Department for Business, Energy & Industrial Strategy

HEAT NETWORKS CONSUMER SURVEY

Technical Report

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HEAT NETWORKS CONSUMER SURVEY TECHNICAL REPORT

A report for BEIS by Kantar Public

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This publication is available for download at: www.gov.uk/government/publications.

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1. Methodology and questionnaire design

This technical report accompanies the Results Report for the 2017 Heat Network Consumer Survey.[1] The survey was commissioned in December 2016 by The Department for Business, Energy and Industrial Strategy (BEIS), to determine consumer experiences of heat networks in England and Wales.

1.1 Methodology

The survey was carried out using a combination of postal questionnaires and an online survey. BEIS originally planned to commission a face-to-face survey but a postal and online method was deemed appropriate for a number of methodological and practical reasons. A telephone approach was discounted on the limitations of the sample frame – chiefly the lack of consumers' names and contact details.

The principal benefit of a postal approach was that it could deliver a much larger interviewed sample of heat network consumers than would have been achievable with a face-to-face survey. This maximised both the precision of our population estimates and the scope for sub-group analysis among heat network consumers. Connected to this, the much lower unit cost for a postal survey enabled us to conduct a survey of a large matched comparison sample of non-heat network consumers using the same method. Additional benefits included:

A postal approach also allowed for a completely unclustered random sample design, which helped to minimise the overall error in the population estimates. In contrast, all face to face surveys require a degree of clustering to ensure interviewer assignments can be managed effectively. In addition, a high proportion of heat network consumers live in London, and in flats. This would have led to high non-contact rates on a face to face survey (caused by difficulties gaining entry to flat blocks and having to speak to potential respondents by intercom rather than face-to-face). In turn, this would have limited the benefit of a potentially higher response rate from a face-to-face approach. Finally, a face to face survey with a high response rate would not have been feasible in the available fieldwork period.

As described later in this section, an incentive of £10 was offered to those who took part in the survey. This was to maximise the response rate and, with this, minimise the risk of non-response bias. The option to take part online was provided to encourage consumers to take part who might be less inclined to complete a paper questionnaire.

[1] Main report

In total, postal questionnaires were sent out to 31,667 households. Kantar Public received 6,537 completed responses, which equates to a response rate of 21%. Kantar Public carried out verification of all responses received to ensure they were eligible as completed responses. After this verification stage there were 5,502[2] complete surveys. Of these, 4,308 respondents completed a postal questionnaire and 1,194 respondents completed the online survey.

Among the 5,502 complete surveys, 3,716 where the household was identified as being served by a heat network and a matched comparison sample of 1,786 non-heat network consumers. Survey responses were received from consumers across 2,218 different heat networks.

Survey approach

The survey was carried out using a self-completion approach, with a 16-page paper questionnaire posted to all selected addresses. Most questions were categorical in style, requiring respondents to pick one or more responses from pre-coded list. The questionnaire was structured around six broad sections:

- Demographics and household profile.
- Heating systems – collecting details of how participants heat and insulate their homes (including whether they were served by a heat network or not).
- Technical service – capturing the extent of issues such as over and under-heating and loss of heating and hot water.
- Complaints and information provision.
- Billing – including how payments are calculated, whether and how consumers received bills and the level of information on bills.
- Pricing – including an estimate of the price paid and attitudes towards this.

Questionnaires were accompanied by a covering letter, which explained the purpose of the research and provided the option for participants to take part online.[3] The research was branded as 'The Energy Survey' to offer as broad an appeal as possible to participants, rather than focusing specifically on 'heating and hot water'. To maximise response and reduce non-response bias, participants were offered a £10 gift card incentive as a thank you for taking part.

[2] Kantar Public received 6,537 responses – including 5,132 postal and 1,405 online. A proportion of questionnaires were excluded from the final sample, as it was not possible to identify whether they were either heat network or non-heat network consumers. This is explained in more detail in Chapter 3.
[3] The letter included a survey webpage address and unique log in details

Fieldwork took place between April and July 2017, including a three week break in interviewing during the 2017 pre-election period.[4] A series of reminders, targeted at households that had not taken part, were sent to maximise response:

- **An initial postcard reminder** – sent three weeks after the original survey invite.
- **A second postcard reminder** - sent in June, to coincide with the end of the pre-election period and to 're-start' fieldwork.[5]
- **A final replacement questionnaire was sent with a covering letter**, towards the end of fieldwork.

The final response rate was 21%.[6] A summary of the response rate is provided in figure 2, in section 3.2.

In total, Kantar Public received 5,502 usable responses; where the household was positively identified as either being served by a heat network or not. This included 3,716 heat network consumers and 1,786 non-heat network consumers. As described in section 4.1, whether a household was served by a heat network or not, was determined using a combination of participants' responses and the publicly available Energy Performance Certificates (EPC) from the Department for Communities and Local Government's (DCLG) EPC database.[7] A proportion of returned questionnaires were excluded where it was uncertain whether they were on a heat network or not. This helped minimise the risk of incorrectly including heat network consumers in the comparison sample and vice versa[8].

1.2 Questionnaire – development and testing

Initial development of the questionnaire

An initial questionnaire outline was agreed between Kantar Public, BEIS and the survey steering group[9]; mapping research questions with survey measures which were suitable for a self-completion questionnaire. Following this, Kantar Public carried out a desk review of relevant, existing survey questionnaires including: The English Housing Survey (EHS), The Energy Follow Up Survey (EFUS), Ofgem's Retail Market Review, and various BEIS

[4] The 2017 general election was announced in April after fieldwork had begun.
[5] Note: this second postcard reminder was not part of the original fieldwork strategy. It was included following a lengthy hiatus due to the pre-election period.
[6] Throughout this technical report, response rates are calculated as the number of usable returns divided by the total number of cases issued. This corresponds to Response Rate 1 according to the AAPOR standard definitions of response rates: http://www.aapor.org/AAPOR_Main/media/publications/Standard-Definitions20169theditionfinal.pdf
[7] https://epc.opendatacommunities.org/
[8] This would increase levels of survey error and potentially dilute measurable differences between the two populations.
[9] The steering group for this project consisted of Heat Trust, Citizens Advice and the University of Edinburgh.

sponsored surveys (including their Public Attitudes Tracker). Where possible, existing survey measures were used or adapted for the current survey. Annex D summarises where which questions were used or adapted and from which source. Based on this review and input from BEIS and the survey steering group, Kantar Public produced an initial questionnaire. There were two rounds of comments and refinements to the questionnaire before agreeing the questionnaire for the survey pilot. BRE were also consulted throughout the questionnaire development phase, providing an additional, external perspective.[10]

Coverage of research questions

It was not possible to cover all of the original research questions for the survey (these are summarised in Annex E). As the survey was self-completed, it was important to keep to survey as simple as possible. This included keeping the routing as simple as possible and ensuring the questionnaire was not too long. To keep the questionnaire at maximum 16 pages, we had to prioritise which research questions to cover. It was also decided to use one survey for both the heat network and the non-heat network sample. Therefore, it was important to keep the survey questions relevant to both those on heat networks and those using other heating sources. Original research questions which are not covered in the survey are detailed below.

Customer service & assistance, awareness and satisfaction

- What is the level of awareness about Heat Networks amongst Heat Networks consumers?
  - *It was decided to include information about what heat networks are in the survey to help heat network consumers identify whether or not they are served by a heat network. Therefore, it was not possible to gauge spontaneous awareness of heat networks among heat network surveys.*
- How many are aware of what they should be aware of?
  - *Although the survey covers areas such as awareness of information received about heating system, on bills and of servicing and maintenance, it was not possible to cover this research question in an exhaustive manner.*

Pricing, Billing and Metering

- How many consumers have access to more than one tariff?
  - *We asked customers about whether they would like to switch supplier, but we did not ask about the number of tariffs available to them.*

[10] BRE is an independent research-based advisory, testing and training organisation, offering expertise in every aspect of the built environment and associated industries. BRE is part of the BRE Trust, which aims to support research and education in the built environment.

- How do consumers pay their bills?
  - *It was decided this was not a priority.*
- How many consumers are satisfied with when and how they pay their bills?
  - *It was decided this was not a priority.*
- Do consumers understand this information?
  - *This would have been difficult to do determine in a self-completion survey and it was decided to focus on satisfaction with, rather than understanding of, information.*
- How many consumers have a heat meter?
  - *Through discussion with the steering group, it became clear that heat meters differ a lot between different heat network consumers. Therefore, this would have been difficult to determine.*

Technical service

- How many consumers feel they should have greater control? What level of control would they like? What aspects of control are they missing?
  - *We asked consumers about how satisfied they are with the level of control they have over their heating system. However, to keep routing minimal and ensure all questions were applicable to all respondents, it was decided not to focus on missing aspects of control.*
- How often is maintenance carried out? How are repairs handled?
  - *Through discussion with the steering group, it became clear that maintenance arrangements differ a lot between different heat network consumers. Therefore, this would have been difficult to determine.*

Survey pilot

To test and refine the survey, and assess likely response, a large-scale pilot was carried out in February 2017. Pilot questionnaires were posted to 4,800 selected addresses. This included a field test of the methodology employed for the main survey, including the options to take part on paper and online.[11] Further details of the pilot design, including the sample design and a response rate analysis are provided in Section 2.

[11] Due to the timings of the pilot, the exercise the questionnaire was only sent to respondents once and required a shortened fieldwork period of three weeks.

Cognitive interviews

In addition to a full scale pilot, Kantar Public carried out 15 cognitive interviews. These were conducted by phone, with participants from the pilot survey. Participants were selected based on their responses to the pilot survey to provide a good cross-section by age and gender, heat network and non-heat network consumers, and consumers with positive and negative experiences of heating and hot water systems. Interviews lasted between 30 and 45 minutes and were typically carried out one to two weeks after the pilot survey. Interviews focused on comprehension of individual survey questions, specific questions or sections of the questionnaire that were considered challenging to answer, and suggestions for improvement. Interviewees were sent a copy of the questionnaire in advance of their interview. Overall, the findings from the cognitive interviews were positive, with most questions being well understood and correctly interpreted, and largely supported the findings from the pilot survey (which also suggested the questions were largely clear and unambiguous).

Recommendations and changes following piloting and cognitive interviewing

The survey was generally seen as easy to complete, of reasonable length, with clear postal and online instructions. Nearly all participants had completed the pilot survey in one sitting/session and without help from friends or family. The main issues arising from cognitive interviews were difficulties providing detailed billing information (including actual price paid, and breakdowns of standing charges and per-unit costs).

Following the pilot and the cognitive interviews, minor amendments were made to improve the flow of the questionnaire. The most substantial changes were made to the billing section: some questions were reordered and additional participant instructions were added to improve comprehension. In addition, the following changes were made between the pilot and mainstage to improve the flow of the questionnaire:

- References to ‘bills’ and ‘billing’ were broadened to include ‘bills, statements, and account summaries’. This more accurately reflected the range of terminology used by respondents.
- Cognitive testing and analysis of pilot data, showed that respondents found three very specific questions in the billing section on standing charges, kWh use, and price per kWh difficult to respond to. The three questions were eventually retained for the main survey, accepting that even partial data from respondents might be valuable.[12]
- Analysis of the pilot data showed that consent to data linkage was slightly lower than anticipated. Additional reassurances and details about what linkage would involve were added to increase transparency. It was hoped this would boost consent rates.

[12] Data on price per kWh are not included in the final analysis in the main report, as they were observed not to be sufficiently reliable for publication. A high proportion of respondents either didn’t know and/or didn’t have a copy of a bill in front of them when taking part.

- It was agreed that the measure of overall satisfaction with heating and hot water service should be moved towards the beginning of the survey. This was to ensure a 'top of mind' response.

- The structure of questions relating to loss of heating and loss of hot water, was amended slightly, to improve the flow.

- Analysis of the pilot data showed that some respondents didn't know whether their home was connected to mains gas. To simplify the question, and aid comprehension, the question was amended to ask about presence of gas cookers or gas hobs[13].

- Analysis of pilot data showed a high proportion of respondents did not answer the household income question. It was agreed to add a banded follow-up question to check whether respondents' household income was above or below £16,000.

Copies of the final main stage questionnaire, invite letter and postcard reminder can be found in Annexes F and G.

[13] This is not a full-proof proxy for presence of gas connection – given that not all gas connected customers will use gas-powered appliances. However, it does accurately identify households that definitely do have a connection.

2. Pilot survey – sampling and response rate analysis

To test our methodology and refine the survey, and assess likely response rates, a large-scale pilot was carried out in February 2017 ahead of the main survey.

2.1 Sample selection for the pilot

Heat network sample

From the heat networks sample frame[14], 4,800 households were randomly selected for a pilot study. The pilot sample only covered England (for the main survey, addresses in Wales were also included). Households in postcodes covered by heat networks registered with the Heat Trust were excluded from the pilot; this is because the number of such households was relatively small and we wanted to reserve these cases for the main survey. Otherwise the pilot sample of heat network consumers was selected using the same process as for the main survey using a combination of the Regulatory Database (RD) and ECO database (see Section 3).

For the pilot, we selected 75% of the heat network consumer sample (3,600 addresses) from postcodes listed on the RD and/or ECO databases. The remaining 25% (1,200 addresses) were selected from postcodes identified through proximity-matching (see Section 3). This was to enable testing of two different approaches for selecting heat network consumers.

Prior to the sample being selected, we sorted the sample frame by the following characteristics (in the order presented below):

- Indices of Multiple Deprivation (IMD)15.
- Output Area Classification (OAC).
- Proportion of residential buildings in Census Lower Layer Super Output Area (LSOA) built since 1993 (based on published VOA statistics).
- Proportion of residential buildings in LSOA which are flats (based on published VOA statistics).
- Postcode.

[14] See discussion of how the heat network sample frame was created in section 3
[15] https://www.gov.uk/government/statistics/english-indices-of-deprivation-2015

A systematic random selection was then made to ensure that the sample selected was representative of the sample frame as a whole, stratified by these characteristics.

Comparison sample

The comparison sample was made up of addresses drawn directly from the Postcode Address File (PAF)[16] and selected, in the pilot, to be broadly nationally representative. Postcodes already covered by the heat networks sample frame were excluded so as to minimise the chances of selecting households which were on a heat network. To ensure the selected sample was geographically disperse, the sample frame was sorted by the following variables to stratify, before a systematic random selection was made:

- Region
- Local Authority
- Census Lower Layer Super Output Area (LSOA)
- Census Output Area (OA)

2.2 Pilot design and response analysis

As part of the pilot exercise, Kantar Public carried out an experiment to test the impact of different incentive levels on response (£10, £5 and no incentive) and the impact of offering the option to take part online or not. Selected addresses were randomly allocated to one of six experimental cells:

- Cell 1: No incentive + option to take part online
- Cell 2: £5 incentive + option to take part online
- Cell 3: £10 incentive + option to take part online
- Cell 4: No incentive + no option to take part online
- Cell 5: £5 incentive + no option to take part online
- Cell 6: £10 incentive + no option to take part online

Findings from the pilot indicated a £10 incentive and the option to take part online, both aided response. Both of these elements were retained for the main survey. A summary of response rates by experimental cell is provided in figure 1.2.

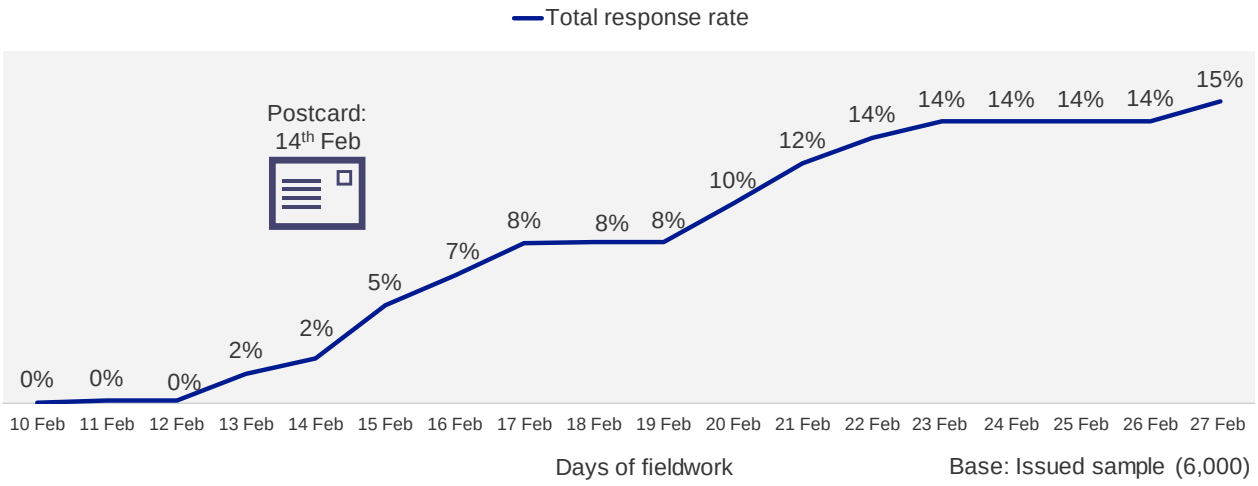
[16] The Postcode Address File is the Royal Mail's database of al known 'delivery points' and postcodes in the United Kingdom. https://www.royalmail.com/business/services/marketing/data-optimisation/paf

In total, 926 participants took part in the pilot, with an overall response rate of 15%. The response varied between 13% and 19%, depending on the level of incentive offered and whether the option to take part online was available. The highest response rate (19%) was achieved with a £10 incentive and the option to take part online.

Pilot response

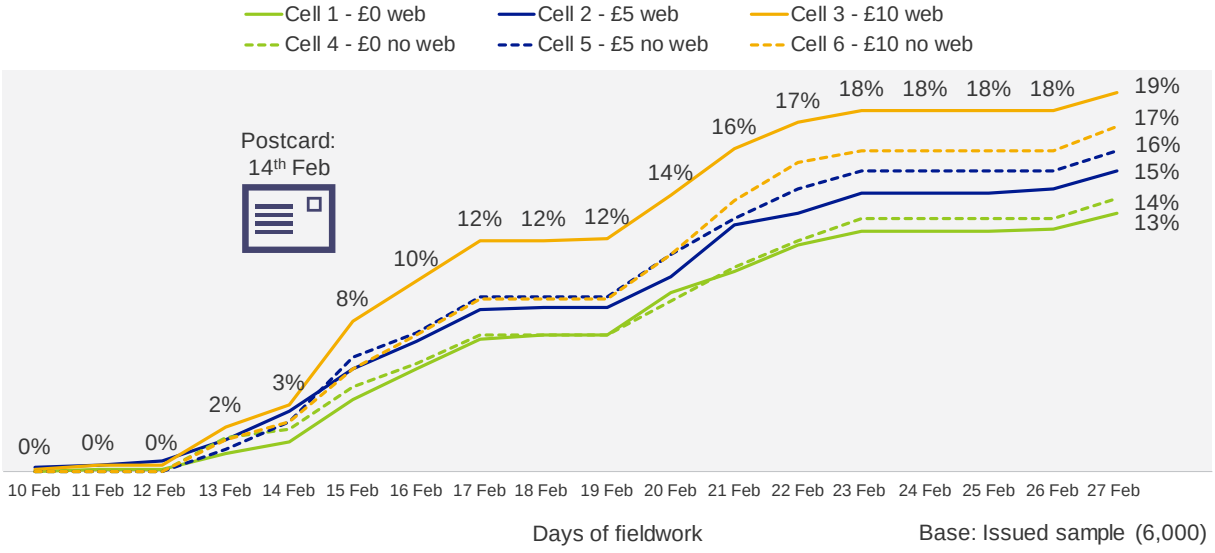
The overall pilot response rate was 15%. This was slightly lower than for the main stage (see figure 2 in section 3), reflecting the shorter fieldwork period, the use of a single postcard reminder and the different incentive strategy[17].

Figure 1.1. Overall, cumulative response rate for pilot survey



The pilot response rate varied between 13% and 19% for the six different experimental cells. As shown in figure 1.2, the two best performing cells were cell 3 (£10 incentive and online option) and cell 6 (£10 incentive and no web option). The response rates for these cells were both statistically significantly higher than the worst performing cell (cell 1). It was agreed to proceed with a £10 incentive and online option at the mainstage of the survey.

Figure 1.2 Cumulative response rate for pilot survey, by experimental cell



[17] For the pilot survey, a third of respondents received no incentive, a third received a £5 incentive and a third received a £10 incentive. For the mainstage, however, all respondents received a £10 incentive as this was the best performing group in the pilot.

3. Main sample design

3.1 Building a sample frame for heat network consumers

There is no single comprehensive database of the entire population of households served by heat networks. We therefore selected a systematic random sample for our survey from a list of *addresses in areas believed to be covered by heat networks*. This list was primarily made up of all residential addresses whose postcodes matched the postcode of a known heat network boiler[18]. Residential addresses in neighbouring postcodes were also included for larger networks which are known to cover more than one postcode.

This approach provided a sample of residential addresses that were *likely* to be served by a heat network; as such, some sampled addresses would *not* have been part of a heat network. We recognise that this was not a completely comprehensive sample frame. Therefore, we cannot say with absolute certainty how representative of all heat network consumers the survey estimates are (if households on the sample frame differed from households that were not included on the sample frame, this is a potential source of bias). Based on the data available at the time of constructing the sample frame we believe this was the best available sample frame. Our method for identifying whether or not a responding household was on a heat network is described in Chapter 3.

Building the list of addresses

The principle source of sample for heat network consumers was the Regulatory Database (RD), consisting of the registered postcode for all heat networks that were known BEIS because the network operator had returned a response to the regulator as per the Heat Network (Metering and Billing) Regulations 2014.[19] In most cases this was the postcode of the block or building in which the boiler or heat source was located. The RD also provided a dwelling count; the number of homes that were served by each network.

As the Regulatory Database (RD) did not include postcodes for individual homes covered by heat networks[20], the sample frame had to be built from the postcode of the registered heat source. For each postcode listed on the RD, we compared the number of dwellings recorded in the RD with the count of residential addresses in the Postcode Address File (PAF) for that postcode. Where the number of addresses on the PAF was: at least 80% of

[18] The postcodes of heat network boilers were sourced from lists held in the Regulatory Database (RD) and Energy Company Obligation (ECO) database of heat networks (held by BEIS), and schemes registered with the Heat Trust.

[19] One limitation of the RD is that it does not cover some of the very smallest heat networks (especially those serving fewer than 10 dwellings). Further, networks which are non-complaint with the regulations (did not submit a return) are not included in the RD element of the sampling frame.

[20] The RD contained just the postcode of the heat source (s) as opposed to the individual addresses of end-users served

the RD dwelling count; or within 15 addresses of the RD dwelling count, we assumed these postcodes included all, or the vast majority of, addresses within that network. **These cases are referred to as the matched RD sample (a)**.

For the remaining postcodes in the RD, we concluded that there was a substantial part of the network which was *not covered* just by the listed postcode. In these cases, we selected the next most geographically close postcode(s) to the RD-listed heat source postcode, until we achieved a total number of addresses which was similar to, or slightly greater than the number of dwellings listed as served by the heat network in the RD dataset. This was based on the assumption that the postcodes which were geographically closest were most likely to include the remaining properties on the network. **These cases are referred to as the proximity-matched sample (b)**. The risk of not including proximity matching in the design would be increased likelihood of excluding larger, multi-property, district schemes. These are much more likely than communal schemes to cover multiple postcodes.

In addition to the RD, the **ECO database (c)** was used to supplement additional postcodes that were known to be served by a heat network[21].

Finally, we checked the list of postcodes against the postcodes of networks **registered with the Heat Trust (d)** listed on the Heat Trust website. In a small number of cases, we identified further postcodes which were not yet included in the sample frame.

The heat network sample frame was then made up of *all residential addresses* in the identified postcodes: **(a) postcodes matched to the RD**, **(b) postcodes selected using proximity-matching**, **(c) postcodes listed in the ECO database**, and **(d) any remaining postcodes listed on the Heat Trust website**, which had not already been accounted for through the other sources.

Merging on additional data for addresses

We merged additional information on to the sample frame of addresses from two sources: (i) local area statistics published by the Valuation Office Agency (VOA) and (ii) modelled address-level information from Experian's ConsumerView database[22]. This additional information was used to inform the sample design and the weighting strategy.

The VOA publishes annual statistics regarding building characteristics. We matched the following information to the sample frame on the basis that these were likely to be correlated with whether or not a property was part of a heat network:

[21] The ECO database consisted of postcodes that were registered under the Energy Company Obligation (*ECO) and* identified as being served by a heat network. This database is less comprehensive than the RD and was therefore used to supplement rather than replace the RD as the principle source.

[22] See the following links for further information about the VOA and Experian's ConsumerView database:
https://www.gov.uk/government/organisations/valuation-office-agency
http://www.experian.co.uk/marketing-services/products/consumerview.html

- The percentage of residential buildings in the area which are flats
- The percentage of residential buildings in the area built after 1993

Experian's ConsumerView database can provide address-level information for households across the UK based on the Edited Electoral Roll and Experian's own proprietary sources. Much of this information is modelled based on known property characteristics. We have done no further validation of this data, and it may contain inaccuracies, however the information the best available and was still useful for the purposes of understanding potential non-response bias. We merged the following variables to the addresses on to the heat networks sample frame:

- Whether or not the property is thought to be on mains gas
- Whether or not the occupiers of the property are thought to experience fuel poverty according to Experian[23]
- Whether or not the occupiers of the property are thought to experience water poverty
- Length of residency
- Employment status

3.2 Sample selection for the main survey

Issued heat network sample

For the main survey, 25,000 addresses were selected from the heat networks sample frame, with a view to achieving interviews with up to 6,000 heat network consumers. The 6,000 interview target was determined using reverse power calculations, as the minimum sample size required to detect differences of 5% between subgroups of interest with 95% confidence. The issued sample size of 25,000 was calculated based on the observed response rates from the pilot study for each group, in order to achieve the target 6,000 interviews.

Before making the random selection to act as the sample, the sample frame was divided into strata based on the following considerations. The first consideration was whether the heat networks were registered with the Heat Trust. This was to ensure sufficient responses from households covered by Heat Trust registered networks to conduct sub-group analysis. This subgroup was deliberately oversampled to ensure sufficient responses were

[23] Fuel poverty is defined by Experian as a household spending more than 10% of its income on fuel in order to heat the home to an adequate standard of warmth. National statistics for fuel poverty in England is defined by the low income high cost methodology: https://www.gov.uk/government/publications/final-report-of-the-fuel-poverty-review

received from households on Heat Trust schemes to answer our key research questions on the 'Heat Trust'.[24]

The second consideration was to ensure that we maximised the proportion of households on heat networks. Based on the findings from the pilot, households in postcodes listed on the RD and/or ECO databases were found to be more likely to be on a heat network than households in postcodes identified through proximity-matching. Analysis of the pilot data also concluded that households in proximity-matched postcodes were less likely to be on a heat network if they were predicted to be on mains gas.[25]

Taking these considerations into account, there were six strata in the design for the heat network sample, as described in Table 1. The sample was selected such that households on heat networks registered with the Heat Trust would make up 15%[26] of the issued sample, and the chance of being selected was halved for households on proximity-matched addresses predicted to be on mains gas.

[24] The oversampling of Heat Trust properties was corrected through down-weighting after fieldwork to ensure that headline statistics were not biased.
[25] This was based on modelled data from Experian's ConsumerView database.
[26] Power calculations suggested this would allow us to achieve sufficient responses for sub-group analysis.

Table 1: Strata for the heat network sample

Stratum	Stratum definition			Number of cases in sample frame *(% of all cases in sample frame)*	Number of cases issued *(% of all issued)*
	Network registered with the Heat Trust	Postcode identified through proximity-matching	Address predicted to be on mains gas		
1	No	No	Not applicable	219,684 (58.7%)	14,269 (57.1%)
2	No	Yes	No	74,984 (20.1%)	5,087 (20.3%)
3	No	Yes	Yes	58,916 (15.8%)	1,894 (7.6%)
4	Yes	No	Not applicable	1,350 (0.4%)	298 (1.2%)
5	Yes	Yes	No	10,656 (2.8%)	1,852 (7.4%)
6	Yes	Yes	Yes	8,373 (2.2%)	1,600 (6.4%)

We sorted the sample frame by the following variables to ensure the selected sample was representative of the population according to these characteristics:

- Region
- Indices of Multiple Deprivation (IMD)
- Output Area Classification (OAC)
- Proportion of residential buildings in LSOA built since 1993 (based on published VOA statistics)
- Proportion of residential buildings in LSOA which are flats (based on published VOA statistics)
- Postcode

We selected these variables to sort on because, f the variables available on the sample frame, we judged these as most likely to be correlated with survey outcomes.

After sorting, a systematic random selection of addresses was made within each stratum. The average sampling probability for each strata can be calculated as the number of cases issued divided by the number of cases in the sample frame.

Comparison sample

A comparison group of non-heat network consumers was designed to be as similar as possible to the heat network sample – the aim being to share as many of the observable characteristics of the heat network consumers group as possible, except for actually being on a heat network.

Initially, output areas (geographic regions) were selected which were similar in nature to those covered by the heat network sample. To do this, we used 2011 Census data to identify output areas with similar characteristics including: property type, tenure, age and gender of residents. We fitted a backwards stepwise logistic regression model for all output areas to predict the likelihood of any given output area being on the heat network sample frame (i.e. it was likely the output area contained a heat network). For predictors, we were limited to variables which were available from the 2011 Census at the output area level, data that could be merged from published VOA statistics (such as the number or properties of different council tax bands), and geographic variables (such as region and decile of the Indices of Multiple Deprivation). Output areas were considered eligible for the comparison group if they had a predicted probability, by virtue of our regression model, of 0.3 or higher of being on the heat network sample frame.[27]

For eligible output areas, we took all addresses from the Postcode Address File for sampling. Prior to making a systematic random selection, addresses in the selected output areas were sorted by the following variables to ensure the selected sample was representative of the population of the chosen output areas. These were the same characteristics as used prior to the selection of the issued heat network sample:

- Region
- Indices of Multiple Deprivation (IMD)
- Output Area Classification (OAC)
- Proportion of residential buildings in LSOA built since 1993 (based on published VOA statistics)
- Proportion of residential buildings in LSOA which are flats (based on published VOA statistics)
- Postcode

[27] This was taken as an indication that households in these areas would be similar in nature to the heat network sample, rather than the households actually being served by a heat network.

It was possible that some households selected to be part of the comparison sample could be on a heat network. This could occur where a heat network was not registered with any of the sources used for building the sample frame, or where an address was in a postcode which was not selected in the proximity-matching stage (see section 3.1). Our approach to identifying heat network households within the comparison sample is described in Chapter 3.

We also applied weightings (see Chapter 4) after the end of fieldwork to ensure the comparison group matched the heat network sample's observable characteristics.

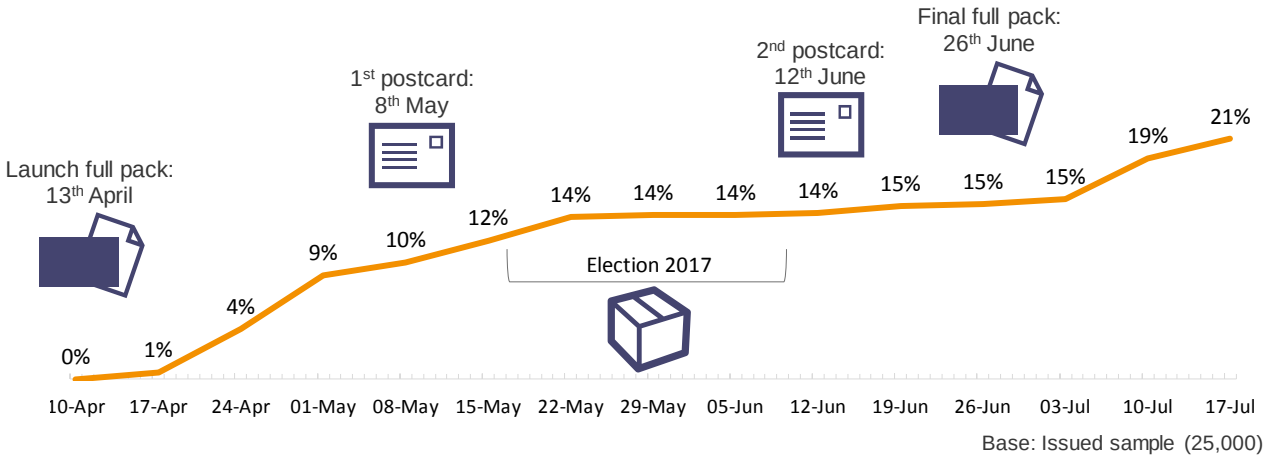
An overview of the sample selection process is provided in Annex A.

3.3 Main stage response rates

For the main stage of the survey, an overall response rate of 21% was achieved[28]. As an unplanned General Election was called for June 2017, the mainstage fieldwork project was extended as Kantar Public were not able to send out any survey communications during the pre-election period. As a result, BEIS and Kantar Public agreed to send out a second postcard reminder before sending the final replacement questionnaire. This delay also meant that the fieldwork period went into the early summer months which might have meant that the survey topic felt less relevant to some respondents.

The response rate was slightly lower than originally anticipated following the survey pilot. This was probably as a result of fieldwork delays due to the pre-election period, the pause in survey communications and some of the fieldwork taking place in summer (when heating and energy use will be less salient topics),

Figure 2. Overall response rate, mainstage



Base: Issued sample (25,000)

[28] This is the response rate based on the total number of usable questionnaires returned to Kantar Public before accounting for wastage – where it was not possible to establish whether the household definitely was or was not served by a heat network.

3.4 Confirming the heat network and non-heat network populations

Heat network sample

As described in chapter 2, the heat network sample was made up of addresses in areas *thought* to be covered by a heat network, based on a direct, or proximity-based, postcode match from Regulatory Delivery data to the Postcode Address File However there was no way in advance of fieldwork for us to know which addresses were *actually* part of a heat network and which were not.

The steps outlined below were taken upon receipt of responses to minimise the amount of misclassification, i.e. the number of non-heat network households included in the heat network sample.

There were two main ways to identify whether a household was on a heat network or not:

i. The questionnaire asked consumers if their household was on a heat network. Directly before this question, we provided an information box which detailed what heat networks are and listed some of the characteristics of communal and district schemes. This was included to help respondents respond correctly to this question.[29]

ii. In addition to this, Energy Performance Certificates (EPC) from DCLG's EPC database[30] identifies properties on a heat network as a 'community scheme' and we matched responses to this dataset after fieldwork concluded.

Neither the respondent data nor the EPC data, in isolation, could provide a comprehensive or fully accurate method for identifying heat network served addresses. Self-identification by respondents in the questionnaire can be misleading if the respondent provides an incorrect response, or inconclusive if the respondent does not give an answer. Equally, EPC data was not available for all sampled addresses. An EPC is generally produced when a property is sold or rented and therefore around half of addresses on the sample frame had no EPC data available. There is also a risk that some EPC data may be outdated, for example, if a heat network were retrofitted in a building after the EPC was produced.

Given the limitations of using questionnaire or EPC data in isolation, we used a combination of both sources to establish whether addresses were or were not served by heat networks.

[29] The full details provided can be seen in the questionnaire in Annex E (before Q15).
[30] https://epc.opendatacommunities.org/

Table 2 shows a comparison of questionnaire data and EPC data for all responding households from the heat network sample. We assumed a property to be on a heat network for the purposes of our reporting and analysis if, as well as it having been identified for inclusion in the heat network sample frame through the process described in Section 3.1, (i) the survey respondent self-identified the household as being part of a heat network in their questionnaire, or (ii) EPC data was available for that property indicating that it was part of a heat network, or (iii) if EPC data indicated that all properties in that postcode are likely to be on a heat network.[31] The final heat network sample was made up of 3,716 addresses which we had a high degree of confidence were on a heat network. Annex A provides an overview of the sample selection process.

Table 2: Heat network identification by survey question and EPC data (heat network sample only)

		Questionnaire data			*Total*
		Heat network	Any other system	Unknown / data missing	
EPC data	Identified as heat network	1,743 33.8%	259 5.0%	173 3.4%	*2,175* *42.2%*
	No EPC data – *but assumed to be heat network given EPC data from other properties in the same postcode*	585 11.3%	81 1.6%	57 1.1%	*723* *14.0%*
	No EPC data – and status uncertain	689 13.4%	684 13.3%	110 2.1%	*1,483* *28.8%*
	Identified as any other heating system	129 2.5%	606 11.8%	41 0.8%	*776* *15.0%*
Total		*3,146* *61.0%*	*1,630* *31.6%*	*381* *7.4%*	*5,157* *100%*

In Table 2, grey signifies that both questionnaire and EPC data indicated a property was not part of a heat network. Black signifies it was uncertain whether or not a household was served by a heat network. White signifies deemed to be on a heat network.

We identified 606 cases where *both* the respondent answer *and* the EPC data indicated that the property was not part of a heat network (highlighted in grey in Table 2). We thought it very unlikely that these households were served by a heat network and so these cases were added to the comparison sample.

For the remaining 835 cases (highlighted in black in Table 2), it was uncertain whether or not these households were served by heat networks. It is very likely that some of these

[31] Where EPC data was not available for the responding household, we could look at the EPC data for other properties in the same postcode. Where there were at least ten EPC records available in a postcode, and all of the available EPC records in a postcode were indicated as being on a heat network, we assumed that *all other* properties in that postcode are likely to also be on a heat network.

were on heat networks while others were not, although there is no way for us to confidently classify these households. Including these cases would have added uncertainty to the comparisons we could make between heat network and non-heat network consumers; potentially masking differences between the two populations. We therefore excluded these cases from analysis. Our approach was driven by the importance of avoiding 'false negatives' in heat network classification. These would artificially reduce genuine differences in experiences between heat network and non-heat network consumers.

Comparison sample

A similar analysis was conducted with the comparison sample (Table 3). We identified 189 households which were identified as being on a heat network by either the questionnaire response and/or available EPC data (highlighted in black in Table 3). These cases were removed from the final comparison sample analysis, to minimise the risk of including addresses that were on heat networks in the comparison group. Such cases were not reallocated to the heat network sample as they were not part of the original sample frame. As such, there was no way to calculate sampling probabilities or weights for them.

The final comparison group consisted of the remaining 1,180 cases issued for the comparison sample, plus the 606 cases originally issued as part of the heat network sample but classified as non-heat network households (see above). In total, the final comparison group therefore consisted of 1,786 cases.

Table 3: Heat network identification by survey question and EPC data (non-heat network comparison sample)

		Questionnaire data			*Total*
		Heat network	Any other system	Unknown / data missing	
EPC data	Identified as heat network	64 4.7%	5 0.4%	11 0.8%	*80* *5.8%*
	No EPC data	88 6.4%	543 39.7%	33 2.4%	*664* *48.5%*
	Identified as any other heating system	21 1.5%	566 41.3%	38 2.8%	*625* *45.7%*
Total		*173* *12.6%*	*1,114* *81.4%*	*82* *6.0%*	*1,369* *100%*

In Table 3, black signifies that questionnaire and / or EPC data indicated that a property was likely to be served by a heat network (and should be excluded from the comparison sample). White signifies inclusion in the comparison group.

Please see Annex A for an overview of the sample selection process.

3.5 Comparing data quality between online and postal

Where self-completion, and particularly, postal questionnaires are used there is a risk that respondents do not complete all questions. This is commonly referred to as item non-response. We have looked at the degree of missing data (or item non-response) for those questionnaires that were return by post. Overall the levels were not worryingly high - for most questions less than 5% of responses. We are therefore confident that the quality of the postal data is good and broadly comparable to the online data. To illustrate further, looking at how well we were able to define heat network status, there was no difference between the survey modes - 21% of online participants and 22% of postal participants were excluded from the analysis because the data available was inconclusive.

Different survey modes using the same questionnaire often lead to different responses due the typical demographics of respondents. We expected a slightly different demographic in respondents via each mode and in fact this was a particular reason for including the online option. The pilot results showed that this option increased the response rates for younger consumers who typically have lower response to surveys, and thus reduced the survey mode bias introduced through our postal survey which the pilot showed disproportionately attracted older respondents.

4. Weighting and analysis

4.1 Weighting the heat network sample

We applied weighting, after the conclusion of fieldwork, to ensure the final heat network sample was as representative as possible of the full sample of households served by heat networks from which it was drawn. The final weight for each case was calculated as the product of the *design weight* and the *non-response weight* (both described below).

Calculating design weights

The design weight is a fixed value for each case which accounts for the different selection probabilities of households across the different sampling strata (see chapter 2 for a description of the sample strata). As addresses which were selected for the pilot stage were not eligible for the main survey, the design weight also accounts for the different selection probabilities at the pilot[32].

The design weights were calculated as follows:

1 / ((1-*p(pilot)*)p(main)*)**

where *p(pilot)* is the probability of being selected for the pilot stage and *p(main)* is the probability of being selected for the main survey.

Calculating non-response weights

Non-response weights were calculated using data available on the sample frame[33] to adjust for any observable differential non-response rates between population sub-groups. Non-response weights were calculated as the inverse of the predicted probability of any given sampled household taking part in the survey.

The predicted probabilities were estimated using a logistic regression model. Ultimately, this means households that were less likely to take part according to the non-response model were given a greater weight to ensure that such households were properly represented in the final sample.

[32] Pilot responses were not included in the final dataset as the questionnaire changed substantially between the pilot stage and the mainstage. Changes included amending the questionnaire structure, replacing some questions and updating others.

[33] The data available on the sample frame included information about heat networks (e.g. number of dwellings in the network), geographic information (e.g. region, geographic measures of deprivation), modelled information matched from the Experian ConsumerView database (e.g. predicted employment status), area-level information matched from the VOA (e.g. percentage of dwellings in the area which are flats).

All available variables were considered for the non-response model, and a backward stepwise approach was used, resulting in the following variables being included in the non-response[34] model:

- Region
- Output Area Classification
- Modelled employment status for head of household (from Experian's ConsumerView database)
- Modelled length of residency in household (from Experian's ConsumerView database)
- Sampling stratum (see chapter 3)

The non-response weight controls for observed differences on the variables included in the model. This data was augmented by data from Experian ConsumerView database and the VOA. While this Experian dataset contains some modelled data and therefore may contain inaccuracies, this does not impact on the validity of the non-response model as it the modelled data is still significantly associated and therefore predictive of the probability of response. Of course, unobservable confounding variables leading to different likelihoods of response may still influence the results if associated with an outcome variable. Nevertheless, we are confident the weighting approach controlled for differences in the non-response as far as was possible (given the limitations around available heat network population data).

4.2 Weighting the comparison sample

The comparison sample of non-heat network consumers was weighted to match the profile of the heat network sample. This was achieved through a two stage process:

i. The final heat network and non-heat network samples were combined into a single dataset. A logistic regression model was applied to predict for each case the probability of being classified as a 'heat network household' (i.e. the likelihood of being in the final heat network sample, as opposed to the comparison sample). We included geographic variables (including Indices of Multiple Deprivation), property characteristics, and household characteristics that were predictive of being on a heat network, but not a result of being on a heat network.

[34] Backward stepwise analysis excluded any non-significant predictors until final models were established, comprised solely of significant predictors.

ii. Using these predicted probabilities, a Propensity Score Matching (PSM) algorithm assigned a weight to each case in the comparison sample. For this, we used a kernel matching algorithm which assigned weights to the non-heat network cases based on the difference between their predicted probabilities of being classified as a 'heat network household' and those of the heat network cases. The algorithm produces higher weights for the non-heat network cases which are most similar to the heat network cases (i.e. those with higher predicted probabilities) and lower weights for the cases which are least similar. The effect of this weight is to make the weighted profile of the comparison group match as closely as possible to the profile of the heat network sample.

The comparison sample weight controls for any *observed* differences in profile or demographics between the final heat network and non-heat network samples. This means that any remaining differences in survey responses could be more confidently attributed to *actual* differences in experiences between heat network and non-heat network households.

The model in step 1 (above) included the following variables. These were selected on the basis that they were found to be predictive of households being classified as on a heat network:[35]

- Flat
- Tenure
- Freehold
- Property age
- Number of bedrooms
- Residency
- Number of people in household
- Income
- Presence of pensionable age person
- Indices of Multiple Deprivation
- Region

[35] The following variables were initially included, but subsequently dropped through a backwards stepwise process from the model due to non-significance: presence of children in household, proportion of residential buildings in LSOA which are flats (based on published VOA statistics), and proportion of residential buildings in LSOA built since 1993 (based on published VOA statistics).

The table in Annex B shows the profiles of the comparison sample and the heat network sample prior to applying the PSM weighting and the corresponding profiles with the PSM weights applied. After weighting, there may remain some unobserved differences between the groups, which can't be controlled for through PSM. However, by using a combination of questionnaire data, VOA data, Experian data, and geographical data in our PSM approach, we aimed to minimise that risk. Some very minor differences in observable characteristics remained after the PSM weighting, but all targeted differences were either eliminated or greatly reduced. This gives us greater confidence that identified differences in survey estimates are not caused by differences in the profile of the population.

4.3 Statistical significance

Results from all surveys are attempts to estimate "true values" in a wider population; and therefore all survey statistics come with an associated margin of error within which the "true" population measure is expected to lie. As such, all differences quoted in the main survey report have been tested to for statistical significance; that is, the difference between two compared values are significant even after we have accounted for the margins of error.

Unless otherwise specified, all commentary in the Main Survey report focuses exclusively on differences that are statistically significant at a 95 per cent confidence level[36]. In basic terms, this means that if the survey was conducted 100 times, a finding of the same nature would be found in at least 95 cases. In a few exceptional circumstances, survey findings which were not statistically significant have been presented where their inclusion was important for context or was consistent with a wider trend. In every case any non-statistically significant results are clearly stated as such.

Applying weights to data as described above, while tending to make the quoted figures more representative of the population of interest, has the effect of reducing the effective sample size of the data. As such the effective base size, which is used in any statistical testing, is smaller than the unweighted base size and this has the effect of increasing the confidence intervals around the survey estimates. This effect has been taken into account when determining whether or not differences between survey estimates described throughout the report are statistically significant. Therefore, while the base sizes reported throughout this report are the actual base sizes, the statistical analysis is based on the effective base.

[36] Differences across sub-groups were tested using chi square tests.

4.4 Regression models

A logistic regression analysis was used to analyse the key drivers of overall satisfaction. This approach estimates the influence of a single factor on overall satisfaction while keeping all other variables in the model fixed (including but not limited to demographic variables). This is particularly important when factors are known to be highly correlated (for example, age of property and whether a household has a meter).

The model included variables that were expected to influence satisfaction as well as a number of control variables. The variables expected to influence satisfaction were:

- Perceived reliability of the household's heating system
- Perceived fairness of the price paid for heating and hot water
- Satisfaction with the information received about the heating system
- Experience of under-heating or over-heating
- Satisfaction with how any complaints were handled

The core purposes of the model were (i) to investigate whether or not the key factors listed above were indeed significantly associated with satisfaction, and (ii) to describe how these factors were associated with satisfaction (after controlling for other variables), for example, understanding the relative importance of these key factors. All of the factors listed above were found to have a strongly significant association with satisfaction. The parameters of the model (see Table 5) allow us to draw some conclusions regarding the relative importance of these factors.

Table 4 includes details of all variables included in the model, how they were coded and how we dealt with missing data.

For most variables, cases with missing data were coded to the modal category. Where the variable with missing data was nominal categorical, a value was imputed using Chi-square Automatic Interaction Detector (CHAID). This produces predicted probabilities for each of the values based on data for other variables where the data is not missing. A value is then assigned randomly in proportion to the predicted likelihood. CHAID was used where data was missing for: heat network operator, age of property, number of people in household, and number of bedrooms. Such imputation is an attempt at reducing the bias due to missing data. While it may not always predict the *true* value for a given case, it allows us to include cases with some missing data in the analysis, rather than excluding these cases altogether. Cases with missing data in the outcome variable were excluded from analysis. This meant that a total of 3,679 cases out of 3,716 were included in the key drivers model.

Table 4. Summary of how missing data was recoded in the regression model[37]

Variable	How variable was coded	How we dealt with missing data	Number of cases imputed
Overall satisfaction (Q14)	Binary – 'very satisfied'/'satisfied' vs. 'neither'/'dissatisfied'/'very dissatisfied'	Cases with missing data were excluded from analysis	N/A (37 excluded)
Perceived reliability of system (Q21)	Binary – 'very reliable' vs. all other	Included with the lower/negative scores	15
Experience of under-heating (Q25)	Binary – 'yes' vs. 'no'	Coded as not having experienced under-heating	134
Experience of over-heating (Q29)	Binary – 'yes' vs. 'no'	Coded as not having experienced over-heating	155
Satisfaction with the level of information provided about their system (Q42)	Three categories: 'very satisfied'/'satisfied' vs. 'neither'/'dissatisfied'/'very dissatisfied' vs. did not receive	Included with the lower/negative scores	216
Satisfaction with handling of complaints (Q37)	Three categories: 'very satisfied'/'satisfied' vs. 'neither'/'dissatisfied'/'very dissatisfied' vs. did not complain	Included with the lower/negative scores	46
Perceived fairness of price (Q60)	Binary – 'very fair'/'fair' vs. all other	Included with the lower/negative scores	230
Heat network operator (Q53)	Three categories: private vs. local authority vs. housing association	Imputed using CHAID	908
Non-metered system (Q49)	Binary – bill based on actual/estimated household usage vs. all other	Coded as non-metered system	830
Receiving separate bill for heating and hot water (Q43)	Binary – receiving a separate bill vs. all other	Coded as not receiving a separate bill	142

[37] Includes just those variables with missing data.

Table 4 (continued). Summary of how missing data was recoded

Variable	How variable was coded	How we dealt with missing data	Number of cases imputed
Vulnerable people in household (Q76, Q77, Q78)	Binary – yes at any of Q76, Q77, Q78 vs. no	Coded as having no vulnerable people in household	45
Age of property (Q4)	Four categories: pre-1960 vs. 1960-1999 vs. 2000-2009 vs. 2010 and later	Imputed using CHAID	615
Not financially struggling (Q63)	Binary – 'strongly agree'/'agree' vs. all other	Coded as not financially struggling	513
Not registered with Heat Trust (sample frame)	Binary – yes vs. no	Not applicable	N/A
Number of people in household (Q7)	Three categories: 1 person vs. 2 people vs. 3 people	Imputed using CHAID	101
No children in household (Q9)	Binary – yes vs. no	Coded as having no children in household	101
No people aged 65 or above in household (Q9)	Binary – yes vs. no	Coded as having no people aged 65 or above in household	101
Number of bedrooms (Q5)	Three categories: 1 bedroom or studio vs. 2 bedrooms vs. 3 bedrooms	Imputed using CHAID	115
Property type: flat (Q1)	Binary – flat vs. all other	Coded as 'not flat'	156

Table 5 outlines the output of our logistic regression model for overall satisfaction, including the confidence intervals associated with the odds ratios. The odds ratio indicates the size of each individual variable on overall satisfaction and thus allows the relative sizes of effects to be compared across different variables. An odds ratio below 1 indicates that a consumer in the specified category is less likely to be satisfied than one in the reference category. An odds ratio greater than 1 indicates that a consumer in the specified category is more likely to be satisfied than one in the reference category, for that variable.

For example, for predictor variable 1 in Table 5, the odds of a consumer saying they were satisfied were more than 4 times greater if a respondent considered their heating system 'very reliable' n comparison to respondents that did not consider their heating system as

'very reliable'. Reference categories were chosen so as to make the interpretation of the results as straightforward as possible.

Table 5. Results from regression model - overall satisfaction with heating

		Beta	Std. err.	sig.	Odds ratio	Confidence interval	
						Lower limit	Upper limit
Predictor variables	**1) System rated 'very reliable' vs. 'fairly reliable'/'not at all reliable'/no answer**	1.450	.114	.000	4.264	3.412	5.329
	2) Perceives price as 'fair'/'very fair' vs. 'not fair'/'not at all fair'/no answer	1.019	.117	.000	2.770	2.202	3.484
	3) Satisfaction with information received						
	Did not receive vs. 'Neither'/'dissatisfied'/'very dissatisfied'/ no answer	.227	.124	.067	1.254	.984	1.599
	'Very satisfied'/'satisfied' vs. 'Neither'/'dissatisfied'/'very	1.204	.129	.000	3.334	2.591	4.291
	4) Not experienced under-heating/no answer vs. experienced under-heating	.669	.134	.000	1.953	1.503	2.539
	5) Not experienced overheating/no answer vs. experienced over-heating	.469	.104	.000	1.598	1.302	1.961
	6) Satisfaction with handling of complaint						
	'Very satisfied'/'satisfied' vs. 'Neither'/'dissatisfied'/'very	.699	.141	.000	2.012	1.527	2.651
	Did not complain vs. 'Neither'/'dissatisfied'/'very dissatisfied'	1.056	.202	.000	2.874	1.933	4.274
	7) Heat network operator						
Control variables	**Private vs. Housing association**	.151	.149	.312	1.163	.868	1.557
	Local authority vs. Housing association	-.056	.143	.692	.945	.715	1.250
	8) Non-metered system	-.027	.128	.834	.973	.757	1.252
	9) Not receiving separate bill for heating and hot water	-.031	.129	.807	.969	.753	1.247
	10) No vulnerable people in household	-.054	.112	.631	.948	.761	1.180

Table 5. (continued)						
11) Age of property						
Pre-1960 vs. 2010 or later	.197	.187	.292	1.217	.844	1.756
1960-1999 vs. 2010 or	.188	.160	.240	1.206	.882	1.650
2000-2009 vs. 2010 or	.384	.184	.037	1.467	1.022	2.106
12) Not financially struggling	-.150	.120	.212	.861	.680	1.089
13) Not registered with Heat Trust	-.051	.165	.760	.951	.687	1.315
14) Number of people in household						
1 person vs. 3 or more	-.167	.257	.516	.846	.511	1.401
2 people vs. 3 or more	-.221	.241	.361	.802	.500	1.287
15) No children in household	.178	.237	.453	1.195	.751	1.902
16) No people aged 65 or above in household	-.273	.122	.025	.761	.599	.966
17) Number of bedrooms						
0 or 1 bedroom vs. 3 or	.288	.216	.183	1.334	.873	2.037
2 bedrooms vs. 3 or more	.378	.206	.067	1.460	.974	2.188
18) Property type: not flat	-.079	.170	.641	.924	.662	1.290
Intercept	-2.211	.343	.000	.110	.056	.215
The Nagelkerke pseudo-R^2 for this model was 0.395.[38]						

Additional regression models to guide our analytical approach

We fitted additional logistic regression models to determine which characteristics were most strongly associated with six other key survey outcomes:

- Satisfaction with the level of control over heating
- Experience of over-heating
- Perceived fairness of price
- Perceptions of the level of information on bills
- Whether consumers had made a complaint (or had reason to make a complaint)
- Satisfaction with information given by the provider

[38] Using the Nagelkerke approach, the analysis calculated pseudo R-squared metrics for the models. Effectively, this provides a quantification of the outcome variability that is explained by the models. However, we note that the usefulness of pseudo R-squared metrics is open to debate amongst data users, with concerns being raised regarding the extent to which these are intuitively interpretable in relation to non-linear outcomes (such as the binary outcomes modelled in this study). For a brief review of pseudo R-squared metrics, see: Tabachnick, B. G; & Fidell, L. S. (2007). Using Multivariate Statistics. Boston: Pearson / Allyn & Bacon.

The same list of characteristics was included as predictors for each model; details of these variables and the parameters of the models can be found in Annex C.

These models were not designed to provide substantive inferences regarding these key outcomes. Instead, the purpose of these models was to identify characteristics which were strongly associated with some or all of the key outcomes listed above. This analysis would then inform the choice of which sub-groups within the population of heat network households would be referenced in the descriptive report of findings.

The following six sub-groups were identified as being consistently strongly associated with responses to most or all of the key outcomes listed above:

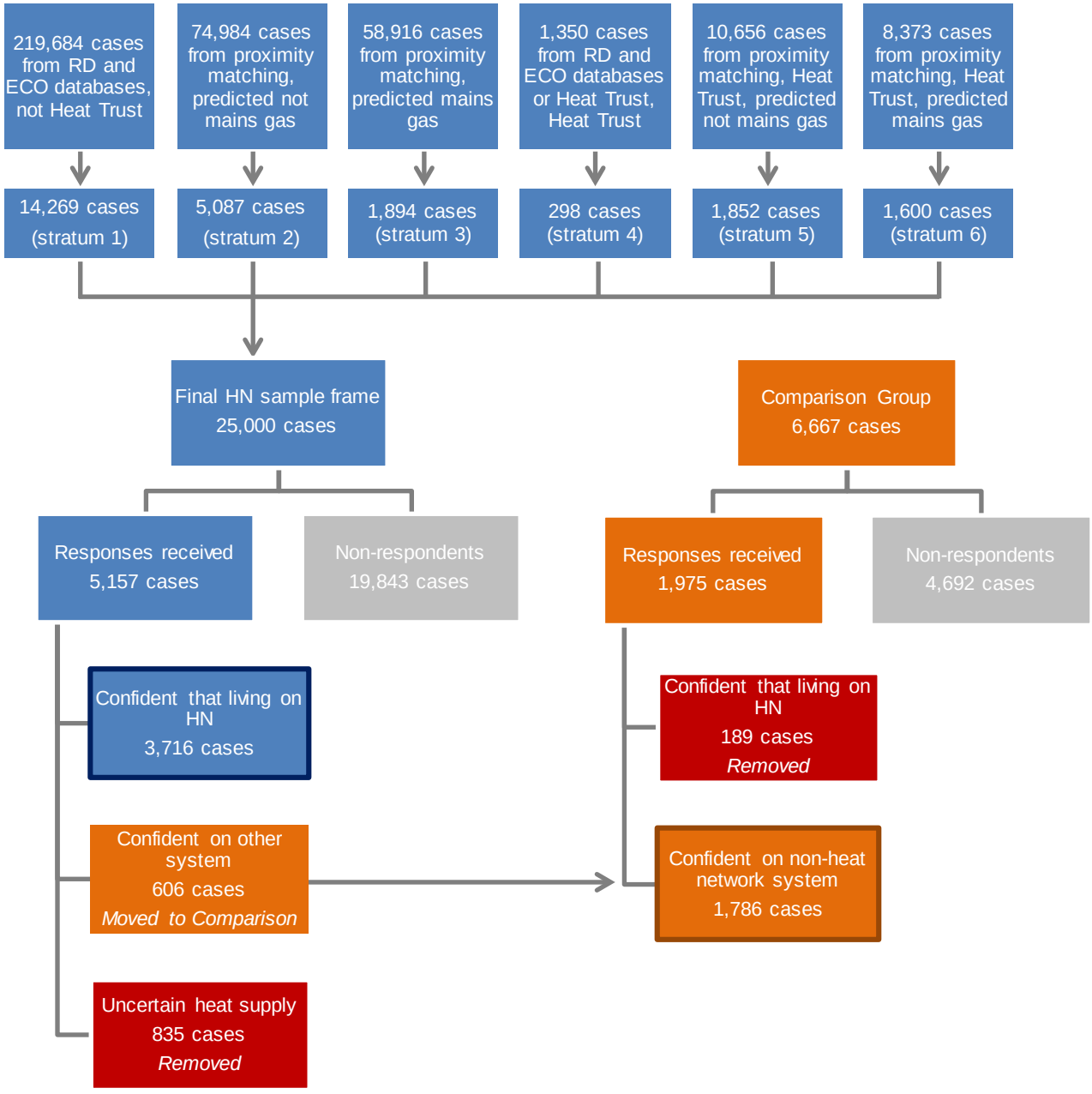
- Whether or not consumers agreed 'keeping up with heating and hot water costs is a bit of a struggle'
- Whether or not there was a vulnerable person in the household39
- Whether or not there was a person of pensionable age in the household
- Metering (whether or not the household was billed on actual/estimated usage)
- Property age
- Property size (number of bedrooms)

These characteristics formed the focus of sub-group analysis. Full results for a wider range of population sub-groups can be found in the accompanying data tables.[40]

[39] Vulnerability was defined as having or caring for someone with a long-term illness, physical or mental health problem, having a hearing or visual impairment of other communication needs, having temporary problems which affect their ability to use their heating, or needing extra support or assistance from their gas or heating supplier.

[40] Published tables

Annex A – Sample selection process tree



Annex B – Weighting model diagnostics

		Basic weight			PSM weight		
		Non-heat network	*Heat network*	*Difference*	*Non-heat network*	*Heat network*	*Difference*
Type of property	Flat or Maisonette	75.8%	89.7%	14%	90.1%	89.7%	0%
	Terrace house	7.2%	1.8%	-5%	1.6%	1.8%	0%
	Semi-detached house / end of terrace house	7.8%	1.0%	-7%	1.8%	1.0%	-1%
	Detached house	2.9%	.2%	-3%	.5%	.2%	0%
	Other	3.0%	3.0%	0%	1.8%	3.0%	1%
	Don't want to answer	3.4%	4.4%	1%	4.1%	4.4%	0%
	Don't know	0.0%	0.0%	0%	0.0%	0.0%	0%
Rent or own property	Own home outright	14.8%	8.4%	-6%	8.5%	8.4%	0%
	Own with the help of a mortgage/loan	0.0%	0.0%	0%	0.0%	0.0%	0%
	Buying it with the help of a mortgage/loan	10.5%	7.2%	-3%	7.3%	7.2%	0%
	Part own and part rent (shared ownership)	1.4%	4.3%	3%	2.4%	4.3%	2%
	Rent from a council or local authority	28.1%	33.8%	6%	36.2%	33.8%	-2%
	Rent from a housing association, housing co-operative, charitable trust or registered social landlord	29.0%	32.1%	3%	31.8%	32.1%	0%
	Rent from a private landlord or letting agency	14.3%	11.1%	-3%	12.0%	11.1%	-1%
	Rent from someone else	.2%	.5%	0%	.1%	.5%	0%
	Rent from an employer	0.0%	0.0%	0%	0.0%	0.0%	0%
	Rent from a relative or friend	0.0%	0.0%	0%	0.0%	0.0%	0%
	Live rent-free in another person's property	.2%	.2%	0%	.2%	.2%	0%
	Don't want to answer	1.5%	2.5%	1%	1.5%	2.5%	1%

Freeholder of property	You/a member of your household	47.8%	15.6%	-32%	15.6%	15.6%	0%
	Local Council	10.7%	14.6%	4%	10.8%	14.6%	4%
	Housing Association	10.5%	20.8%	10%	18.7%	20.8%	2%
	Private Housing Developer	8.9%	18.6%	10%	18.6%	18.6%	0%
	A private landlord	10.5%	8.9%	-2%	17.2%	8.9%	-8%
	Other	3.4%	5.6%	2%	6.8%	5.6%	-1%
	Don't want to answer	6.9%	11.3%	4%	9.7%	11.3%	2%
	Don't know	1.2%	4.8%	4%	2.5%	4.8%	2%
Age of property	Before 1960	23.5%	14.0%	-9%	15.1%	14.0%	-1%
	1960 - 1999	41.9%	40.8%	-1%	42.8%	40.8%	-2%
	2000 - 2009	8.5%	7.1%	-1%	7.2%	7.1%	0%
	2010 or more recently	6.4%	19.9%	13%	11.9%	19.9%	8%
	Don't want to answer	2.0%	2.5%	1%	2.6%	2.5%	0%
	Don't know	17.8%	15.8%	-2%	20.4%	15.8%	-5%
Number of bedrooms	0-1 bedrooms	43.3%	59.9%	17%	61.7%	59.9%	-2%
	2 bedrooms	37.2%	28.1%	-9%	29.1%	28.1%	-1%
	3+ bedrooms	18.4%	8.9%	-9%	7.9%	8.9%	1%
	Don't want to answer	1.1%	3.1%	2%	1.2%	3.1%	2%
Household size	1 person in HH	49.0%	60.0%	11%	60.7%	60.0%	-1%
	2 people in HH	30.2%	24.6%	-6%	24.0%	24.6%	1%
	3+ people in HH	19.3%	12.8%	-7%	13.3%	12.8%	-1%
	Don't want to answer	1.5%	2.6%	1%	2.0%	2.6%	1%
Index of Multiple Deprivation (IMD) Quintile	1	48.6%	45.0%	-4%	47.2%	45.0%	-2%
	2	26.4%	26.1%	0%	26.5%	26.1%	0%
	3	12.1%	14.8%	3%	13.5%	14.8%	1%
	4	8.9%	9.7%	1%	9.2%	9.7%	1%
	5	4.0%	4.4%	0%	3.6%	4.4%	1%

Region	East Midlands	5.0%	3.1%	-2%	3.6%	3.1%	-1%
	East of England	6.8%	6.8%	0%	6.2%	6.8%	1%
	London	37.7%	46.4%	9%	44.5%	46.4%	2%
	North East	5.3%	4.9%	0%	5.5%	4.9%	-1%
	North West	11.5%	9.6%	-2%	9.3%	9.6%	0%
	South East	10.9%	10.2%	-1%	10.6%	10.2%	0%
	South West	5.3%	5.6%	0%	5.7%	5.6%	0%
	Wales	1.1%	1.9%	1%	1.5%	1.9%	0%
	West Midlands	8.3%	5.2%	-3%	5.6%	5.2%	0%
	Yorkshire and The Humber	8.1%	6.4%	-2%	7.4%	6.4%	-1%

Annex C – Additional regression tables

Table A1. Results from regression model – Satisfaction with the level of control

		Beta	Std. err.	sig.	Odds ratio	Confidence Interval	
						Lower limit	Upper limit
Predictor variables	**1) Heat network operator**						
	Private vs. Housing association	-0.357	0.141	0.011	0.700	0.531	0.922
	Local authority vs. Housing association	-0.236	0.138	0.087	0.790	0.603	1.035
	2) Non-metered system	-0.499	0.132	0.000	0.607	0.469	0.787
	3) Not receiving separate bill for heating and hot water	-0.196	0.128	0.125	0.822	0.640	1.056
	4) No vulnerable people in household	0.070	0.108	0.516	1.073	0.868	1.326
	5) Age of property						
	Pre-1960 vs. 2010 or later	-0.880	0.191	0.000	0.415	0.286	0.603
	1960-1999 vs. 2010 or later	-0.464	0.179	0.010	0.629	0.443	0.893
	2000-2009 vs. 2010 or later	-0.195	0.207	0.347	0.823	0.548	1.235
	6) Not financially struggling	0.293	0.117	0.013	1.341	1.065	1.688
	7) Not registered with Heat Trust	0.128	0.194	0.509	1.137	0.776	1.665
	8) Number of people in household						
	1 person vs. 3 or more	0.385	0.239	0.108	1.469	0.920	2.347
	2 people vs. 3 or more	0.190	0.231	0.410	1.210	0.769	1.903
	9) No children in household	0.102	0.242	0.673	1.108	0.689	1.781
	10) No people aged 65 or above in household	-0.730	0.117	0.000	0.482	0.383	0.606
	11) Number of bedrooms						
	0 or 1 bedroom vs. 3 or more	0.338	0.201	0.093	1.403	0.945	2.082
	2 bedrooms vs. 3 or more	0.341	0.196	0.083	1.406	0.957	2.065
	12) Property type: not flat	0.166	0.177	0.348	1.180	0.835	1.669
	13) Communal system	0.044	0.109	0.686	1.045	0.844	1.294
	Intercept	1.429	0.302	0.000	4.175	2.310	7.547

The Nagelkerke pseudo-R2 for this model was 0.102

Table A2. Results from regression model – Whether experienced overheating

		Beta	Std. err.	sig.	Odds ratio	Confidence Interval	
						Lower limit	Upper limit
Predictor variables	**1) Heat network operator**						
	Private vs. Housing association	-0.060	0.158	0.702	0.941	0.690	1.284
	Local authority vs. Housing association	-0.312	0.163	0.056	0.732	0.532	1.007
	2) Non-metered system	0.362	0.161	0.024	1.437	1.048	1.970
	3) Not receiving separate bill for heating and hot water	0.370	0.155	0.017	1.448	1.069	1.960
	4) No vulnerable people in household	-0.269	0.125	0.032	0.764	0.598	0.977
	5) Age of property						
	Pre-1960 vs. 2010 or later	0.448	0.223	0.044	1.565	1.012	2.421
	1960-1999 vs. 2010 or later	-0.080	0.208	0.699	0.923	0.613	1.388
	2000-2009 vs. 2010 or later	0.107	0.234	0.650	1.112	0.702	1.762
	6) Not financially struggling	-0.394	0.140	0.005	0.674	0.512	0.888
	7) Not registered with Heat Trust	0.265	0.261	0.309	1.304	0.781	2.176
	8) Number of people in household						
	1 person vs. 3 or more	-0.062	0.333	0.853	0.940	0.490	1.805
	2 people vs. 3 or more	0.003	0.325	0.993	1.003	0.530	1.897
	9) No children in household	0.053	0.333	0.873	1.055	0.549	2.025
	10) No people aged 65 or above in household	0.432	0.136	0.001	1.540	1.181	2.010
	11) Number of bedrooms						
	0 or 1 bedroom vs. 3 or more	0.040	0.271	0.883	1.041	0.612	1.770
	2 bedrooms vs. 3 or more	0.082	0.259	0.752	1.085	0.653	1.803
	12) Property type: not flat	0.370	0.186	0.046	1.448	1.006	2.085
	13) Communal system	0.045	0.136	0.740	1.046	0.802	1.365
	Intercept	-2.355	0.388	0.000	0.095	0.044	0.203

The Nagelkerke pseudo-R2 for this model was 0.045

Table A3. Results from regression model – Perceptions of price – whether price perceived as fair

		Beta	Std. err.	sig.	Odds ratio	Confidence Interval	
						Lower limit	Upper limit
Predictor variables	**1) Heat network operator**						
	Private vs. Housing association	-0.535	0.163	0.001	0.586	0.426	0.806
	Local authority vs. Housing association	-0.215	0.172	0.212	0.807	0.576	1.130
	2) Non-metered system	-0.294	0.139	0.035	0.746	0.568	0.979
	3) Not receiving separate bill for heating and hot water	0.307	0.128	0.017	1.359	1.057	1.748
	4) No vulnerable people in household	-0.357	0.126	0.005	0.700	0.546	0.897
	5) Age of property						
	Pre-1960 vs. 2010 or later	0.454	0.204	0.026	1.575	1.055	2.352
	1960-1999 vs. 2010 or later	0.648	0.173	0.000	1.911	1.360	2.686
	2000-2009 vs. 2010 or later	0.365	0.205	0.075	1.441	0.964	2.155
	6) Not financially struggling	1.612	0.123	0.000	5.014	3.937	6.386
	7) Not registered with Heat Trust	0.047	0.186	0.800	1.048	0.728	1.509
	8) Number of people in household						
	1 person vs. 3 or more	-0.019	0.275	0.946	0.981	0.572	1.684
	2 people vs. 3 or more	-0.223	0.265	0.399	0.800	0.476	1.344
	9) No children in household	0.218	0.275	0.429	1.243	0.725	2.132
	10) No people aged 65 or above in household	-0.661	0.131	0.000	0.516	0.399	0.668
	11) Number of bedrooms						
	0 or 1 bedroom vs. 3 or more	0.524	0.219	0.017	1.689	1.099	2.596
	2 bedrooms vs. 3 or more	0.134	0.206	0.515	1.144	0.764	1.713
	12) Property type: not flat	-0.014	0.203	0.946	0.986	0.662	1.469
	13) Communal system	0.437	0.120	0.000	1.548	1.224	1.957
	Intercept	-0.296	0.334	0.375	0.744	0.387	1.431

The Nagelkerke pseudo-R2 for this model was 0.278

Table A4. Results from regression model – Whether consumer felt there was 'too little' information on bill

		Beta	Std. err.	sig.	Odds ratio	Confidence Interval	
						Lower limit	Upper limit
Predictor variables	**1) Heat network operator**						
	Private vs. Housing association	-0.567	0.208	0.006	0.568	0.378	0.853
	Local authority vs. Housing association	-0.103	0.192	0.591	0.902	0.619	1.314
	2) Non-metered system	0.706	0.184	0.000	2.027	1.412	2.909
	3) Not receiving separate bill for heating and hot water	0.266	0.162	0.101	1.305	0.949	1.793
	4) No vulnerable people in household	0.160	0.147	0.276	1.173	0.880	1.565
	5) Age of property						
	Pre-1960 vs. 2010 or later	0.252	0.268	0.347	1.287	0.760	2.177
	1960-1999 vs. 2010 or later	-0.202	0.244	0.408	0.817	0.507	1.319
	2000-2009 vs. 2010 or later	0.000	0.267	0.999	1.000	0.592	1.690
	6) Not financially struggling	-0.817	0.152	0.000	0.442	0.328	0.596
	7) Not registered with Heat Trust	0.718	0.261	0.006	2.050	1.229	3.420
	8) Number of people in household						
	1 person vs. 3 or more	-0.649	0.329	0.049	0.523	0.274	0.996
	2 people vs. 3 or more	-0.385	0.319	0.228	0.680	0.364	1.273
	9) No children in household	0.513	0.343	0.135	1.671	0.852	3.274
	10) No people aged 65 or above in household	0.717	0.157	0.000	2.049	1.506	2.788
	11) Number of bedrooms						
	0 or 1 bedroom vs. 3 or more	-0.082	0.276	0.766	0.921	0.536	1.582
	2 bedrooms vs. 3 or more	0.198	0.270	0.462	1.220	0.718	2.071
	12) Property type: not flat	0.161	0.237	0.497	1.175	0.738	1.870
	13) Communal system	-0.309	0.152	0.042	0.734	0.545	0.989
	Intercept	-2.048	0.440	0.000	0.129	0.054	0.306

The Nagelkerke pseudo-R2 for this model was 0.126

Table A5. Results from regression model – Whether had complained or had reason to complain

		Beta	Std. err.	sig.	Odds ratio	Confidence interval	
						Lower limit	Upper limit
Predictor variables	**1) Heat network operator**						
	Private vs. Housing association	0.109	0.135	0.421	1.115	0.855	1.452
	Local authority vs. Housing association	0.173	0.131	0.188	1.188	0.919	1.537
	2) Non-metered system	0.086	0.122	0.479	1.090	0.859	1.383
	3) Not receiving separate bill for heating and hot water	-0.003	0.116	0.981	0.997	0.795	1.251
	4) No vulnerable people in household	-0.296	0.102	0.004	0.744	0.609	0.909
	5) Age of property						
	Pre-1960 vs. 2010 or later	-0.091	0.175	0.603	0.913	0.647	1.287
	1960-1999 vs. 2010 or later	-0.200	0.157	0.201	0.818	0.602	1.113
	2000-2009 vs. 2010 or later	-0.053	0.185	0.776	0.949	0.660	1.364
	6) Not financially struggling	-0.607	0.109	0.000	0.545	0.440	0.675
	7) Not registered with Heat Trust	0.124	0.173	0.474	1.132	0.806	1.589
	8) Number of people in household						
	1 person vs. 3 or more	-0.184	0.241	0.445	0.832	0.519	1.334
	2 people vs. 3 or more	-0.056	0.234	0.812	0.946	0.598	1.496
	9) No children in household	-0.436	0.245	0.075	0.647	0.400	1.045
	10) No people aged 65 or above in household	0.460	0.108	0.000	1.583	1.281	1.957
	11) Number of bedrooms						
	0 or 1 bedroom vs. 3 or more	-0.502	0.192	0.009	0.606	0.416	0.882
	2 bedrooms vs. 3 or more	-0.272	0.186	0.144	0.762	0.529	1.097
	12) Property type: not flat	0.022	0.162	0.892	1.022	0.744	1.404
	13) Communal system	-0.099	0.102	0.333	0.906	0.741	1.107
	Intercept	0.451	0.293	0.124	1.570	0.884	2.787

The Nagelkerke pseudo-R2 for this model was 0.088

Table A6. Results from regression model – Satisfaction with information provided

		Beta	Std. err.	sig.	Odds ratio	Confidence interval	
						Lower limit	Upper limit
Predictor variables	**1) Heat network operator**						
	Private vs. Housing association	-0.215	0.156	0.169	0.806	0.593	1.096
	Local authority vs. Housing association	-0.192	0.160	0.231	0.826	0.603	1.130
	2) Non-metered system	-0.309	0.142	0.030	0.734	0.556	0.970
	3) Not receiving separate bill for heating and hot water	0.104	0.132	0.431	1.110	0.856	1.438
	4) No vulnerable people in household	-0.252	0.122	0.039	0.777	0.612	0.987
	5) Age of property						
	Pre-1960 vs. 2010 or later	-0.207	0.204	0.312	0.813	0.545	1.214
	1960-1999 vs. 2010 or	0.221	0.178	0.216	1.247	0.879	1.769
	2000-2009 vs. 2010 or	-0.187	0.205	0.360	0.829	0.555	1.238
	6) Not financially struggling	0.613	0.131	0.000	1.846	1.427	2.388
	7) Not registered with Heat Trust	0.124	0.187	0.508	1.132	0.785	1.632
	8) Number of people in household						
	1 person vs. 3 or more	0.392	0.272	0.150	1.480	0.868	2.525
	2 people vs. 3 or more	0.083	0.265	0.755	1.086	0.646	1.827
	9) No children in household	0.024	0.279	0.932	1.024	0.592	1.771
	10) No people aged 65 or above in household	-0.636	0.128	0.000	0.530	0.412	0.681
	11) Number of bedrooms						
	0 or 1 bedroom vs. 3 or more	0.133	0.224	0.551	1.143	0.737	1.772
	2 bedrooms vs. 3 or more	-0.043	0.219	0.845	0.958	0.624	1.471
	12) Property type: not flat	0.082	0.206	0.692	1.085	0.724	1.627
	13) Communal system	-0.119	0.123	0.331	0.888	0.698	1.129
	Intercept	0.632	0.335	0.059	1.882	0.976	3.629

The Nagelkerke pseudo-R2 for this model was 0.113

Annex D – Questionnaire development

Where possible we used or adapted existing questions from previous surveys. In some cases, existing question wording was amended to make it more relevant for consumers. The table below shows sources for the questions in the Heat Networks Customer Survey (HNCS) which were taken or adapted from previous questionnaires.

Source of questions from other surveys	Question in the HNCS
Research to explore consumer response to […] winter fuel payments to invest in energy efficiency home improvements (DECC, 2013)	
Q1 Do you have any of the following energy saving home improvements installed in your property? Please include anything that has been done to your property, even if the decision was not made by you personally. • Loft insulation • Cavity wall insulation • Double glazing • Any other energy saving home improvements • None of these • Don't know	Q10 Does your home have any of the following… • Double glazing • Loft insulation • Cavity wall insulation • Solid wall insulation • Don't know • None of these
Public Attitudes Tracker Wave 17 (DECC, 2016)	
Q2 How much thought, if any, would you say you give to saving energy in your home? • A lot • A fair amount • Not very much • None at all • Don't know	Q13 How much thought, if any, would you say you give to saving energy in your home? • A lot • A fair amount • Not very much • None at all
Public Attitudes Tracker Wave 17 (DECC, 2016)	
Q27 Which of the following types of property best describes your accommodation? • Flat or Maisonette • Terrace Property • Semi Detached Property • Detached Property • Other (specify) • Don't know	Q1 What type of property do you live in? • Flat or Maisonette • Terrace house • Semi-detached house / end of terrace house • Detached house • Other (please specify)

Public Attitudes Tracker Wave 19 (DECC, 2016)

Q33 Please could you look at this screen and tell me which of these represents your **household's total income**, before tax and any other deductions. This includes earnings from employment or self-employment, income from benefits and pensions, and income from other sources such as interest from savings.

Annual	Weekly	Monthly
Under £2,500	Under £50	Under £200
£2,500 - £4,999	£50 - £99	£200 - £399
£5,000 - £9,999	£100 - £199	£400 - £829
£10,000 - £15,999	£200 - £309	£830 - £1329
£16,000 - £19,999	£310 - £389	£1,330 - £1,649
£20,000 - £24,999	£390 - £489	£1,650 - £2,099
£25,000 - £29,999	£490 - £579	£2,100 - £2,499
£30,000 - £34,999	£580 - £679	£2,500 - £2,899
£35,000 - £39,999	£680 - £769	£2,900 - £3,349
£40,000 - £44,999	£770 - £869	£3,350 - £3,749
£45,000 - £49,999	£870 - £969	£3,750 - £4,149
£50,000 or more	£970 or more	£4,150 or more
Don't know		
Refused		

Q74 Which of these best describes your household's total income, before taxes and any other deductions? This includes earnings from employment or self-employment, income from benefits and pensions, and income from other sources such as interest from savings.

Annual	Monthly	Weekly
Under £2,500	Under £200	Under £50
£2,500 - £4,999	£200 - £399	£50 - £99
£5,000 - £9,999	£400 - £829	£100 - £199
£10,000 - £15,999	£830 - £1329	£200 - £309
£16,000 - £19,999	£1,330 - £1,649	£310 - £389
£20,000 - £24,999	£1,650 - £2,099	£390 - £489
£25,000 - £29,999	£2,100 - £2,499	£490 - £579
£30,000 - £34,999	£2,500 - £2,899	£580 - £679
£35,000 - £39,999	£2,900 - £3,349	£680 - £769
£40,000 - £44,999	£3,350 - £3,749	£770 - £869
£45,000 - £49,999	£3,750 - £4,149	£870 - £969
£50,000 or more	£4,150 or more	£970 or more
Don't know		
Prefer not to say		

Energy Follow-Up Survey 2010-11 (DECC)

Q1 In which of these ways do you and your household occupy this accommodation?

- Own it outright
- Buying it with the help of a mortgage or loan
- Pay part rent and part mortgage (shared ownership)
- Rent it
- Live here rent-free (including rent-free in relative's/ friend's property; excluding squatting)
- Squatting

Q2 Do you (or your household) own or rent the home that you live in?

- Own home outright
- Buying it with the help of a mortgage/loan Part own and part rent (shared ownership)
- Rent from a council or local authority
- Rent from a housing association, housing co-operative, charitable trust or registered social landlord
- Rent from a private landlord or letting agency
- Rent from someone else
- Live rent-free in another person's property

Energy Follow-Up Survey 2010-11 (DECC)

Q6 What is the heating system that your household uses to heat the majority of your home in the winter?

- Central heating
- Storage radiators
- Gas fires
- Electric heaters
- Coal / wood / smokeless fuel fires or stoves
- Other . . . state (including type of fuel)

Q17 Through which of the following ways do you heat your home?

- Central heating (either radiators or underfloor heating)
- Electric radiators
- Storage heating
- Portable heaters
- Gas fires
- Coal / wood / smokeless fuel fires or stoves
- Other (please specify)

Energy Follow-Up Survey 2010-11 (DECC)

Q78 (Why home is cold) Is this because…

- It costs too much to keep your heating on
- OR because it is not possible to heat the room to a comfortable standard
- BOTH of the above (spontaneous only)
- Neither

Q26 (Why home is cold) Is this because…

- Your heating stops working
- It costs too much to keep your heating on
- You cannot control your heating system to turn the temperature up
- It is not possible to heat your home to a comfortable temperature even with the heating on
- Something else
- Don't know

English Housing Survey 2014/15 (DCLG)

Is the freehold owned by ...

- ...a private individual,
- a company owned by other leaseholders (respondent not a member of company),
- any other type of company,
- a housing association,
- a charity or charitable trust (not housing association),
- a local authority or council,
- the church commissioners,
- or some other organisation?

Q3 Who is the freeholder of your property?

- You/a member of your household
- Local Council
- Housing Association
- Private Housing Developer
- A private landlord
- Other (please specify)
- Don't know

Retail Market Review 2015 (Ofgem)

Q80 Thinking of the last time you complained, taking everything into account regarding the complaints process, how satisfied or dissatisfied were you overall with the way in which your complaint was handled by the energy supplier?

- Very satisfied
- Quite satisfied
- Neither satisfied nor dissatisfied
- Quite dissatisfied
- Very dissatisfied

Q37 When you last made a complaint, how satisfied or dissatisfied were you with the way your complaint was handled?Very satisfied

- Satisfied
- Neither satisfied nor dissatisfied
- Dissatisfied
- Very dissatisfied

Retail Market Review 2015 (Ofgem)

Q76 In the last 12 months, have you contacted a current or previous energy supplier to complain at all?

- Yes
- No

Q81 Excluding any comment about their prices, do you believe you have had cause to complain to an energy supplier in the last year, but have not done so?

- Yes
- No

Q35 Have you or anyone in your household made a complaint about your heating in the last 12 months? Yes – complained

- No – had no reason to complain
- No – had reason to complain but chose not to
- No – had reason to complain but didn't know who to complain to
- Don't know

Retail Market Review 2015 (Ofgem)

Q134 Can I just check, is your own \ your own and your partner's total income, before tax and any other deductions more or less than £16,000 per year?

- Less than £16,000
- £16,000 or more

Q75 Is your household's total income, before taxes and any other deductions, £16,000 or more a year?

- Yes - £16,000 or more per year
- No - less than £16,000 a year
- Don't know
- Prefer not to say

Retail Market Review 2015 (Ofgem)

Q131 Do you or your husband\wife\partner have any long-term illness, physical or mental health problem or disability which limits your daily activities or the work you can do? This includes problems due to old age.

- Yes, I do
- Yes, my husband\wife\partner does
- No

Q76 Do any of the following apply to you or anyone in your household? This includes problems due to old age.

- A long-term illness, physical or mental health problem or disability which limits your daily activities or the work you can do
- Any caring responsibilities for a member of your immediate family, or, a close relative outside of your
- household who has any long-standing illness, physical or mental health problem or disability
- Any hearing or visual impairments or other communication needs, which limit your daily activities or the work you can do
- None of the above

Retail Market Review 2015 (Ofgem)

Q127 Could you tell me the extent to which you agree or disagree with the following statements?

Financially things are a bit of a struggle for me

- Strongly agree
- Tend to agree
- Neither agree nor disagree
- Tend to disagree
- Strongly disagree

Q63 How much do you agree or disagree with this statement:

'Keeping up with my heating and hot water costs is a bit of a struggle'

- Strongly agree
- Tend to agree
- Neither agree nor disagree
- Tend to disagree
- Strongly disagree
- Prefer not to say

Retail Market Review 2015 (Ofgem)

Q134 Can I just check, is your own \ your own and your partner's total income, before tax and any other deductions more or less than £16,000 per year?

- Less than £16,000
- £16,000 or more

Q75 Is your household's total income, before taxes and any other deductions, £16,000 or more a year?

- Yes - £16,000 or more per year
- No - less than £16,000 a year
- Don't know
- Prefer not to say

Retail Market Review 2015 (Ofgem)

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- Yes, I do
- Yes, my husband\wife\partner does
- No

Q76 Do any of the following apply to you or anyone in your household? This includes problems due to old age.

- A long-term illness, physical or mental health problem or disability which limits your daily activities or the work you can do
- Any caring responsibilities for a member of your immediate family, or, a close relative outside of your
- household who has any long-standing illness, physical or mental health problem or disability
- Any hearing or visual impairments or other communication needs, which limit your daily activities or the work you can do
- None of the above

Retail Market Review 2015 (Ofgem)

Q127 Could you tell me the extent to which you agree or disagree with the following statements?

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- Strongly agree
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- Tend to disagree
- Strongly disagree

Q63 How much do you agree or disagree with this statement:

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- Strongly agree
- Tend to agree
- Neither agree nor disagree
- Tend to disagree
- Strongly disagree
- Prefer not to say

Annex E – Original research questions

Customer service & assistance, awareness and satisfaction

- What is the level of awareness about Heat Networks amongst Heat Networks consumers?
- What information have consumers been given/do they have access to? What information were they given before joining a Heat Network? What information have they been given whilst using a Heat Network?
- How many are aware of what they should be aware of?
- How many consumers are aware of the complaint reporting and handling procedures?
- How many have raised a complaint about their Heat Network? How many would like to?
- How was their complaint dealt with? Was it resolved to their satisfaction? If not, why not?

Pricing, Billing and Metering

- How much do Heat Networks consumers pay?
- How many consumers have access to more than one tariff?
- How many HN consumers think they pay a fair price compared to others? To what extent is this due to over-pricing?
- How are their heat bills calculated?
- How do consumers pay their bills?
- When do consumers pay their bills? How often is this?
- How many consumers are satisfied with when and how they pay their bills?
- What billing information do consumers receive? Are consumers aware of what they are paying for? What is the level of billing transparency in the sector? How many bills are based on actual consumption?
- How is this delivered to consumers?
- Do consumers understand this information?
- How many consumers would like to receive more information? What information would they like to receive?
- How many consumers have a Heat meter?

Technical service

- What level of control do consumers have over their heating system? What controls do they have installed?
- How many consumers feel they should have greater control? What level of control would they like? What aspects of control are they missing?
- How satisfied are consumers with their heating and hot water system? Is it performing as they expect?
- How many consumers feel their dwelling is over-heated/under-heated?
- How many consumers have experienced interruptions in service? How frequently?
- How often is maintenance carried out? How are repairs handled?

This research will also assess how experiences differ for different types of consumers:

- How do existing consumer protection measures affect experience? What impact do schemes like the Heat Trust have?
- How do experiences differ depending on the installed system infrastructure? Does performance differ? Does satisfaction differ?
- Do those in social housing schemes have different experiences to those in private schemes?
- Do those in smaller schemes have different experiences to those in larger schemes?
- Do experiences differ in older networks (pre-December 2014) to those in newer networks?
- Does having a Heat Meter correlate with lower bills?
- How do experiences compare to those in the domestic gas sector and the heating oil and gas market? (Where appropriate)

KANTAR PUBLIC=

Department for Business, Energy & Industrial Strategy

Survey of energy use in your home

Thank you for taking the time to answer these questions. The questionnaire should take no longer than 20 minutes to complete and we will keep your answers completely confidential.

Who should complete the questionnaire?

Any adult aged 16 or older can complete the questionnaire as long as they are jointly or solely responsible for household bills.

How do I fill out the questionnaire?

. Please answer the questions as fully as you are able by crossing the boxes or writing in the spaces provided. Please return the completed questionnaire in the reply-paid envelope.

2. Most questions on the following pages can be answered by putting a cross in the box next to the answer that applies to you, like this: ☒
3. Occasionally a question will ask you to "choose all that apply." Please cross as many boxes as apply to you when you see this instruction.
4. Please try to answer every question. If you cannot remember, do not know, or the question does not apply to you then please cross the relevant box where shown or leave the question blank.
5. If you mark the wrong box, fill in the box and put a cross in the right one like this: ■ ☒
6. Please use black or blue ink to complete the questionnaire.
7. If it is difficult for you to complete the questionnaire, you can ask a friend, family member or carer to help you or fill it in on your behalf.

Where can I get more information?

✉ energysurvey@kantarpublic.com

✆ Survey helpline: 0800 015 1484*

*Only during office hours (9am- 5pm)

If you have any queries about the survey or need help completing the questionnaire, please contact Kantar Public

Thank you for taking the time to complete this questionnaire

To begin, we have a few questions about the property that you currently live in.

Q1. **What type of property do you live in?**
Please choose one answer only

- ☐ Flat or Maisonette
- ☐ Terrace house
- ☐ Semi-detached house / end of terrace house
- ☐ Detached house
- ☐ Other (please specify)

Q2. **Do you (or your household) own or rent the home that you live in?**
Please choose one answer only

- ☐ Own home outright
- ☐ Buying it with the help of a mortgage/loan Part own and part rent (shared ownership)
- ☐ Rent from a council or local authority [skip to **Q4**]
- ☐ Rent from a housing association, housing co-operative, charitable trust or registered social landlord [skip to **Q4**]
- ☐ Rent from a private landlord or letting agency [skip to **Q4**]
- ☐ Rent from someone else [skip to **Q4**]
- ☐ Live rent-free in another person's property [skip to **Q4**]

IF YOU OWN OR ARE BUYING YOUR HOME

Q3. **Who is the freeholder of your property?**
Please choose one answer only

- ☐ You/a member of your household
- ☐ Local Council
- ☐ Housing Association
- ☐ Private Housing Developer
- ☐ A private landlord
- ☐ Other (please specify)
- ☐ Don't know

Q4. **Roughly when was your home built?**

Please choose one answer only

- ☐ Before 1960
- ☐ 1960 – 1999
- ☐ 2000 – 2009
- ☐ 2010 or more recently
- ☐ Don't know

Q5. **How many bedrooms do you have in your home?**
Please write in the box provided

☐☐

Q6. **How long have you lived in your current home?**
Please write in the number of years and (if known) the number of months
If you have lived in your home less than a year, just write in the number of months

☐☐ Years ☐☐ Months

Q7. **How many people are there in your household altogether, including any children and yourself?**
Please write in the box provided

And what is the gender of each person in your household? Please include yourself and any children
Please choose one answer per person only

	You	Person 2	Person 3	Person 4	Person 5	Person 6	Person 7	Person 8	Person 9	Person 10
Male										
Female										

Q9. **And how old is each person in your household? Again please include yourself and any children**
Please choose one answer per person only

	You	Person 2	Person 3	Person 4	Person 5	Person 6	Person 7	Person 8	Person 9	Person 10
Under 5										
6 – 17										
8 – 24										
25 – 34										
35 – 44										
45 – 54										
55 – 64										
65 – 74										
75+										

Controlling energy in the home

Q10. **Does your home have any of the following…**
Please choose all that apply

- ☐ Double glazing
- ☐ Loft insulation
- ☐ Cavity wall insulation
- ☐ Solid wall insulation
- ☐ Don't know
- ☐ None of these

Q11. **Does your home have any of the following? If so, do you use any of these devices?**
Please answer yes, no or don't know for each option

	Yes – have it and use it	Yes – have it but I don't use it	No	Don't know
Temperature controls on individual radiators (sometimes called Thermostatic Radiator Valves or TRVs)	☐	☐	☐	☐
Central thermostat that controls overall level of heating throughout your home	☐	☐	☐	☐
A device to program what time your heating comes on	☐	☐	☐	☐

Q12. **How satisfied or dissatisfied are you with the level of control you have over the temperature of your heating?**

Please choose one answer only

- ☐ Very satisfied
- ☐ Satisfied
- ☐ Neither satisfied nor dissatisfied
- ☐ Dissatisfied
- ☐ Very dissatisfied

Q13. **How much thought, if any, would you say you give to saving energy in your home?**

Please choose one answer only

- ☐ A lot
- ☐ A fair amount
- ☐ Not very much
- ☐ None at all

Your heating system

The next few questions are about your heating system.

Q14. **Overall, how satisfied or dissatisfied are you with your heating and hot water system?**

Please choose one answer only

- ☐ Very satisfied
- ☐ Satisfied
- ☐ Neither satisfied nor dissatisfied
- ☐ Dissatisfied
- ☐ Very dissatisfied

PLEASE READ THE FOLLOWING

Most homes have their own boiler or a burner located *inside the home* to generate heating.

For some homes, heating is provided by **communal heating**. This is where heating is provided by a shared boiler, or another heat source, that is located outside of your home but in the same building. The boiler provides heat to all homes within that building. An example of this is a block of flats with a shared communal boiler in the basement.

Other homes are on **district heating** systems. This is where heating is provided by a shared boiler or heat source that provides heating and hot water for multiple buildings. This could be multiple houses or multiple blocks of flats. Often, the central heat source has its own small building near these homes, sometimes called an 'energy centre'.

Q15. **Which of the following applies to you?**

Please choose one answer only

- ☐ My home is part of a **heat network (communal heating or district heating)**
- ☐ My home has its own **gas boiler** which provides my heating [skip to **Q17**]
- ☐ My home has its own **oil boiler** which provides my heating [skip to **Q17**]
- ☐ My home is solely or mostly heated by **electric radiators or storage heaters** [skip to **Q17**]
- ☐ Something else [skip to **Q17**]
- ☐ Don't know [skip to **Q17**]

IF YOUR HOME IS PART OF A HEAT NETWORK

Does your heat network cover just the building you live in or does it cover other buildings too?

Please choose one answer only

- ☐ Heat network covers just your building
- ☐ Heat network covers other buildings too
- ☐ Don't know

Q17. **Through which of the following ways do you heat your home?**
Please choose all answers that apply

- ☐ Central heating (either radiators or underfloor heating)
- ☐ Electric radiators
- ☐ Storage heating
- ☐ Portable heaters
- ☐ Gas fires
- ☐ Coal / wood / smokeless fuel fires or stoves
- ☐ Other (please specify)

Q18. **Do you have a gas cooker or gas hob in your home?**
Please choose one answer only

☐ Yes ☐ No ☐ Don't know

Q19. **How is <u>hot water</u> provided in your home?**

Please choose one answer only

- ☐ Hot water is provided **by a heat network (communal heating or district heating)**
  Please refer back to the text box before Q15 on page 4 to see the definition of a heat network
- ☐ Hot water is provided **by a gas boiler inside my home**
- ☐ Hot water is provided **by an oil boiler inside my home**
- ☐ Hot water is provided **by an electric immersion heater inside my home**
- ☐ Something else
- ☐ Don't know

Q20. **Is hot water available when you need it?**
Please choose one answer only

- ☐ Yes – always available
- ☐ No – it's sometimes not available
- ☐ No – it's regularly not available

Your heating service

Q21. **How reliable would you say your heating system is for heating your home?**
Please choose one answer only

- ☐ Very reliable
- ☐ Fairly reliable
- ☐ Not very reliable
- ☐ Not at all reliable

Q22. **Is heating available at all times?**
Please choose all answers that apply

- ☐ Yes
- ☐ No – it's not available at particular times of **year**
- ☐ No – it's not available at particular times of **day**
- ☐ Don't know

Q23. **In the past 12 months, have you had a <u>loss of heating</u> in your home?**
Please choose one answer only

☐ Yes – once ☐ Yes – more than once ☐ No [skip to **Q25**] ☐ Don't know [skip to **Q25**]

IF YOU HAVE HAD A LOSS OF HEATING

Q24. **How long did this loss of heating last?**
If this has happened more than once, please think about a typical occasion

Please choose one answer only

- ☐ Less than 12 hours
- ☐ 12 – 24 hours
- ☐ Up to 3 days
- ☐ Up to 1 week
- ☐ More than 1 week
- ☐ Don't know

Q25. **Does your home ever get uncomfortably cold?**

Please choose one answer only

☐ Yes ☐ No [skip to **Q29**] ☐ Don't know [skip to **Q29**]

IF YOUR HOME EVER GETS UNCOMFORTABLY COLD

Q26. **Is this because…**

Please choose all answers that apply

- ☐ Your heating stops working
- ☐ It costs too much to keep your heating on
- ☐ You cannot control your heating system to turn the temperature up
- ☐ It is not possible to heat your home to a comfortable temperature even with the heating on
- ☐ Something else
- ☐ Don't know

Q27. **When does your home typically get uncomfortably cold?**

Please choose all answers that apply

- ☐ During the summer months
- ☐ During the winter months
- ☐ During the rest of the year
- ☐ Occasionally/sporadically/no fixed pattern
- ☐ It's always too cold
- ☐ Something else

Q28. **At these times of year, how often does your home get uncomfortably cold?**

Please choose one answer only

- ☐ All the time
- ☐ Most days
- ☐ At least once a week
- ☐ Less often

Q29. **Does your home ever get uncomfortably warm?**

Please choose one answer only

☐ Yes ☐ No [skip to **Q34**] ☐ Don't know [skip to **Q34**]

IF YOUR HOME EVER GETS UNCOMFORTABLY WARM

Q30. **Is this because…**

Please choose all answers that apply

- ☐ You can't control your heating to make it cooler
- ☐ You can't turn off your heating to make it cooler
- ☐ There is poor ventilation (e.g. through windows)
- ☐ It is difficult to keep direct sunlight out
- ☐ Heat from your neighbour's property
- ☐

Something else

☐ Don't know

Q31. **What do you do to cool your home when it is uncomfortably warm?**
Please choose all answers that apply

- ☐ Open a window
- ☐ Use an electric fan
- ☐ Use an air conditioning unit
- ☐ Turn down your heating
- ☐ Turn off your heating
- ☐ Something else (please specify)

- ☐ I don't do anything to cool my home

Q32. **When does your home typically get uncomfortably warm?**

Please choose all answers that apply

- ☐ During the summer months
- ☐ During the winter months
- ☐ During the rest of the year
- ☐ It's always too warm
- ☐ Occasionally/sporadically/no fixed pattern
- ☐ Something else

Q33. **At these times of year, how often does your home get uncomfortably warm?**
Please choose one answer only

- ☐ All the time
- ☐ Most days
- ☐ At least once a week
- ☐ Less often

Q34. **If you had a problem with your gas or heating, who would you contact to get it fixed?**
Please choose all answers that apply

- ☐ Your gas or heating provider
- ☐ Your landlord
- ☐ The council
- ☐ The housing association
- ☐ A plumber / gas engineer
- ☐ An electrician (for electric heating systems)
- ☐ I would try to fix it myself
- ☐ Other (please specify)

- ☐ Don't know who to contact

Q35. **Have you or anyone in your household made a complaint about your heating in the last 12 months?**

Please choose one answer only

- ☐ **Yes** – complained
- ☐ **No** – had no reason to complain [skip to **Q38**]
- ☐ **No** – had reason to complain but chose not to [skip to **Q38**]
- ☐ **No** – had reason to complain but didn't know who to complain to [skip to **Q38**]
- ☐ Don't know [skip to **Q38**]

IF YOU HAVE COMPLAINED ABOUT YOUR HEATING

Q36. **Who did you complain to?**

Please choose all answers that apply

- ☐ Your energy or heating supplier
- ☐ The Energy Ombudsman
- ☐ The Housing Ombudsman
- ☐ Your housing association / council (if they are not your heating supplier)
- ☐ Your local councilor or MP
- ☐ Your landlord
- ☐ Other (please specify)

Q37. **When you last made a complaint, how satisfied or dissatisfied were you with the way your complaint was handled?**

Please choose one answer only

- ☐ Very satisfied
- ☐ Satisfied
- ☐ Neither satisfied nor dissatisfied
- ☐ Dissatisfied
- ☐ Very dissatisfied

Information about heating in your home

Q38. Please think about when you first started using your **current** heating system. This could be when you moved in to your home or when a new system was installed. We are interested in any information you received about the system, other than information provided as part of your bill, account summary or statement.

Did you receive a contract document, such as a Heat Supply Agreement, for the supply of your heating when you moved in to your home or when your system was installed?

Please choose one answer only

☐ Yes ☐ No ☐ Don't know

Q39. **When you first started using your current heating system, did you receive information about any of the following?**

Please choose all answers that apply

- ☐ The type of heating system you have
- ☐ Maintenance and servicing arrangements
- ☐ The likely costs of heating
- ☐ How you would be billed for heating
- ☐ How to change the temperature in your home (if you can)
- ☐ Who to contact if you need a problem with your heating system fixed
- ☐ Who to contact in an energy emergency
- ☐ How to complain if you are dissatisfied with the service
- ☐ Your contract length
- ☐ How environmentally friendly the heating system is
- ☐ No information was provided [skip to **Q43**]
- ☐ Don't know

IF YOU RECEIVED ANY INFORMATION ABOUT YOUR HEATING SYSTEM

Q40. **When did you receive this information?**

Please choose all answers that apply

- ☐ Before I moved in
- ☐ When I moved into the property
- ☐ When the heating system was installed
- ☐ After I made a complaint
- ☐ Another time
- ☐ I did not receive any information [skip to **Q43**]
- ☐ Don't know

Q41. **How did you receive this information?**
Please choose all answers that apply

- ☐ From your landlord
- ☐ From your estate/lettings agent
- ☐ From your heating / energy supplier
- ☐ From your solicitor
- ☐ From the housing developer
- ☐ From whoever installed your heating system
- ☐ From a previous occupant
- ☐ Some other way (please specify)

Q42. **How satisfied or dissatisfied are you with the quality of information you have received about your heating?**
Please choose one answer only

- ☐ Very satisfied
- ☐ Satisfied
- ☐ Neither satisfied nor dissatisfied
- ☐ Dissatisfied
- ☐ Very dissatisfied

Paying for heating and hot water

Q43. We are interested in how you pay for your heating and hot water.
To answer these questions, you must have at least some responsibility for household bills. If you are having difficulty answering these questions you can ask a family member, friend or carer to help you or to fill this out on your behalf.

Do you pay for heating and hot water separately to other household bills?
Please choose one answer only

- ☐ **Yes**
- ☐ **No** – heating and hot water is part of my overall energy bill
- ☐ **No** – heating and hot water is included with rent
- ☐ **No** – heating and hot water is included in a central service charge
- ☐ **Other** (please specify)

If your heating and hot water is paid as part of an overall gas or electricity bill, please think about this overall bill

If your heating and hot water is paid as part of your rent or service charge, please think about just what you pay for heating and hot water.

Q44. The next few questions are about how much you pay for heating and hot water. **This section of the questionnaire is very important. We need this information to help ensure that people are paying a fair price for their energy.**

It will be a lot easier for you to answer if you have your last bill, account summary or statement to hand.

Do you have a copy of your most recent bill, account summary or statement in front of you?
Please choose one answer only

☐ Yes ☐ No

Q45. **Thinking about the last payment you made for heating and hot water, what was the total amount paid?**
Please write in the boxes provided

☐☐☐☐ ☐☐ ☐ Don't know

Q46. **In which month did you make this payment?**
Please write in the boxes provided

M M MONTH Y Y Y Y YEAR ☐ Don't know

Q47. **What period did this cover?**
If this varies, please estimate how often you pay on average
Please choose one answer only

☐ A week
☐ Two weeks
☐ Four weeks
☐ A month
☐ A quarter (three months)
☐ Six months
☐ A year
☐ Some other period of time (please specify)

☐ Don't know

Q48. **Do you pay using a pre-payment meter or pre-payment card?**
Please choose one answer only

☐ **Yes** – I pay using **pre-payment meter** (where you top up credit on a key, card or online account)
☐ **Yes** – I pay using a **pre-payment card or book**
☐ **No** – I do not pay using a pre-payment meter or pre-payment card
☐ Don't know

Q49. **How is the amount you pay for heating and hot water calculated?**
Please choose one answer only

☐ It's based on **actual household use**
☐ It's based on **estimated household use**
☐ It's based on **how much the building uses, divided between households (estimated or actual)**
☐ It's **a set price each time – it doesn't change based on usage**
☐ Some other way (please specify)

☐ Don't Know

Q50. **Which of the following are covered by the price you pay for your heating and hot water?**
Please answer yes, no or don't know for each option

	Yes –included in the price	**No** – not included in	Don't know
Maintenance and servicing of your heating and hot water	☐	☐	☐
The cost of replacing your boiler / heating system if needed	☐	☐	☐
Temporary heating if your heating fails (for example giving you electric heaters to use)	☐	☐	☐
Something else (please specify)	☐	☐	☐

Bills, account summaries and statements

The next few questions focus on the information you receive about your heating and hot water use and how much you pay for this (including any bills you receive). If you pay for heating and hot water as part of an overall gas, electricity or other energy bill, please think about this.

Do you receive a bill, account summary, statement or something else, which details how much you pay for heating and hot water?

This could just be a summary of your account rather than a request for payment

Please choose all answers that apply

- ☐ Yes – by letter
- ☐ Yes – by email
- ☐ Yes – through an online account or system
- ☐ Yes – something else (please specify)

  [ ]
- ☐ No [skip to **Q57**]
- ☐ I don't know – I haven't received one yet [skip to **Q57**]

IF YOU RECEIVE A BILL, ACCOUNT SUMMARY OR STATEMENT

Q52. **Is your bill, account summary or statement <u>just</u> for your heating and hot water?**

Please choose one answer only

- ☐ Yes – **just for heating and hot water**
- ☐ No – it is for **overall gas use**
- ☐ No – it is for **overall electricity use**
- ☐ No – it is for **overall energy use**
- ☐ Something else (please specify)

  [ ]
- ☐ Don't know

Q53. **Who provides this bill, account summary or statement?**

Please choose one answer only

- ☐ An **energy supplier** (please specify)

  [ ]
- ☐ The **council / local authority**
- ☐ A **housing association**
- ☐ Your **landlord**
- ☐ Someone else (please specify)

  [ ]
- ☐ Don't know

Q54. **How often do you receive your bill, account summary or statement?**

Please choose all answers that apply

- ☐ Annually
- ☐ Twice a year (every six months)
- ☐ Quarterly (every three months)
- ☐ Monthly
- ☐ Weekly
- ☐ I can access up to date information online whenever I like
- ☐ No fixed pattern – they come at different times of the year
- ☐ Never [skip to **Q57**]
- ☐ Other (please specify)

  [ ]
- ☐ Don't know

Q55. **Which of the following is included on your bill, account summary or statement?**
Please choose all answers that apply

- ☐ Your total charge for heating and hot water (or equivalent)
- ☐ The time period this covers
- ☐ A description of how this charge has been calculated
- ☐ Any standing or set charges within this
- ☐ The amount of heat you have used (e.g. the number of kWhs you have used)
- ☐ The amount you are charged for each unit of heat (the price per kWh)
- ☐ Any charges for maintenance or upkeep of the heating system (for heat networks)
- ☐ The date by which you must pay the bill (if this is a bill)
- ☐ None of these
- ☐ Don't know

Q56. **Would you say that you receive too much or too little information in your heating and hot water bills, account summaries or statements?**
Please choose one answer only

- ☐ Too much
- ☐ About right
- ☐ Too little

Q57. **We would like to ask you three short questions about your most recent bill, account summary or statement.** If you get an overall gas, electricity or energy bill, please think about this overall bill.

How much is the standing charge on your bill, account summary or statement?
This is the set fee you pay each time, which doesn't change based on how much you use.
Please write in the box provided

☐☐☐☐.☐☐ ☐ Information is not provided on my bill, summary or statement ☐ Don't know

Q58. **How many units of energy were you charged for?**
This is the amount of energy used – this should be a number of Kilowatt Hours (kWh)
Please write in the box provided

☐☐☐☐☐ kWh ☐ Information is not provided on my bill, summary or statement ☐ Don't know

Q59. **How much did you pay for each Kilowatt Hour (kWh) / unit of energy?**
This is the price you pay for each unit of energy in pence per Kilowatt Hours (kWh)
Please write in the box provided

☐☐.☐☐ Pence ☐ Information is not provided on my bill, summary or statement ☐ Don't know

Your views on the price of heating and hot water

Q60. **Based on the service you receive, do you think the price you pay for heating and hot water is fair? Please think about everything that's included in the price you pay for heating and hot water, including maintenance, servicing and repairs.**

Please choose one answer only

- ☐ Very fair
- ☐ Fair
- ☐ Not very fair
- ☐ Not at all fair

Q61. **And why do you say that?**

Q62. **Is the price you pay for heating and hot water as you expected when you first started using your current system?**

Please choose one answer only

- ☐ A lot higher than expected
- ☐ A little higher than expected
- ☐ As expected
- ☐ A little lower than expected
- ☐ A lot lower than expected

Q63. **How much do you agree or disagree with this statement: 'Keeping up with my heating and hot water costs is a bit of a struggle'**

Please choose one answer only

- ☐ Strongly agree
- ☐ Tend to agree
- ☐ Neither agree nor disagree
- ☐ Tend to disagree
- ☐ Strongly disagree
- ☐ Prefer not to say

Q64. **Have any of the following happened in the last 12 months?**

Please choose all answers that apply

- ☐ Missed a payment for heating and hot water
- ☐ Borrowed money to pay for heating and hot water
- ☐ Had to make savings elsewhere to pay for heating and hot water
- ☐ An error with your billing for heating and hot water or gas
- ☐ None of these

Q65. **Do you have any choice over who provides your heating and hot water?**

Please choose one answer only

☐ Yes ☐ No ☐ Don't know

Q66. **How much do you agree or disagree with the following statement:**
'I want to switch my heating and hot water supplier'

Please choose one answer only

- ☐ Strongly agree
- ☐ Tend to agree
- ☐ Neither agree nor disagree
- ☐ Tend to disagree
- ☐ Strongly disagree

Q67. **Have you ever had another type of heating and hot water system, either in your current home or in a previous home?**

Please choose one answer only

- ☐ **Yes** – a different system in my current home
- ☐ **Yes** – a different system in a previous home
- ☐ **No** [skip to **Q72**]
- ☐ Don't know [skip to **Q72**]

IF YOU HAD A DIFFERENT HEATING AND HOT WATER SYSTEM

Q68. **What was the main way heating and hot water was provided by your previous system?**

Please choose one answer only

- ☐ By a **heat network** (**communal heating or district heating -** if you are not sure please re-read the definition before Q15 on page 4)
- ☐ By a **gas boiler**
- ☐ By an **oil boiler**
- ☐ By electric radiators or storage heaters
- ☐ By portable heaters
- ☐ Another way
- ☐ Don't know

Q69. **Do you prefer your current heating and hot water system or the previous system you had?**

Please choose one answer only

- ☐ **I prefer my current system**
- ☐ **I prefer the previous system I had**
- ☐ I have **no preference**
- ☐ Don't know

Q70. **Would you say the price you pay for heating and hot water now is….**

Please choose one answer only

- ☐ **A lot higher** compared with your previous system
- ☐ **A little higher** compared with your previous system
- ☐ **No different** to your previous system [skip to **Q72**]
- ☐ **A little lower** compared with your previous system
- ☐ **A lot lower** compared with your previous system
- ☐ Don't know [skip to **Q72**]

IF YOU PAY MORE OR LESS FOR YOUR CURRENT SYSTEM THAN YOUR PREVIOUS SYSTEM

Q71. **Roughly, how much more or less do you pay for your heating and hot water now <u>each year</u> compared with your previous system?**

Please write in one box only

☐☐☐☐ MORE

☐☐☐☐ LESS

Some questions about your household

Q72. **Which of these best describes the working status of the chief income earner in your household?**
If you are an individual living in a shared house, please answer with your working status
Please choose one answer only

- ☐ Full-time paid work (30+ hours per week)
- ☐ Part-time paid work (8 – 29 hours per week)
- ☐ Part-time paid work (Under 8 hours per week)
- ☐ Retired
- ☐ Still at school
- ☐ In full time higher education
- ☐ Unemployed (seeking work)
- ☐ Not in paid employment (not seeking work)

Q73. **Are there any adults at home during the day, other than at weekends?**
Please choose one answer only

☐ Yes – regularly ☐ Yes – sometimes ☐ Never

Q74. **Which of these best describes your household's total income, before taxes and any other deductions? This includes earnings from employment or self-employment, income from benefits and pensions, and income from other sources such as interest from savings.**
If you are an individual living in a shared house, please answer with your income
Please choose the row which most closely applies. Please choose one answer only

	Annual	Monthly	Weekly
☐	Under £2,500	Under £200	Under £50
☐	£2,500 – £4,999	£200 – £399	£50 – £99
☐	£5,000 – £9,999	£400 – £829	£100 – £199
☐	£10,000 – £15,999	£830 – £1329	£200 – £309
☐	£16,000 – £19,999	£1,330 – £1,649	£310 – £389
☐	£20,000 – £24,999	£1,650 – £2,099	£390 – £489
☐	£25,000 – £29,999	£2,100 – £2,499	£490 – £579
☐	£30,000 – £34,999	£2,500 – £2,899	£580 – £679
☐	£35,000 – £39,999	£2,900 – £3,349	£680 – £769
☐	£40,000 – £44,999	£3,350 – £3,749	£770 – £869
☐	£45,000 – £49,999	£3,750 – £4,149	£870 – £969
☐	£50,000 or more	£4,150 or more	£970 or more

- ☐ Don't know [skip to **Q75**]
- ☐ Prefer not to say [skip to **Q75**]

IF YOU DID NOT ANSWER Q74 ABOUT YOUR HOUSEHOLD'S TOTAL INCOME, PLEASE ANSWER Q75

Q75. **Is your household's total income, before taxes and any other deductions, £16,000 or more a year?**

- ☐ Yes - £16,000 or more per year
- ☐ No - less than £16,000 a year
- ☐ Don't know
- ☐ Prefer not to say

Q76. **Do any of the following apply to you or anyone in your household? This includes problems due to old age.**
Please choose all answers that apply

- ☐ A long-term illness, physical or mental health problem or disability which limits your daily activities or the work you can do
- ☐ Any caring responsibilities for a member of your immediate family, or, a close relative outside of your household who has any long-standing illness, physical or mental health problem or disability
- ☐ Any hearing or visual impairments or other communication needs, which limit your daily activities or the work you can do
- ☐ None of the above

Q77. **Do you or anyone in your household have an injury or any other temporary problems which affect your ability to use your heating system?**

Please choose one answer only

☐ Yes ☐ No

Q78. **Do you or anyone in your household get extra support or assistance from your gas or heating supplier?**

Examples of extra support can include: help in reading or understanding your energy bills, relocation of a prepayment meter to ensure you can use it safely, or priority support in an energy emergency.

Please choose one answer only

☐ Yes ☐ No ☐ Don't know

Final questions

Q79. **Would you be willing for us to share your contact details with the Department for Business, Energy and Industrial Strategy (BEIS) and any research contractors appointed by BEIS for research in the future? Your contact details will not be linked to your responses to this survey.**

Please choose one answer only

☐ Yes, Kantar Public can share my contact details with BEIS and their appointed research contractors

☐ No, Kantar Public cannot share my contact details with BEIS and their appointed research contractors

You will not receive 'junk mail' as a result of sharing your contact details

Q80. **Please provide a telephone number that you would be happy to be contacted on.**

Write in your telephone number below

Q81. **Please provide your name in the box below.**

Please use capitals

Q82. **Please provide your email address in the box below.**

Please use capitals

Q83. It is sometimes possible to link the information you provided in this survey with other datasets held by the Government to help us further understand people's experiences of using and paying for energy, which will help the Government protect the rights of consumers like you.

To do this, we will need to securely send personal information (name and address) to other government departments holding the data. Once linked, all personal information will be removed from the linked dataset.

All research using this linked dataset will be anonymous – your confidentiality will be maintained at all times. The research will be carried out by the Department for Business, Energy and Industrial Strategy (BEIS) (including researchers approved by BEIS); and used for research purposes only.

Are you happy for your data to be linked in this way?

Please choose one answer only

☐ Yes ☐ No

This is the end of the survey. Thank you for taking part in the Energy Use Survey 2017.

Please return the questionnaire to us in the pre-paid envelope.

Where can you get more information about the survey?

Telephone 0800 015 1484

Email: energysurvey@kantarpublic.com

You can contact Kantar Public if you have accessibility requirements, or difficulties completing the questionnaire. If it is difficult for you to complete the questionnaire, you can ask a friend, family member or carer to help you or fill it in on your behalf.

Annex G – Survey materials

- Invite letter (main version)
- Invite letter (with Welsh text)
- Postcard reminder

The Resident(s)
<ADDRESS_LINE_1>
<ADDRESS_LINE_2>
<ADDRESS_LINE_3>
<ADDRESS_LINE_4>
<POSTCODE>

Department for Business,
Energy and Industrial Strategy
1 Victoria Street
London
SW1H 0ET

Date: <XX> April 2017
Our ref.: 139236 / <SERIAL>

Dear Sir/Madam,

This is an invitation for your household to take part in the Energy Use Survey, which is an official Government study. This is your opportunity to tell us about using and paying for energy, which will help the Government protect the rights of consumers like you.

As a thank you for taking part you will be sent a **£10 voucher**.

To take part, please **fill in the enclosed questionnaire** and post it back to in the pre-paid envelope provided by **Friday 19th May**.

Alternatively, you can complete the survey online using the details below:

Go to this website: **www.energysurvey2017.com**

Enter your username: **<123456>**

Enter your passcode: **<abcdef>**

Any adult in your household can take part, as long as they are jointly or solely responsible for household bills. It should take no more than 20 minutes to complete.

This study is being carried out by Kantar Public, an independent research company, on behalf of the Department for Business, Energy and Industrial Strategy (BEIS). All research is carried out in line with the Market Research Society Code of Conduct and your answers will be completely confidential. If you have any questions, accessibility requirements, or difficulties completing the survey please contact Kantar Public using the details below. You can ask also ask a friend, family member or carer to help you.

On behalf of BEIS, I would like to thank you in advance for your help with this important research.

Yours sincerely,

Deputy Director, Heat and Business Energy Directorate
BEIS

If you need to talk to us about the study, contact Kantar Public between 9am-5pm on Monday to Friday.

KANTAR PUBLIC

Department for Business, Energy & Industrial Strategy

Why did we choose your address?

Why did we choose your address?
As it is not possible to ask everyone to take part in the survey, we select a sample of addresses to represent the entire country. Your address was selected at random from a list of private addresses held by the Royal Mail.

Why are my views important?
We need people from all age groups and backgrounds to take part. Your views are important to us as without them we may not have a representative picture of people's energy needs.

Who is conducting the survey?
The survey is being conducted on behalf of the Department for Business, Energy and Industrial Strategy (BEIS) by Kantar Public, an independent research agency. BEIS is the government department responsible for ensuring the country has secure energy supplies that are reliable, affordable and clean.

Is this survey confidential?
Yes. The information that is collected will be used only for research purposes. Your name and address details are kept separate from your answers and will not be passed on to any other organisation without your permission.
No individual or household will be identifiable from the results unless they give their permission to do so. Your answers will be combined with others that take part in the survey.

You will not receive any 'junk mail' as a result of taking part.

How do I know that this is a genuine survey?
The Department for Business, Energy and Industrial Strategy (BEIS) has commissioned Kantar Public to carry out this survey on their behalf.

Kantar Public is an independent research organisation and is a full member of the Market Research Society. We have a strong track record of conducting high quality research

You can rest assured that your responses will be treated in strictest confidence. Kantar Public will not provide BEIS with the names of anyone that takes part without their permission; Kantar Public are bound by the Market Research Society Code of Conduct to keep your answers and personal data confidential. Your contact details will be held securely at all times.

What do you need to do?
If you are happy to take part all you need to do is complete the questionnaire and return it to us in the envelope provided.

What does it mean to be "jointly or solely responsible for household bills"?
To take part you must be at least partly involved in decisions about how you pay for and manage household bills, for example energy and water bills.

The Resident(s)
<ADDRESS_LINE_1>
<ADDRESS_LINE_2>
<ADDRESS_LINE_3>
<ADDRESS_LINE_4>
<POSTCODE>

Department for Business,
Energy and Industrial Strategy
1 Victoria Street
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Date: <XX> April 2017
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On behalf of BEIS, I would like to thank you in advance for your help with this important research.

Yours sincerely,

THE ENERGY USE SURVEY

Deputy Director, Heat and Business Energy Directorate
BEIS

If you need to talk to us about the study, contact Kantar Public between 9am-5pm on Monday to Friday.

THE ENERGY USE SURVEY

HM Government

Dear Resident(s),

We recently invited you to take part in the **Energy Use Survey,** an official Government study to understand your experience of using and paying for energy at home.

If you haven't yet completed the survey, we would be grateful if you could respond by **Friday 19th May**. Please complete and return the paper questionnaire we have already posted to you. You will receive a new questionnaire in the post in two weeks' time, please look out for it.

Alternatively, access the survey online using the details below.

Go to this website: www.energysurvey2017.com
Enter your username: [sample]
Enter your password: [sample]

The survey should take only 20 minutes and as a thank you for your time, we will send you a **£10 voucher**. If you have already completed the survey please accept our sincerest thanks.

If you would like to talk to someone about the study, you can contact Kantar Public on XXXX or xxxxx@kantarpublic.com

mailto:

Thank you in advance for your participation.

Yours sincerely,

Deputy Director

The Resident(s)
Address 1
Address 2
Address 3
Address 4
Postcode

Department for Business, Energy & Industrial Strategy

KANTAR PUBLIC

This publication available from www.gov.uk/beis

Contact us if you have any enquiries about this publication, including requests for alternative formats, at:

Department for Business, Energy and Industrial Strategy
1 Victoria Street
London SW1H 0ET
Tel: 020 7215 5000

Email: enquiries@beis.gov.uk