

Electricity
Distribution

EQUINOX Trial One Customer Experience

August 2023 – v1.0

nationalgrid



Table of Contents

1	Introduction to research	pg. 3-7
2	Key findings	pg. 8-14
3	Trial one demographics	pg. 15-23
4	Customer satisfaction	pg. 24-29
5	Customer comfort	pg. 30-34
6	Customer participation	pg. 35-41
7	Trial design feedback	pg. 42-46

Electricity
Distribution

1

Introduction to research

nationalgrid



EQUINOX Overview

What is EQUINOX? EQUINOX (Equitable Novel Flexibility Exchange) is an innovation project that will test new commercial and technical arrangements to reward households with heat pumps for temporarily altering their heating choices without compromising on comfort. EQUINOX will save consumers money by lowering energy bills and mitigating costly system upgrades, while contributing to a more resilient and equitable low-carbon energy system.

Who is it funded by? EQUINOX is supported by the energy regulator Ofgem and funded through the regulator's Network Innovation Competition.

Who is it led by? EQUINOX is sponsored by National Grid, who are the Distribution Network Operator for the East and West Midlands, the South West and South Wales. They distribute the electricity that comes from the transmission system to the local businesses and homes in their areas.

Who else is involved? The project is undertaken in collaboration with Octopus Energy, ScottishPower, Sero, Passiv UK, SP Energy Networks, West Midlands Combined Authority, Welsh Government, National Energy Action, and Guidehouse.

National Grid

Key Facts:

- EQUINOX will run from 2022 to 2025. The project's first trial took place between December 2022 and March 2023.
- Over 1,000 households that have heat pumps within National Grid's distribution region (Southwest England, the Midlands and South Wales) will take part over the course of four years. Almost 400 participated in the first trial in winter 2022-2023.
- EQUINOX trials will include households from all groups of society, ensuring that when designing commercial and technical arrangements, they are done equitably, and vulnerabilities are taken into consideration.

Trial groups: Participants were placed in one of four trial groups based on payment type and control method

Held 22 “EQUINOX Events”

- Trial events occurred from December to March
- Scheduled for two hours from 5-7pm
- Events up to three times per week

Payment types



1. **Pay monthly:** participants were paid four fixed £25 monthly installments in advance of their participation in that month's events
2. **Pay per event:** participants were paid up to £6 after each event for their participation

Control methods



1. **Aggregator control:** participants allowed suppliers to control heat pumps remotely, but could opt out before or during events
2. **Customer control:** participants were asked to turn off or down their own heat pumps.

Customer experience: Surveys, interviews, and focus groups were used to gauge perceptions of the trial



Quantitative research

- **Post-event surveys:** A two to five question survey (depending on responses from customers) sent by suppliers to households after each of the 22 events was used to gather information on whether households participated and if they experienced any temperature discomfort during the event. Average participation rate across the trial was 91%.
- **Trial one survey:** One longer survey administered towards the end of trial one was utilised to capture customer experience and satisfaction. Participation rate was 96%.



Qualitative research

- **Interviews:** Nine one-to-one semi-structured interviews were conducted with customers to understand how participating in the trial impacted their daily lives, if at all, and to get deeper insights on their experience with the processes of the trial.
- **Focus groups:** Three focus groups were conducted with four to six customers per group. They were asked similar questions as one-to-one interviewees, but with the added benefit of a chance to learn how others may have experienced the trial similarly or differently.



Incentives

- Households were given credits to their energy bill for participating in customer research: £5 for completing the trial one survey, £15 for participating in an interview, and £25 for a focus group.

Limitations: Caveats to this customer research



Does not consider interaction with turndown data. This research was not able consider how customer experience or satisfaction was related to the level of flexibility provided by a participant. This analysis is something that will be explored in trials two and three.



Participants are self-selecting. Sero and Octopus asked for consent from trial participants to provide their contact information to Guidehouse and National Energy Action, for the purpose of carrying out this customer research. Not all participants (257/386) consented to this data sharing, which meant a portion were not able to participate. We are reviewing the terms and conditions of the trial to consider if changes should be made.



Sample size is small for aggregator control. Comparisons across aggregator and customer control are difficult given the limited aggregator control sample size. We plan to expand the number of customers on aggregator control during trial two and three.

Electricity
Distribution

2

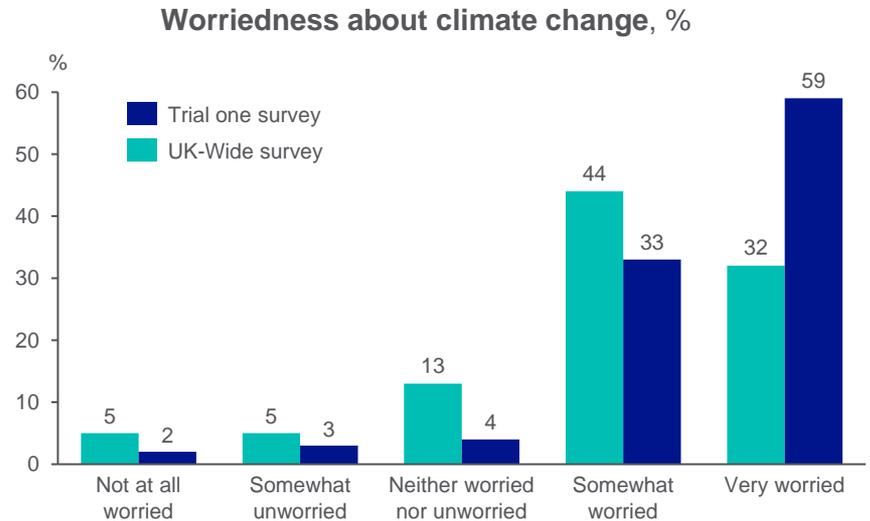
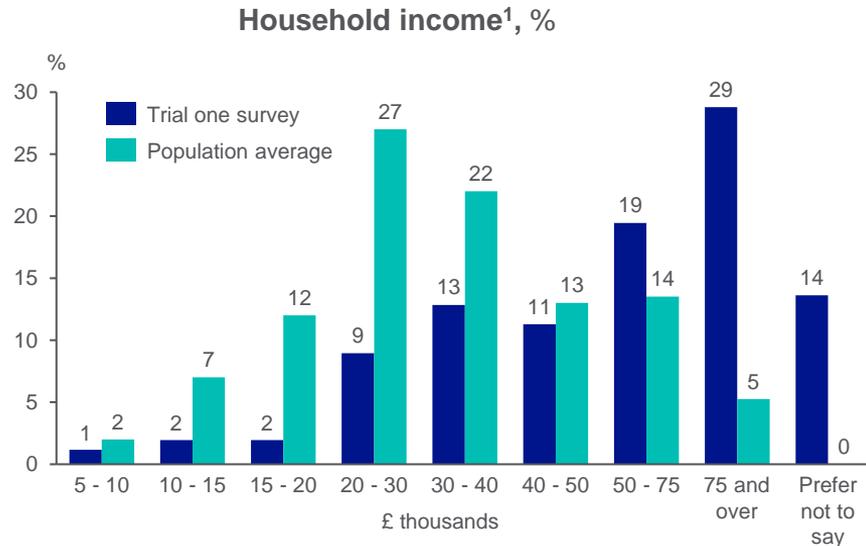
Key findings

nationalgrid



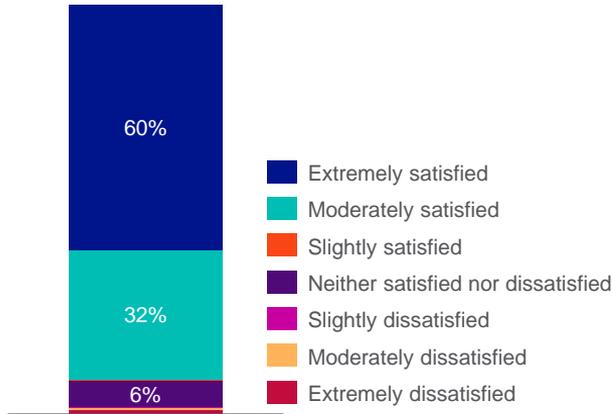
Demographics: It is important to note that trial participants do not fully represent the UK population

On average, EQUINOX trial participants tended to be wealthier and have a greater degree of concern over climate change and its impacts



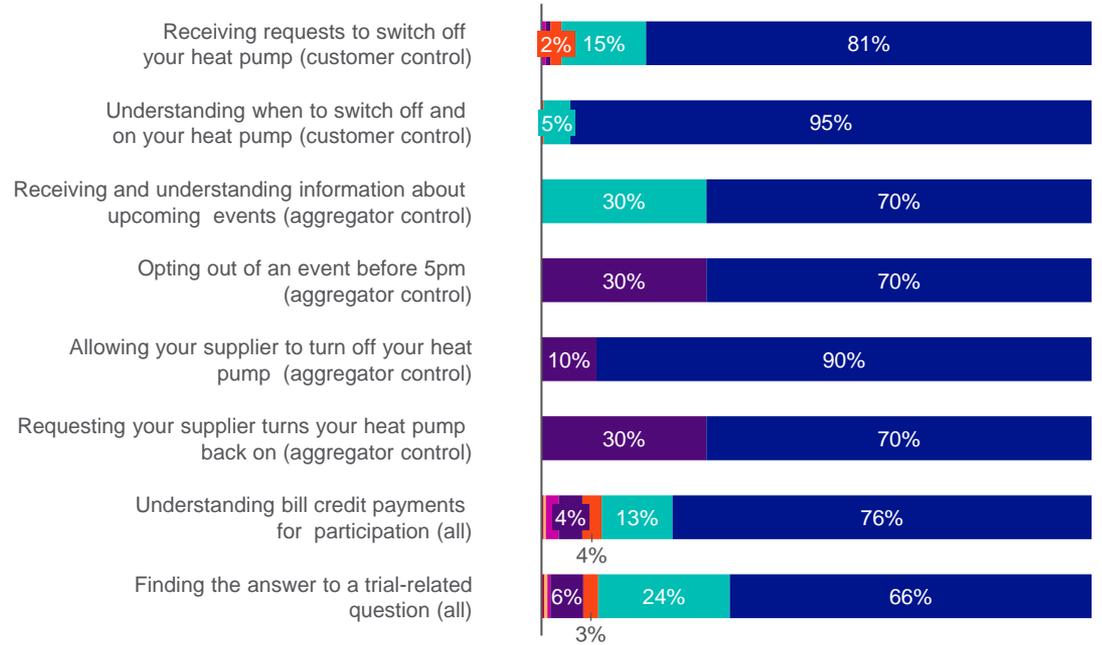
Satisfaction: Participants found the trial easy to navigate and satisfaction was high across all variables

Overall satisfaction, %



- Over 90% of customers were extremely or moderately satisfied with EQUINOX.
- Less than 2% of trial participants reported being dissatisfied.

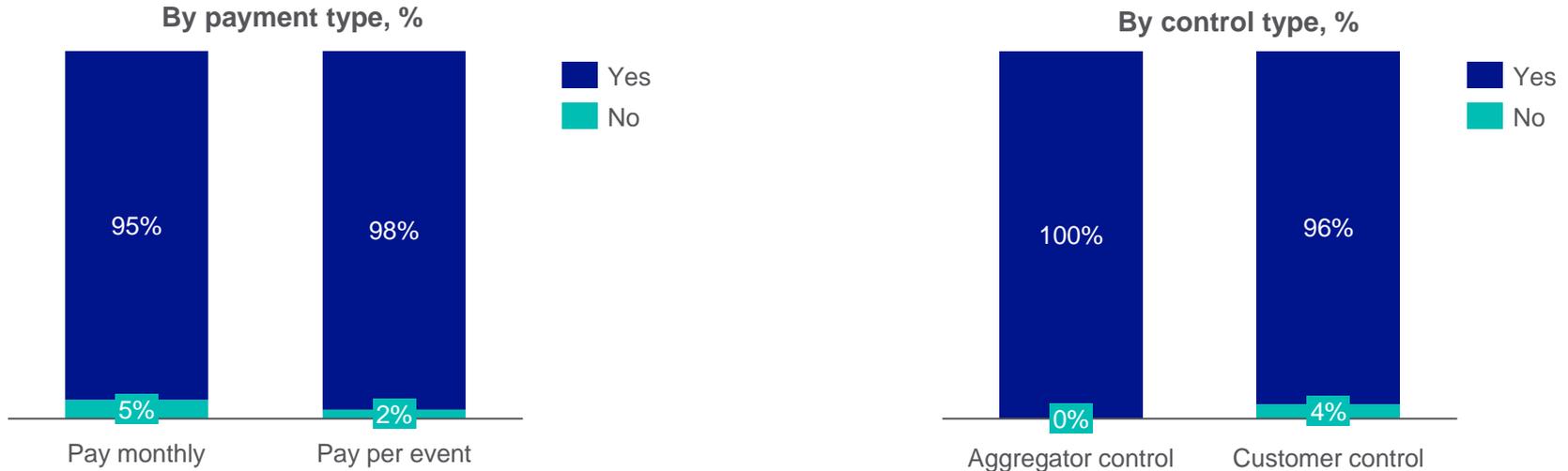
How easy have you found the following elements of participating in EQUINOX?, %



Control: Participants felt in control of their heating throughout the trial

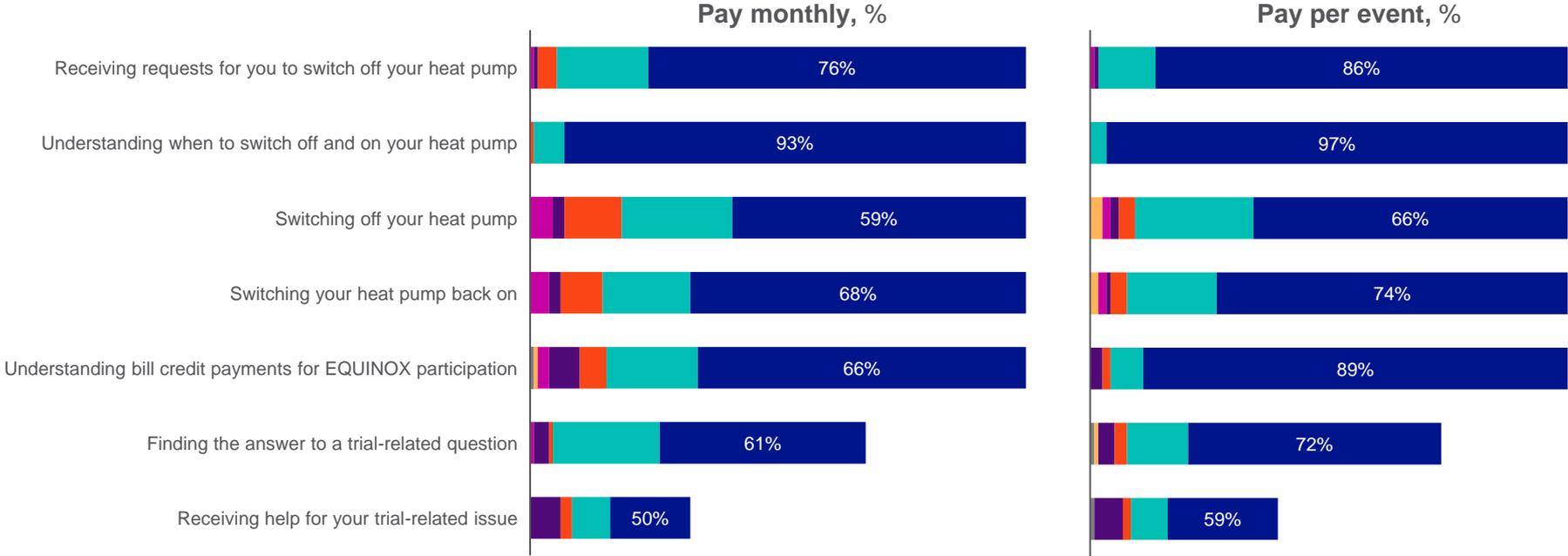
Participants almost unanimously felt in control of their heating during the EQUINOX trial, regardless of their payment group and control type.

Have you felt sufficiently in control of your heating during the EQUINOX trial?



Payment Type: Participants in the pay per event group found the trial marginally easier to navigate

How easy have you found the following elements of participating in EQUINOX events this winter?

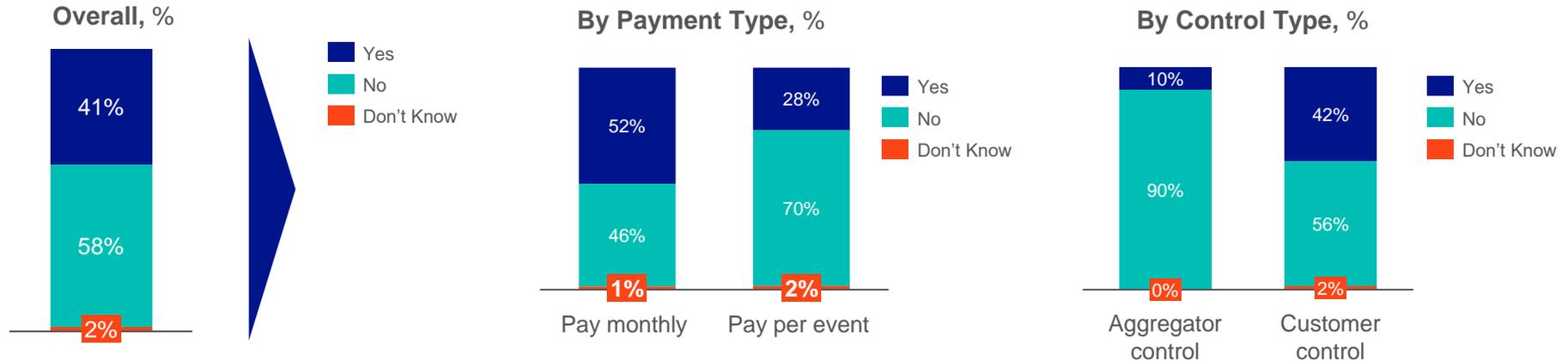


Participation in Events: Pay monthly and customer control participants were more likely to opt out of events

While 52% of pay-monthly participants opted out of at least one event, only 28% of pay-per-event participants did, suggesting the cost of non-participation in the pay-per-event group is incentivising participation.

Only one aggregator control participant opted out of an event, while for customer control it was 40%, indicating that customer control increases non-participation.

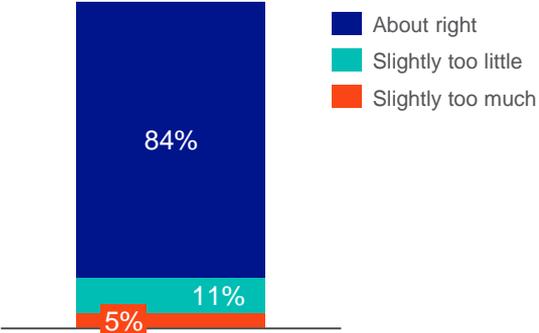
Have you chosen not to participate in at least one EQUINOX event?



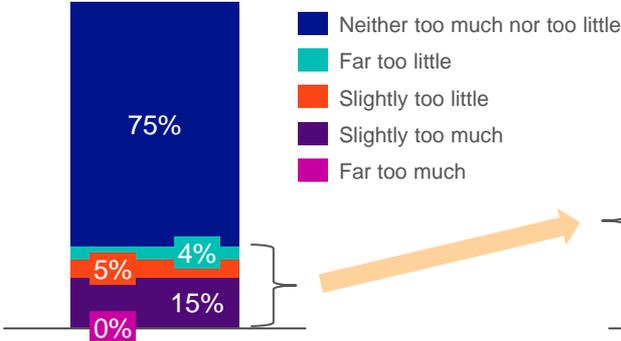
Trial Design: Participants were generally satisfied with the frequency and duration of events

The participants of the EQUINOX trial were generally happy with cadence of 2-3 events per week and with each event lasting two hours. For those who were unhappy with 2-3 events per week, there was a split between more and less frequent events.

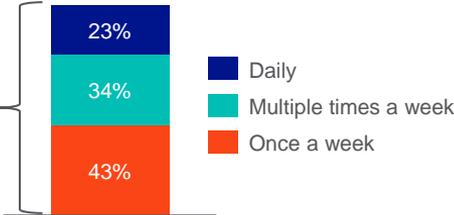
What do you think about the current 2-hour duration of EQUINOX events?, %



During this trial, there have been up to three EQUINOX events per week. What is your view on this frequency?, %



What frequency of EQUINOX events would you prefer?, %



Electricity
Distribution

3

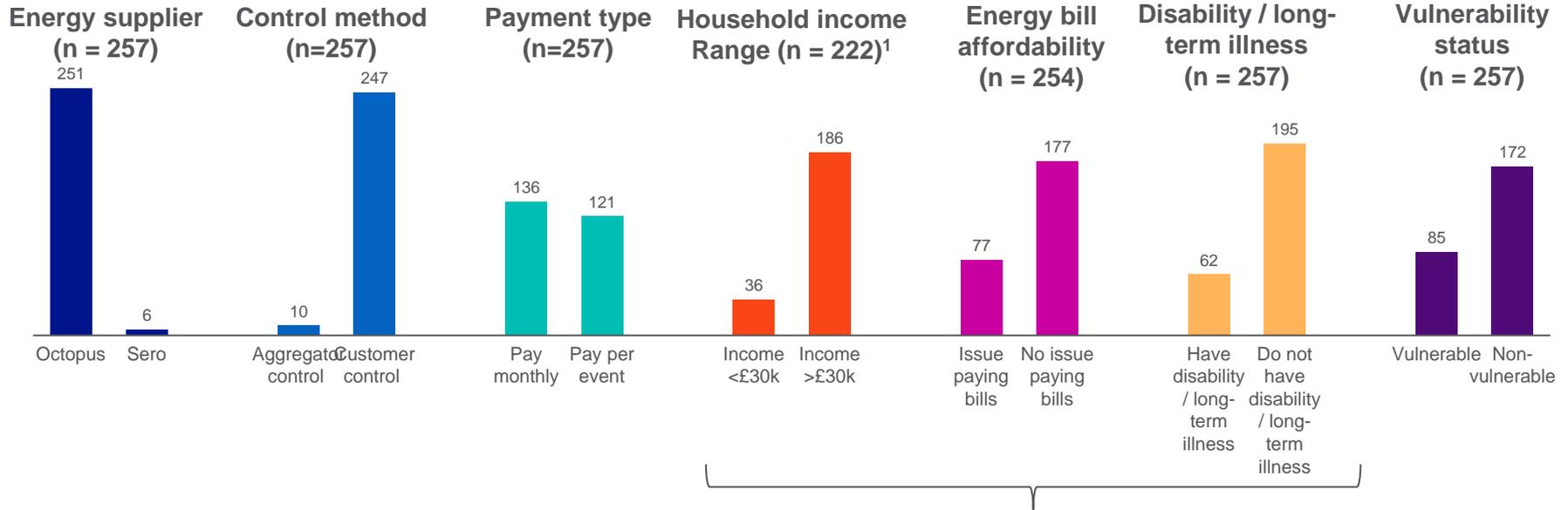
Trial one
demographics

nationalgrid



257 participants responded to the trial one survey

Households in trial one were not representative of the UK population, but trial two aims to recruit from a wider demographic pool. Three indicators were used to identify customers with vulnerabilities: those with a household income under £30,000 annually, who had issues paying bills, or had a disability or long-term illness.



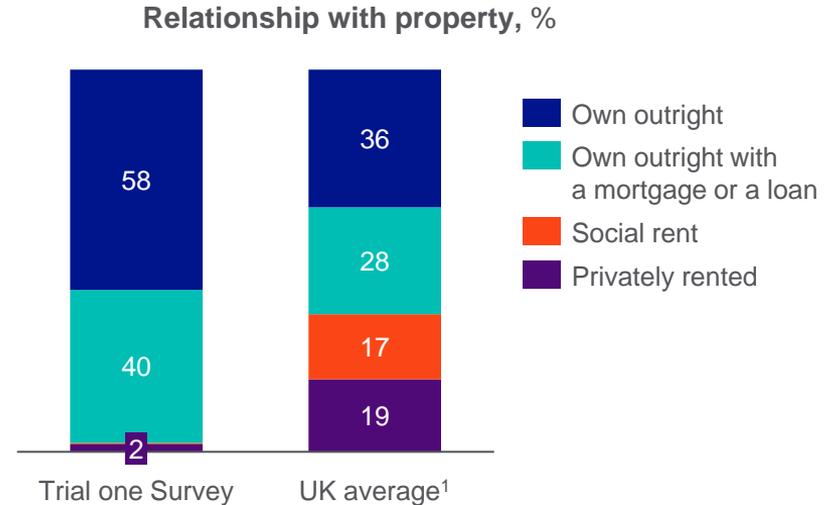
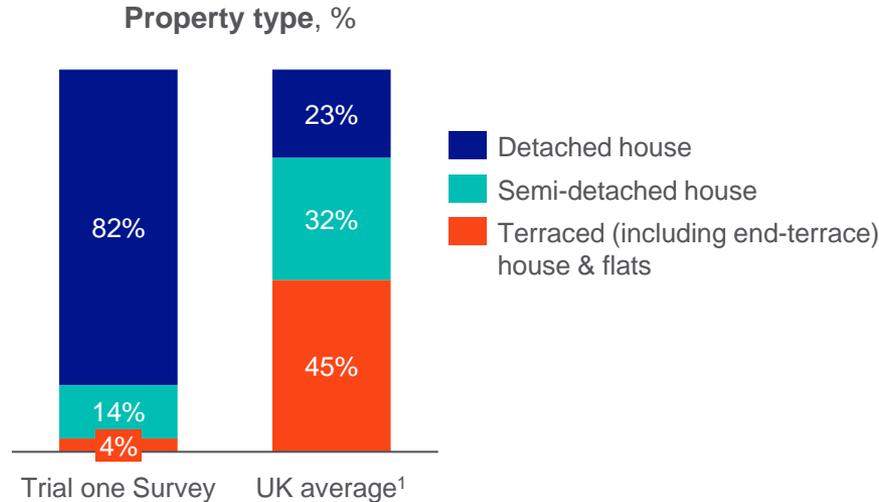
¹Demographics question all had a 'prefer not to say' option. This is why the numbers for the categories do not all add up to 257.

Vulnerability indicators - 33% of trial one participants who took the survey reported having one or more of the vulnerability indicators used

Participants overwhelmingly lived in detached houses and owned their properties outright

The majority of trial one participants lived in detached houses, far above the national average

Almost all households owned their property, again above the national average

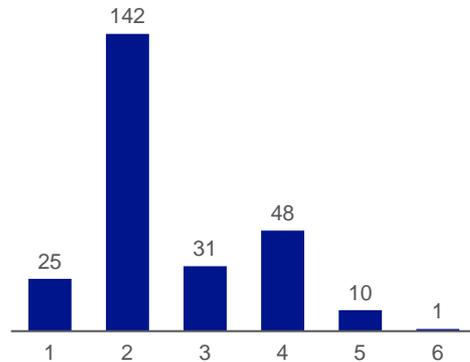


Most participants were older couples or families with one or two children

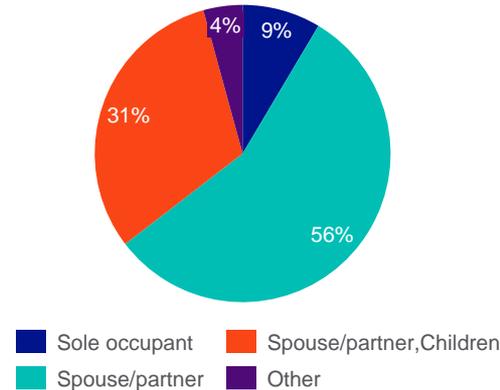
The majority of households were made up of couples, followed by families with one or two children

Householders were most often comprised of older adults

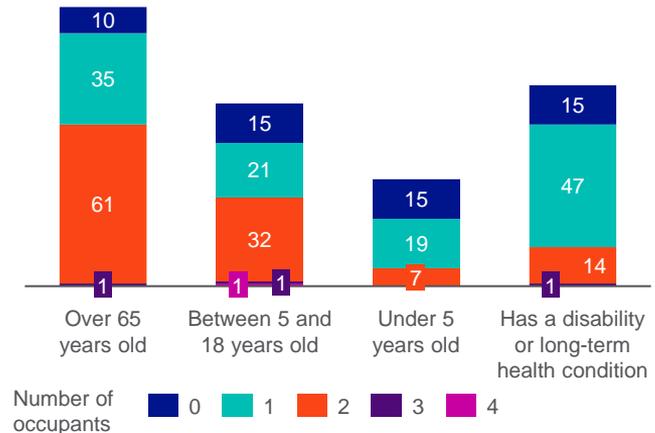
Number of occupants per household, #



Types of occupants, %

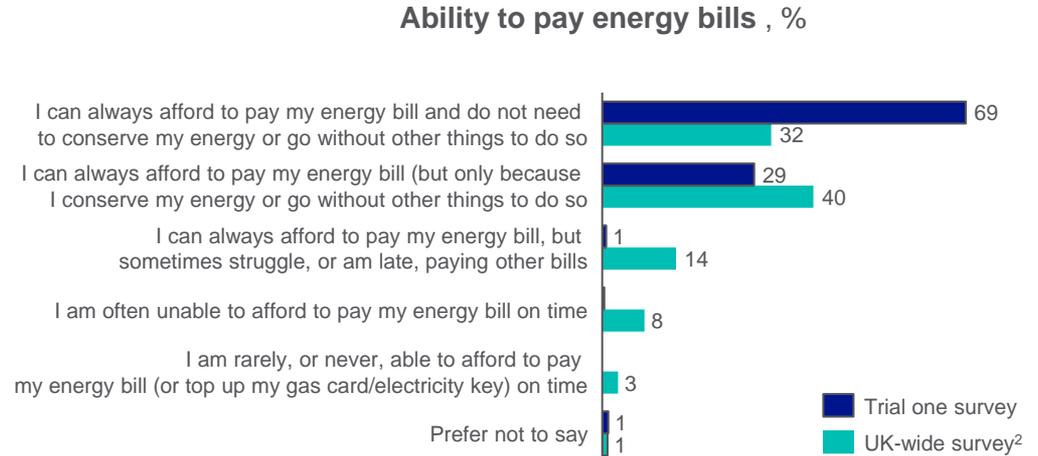
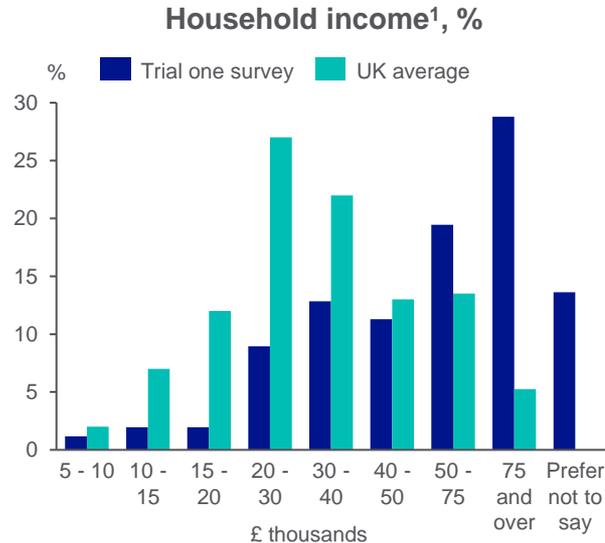


Number of potentially vulnerable occupants, #



The majority of participants were financially comfortable

Most households were from higher income brackets than the average British household. Additionally, most reported that they did not struggle with energy bills, which does not reflect the average British household today.

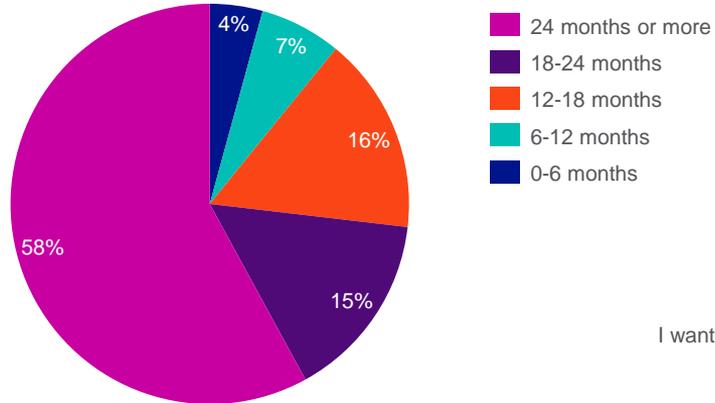


Most participants were experienced with heat pumps and installed one for environmental reasons

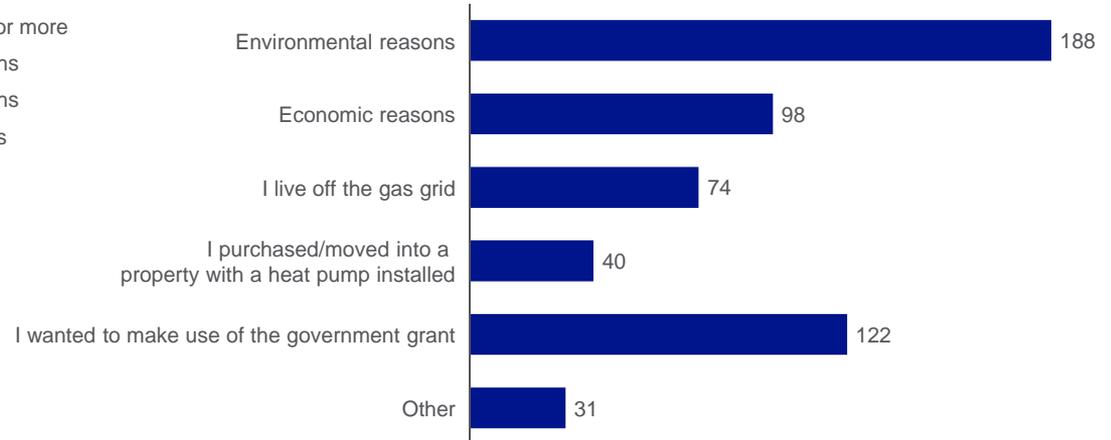
Most households were relatively experienced with their heat pumps, 89% having owned one for at least a year

Most households installed a heat pumps for both environmental and financial reasons

Length of heat pump ownership, %



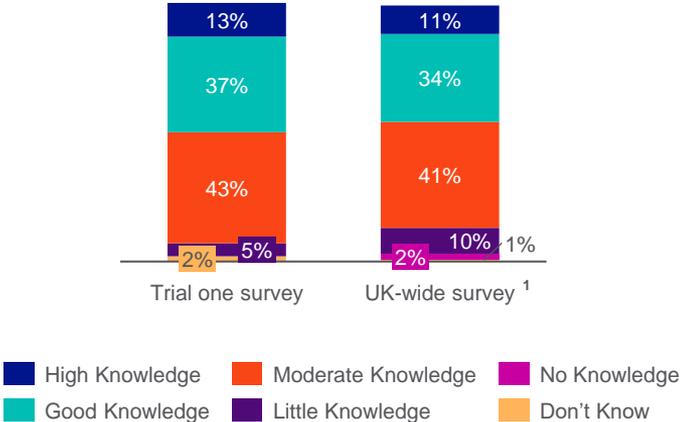
Reasons for getting a heat pump, #



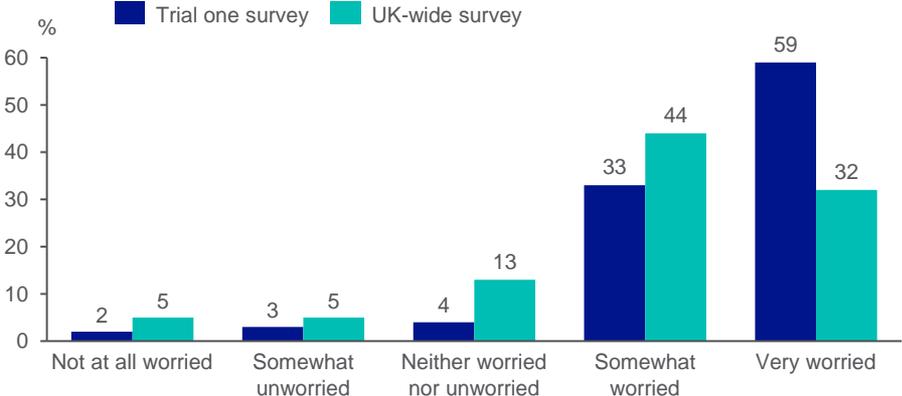
EQUINOX participants were more environmentally aware than average

EQUINOX trial one participants were marginally more environmentally aware than the average British person and tended to be more worried about the impact of climate change.

How would you rate your knowledge about climate change?, %



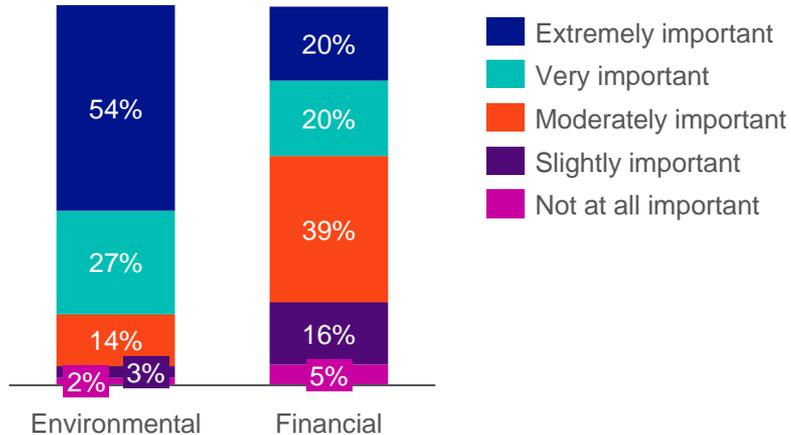
How worried or unworried are you about the impact of climate change? , %



Most participants joined the trial for environmental reasons

Environmental reasons were by far the most popular reason for participating, ahead of financial

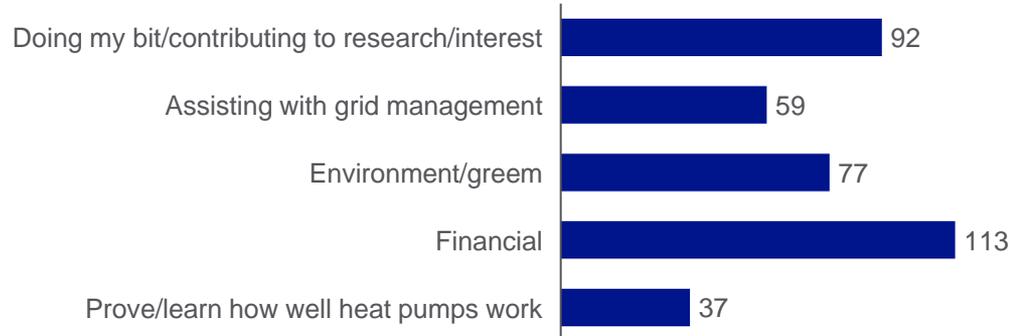
How important were environmental / financial reasons in influencing your decision to participate in the trial, if at all?, %



National Grid Source: Trial one survey

Delving deeper into qualitative motivations revealed more nuance, with understanding heat pump performance, contributing to research, and helping manage the grid commonly cited as reasons

What motivated you to participate in the EQUINOX trial? (Qualitative question, answers grouped under the following five buckets), #



Qualitative research revealed inherent differences between Octopus Energy and Sero trial participants

Note that nearly all Octopus Energy customers were customer control, while all Sero customers were aggregator control.

Octopus Energy customers



Motivation: interest in greener living and contribution to low carbon transition



Energy efficiency: It's really interesting hearing other people's comments because I didn't notice any difference. I hadn't realised how thermally stable the house was."



Manual control: advance notice for events due to need to be home

Sero customers



Passive participation: "The trial kind of happened and I didn't really pay much attention to it to be perfectly honest."



Low impact: "If I didn't get the text telling me that a trial event had happened I would have absolutely no idea that it had happened."



Automation: "I liked it because I literally had to do nothing."

Electricity
Distribution

4

Customer
satisfaction

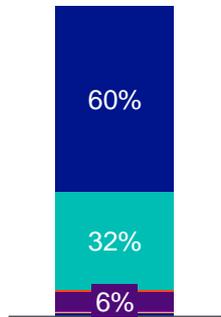
nationalgrid



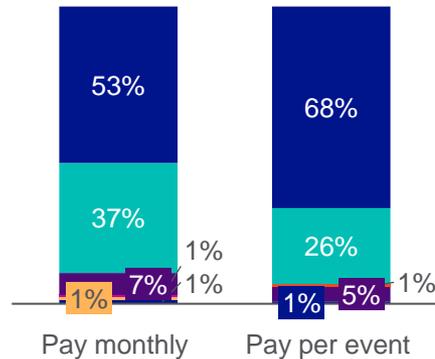
General trial satisfaction was high across all variables

All types of participants were extremely satisfied with the trial. Once broken down into payment type and control types, aggregator control participants and those who were paid per event were more satisfied with the trial than the average.

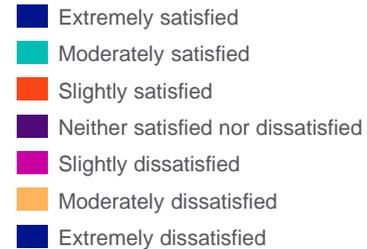
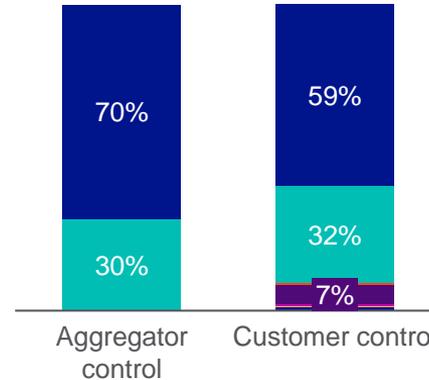
Overall satisfaction, %



Satisfaction by payment type, %



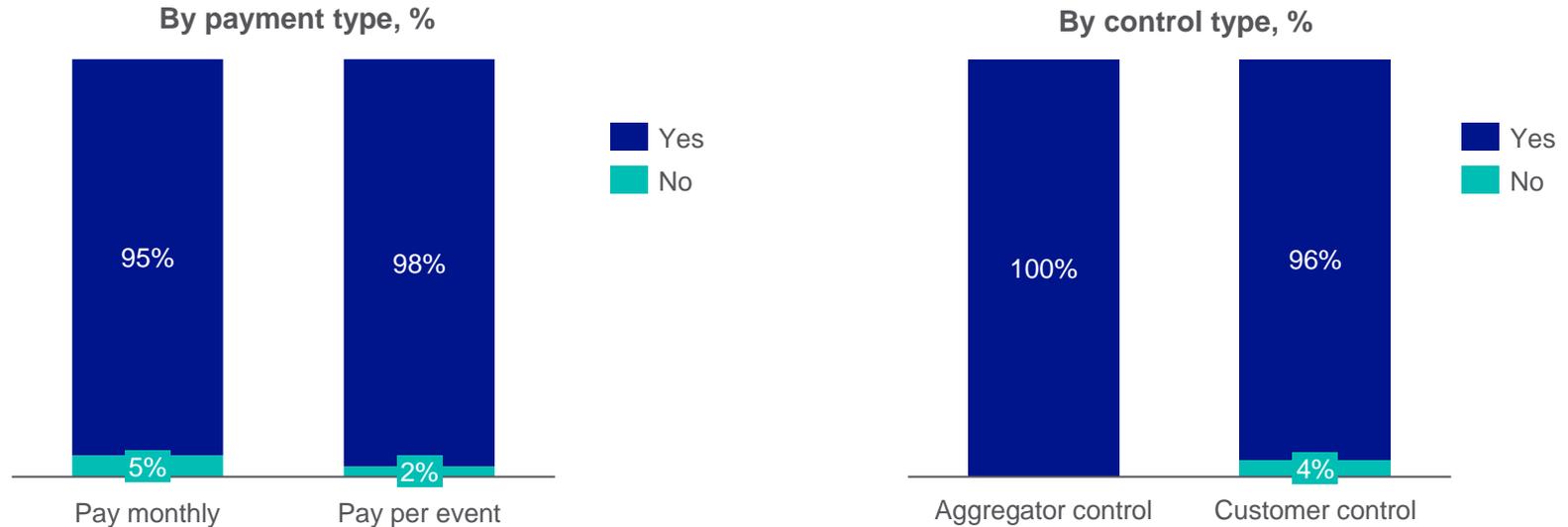
Satisfaction by control type, %



Feeling in control of heating, ease of participation, and thermal comfort were variables that contributed to high satisfaction with the trial.

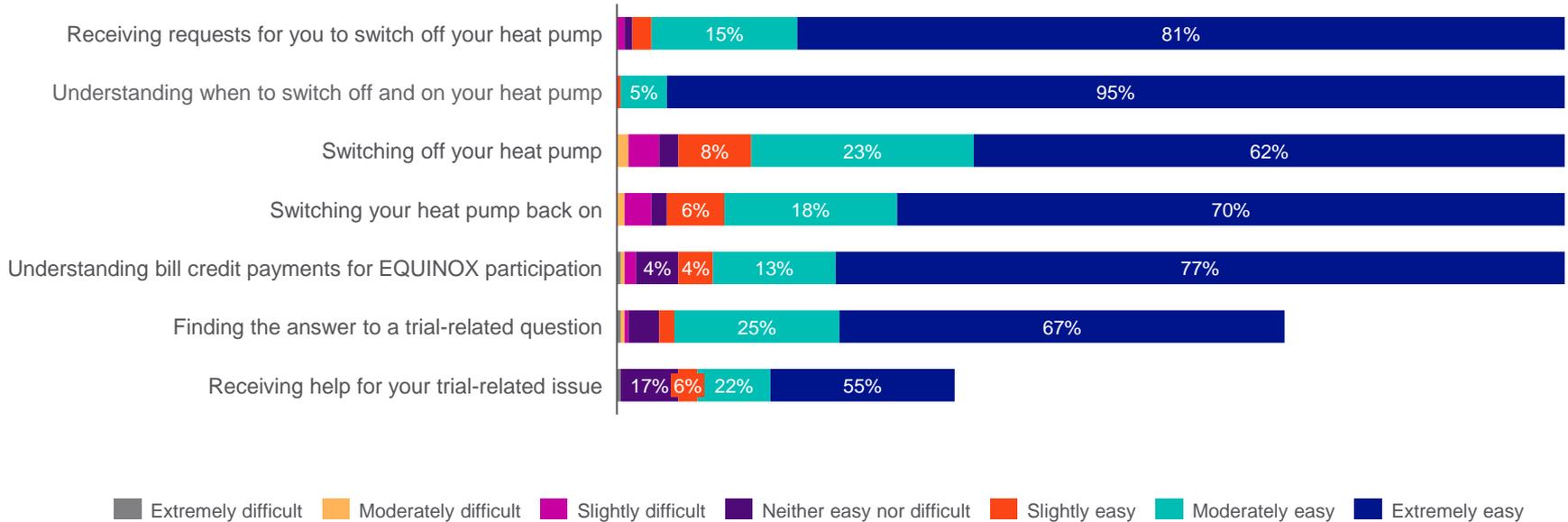
All participants generally felt in control of their heating, independently of their payment and control type

Have you felt sufficiently in control of your heating during the EQUINOX trial?



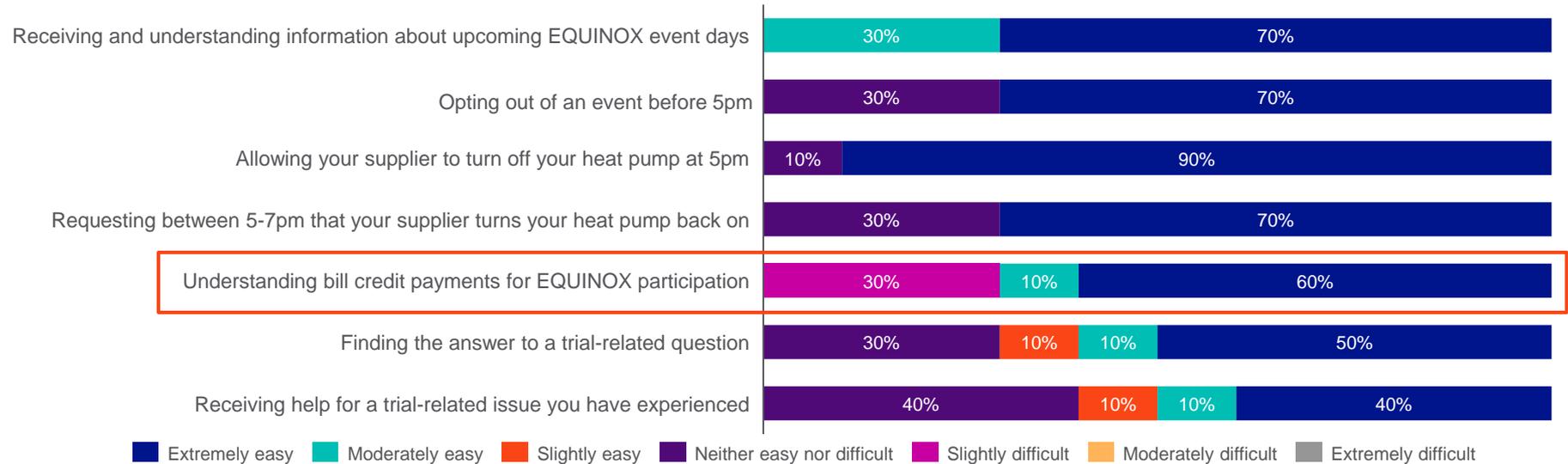
Nearly all customer control households found participating in EQUINOX extremely or moderately easy

How easy have you found the following elements of participating in EQUINOX events this winter? (Customer control), %



Aggregator control participants also found participation easy, but found it more difficult to understand payments

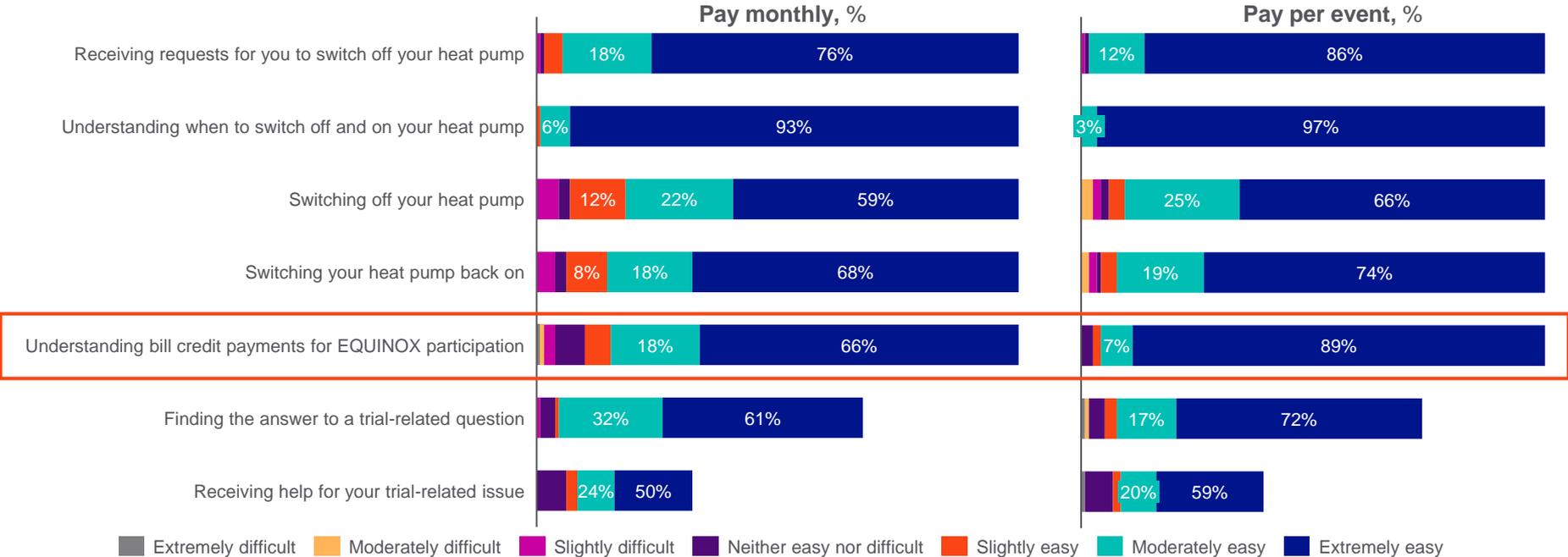
How easy have you found the following elements of participating in EQUINOX events this winter? (Aggregator control), %



On average, customer control participants found it easier to participate in EQUINOX events than aggregator control participants, although a small sample size of aggregator control participants (10, as opposed to 247 customer control) could skew the results.

Participants who were paid per event generally found the trial easier to navigate, especially bill credits

How easy have you found the following elements of participating in EQUINOX events this winter?, %



Electricity
Distribution

5

Customer
comfort

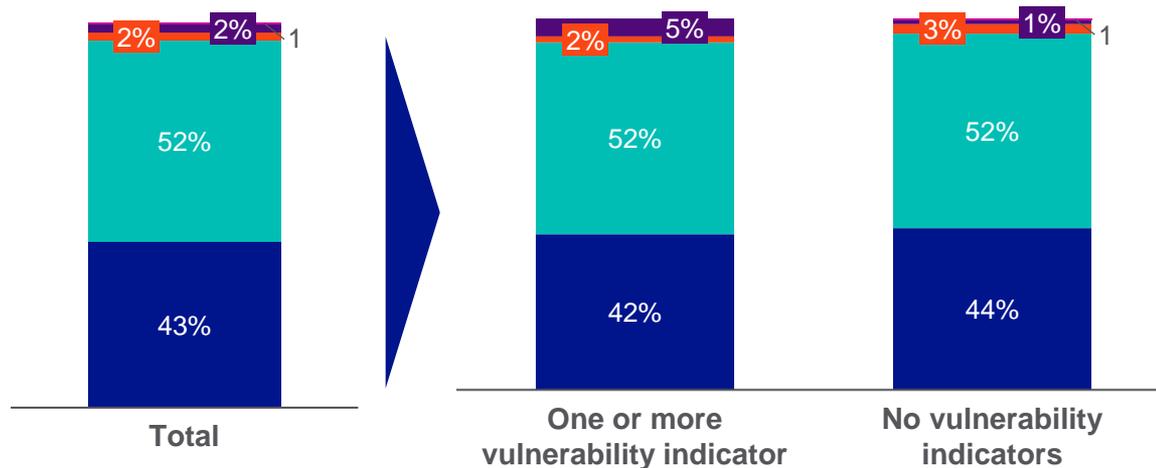
nationalgrid



Customers generally did not feel thermal discomfort as a result of participation in events

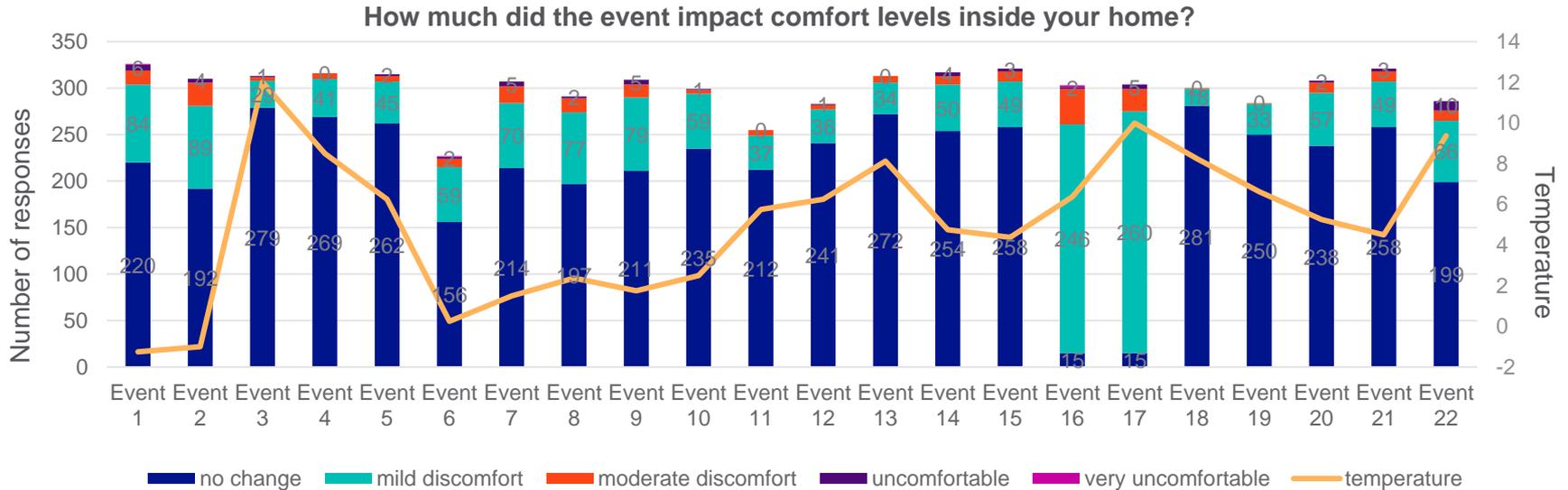
95% of households never or only sometimes felt discomfort during events. Customers with vulnerabilities did not seem to experience significantly more discomfort compared to others.

How frequently has participating in events caused any discomfort for you or someone else in the household?



When we had very cold weather, there were a few occasions where it did feel a little bit cold. But I just put a jumper on or a blanket or whatever else. And it was mildly so, it wasn't extremely uncomfortable, far from it...

Comfort levels did not appear correlated with temperature



- The coldest trial event days (1, 2, and 6) had slightly higher reported discomfort than many other events, however, events 16 and 17 reported much high levels of mild discomfort despite higher temperatures.
- Events on consecutive days (10,11 and 18,19) did not show great differences in reported comfort levels.

Customers did not experience major disruption to their daily routines as a result of participating in events

In focus groups and interviews participants indicated they were able to maintain their usual routines throughout the trial, although their level of voluntary behaviour change varied.



“I’m at home at that time. I suppose I’m usually starting to cook roundabout 6:00 or 7:00. I might still be doing a bit of work on the computer at that time or outside. But **I didn’t change my behaviour at all because we didn’t see any drop in the heat.**”



“I’m generally home at that time. What changed? Well I suppose maybe thinking about what I was cooking. I’m lucky enough to have a gas hob, so obviously on the days when I needed to be cooking within that time period **I would choose things that didn’t need the oven for instance.**”



“EQUINOX and Octopus have caused a shift in energy usage anyways. I’m not sure if behaviour change would still be in place without these tariffs.”

Customer control households adapted different ways of participating in the trial

Whether a participant turned down their heat pump manually or remotely through an app had implications on how they behaved in the trial.

Manual customer control



I mean it wasn't actually literally flicking the switch off. I just reduced the room thermostats because there is a thermostat in each room to below what I would expect it to be. I've got a setting on my thermostats that I can set it for a period of time. By five o'clock I can set it for two hours and then it puts itself right again after that. It wasn't difficult...it was a couple of minutes job.



The process, we found, is actually so easy. I just set an alarm on my phone to say 'turn the pump off', and another alarm, well, sometimes, to put it back on again.

Remote customer control



I just set an alarm on my phone for 5 minutes before and an alarm to switch it back on again... on the Homely App it's very easy. You just switch it to hot water only, and as I say because my hot water is programmed to come on after midnight, I know it's not going to be running.



I just scheduled it. As soon as I got the notification I changed the schedule on the day to the two hours to set it to a lower temperature so the heat pump wasn't on.

6

Customer participation

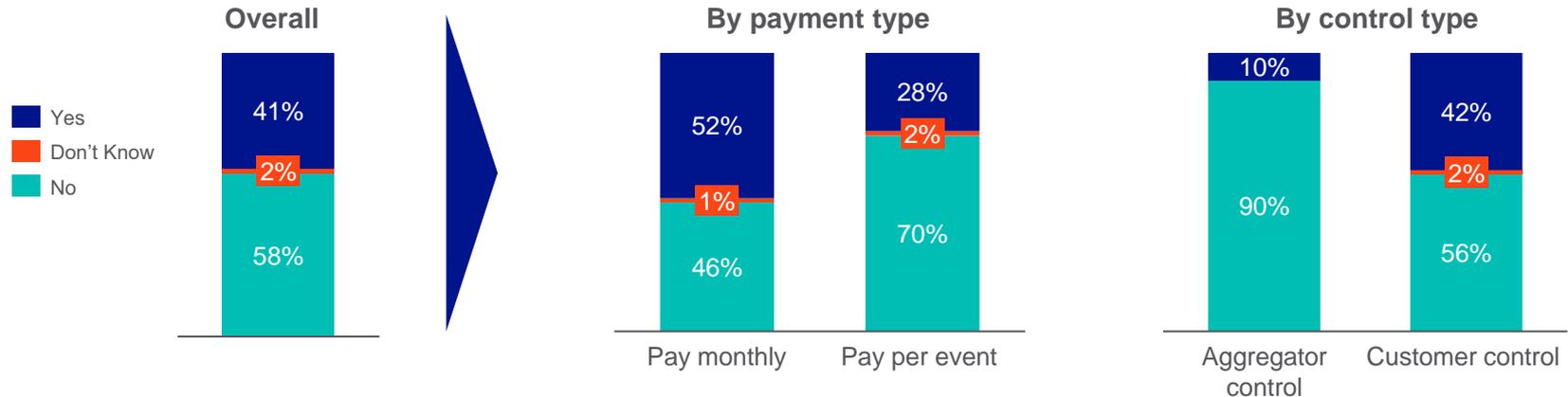
nationalgrid



Payment type and control method seemed to have some influence on participation rates

Over half of pay monthly participants chose not to participate in an event. For the pay-per-event group, it was less than one-third. Only one aggregator control participant chose to opt out of an event, compared to 42% of customer control participants.

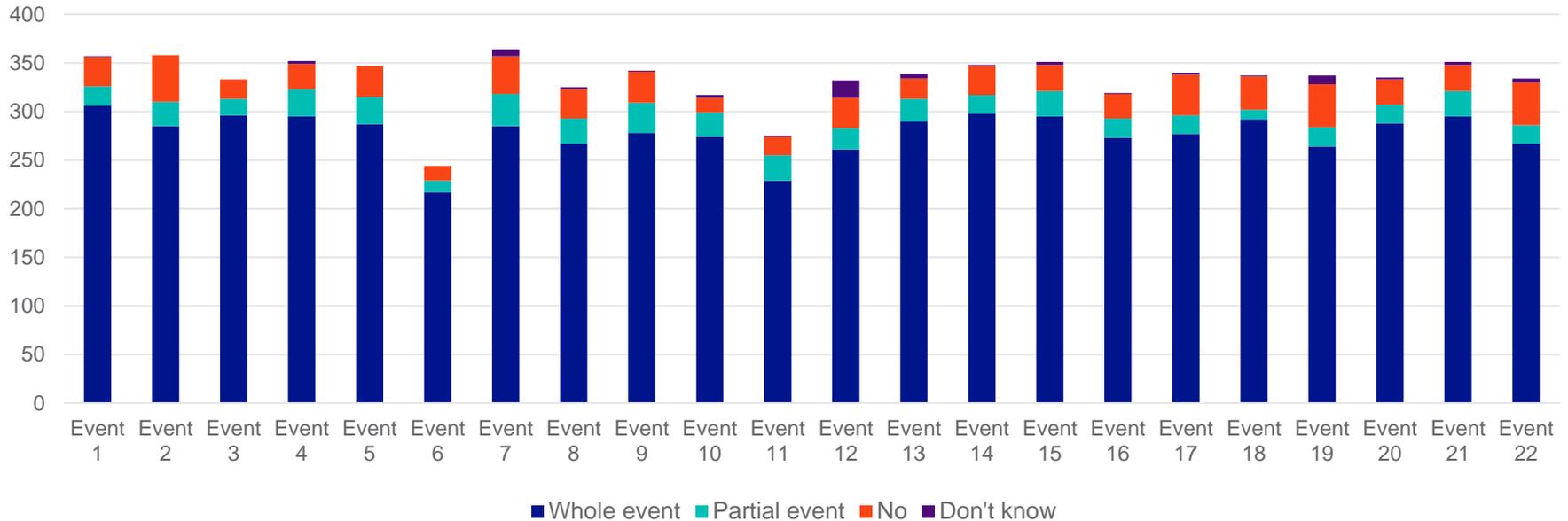
Have you chosen not to participate in at least one EQUINOX event?



Participation remained relatively steady across the trial, with little fluctuation over the winter

On average, there was 82% participation across all events in trial one.

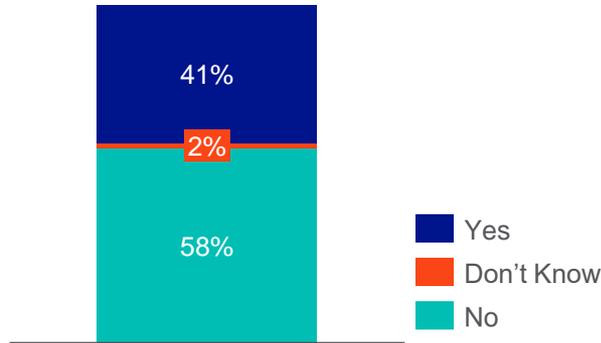
Reported participation per event



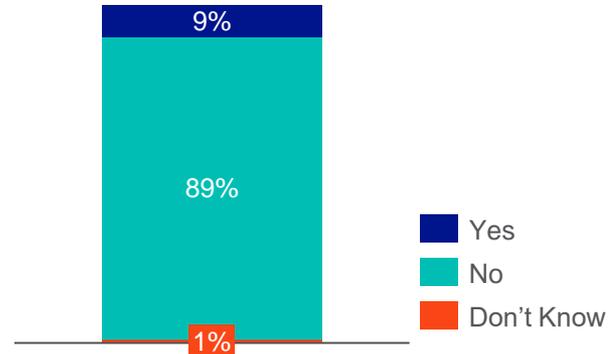
The majority of households who participated in an event kept their heat pump off for the full two-hour window

58% of households participated in all 22 events. 89% of households who chose to participate in an event kept their heat pump off for the full two-hour event window.

Have you chosen not to participate in at least one EQUINOX event?



Have you ever chosen to switch your heat pump back on before 7pm during any EQUINOX events?



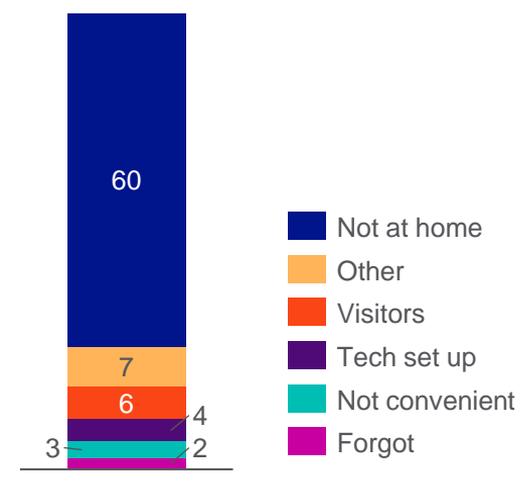
Not being home was the most significant barrier to participation in EQUINOX events

The most common reason for partial or non-participation for customer control households was participants not being home to switch off their heat pump. Not realising there was an event or it being too cold outside were the next most common reasons.

Why have you chosen not to participate in an EQUINOX event?
(Select all that apply)



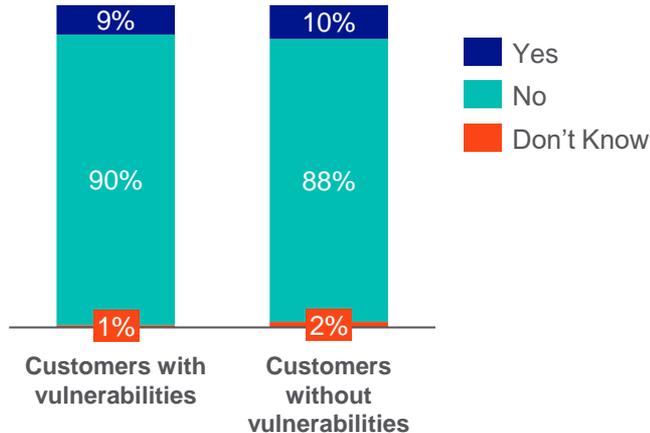
Other reason for non-participation



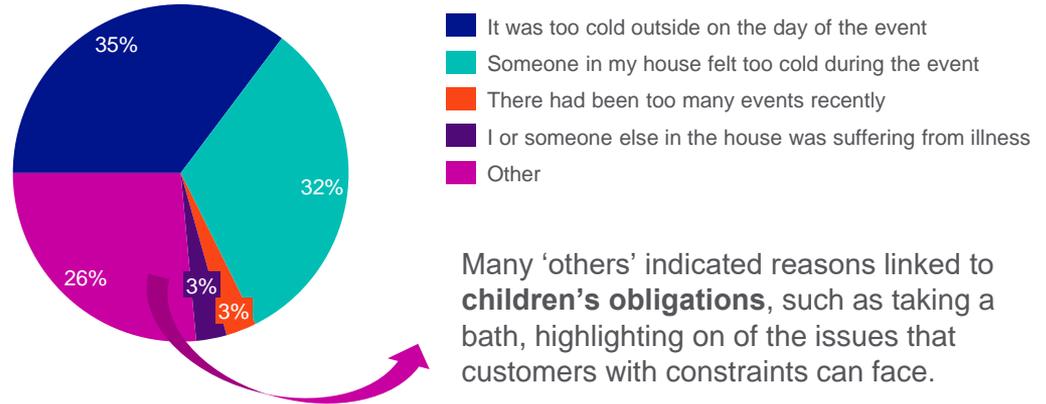
Customers with vulnerabilities were not more likely to switch their heat pumps back on during the trial

Most participants reported never switching their heat pump back on or opting out before the end of an event, but the ones who did were all customer control participants. The majority of customers who did switch their heat pump back on reported it was due to the cold or childcare obligations.

Have you ever chosen to switch your heat pump back on before 7pm during any EQUINOX events?



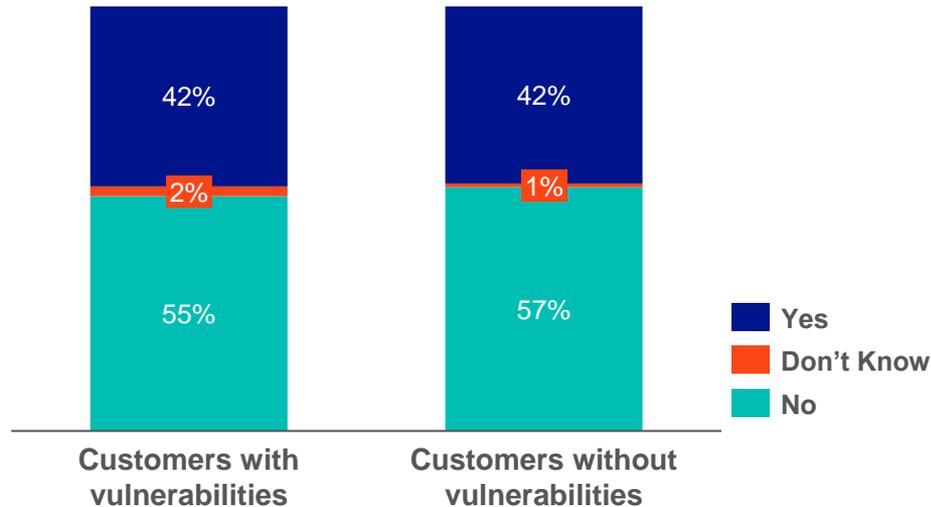
Why have you chosen to switch your heat pump back on before 7pm for at least one EQUINOX event?



Customers with vulnerabilities were as likely to report non-participation

One of the research questions EQUINOX aims to understand is if the benefits of flexibility can be accessed by all types of customers. These results indicate that customers with vulnerabilities are equally likely to not participate when compared to customers without vulnerabilities.

Have you chosen not to participate in at least one EQUINOX event?



Electricity
Distribution

7

Trial design
feedback

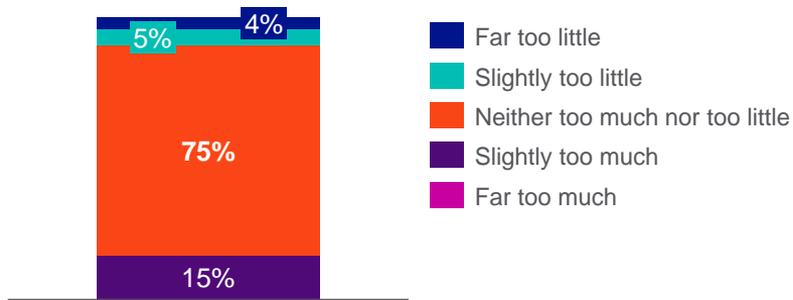
nationalgrid



Most respondents felt the cadence of two to three events a week was reasonable

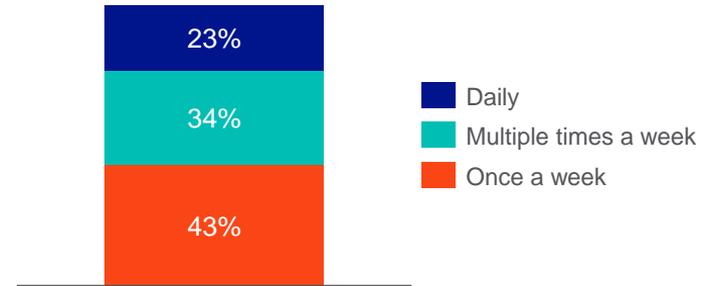
75% of participants found the frequency of EQUINOX events to be satisfactory: neither too frequent nor too infrequent:

During this trial, there have been up to three EQUINOX events per week. What is your view on this frequency?, %



When asked what their preferred number of events was, 43% of those not satisfied indicated they would prefer events only once a week:

What frequency of EQUINOX events would you prefer? (asked to the 25% who answered too little or too much), %



“ I thought it was absolutely manageable. I think mostly mine were at least two, if not three, times a week. So yes, I was happy with that. I didn’t feel inconvenienced by that, it didn’t feel too much.

Most respondents were satisfied with the length of the events and their time of day

84% of participants felt that the 2-hour events were about the right length

This was corroborated in focus groups, in which multiple trial participants expressed that longer event times would have caused them problems or made them reluctant to participate at all:

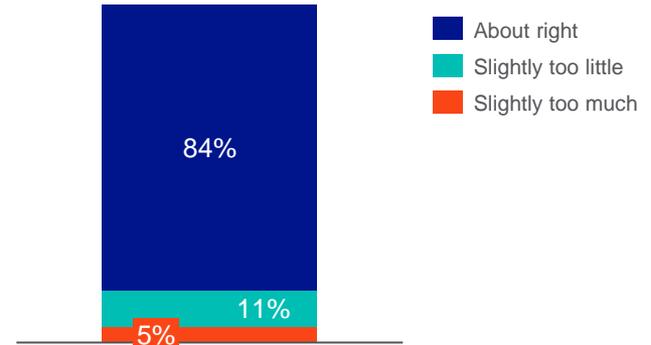
“ You might find, if we’d gone to three hours or four hours, then the house might have got cold. So I think two hours was a good time.

Focus group participants were asked if they felt any discomfort or if it was noticeably cold during events:

“ No, not noticeable. I think if it had been 9:00 or 10:00 in the morning or 11:00 in the morning, we would've noticed it.

“ I think if I was really looking for it I would notice that it was a bit cooler, but the fact that no one else mentioned it made me think, “Okay, it wasn’t a big impact.”

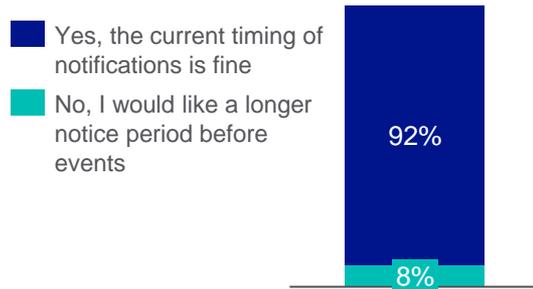
What do you think about the current 2-hour duration of EQUINOX events?



Most participants were satisfied with notification periods and methods, though some wanted changes

92% of participants indicated that they were satisfied with the timing of the trial notifications, while 86% were satisfied with the method of notification. Texts were the most frequently cited additional notification method

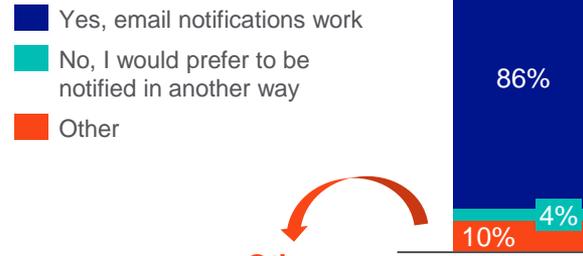
Are you satisfied with how far in advance you are being notified about event periods?



I think the only thing maybe was just that predictability of when the events were going to be, like an actual timeline of that. If you don't then send lots of reminders it becomes problematic to schedule it too far ahead.

Some focus group participants noted that more consistent event timings would increase participation

Are you satisfied with how you are being notified of these events?



Other

+Text	22
+App	6
Email + anything	3
Email was fine	4
Other	18

App notification would be nice. Emails sometimes get hidden amongst others in a busy inbox.

Participants expressed the desire for more updates as they progressed throughout the trial

Customers expressed wanting...

A better understanding of what the trial is investigating: “My curiosity was, how did you determine when to actually run the trial? Was there some event happening within the grid, who was saying, ‘We’ll do it then, or we’ll do it then?’”

To know the impact of their participation: “We weren’t getting any feedback on the carbon saving that we’d been making or the positive impact, which I think would have affected us. I’d have quite liked to know how much positive was actually being made from it.”



To connect with other heat pump owners on the trial: “I don’t know anybody that has got an air source heat pump or anything that would have been taking part in something like this... some sort of group feedback or opportunity would have been quite helpful.”

To know how their contributions will be used for research: “I’d love to see the research findings given that they’ve got that data as well, you know, just to really justify that carbon saving over that period. I’d love to see the research outputs on that.”

national**grid**