



Department for
Energy Security
& Net Zero

Consumer research to inform the exchange of smart metering communications hubs – Appendix



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Appendix A: Interviews and focus groups additional information

A1. Table summarising sample

Table 1. Breakdown of focus group participants by demographics

Focus group participants (Total N=40) (Focus groups N=6)		
Characteristic of interest		
Social renters x1 group		
Private renters x1 group		
Homeowners x2 groups		
Pay energy bills via pre-payment meters x2 groups		
Demographic variable	Demographic sub-group	No.
Gender	Male	22
	Female	18
Age	18-34	10
	35-44	12
	45-64	15
	65+	3
Region	East Midlands	5
	West Midlands	5
	East of England	3
	London	11
	South East	12

	South West	3
	Wales	1
Ethnicity	White	26
	Other	14
SEG	AB	8
	C1C2DE	32
Experienced issues with smart meter	Yes	24
	No	16

Table 2. Breakdown of in-depth interview participants by demographics

In-depth interviews (Total N=10)		
Characteristic of interest		
Digitally excluded x2		
Physical impairment that requires warm home environment x2		
Mental health condition x2		
Neurodivergent condition (e.g. dyslexia) x2		
Low basic literacy (fewer than 5 GCSEs) x2		
Demographic variable	Demographic sub-group	No.
Gender	Male	5
	Female	5
Age	18-34	2
	35-44	2
	45-64	6

	65+	0
Region	East Midlands	2
	West Midlands	0
	East of England	1
	London	0
	South East	6
	South West	1
	Wales	0
Ethnicity	White	8
	Other	2
Experienced issues with smart meter	Yes	6
	No	4

A2. Topic guide

Introduction

(5/10 mins)

To introduce the research, set the tone of the session, provide clarity on what is expected of the participant and start to build rapport

Introduce the session

- Introduce moderator and Verian
- Research is being conducted on behalf of DESNZ to explore how people feel about their smart meters in relation to a particular scenario we will discuss in detail later. Findings from the research will be used to develop future communications about smart meters.
- Group session will be 90 minutes / interviews will be 60 minutes.
- Research is voluntary – they are free to pause or end at any time.
- **GROUPS - Confidential and anonymous – no personal details will appear in public domain reporting, but may be shared with the client**
- IDIS - Confidential and anonymous – no personal details will be shared with client or as part of the reporting.
- Introduce stakeholder observing (if relevant)
- Any questions?

Recording

- Ask participant for permission to record, then start recording and confirm consent [Note: Verian will ensure that recordings of groups or depth interview responses are only conducted with consent and only used for the purposes for which the consent was given]

Participant introduction

- Name, living situation, where their smart meter is where they live (inside/outside) and their in-home display
- Moderator to clarify the difference, as relevant using information below
 - In-home display: A digital display or monitor which displays how much energy you are using in pounds and pence and kWh. The in-home display is separate to your smart meter.
 - Smart meter: The meter which measures and records how much electricity or gas you are using and sends your meter readings to your energy supplier. The meter may be inside or outside your property.
- Whether it is a pre-payment meter or not (for depths only)

Experiences of smart meters (10/15 mins)

Feelings about and experiences of smart meters – to understand the range in the group and understand the context for the later discussion

Experience of installation

- Whether they recall their smart meter installation, or not.
 - If they do:
 - What they recall about the installation – booking it, what happened on the day. What their experience of the installation was like (positive / negative).
 - Prompts to organise the installation.
 - If they do not (assuming the installation was done by someone else):
 - How did they end up with a smart meter?
 - Reasons they did not organise a smart meter installation?

Current attitudes and behaviours around their smart meter

- How do they feel about their smart meter? Positive / negatives.
- How do they use their smart meter? How interested are they in it?
- How has it made a difference to them? Moderator to understand its benefits...
 - **Probe all:** consider energy use, spend on energy, change in behaviour.
 - **Probe bill payment by payment mode:**
 - Credit customers: No longer need to submit energy readings, bills automatically generated, bill accuracy
 - Pre-pay customers: How they top-up, when they top-up
 - **Moderator note:** Listen for spontaneous discussion of benefits and behaviour change as a result of having a smart meter, then probe to explore strength of feeling towards personal benefits
- If they have an in-home display or apps that provide information on energy consumption, do they ever look at them? If so, what prompts this?
- Can they remember their perceptions of smart meters when they first had one? What were they? Has this changed over time?
- How do they expect their use of their smart meter to change in future, if at all?

Identifying issues with smart meters

- Have they ever had any issues with their smart meter? What are these?

- **Probe:** which part have they had issues with - smart meter, in-home display,
- Have the issues been resolved or are they ongoing?
 - Did they contact their supplier about this? If yes – how did they find this experience?

Introducing the concept of the Comms Hub replacement (10/15 mins)

To understand their comprehension of and feelings about the comms hub replacement.

Spontaneous understanding of changes smart meter

- Do they expect any changes to their smart meter to be needed in future?
 - **Moderator note:** Any awareness of how often smart meters need to be maintained or upgraded.
- How would they feel if changes were needed?
 - Initial reactions
 - Ideas of what this might be for
 - Perceived concerns / potential benefits

Testing 'essential' messaging

MODERATOR TO EXPLAIN WE ARE NOW GOING TO LOOK AT SOME SIMPLE STATEMENTS ABOUT FUTURE SMART METERS AND TO GET THEIR REACTION TO THESE. MODERATOR TO SHOW **SLIDES A1 AND A2** ONE BY ONE, READING OUT THE CONTENT AND ROTATING THE ORDER EACH IS SHOWN ACROSS THE FIELDWORK. REPEAT THE FOLLOWING PROBES FOR EACH:

- Initial thoughts
- What do they think it means.
 - If mentioned 'Comms hub': probe to understand what level of detail people would want about what this is.
- Whether they have any concerns / can see any potential benefits of this – for them or more broadly.
- Once they have seen all messages – which is their preferred and why. Moderator to understand differences 'replacement' vs. 'upgrade' makes on interpretation and preference.

MODERATOR TO EXPLAIN THAT WE WILL NOW SHOW THEM A SLIDE TO EXPLAIN MORE ABOUT THE FUTURE OF SMART METERS. MODERATOR TO SHOW **SLIDE B1** AND READ OUT. IF NEEDED, MODERATOR TO SHOW **SLIDE B2** TO AT A RELEVANT POINT IN THE DISCUSSION, AFTER GATHERING INITIAL REACTIONS TO B1.

- Initial thoughts
- How this compares to messages previously seen?
 - **Probe:** whether it is new, helpful, interesting, surprising?
 - What was not in previous messages shown that they would want to know?
- Would this be something they would want and why? **Probe:** benefits and concerns
- What other information would they need / what questions would they have?
- How they feel about language used? **Probe:** 2G/3G/4G communications, 'Comms Hub'.
- Understand views on the image and importance of it
- If they were to explain this to a friend who did not know about it, what would they say? **Moderator to take stimulus off the screen.**

The Comms Hub replacement visit (10/15 mins)

Explore what information is needed from whom to support agreement to an replacement visit

Expectations around how the Comms Hub replacement would happen

- What do they expect getting a replacement Comms Hub to involve?
 - How they expect the replacement to happen? **Probe:** remotely/in-person
 - How long do they think a Comms Hub replacement to take?
 - Who might they expect to hear from about the replacement from?
 - Who would they trust or want to hear from and why? **Probe:** context reasons for the replacement vs. practicalities of the replacement
- Do they think they will need to do anything to get a Comms Hub replacement visit? What do they think they will need to do?

Reactions to the replacement visit

MODERATOR TO EXPLAIN THAT WE WILL NOW SHOW THEM A SLIDE WHICH EXPLAINS MORE ABOUT WHAT NEEDS TO HAPPEN. MODERATOR TO SHOW **SLIDE C1** AND READ OUT.

- Initial responses
- Whether they would accept the replacement visit and reasons for this.

- **Probe:** would they proactively contact their energy supplier to request a visit
- **Probe:** reaction to time it would take
- What information would consumers want to be told before agreeing to a replacement visit?
 - **Probe:** what would motivate you to get your comms hub replacement.
- Who do they want to hear from and how they want to receive this information?
- How quickly are they likely to act after being told about the replacement and reasons for this
 - **Probe:** what would this depend on?
- Moderator to explain potential scenario - if the smart meter and comms hub was outside the property – they would be contacted by their energy supplier in advance and would have to give consent for the energy supplier to carry out the replacement while they aren't at home. Moderator to understand:
 - How do they feel about this.
 - Whether this adds any additional concerns or benefits.
 - What would they want to know specifically in this scenario.

Understanding the timings

MODERATOR TO EXPLAIN THAT WE WILL NOW SHOW THEM A SLIDE WHICH EXPLAINS MORE ABOUT WHEN THIS MIGHT HAPPEN. MODERATOR TO SHOW **SLIDE C2** AND READ OUT.

- Initial reactions
- How this impacts their motivations to get a replacement visit. **Probe** concerns.
- What might help continue to motivate them to accept a visit
- Based on current understanding, whether they expect a replacement to be a requirement or not – how they feel about that and why
 - **Moderator note:** Try to get a sense of “openness” to comms hub replacements if they were to be made mandatory

Enhanced replacement messaging (20/30 mins)

To understand which framings and messages are likely to be most and least effective in encouraging consumers to accept their comms hub replacement visit

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- Based on current understanding and discussion so far - gather spontaneous thoughts about the main motivations to organising/accepting the replacement visit.
 - And factors that might prevent them from a replacement visit
 - **Probe:**
 - Perceived benefits / costs and concerns
 - Environmental – sustainability, reduced energy consumption/waste, cleaner energy use, reduce carbon emissions
 - Personal – money/savings, hassle, timings, control of budgeting
 - Societal – understand energy use locally/of UK
 - Technical – modernisation
- What else is important to know? What information would help better provide benefits or overcome concerns?

Testing further benefit messages

MODERATOR TO EXPLAIN WE ARE NOW GOING TO LOOK AT SOME SIMPLE STATEMENTS ABOUT THE BENEFITS OF GETTING A COMMS HUB REPLACEMENT TO GET THEIR REACTIONS TO THESE.

Moderator to show messaging (rotating as per the rotation table at the start of the guide)

D. SYSTEM UPGRADE

E. PERSONAL BENEFITS

F. ENERGY SECURITY

G. NET ZERO

Collect spontaneous response: What do they think? and then ask...

- How do they feel about this statement in general? Likes/dislikes
- Would this motivate them to get a replacement comms hub? Reasons.
- How do they interpret it - how would they summarise what it is saying?
- Any terms in the messages they aren't sure about?
- Do they believe what the statement says? Why, why not?

At the end of each 'group' of statements ask...

- Which rationale do you find the most convincing – which would encourage you to agree to a replacement visit – which ones wouldn't
- How would they improve the messages

MODERATOR MOVE TO NEXT GROUP OF STATEMENTS UNTIL ALL COMPLETED

After showing all the statements ask (showing stimulus **H** on the screen)...

- Which statements really stood out for you the most? Why?
- What statement would convince them to book a replacement visit? And why?
 - Which others are convincing and why?
- Is there anything missing that would motivate them to book a replacement visit?

Summary

(5 mins)

Capture final thoughts and bring the session to a close

Summarise overall acceptance of a replacement visit

- If they were to explain this to a friend who did not know about it, what would they say? Moderator to understand and probe around language used – e.g., replacement, upgrade, maintenance.
- How do they feel about the idea of the comms hub replacement needed overall?
- What are the main reasons they would accept a replacement visit?
- What would be main factors that might stop them and how might these be overcome?
- If they were in charge of the comms hub replacements, what would they do? **Probe:** What would they tell people to encourage uptake? Who would tell people? What would be main factors to reassure them on?
- What, if anything, does the government need to work out/decide before having these discussions?
- Anything else we have not discussed which you think is relevant?


Incentive

- Give details of how incentive is accessed

Thank and close

A3. Stimulus slides

A1

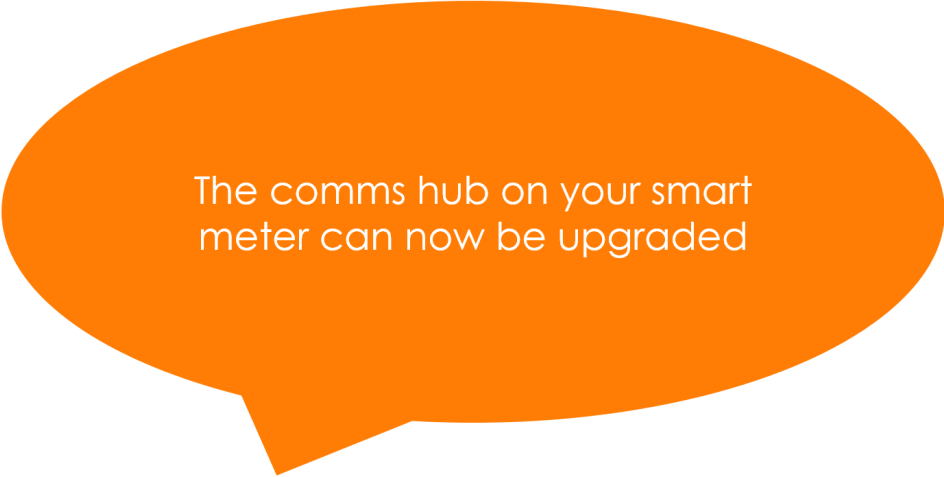


The comms hub on your smart meter needs to be replaced

Smart meters

Confidential | 1

A2



The comms hub on your smart meter can now be upgraded

Smart meters

Confidential | 2

Understanding future changes for smart meters

B1

Why are changes needed?

2G and 3G communications technology is being switched off by mobile operators to support the roll-out of newer 4G and 5G mobile networks, which will offer faster and more reliable services for customers. All technologies will therefore need to be compatible with 4G communications.

How does this impact my smart meter?

Your 'Comms Hub', a part of your smart meter, which uses this technology, will need to be replaced (example image on right). This is because it currently is only compatible with 2G and 3G communications.

What is the 'Comms Hub'?

This is the part of your smart metering equipment that allows your smart meter to communicate with your in-home display and your energy supplier, enabling meter readings to be sent to them automatically. This therefore needs to be replaced with one that is compatible with 4G communications.



Comms Hub

Electricity Smart Meter

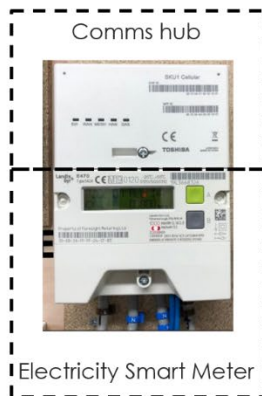
Smart Metering System

Smart meters

Confidential | 3

Understanding your smart metering system and technology

B2



Comms hub

Electricity Smart Meter



Gas Smart Meter



In-home display



Apps

Verian | Smart meters

Confidential | 4

When is the switchover happening and what is required

C1

What will happen before the visit?

- You will be contacted about replacing your Comms Hub.

What will happen on the day of the visit?

- An engineer will visit your premises at an agreed or notified time to replace your Comms Hub.
- Your power should not need to be switched off in that time.
- Your meter will still be recording your energy usage correctly and your bills will remain accurate. Your smart meter's in-home-display will continue to work (though it will temporarily lose its connection).

How long will the replacement take?

- The switchover should take no more than one hour [and will be quicker if you have only an electricity meter].

Smart meters

Confidential | 5

When is the switchover happening

C2


2G and 3G networks are being switched off at the latest by the end of 2033.

However, to ensure that all replacements can be completed in advance, replacements are expected to start in the second half of 2025.

Smart meters

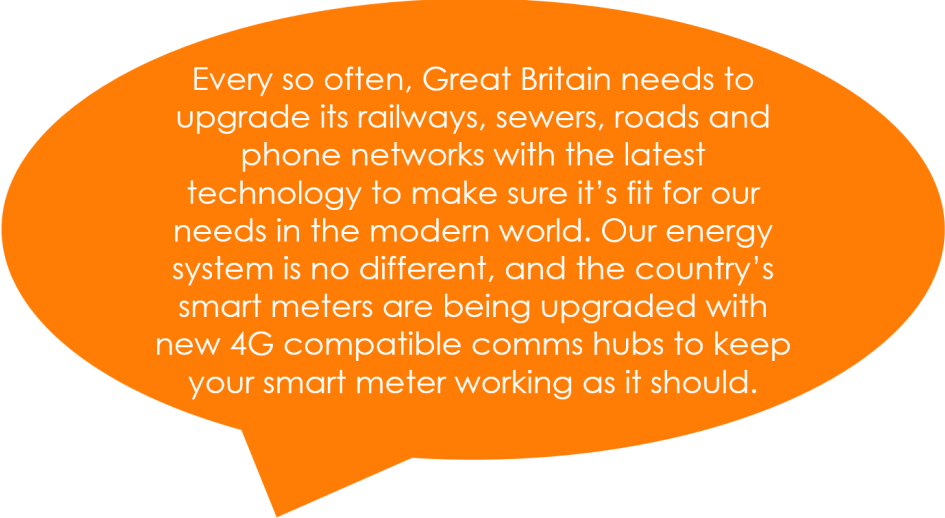
Confidential | 6

D1



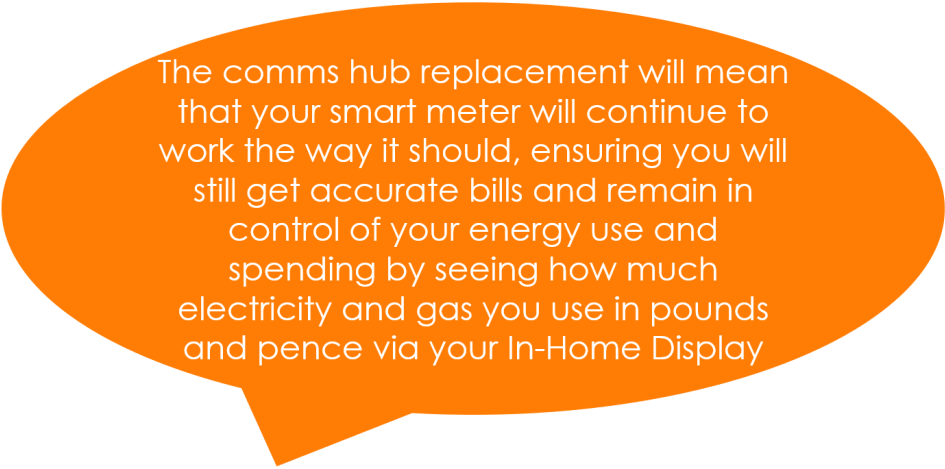
Comms hubs need to be replaced across Great Britain to support an essential national upgrade to our energy system.

D2



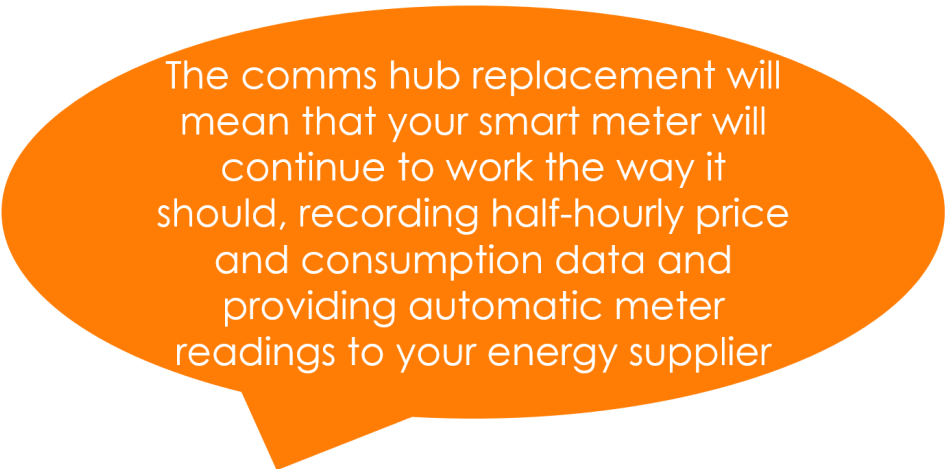
Every so often, Great Britain needs to upgrade its railways, sewers, roads and phone networks with the latest technology to make sure it's fit for our needs in the modern world. Our energy system is no different, and the country's smart meters are being upgraded with new 4G compatible comms hubs to keep your smart meter working as it should.

E1



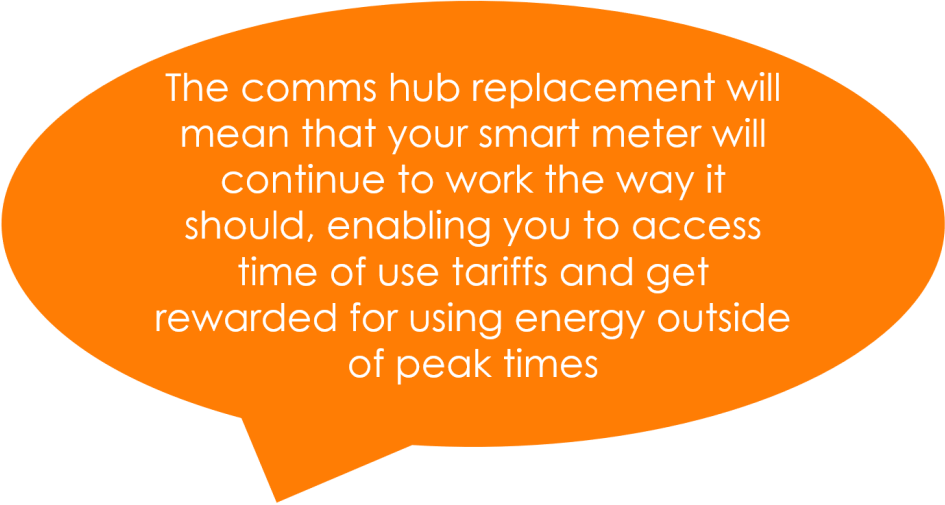
The comms hub replacement will mean that your smart meter will continue to work the way it should, ensuring you will still get accurate bills and remain in control of your energy use and spending by seeing how much electricity and gas you use in pounds and pence via your In-Home Display

E2



The comms hub replacement will mean that your smart meter will continue to work the way it should, recording half-hourly price and consumption data and providing automatic meter readings to your energy supplier

E3



The comms hub replacement will mean that your smart meter will continue to work the way it should, enabling you to access time of use tariffs and get rewarded for using energy outside of peak times

E4



The comms hub replacement will mean your smart meter will continue to work the way it should, allowing you to top up your meter online

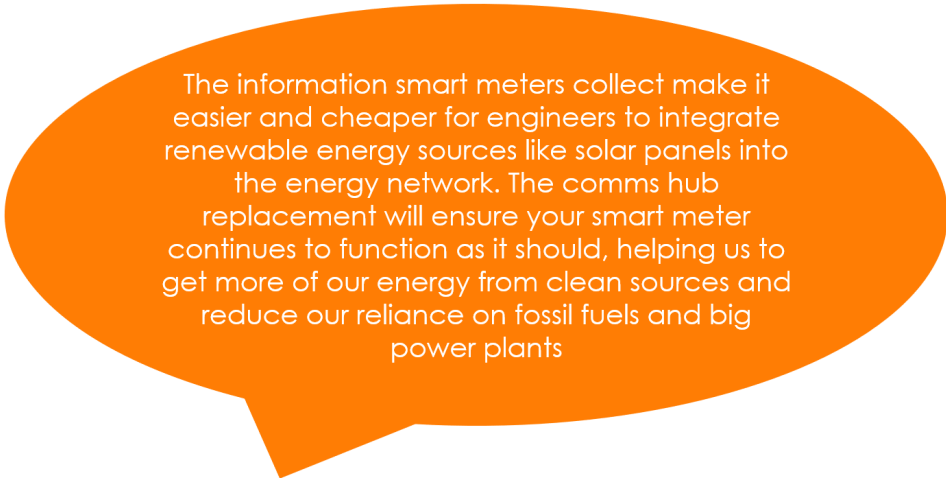
(E4 shown only to pre-payment users)

F



The comms hub replacement will continue to allow energy to be distributed more efficiently and make Great Britain less reliant on imported energy.

G



The information smart meters collect make it easier and cheaper for engineers to integrate renewable energy sources like solar panels into the energy network. The comms hub replacement will ensure your smart meter continues to function as it should, helping us to get more of our energy from clean sources and reduce our reliance on fossil fuels and big power plants

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Benefit	#	Statements
System upgrade	D1	Comms hubs need to be replaced across Great Britain to support an essential national upgrade to our energy system.
	D2	Every so often, Great Britain needs to upgrade its railways, sewers, roads and phone networks with the latest technology to make sure it's fit for our needs in the modern world. Our energy system is no different, and the country's smart meters are being upgraded with new 4G compatible comms hubs to keep your smart meter working as it should.
Accurate bills/energy usage awareness	E1	The comms hub replacement will mean that your smart meter will continue to work the way it should, ensuring you will still get accurate bills and remain in control of your energy use and spending by seeing how much electricity and gas you use in pounds and pence via your In-Home Display
Automatic meter readings	E2	The comms hub replacement will mean that your smart meter will continue to work the way it should, recording half-hourly price and consumption data and providing automatic meter readings to your energy supplier
Benefits of time of use tariffs	E3	The comms hub replacement will mean that your smart meter will continue to work the way it should, enabling you to access time of use tariffs and get rewarded for using energy outside of peak times
Top up online	E4	The comms hub replacement will mean your smart meter will continue to work the way it should, allowing you to top up your meter online
Energy security	F	The comms hub replacement will continue to allow energy to be distributed more efficiently and make Great Britain less reliant on imported energy.
Net zero	G	The information smart meters collect make it easier and cheaper for engineers to integrate renewable energy sources like solar panels into the energy network. The comms hub replacement will ensure your smart meter continues to function as it should, helping us to get more of our energy from clean sources and reduce our reliance on fossil fuels and big power plants.

Appendix B: Experiment and survey additional information

B1. Sample size calculations, demographic quotas, achieved sample, weighted sample

Sample size calculations

We carried out power calculations to inform the number of messages to be tested in this phase. We used the function “pwr.t.test” in the “pwr” module in R statistical software to determine the minimum effect size (MDES) we would be conventionally powered to detect depending on the number of messages tested. Our power calculations assume the following:

- A fixed sample size of 1,000 participants
- That the primary outcome is a continuous measure suitable for parametric analysis

The results are shown in the table below. Minimum detectable effect sizes are shown as “Cohen’s d”, a number between 0 and 1. For a communications intervention, we would usually expect a “small” effect size, which conventionally means d is between 0.2 and 0.5. In an ideal world, we would aim to design a trial to detect the smallest possible meaningful effect size (0.2). In this case, if you want to detect a small effect of 0.2 across all groups, you would be limited to two groups (one message).

Table 3. Minimum detectable effect size (d) by number of groups, with and without Bonferroni adjustments

Number of groups	Minimal detectable effect size (d)	
	No adjustments	Bonferroni adjustments
6	0.31	0.42
5	0.28	0.37
4	0.25	0.31
3	0.22	0.25
2	0.18	0.18

The two columns showing MDES reveal the effect of adjusting for multiple comparisons on power at each number of groups. There is no difference for two groups because we would only carry out a single pairwise comparison. Since our experimental analysis involved four groups, our minimum detectable effect size (d) was 0.25 without the Bonferroni adjustment, and 0.31 with the Bonferroni adjustment.

Sampling and weighting

The target population for this work are consumers who are responsible for their energy bills and who currently have SMETS2 smart meters that use 2G/3G. To date, there are no reliable population estimates for this group, so we applied a three-stage process to arrive at a sample likely to approximately resemble the target population on key characteristics.

First, we applied eligibility criteria to exclude anyone who: did not have a smart meter, had a smart meter that pre-dated the eligible SMETS2 models (pre-2017), who lived outside the regions where most SMETS2 meters that use 2G/3G were installed, or who were not responsible for paying the energy bills in their household.

Second, we applied general population recruitment quotas on age group within gender and tenure, within the target regions. We drew the quota targets for age group within gender from the 2022 ONS Mid-Year estimates and tenure from the 2021 Census results. For the full list of quota targets, see Table 4.¹

Finally, we carried out post-fieldwork calibration weighting to adjust the achieved sample to match 2021 English Housing Survey estimates for smart meter owners, provided by DESNZ. We agreed to restrict the number of weighting targets to minimise the loss of power associated with reducing our effective sample size. The final list of weighting targets is shown in Table 5.

¹ We did not set a quota for participants aged 65 or older, but we did not screen them out. Participants aged 65 or above were recruited and assigned to one of the other age band quotas at random.

Table 4. Demographic quotas used to recruit participants in the online survey experiment

Demographic variable	Demographic sub-group	%
Age x gender	Male x 18-24	7%
	Male x 25-34	11%
	Male x 35-44	11%
	Male x 45-54	10%
	Male x 55-64	10%
	Total male	49%
	Female x 18-24	7%
	Female x 25-34	11%
	Female x 35-44	11%
	Female x 45-54	11%
	Female x 55-64	11%
	Total female	51%
	Tenure	
	Owens outright or owns with a mortgage or loan	62%
	Other	38%

Table 5. Achieved unweighted and weighted sample and weighting targets by demographic variables for the online survey experiment

Demographic variable	Demographic sub-group	Achieved (unweighted) %	Weighted sample %	Weighting target %
Age x gender	Male x 18-34	17.62%	12.03%	12.00%
	Male x 35-44	11.29%	14.11%	14.10%
	Male x 45-64	19.70%	31.71%	31.70%
	Female x 18-34	17.33%	10.67%	10.70%
	Female x 35-44	11.98%	9.99%	10.00%
	Female x 45-64	22.08%	21.49%	21.50%
Tenure	Owns outright or owns with a mortgage or loan	64.06%	66.83%	66.80%
	Other	35.94%	33.17%	33.20%
Ethnicity	White	77.72%	90.60%	90.60%
	Other	22.28%	9.40%	9.40%
Electricity payment method	Direct debit / pay on receipt	85.54%	86.61%	86.60%
	Prepayment / other	14.46%	13.39%	13.40%

B2. Questionnaire

ASK ALL

SINGLE CODE

Thank you for your interest in this study. Please read the information below before deciding whether to take part.

About this study

In this study, we will ask about your views on smart meters. It will take around 15 minutes to complete. Please take the time you need to complete this study at your own speed. Taking part in this study is voluntary. You can withdraw at any point before submitting your answers by closing this window, and you do not have to give a reason for doing so. The survey is being conducted on behalf of the Department for Energy Security and Net Zero (DESNZ) by Verian.

Questions about sensitive information will be asked such as age, gender, ethnicity, homeownership, education, income, employment status, and health condition. You do not need to provide an answer to these questions.

What will happen with my data?

Verian is an independent social research company. All data collected in this study will be kept confidential in line with our privacy policy, and there is no way to link your identity with your answers. All data collected will be used for research purposes only. For more information, see [our privacy policy here](#) [LINK1]. DESNZ will only be provided with anonymised data so will not be able to identify anyone who has taken part.

If you do not wish to proceed, please opt out below.

Are you happy to continue?

- 1 Yes, I am happy to proceed with the study
- 2 No, I do not want to take part [SCREEN OUT]

ASK ALL

SINGLE CODE

Are you solely or jointly responsible for the gas and/or electricity bills in your household?

- 1 Yes, I am fully responsible for paying them
- 2 Yes, I share responsibility for paying them with another member of my household
- 3 Yes, I share responsibility for paying them with someone who is not a member of my household
- 4 No [SCREEN OUT]
- 5 My landlord arranges or pays the energy bills [SCREEN OUT]

ASK ALL

SINGLE CODE

Does your home currently have a gas and/or electricity smart meter?

By smart meter we are referring to a type of gas and/or electricity meter that usually comes with a monitor or screen (digital in-home display), providing you with information about the energy you have used, and automatically sends meter readings to your energy supplier. Those who pre-pay for energy can top-up via their mobile or online.

- 1 Yes
- 2 No [SCREEN OUT]

ASK ALL

SINGLE CODE

You said that your home currently has a gas and/or electricity smart meter.

At the time your smart meter was fitted, did you live in your current home?

- 1 Yes
- 2 No, the smart meter was here when I moved in

ASK ALL

SINGLE CODE

Do you know approximately when your smart meter was installed?

- 1 After 2017 (6 years ago or more recently)
- 2 2017 or before (earlier than 6 years ago) [SCREEN OUT]
- 3 Don't know/not sure [SCREEN OUT]

ASK ALL

SINGLE CODE, WITH OPEN TEXT BOX IF YES

With your consent we would like to collect your postcode to assign regional geographic area to your responses. Once this has been completed, we will destroy the information.

All answers will be treated entirely anonymously and postcode information will not be used for any other purpose. Your answer will not be shared with the Department for Energy Security and Net Zero.

Would you agree to share your postcode with us for that purpose?

- 1 Yes, I agree to share the postcode [OPEN TEXT BOX TO ENTER POST CODE IF YES]
- 2 No, I do not agree

ASK ALL

SINGLE CODE

Where do you live?

- 1 England
- 2 Scotland [SCREEN OUT]
- 3 Wales
- 4 Northern Ireland [SCREEN OUT]

ASK IF REGION1= 1 "England"

SINGLE CODE

Where in England do you live?

- 1 North East [SCREEN OUT]
- 2 North West [SCREEN OUT]
- 3 Yorkshire and the Humber [SCREEN OUT]
- 4 East Midlands
- 5 West Midlands
- 6 East of England

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- 7 Greater London
- 8 South East
- 9 South West

ASK ALL

NUMERIC INPUT

What is your age?

- 1 NUMERIC RESPONSE
- 98 Prefer not to say

ASK IF AGE = 98 "Prefer not to say"

SINGLE CODE

Can you tell us which band your age falls within?

- 1 Under 18 [SCREEN OUT]
- 2 18 to 24
- 3 25 to 34
- 4 35 to 44
- 5 45 to 54
- 6 55 to 64
- 7 65+
- 98 Prefer not to say

ASK ALL

SINGLE CODE

Would you describe yourself as...

- 1 Male
- 2 Female
- 3 Prefer to describe myself in another way

98 Prefer not to say

ASK ALL

SINGLE CODE

Does your household own or rent your accommodation?

- 1 Owns outright
- 2 Owns with a mortgage or loan
- 3 Part-owns and part rents (shared ownership)
- 4 Rents (with or without housing benefit)
- 5 Lives here rent-free

ASK IF TENURE = 3 “Part-owns and part rents (shared ownership)” or 4 “Rents (with or without housing benefit)” or 5 “Lives here rent-free”

SINGLE CODE

Who is your landlord?

- 1 Housing association, housing co-operative, charitable trust, registered social landlord
- 2 Council or local authority
- 3 Private landlord or letting agency
- 4 Employer of a household member
- 5 Relative or friend of a household member
- 6 Other

SHOW TO ALL

TEXT

In this next section, we will ask you some questions about your gas/electricity smart meter. Please read the information on the next page carefully, as we will ask you about it later.

Control group:

dv_group = 1 “control”

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dv_msg = “The ‘Communications Hub’ on your smart meter will need to be exchanged to keep your smart meter working as it should.”

Group 2:

dv_group = 2 “start date”

dv_msg = “From 2025, the ‘Communications Hub’ on your smart meter will need to be exchanged to keep your smart meter working as it should.”

Group 3:

dv_group = 3 “end date”

dv_msg = “Before 2033, the ‘Communications Hub’ on your smart meter will need to be exchanged to keep your smart meter working as it should.”

Group 4:

dv_group = 4 “mandatory”

dv_msg = “Everyone with a smart meter must agree to a ‘Communications Hub’ exchange when your energy company contacts you to arrange it. This will happen between 2025 and 2033. This is needed to keep your smart meter working as it should.”

SHOW TO ALL

TEXT (NO INPUT)

[dv_msg]

In preparation for 2G and 3G communications technology being switched off by mobile operators the ‘Communications Hub’ will need to be exchanged with one that can use the 4G network. The ‘Communications Hub’ is the part of your smart meter that uses this technology to communicate with your in-home display and your energy company.

Your energy company will contact you directly to agree an appointment for this. The appointment should take no more than an hour, will be provided at no additional charge, and your power should not need to be switched off. Your energy company will let you know what to expect and if there’s anything else you need to do in preparation.

ASK ALL

SINGLE CODE

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Now imagine that your energy supplier starts offering appointments for Communications Hub exchanges tomorrow.

How likely or unlikely would you be to **contact your energy supplier within the next 6 months** to request a Communications Hub exchange for your smart meter?

Please answer on a scale of 1 to 7, where 1 is 'Extremely likely and 7 is 'Extremely unlikely.

- | | |
|---|---------------------------------|
| 1 | 1 - Extremely likely |
| 2 | 2 |
| 3 | 3 |
| 4 | 4 - Neither likely nor unlikely |
| 5 | 5 |
| 6 | 6 |
| 7 | 7 - Extremely unlikely |

ASK ALL

SINGLE CODE

If you were **offered a Communications Hub exchange for your smart meter by your energy supplier within the next six months**, how likely or unlikely would you be to accept it?

Please answer on a scale of 1 to 7, where 1 is 'Extremely likely and 7 is 'Extremely unlikely.

- | | |
|---|---------------------------------|
| 1 | 1 - Extremely likely |
| 2 | 2 |
| 3 | 3 |
| 4 | 4 - Neither likely nor unlikely |
| 5 | 5 |
| 6 | 6 |
| 7 | 7 - Extremely unlikely |

ASK IF ACCEPT7 = 4, 5, 6, 7

SINGLE CODE

You said you may not be likely to accept a Communications Hub exchange offered by your energy supplier within the next six months. Why?

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- 1 Within the next six months is too soon but I may want an appointment later
- 2 I don't want a Communications Hub exchange for my smart meter at any time
- 3 Another reason [Please specify] *OPEN RESPONSE*

ASK IF NOACCEPT1 = 1

SINGLE CODE

If you were **offered a Communications Hub exchange for your smart meter by your energy supplier within the next two years**, how likely or unlikely would you be to accept it?

Please answer on a scale of 1 to 7, where 1 is 'Extremely likely and 7 is 'Extremely unlikely.

- 1 1 - Extremely likely
- 2 2
- 3 3
- 4 4 - Neither likely nor unlikely
- 5 5
- 6 6
- 7 7 - Extremely unlikely
- 8 Not sure

ASK IF NOACCEPT1 = 2

MULTICODE

Why do you not want a Communications Hub exchange for your smart meter?

Please select all that apply.

- 1 I am worried the new Communications Hub will not work properly
- 2 I am worried about losing access to gas or electricity **during** the exchange appointment
- 3 I am worried about losing access to gas or electricity **after** the exchange appointment
- 4 I do not mind if my meter stops working in smart mode
- 5 I don't understand why I need a new Communications Hub

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- 6 I am worried the exchange appointment will be inconvenient
- 7 I do not want an engineer to come to my home
- 8 I will move homes soon so it is not worthwhile
- 9 I am worried that the Communications Hub exchange will cost me money
- 10 I am worried that getting a new Communications Hub exchange will increase the amount I pay for my electricity and/or gas
- 11 I am worried that the exchange appointment will take too long
- 12 Another reason

SHOW TO ALL

TEXT (NO INPUT)

Now, some questions about what you think will happen when energy suppliers start exchanging Communications Hubs. Please re-read the information we showed you earlier before you answer.

SHOW TO ALL

TEXT (NO INPUT)

[dv_msg]

In preparation for 2G and 3G communications technology being switched off by mobile operators the 'Communications Hub' will need to be exchanged with one that can use the 4G network. The 'Communications Hub' is the part of your smart meter that uses this technology to communicate with your in-home display and your energy company.

Your energy company will contact you directly to agree an appointment for this. The appointment should take no more than an hour, will be provided at no additional charge, and your power should not need to be switched off. Your energy company will let you know what to expect and if there's anything else you need to do in preparation.

ASK ALL

SINGLE CODE

Based on the information you just read, do you feel you have a good understanding of **what the Communications Hub does?**

- 1 Yes
- 2 No

ASK ALL

SINGLE CODE

Based on the information you just read, do you feel you have a good understanding of **why your Communications Hub needs to be replaced?**

1 Yes

2 No

ASK ALL

SINGLE CODE GRID

Thinking about the **new Communications Hubs...**

How true or false do you think the following statements are?

Columns:

1 Definitely true

2 Probably true

3 Not sure

4 Probably false

5 Definitely false

Rows:

1 The new Communications Hubs will work better than my current one does right now

2 I will be better off waiting a few years before getting a new Communications Hub

3 I will be better off getting a new Communications Hub as soon as possible

4 The new Communications Hub will work the same as my current one does right now

5 It will be important to get a new Communications Hub so I can continue to benefit from my smart meter

ASK ALL

SINGLE CODE GRID

Thinking about the Communications Hub **exchange appointment...**

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How true or false do you think the following statement is?

Columns:

- 1 Definitely true
- 2 Probably true
- 3 Not sure
- 4 Probably false
- 5 Definitely false

Rows:

- 1 Households will pay an additional charge for their Communications Hub exchange appointment
- 2 During my Communications Hub exchange appointment my home will briefly lose power
- 3 An engineer will need to visit my home to complete the Communications Hub exchange
- 4 Everyone with a smart meter must agree to a 'Communications Hub' exchange

ASK ALL

SINGLE CODE

Is either your gas or electricity meter outside of your property?

Your meter(s) will be fixed in place, usually in a cupboard inside or outside your home and will be attached to your gas pipes or main electricity supply.

- 1 Yes, one or both of my meters are outside of my property
- 2 No
- 3 Don't know

ASK ALL

SINGLE CODE

[PIPE]

How happy or unhappy would you be if the communications hub exchange took place while **you were not at home**?

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- 1 Very happy
- 2 Somewhat happy
- 3 Neither happy nor unhappy
- 4 Somewhat unhappy
- 5 Very unhappy

ASK ALL

SINGLE CODE

Which of these, if any, do you think will happen if a household does not exchange their Communications Hub by the time mobile operators switch off 2G and 3G communications technology?

- 1 Their old meter will work but they will need to provide manual readings and their in-home display will stop working
- 2 Their old meter will continue to work as a 'smart' meter and provide automatic readings to their energy supplier
- 3 None of these
- 4 I don't know

ASK ALL

SINGLE CODE

How acceptable or unacceptable would you find the following scenario?

All households with smart meters will be **required** to agree to a Communications Hub exchange between 2025 and 2033.

- 1 Completely acceptable
- 2 Somewhat acceptable
- 3 Neither acceptable nor unacceptable
- 4 Somewhat unacceptable
- 5 Completely unacceptable
- 6 I don't know

SHOW TO ALL

TEXT (NO INPUT)

Now, some questions about what information you would like to receive before agreeing to an appointment to exchange your Communications Hub.

ASK ALL

MULTICODE

Which (if any) of the following would you need to know before accepting an appointment to exchange your Communications Hub?

Please select all that apply.

- 1 How long the exchange visit will take
- 2 Whether my power will need to be switched off during the exchange
- 3 Why the exchange is needed
- 4 What will happen if I do not accept the exchange
- 5 When is the earliest I can get an exchange
- 6 When is the deadline for getting an exchange
- 7 Whether there is an upfront cost for the exchange
- 8 What the engineer will do during the exchange
- 9 Whether I need to be present
- 10 Whether I can choose the time and date of the exchange
- 11 Something else [Please specify] *OPEN RESPONSE*
- 12 None of these *EXCLUSIVE*
- 97 Don't know *EXCLUSIVE*

ASK IF AT LEAST FOUR OF IMPORTANT_1-10 SELECTED

MULTICODE

And which of those are **most** important for you to know before accepting an appointment to exchange your Communications Hub?

Please select **up to 3**.

- 1 How long the exchange visit will take *Show if IMPORTANT_1 = 1*

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- 2 Whether my power will need to be switched off during the exchange
Show if IMPORTANT_2 = 1
- 3 Why the exchange is needed *Show if IMPORTANT_3 = 1*
- 4 What will happen if I do not accept the exchange *Show if IMPORTANT_4 = 1*
- 5 When is the earliest I can get an exchange *Show if IMPORTANT_5 = 1*
- 6 When is the deadline for getting an exchange *Show if IMPORTANT_6 = 1*
- 7 Whether there is an upfront cost for the exchange *Show if IMPORTANT_7 = 1*
- 8 What the engineer will do during the exchange *Show if IMPORTANT_8 = 1*
- 9 Whether I need to be present *Show if IMPORTANT_9 = 1*
- 10 Whether I can choose the time and date of the exchange *Show if IMPORTANT_10 = 1*

ASK ALL

MULTICODE

Who would you want to hear about the Communications Hub exchange from?

Please select all that apply.

- 1 The news (newspaper, TV, radio, online)
- 2 People you know (friends, family, neighbours, colleagues, etc.)
- 3 Other people online (e.g., through social media posts, blogs, forums)
- 4 UK Government
- 5 Politicians/ MPs
- 6 Independent experts (e.g. scientists)
- 7 Your energy supplier
- 8 Smart Energy GB
- 9 Ofgem
- 10 Local Authorities/councils
- 11 Local campaign groups
- 12 Celebrities/ influencers
- 13 Other/ Someone else

97 Don't know *EXCLUSIVE*

ASK IF AT LEAST TWO OF WHO_1-12 SELECTED

SINGLE CODE

Who would you **most** want to hear about the Communications Hub exchange from (i.e., why it needs to happen, who is affected, how to get a Communications Hub exchange)?

Please select **one**.

- 1 The news (newspaper, TV, radio, online) *Show if WHO_1 = 1*
- 2 People you know (friends, family, neighbours, colleagues, etc.) *Show if WHO_2 = 1*
- 3 Other people online (e.g., through social media posts, blogs, forums) *Show if WHO_3 = 1*
- 4 UK Government *Show if WHO_4 = 1*
- 5 Politicians/ MPs *Show if WHO_5 = 1*
- 6 Independent experts (e.g. scientists) *Show if WHO_6 = 1*
- 7 Your energy supplier *Show if WHO_7 = 1*
- 8 Smart Energy GB *Show if WHO_8 = 1*
- 9 Ofgem *Show if WHO_9 = 1*
- 10 Local Authorities/councils *Show if WHO_10 = 1*
- 11 Local campaign groups *Show if WHO_11 = 1*
- 12 Celebrities/ influencers *Show if WHO_12 = 1*

SHOW TO ALL

TEXT (NO INPUT)

Finally, a few questions about you and your circumstances.

All the answers you give will be kept completely confidential and will be used for research purposes only. You do not need to answer any question you do not want to.

ASK ALL

SINGLE CODE

How does your household usually pay for the **electricity** supplied to your home?

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- 1 Direct debit/standing order
- 2 Pay on receipt of bills by cash/cheque/debit or credit card
- 3 Prepayment meter using a key, card or app
- 4 Other
- 5 Don't know

ASK ALL

SINGLE CODE

Have you ever experienced any issues with your smart meter (for example, your in-home display may have stopped working or you may still need to submit meter readings to your energy supplier)?

- 1 Yes
- 2 No
- 98 Prefer not to say

ASK IF ISSUE = 1

SINGLE CODE

You said that you have experienced issues with your smart meter.

Are you still experiencing issues with your smart meter?

- 1 Yes, the issues with my smart meter are still ongoing
- 2 No, the issues have been resolved
- 98 Prefer not to say

ASK ALL

SINGLE CODE, GRID

To what extent are each of these statements true of you?

COLUMN CODE

- 1 Almost always
- 2 Most of the time
- 3 Sometimes

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- 3 Rarely
- 4 Not at all

ROW CODE

- 1 I trust my current energy supplier(s)
- 2 I regularly read communications (e.g. letters, emails, text messages) from my energy supplier
- 3 I understand my energy bills
- 4 My energy bills are accurate
- 5 I use my smart meter to help me manage my energy use
- 6 I regularly check my energy use information through my in-home display/app/online account
- 7 I benefit from having a smart meter installed

ASK ALL

SINGLE CODE

On a scale from 1 to 10, how likely would you be to recommend a gas/electricity smart meter to a friend, colleague or relative?

Where 1 is "Definitely would not" and 10 is "Definitely would".

- 1 1 – Definitely would not
- 2 2
- 3 3
- 4 4
- 5 5
- 6 6
- 7 7
- 8 8
- 9 9
- 10 10 – Definitely would

ASK ALL

MULTICODE

Thinking about where you live right now, which of the following are installed in your home?

Select all that apply.

- 1 Heat pump
- 2 Solar panels
- 3 Neither of the above *EXCLUSIVE*

ASK ALL

SINGLE CODE

Do you own (or have access to via someone in your household) an electric or hybrid vehicle?

- 1 Yes
- 2 No
- 3 Don't know

ASKI IF EV = 1

SINGLECODE

You said that you own or have access to (via someone in your household) a hybrid or electric vehicle.

Can this vehicle be recharged at home using a domestic socket or dedicated home charge point?

- 1 Yes
- 2 No
- 3 Don't know

ASK ALL

SINGLE CODE

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'Time of use' tariffs are flexible tariffs that offer cheaper 'off-peak' rates for using energy at times of night or day when demand is lower for smart meter customers.

Does the rate your household pays for electricity vary depending on what time of day or night you are using it?

- 1 Yes
- 2 No
- 3 Don't know

ASK ALL

SINGLE CODE

What is your ethnicity?

Please select one only

White HEADING NOT A CODE

- 1 Scottish/British/English/Welsh/Northern Irish
- 2 Irish
- 3 Gypsy, Traveller or Irish Traveller
- 4 Any other white background

Mixed HEADING NOT A CODE

- 5 White and Black Caribbean
- 6 White and Black African
- 7 White and Asian
- 8 Any other Mixed/ Multiple ethnic background

Asian and British Asian HEADING NOT A CODE

- 9 Indian
- 10 Pakistani
- 11 Bangladeshi
- 12 Chinese
- 13 Any other Asian background

Black and Black British HEADING NOT A CODE

- 14 African
- 15 Caribbean
- 16 Any other Black/ Black British/ Caribbean background

Other ethnic group HEADING NOT A CODE

- 17 Arab
- 18 Other
- 98 Prefer not to say

ASK ALL

SINGLE CODE

Which of the following best describes your total annual household income before tax?

- 1 Less than £5,000
- 2 £5,000-£9,999
- 3 £10,000-£14,999
- 4 £15,000-£19,999
- 5 £20,000-£24,999
- 6 £25,000-£29,999
- 7 £30,000-£34,999
- 8 £35,000-£39,999
- 9 £40,000-£44,999
- 10 £45,000-£49,999
- 11 £50,000-£59,999
- 12 £60,000-£69,999
- 13 £70,000-£84,999
- 14 £85,000-£99,999
- 15 More than £100,000
- 98 Prefer not to say

ASK ALL

SINGLE CODE

What is the highest level of educational qualification you have received?

- 1 PhD
- 2 Masters Degree or equivalent (NVQ level 5)
- 3 Bachelors Degree or equivalent (such as HND or NVQ level 4)
- 4 A levels or equivalent (such as Scottish Highers or NVQ level 3)
- 5 5 or more GCSEs or equivalent (NVQ level 2)
- 6 Up to 4 GCSEs or equivalent (NVQ level 1)
- 7 Other qualifications
- 8 No qualifications
- 98 Prefer not to say

ASK ALL

SINGLE CODE

How easy or difficult has it been to afford your energy bills in the last 6 months?

- 1 Very easy
- 2 Somewhat easy
- 3 Somewhat difficult
- 4 Very difficult
- 97 Don't know
- 98 Prefer not to say

ASK ALL

SINGLE CODE

Do you have any physical or mental health conditions or illnesses lasting or expected to last 12 months or more?

- 1 Yes

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2 No

98 Prefer not to say

ASK IF HCOND1 = 1

SINGLE CODE

Do any of your conditions or illnesses reduce your ability to carry out day-to-day activities?

1 Yes

2 No

98 Prefer not to say

ASK IF HCOND1 = 1 "Yes"

SINGLE CODE

Do any of your conditions or illnesses mean you need to take special care to keep the house warm most of the time?

1 No

2 Yes

98 Prefer not to say

ASK IF HCOND1 = 1 "Yes"

SINGLE CODE

Do any of your conditions or illnesses mean you need to use more gas or electricity than you might otherwise use?

1 No

2 Yes

98 Prefer not to say

B3. Definition of consumer segments

Table 6. Consumer segments defined by answers to questions SEEK7 and ACCEPT7 from the online survey experiment questionnaire

Customer segment	Logic
Seeker	if SEEK7 = 1, 2, 3
Acceptor	if (ACCEPT7 = 1, 2, 3) and (SEEK7 = 4, 5, 6, 7)
Indifferent	if (ACCEPT7 = 4) and (SEEK7 = 4, 5, 6, 7)
Unlikely	if (ACCEPT7 = 5, 6, 7) AND (SEEK7 = 4, 5, 6, 7)

