

Flexing Fixed Charges: Evidence from Standing Charge Rebate Trials

ofgem

Making a positive difference
for energy consumers



1 October 2026

Flexing Fixed Charges: Evidence from Standing Charge Rebate Trials

Publication date: 01 October 2026

Note: This project was funded by the Evaluation Task Force (Cabinet Office/HM Treasury) via the Evaluation Accelerator Fund (financial year 2025-26).

© Crown copyright 2026

The text of this document may be reproduced (excluding logos) under and in accordance with the terms of the Open Government Licence.

Without prejudice to the generality of the terms of the Open Government Licence, the material that is reproduced must be acknowledged as Crown copyright and the document title of this document must be specified in that acknowledgement. This publication is available at www.ofgem.gov.uk. Any enquiries regarding the use and re-use of this information resource should be sent to psi@nationalarchives.gsi.gov.uk.

Contents

Flexing Fixed Charges: Evidence from Standing Charge Rebate Trials	0
Contents	2
Foreword	3
Executive Summary.....	5
Introduction.....	8
Background and Context	8
Our research	9
Literature Review	11
Views on standing charges	11
Contribution of this research	14
Methodology.....	16
Research questions and outcomes	16
Research methods.....	16
Experimental design.....	20
Sample and eligibility criteria	25
Analytical strategy	28
Results	32
Demand Flexibility Analysis	32
Flexibility.....	43
Discussion and conclusions	53
References	57
Limitations	60

Foreword

The challenges facing Great Britain's energy system are increasingly interconnected. As we transition to a cleaner, more flexible energy system, we need consumers to play a greater role in helping balance electricity demand and supply. At the same time, we need to ensure that the costs of delivering that system are recovered in a way that is fair, efficient and acceptable to consumers.

Addressing these challenges requires robust evidence, not only about what consumers say, but about how they respond in real-world situations. Understanding how consumers actually respond when presented with genuine choices, incentives and trade-offs is a vital part of developing effective policy. This report forms part of Ofgem's wider programme of work to build that understanding.

Through an innovative opt-out trial design, this programme tested whether an enduring price signal, in the form of a rebate on the standing charge, combined with behaviourally informed communications, could incentivise customers to reduce their peak-time electricity consumption. In doing so, it provided valuable insight into how future propositions may work in practice and at scale.

The scale and depth of the research make it particularly valuable. The trials involved tens of thousands of households and combined randomised controlled trials with communications testing, surveys, qualitative research and analysis of half-hourly smart meter data. Together, these methods allow us to understand not only whether consumers responded, but how they experienced the proposition, what motivated behaviour change, and how it impacted their views around acceptability and fairness.

The significance of this work extends beyond the findings themselves. It demonstrates the value of testing policy ideas in real-world settings before decisions are made. As the energy system evolves, this type of real-world experimentation and evidence gathering will become increasingly important.

This programme also highlights the importance of collaboration. I would like to thank British Gas and ScottishPower for their willingness to work with Ofgem to design and deliver these trials. Their commitment to generating evidence has made an important contribution to the wider sector. I would also like to thank The Behaviouralist, Thinks Insight & Strategy and Bayes Business School, whose work helped deliver a rigorous and insightful programme of research.

We are similarly grateful for the support provided through the Evaluation Accelerator Fund, delivered by the Evaluation Task Force, a joint Cabinet Office and HM Treasury initiative. This support enabled us to undertake this work at pace and make a significant contribution to the evidence base informing Ofgem's Cost Allocation and Recovery Review.

This report is part of a broader programme of evidence gathering, combining behavioural research, consumer insight and deliberative engagement. Next, we will be bringing consumers together through a citizens' panel to explore public views on different approaches to allocating and recovering energy system costs.

I hope this programme encourages others across the energy sector to adopt the same spirit of collaboration, experimentation and rigorous evaluation. The challenges ahead are significant, but by testing ideas, learning from evidence and working together, we can make better decisions for consumers and build an energy system that is more flexible, affordable and resilient.

A handwritten signature in black ink, appearing to read 'Tim Jarvis', with a horizontal line above it.

Tim Jarvis

Executive Summary

As Great Britain transitions to a low-carbon electricity system, consumer-led flexibility (CLF) will play an increasingly important role in balancing demand with intermittent renewable generation. At the same time, energy system costs are expected to increase and be shared amongst consumers via fixed costs, prompting Ofgem to review how these costs are allocated and recovered from consumers. Under current arrangements, many fixed costs are recovered through standing charges, which remain one of the least popular components of energy bills and are often perceived as unfair and difficult to control.

To explore whether these challenges could be addressed together, Ofgem partnered with British Gas and ScottishPower to run large-scale randomised controlled trials testing whether consumers would reduce peak-time electricity use in return for standing charge rebates. The programme combined half-hourly smart meter data analysis, surveys, qualitative interviews, and communications testing, reaching over 43,000 customers. The trials provide one of the largest evaluations of a standing charge-linked flexibility proposition and a rare example of a large-scale opt-out flexibility trial, generating evidence from a broader cross-section of consumers than is typically achieved through opt-in flexibility programmes.

Three features of the trials design are particularly noteworthy:

- **Tariff design linked to system costs:** The trials tested a novel flexibility proposition that linked consumer behaviour to standing charge rebates, exploring whether a pricing component associated with fixed energy system costs could be used to encourage consumer-led flexibility.
- **Opt-out participation:** Eligible customers were automatically enrolled unless they chose to opt out. This enabled participation from a broader and more representative cross-section of consumers than traditional opt-in flexibility trials, which often attract more engaged and energy-conscious households.
- **No-loss design:** Participants could earn rebates for reducing peak-time consumption but were not financially penalised for increasing usage. This protected consumers from financial detriment during the trial, although it may have reduced behavioural responses compared with propositions that combine rewards with the risk of higher costs.

The key findings of the research are:

- **Standing charge rebates can encourage peak-time flexibility but behavioural changes were very modest and only statistically significant for one supplier.** The British Gas trial found a statistically significant reduction in peak electricity consumption, demonstrating that consumers respond to standing charge-linked financial incentives. However, the overall reduction was small, reducing average

peak-period consumption by 0.029 kWh per household per day (equivalent to £0.15 per day or charging a 60W laptop for 30 minutes), and no statistically significant effect was observed in the ScottishPower trial. There was no statistically significant change in total or off-peak electricity consumption in either trial. Qualitative evidence suggests some lasting behaviour change through habit formation, but flexibility remained constrained by structural barriers such as family routines and work schedules, limiting the extent to which these households could shift demand.

- **Indicative evidence suggests higher incentives produced diminishing returns.**
The British Gas trial showed that doubling the maximum rebate from 50% to 100% in the final month increased responsiveness, but the additional reduction in peak demand was proportionally smaller than the increase in reward although not statistically significant. The ScottishPower trial showed no significant difference in peak demand between the 50% and 100% rebate groups. These findings suggest that smaller incentives could achieve similar behavioural responses as larger incentives at a lower cost.
- **Customers in vulnerable circumstances demonstrated relatively higher levels of flexibility compared to the average consumer in the trials.**
Prepayment meter and Priority Services Register customers showed some of the strongest responses to the intervention, suggesting these groups can engage successfully when incentives are clear, accessible and linked to bill savings.
- **The intervention improved consumer engagement with flexibility propositions and perceptions of standing charges.**
We observed a slightly stronger sense of control over energy use and less negative views of standing charges among treatment participants than among the control group. Compared with the control group, reports of having little or no control over electricity use were 3.5 to 5.3 percentage points lower, while ratings of standing charges as fair were 3.6 percentage points higher in the ScottishPower trial, and ratings of standing charges as unfair were 6.7 percentage points lower in the British Gas trial. The findings suggest that perceived control may be a mechanism through which standing charge rebates influence consumer engagement. Qualitative evidence indicates that participants valued the ability to influence a charge they typically view as fixed, while linked survey-consumption analysis found that consumers with greater perceived control over their energy bills had lower peak-period consumption. Taken together, the findings suggest that charging structures which give consumers more control over standing charges through their energy use may be viewed more favourably.
- **Qualitative evidence suggests that persistence of flexibility behaviours may be less of a challenge than activation of those behaviours.**
Participants who successfully shifted consumption often reported that behaviours became easier over time and, in some cases, developed into habits. If households can be supported through the initial learning and adjustment period, some behavioural changes may become self-sustaining. This implies that the principal

challenge for future programmes is not necessarily maintaining behaviour change but initiating it.

- **Financial incentives can support flexibility but may work best alongside other enablers.**

Standing charge rebates encouraged peak-time demand reduction for some consumers, but achieving the scale of flexibility required for net zero will likely depend on combining incentives with effective communication and support, alongside automation and smart technologies.

Overall, the research demonstrates that standing charge rebates can support consumer-led flexibility to some extent while improving engagement with energy pricing. The trials provide evidence that a broad range of consumers, including some customers in vulnerable circumstances, can engage with flexibility propositions when incentives are clear and easy to understand.

The findings offer important insights for the future design of consumer flexibility propositions, tariff structures and charging arrangements. They suggest that financial incentives can encourage consumers to shift demand, but that incentives alone are unlikely to deliver the scale of flexibility required for future energy systems. Instead, achieving greater flexibility is likely to require a combination of effective consumer propositions, clear communications, low-friction customer experiences, automation, smart technologies and tariff innovation that make participation easier, more accessible and more effective at scale.

The trials also highlight the importance of consumer agency and perceived control. Giving consumers a clear and visible way to influence their energy costs may help improve engagement with flexibility services and support participation in increasingly dynamic energy systems.

Introduction

Background and Context

Great Britain's energy system is transitioning away from the use of fossil fuels, and towards cleaner and more secure renewable energy sources. This transition creates both new opportunities for consumers to play a more active role in the energy system and new challenges around how the costs of that system are recovered. As the system becomes increasingly reliant on renewable generation to meet our decarbonisation goals, Consumer Led Flexibility (CLF) is expected to play an increasingly important role in the energy system.

CLF involves optimising when consumers use electricity to address local network constraints and better align electricity demand with available supply. The objective of CLF is not simply to reduce consumption during peak periods, but to better align electricity demand with periods of plentiful renewable supply. This suggests that the period to which consumption is moved may be as important as the period from which it is moved, and in some circumstances, increasing demand during traditionally peak periods may be beneficial. Supporting consumers in delivering this type of flexibility can significantly reduce the need for new generation and network infrastructure, making our future energy system more efficient, affordable, and resilient.

The Clean Power 2030 Action Plan ([DESNZ, 2025](#)) highlights the need for at least a fivefold increase in the use of consumer-led flexibility over the next five years, rising from around 2.5 GW today to 10–12 GW by 2030 to support the delivery of clean power. Additionally, in 2025, DESNZ (Department for Energy Security and Net Zero), Ofgem and NESO (National Energy System Operators) published the Clean Flexibility Roadmap, followed by an update in July 2026. The roadmap sets out the government's vision for a clean, flexible and consumer-focused electricity system, alongside timebound actions to unlock greater flexibility across the energy system. Achieving this scale of growth represents a significant challenge and is likely to require innovative structural changes within the energy system, and for consumers to engage with new types of tariffs, incentives and flexibility propositions.

As this transition happens, we also expect the structure of energy system costs to evolve to reflect increased levels of system investment. Many energy system costs are largely fixed and must be recovered regardless of individual consumption patterns. As a result, understanding how these costs are allocated and recovered is becoming increasingly important. Through the Cost Allocation and Recovery Review (CARR), Ofgem has been reviewing whether there are more efficient, fair and sustainable approaches to allocating and recovering these costs from consumers ([Ofgem, 2025](#)).

Under current arrangements, fixed costs of the networks are typically recovered from domestic consumers through standing charges. Standing charges are fixed daily charges that consumers pay for gas and electricity, regardless of how much energy they use. They are intended to recover costs associated with maintaining the core aspects of the energy system, including network costs for physical infrastructure and supplier operating costs. However, existing evidence shows that standing charges are often viewed negatively by consumers, who may perceive them as unfair because they are required to pay a fixed amount before using any electricity, and households with very different consumption patterns are charged the same fee regardless of their energy use ([Ofgem, 2025](#)).

The need for greater consumer flexibility and the challenge of recovering increasingly fixed system costs are therefore closely connected. Future charging arrangements will need to support wider objectives around affordability, fairness, electrification and efficient cost recovery. These challenges require robust evidence about how consumers respond to different incentives and charging structures in practice.

Our research

The standing charge rebate randomised controlled trials (RCTs) were designed in response to two key challenges facing the GB energy system: the growing need for consumer-led flexibility to help manage network costs and support decarbonisation; and informing future approaches to recovering system costs by investigating options that could be more acceptable to consumers than the current charging structure. The trials build on a comprehensive programme of consumer research, which provided insights into consumers' attitudes and perceptions of standing charges.

The novel opt-out, no-loss trials simulate an alternative tariff structure in which consumers can earn rebates on their standing charge by reducing electricity consumption during peak demand periods. By testing whether a standing charge rebate can encourage demand shifting, the trials seek to understand how consumers respond to tariff designs that better align consumer behaviour with system needs. The approach has the potential to address concerns about the fairness of standing charges while encouraging households to reduce peak-time consumption.

A key methodological innovation of the trials is the opt-out design: unlike most previous flexibility trials, which have relied on consumers actively signing up to participate, eligible customers were automatically enrolled unless they chose to withdraw. This allowed the trials to include a wider range of consumers, including those who may be less likely to engage with flexibility offerings, or to respond to interventions more generally.

To build a comprehensive evidence base, this programme of research combined multiple research methods. First, we analysed a large behavioural dataset of half-

hourly energy consumption from smart meters. Second, we conducted post-trial surveys of control and treatment group participants, and qualitative interviews exploring consumer experiences. To inform the communications in the trials, we carried out a set of online experiments to test communications to consumers before and during the trials with Bayes Business School. Together, these methods allowed findings to be triangulated across research methods, providing insight not only into whether consumers responded to the intervention, but also how they experienced it, why changes occurred or did not occur, and what considerations would be relevant for future trials and research.

The research was funded through the Cabinet Office Evaluation Accelerator Fund, which supports the generation of robust evidence to inform government priorities and public service innovation. The funding supported both trial delivery and the standing charge rebate mechanism, enabling large-scale evaluation of approaches designed to improve consumer participation in energy flexibility and contribute to wider Clean Power 2030 objectives.

Literature Review

Views on standing charges

To inform its review of how energy system costs are allocated and recovered from consumers, Ofgem established a pricing research programme examining consumer perceptions of the costs included in domestic energy bills ([Ofgem, 2025](#)). The programme brought together three complementary strands of research: an omnibus survey on attitudes towards standing charges, deliberative research on the future of energy pricing, and an online experiment exploring consumer views on cost allocation. The survey clearly showed opposition to standing charges, with 62% of survey respondents expressing the view that these charges are unfair. The online experiment supported this finding, with 58% of participants stating that standing charges should be reduced or removed. While providing information about the purpose of standing charges reduced perceptions of unfairness to some extent, most participants still felt that standing charges should be lowered. The deliberative research further found that affordability was consumers' number one priority when considering the future of energy pricing. More broadly, these studies highlighted the importance consumers place on energy bill affordability, simple and understandable pricing, ease of control, and transparent innovation that delivers tangible benefits.

Existing research suggests that standing charges can be difficult for consumers to understand. A study by [Jooshandeh \(2023\)](#) published by Which? found that around two-thirds of consumers (65%) either did not know or were unsure what a standing charge was. This lack of understanding may contribute to negative perceptions of standing charges and limit consumers' ability to make informed judgements about energy pricing and tariff structures. [Ofgem \(2023\)](#) released a [call for input on standing charges](#), seeking input from key stakeholders, including consumers, charities, and industry bodies such as energy suppliers. More than 30,000 individual consumers responded to the call for input either independently or through organised email campaigns. Responses consistently highlighted strong support for action to reduce standing charges, with around 90% of respondents expressing the view that current standing charges are unfair. Many consumers highlighted perceived inequities in charging structures, particularly the fact that occupants of small flats and large houses pay the same standing charge despite differences in energy use. Negative perceptions of standing charges appeared to be driven by several factors, including a perceived lack of control over these costs and concerns about the growing proportion of fixed charges relative to variable consumption costs.

The current trials test consumer responses to alternative pricing structures, as well as exploring whether providing more control over standing charges can influence perceptions of fairness and control. It is important to note that these trials did not test

consumer preferences for different balances of standing charges and unit rates, nor consumers' willingness to choose between alternative tariff structures. Instead, they examined whether linking standing charge rebates to peak-time electricity use could encourage consumer-led flexibility within a no-loss trial design.

Consumer Led Flexibility (CLF)

CLF has become a key mechanism in supporting the transition to a decarbonised electricity system. As more renewable generation is being connected to the grid, managing the timing of electricity demand has become increasingly important.

The potential for households to flex varies across different types of electricity use. While some uses, such as EV charging or certain household appliances, can often be shifted with minimal disruption, others are more closely tied to established routines such as cooking and may be less flexible. As a result, the extent to which consumers can participate in demand-shifting opportunities is likely to differ across end uses ([Ofgem & Ipsos, 2025](#)).

Behavioural response from financial incentives

Time-of-use (ToU) tariffs are one of the most widely studied forms of consumer-led flexibility. By varying electricity prices across predefined time periods, they encourage consumers to shift electricity use away from peak demand periods. Evidence from the 2022/2023 GB Demand Flexibility Service (DFS) demonstrates strong consumer willingness to engage when flexibility propositions are clear and accessible. Across DFS events, around 80% of eligible consumers opted into individual flexibility sessions; around 60% of those who opted in were subsequently able to reduce demand during the flex event ([NESO, 2023](#)).

Research suggests that consumer uptake of ToU tariffs is influenced by tariff design as well as potential savings. [Lang et al. \(2023\)](#) found that consumers were more likely to enrol when offered a choice of tariff options and showed a preference for shorter peak periods. The findings highlight the importance of simple, well-designed tariffs that support consumer decision making.

The [NESO \(2026\)](#) CrowdFlex project tested an opt-in, incentive-based consumer-led flexibility scheme in which households adjusted their electricity use during flexibility events, rather than through a dynamic tariff. Across more than 100,000 participants, the trial demonstrated that financial incentives can successfully encourage demand response. This was the strongest driver of engagement in the utilisation trials, with 69% of participants identifying this as their main motivation. However, results suggested diminishing marginal returns from higher incentive levels: lower payments delivered more flexibility per pound spent, while increasing rewards generated larger response volumes but at a progressively lower level of cost-effectiveness. Qualitative research also found broad enthusiasm for participation despite the voluntary opt-in design, with

many participants reporting positive experiences and an increased awareness of their ability to shift electricity use in support of the energy system.

More generally, there is substantial and growing evidence that time-based pricing is an important tool to drive flexibility. A machine-learning-based simulation on 125 Korean consumers shows that peak-time rebate schemes can be effective in reducing peak electricity demand, although the actual response differed across customer segments ([Hwang et al., 2025](#)). Similarly, dynamic pricing that accounts for the amount of renewable electricity in the energy mix is effective in encouraging electric vehicle charging in public chargers ([Bernard et al., 2025](#)).

[UsersTCP \(2024\)](#) highlights evidence from flexibility trials, including an opt-in Octopus Energy and NESO trial where participants reduced peak-period electricity use. In return for reducing consumption, they were rewarded with free electricity for a two-hour period. The trial recruited tens of thousands of customers who on average reduced their consumption by 18% during peak times in the evening, with two-thirds achieving reductions of at least 30% in one or more events. Such flexibility could deliver annual system benefits of around £10 billion ([McHugh, 2022](#)).

Much of the existing evidence comes from schemes in which consumers actively choose to participate. This raises questions about the extent to which observed behavioural responses reflect the wider population, including less engaged consumers who may not opt into flexibility programmes. Furthermore, while previous research has examined incentives linked to electricity prices or flexibility events, there is limited evidence on whether incentives linked to standing charges can encourage similar behavioural responses.

Behavioural response from other incentives

Beyond financial incentives, evidence suggests that participation in energy-related behaviours can be influenced by a range of behavioural factors, including communication framing, transparency that builds trust, positive messaging, and recognising customers' contributions through acknowledgement and appreciation. Studies have shown that messages highlighting environmental, social or collective benefits can affect attitudes and intentions towards energy-related actions and technologies, particularly among some consumer groups ([Mingolla et al., 2020](#); [Li et al., 2023](#)). A study by [Crook \(2024\)](#) suggests that environmental motivations are most effective when paired with tangible personal benefits, such as financial savings or convenience. The study further identifies a range of behavioural approaches that can support engagement, including transparency and trust-building, personalised feedback, social norms, praise and recognition, and more engaging communication of energy use through open data and creative partnerships. The study by [Wen et al. \(2025\)](#) found similar results in that emphasising the carbon reduction benefits of flexibility increased willingness to participate in demand-side flexibility programmes, suggesting

that environmental outcomes can act as an additional motivation for engagement. Evidence also indicates that the way flexibility offers are communicated can substantially influence engagement. In a large-scale field trial conducted by UsersTCP in collaboration with British Gas, messages emphasising eligibility and exclusivity achieved substantially higher click-through and tariff sign-up rates than either simple informational messages or messages focused on personalised savings, demonstrating the importance of communication design in driving participation ([UsersTCP, 2026](#)). However, despite these improvements in engagement, overall uptake remained low.

Barriers

Beyond financial incentives, wider behavioural and practical barriers have been identified as factors that can affect participation in flexibility programmes. For example, renters and those living in flats typically have lower flexibility potential than owner-occupiers in detached properties ([Centre for Sustainable Energy, 2026](#)). Other factors include limited understanding of flexibility schemes and tariffs ([Stampatori & Rossetto, 2024](#)) and habitual energy use patterns and resistance to change ([Hampton et al., 2022](#)). This is reflected in evidence showing that while economic considerations dominate willingness to participate in explicit flexibility, with 86% of consumers citing financial factors, financial incentives alone appear insufficient to generate sustained behavioural change ([Høiseth, 2026](#)).

Household energy use is deeply embedded within daily routines and constrained by factors such as work schedules and caring responsibilities. As a result, consumers may have limited capacity to shift their electricity use, regardless of the incentives offered. Evidence from [Ofgem's Flexibility and Net Zero Survey \(2025\)](#) illustrates these wider behavioural and practical constraints, finding that among the 41% of households unlikely to switch to a Time-of-Use tariff, key barriers included uncertainty about guaranteed savings (27%), inertia or a lack of prior consideration (22%), and limited awareness and understanding of the tariff (21%). Where flexibility offerings require consumers to actively monitor prices or make frequent decisions, participation can be further reduced ([Ofgem, 2020](#)). Consequently, a gap often remains between the theoretical benefits of CLF and consumers' willingness or ability to engage in practice.

Contribution of this research

Standing charges as a flexibility incentive

These trials address a notable gap in the literature: the role of standing charges as a mechanism for encouraging CLF. In particular, these trials connect research on flexibility to research on electricity pricing, particularly research on two-part tariffs.

Despite standing charges being a prominent and often contested feature of energy bills, with consumers frequently viewing them as unfair, there is little evidence examining

whether this "standing charge aversion" could be used to incentivise flexible electricity use relative to using unit rates as a primary mechanism ([Ofgem, 2024](#)). Existing CLF tariff designs typically involve unit rates, dynamic pricing, or reward payments linked to consumption reductions or increases. Although some suppliers offer tariffs with reduced standing charges, these generally recover costs through higher unit rates rather than reducing the fixed component itself. Consequently, there is limited understanding of whether standing charge rebates linked to peak-time behaviour could motivate meaningful behaviour responses.

Eliminating selection bias through opt-out

A further gap relates to the nature of consumer recruitment and participation models. The issues around opt-in participation are acknowledged in the evaluation of households' engagement with demand side flexibility service, which questions how representative these trial outcomes are likely to be of the wider population ([CSE, 2023](#)). Opt-in trials can introduce selection bias, as participants are typically more engaged, motivated, and interested in energy-related issues than the general population. An opt-out design was therefore selected to maximise participation, building on evidence that default options can dramatically increase engagement and make individuals more likely to choose a pre-selected option ([Pass, 2021](#); [Jachimowicz et al., 2019](#)). More importantly, an opt-out design can ensure these trials yield more representative results by reaching a broader range of consumers including those in vulnerable circumstances and those who do not actively engage in energy.

Longevity of intervention

Another limitation in the literature is the limited evidence on the long-term impact of behavioural responses, due to trials that are commonly short in time frame. In this context, "impact" refers to both the ability of consumers to remain in a behavioural intervention (that is, not dropping out); as well as the long-term effect of the intervention itself on the behaviour of consumers that stay in the trial. There are significant policy concerns over behavioural fatigue even within relatively short trials, particularly where consumers must continually monitor and adjust their energy usage ([Wangmo, 2025](#)). The relevance of fatigue is compounded by evidence that the "impact" of time-of-use and flexibility tariffs is often smaller in long trials than in short trials ([Department of Energy and Climate Change, 2012](#)). However, previous research has shown that drop-off rates are manageable even in demanding trials ([Bernard et al., 2026](#)) suggesting that fatigue can be managed. At the same time, there are indications that behavioural interventions can lead to a sustained effect over time, which erodes slowly (rather than fast) only after the intervention terminates ([Allcott and Rogers, 2014](#)). To reduce the likelihood of fatigue, our trial combined a persistent cost signal with behaviourally informed communications, to encourage sustained flexibility behaviour change over a period of 3-4 months.

Methodology

Research questions and outcomes

Our research examined whether financial incentives, in the form of standing charge rebates, and behaviourally informed communications influenced household electricity consumption during the weekday peak period (4pm–7pm)¹, and whether responses varied according to rebate amount and communication frequency.

The trials investigated whether standing charge rebates reduced peak-time energy consumption and whether any effects were driven by demand reduction or demand shifting. We examined whether the size of the incentive, specifically rebates of up to 50 or 100% of the daily standing charge, influenced behavioural response, and whether fortnightly or monthly communications affected response to the intervention. We addressed these questions primarily using half-hourly smart meter energy consumption data, with peak-time electricity consumption serving as the primary outcome measure and off-peak and total electricity consumption serving as secondary outcomes.

We also explored whether responsiveness varied across customer subgroups. We used consumption data alongside a post-trial survey and qualitative research to assess consumer understanding, engagement, perceptions and experiences of the intervention.

Research methods

Overall approach

We designed and ran two opt-out randomised controlled trials (RCT) to evaluate whether financial incentives in the form of standing charge rebates could encourage consumers to reduce peak-time electricity consumption. Unlike many demand-side flexibility trials that rely on voluntary opt-in participation, eligible customers were automatically enrolled unless they chose to opt out.

To identify trial partners, Ofgem issued an open letter inviting suppliers to express interest in participating.² Participation was voluntary, and interested suppliers were assessed against pre-defined criteria relating to implementation feasibility, sample size, data-sharing capability, and ability to meet the methodological requirements of

¹ Energy suppliers typically regard 4pm–7 pm on weekdays as the peak period for energy use. See: [Electricity peak hours explained](#) and [Using energy flexibly | Energy flexibility | Smart Energy GB](#). Also see: [Information and support key to creating “smart” consumers of electricity](#)

² [Split standing charge tariff trial | Ofgem](#)

the trial. We subsequently ran the trials in partnership with two energy suppliers. Additional detail is provided in the Technical Annex.

Both trials focused on reducing electricity usage during peak periods (defined as weekdays between 4pm and 7pm), using financial incentives linked to reductions in consumption. Suppliers randomly assigned participants to treatment and control groups using stratified randomisation based on pre-specified characteristics to enable causal inference on the effectiveness of the interventions. We designed the incentive to reflect participants' relative contribution to peak electricity demand rather than reward reductions against historical consumption, with supplier-specific mechanisms used to determine rebates. This approach enabled us to test whether consumers could be rewarded according to their contribution to system costs, rather than solely the effort required to reduce their consumption.

We adopted a mixed-methods approach combining large-scale behavioural trial data analysis, survey research, qualitative interviews, and communications testing pre-trial. Together, our research aims to understand not only whether the interventions changed behaviour, but also consumers' awareness, understanding, perceptions and reported experiences of the trial. This enabled us to assess how consumers experienced the intervention, how the interventions were communicated and whether similar approaches could be delivered at scale.

Data protection

The trial was designed and delivered in accordance with UK GDPR and Ofgem's internal data governance requirements. Suppliers pseudonymised all trial data before transferring them to Ofgem, and datasets did not contain direct personal identifiers. While suppliers retained the ability to link pseudonymised identifiers back to customers for operational purposes, Ofgem and its research partners accessed only pseudonymised data. Appropriate technical and organisational safeguards, including secure data storage, restricted access controls and documented retention arrangements, were implemented throughout the trial.

Trial participant communication touchpoints

Participants received a series of communications throughout the trial, from initial invitation through to trial completion. These communications provided information about participation, reminders about the trial and updates on savings earned.

Table 1 summarises the participant experience and communication journey.

Both suppliers sent an initial email communication to treatment-group participants informing them of their inclusion in the trial. This first communication outlined the purpose of the trial, provided relevant information about participation, and explained the process for opting out should participants choose not to take part.

One day before the start of the trial, both suppliers sent a reminder email to treatment group participants. This reminded participants that the trial was about to begin and explained how they can engage in the trial.

During the trial, suppliers also sent ongoing communications to participants. The nature and frequency of these communications differed between suppliers. British Gas provided either monthly or fortnightly reminder communications depending on the participant's assigned treatment group. ScottishPower sent SMS reminders to treatment group participants between monthly communications.

The communications across both suppliers were standardised across customers and did not vary according to participants' previous consumption, rebate earnings or engagement with the trial. Both suppliers also provided monthly summaries that informed participants of any savings or rebates earned during the trial period.

At the end of the trial, British Gas sent a closing email informing participants that the trial had concluded. ScottishPower did not send an equivalent communication due to operational constraints.

Table 1: Trial participant communication journey and touchpoints

Trial Stage	Communication	British Gas	ScottishPower
Before trial	Initial trial communication (email)	Yes	Yes
Before trial	Pre-trial reminder (email)	Yes	Yes
During trial	Fortnightly in-trial reminder	Fortnightly treatment group only (email)	All treatment participants (SMS)
During trial	Monthly trial communication (email)	Yes	Yes
During trial	Trial completion communication	Yes	No
After trial	Endline survey invitation (email)	Yes	Yes
After trial	Qualitative research (email)	Yes	Yes

Communications development and testing

Given the novelty and complexity of linking standing charge rebates to peak-time electricity consumption, we undertook behavioural research to inform the design and pre-testing of both the initial trial communication (stage 1) and subsequent during-trial communications (stage 2). We developed and evaluated alternative communication approaches to improve consumers' understanding of the incentive, increase engagement with the trial, and support informed decision-making about participation.

We partnered with academics from Bayes Business School to test and evaluate different message framings and identify communication approaches that were most effective at improving comprehension, perceived clarity and motivation to engage with the intervention. We examined, among other things, how consumers responded to different descriptions of the financial incentive, alternative presentations of standing

charge rebates, environmental and social impact messages, system-level benefits, and potential names for the trial.

We identified several communication principles that improved consumers' understanding of, and engagement with, the intervention. These included using simple language, reducing the amount of information presented, prioritising key information earlier in communications, presenting potential rewards as percentages of the standing charge rather than absolute monetary amounts and emphasising that the trial was being delivered in partnership with Ofgem to increase credibility. The research also identified communication framings that were suitable for further testing within the supplier trials. For British Gas, this included two message variants that focused on social impact and system-level savings.

Overall, these findings informed the design of the communications used throughout the supplier trials. They also provided evidence on how future standing charge reforms and consumer flexibility initiatives could be communicated to consumers.

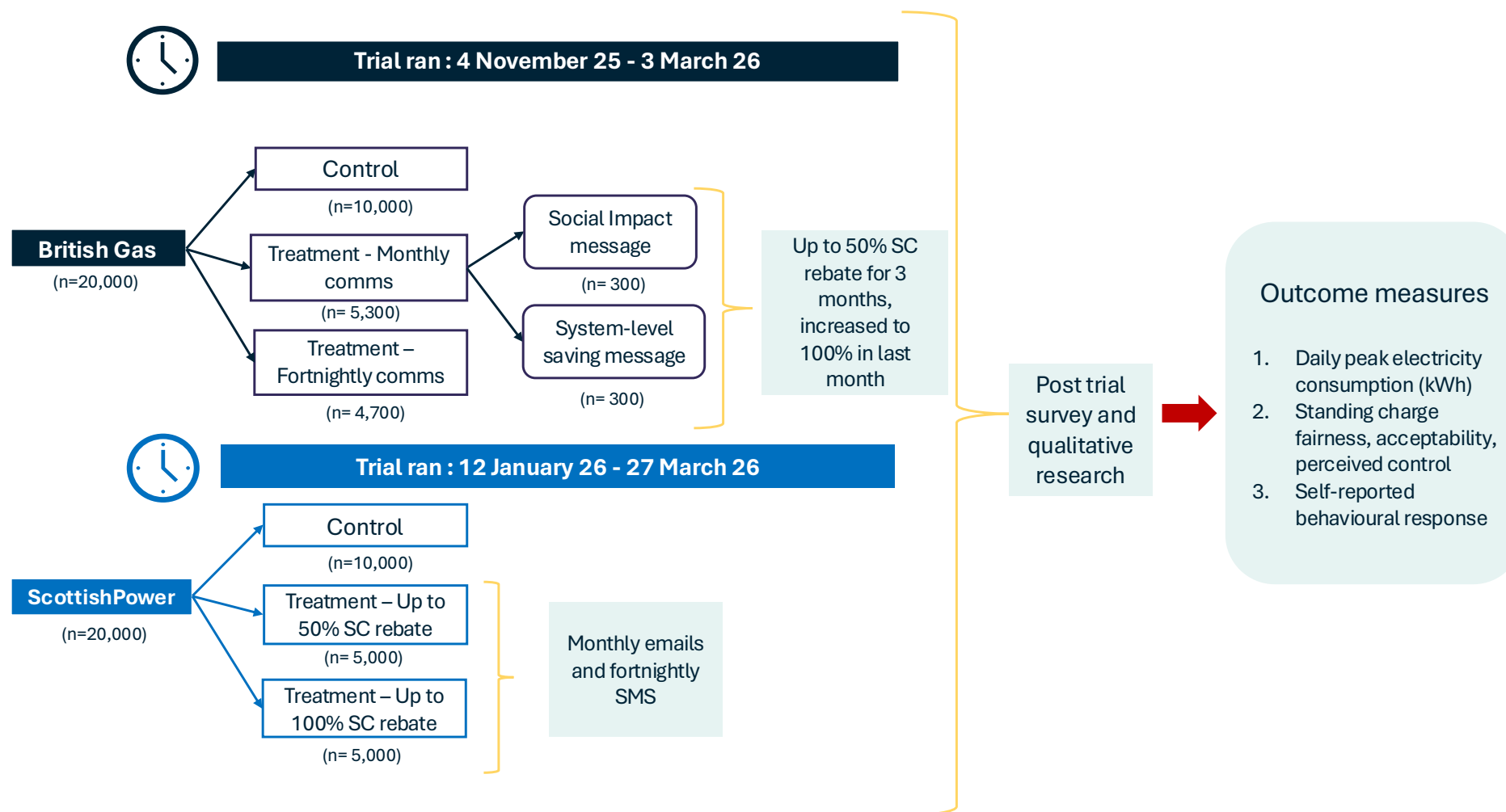
We also referred to the incentive as a standing charge discount rather than a rebate in customer-facing communications.

Full details of the communication testing methodology, message variants and final supplier communications are provided in the supplementary report.

Experimental design

We designed the trials as large-scale field experiments to test whether standing charge rebates could encourage households to reduce electricity consumption during the weekday peak period (4pm- 7pm). Figure 1 shows the overall experimental design of both the randomised controlled trials. Both suppliers randomly assigned eligible customers to treatment and control groups, enabling causal estimation of the impact of the interventions on electricity consumption.

Figure 1: Trial design and treatment arms used by British Gas and ScottishPower (planned sample sizes prior to oversampling and attrition)



The trials adopted different experimental designs reflecting each supplier's operational approach and trial objectives:

- British Gas implemented a multi-arm randomised controlled trial that varied in communication frequency and message framing. The communication frequency varied by group – one group received monthly communications and another received fortnightly and monthly communications. Participants in the monthly group received one of two message variants, which highlighted either the social impact of reducing peak-time electricity use or the potential for system-level savings³.

In the final month, communication frequency was standardised across groups, reducing variation to three effective treatment conditions.

- ScottishPower implemented a two-arm trial that varied the amount of financial incentives, alongside comparisons with a control group.

Customers were assigned to one of the two treatment arms:

- Maximum rebate of 50% of the daily standing charge
- Maximum rebate of 100% of the daily standing charge

In both trials, we complemented behavioural analysis with a post-trial survey to assess participants' understanding, perceptions, and self-reported engagement with the intervention.

Together, the trials enabled us to assess how participants responded to alternative standing charge rebate mechanisms, varying incentive strengths and different communication approaches.

More details about the different incentive designs for both suppliers are provided in the following sections.

British Gas trial design

The British Gas trial ran over a four-month period (4 November 2025 to 3 March 2026). In this trial, the incentives were designed to reward reductions in electricity consumption during the weekday peak period (4pm-7pm). To investigate whether

³ These message variants were included to test whether alternative message framings influenced participants' behavioural responses to the intervention. The framings were informed by previous behavioural science literature suggesting that highlighting wider social, environmental and collective benefits can influence engagement and behaviour change in some contexts. To operationalise these concepts within the trial, Ofgem's Office for Research and Economics (ORE) team developed the specific message wording and illustrative examples for research purposes. The exact wording of the messages was designed to support experimental testing and does not necessarily reflect Ofgem's current views or policy positions.

communication frequency affected behavioural response, participants were allocated to groups receiving either monthly summary emails only or fortnightly reminder emails plus monthly summaries.

Within the monthly summaries' treatment group, a smaller messaging subsample received one of two message variants⁴, which read either:

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

or

‘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!’

We also examined whether increasing the size of the available rebate affected behavioural response to the intervention. During the first three months, participants could earn a rebate of up to 50% of their daily standing charge. In the final month, the maximum available rebate increased to 100% of the daily standing charge, and all participants received monthly notifications (no fortnightly communication anymore), while the threshold structure remained unchanged.

British Gas incentive structure

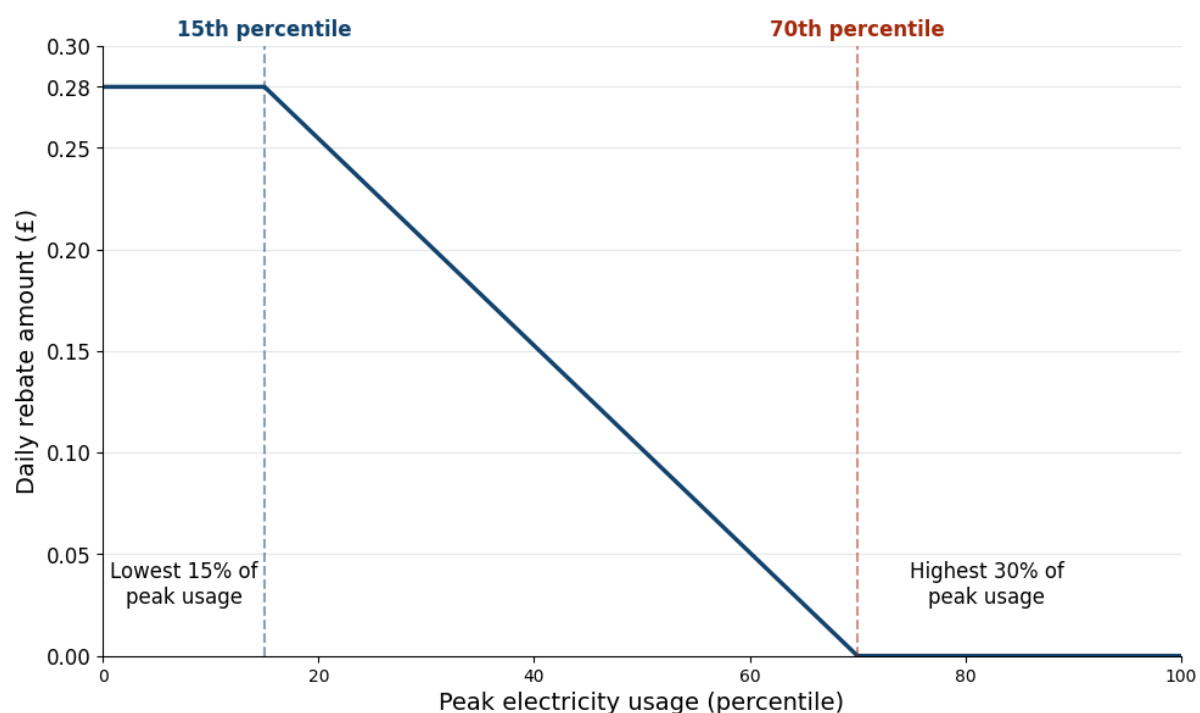
Rewards were allocated based on a relative consumption model, whereby participants' peak-time electricity consumption was compared against a derived control-group distribution rather than against an individual baseline. Each day, participants' peak-time usage was ranked relative to other customers within the distribution, with rebates determined by this relative position. The distribution was calculated separately for each regional distribution area to account for structural differences in electricity consumption across regions.

Participants received rebates using a sliding scale incentive structure (see Figure 2). Those participants whose peak-time electricity usage fell within the lowest 15% of the regional consumption distribution received the full rebate. Participants whose consumption fell at or above the 70th percentile received no rebate. Participants between the 15th and 70th percentiles received a partial rebate that decreased linearly as peak-time usage increased. This approach rewarded incremental reductions in

⁴ Differences in the content of the messages across the two messaging subgroups were marginal. These message variants were included to test whether different framings (social impact or system-level savings) influenced participants' behavioural responses to the intervention. The exact wording of the messages may not reflect the current views of Ofgem.

peak-time consumption and avoided sharp eligibility thresholds where participants with very similar consumption could receive substantially different rewards.

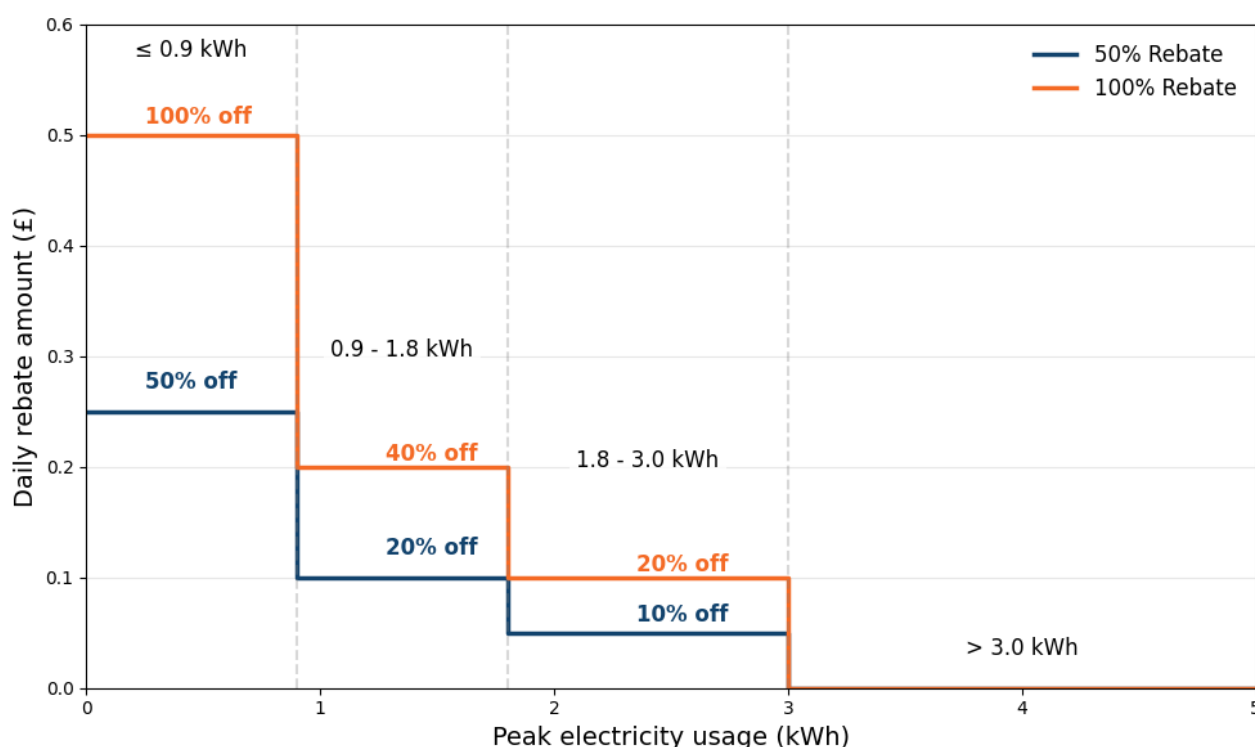
Figure 2: The sliding scale incentive design for British Gas trial



ScottishPower trial and incentive design

ScottishPower used a fixed threshold incentive model based on absolute electricity consumption rather than relative performance against other customers. Participants were randomly assigned to one of two treatment groups or a control group, enabling comparison of different incentive levels against a common counterfactual. ScottishPower also included a separate control group for the survey research, consisting of 9,764 customers.

Daily rewards were determined by the customer's usage band (see Figure 3 for detailed usage bands). Participants in the lowest consumption band (below 0.9 kWh) received the maximum available rebate, Participants in the highest band (over 3 kWh) received no rebate, and participants in the intermediate bands received partial rebates. Unlike British Gas, ScottishPower did not use regional baselines or relative ranking. The same consumption thresholds were applied nationally across all participating customers.

Figure 3: ScottishPower incentive structure and usage bands for both treatment arms

Sample and eligibility criteria

Trial sample

Across both trials, eligibility generally required customers to have a communicating smart meter, to have consented to the sharing and use of their half-hourly (HH) smart meter data, and to have sufficient historical half-hourly consumption data available prior to the start of the trial. The trial was designed to achieve an analytical sample of 10,000 customers in the pooled treatment group and 10,000 customers in the control group.

To ensure the target analytical samples were achieved, British Gas oversampled the eligible population by 15%, and ScottishPower oversampled the eligible population by about 2.5%. A total of 1,149 participants in British Gas and 23 participants in ScottishPower opted out of the trial. While opt-out rates differed between suppliers, participation remained high across both trials, indicating that most customers chose to remain in the trial while retaining the ability to opt out at any stage. Following oversampling and opt-outs, the final analytical samples comprised of 11,478 treatment participants and 11,480 control participants in British Gas, and 10,271 treatment participants and 10,257 control participants in ScottishPower.

We designed the eligibility criteria with the objective of maximising participation and ensuring that findings would be relevant to a broad customer population. However, some eligibility decisions reflected operational constraints within supplier systems and the practical requirements of trial delivery. As a result, the final eligibility criteria represented a balance between inclusivity, participant protection, analytical robustness and operational feasibility.

Eligibility criteria were broadly similar across suppliers and reflected a combination of analytical, operational and customer protection considerations. All participants were required to have a communicating smart meter, consent to share half-hourly smart meter data and a minimum of three months of historical consumption data. Beyond these core criteria, suppliers applied some additional eligibility requirements and exclusions based on their customer bases and operational considerations.

Table 2 summarises the eligibility criteria used by each supplier. The main differences were that ScottishPower required customers to have opted in to marketing communications and did not include prepayment customers, whereas British Gas included both customers who had opted in and customers who had opted out of marketing communications, as well as prepayment customers.

Table 2: Eligibility criteria for both suppliers

<i>Eligibility criterion</i>	<i>British Gas</i>	<i>ScottishPower</i>
<i>Communicating smart meter</i>	Yes	Yes
<i>Consent to share HH data</i>	Yes	Yes
<i>At least three months of HH data</i>	Yes	Yes
<i>Communicating credit customers</i>	Yes	Yes
<i>Prepayment meter customers</i>	Yes	No
<i>Priority Services Register (PSR) customers</i>	Yes	Yes (subject to exclusions)
<i>Customers in debt</i>	Yes	Yes
<i>Economy 7 customers</i>	Yes	Yes
<i>Half Price Weekend customers (ScottishPower flex proposition)</i>	No	Yes
<i>Marketing opt-in required</i>	No	Yes

We applied exclusion criteria to remove customers for whom participation may have been inappropriate, infeasible or analytically unreliable such as customers without sufficient contact details or poor smart meter data quality. Some customers on existing time-of-use and electric vehicle tariffs were excluded because they were already receiving alternative price signals designed to influence consumption behaviour. Including these customers could have made it difficult to isolate the effects of the standing charge rebate intervention and may have created confusion where multiple flexibility propositions operated simultaneously. These exclusions aimed to ensure that customers could receive and engage with the intervention as intended, and that the analysis relied on sufficiently complete and robust smart meter data. While the exclusions reduced the size of the eligible population, they were applied prior to treatment assignment and consistently across treatment and control groups. As a result, they are unlikely to bias the estimated treatment effects within the trial sample, although they may affect the extent to which the findings can be extrapolated to customers who were excluded from participation.

The final analytical samples were also shaped by data quality checks, including exclusions for implausibly high estimated annual consumption values and missing or incomplete smart meter data. We describe these further in the Technical Annex.

Survey sample

Both suppliers conducted a post-trial survey shortly after completion of the trial period. The survey captured participants' awareness and understanding of the intervention, perceived fairness and acceptability, self-reported behavioural changes, and overall experience of participating in the trial. We commissioned The Behaviouralist to administer and manage the survey, and to conduct the standalone analysis of survey responses. Ofgem conducted additional analyses linking survey responses to smart meter consumption data where this linkage was possible, enabling us to examine the relationship between survey responses and observed behavioural outcomes.

For British Gas, invitations were sent to all participants in both treatment and control groups, with reminder communications issued during fieldwork to maximise response rates. We received 2,038 responses, comprising 1,009 treatment participants and 1,029 control participants, representing a response rate of 9%.

For ScottishPower, survey invitations were sent to participants in the treatment groups. For operational reasons, ScottishPower recruited a separate control group for the survey rather than using the control group from the behavioural trial. However, this group was balance checked for characteristics to ensure consistency. Consequently, direct comparisons between behavioural outcomes and survey responses could only be undertaken for treatment participants. This limitation is discussed further in the technical annex. Overall, we received 1,951 responses, comprising 983 treatment participants and 968 control participants, representing a response rate of 10%.

These response rates are relatively high for customer surveys administered in operational energy market settings and provided a substantial sample for attitudinal and behavioural analysis.

For both suppliers, we included partial responses from participants who completed the survey up to Question 12 (see the questionnaire in the Technical Annex). Further details on survey administration, achieved sample characteristics, and the analytical approach are provided in the Technical Annex.

Qualitative sample

Following completion of the trial, we commissioned Thinks Insight and Strategy (TIS) to conduct 36 in-depth interviews (approximately 60 minutes each) with participants across both supplier trials to explore their experiences of the intervention, understanding of the incentive, behavioural responses and barriers to engagement, and reported behaviour change. TIS recruited and screened participants, conducted the interviews and analysed the findings to identify common themes relating to the trial. For British Gas, the qualitative sample comprised 16 participants across different treatment groups, levels of electricity usage and prepayment meter (PPM) customers. For ScottishPower, the qualitative sample comprised 20 participants across both treatment groups and a range of electricity usage levels. Further details of this research are available in the supplementary report.

The qualitative research provided deeper insight into how participants understood the intervention, responded to communications and adapted their energy-use behaviours during the trial. It also helped contextualise the behavioural and survey findings by identifying barriers and enablers to participation.

Further detail on recruitment, response rates and achieved sample characteristics is provided in the supplementary report.

Analytical strategy

In the randomised controlled trials, our primary analytical objective was to estimate whether the standing charge rebates reduced household electricity consumption during weekday peak hours (4pm – 7pm). The primary outcome of interest was peak-time electricity consumption, measured in kWh. Secondary outcomes included off-peak electricity consumption and total electricity consumption to assess whether observed changes reflected demand reduction or load shifting. We obtained advice on our analytical approach from The Evaluation and Trial Advice Panel (ETAP).⁵

Methodologically, we used panel data: in our dataset, we observe household behaviour repeatedly before and during the trial, for several months (215 days for British Gas, 198

⁵ See here for reference: [The Evaluation and Trial Advice Panel \(ETAP\) - GOV.UK](#)

days for ScottishPower). The British Gas half-hourly consumption dataset consists of 236,902,560 observations, and the ScottishPower half-hourly consumption dataset consists of 195,325,746 observations. The datasets aggregating consumption at daily level consist of 4,935,110 observations for British Gas, and 4,064,544 for ScottishPower.

For both suppliers, the trial was based on a Difference-in-Differences (DID) design, and our DID analysis is based on a Two-Way Fixed Effects estimator with household and time fixed effects. In summary, this approach estimates the change in average peak-time consumption between the pre-trial and the trial periods for treated households and subtracts the change in average peak-time consumption between the pre-trial and the trial periods in control households, therefore removing the change that would have been observed in the absence of the trial. Household fixed effects adjust for time-invariant household characteristics that can influence electricity consumption (for example, age, gender, level of insulation); while time fixed effects account for common factors affecting all households in a given period, such as seasonality, holidays, broader energy market conditions or weather patterns common to both treatment and control groups.

We assessed demand shifting by comparing estimated impacts across peak-time, off-peak and total electricity consumption outcomes. The Technical Annex provides the full econometric specifications, including household and time fixed effects, clustering approach, robustness checks and sensitivity analyses and alternative model specifications including extended model specifications. It also describes the survey methodology and analytical approach.

For our samples, DID estimates were obtained as follows.

British Gas data

For British Gas, we specified a basic DID model as:

$$Y_{im} = \alpha_i + \lambda_m + \tau_1(Treated_i \times Post_m) + \varepsilon_{im}$$

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 any treatment group
- $Post_m$: indicator equal to 1 for periods after trial start

Flexing Fixed Charges: Evidence from Standing Charge Rebate Trials

- $(Treated_i \times Post_m)$ 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

Additional model specifications assessed the impact of incentive size, communication frequency and subgroup membership, to estimate the regression:

$$Y_{im} = \alpha_i + \lambda_m + \tau_1(Treated_i \times Post_m) + \tau_2(Treated_i \times Post_m \times Frequency_{im}) + \tau_3(Treated_i \times Post_m \times Rebate100pc_{im}) + \tau_4(Treated_i \times Post_m \times Message_i) + \varepsilon_{im}$$

where

$Frequency_{im}$: indicator equal to 1 if household i received fortnightly communication in month m (monthly notifications = 0);

- $Rebate100pc_{im}$: indicator equal to 1 if household i received a 100% Standing Charge rebate in month m (0 otherwise);

$Message_i$: indicator equal to 1 if household i received an additional message prior to the start of the trial (0 otherwise).

For British Gas, the primary model estimated the average treatment effect on treated households using household-month level data. Daily peak-time consumption was aggregated to calculate the average daily consumption in the month under consideration, to align with the monthly billing and rebate cycle and to smooth high-frequency variation in electricity use. A daily-level specification was also estimated as a sensitivity check.

ScottishPower data

For ScottishPower, the primary model used household-day level data for working weekdays. This reflected the daily structure of the ScottishPower rebate mechanism, where rewards were calculated each day based on peak-time consumption bands.

$$Y_{it} = \alpha_i + \lambda_t + \tau_1(Rebate50pc_{it} \times Post_t) + \tau_2(Rebate100pc_{it} \times Post_t) + \varepsilon_{it}$$

- $Rebate50pc_{it}$: indicator equal to 1 if household i received a 50% Standing Charge rebate in day t (0 otherwise);
- $Rebate100pc_{it}$: indicator equal to 1 if household i received a 100% Standing Charge rebate in day t (0 otherwise).

For ScottishPower, the model was estimated using household-day level consumption data.

Pre-trend analysis - Assessment of parallel trends

The main identifying assumption for the DID approach is that in the absence of the intervention, treatment and control households would have followed parallel trends in peak-time consumption. In other words, any difference between treatment and control groups after the intervention could be attributed to the trial only if their consumption would otherwise have evolved similarly over time. This assumption was assessed using pre-trial consumption data as follows: we estimated the regression

$$Y_{it} = \alpha_i + \sum_{t \neq 0} \beta_t D_t + \gamma \text{Treated}_i + \sum_{t \neq 0} \delta_t (D_t \times \text{Treated}_i) + \varepsilon_{it}$$

using daily data, where:

- Y_{it} : daily peak-hour electricity consumption for household i on day t
- α_i : household fixed effects
- D_t = dummy variable for day t ($t = 0$ is the baseline dummy variable)
- Treated_i : indicator equal to 1 if household i is assigned to any treatment group
- ε_{it} : idiosyncratic error term
- δ_t are the interaction coefficients of interest.

The parallel trend hypothesis is based on a joint Wald test of the coefficients δ_t , where the null hypothesis of no difference in pre-trends corresponds to $H_0: \delta_t = 0 \forall t$, while the alternative hypothesis of different pre-trends corresponds to $H_A: \exists t \text{ such that } \delta_t \neq 0$.

This specification allows for an essentially non-parametric time trend, which is modelled as a series of dummy variables, therefore less restrictive than a linear time trend in capturing high-intensity data.

Additional analyses

In addition to estimating treatment effects, we conducted diagnostic analyses to assess randomisation balance, data completeness, missingness patterns and the plausibility of key identification assumptions.

Results

Demand Flexibility Analysis

In this section, we report results from econometric analysis estimating the impact of 50% and 100% rebates, and the frequency and content of communications on peak energy consumption using half-hourly smart meter data on energy consumption.

Descriptive statistics

Table 3 provides descriptive statistics of the sample and results from the balance tests to confirm that randomisation was successful across the treatment and control groups across both suppliers. There are no significant differences across groups in terms of average electricity consumption pre-trial, estimated annual consumption, the proportion of participants on the Priority Services Register, electricity-only customers, and customers paying by direct debit.⁶ In terms of the average amount of standing charge pre-trial, all groups in British Gas had similar standing charges pre-trial. However, in ScottishPower, there is a statistically significant difference in the pre-trial standing charge paid across groups, albeit the difference is very small, and the significance is possibly due to chance.

To test for differences across groups in terms of average daily peak consumption behaviours pre-trial and during trial (in Table 3), and the proportion of days with zero peak consumption and data missing (in Table 4), we perform statistical tests where we regress using OLS (with clustered residuals) each of the 4 outcomes over three sets of variables: treatment dummies; weekly dummies, to capture time variation in a parsimonious way; and their interaction. Subsequently, we implement a Type-III-style ANOVA test implemented as a joint Wald test of the treatment groups, using cluster-robust standard errors.

In Table 3, we see descriptive evidence that there are statistically significant differences across the control and treatment groups in British Gas in terms of their average daily peak consumption behaviours during the trial. The similar means across the two treatments during the trial suggest that the difference between control and treatment groups was driven primarily by the rebate as opposed to the frequency of communications. We will discuss the details further below in terms of the drivers of these differences across treatments.

⁶ Recall that the trial started in November at British Gas and in January at ScottishPower. The pre-trial and post-trial differences in the control groups at both suppliers are driven by seasonal differences and the timing of the trial (winter had already set in by the time ScottishPower trial had begun so the pre-trial averages are higher for ScottishPower than for British Gas).

Table 3: Descriptive statistics and balance tests of the sample

	British Gas	British Gas	British Gas	British Gas	ScottishPower	ScottishPower	ScottishPower	ScottishPower
Variable name	Control	Fortnightly	Monthly	Test	Control	50% rebate	100% rebate	Test
Average electricity consumption (Oct-2025 - pre-trial) (kWh)	259.80	255.37	255.27	2.75	275.43	277.19	274.62	0.27
Average daily peak electricity consumption pre-trial (kWh)	1.39	1.37	1.38	1.37	1.87	1.88	1.86	0.99
Average daily peak electricity consumption during-trial (kWh)	1.86	1.81	1.81	5.61*	1.88	1.89	1.87	0.05
Estimated Annual Consumption (EAC) (kWh)	3105.93	3066.76	3057.27	1.65	3296	3307	3271	0.19
Proportion on Priority Services Register (PSR)	0.55	0.55	0.54	1.70	0.28	0.28	0.28	0.25
Proportion of electricity only customers	0.09	0.08	0.08	1.97	0.13	0.11	0.12	3.80
Proportion of customers paying by direct debit	0.69	0.69	0.69	0.56	0.91	0.92	0.91	1.83

Flexing Fixed Charges: Evidence from Standing Charge Rebate Trials

	British Gas	British Gas	British Gas	British Gas	ScottishPower	ScottishPower	ScottishPower	ScottishPower
Variable name	Control	Fortnightly	Monthly	Test	Control	50% rebate	100% rebate	Test
Standing charge paid (pre-trial) (GBP)	0.50	0.50	0.50	0.07	0.51	0.50	0.50	74.67***
Number of observations	11,480	5,735	5,739		10,257	5,139	5,132	

Note: For EAC, we tested statistical differences using a Kruskal-Wallis test; for binary variables (PSR, electricity only and direct debit), we used a Pearson chi2 test. For average daily peak electricity consumption pre-trial and during trial, we used OLS regressions. Statistical significance levels are denoted as follows: *** p-value < 0.01, ** p < 0.05, * p < 0.10. In British Gas, for fortnightly and monthly treatments, the rebate increased from 50% to 100% during the trial.

Table 4 compares the proportion of 30-min intervals with missing observations during a day; and whether the smart reader reported zero peak time electricity consumption during the day across groups. Results in Table 4 show that there are no significant differences (at 5% confidence level) across treatments in terms of zero-consumption observations, or missing intervals (however, this metric appears to differ in the ScottishPower sample at 10%). We further assessed whether missing values differ systematically between treatment and control groups over time. Across both suppliers, a series of cross-sectional Kruskal-Wallis tests compared the percent of daily missing half-hourly readings across groups. Results show that differences in missing rates are rare (less than 3% of the time) and occur at rates consistent with chance, with no clear temporal patterns. This suggests that missingness is not systematically related to treatment assignment (see Technical Annex).

We also examined whether the probability of zero daily consumption observations differ across groups using a difference-in-difference estimator with clustered residuals applied to daily data. Results suggest that in some groups, zeros occur more frequently than others: participants were about 0.12% less likely to have zero value in the fortnightly treatment group for British Gas relative to the control group; and 0.23% more likely to have a zero value in the 50% rebate group for ScottishPower relative to the control group. Notably, based on discussions with suppliers, zero values are reflective of consumers who might have low-carbon technologies such as solar panels to generate their own energy and might consume less energy than they produce, less frequently reflecting potential errors in the smart meter. While these differences are significant, they are not consistent across specifications, and their impact is very small and are possibly driven by seasonal factors.

Overall, these findings indicate that missingness and data quality issues are unlikely to bias the estimated treatment effects.

Table 4: Analysis of zero consumption and missing observations

	British Gas	British Gas	British Gas	British Gas	Scottish Power	Scottish Power	Scottish Power	Scottish Power
Variable name	Control	Fortnightly	Monthly	Test	Control	50% rebate	100% rebate	Test
Proportion of data missing	0.02	0.02	0.02	0.9935	0.0068	0.0066	0.0068	5.2142*
Proportion of days with zero peak consumption	0.0085	0.01	0.0093	2.8810	0.0040	0.0032	0.0038	0.2359
Number of observations	2,468,200	1,306,985	1,159,925		2,030,886	1,017,522	1,016,136	

Note: Kruskal-Wallis tests. Statistical significance levels are denoted as follows: *** p-value < 0.01, ** p < 0.05, * p < 0.10. In British Gas, for fortnightly and monthly treatments, the rebate increased from 50% to 100% during the trial.

Table 5 shows the rebate amounts paid across treatments. The average rebate paid to participants in British Gas did not differ across treatments, consistent with the finding that there is no statistically significant difference between the fortnightly and monthly communications groups. On the other hand, the average rebate paid to participants in the 100% rebate group was double that of the rebate paid to the 50% rebate group in ScottishPower over the period 12/01/2026-31/03/2026. The average total savings during the trial was approximately £12 in British Gas and between £7 and £14 in ScottishPower. The number of participants who did not earn a rebate was small across both suppliers.

Table 5: Analysis of rebates

	British Gas	British Gas	ScottishPower	ScottishPower
Variable name	Fortnightly	Monthly	50% rebate	100% rebate
Average daily rebate	£0.15	£0.15	£0.12	£0.25
Range of rebate	[£0, £0.80]	[£0, £0.80]	[£0, £0.40]	[£0, £0.81]
Average monthly rebate	£3.66	£3.66	£2.46	£4.98
Average total rebate	£12.37	£12.37	£6.95	£14.06
Number of participants with £0 rebate	59	52	35	26
Total number of participants	5,735	5,739	5,139	5,132

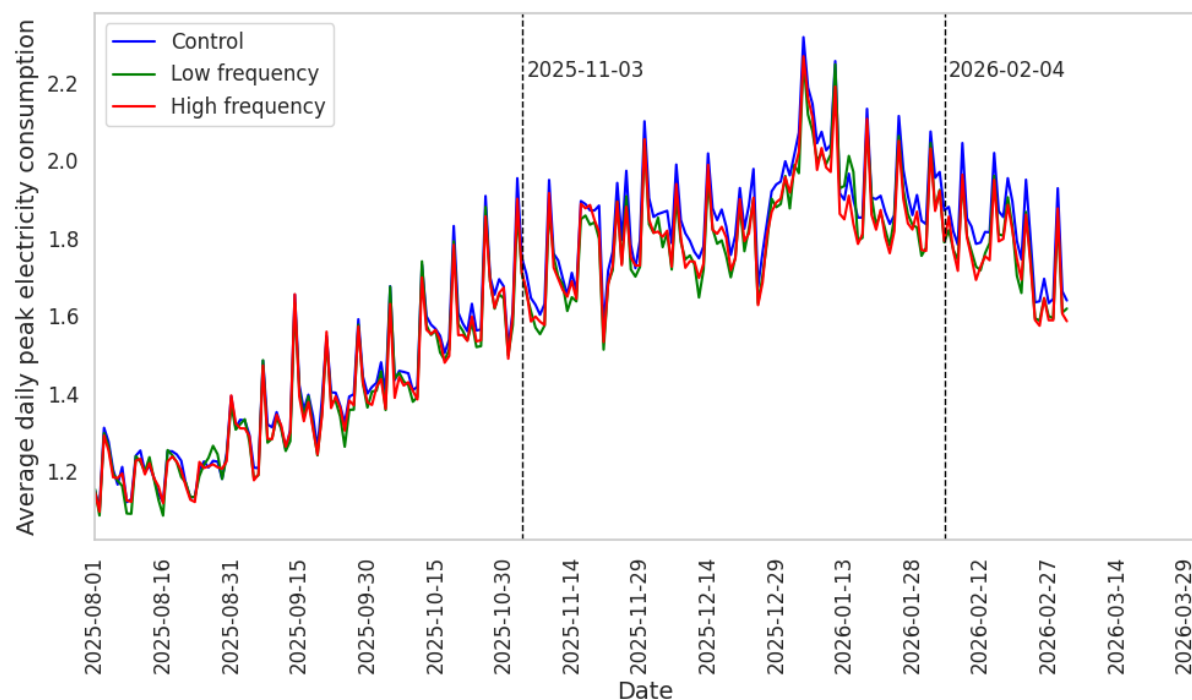
Note: For reference, there were 11,480 customers in the British Gas control group, and 10,257 in the ScottishPower control group. Recall that customers in ScottishPower could earn rebates even if they didn't reduce their peak energy consumption due to the incentive approach implemented, as described earlier.

Assessment of parallel trends assumption

Figure 4 and Figure 5 show the average daily peak consumption (in kWh) for participants across groups at both suppliers. Visually, the figure shows that the treatment and control groups at both the suppliers followed a similar trend before the start of the trial.

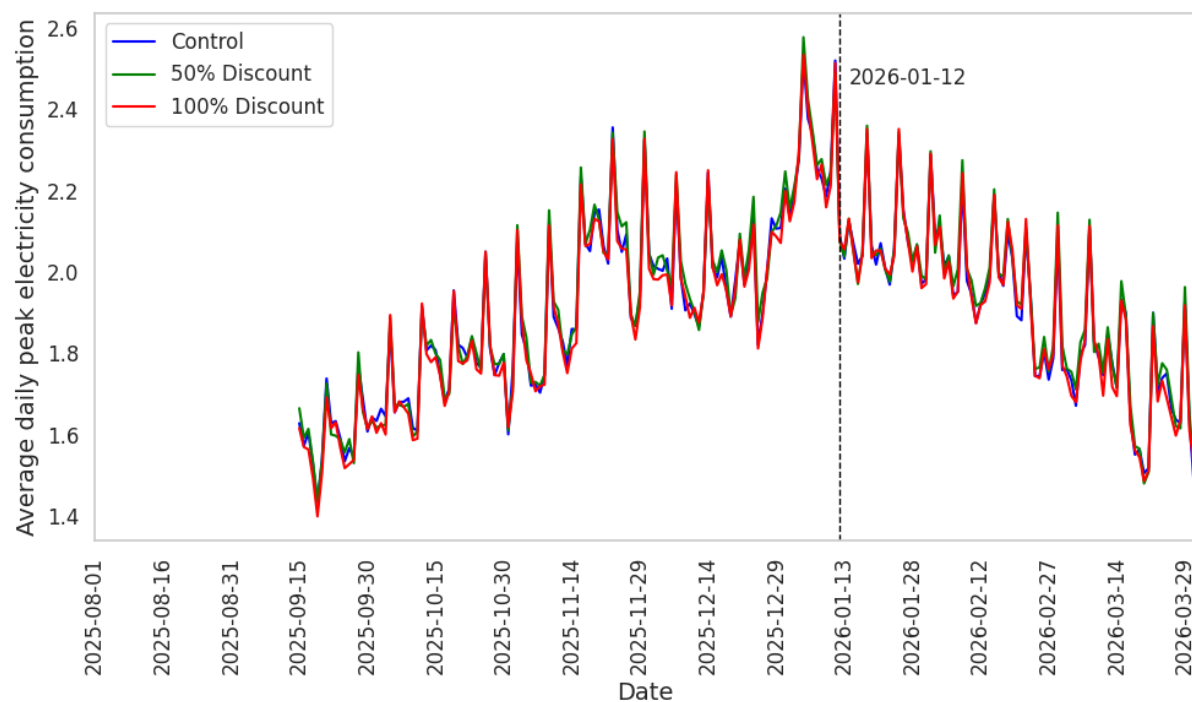
We also conduct econometric tests to validate the parallel trends assumption. In British Gas, we obtain the Wald test statistic $F(66, 22,939) = 1.18$, failing to reject the null hypothesis of no difference in pre-trends ($p = 0.1560$). Similarly, in ScottishPower, we obtain the Wald test statistic $F(101, 20,504) = 1.16$, which also fails to reject the null hypothesis of parallel trends ($p = 0.1250$). These results are expected by the randomisation of individuals into treatment groups, which should return samples that are identical in their pre-trial consumption patterns.

Figure 4: Assessment of parallel trends in British Gas



Note: The dashed line at 2025-11-03 denotes the start of the trial, while the dashed line at 2026-02-04 denotes the increase in rebate for all participants in the treatment groups from 50% to 100% rebate.

Figure 5: Assessment of parallel trends in ScottishPower



Note: The dashed line at 2026-01-12 denotes the start of the trial.

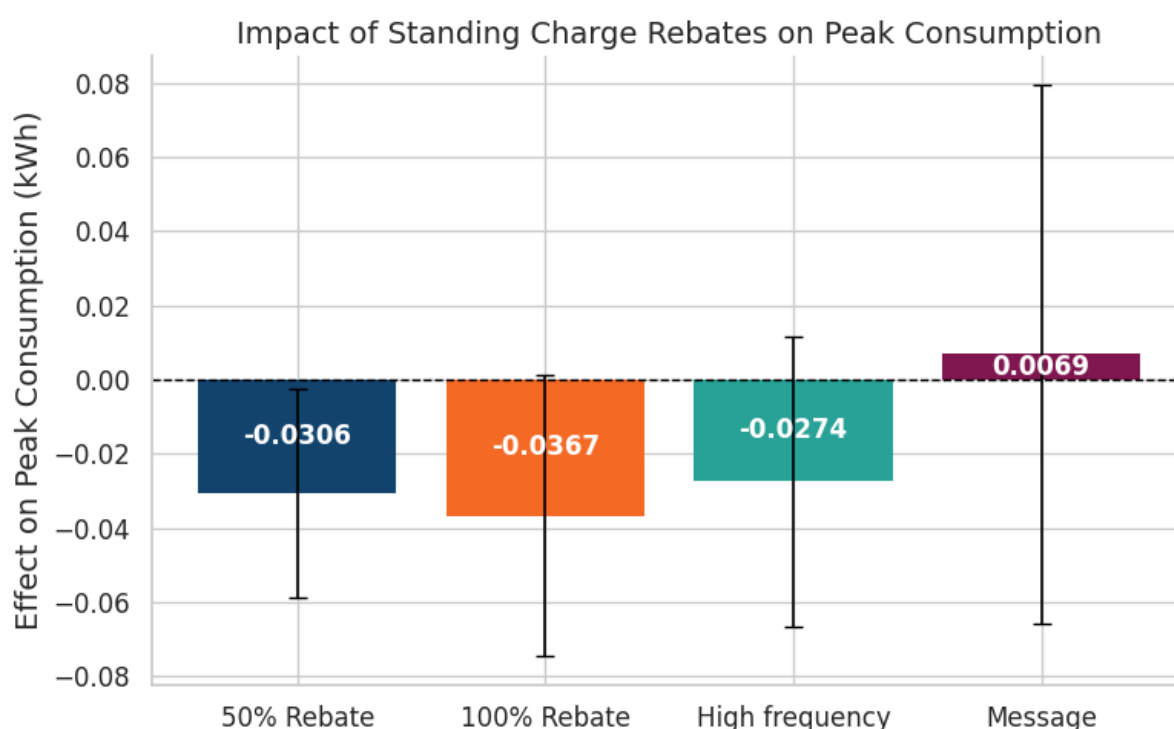
Primary analysis

British Gas

Summary findings

As seen in Figure 6, we find a statistically significant effect on peak consumption only under the 50% rebate of an average -0.0306 kWh per household (95% CI: [-0.059, -0.003], $p = 0.0329$). We find no other significant effect under the other treatment variants tested: the effect of increasing the rebate to 100% from 50% in the final month; sending higher frequency comms to participants; adding an additional system cost message in the original communications email.

Figure 6: Effect of standing charge rebates on peak consumption in British Gas



Effect of 50% rebate on standing charges

Using the difference-in-differences model specified above with household and time fixed effects, we estimate that exposure to the 50% maximum standing charge rebate reduced average daily peak-hour consumption by -0.029 kWh per household (95% CI: [-0.051, -0.009], $p = 0.0058$). This effect size of the reduction in peak demand is modest but statistically significant at the 5% level. As shown in

Table 5, this translates to an average daily saving of £0.15 and the reduction in consumption equates to charging a 60W laptop for 30 minutes.

When adding all experimental manipulations, the estimated average daily peak period reduction is -0.0306 kWh per household (95% CI: [-0.059, -0.003], $p = 0.0329$). The overall treatment effect of all the experimental stimuli can be found in Figure 6.

Results are robust to alternative specifications. A more flexible model allowing treatment effects and time trends to vary with household characteristics yields a highly similar estimate (see Technical Annex).⁷

We find no statistically significant change either in total daily electricity consumption or the off-peak consumption in any trial month. One possible explanation is that the observed reduction in peak demand is offset by adjustments on two margins: a small increase in off peak consumption and a small reduction in overall demand. However, the trial was not sufficiently powered to detect small statistically significant changes in total or off-peak consumption individually.

Effect of increased rebate amount (100%)

As mentioned in the trial design section, we increased the rebate amount for British Gas participants during the trial to analyse the effect of increasing rebate amount from 50% to 100% on peak consumption. We find evidence that increasing the maximum rebate from 50% to 100% led to additional reductions in peak consumption. In the final month of the trial, participants reduced peak usage by approximately 0.01 kWh more per day relative to the 50% period, equivalent to ~33% increase in responsiveness, as shown in Figure 6. However, this effect is not statistically significant and only directionally informative. These results suggest increased responsiveness to financial incentives but the increase in rebate size has diminishing marginal returns in terms of reductions in peak energy consumption. We discuss implications of our results later in the report.

Effect of timing and content of communications (fortnightly vs. monthly)

Figure 6 shows the effect of high frequency communications (fortnightly) relative to the control group in British Gas. We find that there are no statistically significant differences in responsiveness to frequency of communications.

We also analysed whether there were meaningful differences in behavioural outcomes between the two messaging variants within the monthly communication frequency group. We found no statistically significant differences between the two variants. This may be because the communications across the two messaging groups were otherwise

⁷ A sensitivity check using daily-level data produces a slightly smaller estimate (-0.027 kWh per day), reflecting the fact that monthly aggregation smooths short-term volatility and captures more persistent behavioural responses.

very similar except for the one sentence which highlighted whether the reduction in electricity use at peak times would impact hospitals, or system costs, which in turn would keep everyone's bills lower.

ScottishPower

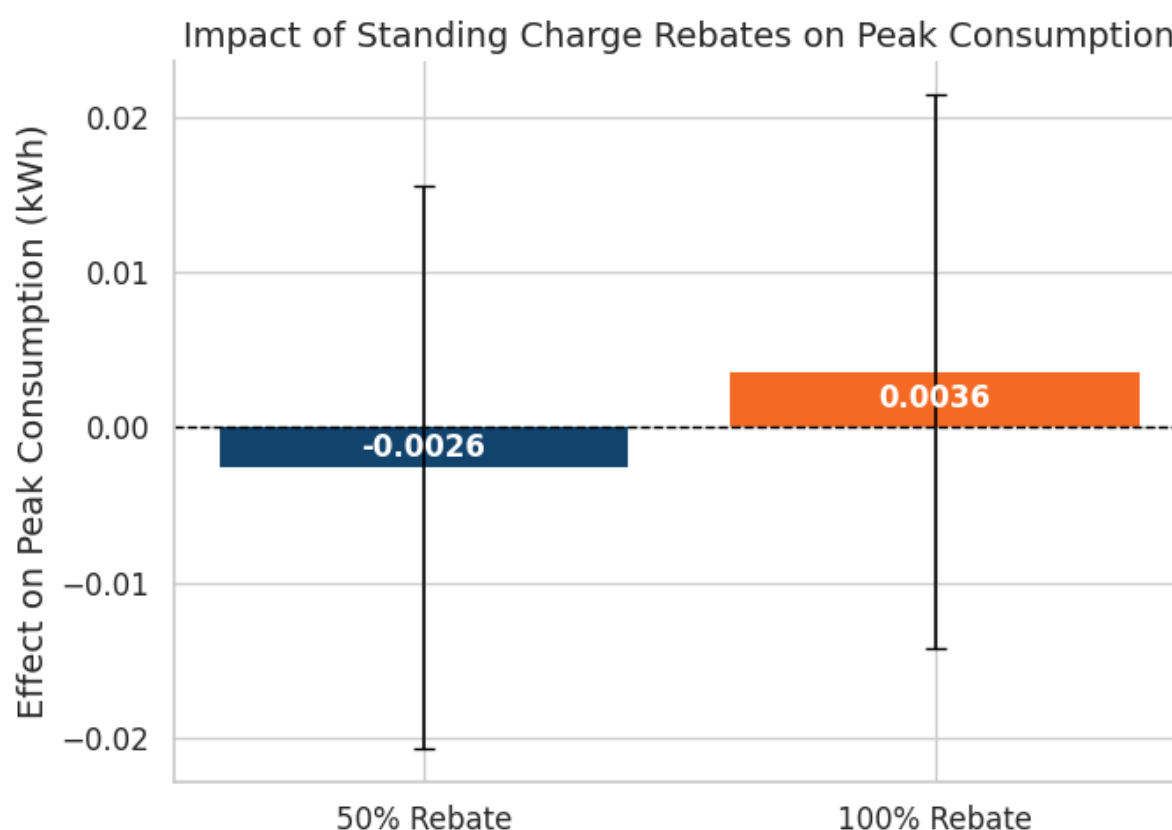
Summary findings

Using the same difference-in-differences model with household and time fixed effects and including the two treatment groups (maximum standing charge rebate of 50% or 100%) of ScottishPower samples, we estimate that exposure to both treatment groups had no statistically significant effect on average daily peak electricity consumption.

Effect of 50% and 100% rebate on standing charges

The estimated treatment effect for the 50% maximum treatment condition was -0.003 kWh per household per day ($p = 0.783$), and +0.004 kWh per household per day for the 100% maximum treatment condition ($p = 0.692$) relative to the control group as shown in Figure 7. These effects are not statistically distinguishable from zero.

Figure 7: Effect of standing charge rebates on peak consumption in ScottishPower



Although it is not possible to determine the precise reason behind this finding, it could be due to data quality differences across suppliers as indicated above which may affect our results. It could also be due to differences in the customer base across the two suppliers, or the difference in incentive mechanism between ScottishPower and British

Gas. For ScottishPower participants, the rebate awarded was according to static peak electricity bands, rather than a dynamic baseline based on the control group data as for British Gas.

Heterogeneous effects - secondary analysis

Using an extended specification (see Technical Annex), for both suppliers, we estimate a conditional average treatment effect, i.e., whether the effect of providing rebates on peak consumption varies across household characteristics.

Estimated responses vary across subgroups in the British Gas trial. We find that prepayment participants (PPM) exhibit effects approximately three times larger than the average treatment effect suggesting a larger peak consumption reduction in response to financial incentives.⁸ PSR participants in British Gas show evidence of 1.6x larger responses relative to the baseline. There is no consistent pattern across other groups (see Technical Annex).

In ScottishPower, we also find some small correlational evidence of heterogeneous responses across customer groups. When interacting with personal characteristics, the difference-in-differences coefficients become positive but are not statistically significant for both treatments. Participants in the top quintile of baseline consumption in the 50% rebate group showed a significant reduction (-0.07 kWh/day) compared to the first quintile, suggesting high consumers at baseline had more flexibility compared to lower consumers. We also observe occasional regional variation, with participants in South Wales receiving the 50% rebate exhibiting reductions in peak electricity consumption (-0.10 kWh); while participants in the Southern region receiving the 100% rebate also recorded a significant decrease in consumption during the trial (-0.13 kWh). No consistent pattern was observed across other customer characteristics at $p < 0.05$ (see Technical Annex).

Summary findings

Overall, the intervention led to a modest but statistically significant reduction in peak electricity consumption in the British Gas trial. However, there were no statistically significant effects observed on total electricity consumption or off-peak demand in either trial. Results are robust across specifications, with some evidence of stronger responses among specific customer groups.

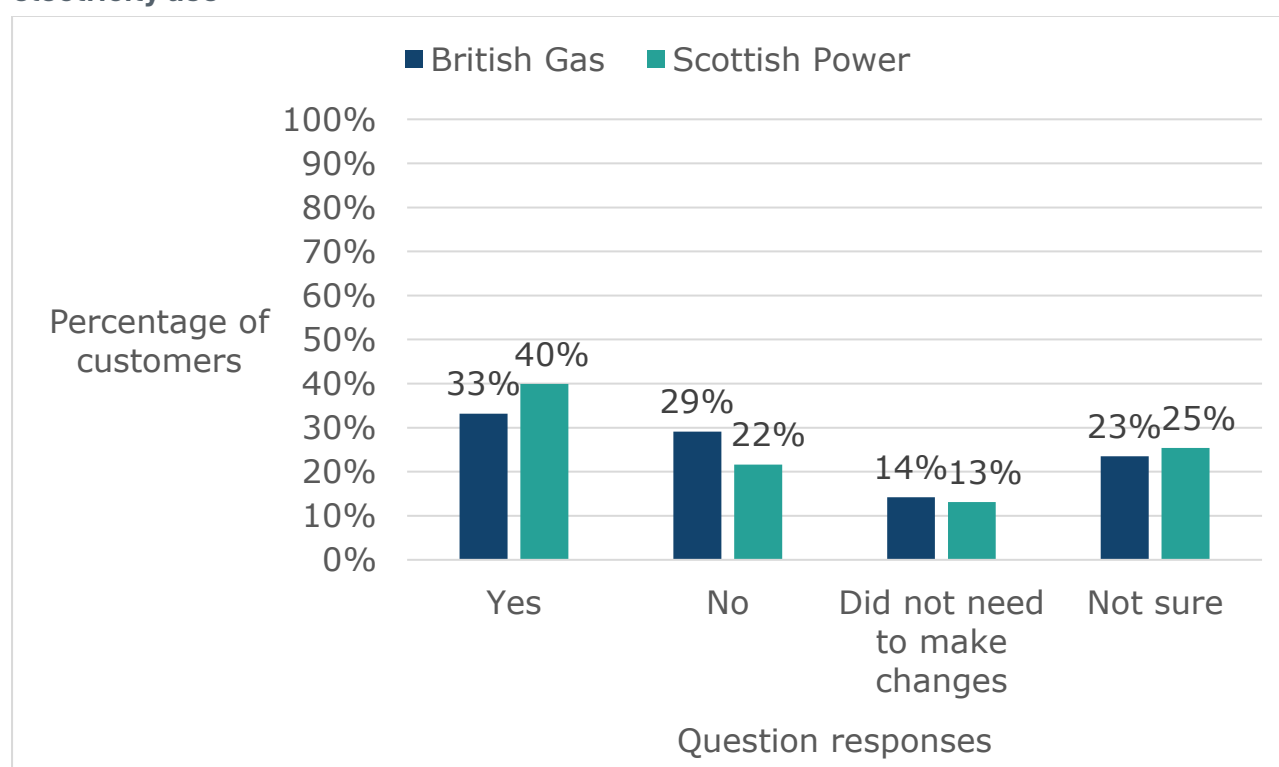
⁸ The ScottishPower trial excluded prepayment meter customers. British Gas included participants on prepayment meters. Therefore, these estimates rely on one supplier.

Flexibility

In this section, we present findings relating to participants' flexibility and ability to shift electricity use away from peak periods. These findings draw on both the survey administered by the Behaviouralist and qualitative interviews conducted by Thinks Insight & Strategy. The full list and order of survey questions can be found in the Technical Annex, and the discussion guide for the qualitative interviews is included in the supplementary report. The survey provides evidence on participants' self-reported intentions, experiences and behavioural responses to the intervention, while the qualitative research offers deeper insight into how participants understood the incentive, the actions they took in response, and the factors that enabled or constrained changes in electricity use. Together, these sources help contextualise the behavioural trial findings and provide a richer understanding of consumers' experiences of flexibility during the trial period.

As seen in Figure 8, 33% of the treatment group survey respondents in the British Gas trial, and 40% in the ScottishPower trial tried to flex their peak electricity use during the trial.

Figure 8: Percentage of customers reporting whether they tried to flex peak electricity use

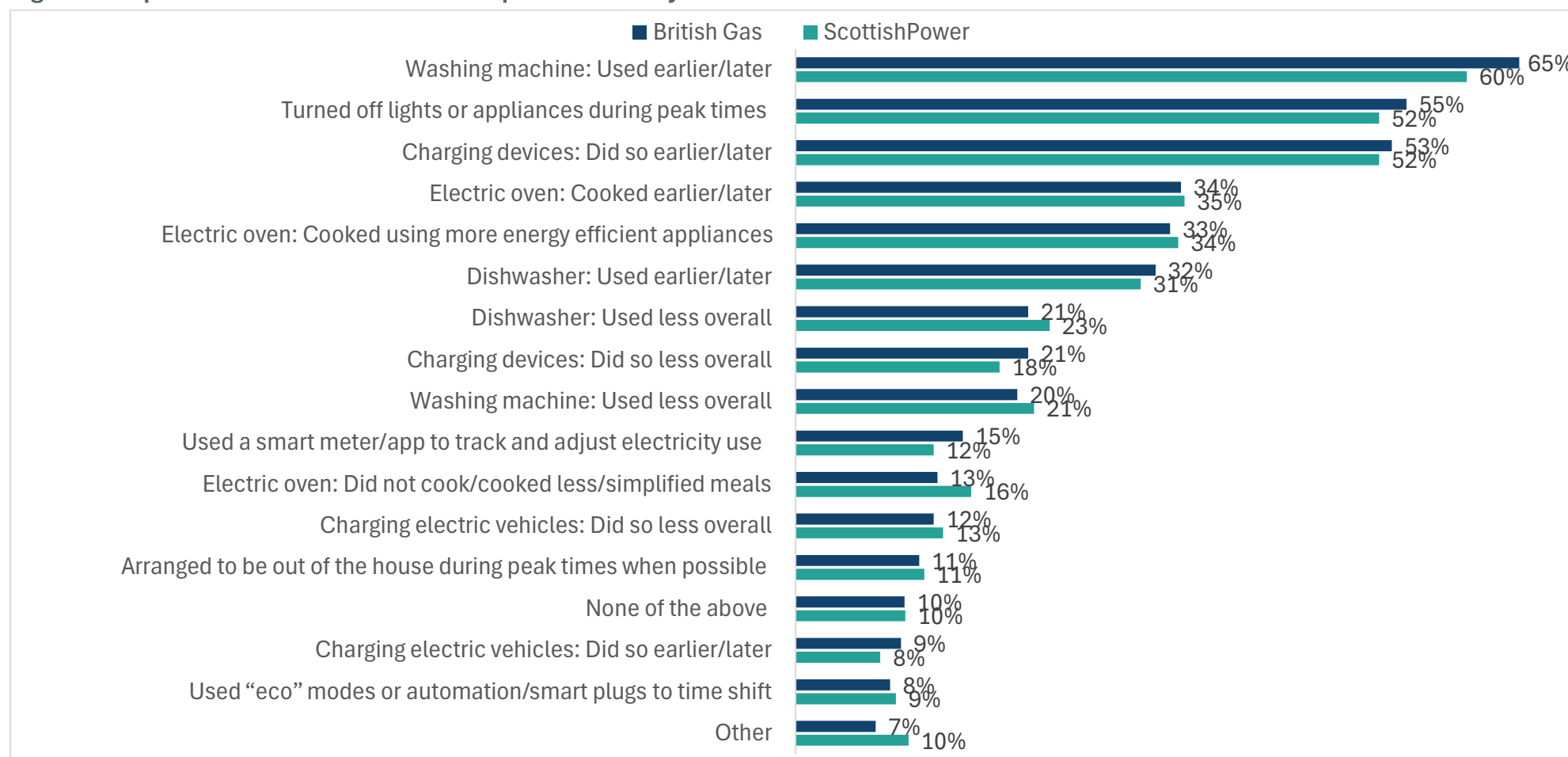


Note: Number of respondents: British Gas treatment = 928, ScottishPower treatment = 894. The question wording is: While you were on the [Weekday Flexi Saver / Ofgem trial], did your household intentionally try to use less electricity during peak times (i.e. between 4pm-7pm on weekdays)?

Flexing Fixed Charges: Evidence from Standing Charge Rebate Trials

Where it was possible to flex energy use, participants reported opting for low effort, low friction actions such as running large appliances at different times as shown in Figure 9.

Figure 9: Reported actions taken to reduce peak electricity use



Note: Number of respondents: British Gas treatment = 928, ScottishPower treatment = 894 (participants who indicated they had intended to use less electricity at peak time). The question wording is: 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)?

Across both suppliers, most participants in the qualitative interviews who had made behavioural changes during the trial reported that they continued them after the trial had finished. This was particularly the case for those who were more readily able to change their daily routines, and who therefore did not experience much disruption as a result of moving electricity use off-peak. The behaviours that were more likely to be continued were shifting appliance timing (running the washing machine, dishwasher, tumble dryer at off-peak times) and air fryer use.

“Yes [will continue with the new routine], there’s no reason not to. It’s a no brainer as far as I’m concerned, just adjust your lifestyle to suit.”

- British Gas, Medium usage

Such behaviours continuing despite no financial incentive was in some cases due to habit formation, with these participants describing using appliances off-peak as “just what we do [now]”. These changes had been integrated into their daily lives, with some even indicating returning to their old routines would now be more difficult than continuing their current habits. This therefore suggests that even relatively small incentives over a few months may be able to support more long-term behaviour change in the form of appliance use:

“[The trial] made me conscious of what I was doing around the house and I made habits of, okay the washing machine’s going to be on first thing in the morning instead while I go out to work. It made me more conscious... stuff like that helped save money.”

- British Gas, Low usage

A smaller group also cited broader non-financial motivations for continuing, including greater awareness of their own energy use, supporting the electricity grid, and contributing to environmental goals. Some participants, for example, expressed a belief that individual actions could collectively make a meaningful difference:

“I don’t use that much [electricity] but if there’s a million people like me who change, then it makes a hell of a lot of a difference”

- British Gas, Low usage

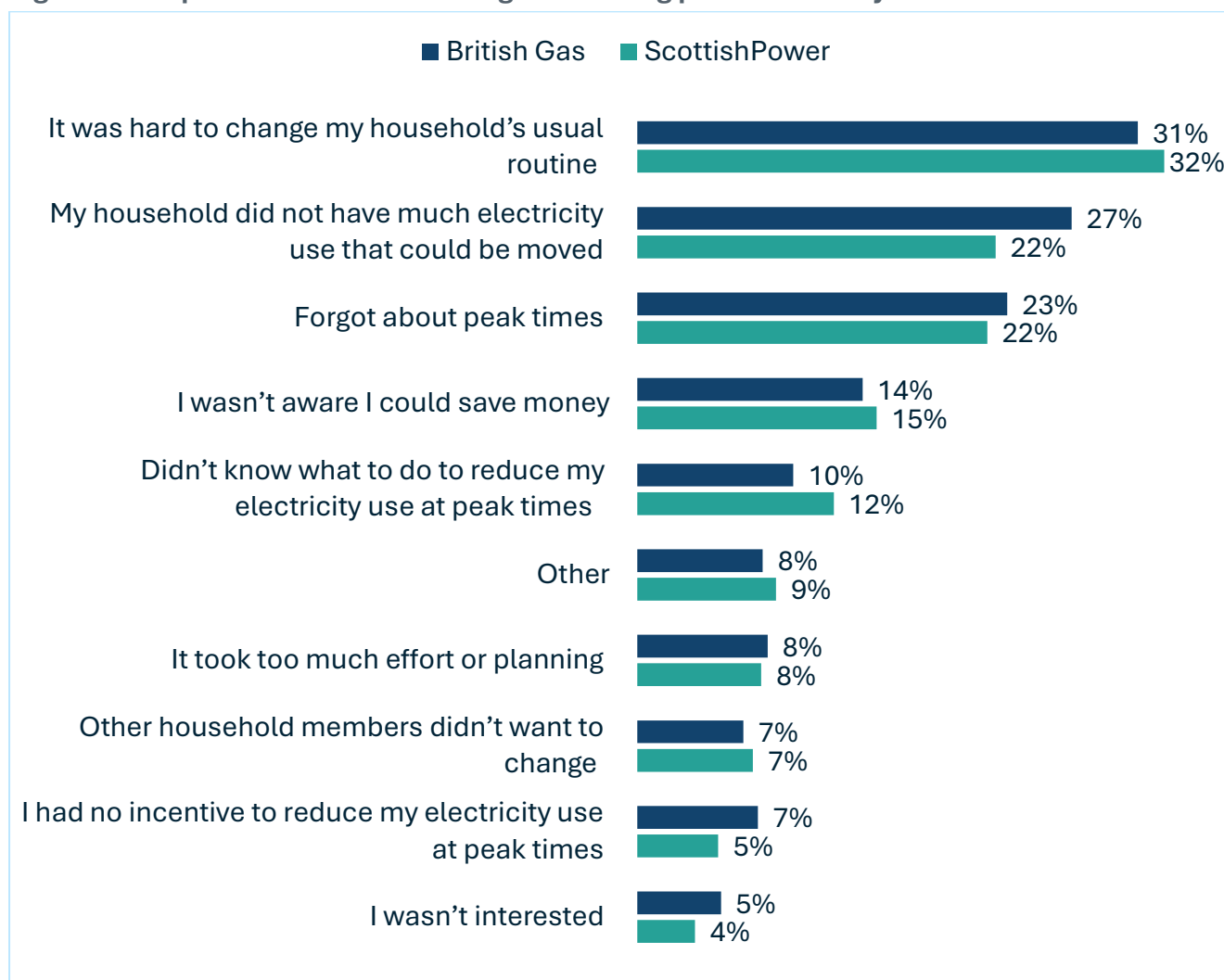
All treatment-group survey respondents were asked what had prevented their household from reducing electricity use at peak times, or from reducing it further. Most commonly selected factors were related to household routines and limited opportunities to shift electricity use away from peak periods. However, respondents also reported informational and behavioural factors, including forgetting about peak times, being unaware of the potential savings available, and uncertainty about what actions to take (Figure 10). These findings suggest that participants experienced a combination of practical, behavioural and informational challenges when engaging with the intervention.

Qualitative findings indicate that this is especially the case for families with children, who had routines that centre around peak hours and could not be moved:

“I couldn’t change cooking times for the kids – I switched over to the air fryer instead of the oven. But didn’t feel able to push it due to family routines and preferences around eating early.”

- British Gas, Low usage

Figure 10: Reported barriers to flexing or reducing peak electricity use



Note: Number of respondents: British Gas = 1009; ScottishPower = 983. The question wording is: What prevented your household from (further) reducing or shifting its energy consumption during peak times?

Participants also reported other, more immediately addressable barriers, including forgetting about peak times, not knowing they could save money or what to do in order to reduce their peak electricity use. Taken together with qualitative insights highlighting the desire for clearer communications and information on incentives, this indicates that timely and informative reminders may be effective for these consumers:

“A weekly email or something coming through as you’re doing the trial saying ‘great, you’ve saved this much this week’... it may have been the information was there and I didn’t access it but it didn’t seem clear to me... just keeping people more updated on how the trial’s going during rather than just concentrating on the beginning and end of it.”

- ScottishPower, Low usage⁹

Consumer experience

In this section, we summarise the results relating to consumer experience, which again draw from the survey responses and the qualitative interviews.

Response to the intervention

Overall, the consumer response to the intervention was positive, with 52% of British Gas and 57% of ScottishPower¹⁰ survey respondents reporting that they would recommend an offering similar to the trial to friends or family. Participants who took part in the qualitative interviews indicated they would be interested in similar future propositions especially if it allowed them to save money. The existence of financial incentives was sufficient as a primary motivation for engaging with the intervention. Most viewed the trial positively overall, describing it as a “win-win” situation:

“Overall [the trial was] really good, very beneficial, easy. I can’t see why people wouldn’t do it. Even if you make a couple changes, you see a reflection [in the savings].”

- ScottishPower, Low usage

“[The experience went] really well, it was good. What was good for me was I took the information on board from what I got from the emails and made habitual changes in my household which saved me a lot of money at the end of the month... It had a direct impact on my pocket, it was to my incentive and benefit to take part.”

- British Gas, Low usage

Despite the overall positive sentiment regarding the trial, participants did not always recollect or understand the details of the intervention. Most participants in the qualitative interviews were able to recall the central purpose of the proposition (to reduce peak electricity use to reduce pressure on the energy grid), but not the structure of the discounts or how they were calculated. This led to general uncertainty but also on occasion, misunderstandings regarding what the discount was being applied to

⁹ ScottishPower participants received monthly summary emails and fortnightly SMS reminders between these communications. The monthly emails included a summary of savings earned, alongside a reminder about the trial and how participants could continue to engage with it.

¹⁰ Number of respondents: British Gas n = 910; ScottishPower n = 847

(standing charges or the whole bill), or whether peak times were in fact the discounted timeframe:

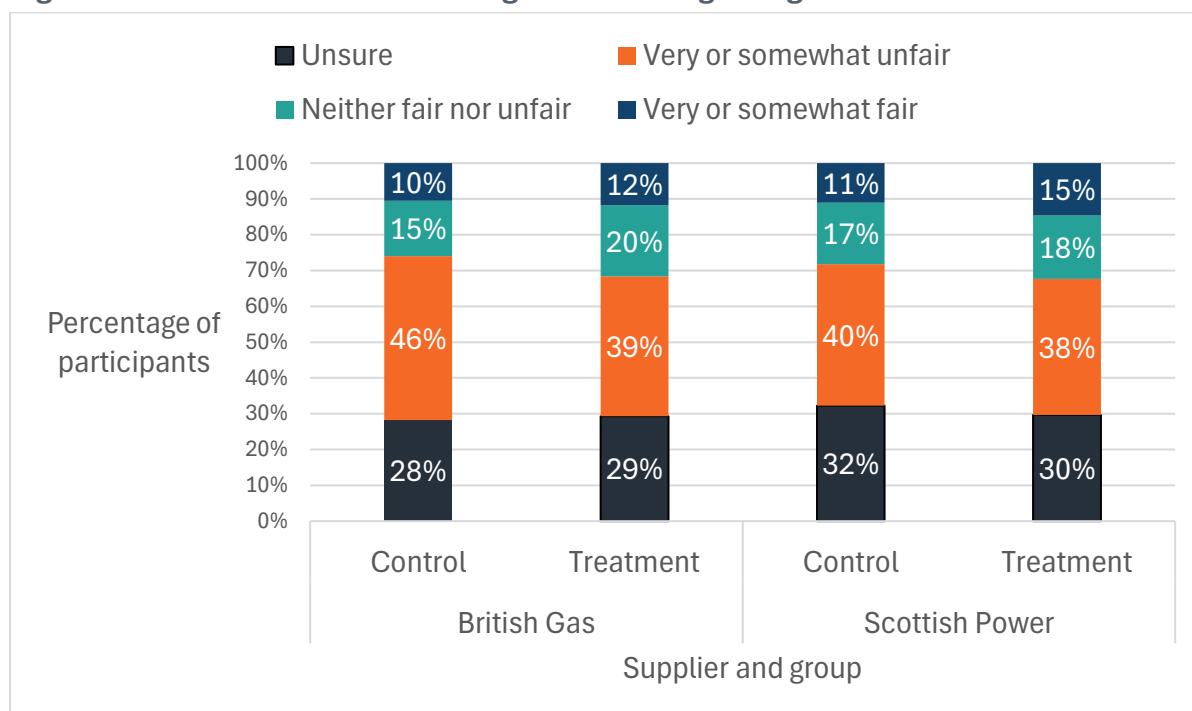
“[The discount] gets lost in the sea of information. I remember seeing [the emails] but I didn't see it as 'because you've done X these are your savings.’”

- British Gas, Low usage

Impact of the intervention on perceptions of standing charges

We find that the intervention softens negative sentiment on the perceived fairness of standing charges. This is shown in Figure 11 where the treatment groups in ScottishPower were more likely to rate standing charges as fair than the control groups by 3.6 percentage points, (95% CI [0.63, 6.56], $p = 0.02$). The treatment group in the British Gas trial had significantly fewer somewhat and very unfair responses (-6.7%, 95% CI [-11.0, -2.4], $p = 0.00$) and 4.4% more neutral responses (95% CI [1.1, 7.7], $p = 0.01$). This shows that the intervention softens negative sentiment across the board but only shifts participants into a positive direction in the ScottishPower trial.

Figure 11: Perceived fairness ratings for standing charges



Note: Number of respondents: British Gas treatment = 1009, control = 1029; ScottishPower treatment = 983, control = 963. The question wording is: Over the past few months, how fair or unfair do you think the standing charges on your electricity bill have been?

The responses to this survey question also indicated a high degree of uncertainty, with the largest proportion of participants across suppliers and both treatment and control

groups stating that they were unsure whether they regarded standing charges as fair (28%-32%).

Perceived fairness of the intervention

Similarly mixed reactions emerged from the qualitative interviews when focussing on the fairness of the intervention itself, with variations largely driven by understanding and attitudes towards standing charges in general. For instance, for the small number who had not been aware of standing charges before the trial, the incentive was seen as fair, with any discount being perceived as acceptable. Another small group of participants who believed standing charges to be inherently unfair also welcomed these incentives, and therefore this discount was an opportunity for this charge to reflect their lower electricity consumption. Most participants, however, accepted standing charges as necessary and felt the incentive was reasonable, although a small group within this category felt that the mechanism was unfair due to its focus on the smallest part of the bill, and one over which they had no control:

“The bigger chunk is the unit rate, if there was a discount on the unit rate that would help me more than just the standing charge.”

- ScottishPower, High usage

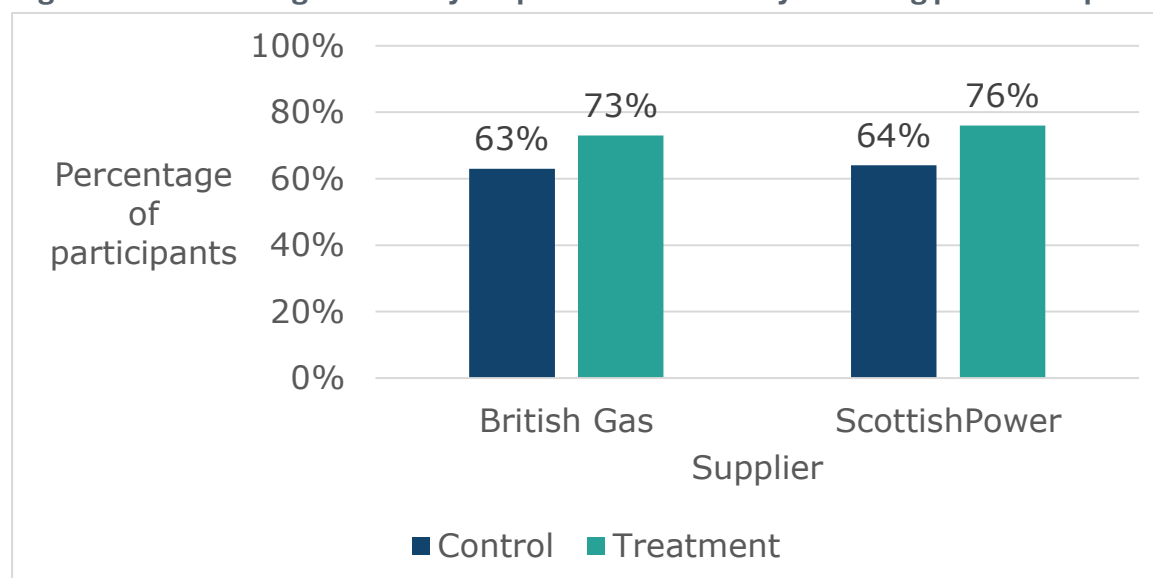
Many interview participants who felt the incentive mechanism was unfair instead argued for a focus on unit rates over standing charges. This was primarily due to the perception that this would provide an opportunity for more control over electricity use and increase the level of discount available:

“I think people would benefit more if it [discount] was on the unit rate rather than the standing charge... The unit rate is variable in terms of how we use it so I think it would favour the customer more if it was based on the unit rate.”

- British Gas, Low usage

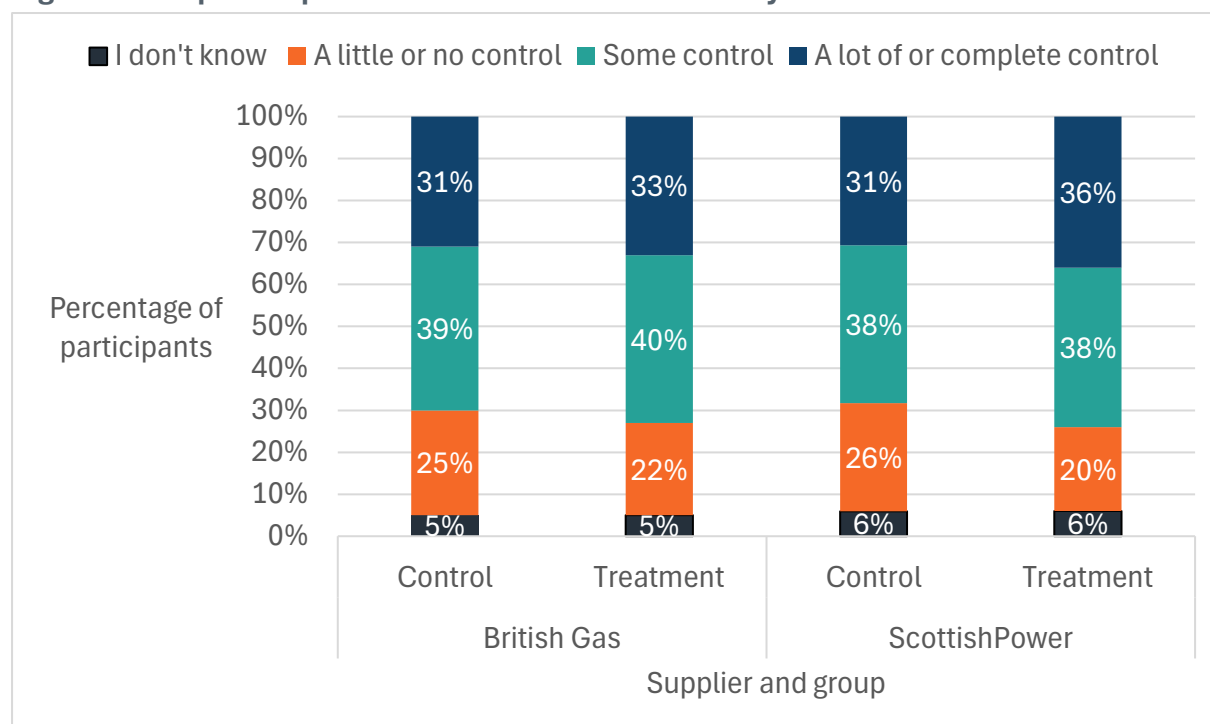
Impact of the intervention on understanding and perceived control

As shown in Figure 12, the intervention did, however, increase understanding of peak times across suppliers for survey participants, with the percentage of those correctly recalling peak times higher in the treatment than in the control group for both British Gas (+10.1%, 95% CI [5.8, 14.5], $p = 0.00$) and ScottishPower (+11.9%, 95% CI [7.6, 16.2], $p = 0.00$).

Figure 12: Percentage of survey respondents correctly recalling peak time periods

Note: Number of respondents: British Gas treatment = 894, control = 865; ScottishPower treatment = 886, control = 846. The question wording is: When do you think peak times typically happen? (correct answer: weekdays between 4pm-7pm)

There was a similar impact on perceived control over electricity use for survey participants. For British Gas, this took the form of a decrease in the proportion of “no control at all” responses when comparing the treatment and control groups, from 8.9% to 5.4% (-3.5%, 95% CI [-5.7, -1.3], $p = 0.00$). For ScottishPower, there was both a decrease in the proportion of those reporting to have a little or no control (-5.3%, 95% CI [-9.0, -1.6], $p = 0.01$), and an increase the proportion of those reporting to have complete or a lot of control over their electricity use (+5.9%, 95% CI [1.7, 10.1], $p = 0.01$), as seen in Figure 13.

Figure 13: Reported perceived control over electricity use

Note: Number of respondents: British Gas treatment = 1006, control = 1028; ScottishPower treatment = 979, control = 964. The question wording is: How much control do you feel your household has over how much electricity it uses overall?

When focussing instead on perceived control over energy bills, there were no significant differences between control and treatment groups among ScottishPower customers. British Gas customers did, however, demonstrate a significant increase in the proportion of “some control” responses (+6.1%, 95% CI [1.8, 10.4], $p = 0.01$).

Associations between survey measures and behavioural response

A further regression analysis combining survey measures with total peak electricity consumption over the intervention period for British Gas customers found no evidence that standing charge understanding, standing charge attitudes, electricity bill attitudes, or engagement with electricity use moderated the behavioural impact of the intervention. Perceived control over energy bills was associated with lower total peak electricity consumption during the intervention period ($\beta = -21.17$, 95% CI [-38.39, -3.96], $p = 0.02$). However, this effect was observed across both treatment and control groups, with no evidence that interventions affected perceived control which in turn, influenced peak electricity consumption.

Discussion and conclusions

The standing charge rebate trials provide robust evidence that there is potential for a wide spectrum of consumers to adapt their energy use during peak periods in return for a financial incentive. Across one trial, households receiving rebates consistently demonstrated lower peak consumption than those without incentives, confirming that even relatively simple tariff mechanisms can influence behaviour. This finding is important because it reinforces a core assumption underpinning consumer-led flexibility policy: consumers can and do respond to incentives when those are sufficiently salient and easy to understand.

However, the findings also highlight a critical distinction between behavioural responsiveness and system-level impact. While the observed reductions in peak demand are statistically significant, their absolute magnitude remains relatively modest when considered against total annual household consumption or wider system needs. The trial therefore suggests that consumers possess a limited “behavioural bandwidth” for demand shifting or reduction in response to rebates via tariff propositions. Furthermore, this may, in part, be driven by the behaviours and actions suggested in the trial communications – for example, asking consumers to change when they use specific large appliances. Some consumers can make these adjustments, but other consumers’ energy demand remains tied to daily routines, comfort requirements and practical constraints that are difficult to alter. Therefore, focussing on simple, routine-compatible actions, and leading with clarity around what participants need to do and what they will receive in return might be more effective at changing behaviours.

The findings also challenge some common assumptions about who is most able and willing to engage in demand flexibility. While flexibility offerings attract already-engaged or highly energy-literate consumers, the trial found evidence that customers in vulnerable circumstances - including Priority Services Register (PSR) and smart prepayment meter (PPM) customers - demonstrated relatively higher levels of flexibility compared to the average consumer in the trials. Qualitative feedback suggests that PPM consumers were highly motivated by the opportunity to reduce their energy costs, averaging around £0.12 per day, and felt empowered to take action when the financial benefit was clear, visible, and directly linked to their behaviour. This interpretation is supported by the quantitative analysis of the survey-consumption linked data which found that higher perceived control over energy bills more generally was associated with lower peak electricity consumption. This suggests that consumers' belief that they can influence their energy costs may be an important driver of flexibility behaviours. Importantly, there was no clear evidence of consumer harm among these groups in terms of a reduction in overall consumption. The implication is that vulnerability should not automatically be viewed as a barrier to participation. Instead, there may be

untapped potential among consumers who have both the motivation and agency to reduce their energy bills, provided that communications are clear, and incentives are transparent, salient and easy to understand. Future flexibility programmes should therefore avoid assuming that customers in vulnerable circumstances are less able to engage and instead consider how interventions can be designed to support and enable participation across a broad range of customer groups.

Another insight from the trial is the diminishing returns associated with larger incentives. In practice, doubling the size of the rebate on the standing charge from 50% to 100% meant doubling the average daily rebate from £0.12 to £0.24 which led to an additional 33% decrease in peak consumption at one of the suppliers, which is not statistically significant. Although higher rebates generated additional peak reduction, there were diminishing returns to increasing rebate size, consistent with the findings in the CrowdFlex research ([National Energy System Operator, 2025](#)).¹¹ In practical terms, the 33% decrease in energy consumption translates to charging a 60W laptop for 40 minutes, up from 30 minutes under a 50% rebate. Together, the quantitative and qualitative findings suggest that the existence of a financial incentive may be more influential than its precise value. Once consumers are motivated to engage, increasing the size of the reward appears to generate progressively smaller behavioural gains.

The trial also provides useful insight into consumer perceptions of standing charges and the role of perceived control. Treatment participants reported a slightly stronger sense of control over their energy use and less negative views of standing charges than participants in the control group. Participants generally responded positively to the proposition, with no evidence of consumer harm, suggesting that providing a clear and visible mechanism for influencing energy costs can improve engagement with energy pricing and soften negative perceptions of standing charges. Previous research has often found standing charges to be a particularly contentious component of energy bills, associated with perceptions of unfairness and a lack of control. However, the findings from the trials paint a more nuanced picture. While some participants expressed concerns about standing charges, we did not observe the strength or consistency of negative reactions that might have been anticipated based on earlier research. Instead, consumers appeared to focus primarily on the overall financial impact of the tariff and the opportunity to reduce their energy costs through the rebate mechanism. While further research would be needed to draw firmer conclusions, the results suggest that perceived control and bill outcomes may be important drivers of consumer sentiment alongside views on standing charges in isolation.

¹¹ Recall that the amount of rebate for British Gas customers was increased only for one month of the trial - the final month. This was also when the average temperatures were higher than the other trial months (as it was the end of winter / start of spring), and therefore, overall consumption had dropped.

Encouragingly, the qualitative evidence suggests that persistence may be less of a challenge than activation. Participants who successfully shifted consumption often reported that behaviours became easier over time and, in some cases, developed into habits, as evidenced by quotes such as “[The trial] made me conscious of what I was doing around the house and I made habits of, okay the washing machine’s going to be on first thing in the morning”. This implies that the principal challenge for future programmes is not necessarily maintaining behaviour change but initiating it. If households can be supported through the initial learning and adjustment period, some behavioural changes may become self-sustaining. This finding strengthens the case for interventions that help consumers build new routines rather than relying solely on repeated financial incentives. Furthermore, we do not see evidence of consumer confusion or dissatisfaction about receiving communications from being defaulted into trialling new tariffs or propositions which suggests potential and scope for trialling defaulting arrangements and opt-out trials on new tariff offerings.

The results also reinforce the well-established challenge of the say-do gap. Customers tried to shift energy usage, and many express positive attitudes towards supporting the energy system. Yet translating intention into sustained action proves considerably harder. In the British Gas trial, we saw consumers reduce peak demand, but the effects are small. In the ScottishPower trial, we didn’t see a significant reduction in peak demand although the survey indicated that consumers did intend to flex peak electricity use, which may in part reflect social-desirability bias. This is particularly notable given the types of actions customers reported taking or intending to take, including shifting washing machine use, cooking with an electric oven outside peak periods, delaying device charging, and turning off lights or appliances. If implemented consistently, some of these actions would be expected to generate larger reductions than those observed. The modest average reductions therefore suggest that participants may have undertaken these actions only occasionally, implemented less energy-intensive actions than planned, or found it difficult to sustain changes in practice. Daily household routines, competing priorities, and limited awareness of real-time consumption all limit the extent to which intentions are realised in practice. In this context, behaviour is not solely driven by motivation; it is sometimes constrained by the realities of day-to-day life. It could also suggest that, while consumers were willing in principle, the proposition was not sufficiently compelling or easy enough to engage with to translate intentions into sustained behavioural change.

These findings are also relevant when considering future tariff innovation. The standing charge rebates tested in this trial represented a relatively modest financial incentive and affected only the standing charge component of customers' bills. However, the intervention had other benefits, in that it softened negative perceptions of standing charges. By contrast, time-of-use (ToU) and potential future Market-wide Half-Hourly Settlement (MHHS) enabled banded tariffs apply different prices to electricity

consumption itself, exposing a larger share of household energy costs to peak and off-peak price signals. Existing ToU tariffs often include substantial off-peak discounts, suggesting that consumers could face stronger financial incentives than those tested in this trial. The findings therefore provide encouraging evidence that consumers can respond to relatively small, persistent price signals linked to peak-period consumption. However, the evidence of diminishing returns suggests that stronger price differentials alone are unlikely to deliver proportionately larger reductions in peak demand. Instead, achieving greater flexibility is likely to require a combination of consumer engagement, price signals, appealing to other motivations, automation, smart technologies (low carbon technologies – LCTs), low-friction consumer propositions, and interventions that remove decision-making burden from consumers. This has important implications for tariff and programme design, suggesting that maximising participation and engagement may be more effective than simply increasing incentive levels.

From a regulatory and system perspective, the findings suggest that programmes that focus on financial incentives should be positioned as complementary tools alongside other ways for consumers to access flexibility within a broader flexibility strategy rather than as standalone solutions. The value may lie less in delivering large aggregate energy savings and more in supporting consumer engagement with flexibility markets and preparing households for more dynamic energy systems. While the individual effects are modest, they may still provide worthwhile and scalable benefits when combined with behavioural interventions that make it easy and appeal to other motivations, technological solutions (LCTs), automation, tariff innovation and broader consumer-led flexibility measures.

Overall, the trial demonstrates that many consumers are willing and able to respond to financial incentives, including customers in vulnerable circumstances such as PSR and PPM customers, who showed meaningful levels of flexibility and no evidence of consumer harm. The trial also improved participants' sense of control over their energy use and softened negative perceptions of standing charges, suggesting that consumers respond positively when given a clear and visible mechanism to influence a charge that is normally perceived as fixed. At the same time, the scale of response is constrained by habits, routines, practical limitations, and consumer awareness. The behavioural response is real and encouraging, but at the incentive levels tested, is unlikely on its own to deliver the scale of flexibility required for major system transformation. Future policy and programme design should therefore focus not only on providing financial rewards, but also on creating conditions that make flexibility easier, more automatic and better integrated into everyday life. Combining incentives with behavioural interventions, smart technologies, automation and low-friction customer experiences is likely to unlock greater and more reliable flexibility than incentives alone.

References

- Allcott, H., & Rogers, T. (2014). The Short-Run and Long-Run Effects of Behavioral Interventions: Experimental Evidence from Energy Conservation. *American Economic Review*, 104(10), 3003–3037. <https://doi.org/10.1257/aer.104.10.3003>
- Bernard, L., Hackett, A., Metcalfe, R., Panzone, L., & Schein, A. (2025). The Impact of Dynamic Prices on Electric Vehicle Public Charging Demand: Evidence from a Nationwide Natural Field Experiment. In National Bureau of Economic Research. <https://doi.org/10.3386/w34600>
- Bernard, L., Metcalfe, R., & Schein, A. (2026). Critical Peak Rewards: Evidence from a Nationwide Demand Response Program. In *National Bureau of Economic Research*. <https://doi.org/10.3386/w35485>
- Centre for Sustainable Energy. (2026). *Smart & Fair 2024-2026 report - Centre for Sustainable Energy*. <https://www.cse.org.uk/resource/smart-and-fair-2024-2026/>
- Crook, T. (2024). *Powering participation: Exploring how creative engagement can unlock domestic demand-side response*. Energy Systems Catapult. [Crook_T_Report_2023_Final.pdf](#)
- CSE. (2023). Household Engagement with the Demand Flexibility Service 2022/23. In NESO. NESO. https://www.neso.energy/document/282981/download?utm_source=copilot.com
- DESNZ. (2025, April 15). Clean Power 2030 Action Plan. GOV.UK. <https://www.gov.uk/government/publications/clean-power-2030-action-plan>
- Department of energy and climate change. (2012). Demand Side Response in the domestic sector- a literature review of major trials. https://assets.publishing.service.gov.uk/media/5a74ce60ed915d3c7d5281b5/5756-demand-side-response-in-the-domestic-sector-a-lit.pdf?utm_source=copilot.com
- Hampton, H., Foley, A., Del Rio, D. F., Smyth, B., Lavery, D., & Caulfield, B. (2022). Customer engagement strategies in retail electricity markets: A comprehensive and comparative review. *Energy Research & Social Science*, 90, 102611. <https://doi.org/10.1016/j.erss.2022.102611>
- Høiseth, M. (2026). Smart systems, constrained engagement: A capability gap in Norwegian households' demand-side flexibility. *Energy Research & Social Science*, 138, 104794. <https://doi.org/10.1016/j.erss.2026.104794>
- Hwang, J., Kim, H., Caesary, D., & Eom, J. (2025). Data-driven assessment of the varied effects of the peak time rebate on household electricity usage. *Applied Energy*, 396, 126329. <https://doi.org/10.1016/j.apenergy.2025.126329>

Jachimowicz, J. M., Duncan, S., Weber, E. U., & Johnson, E. J. (2019). *When and why defaults influence decisions: A meta-analysis of default effects*. *Behavioural Public Policy*, 3(2), 159–186. <https://doi.org/10.1017/bpp.2018.43>

Jooshandeh, J. (2023). Energy bills transparency. Which? <https://www.which.co.uk/policy-and-insight/article/energy-bills-transparency-aT5uF9p6RIqE>

Lang, C., Qiu, Y., & Dong, L. (2023). Increasing voluntary enrolment in time-of-use electricity rates: Findings from a survey experiment. *Energy Policy*, 173, 113410. <https://doi.org/10.1016/j.enpol.2022.113410>

Li, H., Wang, L., Ou, Y., & Zhang, L. (2023). How does goal framing affect household low-carbon behaviour? The roles of environmental self-efficacy and global-local identity. *Frontiers in Environmental Science*, 10. <https://doi.org/10.3389/fenvs.2022.1035118>

McHugh, S. (2022). *We paid customers to use less power at peak times. Here's what happened*. Octopus Energy. <https://octopus.energy/blog/results-big-dirty-turn-down-trial-paid-off-peak-energy/>

Mingolla, C., Hudders, L., & Cauberghe, V. (2020). Framing descriptive norms as self-benefit versus environmental benefit: Self-construal's moderating impact in promoting smart energy devices. *Sustainability*, 12(2), 614. <https://doi.org/10.3390/su12020614>

NESO. (2023). *The Demand Flexibility Service Smart Meter Data Evaluation*. <https://www.neso.energy/document/371411/download>

NESO. (2026). *Ofgem Strategic Innovation Fund CrowdFlex Closure Report*. <https://www.neso.energy/document/382251/download>

Ofgem. (2020). *Consumer Opinion about Climate Change and Decarbonisation*. <https://www.ofgem.gov.uk/publications/consumer-opinion-about-climate-change-and-decarbonisation>

Ofgem. (2023). *Standing charges – call for input*. <https://www.ofgem.gov.uk/call-for-input/standing-charges-call-input>

Ofgem. (2024). *Standing Charges: Summary of responses*. In *Standing Charges: Summary of Responses* [Report]. <https://www.ofgem.gov.uk/sites/default/files/2024-08/Standing%20Charges%20-%20summary%20of%20responses.pdf>

Ofgem. (2025). *Energy System Cost allocation and Recovery review*. In https://consult.ofgem.gov.uk/energy-supply/energy-system-cost-allocation-and-recovery-review/supporting_documents/energy-system-cost-allocation-and-recovery-reviewpdf. <https://consult.ofgem.gov.uk/energy-supply/energy-system-cost->

[allocation-and-recovery-review/supporting_documents/energy-system-cost-allocation-and-recovery-reviewpdf](#)

Ofgem & Ipsos. (2025). *Flexibility and Net Zero (FANZ) Survey*.

<https://www.ofgem.gov.uk/sites/default/files/2026-05/Flexibility-and-Net-Zero-Survey-Findings-Report-2025.pdf>

Ofgem (2025). Domestic consumers' views on energy pricing.

In *Ofgem*. <https://www.ofgem.gov.uk/research/domestic-consumers-views-energy-pricing>

Pass, J. C. (2021). Make the Green Choice the Default. Simple but Psych.

<https://simplyputpsych.co.uk/global-psych/defaults-and-opt-out-programs>

Stampatori, D., & Rossetto, N. (2024). From Hesitation to Participation: Examining behavioural barriers to engage customers in flexibility markets. *Current Sustainable/Renewable Energy Reports*, 11(4), 127–135.

<https://doi.org/10.1007/s40518-024-00241-w>

UsersTCP. (2024). *New guidebook: Applying behavioural insights to unlock energy demand flexibility*. UsersTCP.

<https://userstcp.org/new-guidebook-published-applying-behavioural-insights-to-unlock-energy-demand-flexibility/>

UsersTCP. (2026). *Improving uptake of time-of-use tariffs (UK) | Technical Appendix*.

https://userstcp.org/wp-content/uploads/2024/06/bip_flex_centrica_report_02062026.docx.pdf

Wangmo, D. (2025). NESO warns of flexibility fatigue. *Utility Week*.

<https://utilityweek.co.uk/neso-warns-of-flexibility-fatigue/>

Wen, C., Steadman, S., Rafaq, M. S., Vatougiou, P., & Deakin, M. (2025). Can reduction of local carbon emissions motivate participation in demand-side flexibility programs?

Evidence from the United Kingdom. *Applied Energy*, 388, 125610. <https://doi.org/10.1016/j.apenergy.2025.125610>

Limitations

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

We originally sought to include a broader range of suppliers in the trial to improve representativeness and enhance the generalisability of the findings. Given the voluntary nature of the trial, two suppliers ultimately participated. Both suppliers had customer bases distributed across Great Britain, providing broad geographical coverage of smart meter customers within the trial sample. Whilst this ensured the sample was regionally representative; the findings should be interpreted in the context of several features of the trial design and participant sample.

The trial sample was not fully representative of the wider customer population of the suppliers. As outlined in the methodology and the Technical Annex, there were sample inclusion and exclusion criteria and customer recruitment differed across suppliers. ScottishPower did not include prepayment meter (PPM) customers and only contacted customers who had opted in to marketing communications, potentially resulting in a more engaged participant group. The trial was also limited to smart meter customers, as granular half-hourly consumption data were required to calculate rebates and assess behavioural responses. As a result, the findings may not fully reflect the behaviours and experiences of households without smart meters.

Second, the trial was conducted over a relatively short period of around three months. While sufficient to observe behavioural responses to the rebates, it did not capture seasonal variations in energy use or provide evidence on the persistence of behaviour change over time. A longer trial spanning multiple seasons would have provided a more comprehensive assessment. However, the trial had to be completed within the available funding period, which ended in March 2026.

Third, there were operational constraints on the design and delivery of participant communications. From a trial design perspective, we originally intended to test more frequent and dynamic communications, including more regular reminders and personalised updates showing participants how they were performing against the trial objective. However, supplier operational systems were not equipped to support these approaches at the scale required for the trial. As a result, the communications strategy reflected a balance between research objectives and operational feasibility. From the outset, suppliers favoured monthly communications rather than fortnightly communications. For British Gas, a fortnightly treatment group was included as a compromise to allow some assessment of communication frequency. For ScottishPower, fortnightly messages were included for all treatment group participants; however, they were not dynamic or personalised.

There were also practical limitations in the experimental design. Across both trials, the incentive mechanisms rewarded customers based on their relative peak electricity use, either against predefined consumption thresholds or against a regional consumption benchmark. As neither approach incorporated a personal baseline, households could receive rewards for having relatively low peak-time consumption, regardless of whether they had changed their behaviour in response to the intervention. Although this reflects the lower contribution of these households to system costs, it may have reduced the incentive for some customers to make additional reductions in peak-time consumption relative to their pre-trial usage, thereby limiting the potential for larger overall reductions in peak-time demand across the trial population.

There were also restrictions in terms of testing different rebate structures. While British Gas tested maximum rebates of both 50% and 100%, it was not possible to run separate treatment groups for each rebate level at the same time (i.e., in the 4th month of the trial). This limits the strength of direct comparisons between the two rebate levels in British Gas and means conclusions about the relative effectiveness of larger incentives should be treated as indicative rather than definitive. In addition, operational constraints prevented the continued delivery of fortnightly communications during the final month of the trial, resulting in all participants receiving monthly communications during this period.

Additionally, the rebate levels tested across both suppliers were relatively modest compared with those used in some other flexibility trials, reflecting the need to operate within the overall project budget and trial design constraints. The trial was also designed as a no-loss proposition, meaning participants could receive a rebate for reducing their peak-time consumption but were not financially penalised for increasing their consumption. As a result, the behavioural responses observed in the trial may not fully reflect those that would occur under a commercial flexibility proposition involving larger incentives and/or the possibility of financial losses. As the trial was externally funded to test the viability of the approach, any future scale-up would require funding from suppliers, consumers, or the wider energy system. Therefore, the costs and benefits of standing charge rebates should be assessed against alternative flexibility interventions when considering wider implementation.

These constraints may have reduced opportunities to reinforce behavioural prompts, maintain engagement throughout the trial and assess the full impact of more frequent, timely or dynamic communications on consumer behaviour. Consequently, the findings may underestimate the level of engagement and behaviour change that could be achieved through future flexibility schemes supported by more timely, frequent or personalised communications.

The trial was also not specifically powered to detect statistically significant differences across all customer subgroups. The overall sample size was sufficient to assess the

primary trial outcomes; however, the relatively small magnitude of observed behavioural change limited the ability to draw robust conclusions for some subgroup analyses. As a result, findings for individual customer groups showing no statistically significant difference should be interpreted with caution and are best viewed as indicative rather than conclusive. Further research with larger samples or longer trial durations may be required to establish whether responses vary meaningfully across different customer segments.

In addition, the analysis relied on half-hourly smart meter consumption data, which contained occasional gaps and quality issues. Where required, we applied data cleaning and imputation procedures to address missing or incomplete observations and ensure a consistent analytical dataset. While these procedures followed a predefined methodology and are not expected to have materially affected the overall findings, they introduce an additional source of uncertainty that should be considered when interpreting the results.

These limitations do not alter the overall direction of the findings, but they should be considered when assessing the generalisability and long-term implications of the results.