% | 116 |
| 15 | 8000 | 200 | 26% | 102 |
| 23 | 8000 | 200 | 26% | 102 |
| 9 | 10000 | 165 | 23% | 102 |
| 7 | 10000 | 180 | 20% | 102 |
| 8 | 10000 | 180 | 11% | 116 |
| 4 | 10000 | 190 | 10% | 116 |
| 22 | 10000 | 200 | 11% | 116 |

## Correlational analysis

The tables in this section present the results from the correlational analysis performed to understand the associations between choosing a heat pump in the DCE and a range of household and individual characteristics. The tables in this section present results from OLS regressions conducted using the DCE choice-level data set. In all regressions, standard errors are clustered at the individual level.

Table 55 presents the results of a correlational analysis of heat pump uptake and heating system characteristics. This table allows us to understand the relationship between heating system characteristics of respondents and the likelihood of wanting to install a heat pump. The first column contains results from a single multivariate OLS regression, whereas the second column contains results from multiple (one per variable) bi-variate OLS regressions. In other words, the coefficients presented in the second column are obtained without controlling for any other factors. The coefficients presented in the first column are obtained by controlling for all of the other variables listed in the table. This is the case for the other correlational tables as well. Only coefficients with * or ** are statistically significant at a 5% level or less.

Across all regression tables in this section, the figures in the second column onwards that are on the same rows as variable names represent the coefficient value for that variable. For example, in Table 55, the coefficient “0.1524” which is in the second column on the same row as “High consumption off-grid (oil)” represents the change in the probability that a participant chose a heat pump if they were in the high consumption off-gas grid group relative to those who were in the high consumption on gas grid group. Further, the coefficient “0.1524” shows that participants who are in the high consumption off-grid group are 15.24 percentage points more likely to choose a heat pump than those in the high-consumption on-grid group. The figures shown in parentheses beneath the coefficients represent the standard errors.

Finally, all independent variables used in this sub-section are binary.

**Table 55: Heat pump uptake and heating system characteristics**

| Independent variable | Heat pump chosen (other factors controlled for) | Heat pump chosen (other factors not controlled for) |
|---|---|---|
| High consumption on-grid (gas) coefficient | - | -0.0756** |
| High consumption on-grid (gas) standard error | - | (0.0084) |
| High consumption off-grid (oil) coefficient | 0.1524** | 0.1357** |
| High consumption off-grid (oil) standard error | (0.0100) | (0.0085) |

| | | |
|---|---|---|
| Low consumption on-grid (gas) coefficient | 0.0146 | -0.0816** |
| Low consumption on-grid (gas) standard error | (0.0090) | (0.0078) |
| Low consumption off-grid (oil) coefficient | 0.1398** | 0.0711** |
| Low consumption off-grid (oil) standard error | (0.0252) | (0.0250) |
| High consumption coefficient | - | 0.0691** |
| ‘’Standard error | - | (0.0078) |
| On-grid (gas) coefficient | - | -0.1404** |
| ‘’Standard error | - | (0.0082) |
| Age of heating system: 4 years old or less (DK omitted) coefficient | -0.0413* | -0.0321** |
| Age of heating system: 4 years old or less (DK omitted) standard error | (0.0171) | (0.0085) |
| Age of heating system: 5-9 years old (DK omitted) coefficient | -0.0220 | -0.0038 |
| Age of heating system: 5-9 years old (DK omitted) standard error | (0.0174) | (0.0091) |
| Age of heating system: 10-14 years old (DK omitted) coefficient | -0.0271 | 0.0045 |
| Age of heating system: 10-14 years old (DK omitted) standard error | (0.0179) | (0.0102) |
| Age of heating system: 15+ years old (DK omitted) coefficient | -0.0419* | 0.0236* |
| Age of heating system: 15+ years old (DK omitted) standard error | (0.0175) | (0.0093) |
| Owns an electric vehicle coefficient | 0.0967** | 0.1186** |
| Owns an electric vehicle standard error | (0.0118) | (0.0122) |
| Property has wall insulation coefficient | -0.0011 | -0.0094 |
| Property has wall insulation standard error | (0.0078) | (0.0079) |
| Property has a smart meter coefficient | 0.0422** | 0.0297** |

| | | |
|---|---|---|
| Property has a smart meter standard error | (0.0078) | (0.0080) |
| Property has a solar panel coefficient | -0.0061 | 0.0298* |
| Property has a solar panel standard error | (0.0122) | (0.0125) |
| Property has double/triple glazing coefficient | 0.0131 | -0.0049 |
| Property has double/triple glazing standard error | (0.0134) | (0.0135) |
| Property has loft insulation coefficient | -0.0420** | -0.0232* |
| Property has loft insulation standard error | (0.0114) | (0.0114) |
| Property has underfloor insulation coefficient | 0.0182 | 0.0376** |
| Property has underfloor insulation standard error | (0.0118) | (0.0120) |
| Heating system will need replacing within next 2 years coefficient | 0.0234 | 0.0516** |
| Heating system will need replacing within next 2 years standard error | (0.0139) | (0.0138) |
| Planning to renovate home in near future coefficient | 0.0185* | 0.0475** |
| Planning to renovate home in near future standard error | (0.0079) | (0.0079) |
| Planning to improve energy efficiency in the near future coefficient | 0.0914** | 0.1140** |
| Planning to improve energy efficiency in the near future standard error | (0.0095) | (0.0093) |
| Constant coefficient | 0.2981** | - |
| Constant standard error | (0.0218) | - |
| Observations | 79118 | 79118 |

Notes: This table presents results from a multivariate regression (Column 1) and 20 bi-variate regressions (Column 2), all results are interpreted as correlations since the independent variables are not randomly assigned or exogenous to the individuals. All regressions are run using Linear Probability Models (i.e., OLS models). The dependent variable is, in each case, whether participants chose to install a heat pump (rather than renew their existing heating system). The dependent variables are presented in the top row, and the independent variables are presented in the leftmost column. Each observation in the dataset represents a choice between participants' existing heating system or a heat pump, and each participant makes multiple choices. The upfront and/or the running costs of the heat pump are varied each time participants' make a choice, while the upfront and running costs of their existing heating system depends on the characteristics of their home and whether they are on or off the gas grid. Column 1 presents results from a single regression conducted using the full study sample and all variables are included as independent variables. Column 2 presents results from separate bi-variate regressions (one per independent variable) conducted using the full study sample. The table lacks coefficients in instances where we have categorical variables that are omitted to avoid collinearity with other related variables. In places where categorical variables are used, there is an indication for which variable was omitted (and should be used as the reference point). Regression coefficient estimates are displayed without brackets, and standard errors for the estimates are presented beneath each respective estimate in brackets. Standard errors are clustered on a participant level. Statistical significance is indicated by stars: * p<0.05, **p<0.01.

Table 56 presents the results of a correlational analysis of socio-demographic characteristics. The first column contains results from a single multivariate OLS regression, whereas the second column contains results from multiple (one per variable) bi-variate OLS regressions. This table allows us to understand the relationship between socio-demographic characteristics of respondents and the likelihood of wanting to install a heat pump.

**Table 56: Heat pump uptake and socio-demographic characteristics**

| Independent variable | Heat pump chosen (other factors controlled for) | Heat pump chosen (other factors not controlled for) |
|---|---|---|
| Gender: Female (male omitted) coefficient | 0.0059 | 0.0098 |
| Gender: Female (male omitted) standard error | (0.0080) | (0.0079) |
| Age: 18 - 24 (Prefer not to say omitted) coefficient | 0.1108 | 0.0566 |
| Age: 18 - 24 (Prefer not to say omitted) standard error | (0.0660) | (0.0589) |
| Age: 25 - 34 (Prefer not to say omitted) coefficient | 0.0788** | 0.0456** |
| Age: 25 - 34 (Prefer not to say omitted) standard error | (0.0277) | (0.0124) |
| Age: 35 - 44 (Prefer not to say omitted) coefficient | 0.0753** | 0.0446** |
| Age: 35 - 44 (Prefer not to say omitted) standard error | (0.0266) | (0.0099) |
| Age: 45 - 54 (Prefer not to say omitted) coefficient | 0.0879** | 0.0537** |
| Age: 45 - 54 (Prefer not to say omitted) standard error | (0.0263) | (0.0098) |
| Age: 55 - 64 (Prefer not to say omitted) coefficient | 0.0578* | 0.0029 |
| Age: 55 - 64 (Prefer not to say omitted) standard error | (0.0258) | (0.0095) |
| Age: 65 - 74 (Prefer not to say omitted) coefficient | 0.0459 | -0.0241* |
| Age: 65 - 74 (Prefer not to say omitted) standard error | (0.0260) | (0.0102) |
| Age: 75 - 84 (Prefer not to say omitted) coefficient | -0.0154 | -0.0960** |
| Age: 75 - 84 (Prefer not to say omitted) standard error | (0.0272) | (0.0131) |

| | | |
|---|---|---|
| Age: 85 or older (Prefer not to say omitted) coefficient | 0.0009 | -0.0838** |
| Age: 85 or older (Prefer not to say omitted) standard error | (0.0393) | (0.0316) |
| Income: Less than £20k (DK omitted) coefficient | 0.0295 | -0.0352** |
| Income: Less than £20k (DK omitted) standard error | (0.0154) | (0.0131) |
| Income: £20k-£40k (DK omitted) coefficient | 0.0442** | -0.0140 |
| Income: £20k-£40k (DK omitted) standard error | (0.0129) | (0.0100) |
| Income: £40k-£60k (DK omitted) coefficient | 0.0620** | 0.0250* |
| Income: £40k-£60k (DK omitted) standard error | (0.0132) | (0.0099) |
| Income: £60k-£100k (DK omitted) coefficient | 0.0911** | 0.0711** |
| Income: £60k-£100k (DK omitted) standard error | (0.0137) | (0.0098) |
| Income: £100k or more (DK omitted) coefficient | 0.0955** | 0.0814** |
| Income: £100k or more (DK omitted) standard error | (0.0163) | (0.0120) |
| Has £10k or more in savings coefficient | 0.0348** | 0.0634** |
| Has £10k or more in savings standard error | (0.0093) | (0.0080) |
| Struggles to pay household bills at least sometimes coefficient | 0.0182 | 0.0132 |
| Struggles to pay household bills at least sometimes standard error | (0.0103) | (0.0097) |
| Constant coefficient | 0.2538** | - |
| Constant standard error | (0.0238) | - |
| Observations | 79118 | 79118 |

Notes: This table presents results from a multivariate regression and 16 bi-variate regressions, all results are interpreted as correlations since the independent variables are not randomly assigned or exogenous to the individuals. All regressions are run using Linear Probability Models (i.e., OLS models). The dependent variable is, in each case, whether participants chose to install a heat pump (rather than renew their existing heating system). The dependent variables are presented in the top row, and the independent variables are presented in the leftmost column. Each observation in the dataset represents a choice between participants' existing heating system or a heat pump, and each participant makes multiple choices. The upfront and/or the running costs of the heat pump are varied each time participants' make a choice, while the upfront and running costs of their existing heating system depends on the characteristics of their home and whether they are on or off the gas grid. Column 1 presents results from a single regression conducted using the full study sample and all variables are included as independent variables. Column 2 presents results from separate bi-variate regressions (one per independent variable) conducted using the full study sample. The table lacks coefficients in instances where we have categorical variables that are omitted to avoid collinearity with other related variables. In places where categorical variables are used, there is an indication for which variable was omitted (and should be used as the reference point). Regression coefficient estimates are displayed without brackets, and standard errors for the estimates are presented beneath each respective estimate. Standard errors are clustered on a participant level. Statistical significance is indicated by stars: * p<0.05, **p<0.01.

Table 57 presents the results of a correlational analysis of heat pump uptake and environmental attitudes and knowledge about heat pumps. The first column contains results from a single multivariate OLS regression, whereas the second column contains results from multiple (one per variable) bi-variate OLS regressions. This table allows us to understand the relationship between respondents’ attitudes and knowledge about heat pumps and the likelihood of wanting to install a heat pump.

**Table 57: Heat pump uptake and environmental attitudes, knowledge about heat pumps**

| Independent variable | Heat pump chosen (other factors controlled for) | Heat pump chosen (other factors not controlled for) |
|---|---|---|
| Moderately or very concerned about climate change coefficient | 0.0652** | 0.1601** |
| Moderately or very concerned about climate change standard error | (0.0082) | (0.0085) |
| Expects energy prices to increase in the next 2 years coefficient | -0.0283* | -0.0020 |
| Expects energy prices to increase in the next 2 years standard error | (0.0122) | (0.0078) |
| Expects own energy prices to increase in the next 2 years coefficient | 0.0349** | 0.0206** |
| Expects own energy prices to increase in the next 2 years standard error | (0.0122) | (0.0078) |
| Factors that influence heating system choice: Saving money on monthly bills coefficient | 0.0849** | 0.1091** |
| Factors that influence heating system choice: Saving money on monthly bills standard error | (0.0074) | (0.0081) |
| Factors that influence heating system choice: Saving money on upfront costs coefficient | -0.0295** | -0.0300** |
| Factors that influence heating system choice: Saving money on upfront costs standard error | (0.0088) | (0.0101) |
| Factors that influence heating system choice: Home is heated comfortably coefficient | -0.0116 | -0.0066 |

| | | |
|---|---|---|
| Factors that influence heating system choice: Home is heated comfortably standard error | (0.0083) | (0.0093) |
| Factors that influence heating system choice: Minimising environmental impact coefficient | 0.1871** | 0.2156** |
| Factors that influence heating system choice: Minimising environmental impact standard error | (0.0081) | (0.0080) |
| Factors that influence heating system choice: Being familiar with the heating system choice coefficient | -0.0570** | -0.1248** |
| Factors that influence heating system choice: Being familiar with the heating system choice standard error | (0.0083) | (0.0081) |
| Factors that influence heating system choice: Minimising occupied space coefficient | -0.0637** | -0.1337** |
| Factors that influence heating system choice: Minimising occupied space standard error | (0.0085) | (0.0081) |
| Factors that influence heating system choice: Minimising time/inconvenience coefficient | -0.1112** | -0.1783** |
| Factors that influence heating system choice: Minimising time/inconvenience standard error | (0.0096) | (0.0086) |
| HP knowledge: Has not heard of them coefficient | - | -0.0333** |
| HP knowledge: Has not heard of them standard error | - | (0.0127) |
| HP knowledge: Aware but doesn’t know what they are coefficient | -0.0100 | -0.0086 |
| HP knowledge: Aware but doesn’t know what they are standard error | (0.0137) | (0.0083) |
| HP knowledge: Knows a little about them coefficient | -0.0289* | 0.0245** |
| HP knowledge: Knows a little about them standard error | (0.0146) | (0.0078) |
| HP knowledge: Knows a lot about them coefficient | -0.0752** | -0.0173 |
| HP knowledge: Knows a lot about them standard error | (0.0181) | (0.0140) |
| Passed HP knowledge test coefficient | 0.0524** | 0.0678** |
| Passed HP knowledge test standard error | (0.0104) | (0.0094) |

| | | |
|---|---|---|
| Constant coefficient | 0.2889** | - |
| Constant standard error | (0.0167) | - |
| Observations | 79118 | 79118 |

Notes: This table presents results from a multivariate regression and 15 bi-variate regressions, all results are interpreted as correlations since the independent variables are not randomly assigned or exogenous to the individuals. All regressions are run using Linear Probability Models (i.e., OLS models). The dependent variable is, in each case, whether participants chose to install a heat pump (rather than renew their existing heating system). The dependent variables are presented in the top row, and the independent variables are presented in the leftmost column. Each observation in the dataset represents a choice between participants' existing heating system or a heat pump, and each participant makes multiple choices. The upfront and/or the running costs of the heat pump are varied each time participants' make a choice, while the upfront and running costs of their existing heating system depends on the characteristics of their home and whether they are on or off the gas grid. Column 1 presents results from a single regression conducted using the full study sample and all variables are included as independent variables. Column 2 presents results from separate bi-variate regressions (one per independent variable) conducted using the full study sample. The table lacks coefficients in instances where we have categorical variables that are omitted to avoid collinearity with other related variables. In places where categorical variables are used, there is an indication for which variable was omitted (and should be used as the reference point). Regression coefficient estimates are displayed without brackets, and standard errors for the estimates are presented beneath each respective estimate. Standard errors are clustered on a participant level. Statistical significance is indicated by stars* p<0.05, **p<0.01.

Table 58 presents the results of a correlational analysis of heat pump uptake and housing characteristics. The first column contains results from a single multivariate OLS regression, whereas the second column contains results from multiple (one per variable) bi-variate OLS regressions. This table allows us to understand the relationship between housing characteristics of respondents and the likelihood of wanting to install a heat pump.

**Table 58: Heat pump uptake and housing characteristics**

| Independent variable | Heat pump chosen (other factors controlled for) | Heat pump chosen (other factors not controlled for) |
|---|---|---|
| Property type: End-terrace house coefficient | - | -0.0426** |
| Property type: End-terrace house standard error | - | (0.0159) |
| Property type: Mid-terrace house coefficient | 0.0061 | -0.0270* |
| Property type: Mid-terrace house standard error | (0.0186) | (0.0118) |
| Property type: Flat (ground floor/basement) coefficient | 0.0169 | -0.0253 |
| Property type: Flat (ground floor/basement) standard error | (0.0310) | (0.0269) |
| Property type: Bungalow coefficient | 0.0525** | -0.0138 |
| Property type: Bungalow standard error | (0.0197) | (0.0127) |

| | | |
|---|---|---|
| Property type: Detached house coefficient | 0.0604** | 0.0354** |
| Property type: Detached house standard error | (0.0173) | (0.0080) |
| Property type: Semi-detached house coefficient | 0.0319 | -0.0094 |
| Property type: Semi-detached house standard error | (0.0169) | (0.0086) |
| Property built in: Pre 1900 (DK omitted) coefficient | -0.0237 | 0.0256* |
| Property built in: Pre 1900 (DK omitted) standard error | (0.0335) | (0.0103) |
| Property built in: 1900-1929 (DK omitted) coefficient | -0.0423 | -0.0040 |
| Property built in: 1900-1929 (DK omitted) standard error | (0.0342) | (0.0124) |
| Property built in: 1930-1982 (DK omitted) (DK omitted) coefficient | -0.0601 | -0.0268** |
| Property built in: 1930-1982 standard error | (0.0327) | (0.0079) |
| Property built in: 1983-2011 (DK omitted) coefficient | -0.0478 | 0.0129 |
| Property built in: 1983-2011 (DK omitted) standard error | (0.0333) | (0.0093) |
| Property built in: 2012 onwards (DK omitted) coefficient | -0.0951* | -0.0072 |
| Property built in: 2012 onwards (DK omitted) standard error | (0.0375) | (0.0195) |
| Number of bedrooms coefficient | 0.0117* | 0.0200** |
| Number of bedrooms standard error | (0.0053) | (0.0045) |
| Has a mortgage on your current property coefficient | 0.0485** | 0.0627** |
| Has a mortgage on your current property standard error | (0.0087) | (0.0077) |
| Has owned property for 10 or more years coefficient | -0.0642** | -0.0750** |
| Has owned property for 10 or more years standard error | (0.0086) | (0.0078) |
| Expects to own property for 10 or more years coefficient | -0.0098 | -0.0057 |

| | | |
|---|---|---|
| Expects to own property for 10 or more years standard error | (0.0078) | (0.0078) |
| Constant coefficient | 0.3622** | - |
| Constant standard error | (0.0382) | - |
| Observations | 79118 | 79118 |

Notes: This table presents results from a multivariate regression and 15 bi-variate regressions, all results are interpreted as correlations since the independent variables are not randomly assigned or exogenous to the individuals. All regressions are run using Linear Probability Models (i.e., OLS models). The dependent variable is, in each case, whether participants chose to install a heat pump (rather than renew their existing heating system). The dependent variables are presented in the top row, and the independent variables are presented in the leftmost column. Each observation in the dataset represents a choice between participants' existing heating system or a heat pump, and each participant makes multiple choices. The upfront and/or the running costs of the heat pump are varied each time participants' make a choice, while the upfront and running costs of their existing heating system depends on the characteristics of their home and whether they are on or off the gas grid. Column 1 presents results from a single regression conducted using the full study sample and all variables are included as independent variables. Column 2 presents results from separate bi-variate regressions (one per independent variable) conducted using the full study sample. The table lacks coefficients in instances where we have categorical variables that are omitted to avoid collinearity with other related variables. In places where categorical variables are used, there is an indication for which variable was omitted (and should be used as the reference point). Regression coefficient estimates are displayed without brackets, and standard errors for the estimates are presented beneath each respective estimate. Standard errors are clustered on a participant level. Statistical significance is indicated by stars: * p<0.05, **p<0.01.

Table 59 presents the results of a correlational analysis of heat pump uptake and housing characteristics, socio-demographic characteristics. Environmental attitudes and knowledge about heat pumps and housing characteristics. The first column contains results from a single multivariate OLS regression, whereas the second column contains results from multiple (one per variable) bi-variate OLS regressions. Compared to the previous correlational tables, this table allows us to estimate the likelihood of a given variable while controlling for all categories of variables.

**Table 59: Heat pump uptake and heating system characteristics, socio-demographic characteristics, environmental attitudes and knowledge about heat pumps and housing characteristics**

| Independent variable | Heat pump chosen (other factors controlled for) | Heat pump chosen (other factors not controlled for) |
|---|---|---|
| Gender: Female (male omitted) coefficient | -0.0046 | 0.0098 |

| | | |
|---|---|---|
| Gender: Female (male omitted) standard error | (0.0073) | (0.0079) |
| Age: 18 - 24 (Prefer not to say omitted) coefficient | 0.0463 | 0.0566 |
| Age: 18 - 24 (Prefer not to say omitted) standard error | (0.0533) | (0.0589) |
| Age: 25 - 34 (Prefer not to say omitted) coefficient | 0.0709** | 0.0456** |
| Age: 25 - 34 (Prefer not to say omitted) standard error | (0.0248) | (0.0124) |
| Age: 35 - 44 (Prefer not to say omitted) coefficient | 0.0606* | 0.0446** |
| Age: 35 - 44 (Prefer not to say omitted) standard error | (0.0236) | (0.0099) |
| Age: 45 - 54 (Prefer not to say omitted) coefficient | 0.0749** | 0.0537** |
| Age: 45 - 54 (Prefer not to say omitted) standard error | (0.0228) | (0.0098) |
| Age: 55 - 64 (Prefer not to say omitted) coefficient | 0.0500* | 0.0029 |
| Age: 55 - 64 (Prefer not to say omitted) standard error | (0.0224) | (0.0095) |
| Age: 65 - 74 (Prefer not to say omitted) coefficient | 0.0425 | -0.0241* |
| Age: 65 - 74 (Prefer not to say omitted) standard error | (0.0226) | (0.0102) |
| Age: 75 - 84 (Prefer not to say omitted) coefficient | 0.0142 | -0.0960** |
| Age: 75 - 84 (Prefer not to say omitted) standard error | (0.0236) | (0.0131) |
| Age: 85 or older (Prefer not to say omitted) coefficient | 0.0474 | -0.0838** |
| Age: 85 or older (Prefer not to say omitted) standard error | (0.0338) | (0.0316) |
| Income: Less than £20k (Prefer not to say omitted) coefficient | 0.0238 | -0.0352** |
| Income: Less than £20k (Prefer not to say omitted) standard error | (0.0136) | (0.0131) |
| Income: £20k-£40k (Prefer not to say omitted) coefficient | 0.0281* | -0.0140 |
| Income: £20k-£40k (Prefer not to say omitted) standard error | (0.0113) | (0.0100) |
| Income: £40k-£60k (Prefer not to say omitted) coefficient | 0.0433** | 0.0250* |
| Income: £40k-£60k (Prefer not to say omitted) standard error | (0.0116) | (0.0099) |
| Income: £60k-£100k (Prefer not to say omitted) coefficient | 0.0498** | 0.0711** |
| Income: £60k-£100k (Prefer not to say omitted) standard error | (0.0119) | (0.0098) |

| | | |
|---|---|---|
| Income: £100k or more (Prefer not to say omitted) coefficient | 0.0419** | 0.0814** |
| Income: £100k or more (Prefer not to say omitted) standard error | (0.0146) | (0.0120) |
| Has £10k or more in savings (Prefer not to say omitted) coefficient | 0.0224** | 0.0634** |
| Has £10k or more in savings (Prefer not to say omitted) standard error | (0.0080) | (0.0080) |
| Struggles to pay at least one of the household bills at least sometimes coefficient | 0.0010 | 0.0132 |
| Struggles to pay at least one of the household bills at least sometimes standard error | (0.0091) | (0.0097) |
| Property type: Bungalow coefficient | 0.0123 | -0.0138 |
| Property type: Bungalow standard error | (0.0175) | (0.0127) |
| Property type: Detached house coefficient | 0.0227 | 0.0354** |
| Property type: Detached house standard error | (0.0156) | (0.0080) |
| Property type: Semi-detached house coefficient | 0.0209 | -0.0094 |
| Property type: Semi-detached house standard error | (0.0148) | (0.0086) |
| Property type: End-terrace house coefficient | 0.0000 | -0.0426** |
| Property type: End-terrace house standard error | - | (0.0159) |
| Property type: Mid-terrace house coefficient | 0.0229 | -0.0270* |
| Property type: Mid-terrace house standard error | (0.0163) | (0.0118) |
| Property type: Flat (ground floor/basement) coefficient | 0.0211 | -0.0253 |
| Property type: Flat (ground floor/basement) standard error | (0.0284) | (0.0269) |
| Age of property: Pre 1900 (DK omitted) coefficient | -0.0738* | 0.0256* |
| Age of property: Pre 1900 (DK omitted) standard error | (0.0296) | (0.0103) |
| Age of property: 1900-1929 (DK omitted) coefficient | -0.0428 | -0.0040 |
| ‘Age of property: 1900-1929 (DK omitted) standard error | (0.0300) | (0.0124) |
| Age of property: 1930-1982 (DK omitted) coefficient | -0.0306 | -0.0268** |
| Age of property: 1930-1982 (DK omitted) standard error | (0.0290) | (0.0079) |

| | | |
|---|---|---|
| Age of property: 1983-2011 (DK omitted) coefficient | -0.0327 | 0.0129 |
| Age of property: 1983-2011 (DK omitted) standard error | (0.0294) | (0.0093) |
| Age of property: 2012 onwards (DK omitted) coefficient | -0.0483 | -0.0072 |
| Age of property: 2012 onwards (DK omitted) standard error | (0.0332) | (0.0195) |
| Number of bedrooms (average) coefficient | 0.0049 | 0.0200** |
| Number of bedrooms (average) standard error | (0.0065) | (0.0045) |
| Has a mortgage on current property coefficient | 0.0024 | 0.0627** |
| Has a mortgage on current property standard error | (0.0097) | (0.0077) |
| Has owned property for 10 or more years coefficient | -0.0334** | -0.0750** |
| Has owned property for 10 or more years standard error | (0.0081) | (0.0078) |
| Expects to own property for 10 or more years coefficient | -0.0149* | -0.0057 |
| Expects to own property for 10 or more years standard error | (0.0067) | (0.0078) |
| High energy demand off-gas grid (oil) (high demand gas omitted) coefficient | 0.1704** | 0.1357** |
| High energy demand off-gas grid (oil) (high demand gas omitted) standard error | (0.0096) | (0.0085) |
| Low energy demand on-gas grid (gas) (high demand gas omitted) coefficient | 0.0390** | -0.0816** |
| Low energy demand on-gas grid (gas) (high demand gas omitted) standard error | (0.0122) | (0.0078) |
| Low energy demand off-gas grid (oil) (high demand gas omitted) coefficient | 0.1993** | 0.0711** |
| Low energy demand off-gas grid (oil) (high demand gas omitted) standard error | (0.0271) | (0.0250) |
| Age of heating system: 4 years old or less (DK omitted) coefficient | -0.0265 | -0.0321** |
| Age of heating system: 4 years old or less (DK omitted) standard error | (0.0159) | (0.0085) |
| Age of heating system: 5-9 years old (DK omitted) coefficient | -0.0080 | -0.0038 |
| Age of heating system: 5-9 years old (DK omitted) standard error | (0.0161) | (0.0091) |
| Age of heating system: 10-14 years old (DK omitted) coefficient | -0.0042 | 0.0045 |
| Age of heating system: 10-14 years old (DK omitted) standard error | (0.0167) | (0.0102) |

| | | |
|---|---|---|
| Age of heating system: 15+ years old (DK omitted) coefficient | -0.0166 | 0.0236* |
| Age of heating system: 15+ years old (DK omitted) standard error | (0.0164) | (0.0093) |
| Has an electric vehicle coefficient | 0.0616** | 0.1186** |
| Has an electric vehicle standard error | (0.0108) | (0.0122) |
| Has wall insulation coefficient | -0.0002 | -0.0094 |
| Has wall insulation standard error | (0.0071) | (0.0079) |
| Property has a smart-meter coefficient | 0.0192** | 0.0297** |
| Property has a smart-meter standard error | (0.0069) | (0.0080) |
| Property has a solar panels coefficient | -0.0022 | 0.0298* |
| Property has a solar panels standard error | (0.0111) | (0.0125) |
| Property has double/triple glazing coefficient | 0.0092 | -0.0049 |
| Property has double/triple glazing standard error | (0.0122) | (0.0135) |
| Property has loft insulation coefficient | -0.0207 | -0.0232* |
| Property has loft insulation standard error | (0.0111) | (0.0114) |
| Property has underfloor insulation coefficient | 0.0099 | 0.0376** |
| Property has underfloor insulation standard error | (0.0106) | (0.0120) |
| System will need replacing within the next two years coefficient | 0.0002 | 0.0516** |
| System will need replacing within the next two years standard error | (0.0123) | (0.0138) |
| Planning to renovate home in near future coefficient | -0.0002 | 0.0475** |
| Planning to renovate home in near future standard error | (0.0071) | (0.0079) |
| Planning to improve energy efficiency in the near future coefficient | 0.0405** | 0.1140** |
| Planning to improve energy efficiency in the near future standard error | (0.0088) | (0.0093) |
| Moderately or very concerned about climate change coefficient | 0.0604** | 0.1601** |
| Moderately or very concerned about climate change standard error | (0.0079) | (0.0085) |
| Expects energy prices to increase in the next 2 years coefficient | -0.0395** | -0.0020 |

| | | |
|---|---|---|
| Expects energy prices to increase in the next 2 years standard error | (0.0115) | (0.0078) |
| Expects own energy prices to increase in the next 2 years coefficient | 0.0466** | 0.0206** |
| Expects own energy prices to increase in the next 2 years standard error | (0.0115) | (0.0078) |
| Factors that influence the heating system choice: Saving money on monthly bills coefficient | 0.0733** | 0.1091** |
| Factors that influence the heating system choice: Saving money on monthly bills standard error | (0.0072) | (0.0081) |
| Factors that influence the heating system choice: Saving money on upfront costs coefficient | -0.0158 | -0.0300** |
| Factors that influence the heating system choice: Saving money on upfront costs standard error | (0.0085) | (0.0101) |
| Factors that influence the heating system choice: Home is heated comfortably coefficient | -0.0226** | -0.0066 |
| Factors that influence the heating system choice: Home is heated comfortably standard error | (0.0079) | (0.0093) |
| Factors that influence the heating system choice: Minimising environmental impact coefficient | 0.1778** | 0.2156** |
| Factors that influence the heating system choice: Minimising environmental impact standard error | (0.0079) | (0.0080) |
| Factors that influence the heating system choice: Being familiar with the heating system choice coefficient | -0.0423** | -0.1248** |
| Factors that influence the heating system choice: Being familiar with the heating system choice standard error | (0.0080) | (0.0081) |
| Factors that influence the heating system choice: Minimising occupied space coefficient | -0.0493** | -0.1337** |
| Factors that influence the heating system choice: Minimising occupied space standard error | (0.0081) | (0.0081) |
| Factors that influence the heating system choice: Minimising time/inconvenience coefficient | -0.1036** | -0.1783** |
| Factors that influence the heating system choice: Minimising time/inconvenience standard error | (0.0091) | (0.0086) |

| | | |
|---|---|---|
| Heat pump knowledge: Hadn't previously heard of them coefficient | 0.0000 | -0.0333** |
| Heat pump knowledge: Hadn't previously heard of them standard error | - | (0.0127) |
| Heat pump knowledge: Aware of them but don't really know what they are coefficient | -0.0117 | -0.0086 |
| Heat pump knowledge: Aware of them but don't really know what they are standard error | (0.0134) | (0.0083) |
| Heat pump knowledge: Know a little about them coefficient | -0.0433** | 0.0245** |
| Heat pump knowledge: Know a little about them standard error | (0.0148) | (0.0078) |
| Heat pump knowledge: Know a lot about them coefficient | -0.1003** | -0.0173 |
| Heat pump knowledge: Know a lot about them standard error | (0.0184) | (0.0140) |
| Passed HP knowledge test coefficient | 0.0326** | 0.0678** |
| Passed HP knowledge test standard error | (0.0101) | (0.0094) |
| Constant coefficient | 0.1708** | - |
| Constant standard error | (0.0506) | - |
| Observations | 79118 | 79118 |
| R-squared | 0.123 | 0.000 |

Notes: This table presents results from a multivariate regression and 62 bi-variate regressions, all results are interpreted as correlations since the independent variables are not randomly assigned or exogenous to the individuals. All regressions are run using Linear Probability Models (i.e., OLS models). The dependent variable is, in each case, whether participants chose to install a heat pump (rather than renew their existing heating system). The dependent variables are presented in the top row, and the independent variables are presented in the leftmost column. Each observation in the dataset represents a choice between participants' existing heating system or a heat pump, and each participant makes multiple choices. The upfront and/or the running costs of the heat pump are varied each time participants' make a choice, while the upfront and running costs of their existing heating system depends on the characteristics of their home and whether they are on or off the gas grid. Column 1 presents results from a single regression conducted using the full study sample and all variables are included as independent variables. Column 2 presents results from separate bi-variate regressions (one per independent variable) conducted using the full study sample. The table lacks coefficients in instances where we have categorical variables that are omitted to avoid collinearity with other related variables. In places where categorical variables are used, there is an indication for which variable was omitted (and should be used as the reference point). Regression coefficient estimates are displayed without brackets, and standard errors for the estimates are presented beneath each respective estimate. Standard errors are clustered on a participant level. Statistical significance is indicated by stars: * p<0.05, **p<0.01.

Table 60 presents the same analysis as in Table 59, however, results are weighted to account for discrepancies in gird status distribution. This table serves as the main analysis that is discussed in the main report section called "Other predictors of heat pump adoption".

**Table 60: Heat pump uptake and heating system characteristics, socio-demographic characteristics, environmental attitudes and knowledge about heat pumps and housing characteristics weighed by grid status.**

| Independent variable | Heat pump chosen (other factors controlled for) | Heat pump chosen (other factors not controlled for) |
|---|---|---|
| gender: Female (male omitted) coefficient | 0.0011 | 0.0124 |
| gender: Female (male omitted) standard error | (0.0074) | (0.0080) |
| Age: 18 - 24 (Prefer not to say omitted) coefficient | 0.0572 | 0.0604 |
| Age: 18 - 24 (Prefer not to say omitted) standard error | (0.0513) | (0.0556) |
| Age: 25 - 34 (Prefer not to say omitted) coefficient | 0.0766** | 0.0550** |
| Age: 25 - 34 (Prefer not to say omitted) standard error | (0.0255) | (0.0121) |
| Age: 35 - 44 (Prefer not to say omitted) coefficient | 0.0695** | 0.0554** |
| Age: 35 - 44 (Prefer not to say omitted) standard error | (0.0245) | (0.0100) |
| Age: 45 - 54 (Prefer not to say omitted) coefficient | 0.0745** | 0.0471** |
| Age: 45 - 54 (Prefer not to say omitted) standard error | (0.0238) | (0.0097) |
| Age: 55 - 64 (Prefer not to say omitted) coefficient | 0.0505* | 0.0004 |
| Age: 55 - 64 (Prefer not to say omitted) standard error | (0.0235) | (0.0097) |
| Age: 65 - 74 (Prefer not to say omitted) coefficient | 0.0298 | -0.0441** |
| Age: 65 - 74 (Prefer not to say omitted) standard error | (0.0235) | (0.0102) |

| | | |
|---|---|---|
| Age: 75 - 84 (Prefer not to say omitted) coefficient | 0.0148 | -0.0923** |
| Age: 75 - 84 (Prefer not to say omitted) standard error | (0.0248) | (0.0135) |
| Age: 85 or older (Prefer not to say omitted) coefficient | 0.0248 | -0.1094** |
| Age: 85 or older (Prefer not to say omitted) standard error | (0.0335) | (0.0288) |
| Income: Less than £20k (Prefer not to say omitted) coefficient | 0.0153 | -0.0384** |
| Income: Less than £20k (Prefer not to say omitted) standard error | (0.0137) | (0.0129) |
| Income: £20k - £40k (Prefer not to say omitted) coefficient | 0.0207 | -0.0188 |
| Income: £20k - £40k (Prefer not to say omitted) standard error | (0.0113) | (0.0101) |
| Income: £40k - £60k (Prefer not to say omitted) coefficient | 0.0297* | 0.0281** |
| Income: £40k - £60k (Prefer not to say omitted) standard error | (0.0117) | (0.0099) |
| Income: £60k - £100k (Prefer not to say omitted) coefficient | 0.0303* | 0.0592** |
| Income: £60k - £100k (Prefer not to say omitted) standard error | (0.0119) | (0.0098) |
| Income: £100k or more (Prefer not to say omitted) coefficient | 0.0373* | 0.0891** |
| Income: £100k or more (Prefer not to say omitted) standard error | (0.0148) | (0.0121) |
| Has £10k or more in savings coefficient | 0.0220** | 0.0555** |
| Has £10k or more in savings standard error | (0.0080) | (0.0081) |
| Struggles to pay at least one of the household bills at least sometimes coefficient | -0.0007 | 0.0113 |

| | | |
|---|---|---|
| Struggles to pay at least one of the household bills at least sometimes standard error | (0.0092) | (0.0097) |
| Property type: Bungalow coefficient | 0.0152 | -0.0317* |
| Property type: Bungalow standard error | (0.0172) | (0.0131) |
| Property type: Detached house coefficient | 0.0263 | 0.0212** |
| Property type: Detached house standard error | (0.0153) | (0.0080) |
| Property type: Semi-detached house coefficient | 0.0206 | 0.0004 |
| Property type: Semi-detached house standard error | (0.0145) | (0.0086) |
| Property type: End-terrace house coefficient | 0.0000 | -0.0276 |
| Property type: End-terrace house standard error | | (0.0159) |
| Property type: Mid-terrace house coefficient | 0.0215 | -0.0028 |
| Property type: Mid-terrace house standard error | (0.0161) | (0.0118) |
| Property type: Flat (ground floor/basement) coefficient | 0.0180 | 0.0038 |
| Property type: Flat (ground floor/basement) standard error | (0.0283) | (0.0266) |
| Age of property: Pre 1900 coefficient | -0.0795* | 0.0270* |
| Age of property: Pre 1900 standard error | (0.0338) | (0.0107) |
| Age of property: 1900-1929 coefficient | -0.0538 | 0.0074 |
| Age of property: 1900-1929 standard error | (0.0340) | (0.0124) |
| Age of property: 1930-1982 coefficient | -0.0467 | -0.0269** |
| Age of property: 1930-1982 standard error | (0.0332) | (0.0079) |
| Age of property: 1983-2011 coefficient | -0.0450 | 0.0069 |
| Age of property: 1983-2011 standard error | (0.0335) | (0.0092) |
| Age of property: 2012 onwards coefficient | -0.0571 | 0.0096 |
| Age of property: 2012 onwards standard error | (0.0366) | (0.0194) |

| | | |
|---|---|---|
| How many bedrooms does your property have? Coefficient | 0.0021 | 0.0109* |
| How many bedrooms does your property have? Standard error | (0.0068) | (0.0045) |
| Do you have a mortgage on your current property? Coefficient | 0.0015 | 0.0709** |
| Do you have a mortgage on your current property? Standard error | (0.0099) | (0.0077) |
| Has owned property for 10 or more years coefficient | -0.0268** | -0.0738** |
| Has owned property for 10 or more years standard error | (0.0083) | (0.0078) |
| Expects to own property for 10 or more years coefficient | -0.0143* | -0.0125 |
| Expects to own property for 10 or more years standard error | (0.0068) | (0.0079) |
| Energy demand group: high oil (high gas omitted) coefficient | 0.1648** | 0.1401** |
| Energy demand group: high oil (high gas omitted) standard error | (0.0099) | (0.0085) |
| Energy demand group: low gas (high gas omitted) coefficient | 0.0394** | -0.0422** |
| Energy demand group: low gas (high gas omitted) standard error | (0.0123) | (0.0078) |
| Energy demand group: low oil (high gas omitted) coefficient | 0.1931** | 0.1000** |
| Energy demand group: low oil (high gas omitted) standard error | (0.0276) | (0.0250) |
| Heating system age: 4 years old or less (DK omitted) coefficient | -0.0124 | -0.0170* |
| Heating system age: 4 years old or less (DK omitted) standard error | (0.0156) | (0.0085) |

| | | |
|---|---|---|
| Heating system age: 5-9 years old (DK omitted) coefficient | 0.0026 | 0.0026 |
| Heating system age: 5-9 years old (DK omitted) standard error | (0.0159) | (0.0092) |
| Heating system age: 10-14 years old (DK omitted) coefficient | 0.0027 | 0.0086 |
| Heating system age: 10-14 years old (DK omitted) standard error | (0.0163) | (0.0101) |
| Heating system age: 15+ years old (DK omitted) coefficient | -0.0136 | 0.0041 |
| Heating system age: 15+ years old (DK omitted) standard error | (0.0162) | (0.0096) |
| Respondent has an electric vehicle coefficient | 0.0621** | 0.1102** |
| Respondent has an electric vehicle standard error | (0.0115) | (0.0131) |
| Respondent has wall insulation coefficient | -0.0025 | -0.0142 |
| Respondent has wall insulation standard error | (0.0072) | (0.0079) |
| Property has a smart-meter coefficient | 0.0166* | 0.0293** |
| Property has a smart-meter standard error | (0.0070) | (0.0081) |
| Property has a solar panels coefficient | 0.0025 | 0.0282* |
| Property has a solar panels standard error | (0.0116) | (0.0132) |
| Property has double/triple glazing coefficient | 0.0099 | -0.0046 |
| Property has double/triple glazing standard error | (0.0126) | (0.0138) |
| Property has loft insulation coefficient | -0.0215 | -0.0329** |
| Property has loft insulation standard error | (0.0112) | (0.0113) |
| Property has underfloor insulation coefficient | 0.0071 | 0.0384** |
| Property has underfloor insulation standard error | (0.0110) | (0.0122) |

| | | |
|---|---|---|
| System will need replacing within the next two years coefficient | 0.0105 | 0.0534** |
| System will need replacing within the next two years standard error | (0.0124) | (0.0140) |
| Planning to renovate home in near future coefficient | -0.0023 | 0.0435** |
| Planning to renovate home in near future standard error | (0.0071) | (0.0079) |
| Planning to improve energy efficiency in the near future coefficient | 0.0445** | 0.1149** |
| Planning to improve energy efficiency in the near future standard error | (0.0090) | (0.0095) |
| Moderately or very concerned about climate change coefficient | 0.0559** | 0.1514** |
| Moderately or very concerned about climate change standard error | (0.0079) | (0.0083) |
| Expects energy prices to increase in the next 2 years coefficient | -0.0369** | -0.0031 |
| Expects energy prices to increase in the next 2 years standard error | (0.0123) | (0.0079) |
| Expects own energy prices to increase in the next 2 years coefficient | 0.0446** | 0.0176* |
| Expects own energy prices to increase in the next 2 years standard error | (0.0122) | (0.0078) |
| Factors that influence the heating system choice: Saving money on monthly bills coefficient c | 0.0605** | 0.0943** |
| Factors that influence the heating system choice: Saving money on monthly bills  standard error | (0.0073) | (0.0082) |
| Factors that influence the heating system choice: Saving money on upfront costs coefficient | -0.0315** | -0.0493** |

| | | |
|---|---|---|
| Factors that influence the heating system choice: Saving money on upfront costs standard error | (0.0089) | (0.0106) |
| Factors that influence the heating system choice: Home is heated comfortably coefficient | -0.0143 | -0.0087 |
| Factors that influence the heating system choice: Home is heated comfortably standard error | (0.0079) | (0.0092) |
| Factors that influence the heating system choice: Minimising environmental impact coefficient | 0.1762** | 0.2107** |
| Factors that influence the heating system choice: Minimising environmental impact standard error | (0.0081) | (0.0082) |
| Factors that influence the heating system choice: Being familiar with the heating system choice coefficient | -0.0359** | -0.1208** |
| Factors that influence the heating system choice: Being familiar with the heating system choice standard error | (0.0081) | (0.0081) |
| Factors that influence the heating system choice: Minimising occupied space coefficient | -0.0592** | -0.1347** |
| Factors that influence the heating system choice: Minimising occupied space standard error | (0.0083) | (0.0080) |
| Factors that influence the heating system choice: Minimising time/inconvenience coefficient | -0.0985** | -0.1739** |
| Factors that influence the heating system choice: Minimising time/inconvenience standard error | (0.0092) | (0.0085) |
| Heat pump knowledge: not heard of them coefficient | 0.0735** | -0.0219 |
| Heat pump knowledge: not heard of them standard error | (0.0185) | (0.0126) |

| | | |
|---|---|---|
| Heat pump knowledge: Aware but don't know what they are coefficient | 0.0681** | -0.0066 |
| Heat pump knowledge: Aware but don't know what they are standard error | (0.0138) | (0.0082) |
| Heat pump knowledge: Know a little about them coefficient | 0.0454** | 0.0177* |
| Heat pump knowledge: Know a little about them standard error | (0.0125) | (0.0079) |
| Heat pump knowledge: Know a lot about them coefficient | 0.0000 | -0.0107 |
| Heat pump knowledge: Know a lot about them standard error | - | (0.0145) |
| Passed heat pump knowledge test coefficient | 0.0301** | 0.0573** |
| Passed heat pump knowledge test standard error | (0.0101) | (0.0092) |
| Constant coefficient | 0.1233* | - |
| Constant standard error | (0.0552) | - |
| Observations | 79118 | 79118 |
| R-squared | 0.113 | 0.000 |

Notes: This table presents results from a multivariate regression and 62 bi-variate regressions, all results are interpreted as correlations since the independent variables are not randomly assigned or exogenous to the individuals. All regressions are run using Linear Probability Models (i.e., OLS models) weighted to account for discrepancies in grid status distribution. The dependent variable is, in each case, whether participants chose to install a heat pump (rather than renew their existing heating system). The dependent variables are presented in the top row, and the independent variables are presented in the leftmost column. Each observation in the dataset represents a choice between participants' existing heating system or a heat pump, and each participant makes multiple choices. The upfront and/or the running costs of the heat pump are varied each time participants' make a choice, while the upfront and running costs of their existing heating system depends on the characteristics of their home and whether they are on or off the gas grid. Column 1 presents results from a single regression conducted using the full study sample and all variables are included as independent variables. Column 2 presents results from separate bi-variate regressions (one per independent variable) conducted using the full study sample. The table lacks coefficients in instances where we have categorical variables that are omitted to avoid collinearity with other related variables. In places where categorical variables are used, there is an indication for which variable was omitted (and should be used as the reference point). Regression coefficient estimates are displayed without brackets, and standard errors for the estimates are presented beneath each respective estimate. Standard errors are clustered on a participant level. Statistical significance is indicated by stars: * p<0.05, **p<0.01.

Table 61 presents an analysis of the reasons participants gave for choosing heat pumps in the DCE. Column 2 presents the percentage of all participants that selected each reason. Column 3, instead, presents the percentage of participants that have selected these given reasons among those that chose heat pumps when costs were on par with fossil fuel heating systems.

**Table 61: Stated reasons for choosing heat pumps in the DCE**

| Stated reasons | All participants | Participants that chose a heat pump when costs are at parity with the status quo heating system |
|---|---|---|
| Minimising the amount of money you spend each month on heating | 62% | 68% |
| Minimising the amount of money you spend upfront on installing a new heating system | 73% | 77% |
| Making sure your home is heated to a comfortable temperature | 79% | 77% |
| Minimising the environmental impact of the heat you use | 36% | 45% |
| Having a heating system that you are familiar with | 36% | 26% |
| Minimising the outdoor or indoor space a new heating system requires | 34% | 26% |
| Minimising the time and inconvenience required to install a new heating system | 26% | 15% |
| N | 6086 | 1814 |

Notes: This table presents the stated reasons for choosing heat pumps in the DCE. The first column lists the reasons that participants could select in the post-experiment questionnaire. Column 2 presents the percentage of participants that have selected these given reasons. Column 3 presents the percentage of participants that have selected these given reasons among that chose heat pumps when costs were on par with fossil fuel heating systems.

## Randomised control trial (RCT) results

This section presents three additional tables from the randomised controlled trial (RCT) conducted to understand the potential effect of information provision interventions on the uptake of heat pumps. Table 62 presents the treatment effects of the interventions trialled in the RCT on intentions to install a heat pump in the near future, segregated by demand group. Table 63 presents the effects of the interventions by income level.

**Table 62: Treatment effects of interventions on intentions to install a heat pump by energy consumption level and source segments**

| Independent variables | Somewhat or extremely likely to install a heat pump (High energy consumption gas group) | Somewhat or extremely likely to install a heat pump (High energy consumption oil group) | Somewhat or extremely likely to install a heat pump (Low energy consumption gas group) | Somewhat or extremely likely to install a heat pump (Low energy consumption oil group) |
|---|---|---|---|---|
| Treatment condition 1 coefficient | 0.0448 | 0.0313 | 0.0237 | -0.0244 |
| Treatment condition 1 standard error | (0.0242) | (0.0209) | (0.0184) | (0.0594) |
| Treatment condition 2 coefficient | 0.0489* | 0.0153 | 0.0015 | -0.0218 |
| Treatment condition 2 standard error | (0.0243) | (0.0209) | (0.0184) | (0.0612) |
| Constant coefficient | 0.1443** | 0.1698** | 0.1457** | 0.1711** |
| Constant standard error | (0.0169) | (0.0148) | (0.0131) | (0.0419) |
| Observations | 1453 | 2087 | 2328 | 218 |
| R-squared | 0.003 | 0.001 | 0.001 | 0.001 |

Notes: This table presents the results from four multivariate regressions. All regressions are run using Linear Probability Models (i.e., OLS models with binary outcomes). The dependent variables are presented in the top row, and the independent variables are presented in the leftmost column, the segment included in each regression is specified in each column. Regressions are run without covariates. Regression coefficient estimates are displayed without brackets, and standard errors for the estimates are presented beneath each respective estimate. Statistical significance is indicated by stars* $p<0.05$, ** $p<0.01$.

**Table 63: Treatment effects of interventions on intentions to install a heat pump by income brackets**

| Independent variables | Somewhat or extremely likely to install a heat pump (Household income less than £20k) | Somewhat or extremely likely to install a heat pump (Household income £20k-£40k) | Somewhat or extremely likely to install a heat pump (Household income £40k-£60k) | Somewhat or extremely likely to install a heat pump (Household income £60k-£100k) | Somewhat or extremely likely to install a heat pump (Household income £100k or more) |
|---|---|---|---|---|---|
| Treatment condition 1 coefficient | 0.0237 | 0.0493 | 0.0174 | 0.0370 | -0.0068 |
| Treatment condition 1 standard error | (0.0328) | (0.0255) | (0.0298) | (0.0293) | (0.0408) |
| Treatment condition 2 coefficient | -0.0069 | 0.0271 | 0.0302 | 0.0395 | -0.0088 |
| Treatment condition 2 standard error | (0.0332) | (0.0256) | (0.0291) | (0.0296) | (0.0416) |
| Constant | 0.1227** | 0.1220** | 0.1714** | 0.1694** | 0.2975** |
| ‘’Standard error | (0.0226) | (0.0183) | (0.0209) | (0.0209) | (0.0293) |
| Observations | 608 | 1163 | 1061 | 1092 | 739 |
| R-squared | 0.001 | 0.003 | 0.001 | 0.002 | 0.000 |

Notes: This table presents the results from five multivariate regressions. All regressions are run using Linear Probability Models (i.e., OLS models with binary outcomes). The dependent variables are presented in the top row, and the independent variables are presented in the leftmost column, the segment included in each regression is specified in each column. Regressions are run without covariates. Regression coefficient estimates are displayed without brackets, and standard errors for the estimates are presented beneath each respective estimate. Statistical significance is indicated by stars: * p<0.05, **p<0.01.

# Annex 3: Detailed analysis of the supplementary experiment results

*This annex contains details of the method and results of the analysis of the supplementary experiment results.*

## Descriptive analysis

### Survey engagement

After receiving the invitation letter to participate in the study, 2,054 individuals opened the survey (10,000 households were contacted). Of these, 1,123 successfully completed the survey, 278 dropped out before reaching the end, and 653 were screened out. Respondents were screened out due to not being the homeowner (54%), not having a gas or oil boiler as their current heating system (31%), or living in a high rise flat (15%).

Among participants who successfully completed the survey, the median survey completion time was 14.8 minutes while the mean was 50.8 minutes.

### Socio-demographic characteristics

Table 64 presents the socio-demographic characteristics of the study sample. Both tables present average characteristics for the entire sample as well as for on and off gas grid respondents. Overall, our sample was fairly balanced on most socio-demographic characteristics. The sample is also largely representative of the UK homeowning population in terms of its regional distribution, with the exception of London (at 6% rather than at 13%), the East Midlands (at 10% rather than at 7%) and the Southwest (at 12% rather than at 9%)

**Table 64: Socio-demographic characteristics by grid status (supplementary experiment)**

| Independent variables | Full sample | On-gas grid | Off-gas grid |
| --- | --- | --- | --- |
| gender: Female | 41% | 42% | 41% |
| gender: Male | 55% | 54% | 57% |
| age: 18 - 24 | 0% | 1% | 0% |
| age: 25 - 34 | 8% | 12% | 3% |
| age: 35 - 44 | 13% | 15% | 11% |
| age: 45 - 54 | 18% | 18% | 18% |

| | | | |
|---|---|---|---|
| age: 55 - 64 | 23% | 20% | 27% |
| age: 65 - 74 | 21% | 18% | 25% |
| age: 75 - 84 | 12% | 10% | 14% |
| age: 85 or older | 2% | 2% | 1% |
| income: Less than £20k | 9% | 10% | 8% |
| income: £20k-£40k | 20% | 19% | 22% |
| income: £40k-£60k | 17% | 18% | 15% |
| income: £60k-£100k | 18% | 20% | 14% |
| income: £100k or more | 15% | 12% | 19% |
| £10k+ in savings | 41% | 37% | 47% |
| Struggle with bills | 19% | 23% | 14% |
| region: East Midlands | 10% | 10% | 10% |
| region: East of England | 15% | 11% | 20% |
| region: Eastern Scotland | 3% | 3% | 3% |
| region: London | 6% | 10% | 0% |
| region: Northeast | 4% | 4% | 4% |
| region: Northern Scotland | 2% | 1% | 4% |
| region: Northwest | 10% | 11% | 9% |
| region: Southeast | 13% | 14% | 11% |
| region: Southwest | 12% | 11% | 12% |
| region: Wales | 4% | 4% | 4% |
| region: West Midlands | 11% | 10% | 11% |
| region: Western Scotland | 2% | 3% | 2% |
| region: Yorkshire and Humber | 9% | 8% | 10% |
| N | 1123 | 641 | 482 |

## Housing characteristics

Table 65 presents the housing characteristics of the sample. Overall, the sample was composed of a range of housing types, with the most represented including older, detached houses. The most frequently occurring property type in the sample was detached houses (41% of the sample), followed by semi-detached houses (28%). The largest group of respondents (42%) claimed to own properties built between 1930 and 1982, while 4% owned properties built in 2012 and onwards. The modal number of bedrooms was three, which aligns with Census24 data on average housing characteristics. Most of the respondents (48%) had owned their home for over 10 years, and 53% expect to own the property for 10 more years or more. Just under half (44%) currently had a mortgage on the property.

**Table 65: Housing characteristics by grid status (supplementary experiment)**

| Independent variable | Full sample | On gas grid | off gas grid |
|---|---|---|---|
| property type: Bungalow | 12% | 10% | 14% |
| property type: Detached house | 41% | 28% | 59% |
| property type: End-terrace house | 6% | 7% | 4% |
| property type: Flat (NOT on ground-floor/basement) | 0% | 0% | 0% |
| property type: Flat (ground floor/basement) | 2% | 3% | 0% |
| property type: Mid-terrace house | 11% | 16% | 4% |
| property type: Semi-detached house | 29% | 36% | 19% |
| property age: Pre 1900 | 21% | 12% | 34% |
| property age: 1900-1929 | 11% | 15% | 6% |
| property age: 1930-1982 | 42% | 51% | 31% |
| property age: 1983-2011 | 21% | 17% | 25% |
| property age: 2012 onwards | 4% | 4% | 3% |
| number of bedrooms | 342% | 325% | 364% |
| Have a mortgage | 44% | 49% | 38% |
| Owned property for 10+ years | 48% | 48% | 49% |
| Will own property for 10+ years | 54% | 54% | 54% |
| N | 1123 | 641 | 482 |

## Heating system characteristics

Table 66 presents the characteristics of respondents' heating systems for the whole sample.

Of the study sample, 57% were on the gas grid and 43% were off the gas grid and heated their homes with an oil heating system. This distribution differs to that of the UK homeowning population, where around 12% are off the gas grid. We purposefully oversampled off-grid households to make it possible to obtain statistically meaningful estimates of the effects of costs on off-grid households.

A large share of the sample (58% of respondents) were planning to renovate their home in the near future (defined as either large or small home improvements). However, a smaller proportion (23%) were planning to improve the energy efficiency of their home in the near future. Further, a relatively small share of the sample (27%) reported having a heating system that was 15 years old or older (though a similar share, 27% of the sample had heating systems that were four years old or less). There is, however, a larger share of off-gas grid participants that have 15 years old or older boilers compared to on-gas grid participants (42% and 16%, respectively). When asked, around 9% of the sample believed that their heating system will need replacing within the next two years, which was the amount of time in which we were asking them to imagine making decisions in the choice set (this suggests that the scenario presented in the DCE was relevant to 9% of the sample as they took the survey, while the scenario may become relevant to others as time passes).

**Table 66: Heating system characteristics by grid status**

| Independent variables | Full sample | On gas grid | Off gas grid |
|---|---|---|---|
| Gas central heating system | 57% | 100% | 0% |
| Oil heating system | 43% | 0% | 100% |
| Heating system age: 4 years old or less | 27% | 31% | 21% |
| Heating system age: 5-9 years old | 25% | 31% | 18% |
| Heating system age: 10-14 years old | 16% | 18% | 14% |
| Heating system age: 15+ years old | 27% | 15% | 42% |
| Has an electric vehicle | 15% | 13% | 17% |
| Has wall insulation | 51% | 49% | 53% |
| Property has a smart-meter | 63% | 66% | 58% |
| Property has a solar panels | 13% | 9% | 18% |
| Property has double/triple glazing | 89% | 89% | 89% |

| | | | |
|---|---|---|---|
| Property has loft insulation | 84% | 79% | 91% |
| Property has underfloor insulation | 11% | 8% | 16% |
| Heating system needs replacing in the next 2 years | 9% | 8% | 12% |
| Planning renovations | 58% | 58% | 58% |
| Planning energy improvement | 23% | 22% | 25% |
| N | 1123 | 641 | 482 |

Table 67 the percentage of households that have undergone a heating system replacement in the past, along with the primary motivations behind this decision. Our findings indicate that 70% of households have engaged in heating system replacements, whether in a previous residence or their current home. Within this subgroup, the predominant reason cited by participants is the failure of their previous heating system (31%), followed by integration within a wider property renovation (23%).

**Table 67: Past heating system renovations by grid status**

| Independent variables | Full sample | On gas grid | off gas grid |
|---|---|---|---|
| Replaced heating system in the past: I don' know | 1% | 1% | 0% |
| Replaced heating system in the past: No | 29% | 26% | 33% |
| Replaced heating system in the past: Yes, in a previous home | 14% | 12% | 18% |
| Replaced heating system in the past: Yes, in my current home | 56% | 61% | 49% |
| Why heating replacement: As part of a wider renovation to my property | 23% | 21% | 28% |
| Why heating replacement: I was told it would not last much longer and was better | 22% | 23% | 19% |
| Why heating replacement: It did not heat my home/hot water adequately or quickly | 6% | 5% | 7% |
| Why heating replacement: It had broken down | 31% | 33% | 29% |
| Why heating replacement: It had not broken down yet, but it needed repairs too o | 7% | 8% | 7% |
| Why heating replacement: Other (please specify) | 11% | 11% | 11% |

| | | | |
|---|---|---|---|
| N | 1123 | 641 | 482 |

Table 68 illustrates participants' beliefs regarding energy prices, climate change, and the primary factors influencing their preferences for heating systems. Our findings indicate that a significant majority of participants express concerns about climate change (73%), and the majority anticipate increases in electricity prices and gas and oil prices over the next two years (67% and 71%, respectively). Regarding the main factors influencing households' heating system preferences, the most crucial consideration is its ability to effectively heat their home (85%), followed by saving on upfront costs (68%) and reducing monthly energy bills (59%).

**Table 68: Heating system preferences by grid status**

| Independent variables | Full sample | on gas grid | off gas grid |
|---|---|---|---|
| Climate change concern | 0.759 | 0.738 | 0.786 |
| Expected electricity price increase | 0.671 | 0.633 | 0.72 |
| Expected gas/oil price increase | 0.709 | 0.686 | 0.739 |
| Factors influencing heating system preferences: savings on bills | 0.59 | 0.635 | 0.531 |
| Factors influencing heating system preferences: savings on upfront costs | 0.678 | 0.699 | 0.649 |
| Factors influencing heating system preferences: home heated comfortably | 0.85 | 0.853 | 0.844 |
| Factors influencing heating system preferences: reduce environmental impact | 0.368 | 0.373 | 0.361 |
| Factors influencing heating system preferences: familiar with heating system | 0.376 | 0.384 | 0.365 |
| Factors influencing heating system preferences: minimise space | 0.36 | 0.401 | 0.305 |
| Factors influencing heating system preferences: minimise hassle | 0.284 | 0.295 | 0.27 |
| N | 1123 | 641 | 482 |

## Comparing descriptive statistics between the supplementary experiment and the main experiment.

Table 69 presents the socio-demographic, housing and heating system characteristics of the sample used in this supplementary experiment and in the original main experiment.

Overall, both samples are very similar on most socio-demographic, housing and heating system characteristics, with an absolute average difference of 1.4 percentage points across all characteristics. The largest difference in sample characteristics is found in the share of respondents that have gas or oil powered heating systems (i.e., 5 percentage point difference for both characteristics). However, the ratio between on and off-gas grid respondents in the supplementary experiment was purposely different to that of the main experiment to obtain statistically meaningful estimates of the effects of costs on off-grid households, given that the supplementary experiment has a smaller overall sample.

**Table 69: Comparing descriptive statistics between the supplementary experiment and the main experiment**

| Independent variables | Supplementary experiment | Main experiment | Difference |
|---|---|---|---|
| gender: Female | 41% | 40% | 1.6% |
| gender: Male | 55% | 57% | 1.7% |
| age: 18 - 24 | 0% | 0% | 0.0% |
| age: 25 - 34 | 8% | 7% | 0.9% |
| age: 35 - 44 | 13% | 15% | 1.7% |
| age: 45 - 54 | 18% | 19% | 0.4% |
| age: 55 - 64 | 23% | 23% | 0.0% |
| age: 65 - 74 | 21% | 20% | 0.6% |
| age: 75 - 84 | 12% | 11% | 0.9% |
| age: 85 or older | 2% | 2% | 0.1% |
| income: Less than £20k | 9% | 10% | 0.7% |
| income: £20k-£40k | 20% | 19% | 1.2% |
| income: £40k-£60k | 17% | 17% | 0.5% |
| income: £60k-£100k | 18% | 18% | 0.4% |
| income: £100k or more | 15% | 12% | 2.8% |
| £10k+ in savings | 41% | 40% | 1.1% |

| | | | |
|---|---|---|---|
| Struggle with bills | 19% | 18% | 0.5% |
| region: East Midlands | 10% | 8% | 2.5% |
| region: East of England | 15% | 11% | 3.7% |
| region: Eastern Scotland | 3% | 4% | 0.9% |
| region: London | 6% | 5% | 0.3% |
| region: Northeast | 4% | 4% | 0.5% |
| region: Northern Scotland | 2% | 3% | 0.7% |
| region: Northwest | 10% | 9% | 1.2% |
| region: Southeast | 13% | 16% | 3.3% |
| region: Southwest | 12% | 16% | 3.8% |
| region: Wales | 4% | 6% | 2.2% |
| region: West Midlands | 11% | 8% | 2.7% |
| region: Western Scotland | 2% | 4% | 1.2% |
| region: Yorkshire and Humber | 9% | 8% | 1.1% |
| property type: Bungalow | 12% | 12% | 0.4% |
| property type: Detached house | 41% | 43% | 1.9% |
| property type: End-terrace house | 6% | 6% | 0.2% |
| property type: Flat (NOT on ground-floor/basement) | 0% | 0% | 0.0% |
| property type: Flat (ground floor/basement) | 2% | 2% | 0.1% |
| property type: Mid-terrace house | 11% | 11% | 0.1% |
| property type: Semi-detached house | 29% | 26% | 2.3% |
| property age: Pre 1900 | 21% | 20% | 1.0% |
| property age: 1900-1929 | 11% | 11% | 0.1% |
| property age: 1930-1982 | 42% | 41% | 1.2% |
| property age: 1983-2011 | 21% | 23% | 2.2% |

| | | | |
|---|---|---|---|
| property age: 2012 onwards | 4% | 4% | 0.2% |
| number of bedrooms | 342% | 343% | 0.6% |
| Have a mortgage | 44% | 45% | 0.5% |
| Owned property for 10+ years | 48% | 53% | 4.5% |
| Will own property for 10+ years | 54% | 51% | 3.1% |
| Gas central heating system | 57% | 62% | 5.0% |
| Oil heating system | 43% | 38% | 5.0% |
| Heating system age: 4 years old or less | 27% | 27% | 0.2% |
| Heating system age: 5-9 years old | 25% | 24% | 1.0% |
| Heating system age: 10-14 years old | 16% | 18% | 1.2% |
| Heating system age: 15+ years old | 27% | 26% | 1.0% |
| Has an electric vehicle | 15% | 13% | 2.1% |
| Has wall insulation | 51% | 53% | 1.9% |
| Property has a smart-meter | 63% | 59% | 3.7% |
| Property has a solar panels | 13% | 12% | 0.6% |
| Property has double/triple glazing | 89% | 90% | 0.5% |
| Property has loft insulation | 84% | 87% | 2.6% |
| Property has underfloor insulation | 11% | 13% | 2.1% |
| Heating system needs replacing in the next 2 years | 9% | 10% | 0.8% |
| Planning renovations | 58% | 57% | 1.4% |
| Planning energy improvement | 23% | 26% | 2.1% |
| N | 1123 | 6086 | 4963 |

## Plotting participants' choice data

Figure 9 and Figure 10 presented in this section plot participants choice data based on the supplementary experiment, with linear projections made between choice sets. Each figure presents a demand curve for a different type of cost (either upfront costs or running costs) and a different group (on-gas grid and off-gas grid). Within each figure, the relationship between that given cost and demand is plotted while the omitted cost is held fixed at a different level for each curve. The figures all plot the share of participants who chose the heat pump option in the hypothetical scenarios they were presented with at different cost levels. These figures are useful to observe how upfront costs and running costs interact with one another and how that affects demand for heat pumps. These figures can be used to complement the results found in the main regression specification, which test whether the relationships we observe in the figures are indeed statistically significant. In contrast, Figure 11, presents the demand curves for running costs for both on-gas grid and off-gas grid samples for scenarios where status quo running costs are not inflated and for scenarios where status quo running costs are inflated by 15%. This figure can be used to observe the slope of the demand curves and complement the results found in the following section which tests the statistical significance of inflating the status quo running cost on demand.

**Figure 9: the relationship between upfront costs and ASHP demand at different levels of running costs (on-gas grid and off-gas grid samples)**

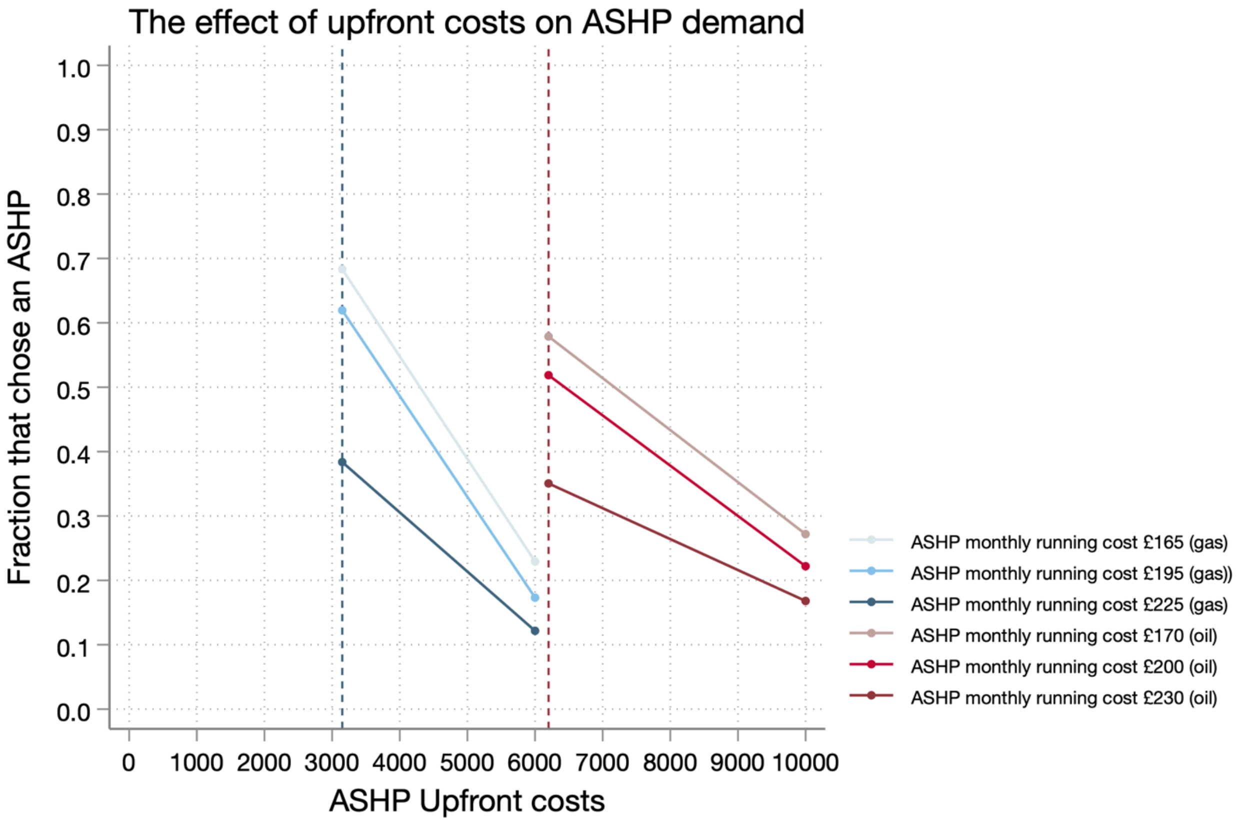


**Figure 10: the relationship between running costs and ASHP demand at different levels of upfront costs (on-gas grid and off-gas grid samples)**

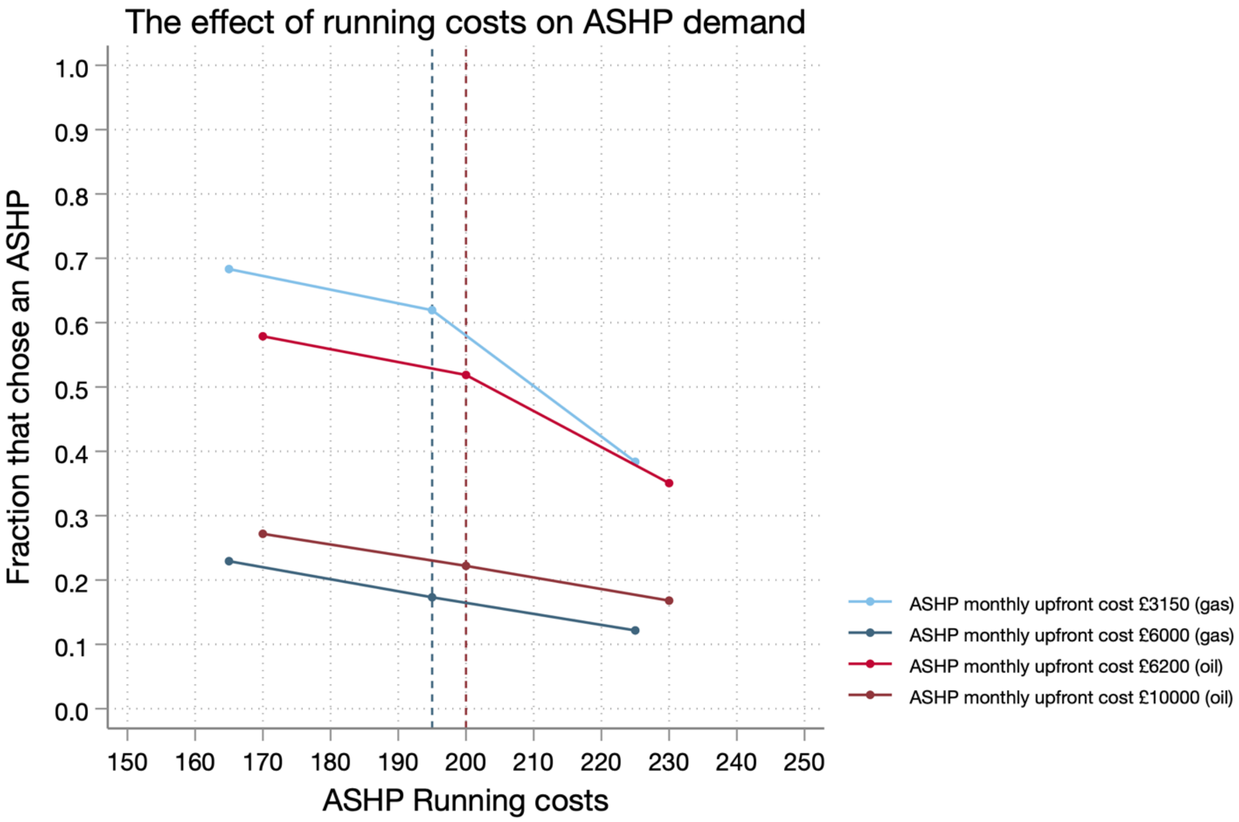
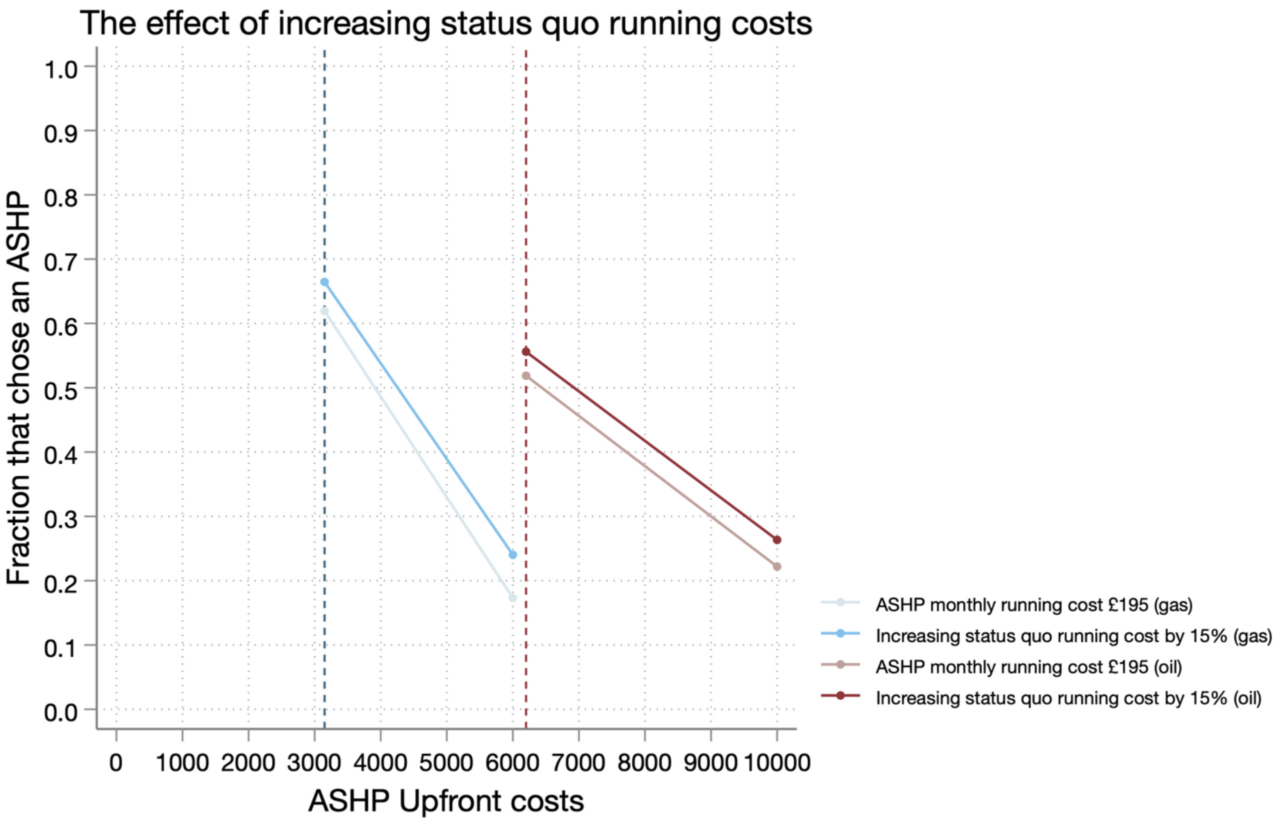


**Figure 11: the effect of increasing the status quo running cost by 15% on ASHP demand**




## Assessing the effect of assigning a higher status quo running cost level on demand

The supplementary experiment's DCE included two additional choice sets with inflated status quo running costs. In this section we compare ASHP demand between these inflated choice sets and specific choice sets without inflated status quo running costs. These comparisons enable us to understand how increasing the status quo running costs by 10-15% influences demand across different levels of ASHP upfront costs, and whether this effect changes at different upfront cost levels.

Table 70 presents the results of three LPM regressions (full sample, on-gas grid sample, and off-gas grid sample)  that estimates the effect of moving from a scenario where both ASHP upfront and running costs are on par with those of the status quo and where upfront costs are set at £3,150/£6,200 (low level - values differ depending on the grid status ) to a scenario where everything is the same, with the exception that the status quo running costs are greater than that of the ASHP. This means that we are comparing two choice sets which are qualitatively different. We find that there is a statistically significant positive effect on ASHP demand when moving from one scenario to the other. This analysis shows us that, on average, a £1 increase in running costs leads to an 0.16 and 0.12 percentage point increase in ASHP demand for on-gas grid and off-gas grid households, respectively.

**Table 70: Effect of status quo running cost disparity (low upfront cost level)**

| Independent variables | Full sample | On-gas-grid | Off-gas-grid |
|---|---|---|---|
| Comparing scenarios coefficient | 0.0429*** | 0.0469*** | 0.0376* |
| Comparing scenarios standard deviation | (0.0097) | (0.0122) | (0.0158) |
| Constant coefficient | 0.5764*** | 0.6203*** | 0.5177*** |
| Constant standard error | (0.0148) | (0.0192) | (0.0229) |
| Observations | 2238 | 1280 | 958 |
| R-squared | 0.002 | 0.002 | 0.001 |

Notes: This table presents the results from three multivariate regressions. All regressions are run using Linear Probability Models (i.e., OLS models with binary outcomes). The dependent variable is, in each case, whether participants chose to install a heat pump (rather than renew their existing heating system). The dependent variables are presented in the top row, and the independent variables are presented in the leftmost column. The first regression (column 1) is conducted using the full study sample. The following two regressions (columns 2-3) are conducted on subsets of the sample: A) on-gas grid, B) off-gas grid. Regression coefficient estimates are displayed without brackets, and standard errors for the estimates are presented beneath each respective estimate. Standard errors are clustered on a participant level. Statistical significance is indicated by stars: * p<0.05, **p<0.01, ***p<0.001.

Table 71 presents the results of three LPM regressions (full sample, on-gas grid sample, and off-gas grid sample) that estimates the effect of moving from a scenario where both ASHP upfront and running costs are on par with those of the status quo and where upfront costs are set at £6,200/£10,000 (high level - values differ depending on the grid status) to a scenario where the status quo running costs are greater than that of the ASHP. Similarly to the comparison made above, we are comparing two choice sets that are qualitatively different. However, unlike the comparison between the two scenarios above, the status quo upfront cost and the ASHP upfront cost are set at a higher level. We find that there is a positive statistically significant effect on ASHP demand when moving from one choice set to the other. This analysis shows that, on average, a £1 increase in status quo running costs leads to an 0.23 and 0.14 percentage points increase in ASHP demand for on-gas grid and off-gas grid households, respectively. While these effects appear to be more pronounced than those found in Table 70, the difference in demand is not statistically significant. In other words, we cannot conclude that the effect on demand is greater when ASHP upfront costs are higher.

**Table 71: Effect of status quo running cost disparity (high upfront cost level)**

| Independent variables | Full sample | On-gas-grid | Off-gas-grid |
|---|---|---|---|
| Comparing scenarios coefficient | 0.0572*** | 0.0688*** | 0.0418** |

| | | | |
|---|---|---|---|
| Comparing scenarios standard deviation | (0.0097) | (0.0135) | (0.0137) |
| Constant coefficient | 0.1921*** | 0.1719*** | 0.2192*** |
| Constant standard deviation | (0.0118) | (0.0149) | (0.0189) |
| Observations | 2238 | 1280 | 958 |
| R-squared | 0.005 | 0.007 | 0.002 |

Notes: This table presents the results from three multivariate regressions. All regressions are run using Linear Probability Models (i.e., OLS models with binary outcomes). The dependent variable is, in each case, whether participants chose to install a heat pump (rather than renew their existing heating system). The dependent variables are presented in the top row, and the independent variables are presented in the leftmost column. The first regression (column 1) is conducted using the full study sample. The following two regressions (columns 2-3) are conducted on subsets of the sample: A) on-gas grid, B) off-gas grid. Regression coefficient estimates are displayed without brackets, and standard errors for the estimates are presented beneath each respective estimate. Standard errors are clustered on a participant level. Statistical significance is indicated by stars: * p<0.05, **p<0.01, ***p<0.001.

Table 72 presents the results of three LPM regressions (full sample, on-gas grid sample, and off-gas grid sample) that lets us study whether increasing the ASHP upfront cost has a larger effect on ASHP demand when the status quo and ASHP running costs are at £195 (£200 for off-grid) or when they are at £225 (£230 for off-grid). In other words, this comparison lets us examine if setting the status quo running costs at a higher level in the original experiment is likely to have influenced our estimates of the effects of ASHP upfront costs. We do not find statistically significant differences in the effects of ASHP upfront costs on ASHP demand between scenarios that do not have inflated status quo running costs and scenarios that do have inflated running costs. In other words, this suggests that using status quo running costs that were 10% higher in the main experiment is unlikely to have affected the estimated effects of ASHP upfront costs on ASHP demand, and that the effects reported in the main report are likely to be generalisable.

Taken together, these comparisons show that, for any given level of ASHP upfront costs, demand for ASHP is higher when status quo running costs increase by 10%. This suggests that our initial estimations of ASHP demand may have been over-estimated. However, we also find that there is no difference in the effect of increasing the status quo running costs at different levels of ASHP upfront costs. Importantly, this means that the regression coefficients in the main experiment were not affected by the status quo running cost being 10% too high. In essence, while the original main experiment might have overestimated absolute demand projections due to the presence of higher status quo running costs, the relative difference in demand remains consistent when ASHP upfront costs vary. This means that one can easily recalibrate the estimates by revising the constant downwards by the average differences (i.e., 3.8 and 2.6 percentage points for on and off gas grid respondents, respectively).

**Table 72: Effect of status quo running cost disparity when varying ASHP upfront Costs**

| Independent variables | Full sample | On-gas-grid | Off-gas-grid |
|---|---|---|---|
| Non-inflated running costs coefficient | 0.0429*** | 0.0469*** | 0.0376* |
| Non-inflated running costs standard deviation | (0.0097) | (0.0122) | (0.0158) |
| Inflated running costs coefficient | -0.3843*** | -0.4484*** | -0.2985*** |
| Inflated running costs standard deviation | (0.0151) | (0.0202) | (0.0224) |
| Interaction: non-inflated x inflated running costs coefficient | 0.0143 | 0.0219 | 0.0042 |
| Interaction: non-inflated x inflated running costs standard error | (0.0137) | (0.0185) | (0.0203) |
| Constant coefficient | 0.5764*** | 0.6203*** | 0.5177*** |
| Constant standard error | (0.0148) | (0.0192) | (0.0229) |
| Observations | 4476 | 2560 | 1916 |
| R-squared | 0.150 | 0.199 | 0.094 |

Notes: This table presents the results from three multivariate regressions. All regressions are run using Linear Probability Models (i.e., OLS models with binary outcomes). The dependent variable is, in each case, whether participants chose to install a heat pump (rather than renew their existing heating system). The dependent variables are presented in the top row, and the independent variables are presented in the leftmost column. The first regression (column 1) is conducted using the full study sample. The following two regressions (columns 2-3) are conducted on subsets of the sample: A) on-gas grid, B) off-gas grid. Regression coefficient estimates are displayed without brackets, and standard errors for the estimates are presented beneath each respective estimate. Standard errors are clustered on a participant level. Statistical significance is indicated by stars: * p<0.05, **p<0.01, ***p<0.001.

## Estimating demand when ASHP running costs are decreased to levels comparable to or lower than those of fossil fuel boilers

In this section, we re-run the multivariate regressions and main specification model used in the main experiment, reweighted for differences in grid status distribution. We aim to estimate ASHP demand in scenarios where the ASHP running cost exceeds the status quo running cost and is then reduced to levels equal to or lower than the status quo. These analyses serve to complement the findings of the main experiment, which did not encompass scenarios where ASHP running costs exceeded those of the status quo; it solely addressed scenarios where ASHP running costs were equivalent to or lower than the status quo.

Table 73 presents the results from five LPM regressions that estimate the relationship between upfront costs, running costs, and heat pump demand, reweighted by grid status. This analysis does not include any control variables, interaction terms or non-linear terms. It therefore estimates the average linear relationship between heat pump costs and demand. It is often good practice to start an analysis with a simple model and then to amend it to allow for more flexibility (i.e. include non-linear terms, interaction term, control variables). When looking at results from a simple multivariate regression model, we find that ASHP upfront costs and running have a statistically significant negative effect on ASHP demand for both on-gas-grid and off-gas-grid participants.

**Table 73: The relationship between heat pump costs and demand reweighted by grid status (supplementary experiment)**

| | Full sample | On-gas-grid | Off-gas-grid |
|---|---|---|---|
| Upfront cost coefficient | -0.0001*** | -0.0001*** | -0.0001*** |
| Upfront cost standard error | (0.0000) | (0.0000) | (0.0000) |
| Running costs coefficient | -0.0033*** | -0.0034*** | -0.0027*** |
| Running costs standard error | (0.0002) | (0.0002) | (0.0002) |
| Status quo upfront cost coefficient | 0.0001*** | 0.0000 | 0.0000 |
| Status quo upfront cost standard error | (0.0000) | (.) | (.) |
| Status quo running cost coefficient | 0.0000 | 0.0000 | 0.0000 |
| Status quo running cost standard error | (.) | (.) | (.) |
| Constant coefficient | 1.1207*** | 1.6501*** | 1.4602*** |
| Constant standard error | (0.0473) | (0.0530) | (0.0691) |
| Observations | 6720 | 3840 | 2880 |
| R-squared | 0.166 | 0.189 | 0.095 |

Notes: This table presents the results from three multivariate regressions. All regressions are run using Linear Probability Models (i.e., OLS models with binary outcomes). The dependent variable is, in each case, whether participants chose to install a heat pump (rather than renew their existing heating system). The dependent variables are presented in the top row, and the independent variables are presented in the leftmost column. Each observation in the dataset represents a choice between participants' existing heating system or a heat pump, and each participant makes multiple choices. The upfront and/or the running costs of the heat pump are varied each time participants' make a choice, while the upfront and running costs of their existing heating system depends on the characteristics of their home and whether they are on or off the gas grid, and remains the same across choice sets for participants. The first regression (column 1) is conducted using the full study sample. The following two regressions (columns 2-3) are conducted on subsets of the sample: A) on gas grid, B) off gas grid. Regression coefficient estimates are displayed without brackets, and standard errors for the estimates are presented beneath each respective estimate. Standard errors are clustered on a participant level. Statistical significance is indicated by stars: * p<0.05, **p<0.01, *** p<0.001.

Table 74 presents the same specification as Table 39, but using data from the supplementary experiment and reweighting results to account for discrepancies in grid distribution. This model includes interactive effects between upfront and running costs, which helps us estimate how the levels of one cost influences the effects of the other cost on demand. Moreover, the model includes a series of independent variables (e.g., the income of participants), and exponential terms (which allow us to capture a non-linear relationship between costs and demand).

**Table 74: Main specification reweighted by grid status (supplementary experiment)**

| Independent variables | Full sample | On-gas-grid | Off-gas-grid |
|---|---|---|---|
| Upfront cost coefficient | -0.0003 | -0.0004*** | -0.0002*** |
| Upfront cost standard error | (2.2354) | (0.0000) | (0.0000) |
| Running costs coefficient | 0.0108 | 0.0092** | 0.0053 |
| Running costs standard error | (0.1016) | (0.0032) | (0.0038) |
| Squared upfront cost coefficient | 0.0000 | 0.0000 | 0.0000 |
| Squared upfront cost standard error | (0.0004) | (.) | (.) |
| Squared running cost coefficient | -0.0000 | -0.0000*** | -0.0000** |
| Squared running cost standard error | (0.0005) | (0.0000) | (0.0000) |
| Cubed upfront cost coefficient | 0.0000 | 0.0000 | 0.0000 |
| Cubed upfront cost standard error | (0.0000) | (.) | (.) |
| Cubed running cost coefficient | -0.0000 | 0.0000 | 0.0000 |
| Cubed running cost standard error | (0.0000) | (.) | (.) |
| Interaction: upfront x running costs coefficient | 0.0000*** | 0.0000*** | 0.0000*** |
| Interaction: upfront x running costs | (0.0000) | (0.0000) | (0.0000) |
| Status quo upfront cost coefficient | 0.0001 | 0.0000 | 0.0000 |
| Status quo upfront cost standard error | (0.0160) | (.) | (.) |
| Status quo running cost coefficient | 0.0000 | 0.0000 | 0.0000 |
| Status quo running cost standard error | (.) | (.) | (.) |
| Status quo fuel type: Gas (Oil omitted) coefficient | 0.0000 | 0.0000 | 0.0000 |
| Status quo fuel type: Gas (Oil omitted) standard error | (.) | (.) | (.) |

| | | | |
|---|---|---|---|
| Income quintile 1 coefficient | 0.0000 | 0.0000 | 0.0000 |
| Income quintile 1 standard error | (.) | (.) | (.) |
| Income quintile 2 coefficient | 0.0386 | 0.0655 | -0.0658 |
| Income quintile 2 standard error | (0.0404) | (0.0491) | (0.0571) |
| Income quintile 3 coefficient | 0.0469 | 0.0528 | -0.0039 |
| Income quintile 3 standard error | (0.0395) | (0.0447) | (0.0704) |
| Income quintile 4 coefficient | 0.0723 | 0.0790 | 0.0379 |
| Income quintile 4 standard error | (0.0438) | (0.0489) | (0.0744) |
| Income quintile 5 coefficient | 0.0685* | 0.0752* | 0.0052 |
| Income quintile 5 standard error | (0.0306) | (0.0352) | (0.0492) |
| Income: Don't know or prefer not to say coefficient | -0.0120 | -0.0040 | -0.0800 |
| Income: Don't know or prefer not to say standard error | (0.0340) | (0.0393) | (0.0529) |
| Property type: Bungalow (detached house omitted) coefficient | -0.0566 | -0.0871 | 0.0499 |
| Property type: Bungalow (detached house omitted) standard error | (0.0363) | (0.0445) | (0.0518) |
| Property type: End-terrace house (detached house omitted) coefficient | 0.0878 | 0.0944 | -0.0190 |
| Property type: End-terrace house (detached house omitted) standard error | (0.0547) | (0.0621) | (0.0800) |
| Property type: Flat (ground floor/basement) (detached house omitted) coefficient | -0.2089*** | -0.2155*** | 0.0000 |
| Property type: Flat (ground floor/basement) (detached house omitted) standard error | (0.0551) | (0.0566) | (.) |
| Property type: Mid-terrace house (detached house omitted) coefficient | -0.0072 | -0.0172 | 0.0680 |
| Property type: Mid-terrace house (detached house omitted) standard error | (0.0374) | (0.0416) | (0.0955) |

| | | | |
|---|---|---|---|
| Property type: Semi-detached house (detached house omitted) coefficient | -0.0384 | -0.0435 | -0.0335 |
| Property type: Semi-detached house (detached house omitted) standard error | (0.0275) | (0.0325) | (0.0414) |
| Age of property: Pre 1900 coefficient | 0.0000 | 0.0000 | 0.0000 |
| Age of property: Pre 1900 standard error | (.) | (.) | (.) |
| Age of property: 1900-1929 coefficient | 0.0805 | 0.1025* | -0.1466* |
| Age of property: 1900-1929 standard error | (0.0438) | (0.0520) | (0.0636) |
| Age of property: 1930-1982 coefficient | 0.0227 | 0.0340 | -0.0411 |
| Age of property: 1930-1982 standard error | (0.0314) | (0.0411) | (0.0427) |
| Age of property: 1983-2011 coefficient | -0.0257 | -0.0287 | -0.0361 |
| Age of property: 1983-2011 standard error | (0.0355) | (0.0481) | (0.0448) |
| Age of property: 2012 onwards coefficient | 0.0827 | 0.0753 | 0.1520 |
| Age of property: 2012 onwards standard error | (0.0599) | (0.0718) | (0.0999) |
| Age of property: I don't know coefficient | 0.0487 | 0.0454 | 0.2883 |
| Age of property: I don't know standard error | (0.1063) | (0.1125) | (0.2486) |
| Constant coefficient | 0.3311 | 0.9030** | 1.1595** |
| Constant standard error | (3873.9983) | (0.3199) | (0.3896) |
| Observations | 6720 | 3840 | 2880 |
| R-squared | 0.199 | 0.222 | 0.120 |

Notes: This table presents the results from three multivariate regressions. All regressions are run using Linear Probability Models (i.e., OLS models with binary outcomes). The dependent variable is, in each case, whether participants chose to install a heat pump (rather than renew their existing heating system). The dependent variables are presented in the top row, and the independent variables are presented in the leftmost column. The first regression (column 1) is conducted using the full study sample. The following two regressions (columns 2-3) are conducted on subsets of the sample: A) on-gas grid, B) off-gas grid. Regression coefficient estimates are displayed without brackets, and standard errors for the estimates are presented beneath each respective estimate. Standard errors are clustered on a participant level. Statistical significance is indicated by stars: * p<0.05, **p<0.01, ***p<0.001.

Table 75 presents estimated from the main specification model using data from the supplementary experiment and reweighting to account for discrepancies in grid distribution and number of rooms in households' properties. This model includes interactive effects between upfront and running costs, which helps us estimate how the levels of one cost influences the effects of the other cost on demand. Moreover, the model includes a series of independent variables (e.g., the income of participants), and exponential terms (which allow us to capture a non-linear relationship between costs and demand).

**Table 75: Main specification reweighted by grid status and number of rooms in property (supplementary experiment)**

| Independent variables | Full sample | On-gas grid | Off-gas grid |
|---|---|---|---|
| Upfront cost coefficient | -0.0165*** | -0.0004*** | -0.0002*** |
| Upfront cost standard error | (0.0013) | (0.0000) | (0.0000) |
| Running costs coefficient | 0.1206 | 0.0094** | 0.0049 |
| Running costs standard error | (0.1006) | (0.0032) | (0.0038) |
| Squared upfront cost coefficient | 0.0000*** | 0.0000 | 0.0000 |
| Squared upfront cost standard error | (0.0000) | (.) | (.) |
| Squared running cost coefficient | -0.0006 | -0.0000*** | -0.0000** |
| Squared running cost standard error | (0.0005) | (0.0000) | (0.0000) |
| Cubed upfront cost coefficient | -0.0000*** | 0.0000 | 0.0000 |
| Cubed upfront cost standard error | (0.0000) | (.) | (.) |
| Cubed running cost coefficient | 0.0000 | 0.0000 | 0.0000 |
| Cubed running cost standard error | (0.0000) | (.) | (.) |
| Interaction: upfront x running costs coefficient | 0.0000*** | 0.0000*** | 0.0000*** |
| Interaction: upfront x running costs standard error | (0.0000) | (0.0000) | (0.0000) |
| Status quo upfront cost coefficient | 0.0000 | 0.0000 | 0.0000 |

| | | | |
|---|---|---|---|
| Status quo upfront cost standard error | (.) | (.) | (.) |
| Status quo running cost coefficient | 0.0000 | 0.0000 | 0.0000 |
| Status quo running cost standard error | (.) | (.) | (.) |
| Status quo fuel type: Gas (Oil omitted) coefficient | 0.0000 | 0.0000 | 0.0000 |
| Status quo fuel type: Gas Oil omitted) standard error | (.) | (.) | (.) |
| Income quintile 1 coefficient | 0.0000 | 0.0000 | 0.0000 |
| Income quintile 1 standard error | (.) | (.) | (.) |
| Income quintile 2 coefficient | -0.0020 | 0.0561 | -0.0615 |
| Income quintile 2 standard error | (0.0376) | (0.0493) | (0.0573) |
| Income quintile 3 coefficient | 0.0236 | 0.0408 | -0.0125 |
| Income quintile 3 standard error | (0.0385) | (0.0451) | (0.0697) |
| Income quintile 4 coefficient | 0.0561 | 0.0746 | 0.0352 |
| Income quintile 4 standard error | (0.0416) | (0.0489) | (0.0729) |
| Income quintile 5 coefficient | 0.0537 | 0.0741* | 0.0063 |
| Income quintile 5 standard error | (0.0291) | (0.0355) | (0.0491) |
| Income: Don't know or prefer not to say coefficient | -0.0293 | -0.0059 | -0.0786 |
| Income: Don't know or prefer not to say standard error | (0.0322) | (0.0395) | (0.0533) |
| Property type: Bungalow (detached house omitted) coefficient | -0.0143 | -0.0810 | 0.0471 |
| Property type: Bungalow (detached house omitted) standard error | (0.0349) | (0.0450) | (0.0521) |
| Property type: End-terrace house (detached house omitted) coefficient | 0.0605 | 0.0878 | -0.0299 |
| Property type: End-terrace house (detached house omitted) standard error | (0.0504) | (0.0628) | (0.0802) |
| Property type: Flat (ground floor/basement) (detached house omitted) coefficient | -0.1949*** | -0.2127*** | 0.0000 |
| Property type: Flat (ground floor/basement) (detached house omitted) standard error | (0.0550) | (0.0562) | (.) |

| | | | |
|---|---|---|---|
| Property type: Mid-terrace house (detached house omitted) coefficient | 0.0132 | -0.0134 | 0.0696 |
| Property type: Mid-terrace house (detached house omitted) standard error | (0.0372) | (0.0420) | (0.0962) |
| Property type: Semi-detached house (detached house omitted) coefficient | -0.0346 | -0.0460 | -0.0303 |
| Property type: Semi-detached house (detached house omitted) standard error | (0.0253) | (0.0328) | (0.0415) |
| Age of property: Pre 1900 coefficient | 0.0000 | 0.0000 | 0.0000 |
| Age of property: Pre 1900 standard error | (.) | (.) | (.) |
| Age of property: 1900-1929 coefficient | 0.0389 | 0.1037* | -0.1426* |
| Age of property: 1900-1929 standard error | (0.0399) | (0.0520) | (0.0642) |
| Age of property: 1930-1982 coefficient | 0.0022 | 0.0316 | -0.0392 |
| Age of property: 1930-1982 standard error | (0.0290) | (0.0418) | (0.0428) |
| Age of property: 1983-2011 coefficient | -0.0302 | -0.0365 | -0.0390 |
| Age of property: 1983-2011 standard error | (0.0326) | (0.0485) | (0.0449) |
| Age of property: 2012 onwards coefficient | 0.0847 | 0.0617 | 0.1389 |
| Age of property: 2012 onwards standard error | (0.0566) | (0.0713) | (0.0984) |
| Age of property: I don't know coefficient | 0.0510 | 0.0371 | 0.2524 |
| Age of property: I don't know standard error | (0.1075) | (0.1178) | (0.2417) |
| Constant coefficient | 21.2682** | 0.8943** | 1.1983** |
| Constant standard error | (7.2481) | (0.3184) | (0.3979) |
| Observations | 6720 | 3840 | 2880 |
| R-squared | 0.168 | 0.224 | 0.120 |

Notes: This table presents the results from three multivariate regressions. All regressions are run using Linear Probability Models (i.e., OLS models with binary outcomes). The dependent variable is, in each case, whether participants chose to install a heat pump (rather than renew their existing heating system). The dependent variables are presented in the top row, and the independent variables are presented in the leftmost column. The first regression (column 1) is conducted using the full study sample. The following two regressions (columns 2-3) are conducted on subsets of the sample: A) on-gas grid, B) off-gas grid. Regression coefficient estimates are displayed without brackets, and standard errors for the estimates are presented beneath each respective estimate. Standard errors are clustered on a participant level. Statistical significance is indicated by stars: * p<0.05, **p<0.01, ***p<0.001.

Table 76 presents estimated from the main specification model using data from the supplementary experiment. Respondents that chose a heat pump but stated that they were not confident in their decision were recoded as not having chosen a heat pump, but a fossil fuel boiler instead. This analysis allows us to test the robustness of the main specification results.

**Table 76: Main specification (LPM) – recoding those who are not confident in their decision to choose a heat pump (supplementary experiment)**

| Independent variables | Chose heat pump (Full sample) | Chose heat pump (on-gas grid) | Chose heat pump (off-gas grid) |
|---|---|---|---|
| Upfront cost coefficient | -0.0002 | -0.0003*** | -0.0002*** |
| Upfront cost standard deviation | (0.8734) | (0.0000) | (0.0000) |
| Running cost coefficient | 0.1215 | 0.0096** | 0.0049 |
| Running cost standard deviation | (0.0977) | (0.0032) | (0.0037) |
| Squared upfront cost coefficient | -0.0000 | 0.0000 | 0.0000 |
| Squared upfront cost standard deviation | (0.0002) | (.) | (.) |
| Squared running cost coefficient | -0.0006 | -0.0000*** | -0.0000** |
| Squared running cost standard deviation | (0.0005) | (0.0000) | (0.0000) |
| Cubed upfront cost coefficient | 0.0000 | 0.0000 | 0.0000 |
| Cubed upfront cost standard deviation | (0.0000) | (.) | (.) |
| Cubed running cost coefficient | 0.0000 | 0.0000 | 0.0000 |
| Cubed running cost standard deviation | (0.0000) | (.) | (.) |
| Interaction: upfront x running cost coefficient | 0.0000*** | 0.0000*** | 0.0000*** |
| Interaction: upfront x running cost standard deviation | (0.0000) | (0.0000) | (0.0000) |
| Status quo upfront cost coefficient | 0.0001 | 0.0000 | 0.0000 |
| Status quo upfront cost standard deviation | (0.0057) | (.) | (.) |
| Status quo running cost coefficient | 0.0000 | 0.0000 | 0.0000 |

| | | | |
|---|---|---|---|
| Status quo running cost standard deviation | (.) | (.) | (.) |
| Statusquo fuel type: Gas (Oil omitted) coefficient | 0.0000 | 0.0000 | 0.0000 |
| Statusquo fuel type: Gas (Oil omitted) standard deviation | (.) | (.) | (.) |
| Income: less than 10000 coefficient | 0.0000 | 0.0000 | 0.0000 |
| Income: less than 10000 standard deviation | (.) | (.) | (.) |
| Income: 10000-14999 coefficient | -0.0769 | -0.0870 | -0.0624 |
| Income: 10000-14999 standard deviation | (0.0744) | (0.0836) | (0.1384) |
| Income: 15000-19999 coefficient | 0.0205 | -0.0035 | 0.0380 |
| Income: 15000-19999 standard deviation | (0.0696) | (0.0778) | (0.1271) |
| Income: 20000-29999 coefficient | 0.0383 | 0.0306 | 0.0230 |
| Income: 20000-29999 standard deviation | (0.0627) | (0.0698) | (0.1142) |
| Income: 30000-39999 coefficient | 0.0392 | 0.0748 | -0.0079 |
| Income: 30000-39999 standard deviation | (0.0617) | (0.0730) | (0.1072) |
| Income: 40000-49999 coefficient | 0.0804 | 0.0883 | 0.0405 |
| Income: 40000-49999 standard deviation | (0.0632) | (0.0703) | (0.1153) |
| Income: 50000-59999 coefficient | 0.0985 | 0.0790 | 0.1196 |
| Income: 50000-59999 standard deviation | (0.0653) | (0.0724) | (0.1184) |
| Income: 60000-99999 coefficient | 0.1258* | 0.1352* | 0.0712 |
| Income: 60000-99999 standard deviation | (0.0601) | (0.0668) | (0.1093) |
| Income: 100000 or more coefficient | 0.0817 | 0.0725 | 0.0572 |
| Income: 100000 or more standard deviation | (0.0617) | (0.0722) | (0.1079) |
| Income: Don't know or prefer not to say coefficient | -0.0006 | -0.0016 | -0.0338 |
| Income: Don't know or prefer not to say standard deviation | (0.0592) | (0.0668) | (0.1064) |

| | | | |
|---|---|---|---|
| Property type: Bungalow (detached house omitted) coefficient | 0.0161 | -0.0573 | 0.0853 |
| Property type: Bungalow (detached house omitted) standard deviation | (0.0345) | (0.0447) | (0.0510) |
| Property type: End-terrace house (detached house omitted) coefficient | -0.0047 | 0.0306 | -0.1177 |
| Property type: End-terrace house (detached house omitted) standard deviation | (0.0466) | (0.0607) | (0.0651) |
| Property type: Flat (ground floor/basement) coefficient | -0.1862*** | -0.2075*** | 0.0000 |
| Property type: Flat (ground floor/basement) (detached house omitted) standard deviation | (0.0555) | (0.0572) | (.) |
| Property type: Mid-terrace house coefficient | 0.0236 | -0.0059 | 0.1077 |
| Property type: Mid-terrace house standard (detached house omitted) deviation | (0.0365) | (0.0413) | (0.0952) |
| Property type: Semi-detached house (detached house omitted) coefficient | -0.0280 | -0.0380 | -0.0242 |
| Property type: Semi-detached house (detached house omitted) standard deviation | (0.0243) | (0.0318) | (0.0395) |
| Property age: Pre 1900 coefficient | 0.0000 | 0.0000 | 0.0000 |
| Property age: Pre 1900 standard deviation | (.) | (.) | (.) |
| Property age: 1900-1929 coefficient | 0.0553 | 0.1100* | -0.1008 |
| Property age: 1900-1929 standard deviation | (0.0393) | (0.0519) | (0.0627) |
| Property age: 1930-1982 coefficient | 0.0049 | 0.0330 | -0.0406 |
| Property age: 1930-1982 standard deviation | (0.0280) | (0.0409) | (0.0409) |
| Property age: 1983-2011 coefficient | 0.0065 | -0.0039 | -0.0017 |
| Property age: 1983-2011 standard deviation | (0.0319) | (0.0475) | (0.0441) |
| Property age: 2012 onwards coefficient | 0.1070 | 0.0977 | 0.1301 |
| Property age: 2012 onwards standard deviation | (0.0565) | (0.0707) | (0.1006) |

| | | | |
|---|---|---|---|
| Property age: I don't know coefficient | 0.0931 | 0.0716 | 0.3255 |
| Property age: I don't know standard deviation | (0.1089) | (0.1195) | (0.2381) |
| Constant coefficient | -7.0905 | 0.7672* | 1.0468** |
| Constant standard deviation | (2212.8274) | (0.3202) | (0.3914) |
| Observations | 6720 | 3840 | 2880 |
| R-squared | 0.169 | 0.219 | 0.124 |

Table 77 presents results from the mixed logistical regression analysis of the DCE where upfront and running costs are modelled as continuous variables. We performed this analysis to understand how the different attributes impact the uptake of heat pumps while accounting for unobserved preference heterogeneity (i.e., individual-level differences in heat pump preferences that we do not directly see in the data). The main benefit of the mixed logit regressions is that they have higher statistical power than the multivariate results.

**Table 77: Mixed logistical regression - continuous upfront and running costs (all segments - supplementary experiment)**

| Independent variables | Chose heat pump (full sample not controlling for heat pump installation) | Chose heat pump (full sample controlling for heat pump installation) | Chose heat pump (on-gas-grid not controlling for heat pump installation) | Chose heat pump (on-gas-grid controlling for heat pump installation) | Chose heat pump (off-gas-grid not controlling for heat pump installation) | Chose heat pump (off-gas-grid controlling for heat pump installation) |
|---|---|---|---|---|---|---|
| Upfront cost coefficient | -0.0016*** | -0.0023*** | -0.0018*** | -0.0028*** | -0.0013*** | -0.0016*** |
| Upfront cost standard error | -0.0001 | -0.0001 | -0.0001 | -0.0002 | -0.0001 | -0.0001 |
| Running costs coefficient | -0.0210*** | -0.0630*** | -0.0246*** | -0.0679*** | -0.0162*** | -0.0562*** |

| | | | | | | |
|---|---|---|---|---|---|---|
| Running costs standard error | -0.0012 | -0.0036 | -0.0016 | -0.005 | -0.0018 | -0.0054 |
| Heat pump installation coefficient | | 0.1902 | | 0.7672*** | | -1.1259*** |
| Heat pump installation standard error | | -0.2299 | | -0.2581 | | -0.3813 |
| Observations | 17920 | 17920 | 10240 | 10240 | | 7680 |
| R-squared | | | | | | |

Notes: This table displays the attribute level coefficients as log odd ratios estimated using the mixed logit model with panel data to account for unobserved preference heterogeneity. The model was estimated using the mixlogit command with 500 random Halton draws in Stata 15. The dependent variable is, in each case, whether participants chose to install a heat pump (rather than renew their existing heating system). The dependent variables are presented in the top row, and the independent variables are presented in the leftmost column. Each observation in the dataset represents a choice between participants' existing heating system or a heat pump, and each participant makes multiple choices. The upfront and/or the running costs of the heat pump are varied each time participants' make a choice, while the upfront and running costs of their existing heating system depends on the characteristics of their home and whether they are on or off the gas grid. Models presented in this table are ran on the following subsets of the sample: A) on gas grid households, B) off gas grid. Results of two models are presented for each sample, the first only includes upfront and running costs as attributes and the second also includes an attribute for installation of heat pump, which differentiates the option from the status quo heating system. In both columns, cost attributes are modelled as continuous variables. Regression coefficient estimates are displayed without parenthesis, and standard errors for the estimates are presented beneath each respective estimate. Statistical significance is indicated by stars: * p<0.05, **p<0.01, *** p<0.001.

## Correlational analysis

The tables in this section present the results from the correlational analysis performed to understand the associations between choosing a heat pump in the DCE and a range of household and individual characteristics. The tables in this section present results from OLS regressions conducted using the DCE choice-level data set. In all regressions, standard errors are clustered at the individual level.

Table 78 presents the results of a correlational analysis of heat pump uptake and housing characteristics, socio-demographic characteristics. Environmental attitudes and knowledge about heat pumps and housing characteristics. The first column contains results from a single multivariate OLS regression, whereas the second column contains results from multiple (one per variable) bi-variate OLS regressions. This table allows us to estimate the likelihood of a given variable while controlling for all categories of variables.

For example, in Table 78, the coefficient “0.0204” which is in the second column on the same row as “Gender: Female coefficient” represents the change in the probability that a participant chose a heat pump if they are female relative to participants that are male participants. Further, the coefficient “0.0204” shows that female participants are 2.04 percentage points more likely to choose a heat pump than male participants. The figures shown in parentheses beneath the coefficients represent the standard errors.

**Table 78: Heat pump uptake and heating system characteristics, socio-demographic characteristics, environmental attitudes and knowledge about heat pumps and housing characteristics**

| Independent variables | Heat pump chosen (other factors controlled for) | Heat pump chosen (other factors not controlled for) |
|---|---|---|
| Gender: Female (male omitted) coefficient | 0.0204 | 0.0264 |
| Gender: Female (male omitted) standard deviation | (0.0189) | (0.0204) |
| Age: 18 - 24 (Prefer not to say omitted) coefficient | 0.0703 | 0.0896 |
| Age: 18 - 24 (Prefer not to say omitted) standard deviation | (0.1052) | (0.0528) |
| Age: 25 - 34 (Prefer not to say omitted) coefficient | -0.0005 | 0.0336 |
| Age: 25 - 34 (Prefer not to say omitted) standard deviation | (0.0623) | (0.0310) |
| Age: 35 - 44 (Prefer not to say omitted) coefficient | -0.0207 | 0.0207 |
| Age: 35 - 44 (Prefer not to say omitted) standard deviation | (0.0602) | (0.0289) |
| Age: 45 - 54 (Prefer not to say omitted) coefficient | 0.0297 | 0.0697** |
| Age: 45 - 54 (Prefer not to say omitted) standard deviation | (0.0582) | (0.0259) |
| Age: 55 - 64 (Prefer not to say omitted) coefficient | 0.0129 | -0.0026 |

| | | |
|---|---|---|
| Age: 55 - 64 (Prefer not to say omitted) standard deviation | (0.0570) | (0.0249) |
| Age: 65 - 74 (Prefer not to say omitted) coefficient | -0.0088 | -0.0251 |
| Age: 65 - 74 (Prefer not to say omitted) standard deviation | (0.0577) | (0.0248) |
| Age: 75 - 84 (Prefer not to say omitted) coefficient | -0.0303 | -0.0735* |
| Age: 75 - 84 (Prefer not to say omitted) standard deviation | (0.0596) | (0.0329) |
| Age: 85 or older (Prefer not to say omitted) coefficient | 0.0001 | -0.0781 |
| Age: 85 or older (Prefer not to say omitted) standard deviation | (0.0868) | (0.0712) |
| Income: Less than £20k (DK omitted) coefficient | -0.0192 | -0.0417 |
| Income: Less than £20k (DK omitted) standard deviation | (0.0364) | (0.0326) |
| Income: £20k - £40k (DK omitted) coefficient | -0.0039 | -0.0132 |
| Income: £20k - £40k (DK omitted) standard deviation | (0.0295) | (0.0251) |
| Income: £40k - £60k (DK omitted) coefficient | -0.0165 | 0.0255 |
| Income: £40k - £60k (DK omitted) standard deviation | (0.0296) | (0.0264) |
| Income: £60k - £100k (DK omitted) coefficient | -0.0124 | 0.0600* |
| Income: £60k - £100k (DK omitted) standard deviation | (0.0299) | (0.0261) |
| Income: £100k or more (DK omitted) coefficient | -0.0160 | 0.0229 |

| | | |
|---|---|---|
| Income: £100k or more (DK omitted) standard deviation | (0.0342) | (0.0291) |
| Savings: 10k + coefficient | 0.0412* | 0.0681** |
| Savings: 10k + standard deviation | (0.0204) | (0.0207) |
| How often have you struggled to pay at least one of your household bills? Coefficient | 0.0218 | 0.0485 |
| How often have you struggled to pay at least one of your household bills? | (0.0236) | (0.0249) |
| Property type: Bungalow coefficient | 0.1646* | -0.0236 |
| Property type: Bungalow standard deviation | (0.0655) | (0.0309) |
| Property type: Detached house coefficient | 0.1756** | 0.0085 |
| Property type: Detached house standard deviation | (0.0621) | (0.0207) |
| Property type: End-terrace house coefficient | 0.1577** | -0.0253 |
| Property type: End-terrace house standard deviation | (0.0578) | (0.0217) |
| Property type: Flat (NOT on ground-floor/basement) coefficient | 0.2140** | 0.0853 |
| Property type: Flat (NOT on ground-floor/basement) standard deviation | (0.0679) | (0.0452) |
| Property type: Flat (ground floor/basement) coefficient | 0.1862** | 0.0318 |
| Property type: Flat (ground floor/basement) standard deviation | (0.0622) | (0.0331) |
| Property type: Mid-terrace house coefficient | 0.0000 | -0.1451** |
| Property type: Mid-terrace house standard deviation | (.) | (0.0519) |
| Property type: Semi-detached house coefficient | -0.0169 | 0.0023 |

| | | |
|---|---|---|
| Property type: Semi-detached house standard deviation | (0.0795) | (0.0250) |
| Property built in: 1900-1929 (pre 1900 omitted) coefficient | 0.0054 | 0.0355 |
| Property built in: 1900-1929 pre 1900 omitted) standard deviation | (0.0826) | (0.0340) |
| Property built in: 1930-1982 pre 1900 omitted) coefficient | 0.0107 | -0.0091 |
| Property built in: 1930-1982 pre 1900 omitted) standard deviation | (0.0774) | (0.0203) |
| Property built in: 1983-2011 pre 1900 omitted) coefficient | -0.0046 | -0.0375 |
| Property built in: 1983-2011 pre 1900 omitted) standard deviation | (0.0791) | (0.0252) |
| Property built in: 2012 onwards pre 1900 omitted) coefficient | 0.0865 | 0.1048* |
| Property built in: 2012 onwards pre 1900 omitted) standard deviation | (0.0894) | (0.0506) |
| How many bedrooms does your property have? Coefficient | -0.0163 | 0.0092 |
| How many bedrooms does your property have? standard deviation | (0.0157) | (0.0114) |
| Do you have a mortgage on your current property? Coefficient | -0.0174 | 0.0403* |
| Do you have a mortgage on your current property? standard deviation | (0.0236) | (0.0202) |
| Has owned property for 10 or more years coefficient | -0.0253 | -0.0264 |
| Has owned property for 10 or more years standard deviation | (0.0173) | (0.0203) |
| Expects to own property for 10 or more years coefficient | -0.0430* | -0.0817*** |

| | | |
|---|---|---|
| Expects to own property for 10 or more years standard deviation | (0.0210) | (0.0201) |
| High energy demand off-gas grid (oil) (high on gas gird omitted) coefficient | -0.0274 | -0.0204 |
| High energy demand off-gas grid (oil) (high on gas gird omitted) standard deviation | (0.0254) | (0.0212) |
| low energy demand on-gas grid (gas) (high on gas gird omitted) coefficient | -0.0151 | -0.0036 |
| low energy demand on-gas grid (gas) (high on gas gird omitted) standard deviation | (0.0302) | (0.0206) |
| Low energy demand off-gas grid (oil) (high on gas gird omitted) coefficient | -0.0955 | -0.0232 |
| Low energy demand off-gas grid (oil) (high on gas gird omitted) standard deviation | (0.0617) | (0.0566) |
| Heating system age: 4 years old or less (DK omitted) coefficient | -0.0762 | -0.0214 |
| Heating system age: 4 years old or less (DK omitted) standard deviation | (0.0429) | (0.0222) |
| Heating system age: 5-9 years old (DK omitted) coefficient | -0.0289 | 0.0704** |
| Heating system age: 5-9 years old (DK omitted) standard deviation | (0.0439) | (0.0232) |
| Heating system age: 10-14 years old (DK omitted) coefficient | -0.0705 | -0.0403 |
| Heating system age: 10-14 years old (DK omitted) standard deviation | (0.0449) | (0.0265) |
| Heating system age: 15+ years old (DK omitted) coefficient | -0.0606 | -0.0401 |
| Heating system age: 15+ years old (DK omitted) standard deviation | (0.0454) | (0.0233) |
| Has an electric vehicle coefficient | 0.0400 | 0.0863** |
| Has an electric vehicle standard deviation | (0.0259) | (0.0304) |

| | | |
|---|---|---|
| Has wall insulation coefficient | -0.0058 | -0.0304 |
| Has wall insulation standard deviation | (0.0189) | (0.0202) |
| Property has a smart-meter coefficient | 0.0098 | 0.0423* |
| Property has a smart-meter standard deviation | (0.0176) | (0.0207) |
| Property has a solar panels coefficient | 0.0616* | 0.0785* |
| Property has a solar panels standard deviation | (0.0278) | (0.0336) |
| Property has double/triple glazing coefficient | -0.0598* | -0.0449 |
| Property has double/triple glazing standard deviation | (0.0299) | (0.0333) |
| Property has loft insulation coefficient | 0.0008 | -0.0252 |
| Property has loft insulation standard deviation | (0.0275) | (0.0278) |
| Property has underfloor insulation coefficient | 0.0299 | 0.0464 |
| Property has underfloor insulation standard deviation | (0.0294) | (0.0343) |
| System will need replacing within the next two year coefficient | -0.0216 | 0.0358 |
| System will need replacing within the next two year standard deviation | (0.0334) | (0.0353) |
| Planning to renovate home in near future coefficient | 0.0228 | 0.0772*** |
| Planning to renovate home in near future standard deviation | (0.0184) | (0.0202) |
| Planning to improve energy efficiency in the near future coefficient | 0.0859*** | 0.1680*** |
| Planning to improve energy efficiency in the near future standard deviation | (0.0230) | (0.0251) |

| | | |
|---|---|---|
| Moderately or very concerned about climate change coefficient | 0.0446* | 0.1804*** |
| Moderately or very concerned about climate change standard deviation | (0.0211) | (0.0217) |
| Expects energy prices to increase in the next 2 years coefficient | -0.0141 | -0.0095 |
| Expects energy prices to increase in the next 2 years standard deviation | (0.0269) | (0.0212) |
| Expects own energy prices to increase in the next 2 year coefficient | 0.0245 | 0.0279 |
| Expects own energy prices to increase in the next 2 year standard deviation | (0.0274) | (0.0216) |
| Factors that influence the heating system choice: Saving money on monthly bills coefficient | 0.0821*** | 0.1208*** |
| Factors that influence the heating system choice: Saving money on monthly bills standard deviation | (0.0182) | (0.0208) |
| Factors that influence the heating system choice: Saving money on upfront costs coefficient | -0.0452* | -0.0643** |
| Factors that influence the heating system choice: Saving money on upfront costs standard deviation | (0.0206) | (0.0236) |
| Factors that influence the heating system choice: Home is heated comfortably coefficient | -0.0249 | -0.0148 |
| Factors that influence the heating system choice: Home is heated comfortably standard deviation | (0.0248) | (0.0282) |
| Factors that influence the heating system choice: Minimising environmental impact coefficient | 0.2302*** | 0.2811*** |

| | | |
|---|---|---|
| Factors that influence the heating system choice: Minimising environmental impact standard deviation | (0.0203) | (0.0202) |
| Factors that influence the heating system choice: Being familiar with the heating system choice coefficient | -0.0569** | -0.1391*** |
| Factors that influence the heating system choice: Being familiar with the heating system choice standard deviation | (0.0192) | (0.0204) |
| Factors that influence the heating system choice: Minimising occupied space coefficient | -0.0898*** | -0.1684*** |
| Factors that influence the heating system choice: Minimising occupied space standard deviation | (0.0209) | (0.0202) |
| Factors that influence the heating system choice: Minimising time/inconvenience coefficient | -0.1034*** | -0.2060*** |
| Factors that influence the heating system choice: Minimising time/inconvenience standard deviation | (0.0236) | (0.0208) |
| Heat pump knowledge: Hadn't previously heard of them coefficient | 0.0993* | -0.0006 |
| Heat pump knowledge: Hadn't previously heard of them standard deviation | (0.0489) | (0.0379) |
| Heat pump knowledge: Aware of them but don't really know what they are coefficient | 0.1189*** | 0.0176 |
| Heat pump knowledge: Aware of them but don't really know what they are standard deviation | (0.0333) | (0.0214) |
| Heat pump knowledge: Know a little about them coefficient | 0.0546 | 0.0089 |
| Heat pump knowledge: Know a little about them standard deviation | (0.0295) | (0.0202) |

| | | |
|---|---|---|
| Heat pump knowledge: Know a lot about them coefficient | 0.0000 | -0.0519 |
| Heat pump knowledge: Know a lot about them standard deviation | (.) | (0.0323) |
| Passed HP knowledge test coefficient | 0.0539* | 0.0403 |
| Passed HP knowledge test standard deviation | (0.0259) | (0.0251) |
| Constant coefficient | 0.2072 | (.) |
| Constant standard deviation | (0.1385) | (.) |
| Observations | 8984 | 8984 |
| R-squared | 0.166 | 0.001 |

Notes: This table presents results from a multivariate regression and 62 bi-variate regressions using the data from the supplementary experiment, all results are interpreted as correlations since the independent variables are not randomly assigned or exogenous to the individuals. All regressions are run using Linear Probability Models (i.e., OLS models). The dependent variable is, in each case, whether participants chose to install a heat pump (rather than renew their existing heating system). The dependent variables are presented in the top row, and the independent variables are presented in the leftmost column. Each observation in the dataset represents a choice between participants' existing heating system or a heat pump, and each participant makes multiple choices. The upfront and/or the running costs of the heat pump are varied each time participants' make a choice, while the upfront and running costs of their existing heating system depends on the characteristics of their home and whether they are on or off the gas grid. Column 1 presents results from a single regression conducted using the full study sample and all variables are included as independent variables. Column 2 presents results from separate bi-variate regressions (one per independent variable) conducted using the full study sample. The table lacks coefficients in instances where we have categorical variables that are omitted to avoid collinearity with other related variables. Regression coefficient estimates are displayed without brackets, and standard errors for the estimates are presented beneath each respective estimate. Standard errors are clustered on a participant level. Statistical significance is indicated by stars: * p<0.05, **p<0.01, ***p<0.001.

Similarly, Table 79 presents the results of a correlational analysis examining heat pump uptake and various housing characteristics, socio-demographic attributes, environmental attitudes, and knowledge related to heat pumps and housing. However, the estimates for the full sample are re-weighted to address discrepancies in on/off gas grid distribution.

**Table 79: Heat pump uptake and heating system characteristics, socio-demographic characteristics, environmental attitudes and knowledge about heat pumps and housing characteristics weighted by grid status**

| Independent variables | Heat pump chosen (other factors controlled for) | Heat pump chosen (other factors not controlled for) |
|---|---|---|
| Gender: Female (male omitted) coefficient | 0.0059 | 0.0053 |

| | | |
|---|---|---|
| Gender: Female (male omitted) standard deviation | (0.0197) | (0.0220) |
| Age: 18 - 24 (prefer not to say omitted) coefficient | 0.0478 | 0.0765 |
| Age: 18 - 24 (prefer not to say omitted) standard deviation | (0.0943) | (0.0636) |
| Age: 25 - 34 (prefer not to say omitted) coefficient | 0.0040 | 0.0348 |
| Age: 25 - 34 (prefer not to say omitted) standard deviation | (0.0595) | (0.0325) |
| Age: 35 - 44 (prefer not to say omitted) coefficient | -0.0130 | 0.0294 |
| Age: 35 - 44 (prefer not to say omitted) standard deviation | (0.0576) | (0.0311) |
| Age: 45 - 54 (prefer not to say omitted) coefficient | 0.0084 | 0.0418 |
| Age: 45 - 54 (prefer not to say omitted) standard deviation | (0.0547) | (0.0278) |
| Age: 55 - 64 (prefer not to say omitted) coefficient | 0.0242 | 0.0226 |
| Age: 55 - 64 (prefer not to say omitted) standard deviation | (0.0537) | (0.0275) |
| Age: 65 - 74 (prefer not to say omitted) coefficient | -0.0261 | -0.0412 |
| Age: 65 - 74 (prefer not to say omitted) standard deviation | (0.0547) | (0.0271) |
| Age: 75 - 84 (prefer not to say omitted) coefficient | -0.0499 | -0.0815* |
| Age: 75 - 84 (prefer not to say omitted) standard deviation | (0.0563) | (0.0362) |
| Age: 85 or older (prefer not to say omitted) coefficient | 0.0229 | -0.0595 |

| | | |
|---|---|---|
| Age: 85 or older (prefer not to say omitted) standard deviation | (0.0925) | (0.0793) |
| Income: Less than £20k (prefer not to say omitted) coefficient | -0.0281 | -0.0613 |
| Income: Less than £20k (prefer not to say omitted) standard deviation | (0.0388) | (0.0336) |
| Income: £20k - £40k (prefer not to say omitted) coefficient | -0.0106 | -0.0086 |
| Income: £20k - £40k (prefer not to say omitted) standard deviation | (0.0307) | (0.0276) |
| Income: £40k - £60k (prefer not to say omitted) coefficient | -0.0276 | 0.0206 |
| Income: £40k - £60k (prefer not to say omitted) standard deviation | (0.0306) | (0.0281) |
| Income: £60k - £100k (prefer not to say omitted) coefficient | -0.0272 | 0.0662* |
| Income: £60k - £100k (prefer not to say omitted) standard deviation | (0.0303) | (0.0275) |
| Income: £100k or more (prefer not to say omitted) coefficient | -0.0442 | 0.0120 |
| Income: £100k or more (prefer not to say omitted) standard deviation | (0.0363) | (0.0323) |
| Savings: 10k + coefficient | 0.0514* | 0.0674** |
| Savings: 10k + standard deviation | (0.0213) | (0.0225) |
| How often have you struggled to pay at least one of your household bills? Coefficient | 0.0126 | 0.0245 |
| How often have you struggled to pay at least one of your household bills? | (0.0248) | (0.0265) |
| Property type: Bungalow coefficient | 0.1128 | -0.0556 |
| Property type: Bungalow standard deviation | (0.0634) | (0.0325) |

| | | |
|---|---|---|
| Property type: Detached house coefficient | 0.1530* | 0.0178 |
| Property type: Detached house standard deviation | (0.0609) | (0.0226) |
| Property type: End-terrace house coefficient | 0.1461** | -0.0237 |
| Property type: End-terrace house standard deviation | (0.0562) | (0.0232) |
| Property type: Flat (NOT on ground-floor/basement) coefficient | 0.2040** | 0.1154* |
| Property type: Flat (NOT on ground-floor/basement) standard deviation | (0.0677) | (0.0485) |
| Property type: Flat (ground floor/basement) coefficient | 0.1704** | 0.0229 |
| Property type: Flat (ground floor/basement) standard deviation | (0.0612) | (0.0338) |
| Property type: Mid-terrace house coefficient | 0.0000 | -0.1525** |
| Property type: Mid-terrace house standard deviation | (.) | (0.0521) |
| Property type: Semi-detached house coefficient | 0.0062 | -0.0085 |
| Property type: Semi-detached house standard deviation | (0.0821) | (0.0284) |
| Property built in: 1900-1929 (Pre 1900 omitted) coefficient | 0.0502 | 0.0700 |
| Property built in: 1900-1929 (Pre 1900 omitted) standard deviation | (0.0858) | (0.0358) |
| Property built in: 1930-1982 (Pre 1900 omitted) coefficient | 0.0436 | -0.0067 |
| Property built in: 1930-1982 (Pre 1900 omitted) standard deviation | (0.0799) | (0.0219) |
| Property built in: 1983-2011 (Pre 1900 omitted) coefficient | 0.0103 | -0.0557* |

| | | |
|---|---|---|
| Property built in: 1983-2011 (Pre 1900 omitted) standard deviation | (0.0816) | (0.0271) |
| Property built in: 2012 onwards (Pre 1900 omitted) coefficient | 0.0734 | 0.0733 |
| Property built in: 2012 onwards (Pre 1900 omitted) standard deviation | (0.0915) | (0.0509) |
| How many bedrooms does your property have? Coefficient | -0.0051 | 0.0199 |
| How many bedrooms does your property have? standard deviation | (0.0164) | (0.0120) |
| Do you have a mortgage on your current property? Coefficient | -0.0211 | 0.0436* |
| Do you have a mortgage on your current property? standard deviation | (0.0265) | (0.0218) |
| Has owned property for 10 or more years coefficient | -0.0319 | -0.0362 |
| Has owned property for 10 or more years standard deviation | (0.0183) | (0.0218) |
| Expects to own property for 10 or more years coefficient | -0.0443* | -0.0810*** |
| Expects to own property for 10 or more years standard deviation | (0.0224) | (0.0216) |
| High energy demand off-gas grid (oil) (high on gas grid omitted) coefficient | -0.0205 | -0.0218 |
| High energy demand off-gas grid (oil) (high on gas grid omitted) standard deviation | (0.0259) | (0.0213) |
| low energy demand on-gas grid (gas) (high on gas grid omitted) coefficient | -0.0009 | -0.0178 |
| low energy demand on-gas grid (gas) (high on gas grid omitted) standard deviation | (0.0319) | (0.0217) |
| Low energy demand off-gas grid (oil) (high on gas grid omitted) coefficient | -0.0630 | -0.0288 |

| | | |
|---|---|---|
| Low energy demand off-gas grid (oil) (high on gas grid omitted) standard deviation | (0.0645) | (0.0567) |
| Heating system age: 4 years old or less coefficient | -0.0815 | -0.0200 |
| Heating system age: 4 years old or less (DK omitted) standard deviation | (0.0436) | (0.0241) |
| Heating system age: 5-9 years old (DK omitted) coefficient | -0.0416 | 0.0582* |
| Heating system age: 5-9 years old (DK omitted) standard deviation | (0.0443) | (0.0245) |
| Heating system age: 10-14 years old (DK omitted) coefficient | -0.0656 | -0.0374 |
| Heating system age: 10-14 years old (DK omitted) standard deviation | (0.0457) | (0.0285) |
| Heating system age: 15+ years old (DK omitted) coefficient | -0.0571 | -0.0467 |
| Heating system age: 15+ years old (DK omitted) standard deviation | (0.0467) | (0.0259) |
| Has an electric vehicle coefficient | 0.0539* | 0.1082** |
| Has an electric vehicle standard deviation | (0.0270) | (0.0340) |
| Has wall insulation coefficient | 0.0122 | -0.0211 |
| Has wall insulation standard deviation | (0.0200) | (0.0218) |
| Property has a smart-meter coefficient | 0.0148 | 0.0528* |
| Property has a smart-meter standard deviation | (0.0186) | (0.0221) |
| Property has a solar panels coefficient | 0.0756** | 0.1032** |
| Property has a solar panels standard deviation | (0.0291) | (0.0389) |
| Property has double/triple glazing coefficient | -0.0671* | -0.0438 |

| | | |
|---|---|---|
| Property has double/triple glazing standard deviation | (0.0309) | (0.0357) |
| Property has loft insulation coefficient | 0.0065 | -0.0161 |
| Property has loft insulation standard deviation | (0.0299) | (0.0287) |
| Property has underfloor insulation coefficient | 0.0326 | 0.0518 |
| Property has underfloor insulation standard deviation | (0.0317) | (0.0385) |
| System will need replacing within the next two year coefficient | -0.0434 | 0.0358 |
| System will need replacing within the next two year standard deviation | (0.0334) | (0.0369) |
| Planning to renovate home in near future coefficient | 0.0205 | 0.0765*** |
| Planning to renovate home in near future standard deviation | (0.0191) | (0.0219) |
| Planning to improve energy efficiency in the near future coefficient | 0.0945*** | 0.1794*** |
| Planning to improve energy efficiency in the near future standard deviation | (0.0246) | (0.0271) |
| Moderately or very concerned about climate change coefficient | 0.0475* | 0.1734*** |
| Moderately or very concerned about climate change standard deviation | (0.0225) | (0.0236) |
| Expects energy prices to increase in the next 2 years coefficient | -0.0125 | 0.0129 |
| Expects energy prices to increase in the next 2 years standard deviation | (0.0266) | (0.0226) |
| Expects own energy prices to increase in the next 2 year coefficient | 0.0399 | 0.0448 |

| | | |
|---|---|---|
| Expects own energy prices to increase in the next 2 year standard deviation | (0.0277) | (0.0230) |
| Factors that influence the heating system choice: Saving money on monthly bills coefficient | 0.0832*** | 0.1146*** |
| Factors that influence the heating system choice: Saving money on monthly bills standard deviation | (0.0190) | (0.0228) |
| Factors that influence the heating system choice: Saving money on upfront costs coefficient | -0.0399 | -0.0681** |
| Factors that influence the heating system choice: Saving money on upfront costs standard deviation | (0.0220) | (0.0259) |
| Factors that influence the heating system choice: Home is heated comfortably coefficient | -0.0126 | 0.0008 |
| Factors that influence the heating system choice: Home is heated comfortably standard deviation | (0.0260) | (0.0310) |
| Factors that influence the heating system choice: Minimising environmental impact coefficient | 0.2110*** | 0.2593*** |
| Factors that influence the heating system choice: Minimising environmental impact standard deviation | (0.0211) | (0.0219) |
| Factors that influence the heating system choice: Being familiar with the heating system choice coefficient | -0.0701*** | -0.1505*** |
| Factors that influence the heating system choice: Being familiar with the heating system choice standard deviation | (0.0195) | (0.0218) |

| | | |
|---|---|---|
| Factors that influence the heating system choice: Minimising occupied space coefficient | -0.1056*** | -0.1890*** |
| Factors that influence the heating system choice: Minimising occupied space standard deviation | (0.0213) | (0.0216) |
| Factors that influence the heating system choice: Minimising time/inconvenience coefficient | -0.0967*** | -0.2112*** |
| Factors that influence the heating system choice: Minimising time/inconvenience standard deviation | (0.0241) | (0.0227) |
| Heat pump knowledge: Hadn't previously heard of them coefficient | 0.0000 | -0.0026 |
| Heat pump knowledge: Hadn't previously heard of them standard deviation | (.) | (0.0381) |
| Heat pump knowledge: Aware of them but don't really know what they are coefficient | 0.0040 | -0.0014 |
| Heat pump knowledge: Aware of them but don't really know what they are standard deviation | (0.0394) | (0.0228) |
| Heat pump knowledge: Know a little about them coefficient | -0.0571 | 0.0150 |
| Heat pump knowledge: Know a little about them standard deviation | (0.0415) | (0.0218) |
| Heat pump knowledge: Know a lot about them coefficient | -0.1241* | -0.0348 |
| Heat pump knowledge: Know a lot about them standard deviation | (0.0498) | (0.0391) |
| Passed HP knowledge test coefficient | 0.0484 | 0.0444 |
| Passed HP knowledge test standard deviation | (0.0264) | (0.0262) |

| | | |
|---|---|---|
| Constant coefficient | 0.2743 | (.) |
| Constant standard deviation | (0.1410) | (.) |
| Observations | 8984 | 8984 |
| R-squared | 0.165 | 0.000 |

Notes: This table presents results from a multivariate regression and 62 bi-variate regressions using the data from the supplementary experiment, all results are interpreted as correlations since the independent variables are not randomly assigned or exogenous to the individuals. All regressions are run using Linear Probability Models (i.e., OLS models) weighted to account for discrepancies in grid status distribution. The dependent variable is, in each case, whether participants chose to install a heat pump (rather than renew their existing heating system). The dependent variables are presented in the top row, and the independent variables are presented in the leftmost column. Each observation in the dataset represents a choice between participants' existing heating system or a heat pump, and each participant makes multiple choices. The upfront and/or the running costs of the heat pump are varied each time participants' make a choice, while the upfront and running costs of their existing heating system depends on the characteristics of their home and whether they are on or off the gas grid. Column 1 presents results from a single regression conducted using the full study sample and all variables are included as independent variables. Column 2 presents results from separate bi-variate regressions (one per independent variable) conducted using the full study sample. The table lacks coefficients in instances where we have categorical variables that are omitted to avoid collinearity with other related variables. Regression coefficient estimates are displayed without brackets, and standard errors for the estimates are presented beneath each respective estimate. Standard errors are clustered on a participant level. Statistical significance is indicated by stars: * p<0.05, **p<0.01, ***p<0.001.

# Annex 4: Bibliography

*This annex lists the documents that were reviewed as part of the scoping phase of the study, and which informed the design of the questionnaire and DCE method.*

**Table 80: List of documents reviewed for the scoping phase of the study**


| Author | Date | Title | Link |
|---|---|---|---|
| Energy Systems Catapult | 2023 | Electrification of heat - overview, participant report and home surveys install report | https://es.catapult.org.uk/news/mass-rollout-of-heat-pumps-feasible-but-innovation-needed/?reportDownload=https://es.catapult.org.uk/wp-content/uploads/2022/12/EoH-Participant-Recruitment-Report.pdf |
| BIT, Nesta | 2022 | Estimating the willingness to pay for a heat pump - incl. technical annex and trial protocol | https://www.nesta.org.uk/report/estimating-willingness-pay-heat-pump/ |
| Department of Energy and Climate Change | 2016 | Qualitative research with social housing providers | https://www.gov.uk/government/collections/renewable-heat-incentive-evaluation#domestic-rhi-evaluation-reports |
| Department of Energy and Climate Change | 2016 | MCS Renewable Heat Technology Installers Survey | https://www.gov.uk/government/collections/renewable-heat-incentive-evaluation#domestic-rhi-evaluation-reports |
| Centrica plc | 2023 | British Gas to Drive Demand for Heat Pumps with Lowest Price Guarantee | https://twitter.com/ClemCowton/status/1614960321206026241?t=MPP4_Kn-_nvoYGIXiT6Jfg&s=09 |
| ICF | 2022 | Electrification of Heat Interim Evaluation | Unpublished (when this report was prepared) |
| Department for Business, Energy and Industrial Strategy | 2023 | Reforms to the Domestic Renewable Heat Incentive: evaluation | https://www.gov.uk/government/publications/reforms-to-the-domestic-renewable-heat-incentive-evaluation |

| | | | |
|---|---|---|---|
| Public First | 2021 | Research on Air-Source Heat Pumps | https://www.publicfirst.co.uk/research-in-air-source-heat-pumps.html |
| Meles et. al. | 2019 | Preferences for Renewable Home Heating: A Choice Experiment Study of Heat Pump System in Ireland | https://researchrepository.ucd.ie/server/api/core/bitstreams/e9f1b773-1705-49aa-94a4-ce7ef6fa1070/content |
| Department for Business, Energy and Industrial Strategy | 2022 | Five reasons to get a heat pump | https://www.gov.uk/government/news/five-reasons-to-get-a-heat-pump |
| Gov.uk | 2022 | Energy Saving Tips to Save Money | https://helpforhouseholds.campaign.gov.uk/energy-saving-advice/ |
| Public First | 2022 | Research on Opinions Towards Air-Source Heat Pumps | Unpublished (when this report was prepared) |

# Annex 5: List of interviewees

The following interviewees were consulted as part of the scoping phase of the study.

**Table 81: List of interviewees**

| Organisation | Role |
|---|---|
| DESNZ | Lead economist |
| DESNZ | Lead economist |
| DESNZ | Expert in barriers to ASHP installation and related policy |
| DESNZ | Lead behavioural scientist |
| ICF | Heat pump expert |

# Annex 6: Final questionnaire

*This annex contains the text of the final version of the questionnaire that was used for the main experiment. The survey was scripted using Qualtrics, and its formatting and appearance was different from the text that appears here.*

**Introduction**

Welcome! This survey is being conducted by ICF and The Behaviouralist on behalf of the Department for Energy Security and Net Zero.

This study aims to understand households' preferences for different heating systems. By participating, you will help make low-carbon heating systems more accessible.

The survey takes 13 minutes to complete, and you will earn £5 upon completion. You will also stand a chance to win an additional £250 reward.

We understand that energy costs may be a concern and have provided links to government support at the end of the survey.

To proceed, confirm that you are 18 or older and have read and agreed to the data protection notice. For questions, please contact info@thebehaviouralist.com.

I am 18+ years old and I have read and agreed to the data protection notice

Please note, we will be tracking the time you spend completing the survey. If you choose to withdraw or complete the survey too quickly, you will not earn a Voucher Express voucher worth £5 as compensation.

**Screening questions**

Before we begin, we will first ask you a few questions about your primary residence.

Is the property you are currently living in your primary residence?

- [Yes, No, I don’t know]

Do you own this specific property?

- [Yes, No, I don’t know]

Which of the following best describes this property?

- [Detached house, Semi-detached house/, Mid-terrace house], End-terrace house/, Flat (ground floor, including basement) , Flat (not on ground-floor), Bungalow]

How many bedrooms does your property have?

- [1, 2, 3, 4, 5 or more]

Roughly, when was your property built?

-  [Pre 1900, 1900-1929, 1930-1982, 1983-2011, 2012 onwards, I don’t know]

How much would you say you know about heat pumps?

-  [Hadn’t previously heard of them; Aware of them but don't really know what they are; Know a little about them; Know a lot about them]

Please select the option below that you think best describes a heat pump:

-  [A heat pump uses electricity to extract heat from the air or ground, and delivers that heat via hot water to your radiator system and water taps; ; A heat pump uses electricity to make your gas or oil boiler work harder, pumping the hot water through your radiators at higher pressure; A heat pump uses electricity and works like a whole house fan, pumping hot air out the windows during summer; I don’t know.]

What is your primary heating system? By 'primary heating system', we mean the system that you use to heat rooms and water in your property.

-  [Gas central heating: you have a gas-fired boiler that heats water to provide central heating through radiators and hot water from your tap; LPG central heating: you have a tank where you store liquid petroleum gas (LPG) which you use to run your LPG-fired boiler at home; Oil heating system: you have a tank where you store oil, which you use to run an oil-fired boiler; Electric heating system: You have electric radiators or an electric boiler that provides heating through radiators and hot water from your tap; Biomass heating system: You have a boiler that burns logs, pellets or coal, and is connected to a central heating and hot water system; Heat pump system: You have a heat pump that takes heat from the air (air source heat pump) or from the ground (ground source heat pump) and transfers the heat to the heating system in your home. This includes hybrid systems that combine a heat pump with a fossil-fuel boiler.; Heat network: You don’t have an individual boiler but receive heat from a network of underground pipes that can cover a large area, such as a district or even a city. Other (please specify)]

Roughly, how old is your primary heating system?

-  [4 years old or less, 5-9 years old, 10-14 years old, 15+ years old, I don’t know]

Do you have any of the following? Please select all that apply

-  [Wall insulation (cavity or solid wall); Double/Triple glazing; Loft insulation or room in roof insulation; Underfloor insulation; A smart meter (a meter that records your energy use and provides automatic readings to your supplier); Solar panels (panels that absorb the sun’s rays and generate electricity); An electric car, including a hybrid (a car that is propelled by an electric motor, rather than by an internal combustion engine); None of the above]

**Scenarios and information presented**

The next part of the survey will be related to heat pumps. Please read the information below carefully before proceeding.

What is an air source heat pump?

Air source heat pumps are heating systems that take heat from the outside air to heat homes and provide hot water. Most heat pumps in the UK come with a water tank to store hot water and heat your home via hot water circuits. They work well even when outdoor temperatures are well below freezing levels.

Air source heat pumps are a good choice if you want to help the environment because they use less energy than other heating systems and run on electricity, which is generated in part from renewable sources. By 2035, all electricity in the UK will come from renewable sources, so using an air-source heat pump means you'll be heating your home without polluting.

How do you install an air source heat pump?

Similar to air conditioning units, most air source heat pumps will require an outside unit positioned at the side or back of a property with space around for air to circulate. The inside unit will usually consist of a water tank for storing hot water along with other heating components.

It’s important to ensure that your home is well-insulated and has good heat distribution systems if you are planning to install an air source heat pump. Most homes in the UK are already adequately insulated and ready for a heat pump installation.

You won't normally need planning permission for installing an air source heat pump, but if you live in a listed building or conservation area, then you'll need the consent of your local authority.

What you need to know about air source heat pumps:

Energy efficient: Heat pumps use up to 4 times less energy than many conventional heating systems to generate the same amount of heat and hot water.

Good for the environment: Switching to a heat pump will typically reduce carbon emissions by 75%. What's more, heat pumps run on electricity which is generated in part by renewable sources. By 2035, the grid will be fully powered by renewable sources, meaning that you will be heating your home with zero emissions.

Low maintenance: A heat pump can last up to 20 years – 5 years longer than a conventional boiler. Like a boiler, a heat pump should be serviced every year to make sure that it is still working at its best.

Constant heat: Heat pumps are best at maintaining a constant comfortable temperature over time. However, it may take you longer to heat your home with a heat pump compared to a regular boiler, so many people install smart controls alongside their heat pump to ensure their home is warm when they need it to be.

Space requirements: You will need space outside for the pump and inside for a water storage tank.

Installation time: While replacing a boiler typically takes between 1-3 days, installing a heat pump can a little longer (usually 2-7 days) as the system may take extra time to design, and larger radiators may be installed alongside them. If you are interested in installing a heat pump it can pay to plan ahead.

For this part of the survey, you will be presented with a series of choices regarding your heating system.

In each round, we will ask you to imagine that you want to replace your gas/oil boiler in the next two years and to choose between two options: (1) installing a new gas/oil boiler or (2) switching to an air source heat pump.

Both options will have associated costs, including upfront costs (the cost of the new heating system and costs related to its installation, such as radiator replacements) and running costs (the price you pay for your energy bills). All costs include VAT.

Pay attention to the upfront and running costs of the heat pump, as these will change after each round.

You will have to select the option you would most likely choose in real life. It is important that you imagine that you want to replace your boiler in the next two years, regardless of how old your current boiler is.

Press ‘Next’ to take a practice round and get used to the exercise.

**Practice round**

This is a practice round. Follow the steps below to familiarise yourself with the exercise. Once you complete this practice round, press 'Start' to begin the activity.

Step 1: Review the heating options below. Pay attention to the heat pump's upfront and running costs, as these will change after each round.

Step 2: Imagine you want to replace your current gas/oil boiler in the next two years. Select your preferred heating system by clicking on one of the options below.

Step 3: Indicate how confident you are that you would make this choice in real life.

[information icon] What is a heat pump?

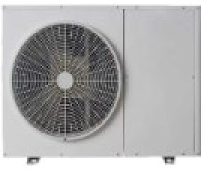
[practice choice set]

Discrete choice experiment

Round X/Y[28]

Imagine that you want to replace your current heating system in the next two years. If you could only choose from the following two options, which would you choose?

[information icon] What is a heat pump?

| **Heat pump** | **Gas boiler**[29] |
| --- | --- |
|  |  |

[28] Here, participants were presented with the number of the choice set they were on, and how many there were in total e.g., Round 1 of 13.
[29] Where participants were off the gas grid, this was replaced with relevant information for an oil boiler.

| | |
|---|---|
| Typically lasts up to 20 years. Takes 2-7 days to install. You may have to install larger radiators (included in the upfront cost). Low carbon emissions (zero by 2035 when UK energy will be 100% green). | Typically lasts up to 15 years. Takes 1-3 days to install and does not require any other changes in the home. High carbon emissions. |
| All upfront costs (labour & materials): £[cost][30] | All upfront costs (labour & materials): £[cost] |
| Monthly energy bills (heating & electricity): £[cost] | Monthly energy bills (heating & electricity): £[cost] |

Note: The values displayed in the table above are for illustrative purposes only: the customised information section was tailored to respondents' heating systems, the heat pump attribute levels randomly varied in each choice set.

How confident are you that you would make this choice in real life if you are exposed to this scenario?

- [Completely confident, Moderately confident; Slightly confident; Not at all confident]

**Post-experiment questions**

Thank you. We will now ask you a few additional questions. This should take you no longer than 10 minutes.

Please rate the importance of each factor when you were deciding whether or not to install a heat pump.

- Minimising the amount of money you spend each month on heating [not at all important – very important]
- Minimising the amount of money you spend upfront on installing a new heating system [not at all important – very important]
- Making sure your home is heated to a comfortable temperature [not at all important – very important]
- Minimising the environmental impact of the heat you use [not at all important – very important]
- Having a heating system that you are familiar with [not at all important – very important]
- Minimising the outdoor or indoor space a new heating system requires. [not at all important – very important]
- Minimising the time and inconvenience required to install a new heating system [not at all important – very important]

[30] Where we have included the placeholder [cost] we provided participants with a cost figure for the upfront and running costs for the heat pump option or their status quo heating system. These costs were tailored to whether consumers were on or off the gas grid, and whether they were in the high or low energy consumption group.

Were there any other factors which influenced your decisions? (please specify)

- [open ended]

How long have you owned your current property?

- [less than 1 year, 1-4 years, 5-9 years, 10-19 years, 20 years or more, I don't know]

How much longer do you expect to own your current property?

- [less than 1 year, 1-4 years, 5-9 years, 10-19 years, 20 years or more, I don't know]

Do you have a mortgage on your current property?

- [yes, no]

[if yes] How long have you had a mortgage for?

- [less than 1 year, 1-4 years, 5-9 years, 10-19 years, 20years or more, I don't know]

Are you planning to renovate your property in the near future?

- [yes – by making small improvements e.g., repainting, yes – by making larger renovations e.g., an extension, no, I don't now]

Are you planning on improving the energy efficiency of your property in the near future?

- [Yes, No, I don't know]

[if Yes] Do you plan on installing any of the following (select all that apply):

- [Smart meter, Wall insulation (cavity or solid wall), Double/Triple glazing, Loft insulation or room in roof insulation, Underfloor insulation, a more efficient heating system, Other (please specify), None of the above]

When do you think that your [current heating system] will need replacing?

- [In the next year, 1-2 years from now, 3-4 years from now, 5-9 years from now, in 10 years or more, I don't know]

Have you had to replace your heating system in the past?

- Yes, in my current home
- Yes, in a previous home
- No, never
- I don't know

[if Yes] Thinking of the most recent time where you replaced your heating system, what was the most important reason leading you to do so?

- It had broken down
- I was told it would not last much longer and was better to replace it before it broke

- It had not broken down yet, but it needed repairs too often
- It did not heat my home/hot water adequately or quickly enough
- As part of a wider renovation to my property
- Other (please specify)

How do you expect energy prices to change in the next 2 years?

- Electricity [decrease, stay the same, increase]
- [primary heating system] [decrease, stay the same, increase]

We will now ask you a few questions about yourself.

Do you identify as?

- [Male, Female, Non-binary/Third gender, Prefer not to say]

How old are you?

- [Under 18, 18-24, 25-34, 35-44, 45-54, 55-64, 65-74, 75-84, 85 or older, Prefer not to say]

What part of the UK do you currently live in?

- [Eastern Scotland, East Midlands, East of England, London, Northeast, Northern Scotland, Northwest, Southeast, Southwest, Wales, Western Scotland, West Midlands, Yorkshire and Humber]

What was your total household income in 2022 (before taxes)?

- [less than £10,000, £10,000-£14,999, £15,000-£19,999, £20,000-£29,999, £30,000-£39,999, £40,000-£49,999, £50,000-£59,999, £60,000-£99,999, £100,000 or more, I don’t know, Prefer not to say]

Roughly, how much does your household have in savings?

- [less than £10,000, £10,000-£14,999, £15,000-£19,999, 20,000-£29,999, £30,000-£39,999, £40,000-£49,999, £50,000-£59,999, £60,000-£99,999, £100,000 or more, I don’t know, Prefer not to say]
- Thinking about your finances over the last year, how often, if at all, have you struggled to pay at least one of your household bills?
- [All of the time, Most of the time, Sometimes, Rarely, Never, I don’t know]

How concerned are you about climate change?

- [Not all concerned, Slightly concerned, Moderately concerned, Very concerned, Extremely concerned]

**Randomised control trial & outcomes**

Control:

[No information]

Treatment group 1:

Heat pumps are a more efficient and environmentally friendly way to heat your home. Based on the characteristics of your property, installing a heat pump will cost you roughly £X (including the Boiler Upgrade Scheme grant[31] from the government) and take between 2-7 days. You can expect your monthly energy bill to be roughly the same as it is now.

[From later this decade/In the early 2030's], the government will phase out [new gas boiler replacements/new oil boiler replacements] in your area. This means that if your existing [oil boiler/gas boiler] breaks down after this date, you will no longer be able to replace it with a new [oil boiler/gas boiler] and will likely need to replace it with a heat pump instead.[32]

Treatment group 2:

Heat pumps are a more efficient and environmentally friendly way to heat your home. Based on the characteristics of your property, installing a heat pump will cost you roughly £X (including the Boiler Upgrade Scheme grant[33] from the government) and take between 2-7 days. You can expect your monthly energy bill to be roughly the same as it is now.

[From later this decade/In the early 2030's], the government will phase out new replacement fossil-fuel boilers in your area. This means that if your existing system breaks down after this date, you will no longer be able to replace it with the same system and will likely need to replace it with a heat pump instead.

Plan Ahead. Don't wait for your boiler to break to install a heat pump. Heat pump installation can take 2-7 days and may require replacing radiators or installing underfloor heating first.

If you are interested in future-proofing your home by installing a heat pump, look it into it now.

Step 1: Check[34] if a heat pump could be suitable for your home

Step 2: Find[35] a qualified heat pump installer

Step 3: Apply[36] to the governments' Boiler Upgrade Scheme

Please return to the survey to complete if you choose to check the resources above.

**Outcome questions**

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[31] Here, participants were provided with a link to the BUS grant page, available here: https://www.gov.uk/apply-boiler-upgrade-scheme

[32] . Note that this research was conducted in 2023 and is reflective of the previous Government's policy direction, which announced plans to phase-out the installation of fossil-fuel boilers off the gas grid from 2035.

[33] Here, participants were provided with a link to the BUS grant page, available here: https://www.gov.uk/apply-boiler-upgrade-scheme

[34] Here, participants were provided with the following link: https://www.gov.uk/check-heat-pump

[35] Here, participants were provided with the following link: https://www.gov.uk/guidance/find-a-heat-pump-installer

[36] Here, participants were provided with the following link: https://www.gov.uk/apply-boiler-upgrade-scheme

How likely do you think you would be to install an air source heat pump in your home over the next few years?

- [Extremely unlikely; Somewhat unlikely; neither likely nor unlikely; Somewhat likely; Extremely likely]

To what extent do the following financing options make you more likely to install a heat pump?

- 0% interest loan repaid over 2 years [not at all; a little; A moderate amount; A lot; A great deal]
- 0% interest loan repaid over 7 years [not at all; a little; A moderate amount; A lot; A great deal]
- [if respondent has a mortgage] Reduced mortgage interest rate if you install a heat pump [not at all; a little; A moderate amount; A lot; A great deal]
- [if respondent has a mortgage] Adding the upfront cost of a heat pump onto your mortgage [not at all; a little; A moderate amount; A lot; A great deal]
- Buyers of your property get stamp duty relief if it has a heat pump [not at all; a little; A moderate amount; A lot; A great deal]
- Heat pump energy tariff with discounted electricity rates during off peak hours [not at all; a little; A moderate amount; A lot; A great deal]

Do you have any additional comments you would like to make at this stage?

- [open text]

Thank you for your response. We will soon be in touch with a £5 voucher to thank you for your time.

We will also let you know if you won the free prize draw (for a voucher worth £250). Only one participant will be selected to win the prize. The winner of the prize draw will be randomly selected and contacted by post. You also have an option of receiving your voucher(s) via email, should you consent to be contacted in this way. You will receive your £5 compensation and/or £250 prize if you won the prize draw within 4 weeks of the survey closure.

If you prefer for your voucher(s) to be sent to you via email rather than by post, please tick the box below and provide your preferred contact details:

I would like to receive my voucher(s) via email; Email.

We are conscious you may have concerns regarding the cost of energy at the moment. If you would like to review government advice and support that is available, please click here[37]. (Please return to the survey to complete if you choose to check the resource above.).

[37] A link to the Government Help for Households campaign was provided as a link here, available here: https://helpforhouseholds.campaign.gov.uk/

# Annex 7: Cognitive interview guides

*This annex contains the interview guides that were deployed for the cognitive interviews.*

**Introduction**

Introduce yourself and ICF.

Purpose of this study: ICF has been commissioned by the Department for Energy Security and Net Zero (DESNZ) to develop a study assessing consumer willingness to pay for Air Source Heat Pumps at various cost levels. The key aims of the study are to assist DESNZ in gathering representative evidence on the effects of upfront and running costs on willingness to install ASHPs, to feed into the evidence base on incentives required to meet aims of scaling up uptake and therefore overarching ambitions of decarbonizing domestic heating.

Focus and scope of interview: The aim of this interview is to find out a bit more about how you answered the questions in the survey you just completed, and to see if there are parts of it you were more confident about than others.

Consent: The results of this interview will be confidential and will not be made available to DESNZ or anyone else in a way that would identify you personally. Results will be reported in aggregate, with anonymous quotations if relevant. With your permission, we would like to record the interview for the purpose of keeping accurate notes. The audio file will be deleted as soon as interview notes have been prepared. Do you provide your consent to take part in this interview and for it to be recorded?

Notes for the interviewer are in *italic* text.

**Questions**

*Interviewer: throughout the questionnaire prompt respondents on how they arrived at their answers, and what they considered. When observing respondents answering questions, please make a note of time required for them to finish each section of the survey.*

1. First of all, how easy or difficult did you find it to complete the survey? Why do you say that? Spend more time on this question to understand the problems respondents realised they had. Prompt: Why did you find it difficult? Was it the questions or the subject matter i.e., ASHPs? Was there anything that was more difficult than anything else?

2. How much did you know about heat pumps before the survey started?

*IF RESPONSE IS ANYTHING OTHER THAN NEVER HEARD OF HEAT PUMPS BEFORE:*

2.a. Can you say a bit more about what you knew about heat pumps before the survey started? *Prompt for anything they may mention that we haven't covered in the survey. Prompt for understanding that heat pumps are the greener option.*

*IF RESPONDENT HEARD OF HEAT PUMPS BUT IS NOT SURE:*

2.b.Can you remember where you had heard of heat pumps before? Did you know anything about how they work and their benefits/drawbacks? *Prompt for anything they may mention that we haven't covered in the survey. Look for what general awareness of heat pumps is when respondents are "unsure". Prompt for understanding that heat pumps are the greener option.*

*IF RESPONDENT KNOWS ROUGHLY HOW THEY WORK*

2.c. Can you remember where you had heard of heat pumps before? What did you know about how they work and their benefits/drawbacks before you did the survey? *Prompt for anything they may mention that we haven't covered in the survey. Prompt for understanding that heat pumps are the greener option.*

*IN THE UNLIKELY EVENT OF ANYONE SAYING THEY WERE KNOWLEDGEABLE*

2.d. Where had you seen or read about heat pumps before? Is there any particular reason why you knew quite a lot about them and their benefits/drawbacks? *Prompt for anything they may mention that we haven't covered in the survey.*

3. After we gave you more explanation about heat pumps in the survey, how confident were you that you understood the basics of how they work and their benefits/drawbacks? Why do you say that? *Check for the degree of knowledge when they were answering the questions/choices offered to them, and how much this affected ability to answer questions.*

4. Do you think we gave you enough information about how heat pumps work and their benefits/drawbacks for you to be able to answer the choice questions? What more information would you have liked? *Prompt on what we didn't say that they would have liked to have known when answering questions/making decisions on ASHP installation. In particular, prompt on whether they would have liked to know what the total cost (upfront and running) of installing an ASHP would be. How was their decision-making process affected without total costs?*

5. Did you find the practice exercise useful or not particularly? Why do you say that? Prompt on whether it was felt to be necessary and/or caused potential confusion created by this (knowing that it was a practice exercise). Would they have found the subsequent questions any more easy/difficult to answer without it.

6. The choices section asked you to imagine that you want to replace your heating system in the next two years.

6.a. You said that in fact your current system will need replacing in *[X]* years. How confident are you about that answer? What made you choose that option? *Look for the degree of awareness of these answers – what is behind their estimates?*

6.b. *IF RESPONDENT STATES THEIR CURRENT SYSTEM WILL NEED REPLACING IN MORE THAN 2 YEARS:* How did you feel about having to imagine a different time? *Prompt on whether imagining a choice in the future was difficult.*

7. In the questions where we asked you to make choices about replacing your heating system, how easy or difficult was it to choose an option?

7.a. Why was that? *Prompt for any choices that were too similar to choose from/any dominated options. Which options were easy/difficult to choose from. Also, prompt on whether they found it difficult to have 2/3 options to choose from.*

7.b. What might have made it easier to choose one? *Prompt for whether respondents wanted more information or a different choice environment.*

8. In the questions where we asked you to make choices between 2/3 different heating options, why did you choose the options that you did? Did any of the options stand out as worst/best, or were they all relatively equal? *Prompt on level of consideration of costs and/or hassle when making decisions – to what extent did they think beyond financial costs. Also prompt which of the factors (upfront, running costs, financing etc.) were more important to them in making this choice. Was their decision-making affected by the separation of upfront and running costs? How would it have been affected by knowing the net present total value of installing an ASHP?*

8.a. When making these choices, how realistic do you think you were? How similar were the choices you made relative to those you might have made in a real situation? *Prompt on whether they would have (in a real-life situation) considered anything that wasn't captured in the experiment, or faced any barriers that were not included in our scenario. Also prompt on whether the scenario affected how realistic they were in their decisions.*

9. We asked you how important a number of things about heat pumps were to you. Were you unsure of the meaning of any of these? Were you unsure on the meaning of these in terms of how these would affect your decision to install a heat pump? *PROMPT IF NECESSARY – show interviewees the list of heat pump features (underlying motivations and misconceptions questions) after an initial unprompted discussion and ask them again.*

10. Thank you very much for your time. This pilot survey is being conducted in advance of a larger scale survey. Is there anything else we haven't yet discussed that we could change in the survey to make it easier for others to respond to?

If you need a version of this document in a more accessible format, please email enquiries@energysecurity.gov.uk. Please tell us what format you need. It will help us if you say what assistive technology you use.