

Flexing Fixed Charges: Evidence from Standing Charge Rebate Trials: Technical Annex

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Contents

Flexing Fixed Charges: Evidence from Standing Charge Rebate Trials: Technical Annex.. 1

Contents	2
1. Introduction	3
2. Trial Implementation	3
2.1. Sampling.....	3
2.2. Incentive mechanism.....	10
3. Communications pilot testing	12
4. Data processing	13
4.1. Data collection.....	13
4.2. Data cleaning steps.....	13
4.3. Imputation method for missing readings.....	16
5. Analytical approach: Consumer demand response	23
5.1. Datasets.....	23
5.2. Primary and Secondary research questions.....	24
5.3. Model selection.....	24
5.4. Identification Strategy.....	25
5.4. Key variables.....	26
5.5. Statistical power.....	28
5.6. Model specifications.....	32
6. Consumer demand response results summary	36
6.1. British Gas.....	36
6.2. ScottishPower.....	37
7. Robustness checks for incentive functioning and rebate outcome	38
7.1. Standing Charge rebate outcomes.....	39
8. Survey	45
8.1. Survey administration.....	45
8.2. Sampling.....	46
8.3. Survey delivery.....	55
8.4. Survey data processing.....	55
8.5. Survey analytical approach.....	56
9. Qualitative interviews	57
10. Final communications	58
10.1. Pre-trial communication.....	58
10.2. During trial communication.....	60
10.3. End of trial communication (Only British Gas).....	63
10.5. Qualitative research invite.....	67
11. Final endline survey questionnaire	69

1. Introduction

The Standing Charge Rebates and Electricity Consumption trials conducted with British Gas and ScottishPower tested whether offering households rebates on their electricity standing charge could encourage reductions in weekday peak-time electricity consumption (4pm-7pm). Households were offered standing charge rebates conditional on maintaining low weekday peak-period electricity consumption. Using half-hourly smart meter data, suppliers calculated rewards either relative to other customers' consumption (British Gas) or against predefined consumption thresholds (ScottishPower). Participants could earn rebates of up to 50% or 100% of their standing charge but were not penalised for higher consumption, making the intervention an opt-out, no-loss flexibility proposition. The research combined half-hourly smart meter data analysis, surveys, qualitative interviews, and communications testing, reaching over 43,000 customers.

This technical annex accompanies the main Standing Charge Rebates and Electricity Consumption report, which presents the background, methodology, headline findings and conclusions from the Standing Charge Rebate trials. The annex provides additional detail on the design, implementation and evaluation of the research, supporting the interpretation of the findings presented in the main report. Specifically, the annex provides detailed information on participant eligibility, sampling and randomisation procedures, trial design, incentive mechanisms, communications development and delivery, data processing and cleaning procedures, the treatment of missing data, and the statistical approaches used to estimate trial impacts. It also describes the methodologies used for the survey and qualitative research components and presents the robustness checks, sensitivity analyses and diagnostic tests undertaken to assess the reliability of the findings.

The purpose of this annex is to provide transparency regarding the research methods, analytical decisions and assumptions underpinning the trials, enabling readers to understand, interpret and assess the evidence presented in the main report.

2. Trial Implementation

2.1. Sampling

2.1.1. Sample sizes

The trial was designed to include a target analytical sample of 10,000 customers for each suppliers' pooled treatment group, and 10,000 customers for each control group. This target sample size was based on initial indicative power calculations using assumptions for mean peak electricity consumption, variability in consumption, and within-household autocorrelation drawn from Ofgem's Domestic Archetypes dataset and published evidence on domestic electricity use patterns. These indicated that to achieve 80% statistical power, a significance level of 5% and detect a 5% relative change in peak electricity as a main effect, a sample size of 4,080 per arm was required. To allow for further subgroup analysis and make best use of the available budget, the

final recommended sample size was 10,000 per arm, with additional mitigation for attrition. More information on the statistical power of the analyses can be found in section 5.6.

For ScottishPower, an additional survey control group was also recruited. This was necessary because control group customers were not informed of their participation in the trial in order to minimise any behavioural effects arising from trial communications. Whilst this did not impact British Gas, ScottishPower communication requirements would have necessitated the control survey inform participants that it was being conducted as part of a wider trial. To avoid potential confusion among customers who had not knowingly participated, for ScottishPower we therefore recruited a separate survey-only control group of 9,764 customers with no involvement in the trial. Smart meter consumption data were not collected for this group, and their inclusion was solely to support treatment-control comparisons within the survey.

To mitigate the risk of attrition and to ensure the required analytical sample size was achieved, we oversampled the eligible population. Attrition could occur due to households opting out of the trial, changing energy supplier, moving home (leaving the account inactive), changing to an ineligible tariff, or being removed from the trial due to ongoing smart meter outages or technical issues. We consulted previous trials including the Australian Energy Market (AEM) Beat the Peak+ trial and the National Energy System Operator's CrowdFlex trial to estimate an attrition rate, which indicated a possible range of approximately 11% to 14%. These rates were then cross-referenced with data from the suppliers on the incidence of such events to arrive at a final appropriate percentage by which to oversample, which was 15% for British Gas, and 5% for ScottishPower, distributed across conditions as outlined in Table 1 and Table 2. Customers were randomly assigned to treatment and control groups following the stratified sampling process described in Section 2.1. Sampling. Final achieved sample sizes were 11,478 treatment participants for British Gas and 10,271 treatment participants for ScottishPower.

Table 1: Initial sample size of British Gas by treatment assignment

	Treatment 1 (monthly email)	Treatment 2 (fortnightly email)	Treatment 3 (monthly email, environmental message 1)	Treatment 4 (monthly email, environmental message 2)	Control
Target sample	4,700	4,700	300	300	10,000
Total with oversampling	5,405	5,405	345	345	11,500

Table 2: Initial sample size for ScottishPower by treatment assignment

	Treatment 1 (maximum rebate 50%)	Treatment 2 (maximum rebate 100%)	Consumption control	Survey-only control
Target sample	5,000	5,000	10,000	10,000
Total with oversampling	5,250	5,250	10,500	10,500

2.1.2. Inclusion criteria

The samples were drawn from all domestic smart meter customers with live electricity contracts and at least 3 months' worth of half-hourly data consumption at the start of the trial, subject to the inclusion and exclusion criteria in Table 3. Considering the opt-out nature of the trial, it was our goal to include as many smart meter customers as possible to maximise the generalisability of our findings and the representativeness of our sample. Exclusions were therefore applied only where there was a clear justification. These justifications generally fell into three categories: protecting consumers from potential harm or confusion, ensuring the practical delivery of the intervention, and addressing data sharing and technical requirements. For example, customers that were deemed to be vulnerable or at risk of unintended harm were excluded, such as those who had been recently bereaved or those with active complaints. Those already on time-of-use propositions were excluded to avoid creating confusion by conflicting advice, and customers for whom contact or data collection would be problematic (e.g. no email address or poor smart meter data availability) were not recruited for practicality.

Table 3: Inclusion and exclusion criteria

Justification for exclusion	Criteria	British Gas	Scottish Power
N/A	Economy 7 customers	Yes	Yes
N/A	Customers who have opted into marketing communications	Yes	Yes
Customer protection from harm or confusion	Customers in debt	Yes	No
Customer protection from harm or confusion	Priority Service Register customers	Yes	Partially *
Customer protection from harm or confusion	Bereaved customers	No	No
Customer protection from harm or confusion	Customers with active complaints	No	No
Customer protection from harm or confusion	Peak Save customers (British Gas only)	No	N/A

Justification for exclusion	Criteria	British Gas	Scottish Power
Customer protection from harm or confusion	Half price weekends customers (ScottishPower only)	N/A	Yes
Customer protection from harm or confusion	Time of Use (TOU) customers	No	No
Customer protection from harm or confusion	EV tariff customers	No	No
Practical delivery of the trial	Customers who request communication in non-standard formats	Yes	No
Practical delivery of the trial	Consumers on fixed-term contracts where the end date falls before the trial end date	No	No
Practical delivery of the trial	Households with no listed occupier	No	No
Practical delivery of the trial	Customers with no email address	No	No
Practical delivery of the trial	Customers with no mobile number	Yes	No
Practical delivery of the trial	Households with smart meter data unavailable or consistently poor quality for last 6 months	No	No
Practical delivery of the trial	Home movers (where notified in advance of trial launch)	No	No
Data or technical requirements	Customers who have not consented to half-hourly consumption data sharing	No	No
Data or technical requirements	Customers who have opted out of marketing communications	Yes	No
Data or technical requirements	Prepayment Meter (PPM) customers	Yes**	No

* For ScottishPower, the following PSR categories were excluded (with the remaining categories included): developmental conditions, dementia/cognitive impairment, requiring energy for medical equipment, severe financial insecurity, blind, temporary post hospital recovery, unable to communicate in English, mental health (severe trauma), vulnerable flag, forgetful/confused.

** Excluding those that do not have SMETS 2 meters

2.1.3. Sampling strategy

2.1.3.1. Stratification and randomisation

For both suppliers, we specified a stratified random sampling approach that suppliers used to select customers for the trial and allocate them to treatment and control groups. The process was designed to ensure that the final sample reflected the geographic distribution of GB domestic

electricity while maintaining random assignment within strata. The sampling process consisted of three stages:

1. Application of the agreed inclusion and exclusion criteria to the eligible customer base.
2. Stratification by Distribution Network Operator (DNO) region using the target regional proportions shown below (Table 4).
3. Random assignment of eligible customers within each region to treatment and control groups using a random number generator.

Table 4: Target percentage recruited for each DNO region

Region	Target % regional distribution
North West	7.97%
Northern	5.83%
Yorkshire	7.80%
Northern Scotland	2.06%
Southern	10.45%
Southern Scotland	5.67%
North Wales and Mersey	4.89%
London	6.70%
South East	7.95%
Eastern	13.14%
East Midlands	10.08%
Midlands	8.57%
Southern Western	5.33%
South Wales	3.56%

2.1.4. Balance checks

Each supplier followed the sampling and randomisation process described above to generate three candidate samples with treatment group allocations. Ofgem's consumer and behavioural team conducted balance checks on each candidate sample to assess the comparability of treatment and control groups across key customer characteristics. The sample demonstrating the greatest overall balance between groups, based on statistical tests was selected for use in the trial, whilst keeping in mind the likelihood of significant differences even when randomisation has been successful. Kruskal Wallis tests were used to determine differences across treatment groups for continuous variables, while Pearson Chi² tests was used for binary (PSR) or categorical data (tariff type).

The balance checks were conducted on the following variables:

- Electricity consumption from the previous month
- Estimated Annual Consumption (EAC)
- Whether the consumer is an electricity only customer
- Number of PSR customers (yes or no)
- Type of tariff

2.1.4.1. British Gas balance check results

The results of the British Gas balance checks across all five conditions (control and the 4 treatment groups) for each of the three candidate samples are summarised in Table 5. The reported test statistics assess whether the distribution of each characteristic differs across the five groups as a whole. A statistically significant result indicates that at least one group differs from one or more of the others on that characteristic, although the test does not identify which specific groups differ. In this context, balance is assessed by examining whether the control and treatment groups collectively appear comparable across key pre-randomisation characteristics. Note that these tests do not compare each treatment group against the control group individually. Rather, they assess whether there are any statistically significant differences across the five experimental conditions overall.

Table 5: Balance check results for the three British Gas candidate samples

	Candidate sample	1	1	2	2	3	3
	Test	Test statistic	p	Test statistic	p	Test statistic	p
Consumption past month	Kruskal-Wallis	3.399	0.493	3.452	0.485	5.391	0.250
EAC	Kruskal-Wallis	4.255	0.373	2.864	0.581	6.069	0.194
PSR	Pearson Chi ²	5.542	0.236	2.213	0.697	4.422	0.352

Electricity Only	Pearson Chi ²	3.919	0.417	2.250	0.690	0.835	0.934
Payment Type	Pearson Chi ²	10.157	0.254	4.728	0.786	6.980	0.539
Tariff Type	Pearson Chi ²	19.700 *	0.012	6.699	0.569	18.143*	0.020
Region	Pearson Chi ²	0.120	1.000	0.120	1.000	0.120	1.000

Sample 2 was the only candidate sample to demonstrate no significant differences across all of the variables, and this was therefore the one selected for the trial.

2.1.4.2. ScottishPower

The results of the ScottishPower balance checks across the four conditions (control, two treatment groups and the survey control group) are summarised in Table 6.

Table 6: Balance check results for the three ScottishPower candidate samples

	Candidate sample	1	1	2	2	3	3
	Test	Test statistic	p	Test statistic	p	Test statistic	p
Consumption past month	Kruskal–Wallis	0.341	0.952	6.516	0.089	3.931	0.269
EAC	Kruskal–Wallis	0.587	0.899	3.931	0.269	4.044	0.257
PSR	Pearson Chi ²	6.209	0.102	2.508	0.474	1.825	0.610
Electricity Only	Pearson Chi ²	5.483	0.140	4.852	0.183	1.943	0.584
Tariff Type	Pearson Chi ²	5.571	0.782	5.103	0.825	9.231	0.416
Region	Pearson Chi ²	374.5*	0.000	374.5*	0.000	374.5*	0.000

All candidate samples failed the balance test for region. This was anticipated, as the geographic distribution of ScottishPower’s eligible customer base did not allow for the target regional quotas to be fully achieved for all groups. We therefore agreed that as the group for which a regional imbalance would be least disruptive to the results, the survey control group would be allowed to deviate from these quotas. Replicating the balance checks without including this group returned no significant differences across all candidate samples. Whilst all samples therefore showed evidence of balance, sample 1 was selected as it returned the highest p-values.

2.2. Incentive mechanism

2.2.1. British Gas

British Gas implemented a dynamic rebate mechanism that linked participants' daily rewards to their electricity consumption during the weekday peak period (4pm–7pm). Rebates were calculated by comparing each treatment participant's peak-period electricity consumption against a regional benchmark derived from the control group. Lower levels of peak-period consumption resulted in higher rebate payments. To account for regional variation in electricity consumption patterns, separate benchmark thresholds were calculated for each DNO region. This ensured that participants were assessed relative to customers in the same region rather than against a single national benchmark.

Each day, British Gas calculated the 15th percentile (L) and 70th percentile (U) of peak-period electricity consumption within the control group for each DNO region. These thresholds were used to define a piecewise linear payment function, specified below.

The daily reward r was allocated with a piecewise linear function of on-peak electricity consumption x , defined as:

$$r(x) = \begin{cases} R & x \leq L \\ R - \left(\frac{x - L}{U - L} \right) \times R, & L < x < U \\ 0 & x \geq U \end{cases}$$

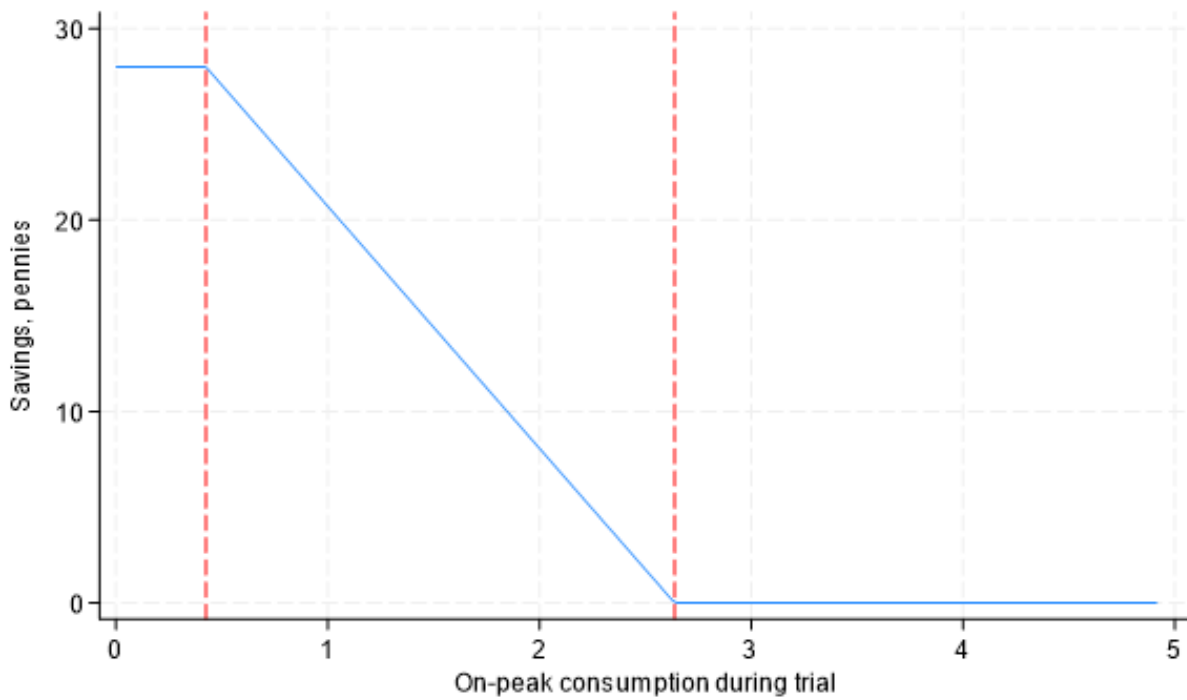
where R is the maximum discount of the regional standing charge.

Participants with consumption below the lower threshold received the maximum rebate available under their treatment condition, participants above the upper threshold received no rebate, and participants between the thresholds received a proportionate rebate calculated using a linear scale:

$$r = \left\lfloor R - \frac{x - L}{U - L} \times R \right\rfloor$$

where $\lfloor \cdot \rfloor$ refers to a floor function, indicating that the rebate values r were rounded down to the nearest whole penny.

Figure 1: Graphical representation of the reward structure: daily rebate amount by peak time kWh for 50% discount max rebate amount



Note: this graph uses $R = 28p$, $L = 15^{\text{th}}$ percentile, and $U = 70^{\text{th}}$ percentile.

2.2.1.1. Calculating the rebate for missing values

If a customer had a faulty or missing reading on any given day during the trial, they received the average rebate within their DNO region for the day. In the case where a customer had more than 15 faulty readings in a single month, they remained on the trial but received the average rebate for their region for the duration of the trial.

2.2.2. ScottishPower

ScottishPower implemented an incentive mechanism based on four electricity consumption bands, determined by customers' daily peak-period electricity use determined from historical usage data provided by ScottishPower. The daily reward r for ScottishPower was allocated with another piecewise linear function of on-peak electricity consumption x , defined as:

50% Rebate group:

$$r_{50}(x) = \begin{cases} -50\% & x \leq 0.9 \\ -20\% & 0.9 < x \leq 1.8 \\ -10\% & 1.8 < x \leq 3.0 \\ -0\% & x > 3.0 \end{cases}$$

100% Rebate group:

$$r_{100}(x) = \begin{cases} -100\% & x \leq 0.9 \\ -40\% & 0.9 < x \leq 1.8 \\ -20\% & 1.8 < x \leq 3.0 \\ -0\% & x > 3.0 \end{cases}$$

Customers in the lowest consumption band received the maximum rebate available under their treatment allocation (50% or 100% of the standing charge), while customers in the highest consumption band received no rebate. Customers in the two intermediate bands received partial rebates of 10% and 20% (Treatment 1) or 20% and 40% (Treatment 2). Thresholds were selected to maximise the proportion of customers eligible to receive a rebate while ensuring that overall trial costs remained within the agreed budget. Table 7 summarises the consumption thresholds and the associated rebates in the ScottishPower study.

Table 7: Usage bands for the ScottishPower incentive mechanism

Usage band	Rebate for treatment 1 (maximum 50%)	Rebate for treatment 2 (maximum 100%)
≤ 0.9 kWh	50%	100%
0.91 – 1.8 kWh	20%	40%
1.81 – 3.0 kWh	10%	20%
≥ 3.1 kWh	0%	0%

2.2.2.1. Calculating the rebate for missing values

If a customer had a faulty or missing reading on any given day, they were awarded the rebate associated with the upper middle band for their treatment (so 10% for treatment 1, or 20% for treatment 2). Customers with more than 5 working days of no smart meter data were removed from the trial to maintain data integrity and would therefore receive no rebate after this point.

3. Communications pilot testing

Prior to trial implementation, three rounds of communications testing were conducted by researchers at Bayes Business School in collaboration with Ofgem. The purpose of the study was to identify the most effective communication approach for introducing the trial to participants, with a particular focus on message comprehension, motivation to participate, and willingness to engage with the proposed tariff design. The findings informed the design of participant communications used in the main trial.

All details on this pilot testing can be found in the supplementary report. The resultant final communications can be found in Section 10.

4. Data processing

4.1. Data collection

The primary source of trial data was half-hourly smart meter electricity consumption data provided by British Gas and ScottishPower for eligible trial participants through Ofgem's Request for Information (RFI) process. All datasets included a unique household identifier generated by the suppliers in place of customer account numbers or MPANs. This enabled Ofgem to link datasets relating to the same household while ensuring that identifying information remained with the suppliers and was not included in the datasets provided to Ofgem, following all data protection procedures.

Suppliers provided historical half-hourly smart meter electricity consumption data covering the baseline period prior to the start of the trial. Once the trials commenced, updated consumption data were provided on a monthly basis throughout the trial period. These datasets included half-hourly electricity consumption (kWh) and information on peak and off-peak unit rates. For the trial period, suppliers also provided data on rebates paid and customer interaction metrics, including the sending and delivery of trial communications, participant opt-outs and, for ScottishPower, email open rates.

In addition to consumption data, suppliers provided customer and account characteristics used for randomisation, balance checks and subgroup analyses. These included variables such as Estimated Annual Consumption (EAC), Priority Services Register (PSR) status, payment type, tariff type, electricity-only status and region.

These datasets for each supplier were then linked using the aforementioned unique household identifier to create one full dataset for analysis.

4.2. Data cleaning steps

After the customer information, historical consumption data and trial period consumption data were merged, the following steps were followed to clean the data:

- i. Ensure the correct format for variables, particularly to ensure low memory needs;
- ii. Check for duplicates within the data by testing for repeated ID-day-time combinations;
 - a. If the duplicate was an error, extra entries were dropped;
 - b. If the duplicate had 2 different readings, observations would be merged, storing the average of the two readings;
- iii. Check for periods with more/less than 48-time intervals. Observations with many instances of missing data (3 instances in the British Gas dataset with 41/215 days of data; 33 in the ScottishPower dataset with less than 65% available data) were removed, leaving only observations with minimal missing data. More detail is provided in the next section.
- iv. Extract usable information from the time variable (in timestamp format):
 - a. Identify the exact 30-min interval (to separate peak and off-peak consumption)

- b. Extract the year and month
 - c. Extract the day of the week
 - d. Extract the hour of the day
 - e. Determine whether the day is bank holiday
- v. Create daily aggregations for peak and off-peak times from the half-hourly intervals

4.2.1. Missing observations and zero values

The data contained two types of missing or non-positive consumption data, observations recording a zero, and observations that are missing due to a lack of data from the smart meter. In the case of zero observations, these are likely accurate and correct, and reflect instances where the consumer is not importing electricity. For instance, these customers may be using solar panels or heat pumps at a certain point during the day, and also possibly exporting onto the grid.

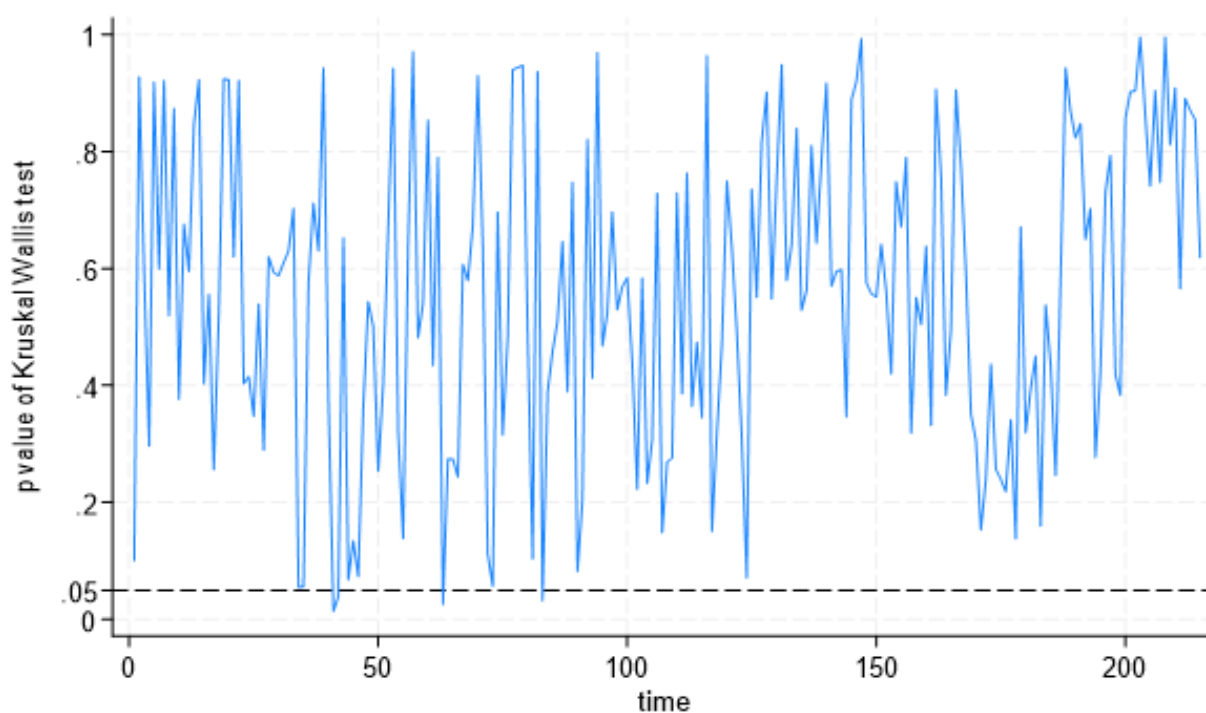
For the second type of missing observations, smart meters record and share half-hourly electricity data but communication failures between the meter and data repository, non-responsive smart meters or temporary outages or network congestion can result in a missing value for that time period. Some platforms re-query the smart meter repeatedly to fill gaps and therefore replace the missing value quickly. However, in many instances, corrections are not immediate and can be backfilled over days, weeks, or up to 3 months. In some cases, this information is filled with actual readings if the data exists and it is received at a later date or in some cases it is filled with estimates using load profiles or adjacent data. Both datasets contained instances of missing data.

In order to ensure the presence of missing observations and zero values did not bias our analyses, we tested whether these were related to treatment conditions and in the case of zero values, whether they changed over time.

4.2.2. Checking associations between missing observations and treatment

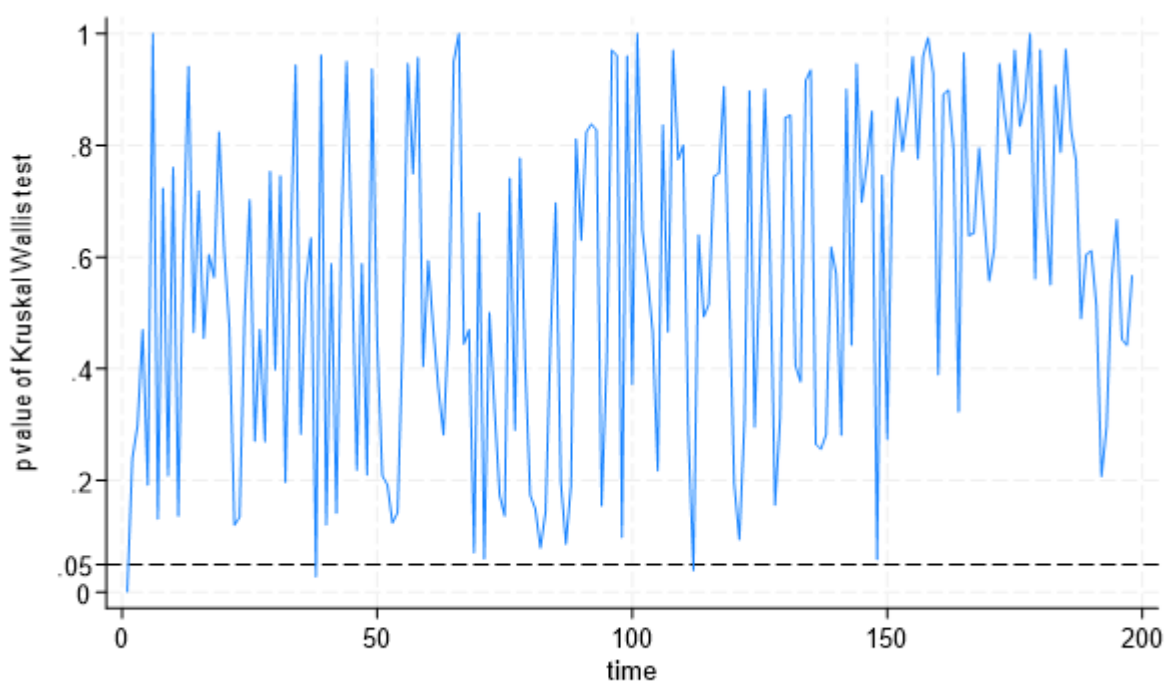
Cross sectional Kruskal Wallis tests conducted on the British Gas data showed that the percentage of daily missing observations were unrelated to treatment, with only 4 time periods out of 215 returning a significant result (see Figure 2).

Figure 2: P values for 215 Kruskal Wallis tests comparing the percentage of daily missing observations across treatment groups for British Gas.



The same result emerged for ScottishPower, with significant results for only 3 out of 198 time periods (See Figure 3), indicating effectively no association between treatment group and the percentage of daily missing observations.

Figure 3: P values for 215 Kruskal Wallis tests comparing the percentage of daily missing observations across treatment groups for ScottishPower



4.2.3. Checking whether the number of zero readings differed across time

We also investigated whether the number of zero readings on a given day (indicating zero electricity used) differed significantly across groups over time. To this end, a linear Difference-in-Difference model was estimated with both time and individual fixed effects. Standard errors were clustered at the household level.

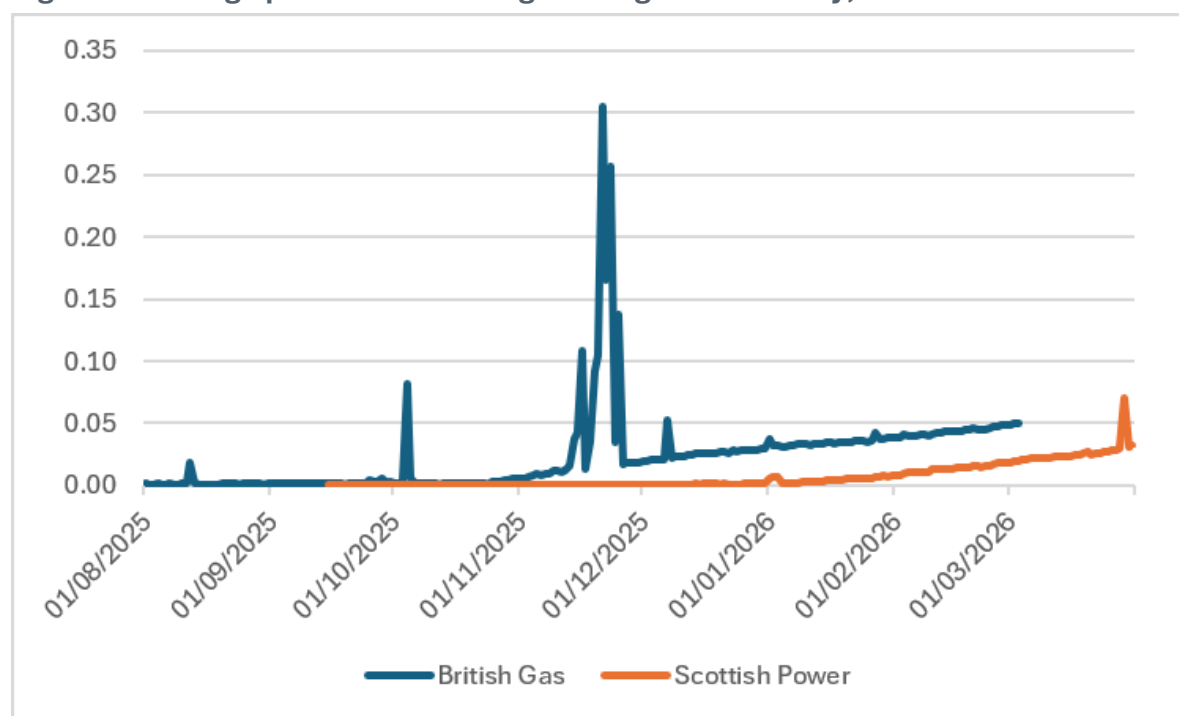
For British Gas, one treatment group (high frequency of messaging) showed a statistically significant increase in the prevalence of zero-valued observations following the intervention ($\beta = 0.0023$, $SE = 0.0010$, $t = 2.15$, $p = .032$, 95% CI [0.0002, 0.0043]), equivalent to an increase of approximately 0.23 percentage points. No significant effect was observed for the second treatment group ($\beta = 0.0013$, $p = .225$). For ScottishPower, the maximum 50% rebate treatment group showed a statistically significant decrease in the prevalence of zero-valued observations ($\beta = -0.0012$, $SE = 0.0006$, $t = -1.99$, $p = 0.051$, 95% CI = [-0.0025, +0.0000]), equivalent to a reduction of approximately 0.12 percentage points, while no significant effect was identified for the second treatment group ($\beta = -0.0004$, $p = 0.620$).

Taken together, these analyses provide limited and inconsistent evidence that the intervention affected the prevalence of zero-valued observations. Statistically significant effects were observed for a single treatment group in each supplier, but the direction of the effect differed between suppliers and the estimated effects were small in magnitude. However, the intervention was designed to reduce consumption, and an increase in the number of zero electricity readings at peak time may be reflective of consumers holding their consumption to earn the reward; on the other hand, this might be caused by smart meters increasingly malfunctioning under pressure at peak time over winter (when the bulk of the British Gas trial took place). Similarly, a reduction in the number of zeros stems from consumers increasing their consumption slightly during the trial, as well as smart meters functioning better in spring (when the ScottishPower took place).

4.3. Imputation method for missing readings

While zero-valued observations were able to be retained as accurate data, imputation was required for the missing readings. Consumption data across the baseline and intervention periods contained a small proportion of missing readings: of 236,902,560 observations (time-ID combinations) in the British Gas dataset, 2.35% (5,563,872 cells) had missing values. For ScottishPower, of 195,325,746 observations only 0.68% (1,333,954) were missing. In both datasets, the level of missingness increased over time. For British Gas, the average missing daily readings of consumers went from around 0.01% at the beginning of the dataset, and reached 5% by the end of the trial; similarly, for ScottishPower, the average missing daily readings went from about 0.01% in the initial periods to about 3% at the end of the trial (with a peak of approximately 7% of readings on 29 March 2026, see Figure 4). In the case of British Gas, between November 20 and November 23, 2025, there was a widespread technology glitch affecting the data pipeline between smart meters and customer accounts, which resulted in an average of daily missing readings reaching 30%.

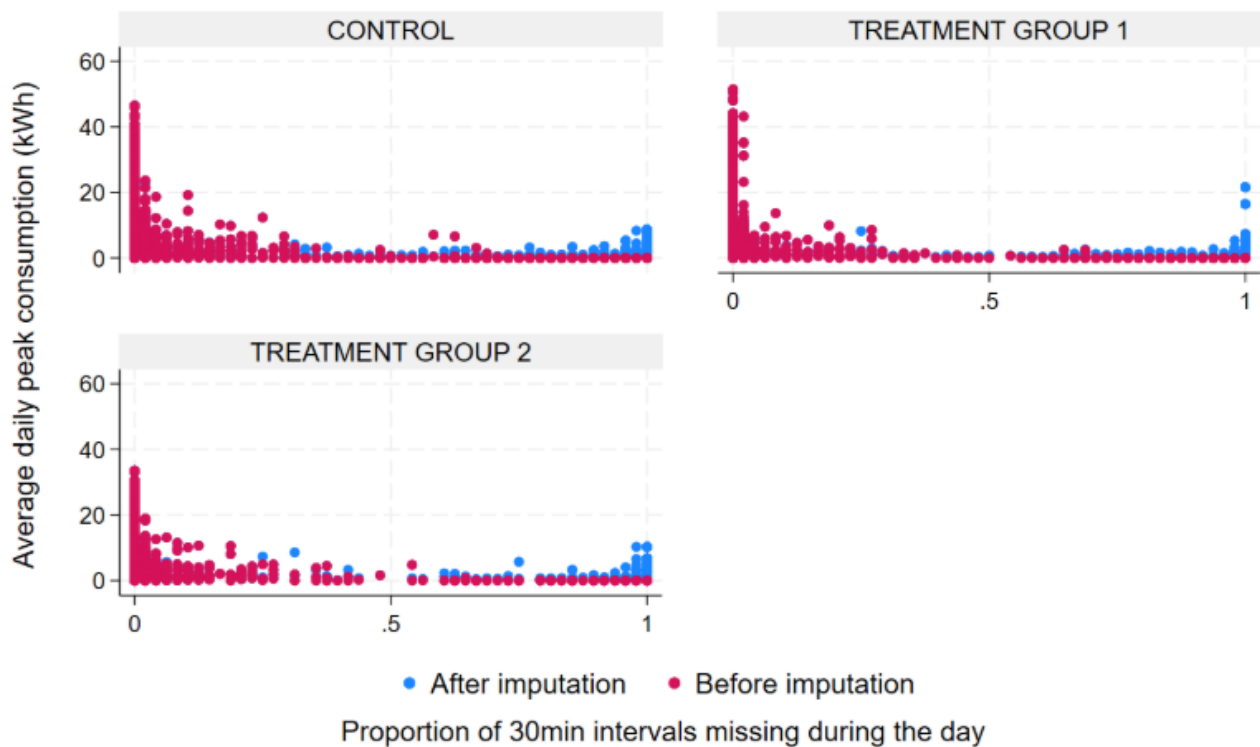
Figure 4: Average percent of missing readings within a day, over time



Missing consumption values were imputed using linear interpolation, whereby missing readings were estimated from the nearest observed values immediately before and after the missing period. This approach preserves continuity in the time series and minimises data loss while avoiding more complex modelling assumptions. A limitation of linear interpolation is that extended periods of missing data (e.g. a full day of missing readings) are imputed as a smooth transition between surrounding observations. Consequently, the imputed profile may underestimate within-day variability and peak consumption during prolonged outages. However, given the random allocation of participants to treatment and control groups, any impact of missing readings would be expected to affect both groups similarly.

To assess the potential impact of imputation, we examined average peak consumption across different levels of missingness across data from both suppliers. For ScottishPower, this indicated that days with higher proportions of imputed data tended to exhibit lower estimated consumption than days with minimal missing data (Figure 5). However, when looking at the data overall, the imputation procedure had little material effect on estimated average peak electricity consumption suggesting that the findings are unlikely to be sensitive to the chosen imputation approach.

Figure 5: Average daily peak electricity consumption across before and after imputation across varying degrees of missingness for ScottishPower.



4.3.1. Robustness check of an alternative imputation method

As a robustness check, we implemented an alternative, data-driven imputation method to quality assure our procedures, and to ensure that the results of the analysis are sufficiently robust. In this alternative approach, the aim is to remove different manifestations of spurious data, which include missing values, but also unusual (i.e., abnormally high or low) readings.

To achieve this aim, the imputation method relies on a data-driven data correction algorithm that leverages the statistical information provided by the historical/reference data available rather than simpler heuristics (e.g. averaging adjacent values). In other words, the approach involves identifying what constitutes the ‘typical’ behaviour of each individual consumer for a certain 30-minute interval, so that this information can then be used as the value to impute when actual consumption is missing for the consumer in question. This ‘typical’ behaviour is implemented in the form of a set of 48 half-hourly distributions calculated over a rolling window, to account for changes due to seasonal variations. Figure 6 below shows a pseudo-code implementation of the approach in question.

Figure 6: A pseudo-code implementation of the alternative imputation method

1. For each consumer:
 - 1.1. For each window:
 - 1.1.1. Calculate 48 half-hourly distributions of meter readings based on **all full data days** within window
 - 1.1.2. For each day within window:

1.1.2.1. For each half-hourly time slot:

- Use the corresponding half-hourly distribution to identify problematic values
- Convert problematic values to missing data

1.1.3. For each day with missing data:

- Identify time slots with missing data
- Use the corresponding half-hourly distribution to impute data

This kind of imputation approach is more robust as it implements a time-aware dynamic outlier detection. This is important because a meter reading of, say, 4.0 kWh might be the norm at 6pm, but could be a complete anomaly at 4am. As a result, for each half-hourly time slot, the upper bound is set for a typical outlier threshold: that is, 1.5 x the interquartile ratio (IQR).

Missing values are then imputed using the median value for that half-hourly interval for each consumer. The median is preferred to the mean because it is generally a much better measure of central tendency than the average consumption when distributions are skewed, as is the case of energy consumption. This point is shown in Figure 7, which shows that the mean tends to return higher values than the median in our data.

Figure 7: Sample distribution profile

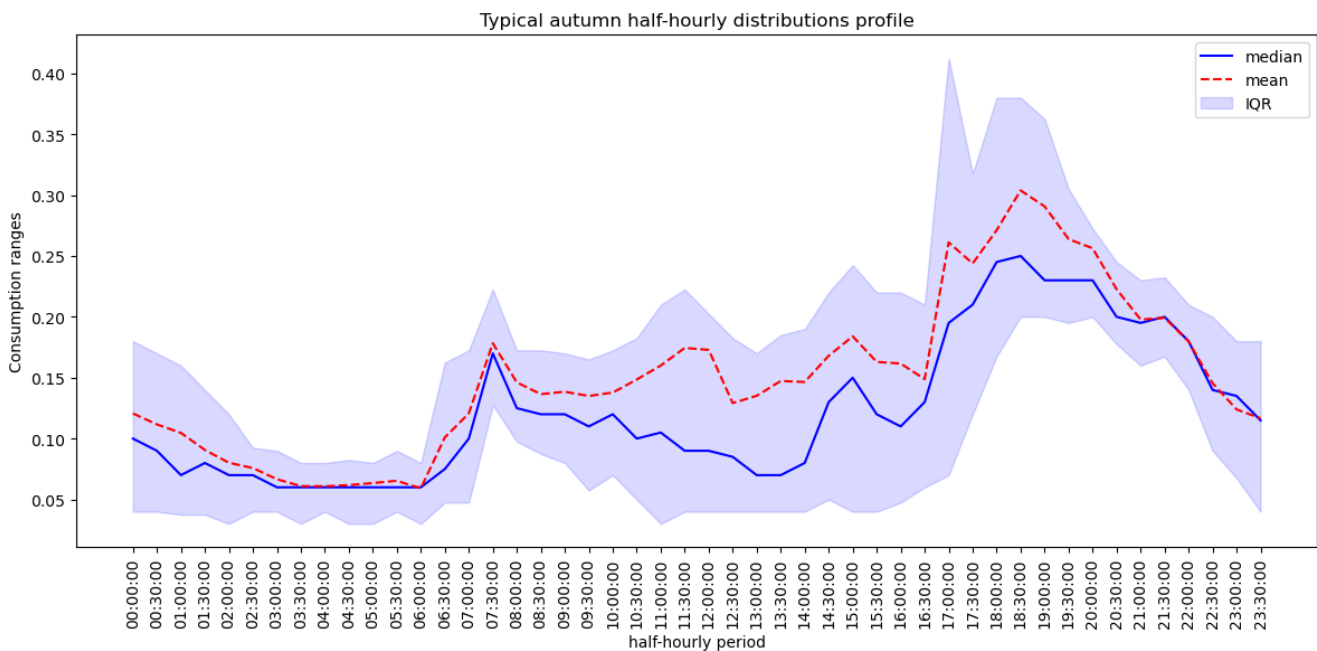


Table 8 and Table 9 present a comparison of the two approaches for both suppliers. The table presents the average peak electricity consumption by treatment and trial period in three different contexts: the average before any imputation; the average under our current imputation method; and the average under the alternative imputation method. Results indicate that the current imputation method returns higher values than the alternative, more precise imputation method. Despite these differences, however, the relative differences across groups (i.e. between treated and untreated) remain consistent, as would be expected if random missingness is random with

respect to treatment allocation. As a result, the use of a more precise imputation approach should not affect the main claims in the SSC trial report in terms of responsiveness to treatment.

Table 8: Comparison of average consumption, by imputation method - British Gas

		Non imputed	Non imputed	Current imputation	Current imputation	Current imputation	New imputation	New imputation	New imputation
source		Peak kwh	Off-peak kwh	Peak kwh	Off-peak kwh	N	Peak kwh	Off-peak kwh	N
Pre-trial	Control	1.373	6.233	1.374	6.240	769160	1.148	5.277	766800
	Treatment	1.354	6.158	1.354	6.164	768758	1.129	5.223	765907
Trial – month1	Control	1.808	7.456	1.761	7.357	218120	1.555	6.342	208237
	Treatment	1.766	7.310	1.720	7.216	218063	1.515	6.206	207697
Trial – month2	Control	1.877	8.163	1.849	8.089	264040	1.609	6.899	256901
	Treatment	1.824	7.956	1.796	7.876	263971	1.560	6.724	256729
Trial – month3	Control	1.995	8.437	1.951	8.320	252560	1.753	7.312	243164
	Treatment	1.948	8.347	1.905	8.231	252494	1.698	7.187	243215
Trial – month4	Control	1.846	7.875	1.802	7.792	252560	1.598	6.782	240845
	Treatment	1.788	7.706	1.744	7.605	252494	1.543	6.635	240999

Table 9: Comparison of average consumption, by imputation method - ScottishPower

		Non imputed	Non imputed	Current imputation	Current imputation	Current imputation	New imputation	New imputation	New imputation
Period	Treatment	Peak kwh	Off-peak kwh	Peak kwh	Off-peak kwh	N	Peak kwh	Off-peak kwh	N
Pre-trial	Control	1.904	7.925	1.870	7.684	871845	1.592	6.459	872751
	50% Rebate	1.913	7.997	1.882	7.765	436815	1.601	6.546	437460
	100% Rebate	1.891	7.928	1.857	7.693	436220	1.573	6.449	436030
Trial	Control	1.897	8.103	1.845	7.810	594906	1.607	6.717	585281
	50% Rebate	1.907	8.174	1.856	7.900	298062	1.614	6.782	293513
	100% Rebate	1.888	8.133	1.838	7.879	297656	1.594	6.727	292824

5. Analytical approach: Consumer demand response

Our two SSC trials were a novel attempt to identify potential consumer demand response to a persistent cost signal – that is, a rebate off the usually fixed daily standing charge – in return for shifting demand out of peak hours (4-7pm) from a heterogeneous group of British consumers that also includes consumers who are typically less engaged, under an opt-out, no loss design. The rebate applied at weekdays only – so to not interact with suppliers’ existing peak charging propositions that applied at weekends.

Treatment group participants were made aware of their selection into the trial, the rebate mechanism and the peak shifting action required via the initial email communication sent by suppliers. The initial email communication also made clear their ability to opt out, and consumers could choose to opt-out of the trial if they wished to.

As set out above, both trial rebate mechanisms looked to reward participants according to their relative contribution to peak demand rather than maximise peak shifting behaviour. Lower consumption at peak hours (4-7pm) was matched by a higher rebate, even in the case of no behavioural change at the household level. More specifically:

- British Gas trial participants were told that they could earn up to 50% off their standing charge in return for shifting their electricity consumption outside of peak hours. Accompanying the third monthly summary for the 50% phase of the trial, participants were told that the trial was being extended for 1 month and the size of the potential SC rebate would be doubled to 100% in this final month.
- ScottishPower trial participants were told that they would receive a rebate on their daily standing charge if their peak consumption was within the kWh thresholds (see section 2.2), with the size of the rebate increasing at lower kWh bands.

In both trials, participants were informed of their rebate earned in monthly bill summaries. The only exception was PPM customers in the British Gas trial who could view their rebates real time on their prepayment meters.

5.1. Datasets

For British Gas, the cleaned dataset we use for analysis comprises 22,957 households observed over 8 months, generating 183,647 observations. The panel structure enables identification based on within-household variation over time. Observations were restricted to weekdays and households with estimated annual consumption (EAC) above 20,000 kWh (23 households) were excluded from the analysis. The threshold was selected following exploratory analysis of the consumption distribution and discussion with suppliers. An EAC of 20,000 kWh sits substantially

above typical domestic electricity consumption¹ and represents an extreme outlier within the sample. These cases were therefore treated as atypical observations whose inclusion could disproportionately influence estimated treatment effects. Given the very small number of households affected (23 households, less than 0.1% of the analytical sample), the exclusion is unlikely to materially affect the findings.

For ScottishPower, the cleaned dataset we use for analysis comprises 20,505 households over 170 days, for a total of 3,485,850 observations. As for British Gas, observations are restricted to weekdays and filtered to remove anomalous consumption values (14 households where EAC > 20,000).

5.2. Primary and Secondary research questions

The primary research questions this aspect of the analysis aimed to answer were as follows:

- Can we reduce daily peak-time (4-7pm) household electricity consumption by linking the payment of the standing charge to peak-time consumption?
- What happens when we increase the rebate from a maximum 50% to a maximum 100% off the daily standing charge?

There were also several secondary areas of interest, in particular the heterogeneity in peak demand response across household characteristics, and for British Gas, the effect of communications frequency on peak demand response.

5.3. Model selection

To address these research questions, we used a Difference-in-Difference (DiD) estimator. This is a technique commonly used in the analysis of experimental and quasi-experimental data that compares the change in outcome (in this case, peak electricity use) between the pre-trial and post-trial period in the treatment group to the change in the same outcome within the control group. By removing the change in outcome in the control group, this approach eliminates time-varying unobservable factors that may have changed at the same time as the start of the trial, which affected electricity consumption in both groups. The effect is identified as long as, absent the treatment, the average change in the outcome for the treated group would have followed the same trajectory as the control group – the so-called (unconditional) Parallel Trends Assumption, which we assess using pre-trial data. Our DiD specification uses Two-Way Fixed Effects (2WFE) estimator to identify the causal effect of a reduction in standing charge after removing constant household-specific characteristics that affect energy consumption, and common month-to-month or day-to-

¹ Ofgem's Typical Domestic Consumption Values (TDCVs) provide benchmark annual electricity consumption levels for domestic customers. An EAC of 20,000 kWh is substantially above these benchmark values and was treated as an outlier for the purposes of this analysis. See Ofgem's guidance on average household energy consumption.

day variation (e.g. seasonality and holidays common to all customers in both the treatment and control groups).

In other words, this design allows us to compare changes in electricity use over time between groups, controlling for baseline differences and time trends. While our randomisation strategy allows us to identify the causal effect of the intervention even in the absence of a pre-trial period, using a DiD approach improves the precision of our estimates by accounting for pre-existing differences occurring within the groups.

For ScottishPower, we identified two clearly defined periods: a 4-month pre-trial baseline period, and a trial period. The treatment effect then requires interacting the dummy variable identifying the trial period and the two treatments, separately.

For British Gas, we separated the timeline into three distinct periods. We identified the 3-month pre-trial baseline (August to October 2025). The trial period is then split into two parts: the trial period covering the first phase (November 2025 to January 2026), where participants were offered a 50% maximum rebate; and a final month (February 2026) where consumers were offered a 100% maximum rebate. Given that all treated customers are exposed to the 100% maximum rebate in the final month (single treated cohort) right after the 50% rebate, we do not have a clean comparison, with potential carryover effects from the smallest to the largest rebate. As a result, the estimated marginal effect of doubling the rebate of 100% rebate may be confounded with the previous effect of a 50% rebate, and results would possibly differ if the 100% rebate treatment was presented as a simpler between design alongside the 50% rebate group.

5.4. Identification Strategy

As indicated in the main report, the primary identifying assumption under the simple model specification is unconditional parallel trends, which was tested in the main body of this report. Additional assumptions include:

No anticipation of treatment: participants are assumed not to prepare for treatment before it starts (see Ashenfelter, 1978²). This assumption is likely to hold when working on daily data, given that consumers are unlikely to anticipate electricity consumption by 24 hours. Consumers could still bring forward planned structural investments (e.g., installation of solar panels) that could help earn the reward; however, the small size of the reward is unlikely to be a significant motivator for such an expensive investment.

No spatial spillovers: we expect units to be independent of each other, so that the benefits accrued by one account are not shared or correlated with other accounts. This assumption is likely to hold, to the extent that domestic energy accounts tend to operate independently. The effect may be increased or reduced based on positive or negative work-of-mouth and social learning, but we consider this element part of the treatment effect.

- Independence of treatment to time-varying confounders: our analytical approach removes (by design) the effect of time-invariant confounders using a fixed effect (within-consumer)

² Ashenfelter, Orley (1978), "Estimating the Effect of Training Programs on Earnings," *The Review of Economics and Statistics*, Vol. 60, No. 1, pp. 47–57.

estimator. Our analysis assumes that unobserved time-varying confounders that affect demand are not affecting treatment allocation, a reasonable assumption given that individuals were randomly assigned to treatment or control groups.

5.4. Key variables

As a reminder, our sample was stratified at regional level. Along with consumption data, we can also count on a small set of consumer characteristics: payment type, PSR status (binary) and PSR category.

To investigate the heterogeneity of demand responsiveness, we extend our model specification with key covariates to identify heterogeneous treatment effects. To this extent, we create a new variable, baseline consumption quintile, to group customers by ‘historical’ consumption levels identified in the three-month pre-trial period to allow us the ability to identify variation in response by level of pre-trial usage. We prefer this metric to EAC due to the more complex endogeneity brought by the latter variable: EAC is an estimate on forecasting future consumption over the next 12 months – in our study, where EAC refers to the 3 months prior to the start of the trial, this estimate captures expected trial consumption as well, complicating its use in the final analysis.

In the British Gas data, we estimate the ATT as the average reduction in daily peak kWh per household during treated months. Aggregating to the monthly level aligns the measurement window with the monthly billing and rebate (the point at which customers were made aware of any rebate they had earned); while absorbing intra-month variation event-driven responses (e.g. Christmas period within December). While this aligns with the monthly billing structure of the intervention, it implicitly assumes that treatment effects are constant within month and may mask shorter-run behavioural dynamics. A key benefit of this monthly aggregation is the reduction of the number of observations, which makes the sample and the analyses more tractable, requiring less computational power. As a robustness check, we also estimate specifications using daily data with daily fixed effects and find no change in estimated effect under all model specifications.

In the ScottishPower data, we estimate the ATT as the average reduction in peak kWh per household during a treatment day. Monthly aggregation was not feasible due to the trial starting at around mid-January (January 12th 2026). While this aligns with the monthly billing structure of the intervention, it implicitly assumes that treatment effects are constant within month and may mask shorter-run behavioural dynamics. A key benefit of this monthly aggregation is the reduction of the number of observations, which makes the sample and the analyses more tractable, requiring less computational power.. As a robustness check, we also estimate specifications using daily data with daily fixed effects and find no change in estimated effect under all model specifications.

The SSC trials were primarily designed and powered to estimate overall treatment effects on peak-period electricity consumption using the primary difference-in-differences specification. Statistical power is determined by both sample size and model complexity: while the large treatment and control groups provide sufficient power to detect relatively small overall effects, analyses that split the sample into smaller subgroups or estimate multiple interaction effects have lower effective sample sizes and therefore reduced power. Table 10 summarises the model specifications used in

the analysis and their purpose, and section 5.6 outlines the power calculations conducted prior to the trial and after baseline data was available.

Table 10: Analytical model specifications

Model Specification	Description	Purpose
Primary model specification	Canonical difference-in-differences model with 2WFE. Standard errors clustered at the household level.	Identify ATT of intervention controlling for household level difference and common time shocks
Secondary model specification	As above, but allows for multiple experimental stimuli	Identify ATT of intervention controlling for household level difference and common time shocks
Extended (CATE) model specification	Highly flexible specification with covariate interaction, differential time trends and level shifts. Allows for conditional parallel trends. Standard errors clustered at the household level.	Identify heterogeneous treatment effects as deviations from the average ATT
Pooled TWFE specification	Pooled two-way fixed effects (TWFE) difference-in-differences specification with household and time fixed effects. Standard errors clustered at the household level.	Identify marginal effect of 100% rebate compared to 50% rebate
Event Study Specification Model	Dynamic TWFE event study with standard errors clustered at the household level identifies dynamic treatment effects and allows behaviour to evolve flexibly over time.	Identify marginal effect of 100% rebate compared to 50% rebate.

5.5. Statistical power

Initial indicative power calculations were conducted to identify the minimum sample size required to detect a main effect, assuming 80% statistical power and a two-sided significance level of 5%. Estimates for mean peak electricity use and standard deviations were based upon Ofgem's

Domestic Archetypes dataset (1.64 kWh, SD = 0.33). As no directly comparable estimate of autocorrelation in daily peak household electricity demand was identified, a moderate level of within-household autocorrelation was assumed ($r = 0.45$). This assumption was informed by published evidence demonstrating persistent and recurring patterns in domestic electricity consumption (e.g. Pinto, Gorman & Regan, 2024³). These parameters were then used to generate repeated datasets for a Monte-Carlo simulation-based power analysis under a hurdle model DiD framework, which were run based on an approximately nine-month trial, with four months of baseline data.

These calculations indicated that, under the original hurdle-model specification, a minimum of 2,040 participants per arm would be required to achieve 80% power to detect a scenario in which the intervention produced both a 5% change in the probability of behavioural change and a 5% change in the magnitude of peak electricity use. This estimate was adjusted to reflect a DiD analytical approach, and the reduction in longitudinal information associated with moving from a four-month baseline and nine-month intervention period to three months in both the baseline and intervention periods. Assuming variance is proportional to $(1/T_{pre} + 1/T_{post})$, the revised design increased variance by a factor of approximately 2.02. Applying this inflation factor to the original estimate yielded a new estimate of 4,000 participants per arm, which led to us adopting a new goal sample of 4,080.

The baseline data obtained as part of the trial provided an opportunity to update these calculations with more accurate estimations. These were based on the DiD framework proposed by Burlig, Preonas and Woerman (2020)⁴, assuming 80% statistical power and a two-sided significance level of 5%. These calculations reflected the final length of the baseline and intervention periods, and assumed the inclusion of daily data points. Residual standard deviations were estimated from baseline two-way fixed effects (TWFE) models including household and date fixed effects. These residual standard deviations were used as the primary variance inputs because they more closely reflect the variation used to identify treatment effects in the DiD models than raw consumption variability. Autocorrelation was estimated from baseline TWFE residuals and modelled as an AR(1) process. This resulted in the following parameters in Table 11.

Table 11. Parameters used in the power calculations, based on the baseline data.

	British Gas	ScottishPower
Baseline mean peak kWh	1.3713	1.8602
Baseline peak kWh SD	1.3176	1.7910
TWFE residual SD	0.9516	1.2765

³ Pinto, S., Gorman, R., & Regan, A. (2024). *Insights into electricity consumption patterns in Great Britain*. London: Nesta. Published 15 October 2024

⁴ Burlig, F., L. Preonas, and M. Woerman (2020), "Panel Data and Experimental Design," *Journal of Development Economics*, 144, 102458

Residual AR(1) autocorrelation	0.1187	0.1723
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These analyses provided the minimum sample size required for each effect size (as an absolute percentage change in peak electricity use) and the observed minimum detectable effect possible with our achieved sample size, all of which are summarised in Tabel 12.

Table 12. Minimum required total sample sizes required to achieve 80% power and an alpha of 0.05, based on baseline data parameters, and achieved minimum detectable effects.

							Extended (CATE) model			
	Supplier	Effect size	Primary DiD model	Secondary DiD model*	Pooled TWFE	Event study model	Payment type	Priority Service Register	Region	Usage quintile
Min total sample	British Gas	1%	5,741	18,098	16,463	21,802	38,898	23,210	49,242	22975
		5%	230	724	659	873	1,556	929	1,970	919
		10%	58	181	165	219	389	233	493	230
	ScottishPower	1%	6,089	9,134	8,121	N/A	79,066	29,972	43,447	24356
		5%	244	366	325	N/A	3,163	1,199	1,738	975
		10%	61	92	82	N/A	791	300	435	244
Achieved minimum detectable effect**	British Gas		0.50%	1.78%	0.85%	0.97%	1.42%	1.01%	3.75%	1.58%
	ScottishPower		0.54%	0.77%	0.89%	N/A	1.96%	1.21%	4.18%	1.72%

* For British Gas, the secondary DiD model included the different messaging treatment groups. For ScottishPower, this refers to the model including the 50% and 100% rebate treatment conditions.

** Presented as the smallest detectable treatment effect, or for CATE analyses, the smallest detectable difference in treatment effects between subgroup levels, as a percentage of peak electricity use.

The substantially lower sample size requirements observed in the updated analyses are primarily due to the assumptions on which they were based; the baseline data revealed lower residual variance and considerably weaker within-household autocorrelation than had been included in the original indicative calculations. This therefore increased the expected precision of the difference-in-differences estimators, reducing the number of households required to achieve the same statistical power. Consequently, both trials were adequately powered to identify an effect size of 5% change in peak electricity use, with most models also powered to 1%.

5.6. Model specifications

5.6.1. Primary model specification

Across both trials, the primary model was specified as follows:

$$Y_{im} = \alpha_i + \lambda_m + \tau (Treated_i \times Post_m) + \varepsilon_{im}$$

Where:

- Y_{im} : mean daily peak-hour electricity consumption for household i during month m (for British Gas) or day m (ScottishPower)
- α_i : household fixed effects, capturing time-invariant household characteristics
- λ_m : month-year fixed effects, capturing common temporal shocks and seasonality
- $Treated_i$: indicator equal to 1 if household i is assigned to the treatment group
- $Post_m$: indicator equal to 1 for periods after trial start
- $(Treated_i \times Post_m)$ interaction term identifying treated households in the post-treatment period
- τ : the difference-in-differences treatment effect estimate (ATT under the unconditional parallel trends assumption)
- ε_{im} : idiosyncratic error term

In our analyses, total peak kWh savings over the trial period are calculated by multiplying the ATT (τ) by the number of treatment days and households, assuming treatment effects are stable within and across months.

5.1.1. Secondary model specification

5.1.1.1. British Gas

The British Gas secondary model was specified as follows:

$$Y_{im} = \alpha_i + \lambda_m + \tau_1 (Treated_i \times Post_m) + \tau_2 (Treated_i \times Post_m \times Frequency_{im}) + \tau_3 (Treated_i \times Post_m \times 100\%Rebate_{im}) + \tau_4 (Treated_i \times Post_m \times Message_i) + \varepsilon_{im}$$

Where:

- Y_{im} : mean daily peak-hour electricity consumption for household i during month m

- α_i : household fixed effects, capturing time-invariant household characteristics
- λ_m : month-year fixed effects, capturing common temporal shocks and seasonality
- $Treated_i$: indicator equal to 1 if household i is assigned to the treatment group
- $Post_m$: indicator equal to 1 for periods after trial start
- $Frequency_{im}$ = dummy variable equal to 1 if individual i received fortnightly communication at time m .
- $100\%Rebate_{im}$ = dummy variable equal to 1 if individual i received a 100% rebate at time m
- $Message_i$ = dummy variable equal to 1 if individual i received the additional message before the start of the trial.
- $(Treated_i \times Post_m)$ interaction term identifying treated households in the post-treatment period
- τ : the difference-in-differences treatment effect estimate (ATT under the unconditional parallel trends assumption)
- ε_{im} : idiosyncratic error term

5.1.1.2. ScottishPower

For ScottishPower, the secondary model was specified as follows:

$$Y_{it} = \alpha_i + \lambda_t + \tau_1 (50\%Rebate_i \times Post_t) + \tau_2 (100\%Rebate_i \times Post_t) + \varepsilon_{it}$$

Where:

- Y_{it} : mean daily peak-hour electricity consumption for household i during day t
- α_i : household fixed effects, capturing time-invariant household characteristics
- λ_t : month-year fixed effects, capturing common temporal shocks and seasonality
- $Post_t$: indicator equal to 1 for periods after trial start
- $50\%Rebate_i$ = dummy variable equal to 1 if individual i received a 50% rebate on day t
- $100\%Rebate_i$ = dummy variable equal to 1 if individual i received a 100% rebate on day t
- $(50\%Rebate_i \times Post_t)$ and $(100\%Rebate_i \times Post_t)$: interaction term identifying treated households in the post-treatment period
- τ : the difference-in-differences treatment effect estimate (ATT under the unconditional parallel trends assumption)
- ε_{it} : idiosyncratic error term

5.6.2. Extended conditional average treatment effect (CATE) model specification

This full model specification allows us to estimate conditional average treatment effects (CATEs) by household characteristics. In the British Gas dataset, covariates were demeaned to improve interpretability of interaction terms. Under this specification, the main treatment coefficient represents the estimated treatment effect evaluated at the mean value of the included covariates., and heterogeneous effects are captured as deviations from this average ATT. We do not demean in the ScottishPower dataset.

As mentioned above, identification relies on a conditional parallel trends assumption, whereby absent treatment, the difference between treated and control households would evolve similarly within covariate groups. We allow for this by interacting post-period level shocks and observed

customer characteristics. Conditional on these controls, the identification of the treatment effect comes from within-group differences between treated and control in trial period. We verify common support from distribution of covariate characteristics between treated and control groups to support the plausibility of this identification strategy.

Using such a complex model risks multicollinearity as well as overfitting and loss of precision. We run diagnostics and drop one covariate only (high frequency communications treatment indicator) and do not observe any substantial increase in SE for the baseline ATT estimate. To assess robustness, we compare estimates from this fully specified model with those from the simpler baseline specification and find that the estimated ATT is roughly stable across specifications. We also run separate simple model specification by baseline consumption quintile group to mitigate multicollinearity and overfitting concerns but find no significant heterogeneity by baseline consumption group.

British Gas

The CATE model for British Gas specification was:

$$Y_{im} = \alpha_i + \lambda_m + \tau (Treated_i * Post_m) + \delta (X_i * Post_m) + \varphi (X_i * m) + \gamma (X_i * Treated_i * Post_m) + \varepsilon_{im}$$

Where:

- Y_{im} : mean daily peak-hour electricity consumption for household i during month m
- α_i : household fixed effects, capturing time-invariant household characteristics
- λ_m : month-year fixed effects, capturing common temporal shocks and seasonality
- $Treated_i$: indicator equal to 1 if household i is assigned to the treatment group
- $Post_m$: indicator equal to 1 for periods after trial start
- $(Treated_i \times Post_m)$ interaction term identifying treated households in the post-treatment period
- τ : the difference-in-differences treatment effect estimate (ATT under the unconditional parallel trends assumption)
- X_i : vector of demeaned household characteristics
- ε_{im} : idiosyncratic error term

This included the following interaction terms:

- δ = Captures differential post-period shocks across covariate groups affecting both treated and control households. Helps isolate treatment-specific heterogeneity by accounting for common shifts correlated with characteristics
- φ = Relaxes the assumption of unconditional parallel trends and allows for conditional parallel trends, i.e. linear time trends that vary systematically with observable characteristics
- γ = Captures treatment effect heterogeneity. Measures how responsiveness to the intervention varies with household characteristics Interpreted as deviations from the average ATT (τ)

ScottishPower

The extended CATE model for ScottishPower was specified as follows:

$$Y_{it} = \alpha_i + \lambda_t + \delta (X_i * Post_m) + \tau_1 (50\%Rebate_i \times Post_t) \times X_i + \tau_2 (100\%Rebate_i \times Post_t) \times X_i + \varepsilon_{it}$$

Where:

- Y_{it} : mean daily peak-hour electricity consumption for household i during month t
- α_i : household fixed effects, capturing time-invariant household characteristics
- λ_t : month-year fixed effects, capturing common temporal shocks and seasonality
- $Post_t$: indicator equal to 1 for periods after trial start
- $50\%Rebate_i$: dummy variable equal to 1 if individual i received a 50% rebate at time t
- $100\%Rebate_i$: dummy variable equal to 1 if individual i received a 100% rebate at time t
- $(50\%Rebate_i \times Post_t)$ and $(100\%Rebate_i \times Post_t)$: interaction term identifying treated households in the post-treatment period
- τ : the difference-in-differences treatment effect estimate (ATT under the unconditional parallel trends assumption)
- X_i : vector of household characteristics
- ε_{im} : idiosyncratic error term

Model specification for estimating the impact of the 100% maximum rebate period for British Gas.

Finally, we present an event-study design that estimates treatment effects separately by month relative to the intervention start. We use these estimates to assess whether responses plateau during the 50% phase and to construct a more credible estimate of the marginal effect by comparing the final 50% month (month 3) with the 100% phase (month 4) as well as the average over the 3 month 50% period and the 100% phase. The estimated regression corresponds to:

$$Y_{im} = \alpha_i + \gamma_m + \sum_{k \neq -1} \beta_k * (Treated_i \times 1[m - m_0 = k]) + \varepsilon_{im}$$

Where:

- Y_{im} : mean daily peak-hour electricity consumption for household i during month m
- α_i : household fixed effects, capturing time-invariant household characteristics
- γ_m : month-year fixed effects, capturing common temporal shocks and seasonality
- $Treated_i$ indicator equal to 1 if household is assigned to the treatment group
- m : Calendar month index
- m_0 : Month of treatment start
- $m - m_0 = k$ (event time): Event time, indexing months relative to treatment start
- $1[m - m_0 = k]$ (event time indicator): Indicator equal to 1 if observation is k months relative to treatment start, 0 otherwise
- β_k (dynamic treatment effects): treatment effect k months relative to treatment start (relative to the omitted reference period $k = -1$)
- ε_{im} : idiosyncratic error term

This specification allows treatment effects to vary flexibly over time and avoids imposing a constant effect across different phases of the intervention. Crucially, rather than interpreting individual coefficients in isolation, we construct linear contrasts of the event-time coefficients to recover estimated treatment effects. The standard error of these contrasts is estimated using the delta method, which accounts for covariance between estimated coefficients by using the full covariance matrix of the estimated parameters. Because these contrasts are linear functions of the estimated parameters, the delta method yields exact (rather than approximated) standard errors.

The estimated parameters are:

- $\beta_4 - \beta_3$: Marginal effect of increasing rebate intensity. This difference compares the first period of full (100%) rebate to the final period of partial (50%) rebate, providing a test for a discrete “step-change” from 50% to 100% rebate. For identification, this difference requires strong assumptions over the absence of carryover effects across treatments.
- $\beta_4 - 1/3 (\beta_1 + \beta_2 + \beta_3)$: Full rebate vs average partial rebate. This provides a more stable estimate of whether increasing incentive intensity produces additional effects, but combines month-to-month variation during the 50% phase.

6. Consumer demand response results summary

6.1. British Gas

The results of the consumer demand response analyses for British Gas are summarised in Table 13.

Table 13: Results summary table - British Gas

Trial	Analysis	50% Phase	100% Phase
British Gas	Primary model specification	-0.0276 (p=0.011)	N/A
British Gas	Pooled TWFE	-0.0272 (p=0.013)	-0.0377 (p=0.001)
British Gas	Event study	Event study	-0.0196 average over months 1–3 (p=0.056) -0.0301 Month 4 (p=0.010)

6.1.2. Results for the 50% maximum rebate analysis

The baseline model estimates a treatment effect of approximately -0.03 kWh per day $[-0.0563 - 0.0088]$ (p value = 0.0072, SE = 0.0121). The extended specifications yield a highly similar baseline estimate (evaluated at the mean of covariates), which indicates a level of robustness across our model specifications $(-0.0365 [-0.0622, -0.0108], p \text{ value} = 0.0054)$. We run the baseline model at

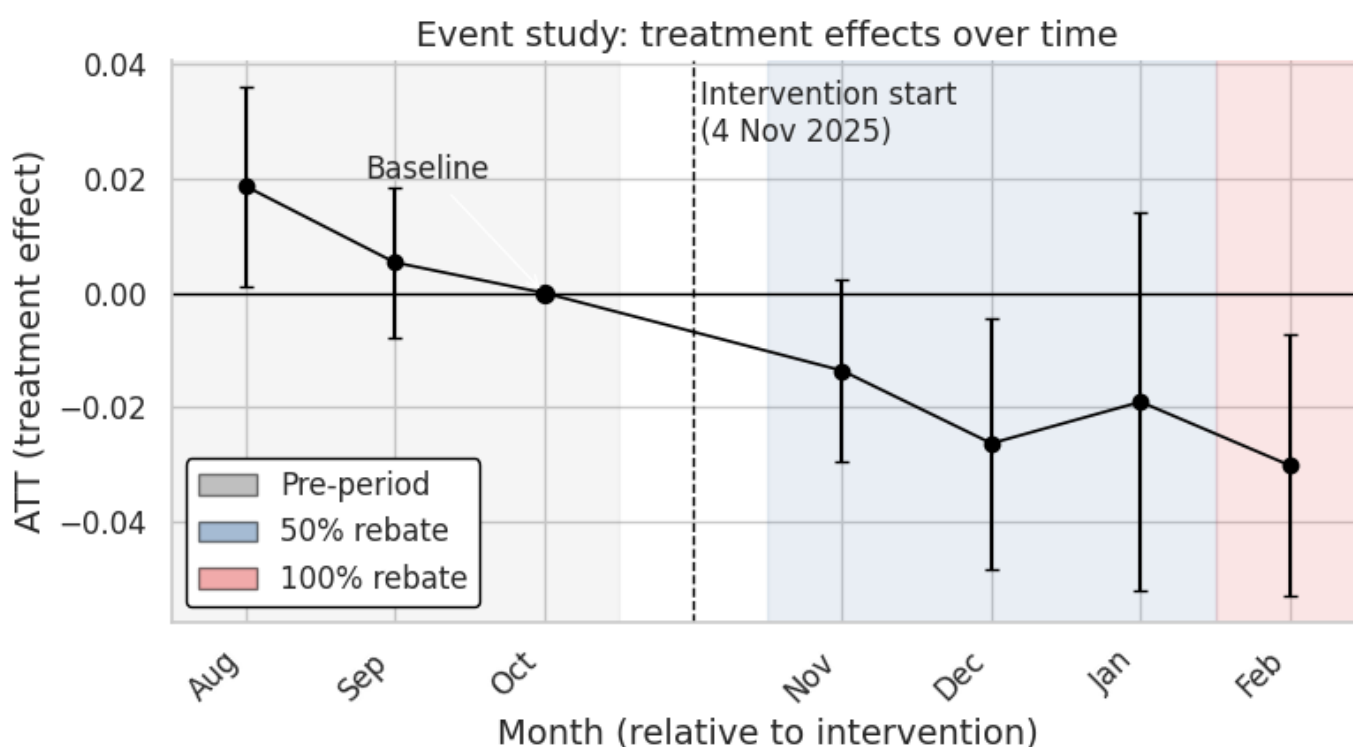
the daily level as a sensitivity check and identify a slightly smaller estimate (-0.027 kWh) [-0.0490 - 0.0062] (p value = 0.0114, SE = 0.0109) statistically significant at the 5% level.

This difference is due to the monthly specification smoothing out day-to-day variation and removing high-frequency noise. The monthly-level estimate reflects persistent treatment effects more than short-run fluctuations. At the same time, this monthly aggregation reduces the number of observations, which increases standard errors very slightly compared to the daily level model. Statistical significance varies slightly around the 1% threshold, reflecting modest differences in the estimated effect size (smaller under the daily model) rather than substantial changes in precision.

6.2.2. Results of the 100% maximum rebate analysis

Using our pooled TWFE model we reconfirm the significant effect at the 50% rebate phase (-0.0272, p value = 0.0126) and a larger effect at the 100% phase (-0.0377, p value = 0.0012). Plotting out the event study coefficients, we see evidence for the treatment effect start in month 1, with the strongest effect observed in month 2 (See Figure 8). There is some noise, noticeably in the third month but overall; nevertheless, we identify a consistent negative effect, suggesting the existence of a non-zero effect that persists over time.

Figure 8: Event study estimates of treatment effects on peak-period electricity consumption over time - British Gas



6.2. ScottishPower

The results of the consumer demand-response analyses for ScottishPower are summarised in Table 14. The primary analysis estimated the effect of the 50% and 100% maximum standing charge rebates separately, relative to the control group, using household-day data and a difference-in-differences model with household and day fixed effects.

Table 14. Results summary table – ScottishPower

Trial	Analysis	50% maximum rebate	100% maximum rebate
ScottishPower	Primary difference-in-differences model	-0.0026 kWh per day (p = 0.783)	+0.0036 kWh per day (p = 0.692)
ScottishPower	Extended CATE specification	No consistent evidence of an overall treatment effect across customer characteristics	No consistent evidence of an overall treatment effect across customer characteristics

The primary difference-in-differences model estimates no statistically significant effect of either standing charge rebate treatment on weekday peak-period electricity consumption. Relative to the control group, the estimated treatment effect for the 50% rebate condition was -0.003 kWh per household per day (95% CI: [-0.0208, 0.0156], p value = 0.783, SE = 0.0093), while the corresponding estimate for the 100% rebate condition was 0.004 kWh per household per day (95% CI: [-0.0142, 0.0214], p value = 0.692, SE = 0.0091). Neither estimate is statistically distinguishable from zero, indicating no detectable impact of either rebate condition on peak-period electricity consumption.

The extended model specifications explored whether responsiveness varied according to baseline consumption, customer characteristics, payment method and geographic region. While some statistically significant subgroup interactions were identified, these did not form a consistent across rebate levels or customer characteristics. For example, participants in the highest baseline consumption quintile within the 50% treatment group exhibited larger reductions in peak consumption than lower-consuming households (95% CI [-0.144, -0.003], p value = 0.04, SE = 0.0359), and some regional differences were observed across individual specifications. Participants located in South Wales receiving the 50% rebate recorded larger reductions in peak consumption than the baseline (95% CI [-0.204, -0.005], p value = 0.039, SE = 0.0507) and within the 100% rebate treatment group, participants in the Southern region exhibited a larger reduction in peak-period consumption relative to the baseline (95% CI [-0.209, -0.056], p value = 0.001, SE = 0.0391). However, these findings were not replicated consistently across treatments and should therefore be interpreted as exploratory rather than as evidence of systematic treatment-effect heterogeneity. Overall, the extended analyses support the conclusion that there is no robust evidence of an average treatment effect or consistent subgroup-specific treatment effects within the ScottishPower trial.

7. Robustness checks for incentive functioning and rebate outcome

This section examines how the standing charge rebate mechanisms operated in practice across both trials. Rather than assessing behavioural outcomes directly, these analyses provide

descriptive evidence on the distribution of rebates earned by participants, patterns of peak-period electricity consumption, and the relationship between electricity use and rebate payments. Together, these analyses help assess whether the incentive structures functioned as intended, whether participants were able to access rewards under the scheme, and the extent to which rebate payments varied across customers and treatment conditions.

The analyses presented in this section should be interpreted as implementation and mechanism checks that support interpretation of the main behavioural findings. In particular, they provide insight into participants' exposure to the financial incentives, the range of rewards delivered during the trials, and whether rebate payments aligned with the incentive structures described in Section 2.2. Understanding these features is important for contextualising the demand response results presented in the preceding sections and for assessing the practical feasibility of standing charge rebates as a mechanism for encouraging peak-time flexibility.

7.1. Standing Charge rebate outcomes

This section presents descriptive analyses of rebate earnings and electricity consumption observed during the trial periods. It examines the distribution of rebates received by participants, the distribution of peak-period electricity consumption, and the relationship between consumption and rebate payments under each supplier's incentive design. These analyses provide evidence on the extent to which participants were able to earn rebates and whether the reward structures operated in accordance with the intended design of each trial.

Below, we present the total amount of earnings consumers were able to obtain in both the British Gas trial (Figure 9) and the ScottishPower trial (Figure 10). Note these graphs only include a single observation per respondent, that is the total amount they earned during the trial (in the case of British Gas, separately in the two rebate periods). Both figures show that the majority of consumers earned money in both trials, an indication that the goal was accessible. The ScottishPower data shows that distribution of earnings flattens as the reward increases, with consumers earning more money (the mean shifts to the right), and increasing variability (the variance also increases, with a bigger spread); we do not see the same profile in the British Gas data because the period when all consumers had a potential 100% rebate was only 1 month, versus consumers could earn a maximum 50% rebate in standing charge for 3 months.

Figure 9: Distribution of total rebate received – British Gas

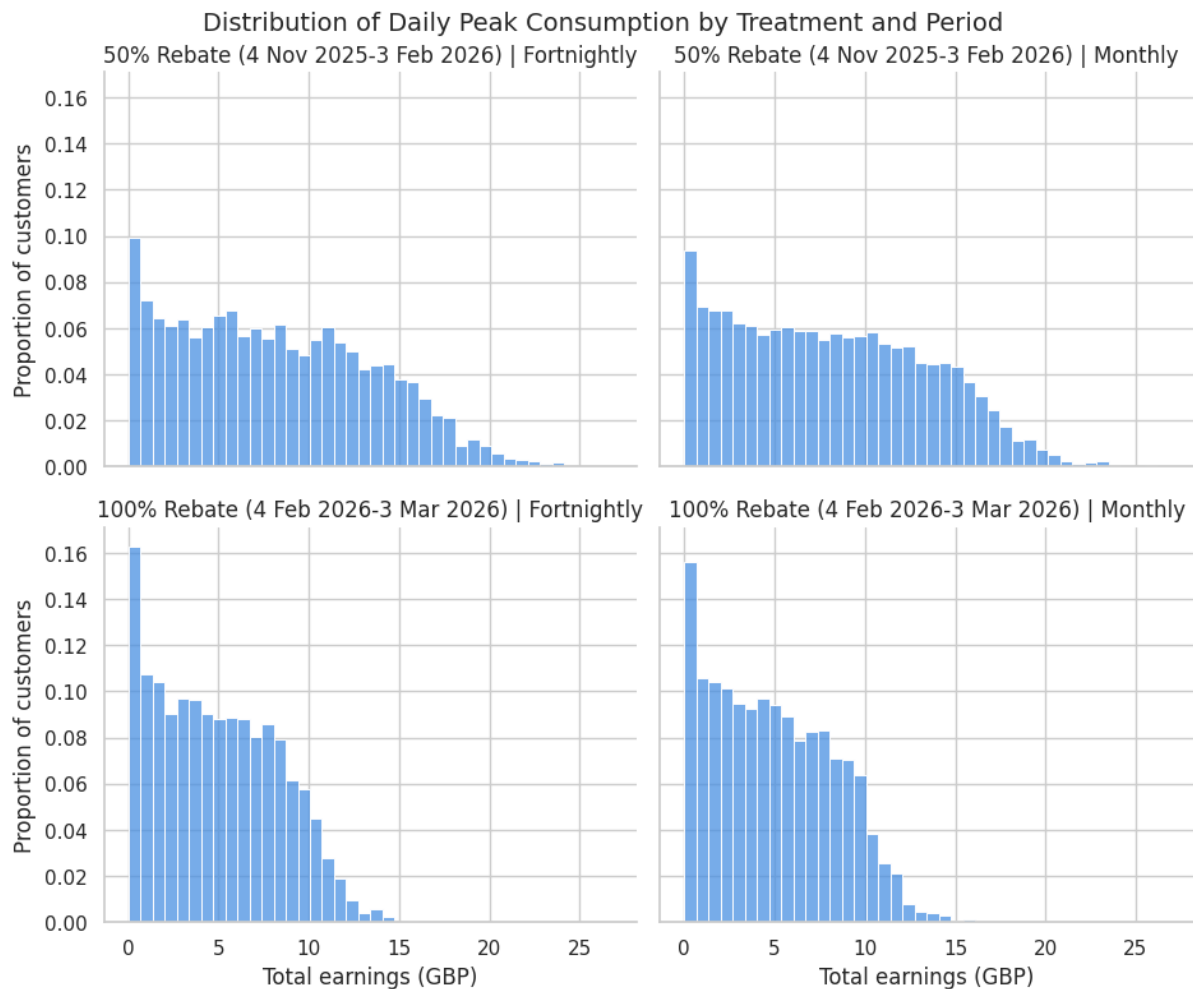


Figure 10: Distribution of total rebate received – ScottishPower

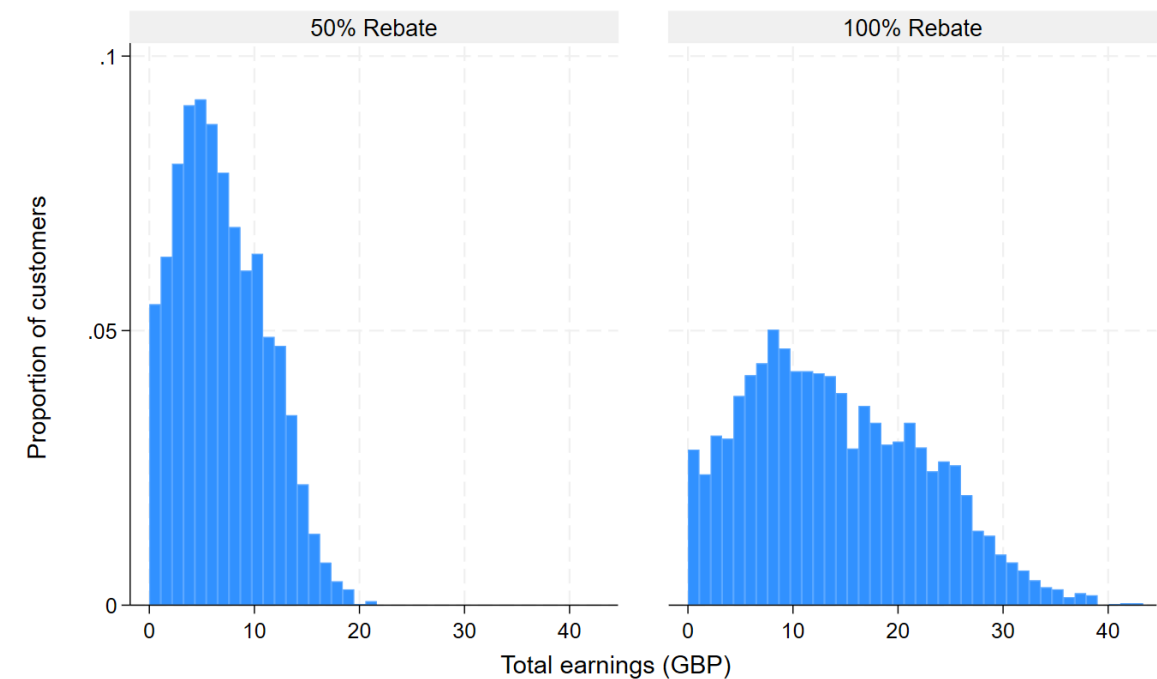


Figure 11 and Figure 12 present the distribution of daily peak-time consumption during the trial (in these graphs, data has not been imputed). Note that consumers appear multiple times (once for each day of trial) in each of these graphs. Figure 11 presents the British Gas data, while Figure 12 presents the ScottishPower data. For British Gas, the distribution shifts slightly towards lower levels of consumption during the 100% rebate phase compared with the 50% rebate phase, suggesting a modest reduction in peak-time usage. No comparable shift is observed between the monthly and fortnightly communication groups. For ScottishPower, the distribution for the 50% and 100% rebate groups are highly similar, indicating little evidence of change in peak-time consumption associated with the higher rebate level.

Figure 11: Distribution of daily peak consumption (restricted to <5kWh) – British Gas

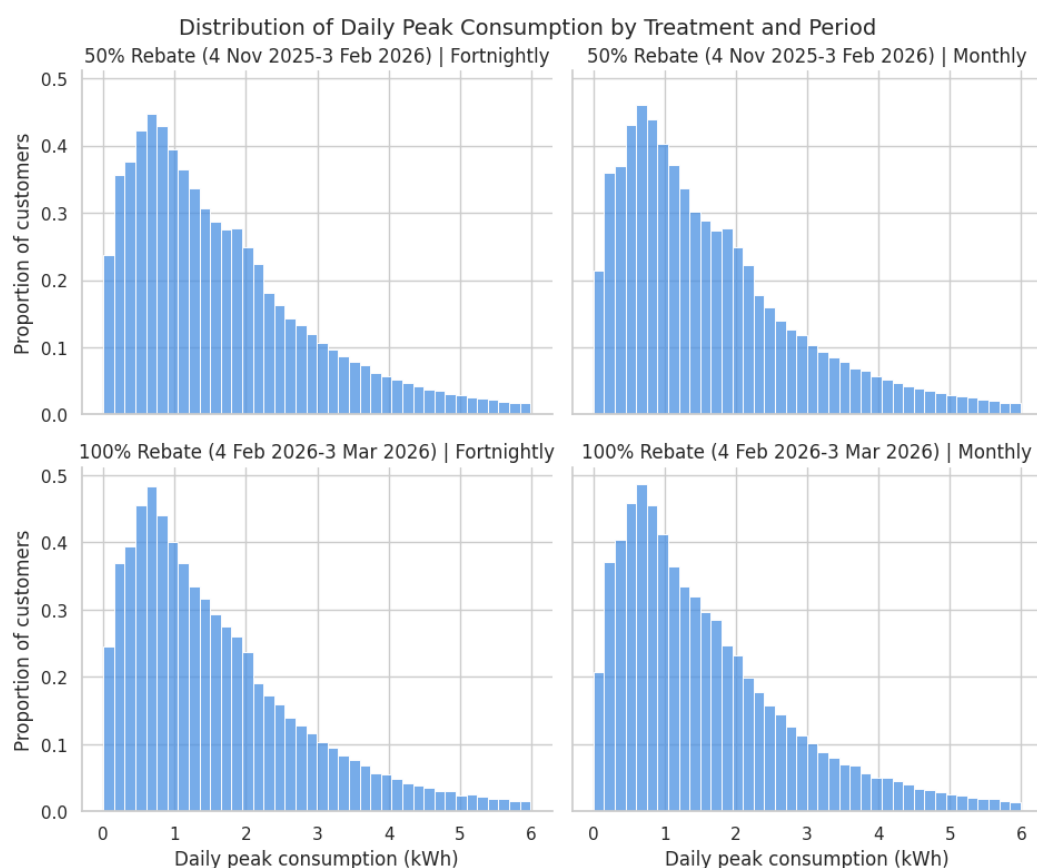


Figure 12: Distribution of daily peak consumption (restricted to <5kWh) – ScottishPower

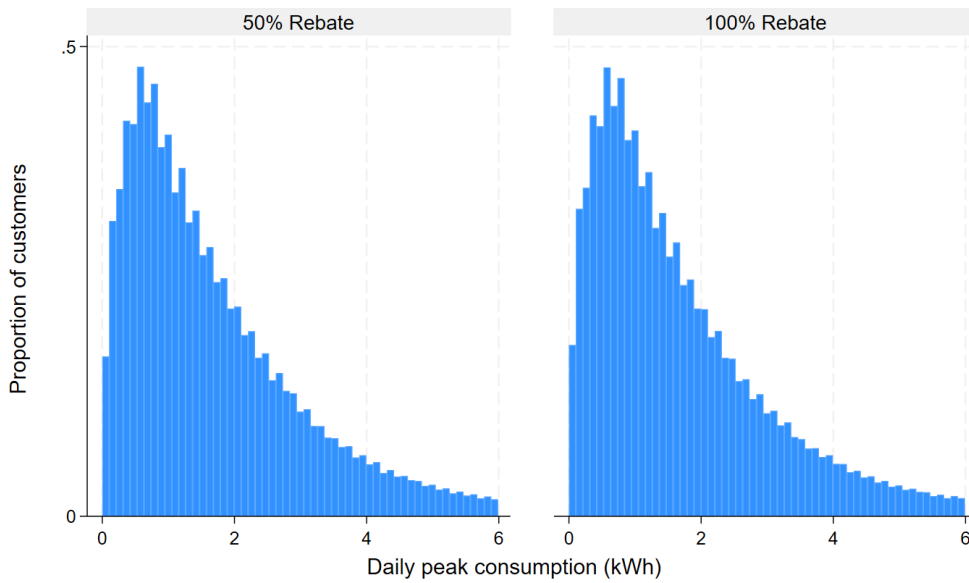
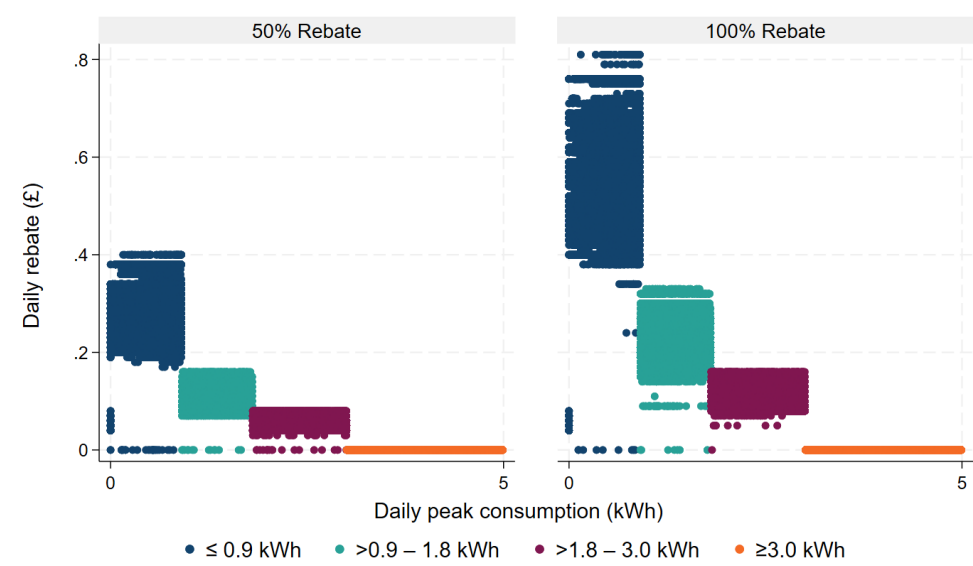


Figure 13 and Figure 14 show the relationship between reward and consumption. In particular, the graphs relate Daily peak consumption (kWh) on the x-axis with Daily rebate (£) in the y-axis. Figure 13 refers to British Gas consumers, while Figure 14 portrays ScottishPower consumers. Both graphs show that – by and large – rewards aligned with the incentive structure presented in section 2.2 on incentive mechanisms. In particular, British Gas consumers started earning a reward when they were below about 2.5 kWh per day, and their reward increased linearly as consumption decreased, up to about 0.5 kWh per day. The line is steeper when the incentive increased from 50% to 100%, as expected. Similarly, ScottishPower consumers show a step-wise increase in earnings, as expected by the incentive design, with much larger rebates in the 100% Rebate group.

Figure 13: Relationship between daily rebate and daily peak consumption (restricted to <5 kWh) – British Gas



Figure 14: Relationship between daily rebate and daily peak consumption (restricted to <5 kWh) – ScottishPower



8. Survey

The survey was designed to complement the behavioural trials by providing additional evidence on participants' awareness, understanding, perceptions and experiences of the interventions. While the smart meter analysis examined observed behavioural outcomes, the survey explored participants' attitudes towards standing charges and electricity flexibility, perceptions of fairness and acceptability, engagement with electricity use, perceived control over energy bills, and the motivations and barriers associated with behavioural change.

Specifically, the survey was designed to address the following topics of interest:

- awareness and understanding of standing charges and flexibility;
- perceptions of the standing charge-based price signal;
- perceived fairness and acceptability of the intervention;
- motivation and ability to shift peak-time electricity use;
- engagement with electricity use and perceived control over bills;
- customer understanding of the proposition;
- satisfaction with the intervention and overall trial experience; and
- barriers and enablers to behaviour change.

8.1. Survey administration

We commissioned The Behaviouralist to administer and manage the survey, which was hosted on Qualtrics and distributed using unique participant-specific survey links generated by The Behaviouralist. To protect participant privacy and maintain separation between survey responses and personally identifiable information, all survey administration processes relied on pseudonymised participant identifiers.

The survey administration process consisted of the following steps:

- i. The Behaviouralist generated unique survey links using pseudonymised participant identifiers.
- ii. Survey links were matched to pseudonymised participant records and shared with suppliers for distribution by Ofgem.

- iii. Suppliers distributed survey invitations to eligible participants using the assigned links.
- iv. Participants completed the survey through Qualtrics.
- v. Survey responses were collected directly through Qualtrics and were available to The Behaviouralist.
- vi. The Behaviouralist undertook data cleaning and quality assurance checks, produced a standalone survey analysis, and shared the cleaned survey dataset with Ofgem.
- vii. Survey responses were linked to pseudonymised trial datasets for analysis.
- viii. Suppliers administered participant incentives where applicable.

This approach allowed survey responses to be linked to behavioural smart meter data while ensuring that personally identifiable customer information remained under supplier control throughout the data collection process. We subsequently matched survey responses to pseudonymised participant identifiers and linked them to half-hourly consumption data where possible, enabling analysis of both attitudinal and behavioural outcomes.

8.2. Sampling

The survey adopted a census-style sampling approach. Rather than selecting a subsample of trial participants, both suppliers invited all eligible treatment and control group participants to complete the survey. This approach was intended to maximise statistical power, support robust comparisons between groups, and improve the representativeness of the achieved survey sample relative to the wider trial population. Prior to deployment, we developed the survey questionnaire and shared a survey brief, including proposed survey questions and administration requirements, with suppliers for review and feedback.

Participation in the survey was voluntary. By completing the survey, participants provided explicit consent for the processing and analysis of their survey responses in accordance with the information provided within the survey invitation and participant information materials.

Throughout the process, we and The Behaviouralist received only pseudonymised participant identifiers and survey responses. Personally identifiable customer information remained under supplier control and was used solely for the purposes of survey invitation and incentive administration. No additional Request for Information (RFI) process was required to obtain survey responses because survey data were collected directly through Qualtrics and processed by The Behaviouralist before being shared with us.

Tables 15-24 show the demographic profile of survey respondents and balance across the control and treatment groups for both suppliers. Percentages are rounded to the nearest whole number.

8.2.1. British Gas

Table 15: Age group for British Gas survey participants

Variable	Category	Total N (%)	Control N (%)	Treatment N (%)
Age group	18–24	23 (1%)	14 (1%)	9 (1%)
Age group	25–34	224 (12%)	118 (12%)	106 (12%)
Age group	35–49	522 (28%)	276 (29%)	246 (28%)
Age group	50–64	519 (28%)	277 (29%)	242 (28%)
Age group	65–74	305 (17%)	161 (17%)	144 (16%)
Age group	75 or older	250 (14%)	122 (13%)	128 (15%)

Notes: Percentages are calculated within the relevant column. The p-value from a chi-square test comparing the distribution of responses across control and treatment groups was 0.818, indicating no significant differences. 'Prefer not to say' and 'Don't know' responses are excluded from the tables. Variable names are repeated on every row to support accessibility.

Table 16: Home ownership for British Gas survey participants

Variable	Category	Total N (%)	Control N (%)	Treatment N (%)
Home ownership	Bought on mortgage	453 (25%)	240 (25%)	213 (25%)
Home ownership	Living rent free	8 (0%)	3 (0%)	5 (1%)
Home ownership	Other	7 (0%)	1 (0%)	6 (1%)
Home ownership	Owned outright	630 (35%)	328 (34%)	302 (36%)
Home ownership	Rented from Housing Association/Trust	261 (14%)	146 (15%)	115 (14%)
Home ownership	Rented from Local Authority	211 (12%)	117 (12%)	94 (11%)

Variable	Category	Total N (%)	Control N (%)	Treatment N (%)
Home ownership	Rented from private landlord	193 (11%)	97 (10%)	96 (11%)
Home ownership	Shared ownership	44 (2%)	26 (3%)	18 (2%)

Notes: Percentages are calculated within the relevant column. The p-value from a chi-square test comparing the distribution of responses across control and treatment groups was 0.345, indicating no significant differences. 'Prefer not to say' and 'Don't know' responses are excluded from the tables. Variable names are repeated on every row to support accessibility.

Table 17: household size for British gas survey participants

Variable	Category	Total N (%)	Control N (%)	Treatment N (%)
Household size	1 person	556 (30%)	306 (32%)	250 (29%)
Household size	2 people	651 (36%)	335 (35%)	316 (37%)
Household size	3–4 people	513 (28%)	269 (28%)	244 (28%)
Household size	5+ people	110 (6%)	60 (6%)	50 (6%)

Notes: Percentages are calculated within the relevant column. The p-value from a chi-square test comparing the distribution of responses across control and treatment groups was 0.633 indicating no significant differences. 'Prefer not to say' and 'Don't know' responses are excluded from the tables. Variable names are repeated on every row to support accessibility.

Table 18: Electric heating only for British Gas survey participants

Variable	Category	Total N (%)	Control N (%)	Treatment N (%)
Electric heating only	No	1635 (87%)	859 (87%)	776 (86%)

Variable	Category	Total N (%)	Control N (%)	Treatment N (%)
Electric heating only	Not sure	65 (3%)	24 (2%)	41 (5%)
Electric heating only	Yes	190 (10%)	102 (10%)	88 (10%)

Notes: Percentages are calculated within the relevant column. The p-value is from a chi-square test comparing the distribution of responses across control and treatment groups was 0.043. Variable names are repeated on every row to support accessibility.

Table 19: Annual household income for British Gas survey participants

Variable	Category	Total N (%)	Control N (%)	Treatment N (%)
Annual household income	Less than £5,000	45 (3%)	21 (3%)	24 (4%)
Annual household income	£10,000–£14,999	165 (13%)	96 (14%)	69 (12%)
Annual household income	£15,000–£19,999	121 (9%)	64 (9%)	57 (10%)
Annual household income	£20,000–£24,999	133 (10%)	66 (9%)	67 (11%)
Annual household income	£25,000–£29,999	114 (9%)	66 (9%)	48 (8%)
Annual household income	£30,000–£34,999	105 (8%)	52 (7%)	53 (9%)

Variable	Category	Total N (%)	Control N (%)	Treatment N (%)
Annual household income	£35,000–£44,999	117 (9%)	62 (9%)	55 (9%)
Annual household income	£45,000–£49,999	61 (5%)	31 (4%)	30 (5%)
Annual household income	£5,000–£9,999	66 (5%)	42 (6%)	24 (4%)
Annual household income	£50,000–£54,999	50 (4%)	25 (4%)	25 (4%)
Annual household income	£55,000–£59,999	76 (6%)	43 (6%)	33 (6%)
Annual household income	£60,000–£79,999	117 (9%)	61 (9%)	56 (9%)
Annual household income	£80,000 or over	121 (9%)	68 (10%)	53 (9%)

Notes: Percentages are calculated within the relevant column. The p-value from a chi-square test comparing the distribution of responses across control and treatment groups was 0.749, indicating no significant differences. 'Prefer not to say' and 'Don't know' responses are excluded from the tables. Variable names are repeated on every row to support accessibility.

8.2.2. ScottishPower

Table 20: Age group for ScottishPower survey participants

Variable	Category	Total N (%)	Control N (%)	Treatment N (%)
Age group	18–24	16 (1%)	9 (1%)	7 (1%)
Age group	25–34	171 (10%)	90 (10%)	81 (10%)
Age group	35–49	515 (30%)	265 (29%)	250 (30%)
Age group	50–64	593 (34%)	305 (34%)	288 (35%)
Age group	65–74	293 (17%)	161 (18%)	132 (16%)
Age group	75 or older	148 (9%)	77 (8%)	71 (9%)

Notes: Percentages are calculated within the relevant column. The p-value from a chi-square test comparing the distribution of responses across control and treatment groups was 0.939, indicating no significant differences. 'Prefer not to say' and 'Don't know' responses are excluded from the tables. Variable names are repeated on every row to support accessibility.

Table 21: Home ownership for ScottishPower survey participants

Variable	Category	Total N (%)	Control N (%)	Treatment N (%)
Home ownership	Bought on mortgage	510 (30%)	266 (30%)	244 (30%)
Home ownership	Living rent free	6 (0%)	1 (0%)	5 (1%)
Home ownership	Other	6 (0%)	3 (0%)	3 (0%)
Home ownership	Owned outright	509 (30%)	267 (30%)	242 (30%)
Home ownership	Rented from Housing Association/Trust	213 (13%)	104 (12%)	109 (13%)

Variable	Category	Total N (%)	Control N (%)	Treatment N (%)
Home ownership	Rented from Local Authority	145 (9%)	92 (10%)	53 (7%)
Home ownership	Rented from private landlord	277 (16%)	141 (16%)	136 (17%)
Home ownership	Shared ownership	31 (2%)	15 (2%)	16 (2%)

Notes: Percentages are calculated within the relevant column. The p-value from a chi-square test comparing the distribution of responses across control and treatment groups was 0.11, indicating no significant differences. 'Prefer not to say' and 'Don't know' responses are excluded from the tables. Variable names are repeated on every row to support accessibility.

Table 22: Household size for ScottishPower survey participants

Variable	Category	Total N (%)	Control N (%)	Treatment N (%)
Household size	1 person	416 (25%)	215 (24%)	201 (25%)
Household size	2 people	588 (35%)	324 (36%)	264 (33%)
Household size	3–4 people	569 (34%)	315 (35%)	254 (32%)
Household size	5+ people	124 (7%)	53 (6%)	71 (9%)

Notes: Percentages are calculated within the relevant column. The p-value from a chi-square test comparing the distribution of responses across control and treatment groups was 0.052, indicating no significant differences. 'Prefer not to say' and 'Don't know' responses are excluded from the tables. Variable names are repeated on every row to support accessibility.

Table 23: Electric heating only for ScottishPower survey participants

Variable	Category	Total N (%)	Control N (%)	Treatment N (%)
Electric heating only	No	1496 (86%)	784 (86%)	712 (85%)
Electric heating only	Not sure	75 (4%)	38 (4%)	37 (4%)
Electric heating only	Yes	177 (10%)	87 (10%)	90 (11%)

Notes: Percentages are calculated within the relevant column. The p-value from a chi-square test comparing the distribution of responses across control and treatment groups was 0.695, indicating no significant differences. Variable names are repeated on every row to support accessibility.

Table 24: Annual household income for ScottishPower survey participants

Variable	Category	Total N (%)	Control N (%)	Treatment N (%)
Annual household income	Less than £5,000	32 (2%)	16 (2%)	16 (3%)
Annual household income	£10,000–£14,999	135 (10%)	73 (11%)	62 (10%)
Annual household income	£15,000–£19,999	137 (10%)	73 (11%)	64 (10%)
Annual household income	£20,000–£24,999	127 (10%)	58 (8%)	69 (11%)
Annual household income	£25,000–£29,999	129 (10%)	67 (10%)	62 (10%)

Variable	Category	Total N (%)	Control N (%)	Treatment N (%)
Annual household income	£30,000–£34,999	128 (10%)	73 (11%)	55 (9%)
Annual household income	£35,000–£44,999	130 (10%)	74 (11%)	56 (9%)
Annual household income	£45,000–£49,999	94 (7%)	52 (8%)	42 (7%)
Annual household income	£5,000–£9,999	53 (4%)	31 (4%)	22 (3%)
Annual household income	£50,000–£54,999	68 (5%)	31 (4%)	37 (6%)
Annual household income	£55,000–£59,999	63 (5%)	31 (4%)	32 (5%)
Annual household income	£60,000–£79,999	110 (8%)	59 (9%)	51 (8%)
Annual household income	£80,000 or over	125 (9%)	54 (8%)	71 (11%)

Notes: Percentages are calculated within the relevant column. The p-value from a chi-square test comparing the distribution of responses across control and treatment groups was 0.479, indicating no significant differences. 'Prefer not to say' and 'Don't know' responses are excluded from the tables. Variable names are repeated on every row to support accessibility.

8.3. Survey delivery

8.3.1. British Gas

The British Gas endline survey was launched on 11 March 2026 and closed before 31 March 2026. All participant incentives were distributed by 31 March 2026. To maximise response rates and support robust comparisons between treatment and control groups, British Gas invited all treatment and control group participants to complete the survey. The survey sought to obtain a minimum of 800 completed responses, split broadly equally between treatment and control group participants and balanced across key participant characteristics where possible.

To encourage participation, additional project funding was allocated specifically for endline survey incentives. Participants who completed the survey received a £10 Amazon voucher. British Gas purchased and distributed vouchers through a third-party provider used for voucher administration. Incentive payments were capped within the allocated survey incentive budget.

8.3.2. ScottishPower

The ScottishPower endline survey was launched on 17th March 2026 and closed on 31st March 2026. ScottishPower distributed survey invitations to all identified treatment and matched control group participants. As with British Gas, survey administration relied on pseudonymised identifiers, ensuring that neither Ofgem nor The Behaviouralist received personally identifiable customer information. The first 1000 participants who completed the survey received a £10 Amazon voucher, which was administered by Scottish Power.

8.4. Survey data processing

8.4.1. Data cleaning and quality assurance

Prior to data transfer, The Behaviouralist reviewed all open-text responses to identify and remove any personal data that may have been inadvertently disclosed by participants. Personal identifiers such as names, contact details, account numbers, addresses and other potentially identifiable information were removed and replaced with placeholders where necessary. An anonymised redaction log was maintained throughout this process.

In addition, survey data underwent a series of quality assurance checks, including:

- completion-time checks to identify respondents who completed the survey unusually quickly;
- response-pattern checks to identify straight-lining and other systematic response patterns;
- verification of variable formats and coding structures;
- verification of survey routing and respondent eligibility; and
- maintenance of a documented cleaning log recording decisions, exclusions and recoding steps.

Any anomalies identified during cleaning were flagged for review rather than automatically removed from the dataset.

8.4.2. Data linkage and privacy protections

The survey design enabled us to link survey responses to the wider trial dataset using pseudonymised identifiers while maintaining robust privacy protections. Suppliers retained control of personally identifiable customer information throughout the survey administration process. We and The Behaviouralist accessed only pseudonymised participant identifiers and survey response data. This approach enabled integrated analysis of survey responses, trial participation records and smart meter consumption data while minimising the handling of personal data.

Where available, survey responses were linked to behavioural smart meter consumption data using pseudonymised participant identifiers. This enabled additional analyses examining relationships between participants' survey responses and observed behavioural outcomes during the trial. The linked analyses were conducted separately from the standalone survey analysis produced by The Behaviouralist. For ScottishPower, these linked analyses could not be conducted for the control group because the survey was administered to a separate control sample for which consumption data were not available. For British Gas, linked analyses were conducted using the subset of survey respondents whose survey responses could be successfully matched to consumption data; a technical issue affecting participant identifiers meant that the first 1,000 survey respondents could not be matched.

8.5. Survey analytical approach

The primary survey analysis population consisted of all respondents who provided usable responses to the relevant outcome measures. We included partial responses in item-level analyses where the relevant survey item had been completed and did not impute missing responses. Pairwise deletion was applied for item-specific analyses. Survey analyses were conducted on unweighted data.

For the majority of analyses, treatment groups were pooled and compared with the control group. Trial-specific treatment comparisons were conducted only where relevant to the underlying experimental design, specifically:

- British Gas: comparisons between communication-frequency treatment variants.
- ScottishPower: comparisons between rebate-level treatment variants.

8.5.1. Standalone survey data analysis

The primary survey analyses compared pooled treatment and control groups for each supplier across key outcome measures. Outputs included:

- descriptive statistics for all survey items;
- counts of non-missing responses;
- proportions of missing data;
- treatment-control mean differences;
- standard errors;
- p-values for statistical comparisons; and

- standardised effect sizes (Cohen's d)

The analysis focused on a set of primary outcomes: understanding of standing charges, perceived fairness of standing charges and engagement with electricity use. We also included secondary outcomes, including perceived control, understanding of energy bills, motivation to engage with flexibility, and satisfaction with the supplier proposition and trial experience.

9. Qualitative interviews

Following completion of the trial, qualitative interviews were conducted with selected participants from the treatment groups of both suppliers. The research examined how consumers understood and responded to trial communications, their experiences throughout the trial, factors influencing participation and behavioural responses, and perceptions of the trial's acceptability, fairness, benefits and drawbacks. Findings were used to support the interpretation of trial outcomes.

We commissioned Thinks Insight & Strategy to recruit and screen participants, conduct the interviews, and analyse the resulting data. Interviews were conducted online and lasted approximately one hour. The full discussion guide is provided in the supplementary report alongside this publication.

10. Final communications

10.1. Pre-trial communication

Initial communication emails

Figure 15: British Gas initial communication email

[View this email online](#)



Save up to £6 a month – trial starts 4th November

Your customer account number: A1234567

Hello Paul

Together with Ofgem, we're delighted to share that you've been included in an **exciting new Weekday Flexi Saver trial** this winter.

By taking part, you **could earn a discount on your daily standing charge** simply by moving your electricity use away from peak times during the week.

And together, we'll help ease the pressure on the UK's energy grid so everyone can get the electricity they need.

// Just think, if every home used **6% less electricity at peak times**, we could generate enough power for **67 hospitals for a whole year!** //

// Just think, if every home used **6% less electricity at peak times**, we could save over **£3 billion** on energy infrastructure building costs and help keep everyone's bills lower! //



How it works

From **Tuesday 4th November**, try moving your electricity use away from peak times – **weekdays between 4pm and 7pm**.

For each day you do, you could earn a discount of **up to 50% on your standing charge** for that day. Keep it up and you could **save up to £6 a month.***

Your daily savings will vary based on how much electricity you use during peak hours compared to similar homes in your area who are not part of this trial. **Use less electricity than they do, and you could earn a discount on your standing charge.**

Each month we'll let you know how much you've earned, and we'll credit the money straight back to your account or prepayment meter.

Simple ways to save

No need to sit in the dark or unplug the freezer. It's about the **little things you can do in the week to use less electricity at peak times.**

So, maybe it's using the dishwasher earlier, running the tumble dryer later or switching off the lights you don't need.

Your tariff and prices won't change. **The trial runs until 4th February 2026**, and you can **opt out** anytime. If you do, you'll keep all the savings you've earned so far in the trial, but you won't earn any new savings on your energy bill or meter. Once you opt out, we'll stop sending trial updates, and **you won't be able to rejoin the trial later.**

To find out more, take a look at our [FAQs](#).

We're just getting everything ready, and we'll send you a quick reminder **the day before the trial starts.**

Thanks for being with us and helping to make a difference,

Your British Gas Team

Figure 16: ScottishPower initial communication email


Account number:



Hello,

We're running an exclusive trial with Ofgem which kicks off on 12th January and will run until 31st March 2026. As a valued ScottishPower customer, you've been selected to take part in it.

You'll be automatically entered into this trial and just by shifting your electricity use away from peak times (Monday to Friday, 4pm to 7pm), you could save up to 100% on your standing charge. If you don't manage to shift any of your electricity, you'll continue to pay your standing charge at your normal rate.

Don't worry, if you don't want to take part in the trial, it's simple to opt out. Just send us an email to ofgem-trial@scottishpower.com including your name and account number with 'Ofgem trial opt out' in the subject line and we will update your preferences.

Savings you could make during peak times each weekday

Save 100%	If you use 0.9kWh or less.
Save 40%	If you use more than 0.9kWh but less than 1.8kWh.

Save 20% If you use between 1.8kWh and 3kWh.

Did you know?
You currently use an average of 2.48kWh of electricity during peak times.

How does the trial work?

- Shift**
Shift as much of your electricity use as you can away from the peak times of Monday to Friday, 4pm to 7pm.
Remember, this isn't about turning off every appliance you own - it's about the small changes you can make during the week to shift your electricity use away from peak times. For example, try using appliances a little earlier or later - like changing the time of your tumble dryer or loading the dishwasher after 7pm.
- Save**
Every day you shift your electricity use you could save up to 100% on your standing charge for that day. Depending on how much kWh you use during peak times, the lower the kWh usage, the larger the standing charge saving.
- See**
You'll be charged for your electricity as normal and then we'll credit your bill with the money you've saved by the middle of the following month.

We'll keep in touch by sending a fortnightly text message and a monthly roundup email so you can see the rewards you've earned.

Remember, when you shift some of your electricity use away from these peak times, you're also doing your bit for the planet. Because you're helping balance demand on the grid and making the most of renewable energy.

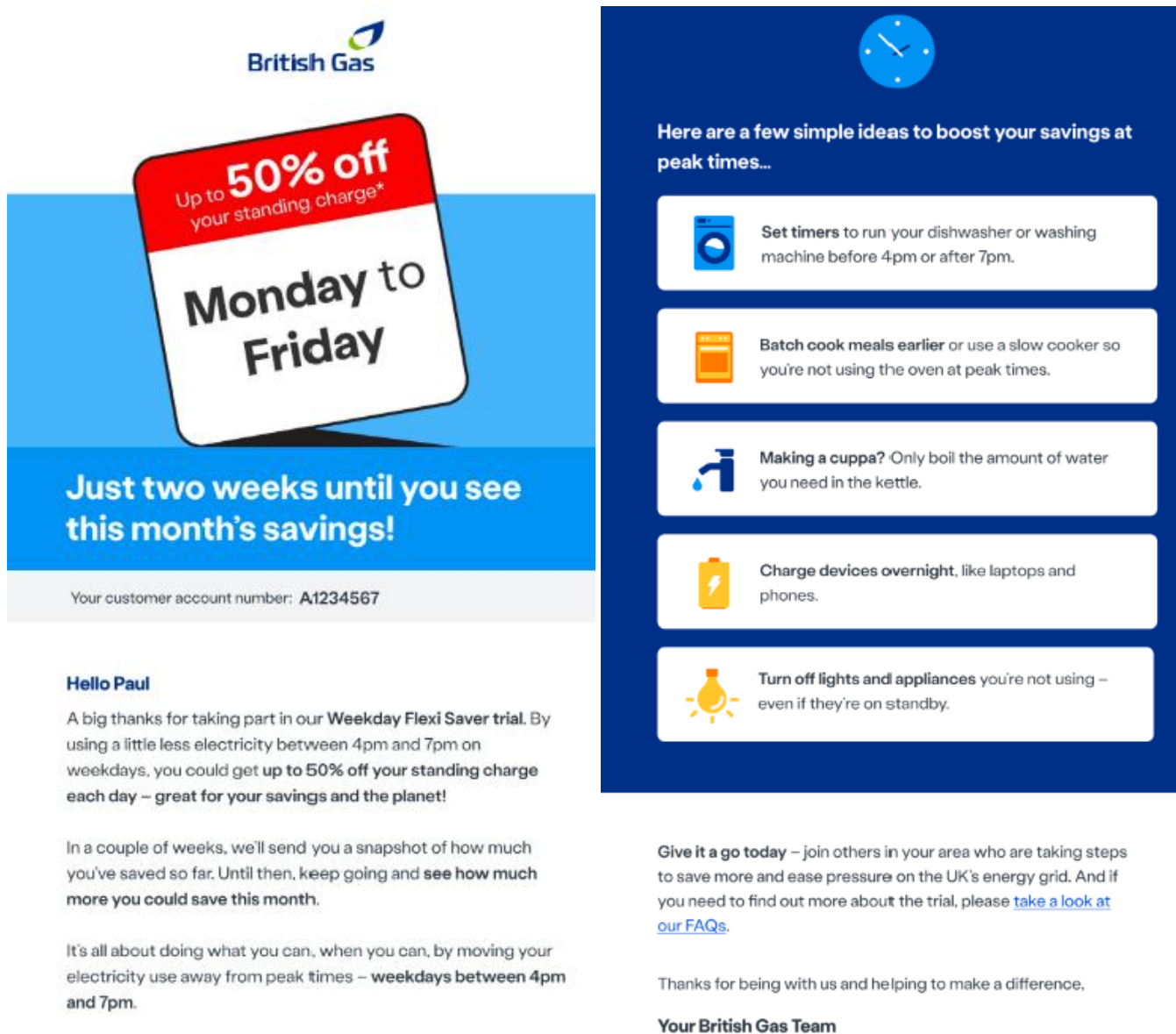
Thanks for being a ScottishPower customer.

Note: This example includes the savings available for Treatment 2. For Treatment 1, the savings you could make section read as 50%, 20% and 10%.

10.2. During trial communication

Fortnightly/reminder communication

Figure 17: British Gas fortnightly communication email



The image is a screenshot of a British Gas email. The top section features the British Gas logo and a large graphic of a calendar page with a red banner that says "Up to 50% off your standing charge*" and "Monday to Friday". Below this, a blue banner reads "Just two weeks until you see this month's savings!". The email body includes a personalized greeting "Hello Paul", a thank you for participating in the Weekday Flexi Saver trial, and a reminder to use electricity between 4pm and 7pm on weekdays. It also provides a customer account number: A1234567. On the right side, there is a blue sidebar with a clock icon and the heading "Here are a few simple ideas to boost your savings at peak times...". This sidebar contains five tips: 1. Set timers to run your dishwasher or washing machine before 4pm or after 7pm. 2. Batch cook meals earlier or use a slow cooker so you're not using the oven at peak times. 3. Making a cuppa? Only boil the amount of water you need in the kettle. 4. Charge devices overnight, like laptops and phones. 5. Turn off lights and appliances you're not using – even if they're on standby. At the bottom, there is a call to action "Give it a go today" and a link to the FAQs, followed by a thank you message and the signature "Your British Gas Team".

British Gas

Up to **50% off**
your standing charge*

Monday to Friday

Just two weeks until you see this month's savings!

Your customer account number: **A1234567**

Hello Paul

A big thanks for taking part in our **Weekday Flexi Saver** trial. By using a little less electricity between 4pm and 7pm on weekdays, you could get **up to 50% off your standing charge each day** – great for your savings and the planet!

In a couple of weeks, we'll send you a snapshot of how much you've saved so far. Until then, keep going and **see how much more you could save this month**.

It's all about doing what you can, when you can, by moving your electricity use away from peak times – **weekdays between 4pm and 7pm**.

Here are a few simple ideas to boost your savings at peak times...

- Set timers** to run your dishwasher or washing machine before 4pm or after 7pm.
- Batch cook meals earlier** or use a slow cooker so you're not using the oven at peak times.
- Making a cuppa?** Only boil the amount of water you need in the kettle.
- Charge devices overnight**, like laptops and phones.
- Turn off lights and appliances** you're not using – even if they're on standby.

Give it a go today – join others in your area who are taking steps to save more and ease pressure on the UK's energy grid. And if you need to find out more about the trial, please [take a look at our FAQs](#).

Thanks for being with us and helping to make a difference.

Your British Gas Team

ScottishPower sent two SMS reminders.

First SMS (sent two weeks after the initial communication email): "Shift your electricity use away from peak times, Mon to Fri, 4-7pm as part of our Ofgem trial and you could save money."

Second SMS (sent two weeks after the first month roundup email): "Remember to shift your electricity use away from peak times, Mon to Fri, 4-7pm, to save money on your standing charge."

Monthly summary communication

Figure 18: British Gas Monthly summary communication email

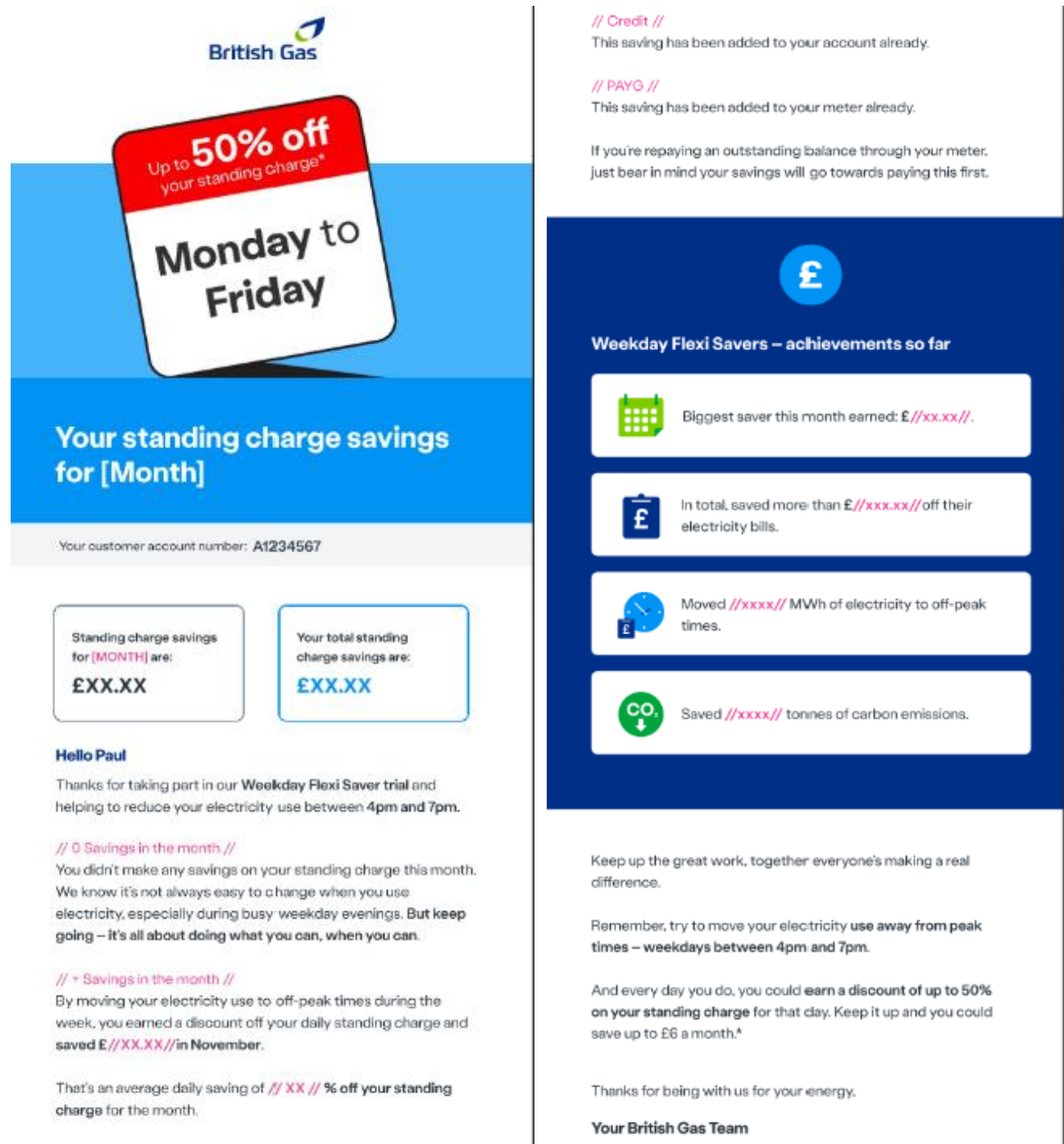


Figure 19: ScottishPower monthly summary communication email

 Account number:

Shift and
save

Get more from the trial



Hello **Greens**.

Because you're part of our exclusive trial¹ with Ofgem, when you **shift your electricity use away from peak times (Monday to Friday, 4pm to 7pm)** you can save up to 50%² off your standing charge.

The trial runs until 31st March 2026

You've been doing your bit to move your electricity to off-peak times, and you've saved £4.94 in the first two weeks of the trial. We've got some tips to help you to continue shifting your electricity use to make more savings.

Tips to make the most of your savings

Making small shifts in your habits could really add up while you're taking part in our Ofgem trial. Here are three tips to help make the most of it.

 Use delay timers to your advantage

Most washing machines, tumble dryer and dishwashers have delay timers. So, you can pop your washing in when you get home from work, and set the time so that it comes on after 7pm. Fresh clothes and a standing charge saving? Win-win.

 Get your batch cook on

Weekends are the ideal time to make the most of 50% off your standing charge. And what better way than by cooking up a storm to get your weeknight meals sorted.

 Make the most of the mornings

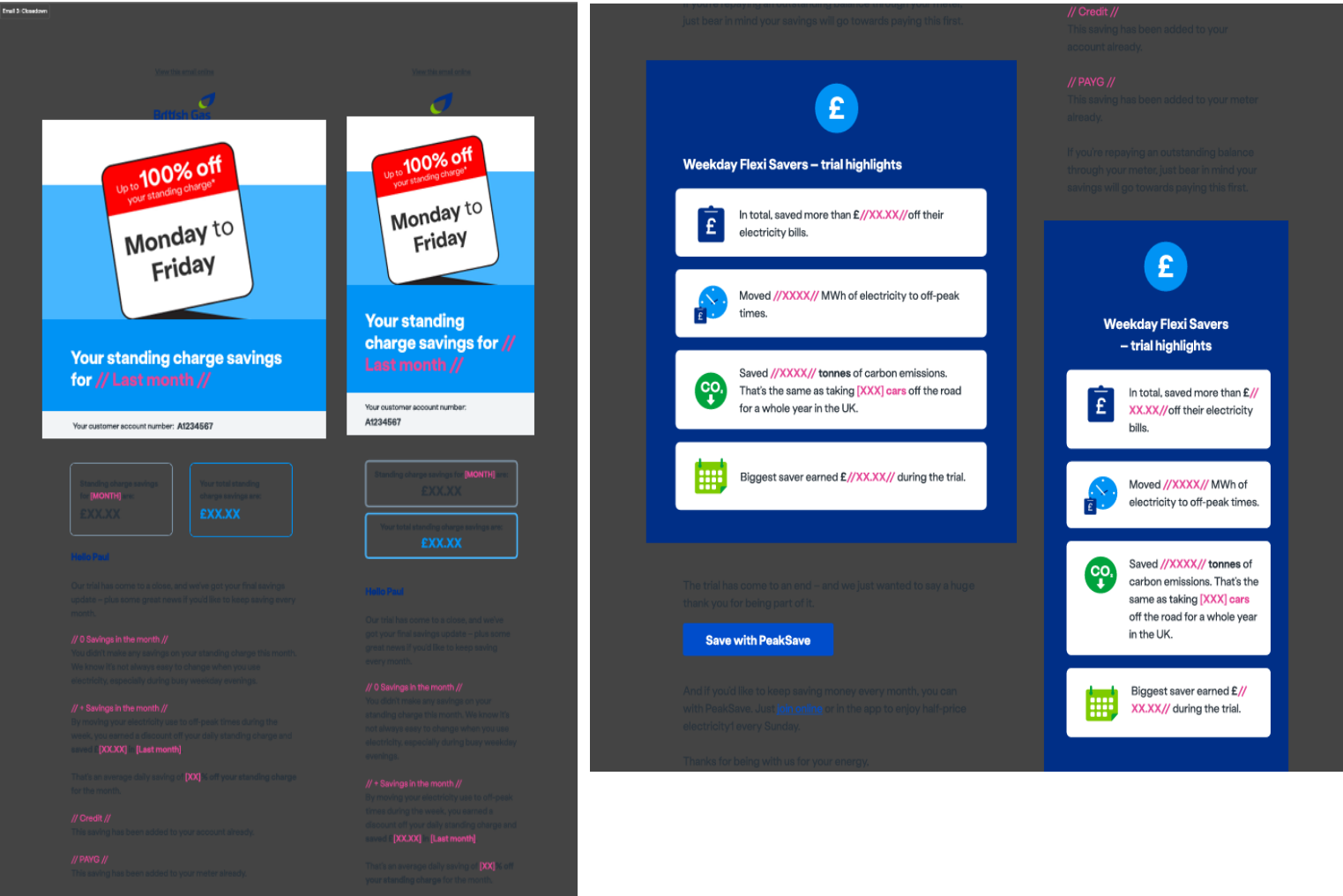
If weekends and evenings don't work for you, the best way to get more out your savings is to do your high energy use tasks in the morning. A quick Hoover before you head to work, using your slow cooker for your tea or popping the dishwasher on at lunchtime could all add up.

Thanks for being a ScottishPower customer.

62

10.3. End of trial communication (Only British Gas)

Figure 20 British Gas end of trial communication email



10.4. Endline survey communication

Survey Invite email

Figure 21 British Gas email invite for survey participation



Hello Paul

We're working with Ofgem, the energy regulator, to get a better picture of how households use electricity day to day, and we'd love your feedback. It's a quick survey and should only take around 10-15 minutes.

To say thanks for your time, we're giving a **£10 Amazon gift card** to the first 1,000 people who complete it.

Be quick, though - the survey closes on **28th March**.

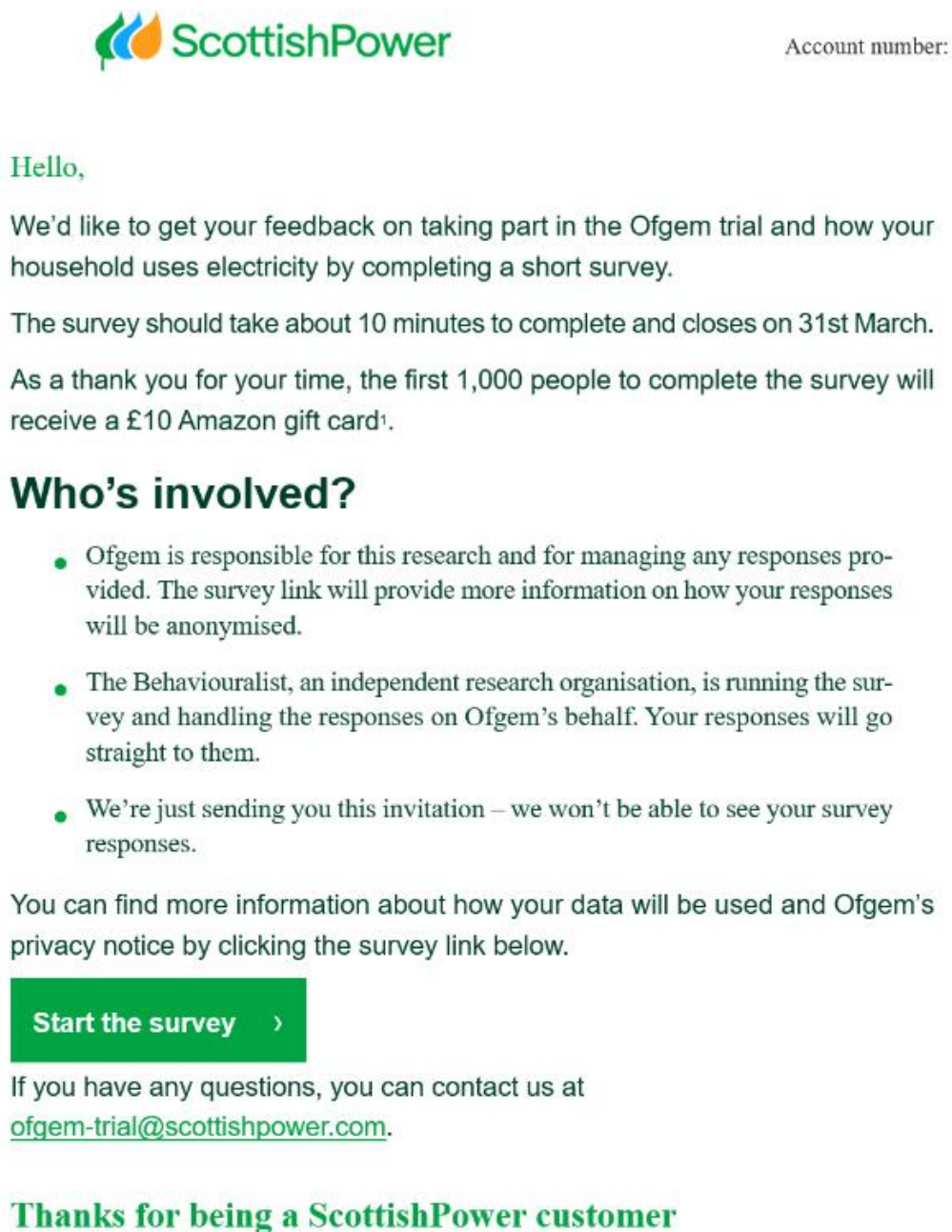
[Start the survey](#)

Your insights will help us shape smarter, more flexible tariffs in the future, so more UK homes can save money and energy. You'll find more information below about who's running the survey and how your data is protected.

Thanks for being with us for your energy.

Your British Gas team

Figure 22: ScottishPower email invite for survey participation



Survey reminder email (Only British Gas)

Figure 23: British Gas reminder email for survey



Hello Paul

Thanks to the amazing response to our survey so far, we're increasing the number of Amazon gift cards available. We're working with Ofgem to better understand how households use electricity day to day, and we'd love to hear from you.

It's a quick survey and should only take around 10 minutes. And as a thank you, we're now offering a **£10 Amazon gift card** to the next 1,500 people who take part.

Be quick, though - the survey closes on **28th March**.

[Start the survey](#)

Your insights will help us shape smarter, more flexible tariffs in the future, so more UK homes can save money and energy. You'll find more information below about who's running the survey and how your data is protected.

Thanks for being with us for your energy.

Your British Gas team

10.5. Qualitative research invite

Figure 24: British Gas email invite for the qualitative research interviews



Energy account A8490666



Tell us about your Flexi Saver experience

Hello Paul

You recently took part in our **Weekday Flexi Saver trial**, where you could get a discount on your standing charge by reducing your energy use between 4pm and 7pm on weekdays.

We're getting in touch about some follow-up research to learn more about your experience of the trial. We'd like to invite you to take part in a **60-minute telephone or video interview** (via Zoom) at a time that suits you.

As a thank you for your time, you'll receive **£50** from the research agency running this study on behalf of Ofgem.

You can read more about the research and how we'll use your data below. If you'd like to take part, just sign up.

Sign up

Your feedback will help us improve future trials, and we'd really appreciate you sharing your thoughts.

Thanks for being with us for your energy.

Your British Gas team

My Account

Privacy policy

Help & Support

Contact us

Information about the research

- This research is being carried out by Thinks Insight and Strategy, an independent research agency, on behalf of Ofgem. Further information about how your data is handled is provided on the sign-up page.
- A researcher from Thinks may call you to follow up after you submit the form and, if you agree, to book a time and date for the interview.
- Ofgem will receive only fully anonymised data from Thinks, and no other parties will have access to your personal data.
- If you have any questions about the research, please email Thinks at [PROJECT EMAIL ADDRESS] or call **020 7845 5880**.

Figure 25: ScottishPower email copy for the qualitative research invite



Account number: XXXXXXXXXXXX

Ofgem trial: We'd like your feedback

Hello XXXXX,

You recently took part in the Ofgem trial¹, where you could save on your standing charge by moving some of your electricity use away from peak times Monday to Friday, between 4pm and 7pm.

We'd like to hear more about your experience of the trial so would like to invite you to take part in a 60-minute telephone or video interview (via Zoom) at a time that suits you. If you're selected to take part, you'll receive a £50 payment from the independent agency carrying out this research on behalf of Ofgem, Thinks Insight and Strategy.

To register your interest, please sign up using the link below.

[Sign up](#)

You can read more about the research and how your data will be used below.

We look forward to hearing your views.

Information about the research:

- You can find more information about how your data is being used on the sign-up page.
- A researcher from Thinks may call you after you submit the form and, if you agree, will book a time and date for the interview.
- Ofgem will receive fully anonymised data from Thinks, and no other parties will have access to your personal data.
- If you have any questions about the research, please email Thinks on ofgemenergytrials@thinksinsight.com or call [020 7845 5880](tel:02078455880) (lines open Monday to Friday, 9am to 5pm).

Thanks for being a ScottishPower customer.

11. Final endline survey questionnaire

Q #	Question	Base	Type	Response options
	Section 1: Awareness, perceptions and understanding			
1	Before today, have you come across the term “peak times” in electricity use?	All	Single response	Yes; No; Not sure
2	When do you think peak times typically happen?	Q1 = Yes	Single response	Weekdays between 12pm–2pm; Weekdays between 4pm–7pm; Only weekends between 12pm–2pm; Only weekends between 4pm–7pm; Don’t know
3	Peak times are when electricity use is highest, such as early evening when people get home from work. Peak times typically happen on weekdays between 4pm–7pm. To what extent do you agree or disagree with the following statements?	All	-	-
3a	If people use less electricity during peak times (i.e., 4pm–7pm on weekdays) by reducing their overall usage or moving it to off peak times...it will be better for the environment.	All	Single response	Strongly disagree; Disagree; Neither agree nor disagree; Agree; Strongly agree; Don’t know
3b	If people use less electricity during peak times (i.e., 4pm–7pm on weekdays) by reducing their overall usage or moving it to off peak times...it will reduce pressure on the electricity system.	All	Single response	Strongly disagree; Disagree; Neither agree nor disagree; Agree; Strongly agree; Don’t know
3c	If people use less electricity during peak times (i.e., 4pm–7pm on weekdays) by reducing their overall usage or moving it to off peak times...it will reduce overall electricity prices for households.	All	Single response	Strongly disagree; Disagree; Neither agree nor disagree; Agree; Strongly agree; Don’t know

Technical Annex Standing Charge Rebates Trials

Q #	Question	Base	Type	Response options
3d	If people use less electricity during peak times (i.e., 4pm–7pm on weekdays) by reducing their overall usage or moving it to off peak times...it will reduce the need to build new powerlines and power stations in the future.	All	Single response	Strongly disagree; Disagree; Neither agree nor disagree; Agree; Strongly agree; Don't know
4	Do you pay a standing charge on your electricity bill?	All	Single response	Yes, I definitely pay a standing charge; I probably pay a standing charge; I'm not sure if I pay a standing charge; I probably don't pay a standing charge; I definitely don't pay a standing charge
5	Can you estimate the amount you usually pay in standing charges for your electricity bills each month?	All	Single response	Less than £10 (Less than £120 annually) £10 - £20 (£120 – £240 annually); £20 - £30 (£240 – £360 annually); £30 - £40 (£360 - £480 annually); I don't pay a standing charge; Unsure
6	A standing charge is a daily fixed amount that is part of an energy bill. How much control do you feel you have over the amount you pay in standing charges?	All	Single response	No control at all; A little control; Some control; A lot of control; Complete control; Unsure
7	And how acceptable or unacceptable do you feel the standing charges on your electricity bill were over the past few months?	All	Single response	Very unacceptable; Somewhat unacceptable; Neither acceptable nor unacceptable Somewhat acceptable; Very acceptable; I don't know
8	Over the past few months, how fair or unfair do you think the standing charges on your electricity bill have been?	All	Single response	Very unfair; Somewhat unfair; Neither fair nor unfair; Somewhat fair; Very fair; Unsure
9	How much control do you feel your household has over how much electricity it uses overall?	All	Single response	No control at all; A little control; Some control; A lot of control; Complete control; I don't know

Technical Annex Standing Charge Rebates Trials

Q #	Question	Base	Type	Response options
10	How much control do you feel your household has over the size of its monthly electricity bill?	All	Single response	No control at all; A little control; Some control; A lot of control; Complete control; I don't know
11	In the past few months, how dissatisfied or satisfied were you with the ease of understanding of your electricity bills??	All	Single response	Very dissatisfied; Slightly dissatisfied; Neither dissatisfied nor satisfied; Slightly satisfied; Very satisfied; Don't know / Not applicable
12	In the past few months, how often have you done the following:	All	-	-
12a	...Logged into your online electricity account	All	Single response	Never; Once or twice in the last few months; Monthly; Weekly; Daily; Don't know / Not applicable
12b	...Viewed your electricity bill (online or paper)	All	Single response	Never; Once or twice in the last few months; Monthly; Weekly; Daily; Don't know / Not applicable
12c	...Checked your smart meter in-home display	All	Single response	Never; Once or twice in the last few months; Monthly; Weekly; Daily; Don't know / Not applicable
12d	...Viewed your half-hourly or daily smart-meter data (e.g., on an app or portal)	All	Single response	Never; Once or twice in the last few months; Monthly; Weekly; Daily; Don't know / Not applicable
12e	...Checked how much electricity your household is using at different times of day	All	Single response	Never; Once or twice in the last few months; Monthly; Weekly; Daily; Don't know / Not applicable
12f	...Looked for ways to reduce your electricity use	All	Single response	Never; Once or twice in the last few months; Monthly; Weekly; Daily; Don't know / Not applicable

Technical Annex Standing Charge Rebates Trials

Q #	Question	Base	Type	Response options
12g	...Looked specifically at your electricity use during peak times (4pm–7pm)	All	Single response	Never; Once or twice in the last few months; Monthly; Weekly; Daily; Don't know / Not applicable
12h	...Read information from your supplier about your electricity use	All	Single response	Never; Once or twice in the last few months; Monthly; Weekly; Daily; Don't know / Not applicable
	Section 2: Motivation and behavioural response			
13	If your household wanted to reduce its electricity use between 4-7pm on weekdays, how easy or difficult would that be?	All	Single response	Very difficult; Somewhat difficult; Neither easy nor difficult; Somewhat easy; Very easy; Unsure
14	How confident are you that you know which devices, appliances or activities reduce peak electricity use the most?	All	Single response	Not confident; A little confident; Somewhat confident; Quite confident; Very confident; I don't know
	Section 3: Understanding, experience and satisfaction with the proposition and trial (treatment group only)			
15	In the last few months, do you remember being on the [Weekday Flexi Saver trial / Ofgem trial] where you could get a rebate on your standing charges?	Treatment only	Single response	Yes; No; Not sure
17	What level of rebate could households earn in the [Weekday Flexi Saver trial / Ofgem trial]?	Q15 = Yes	Single response	[Up to 25% off the daily standing charge on weekdays; A one-off credit on your next bill; Up to 50% off the standing charges on weekdays, later increased to 100%; A fixed rebate amount each month ; A percentage discount on the unit rate; Not sure] / [Up to 50% off the daily standing charge on weekdays; Up to 100% off the daily standing

Technical Annex Standing Charge Rebates Trials

Q #	Question	Base	Type	Response options
				charge; A one-off credit automatically applied to your next bill; A fixed rebate amount each month; A percentage discount on the unit rate; Not sure]
18	How easy or difficult was it to follow the instructions in the communication you received from [British Gas / ScottishPower] about the [Weekday Flexi Saver trial / Ofgem trial]?	Q15 = Yes	Single response	Very difficult; Somewhat difficult; Neither easy nor difficult; Somewhat easy; Very easy; Unsure
19a	In this trial, your standing charge rebate was worked out using the method shown below [description of the incentive mechanism] How fair do you think it is to offer a rebate calculated in the above way?	Treatment only	Single response	Very unfair; Somewhat unfair; Neither fair nor unfair; Somewhat fair; Very fair; Unsure
19b	Outside of this trial, standing charges are fixed daily fees, unaffected by how much energy you use that are calculated by your supplier based on factors such as region, tariff type, payment method, and the underlying fixed costs of maintaining networks, metering, operations, and government schemes. Do you think this is more, less or as fair as how standing charges work outside of the trial?	Treatment only	Single response	Very unfair; Somewhat unfair; Neither fair nor unfair; Somewhat fair; Very fair; Unsure
19c	Is the rebate method you experienced in this trial more or less fair than a system where your rebate would depend on how much you personally cut your electricity use between 4–7pm compared with your usual level rather than comparisons with other customers?	Treatment only	Single response	Much less fair; Somewhat less fair; The same fairness; Somewhat more fair; Much more fair; Unsure

Technical Annex Standing Charge Rebates Trials

Q #	Question	Base	Type	Response options
20	While you were on the [Weekday Flexi Saver trial / Ofgem trial], did your household intentionally try to use less electricity during peak times (i.e. between 4-7pm on weekdays)?	Treatment only	Single response	Yes; No; Did not need to make any changes – my household already uses little electricity at peak times; Not sure
21a	In order to use less electricity during peak times (4pm–7pm on weekdays), did your household shift your electricity use to different times, or reduce your overall electricity use?	Q19 = Yes	Single response	Shifted electricity use to different times; Reduced overall electricity use; A combination of both shifting and reducing electricity use; Unsure
21b	Thinking about specific activities or appliances, which of the following did you do to use less electricity or shift electricity use away from peak times (4pm–7pm on weekdays)?	Q19 = Yes	Multi response	Dishwasher: Used less overall; Dishwasher: Used earlier/later; Washing machine: Used less overall; Washing machine: Used earlier/later; Charging devices (e.g. phones, laptops): Did so less overall; Charging devices (e.g. phones, laptops): Did so earlier/later; Charging electric vehicles: Did so less overall; Charging electric vehicles: Did so earlier/later; Electric oven: Did not cook/cooked less/simplified meals to reduce oven or hob use; Electric oven: Cooked earlier/later; Electric oven: Cooked using more energy efficient appliances (e.g. microwave, air fryer); Used a smart meter/app to track and adjust electricity use; Arranged to be out of the house during peak times when possible; Used “eco” modes or automation/smart plugs to time shift; Turned off lights or appliances during peak times; None of the above ; Other (please specify).

Technical Annex Standing Charge Rebates Trials

Q #	Question	Base	Type	Response options
22	Overall, to what degree did your household attempt to reduce its electricity use during peak times while you were on the [Weekday Flexi Saver trial / Ofgem trial]?	Q19 = Yes	Single response	Not at all; A little; A moderate amount; Quite a lot; A great deal; Unsure
23	What were the main reasons your household tried to use less electricity or shift it away from peak times? Please select 1-3 main reasons.	Q19 = Yes	Multi response	To reduce my electricity bill; Because I received information, advice, or prompts from my electricity provider; Because I received a rebate on my standing charges; Because I wanted to help reduce pressure on the electricity network; Because I felt it was the right or responsible thing to do; Because of environmental or climate concerns; Other (please specify); Unsure
24	What prevented your household from (further) reducing or shifting its energy consumption during peak times? Please select all that apply	Treatment only	Multi response	I wasn't interested; I had no incentive to reduce my electricity use at peak times; It was hard to change my household's usual routine; It took too much effort or planning; Forgot about peak times; Other household members didn't want to change; My household did not have much electricity use that could be moved; Didn't know what to do to reduce my electricity use at peak times ; I wasn't aware I could save money; Other (please specify)
26	Did being on the [Weekday Flexi Saver trial / Ofgem trial] make you more or less likely to look at your electricity use?	Treatment only	Single response	Much less likely; Slightly less likely; No change; Slightly more likely; Much more likely; Don't know
27	Now the trial is over, how likely is your household to try to use less electricity or shift electricity use away from	Treatment only	Single response	Very unlikely; Unlikely; Neither likely nor unlikely; Likely; Very likely; Unsure

Technical Annex Standing Charge Rebates Trials

Q #	Question	Base	Type	Response options
	peak times (4pm–7pm on weekdays) in the next few months?			
28	Can you provide a rough estimate of how much rebate you earned on a typical month by taking part in the [Weekday Flexi Saver trial / Ofgem trial]?	Treatment only	Single response	£0 per month; less than ~£2 per month; ~£2–£6 per month; ~£6–£12 per month; ~£12–£18 per month; ~£18–£24 per month; It varies too much to say; Unsure
29	Overall, did the amount of rebate you earned from the [Weekday Flexi Saver trial / Ofgem trial] match what you expected?	Treatment only	Single response	It was much less than I expected; It was a little less than I expected; It was about what I expected; It was a little more than I expected; It was much more than I expected; I didn't have any expectations; Unsure
30	Overall, how did the effort your household put in compare to the benefit you received?	Treatment only	Single response	Much more effort than benefit; Somewhat more effort than benefit; About the same; Somewhat more benefit than effort; Much more benefit than effort; Unsure
31	Did the communication about [Weekday Flexi Saver trial / Ofgem trial] trial make you more or less likely to look at your electricity use or bills?	Treatment only	Single response	Yes, I looked at my use/bills much more than usual; Yes, I looked at my use/bills a little more than usual; No, they did not change how much I looked at my use/bills; Yes, I looked at my use/bills a little less than usual; Yes, I looked at my use/bills a lot less than usual; Unsure
32	If a scheme like the one offered in the [Weekday Flexi Saver trial / Ofgem trial] was to be available in the future, how likely would you be to recommend it to a friend or neighbour?	Treatment only	Single response	Very unlikely; Unlikely; Neither likely nor unlikely; Likely; Very likely; Unsure

Technical Annex Standing Charge Rebates Trials

Q #	Question	Base	Type	Response options
33	Overall, how satisfied were you with the [Weekday Flexi Saver trial / Ofgem trial]?	Treatment only	Single response	Very dissatisfied; Dissatisfied; Neither satisfied nor dissatisfied; Satisfied; Very satisfied; Unsure
	Section 4: Attitudes and demographics			
36	What is your age group?	All	Single response	18–24; 25–34; 35–49; 50–64; 65–74; 75 or older; Prefer not to say
37	Which of the following best describes the ownership of your home?	All	Single response	Being bought on a mortgage; Owned outright by household; Shared ownership (part owned and part rented); Rented from Local Authority; Rented from Housing Association/Trust; Rented from private landlord; Living rent free; Other; Don't know; Prefer not to say
38a	Including yourself, how many people live in your household?	All	Single numerical response	Single numerical response
38b	Please select all that apply and indicate the number of people in the household including yourself.	All	Multi response, numerical response	Someone who is expecting (currently pregnant); Children under 5; Children aged 5-15; Adults aged 16-64; Adults aged 65+; Prefer not to say
39	Is your home heated using electricity only (not gas or other fuels)?	All	Single response	Yes; No; Not sure
40	Does your home have any of the following?	All	Multi response	Electric storage heaters; A hybrid car or van that you do not plug in to charge (that charges from the engine alone); A plug-in hybrid car or van (that charges from the engine, but that you can also plug in to charge); A fully electric car or van (does not charge from the engine, has to

Technical Annex Standing Charge Rebates Trials

Q #	Question	Base	Type	Response options
				be plugged in to charge); Solar panels; Home battery storage for electricity (e.g. Tesla Powerwall); Heat pump – a specific type of home heating (e.g. air source / ground source / hybrid heat pump); Immersion heater (i.e. a way of heating water in the home); Heat battery (e.g. Sunamp Thermo for hot water, Tepeo Zero Emission Boiler (ZEB) for space heating, which specifically stores heat); Wood burners or other alternative heating methods; None of the above; Don't know; Prefer not to say
41	What is your annual household income before tax and other deductions?	All	Single response	Less than £5,000; £5,000 to less than £10,000; £10,000 to less than £15,000 ; £15,000 to less than £20,000; £20,000 to less than £25,000; £25,000 to less than £30,000; £30,000 to less than £35,000; £35,000 to less than £45,000; £45,000 to less than £50,000; £50,000 to less than £55,000; £55,000 to less than £60,000; £60,000 to less than £80,000; £80,000 or over; Unsure; Prefer not to say
42	Does your household normally pay different amounts for its energy depending on when you use it? This could mean you pay less for your energy at certain times during the day or night, or at weekends.	All	Single response	Yes; No; Don't know
43	To what extent do you agree or disagree with the following statement: I think of myself as someone who is concerned with environmental issues	All	Single response	Strongly disagree; Disagree; Neither agree nor disagree; Agree; Strongly agree; Prefer not to say

Technical Annex Standing Charge Rebates Trials

Note: Variations in the question or answers between the British Gas and ScottishPower versions of the survey are represented by square brackets, with the British Gas variation appearing first.