Electricity Distribution

Webinar: Customer Perceptions on Unlocking Flexibility from Heat

April 2022

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Agenda

1. **Introduction** (5 minutes): Ryan Huxtable
2. **Project Overview** (10 minutes): Jacob Lynch
3. **Research Findings** (20 minutes): Alyssa Fournier
4. **Q&A** (20 minutes)

Introductions

Ryan Huxtable:
Innovation Engineer,
National Grid

Jacob Lynch:
Innovation Engineer,
National Grid

Alyssa Fournier:
Associate Director,
Guidehouse

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Project Overview

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EQUINOX Overview

What is EQUINOX? EQUINOX will test new commercial and technical arrangements to reward households with heat pumps for temporarily altering their heating choices without compromising on comfort.

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

Who is it led by? EQUINOX is sponsored by National Grid Electricity Distribution (National Grid), who are the Distribution Network Operator for the East and West Midlands, the South West and South Wales.

Who else is involved? Octopus Energy, Passiv UK, Sero, SP Energy Networks, Welsh Government, West Midlands Combined Authority, National Energy Action, Scottish Power Energy Retail, and Guidehouse.

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 will take part over 4 years.
- Over 350 signed up for the first trial in winter 2022-2023.
- EQUINOX trials aims to include households from all sectors of society, ensuring that commercial and technical arrangements are designed equitably

Why is EQUINOX important?

Expect an increase in about 600,000 heat pumps to connect to National Grid's distribution grid —meaning **a significant increase in electricity peak demand.**

Heating load and flexibility not yet proven in trials

No proven solutions enable DNOs to **unlock flexibility from residential electric heat** reliably and cost-effectively

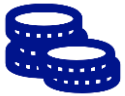
Vital that all customers—including **2.4 million households in fuel poverty**—access and benefit from smart solutions

How the Trial Worked This Winter

Held 22 “EQUINOX Events”

- Trial events occurred from December to March
- Scheduled from 5-7pm
- Events up to 3 times per week

Two Commercial Arrangements



1. **‘Save in Advance’** participants paid fixed monthly installments in advance
2. **‘Save as You Go’ participants paid per event afterwards**

Two Control Methods

1. **Direct Load Control:** participants allowed suppliers to control heat pumps remotely, but could opt out before or during events
2. **Behavioural Demand Response:** customers asked to turn off or down heat pumps manually

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Research Findings

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The objective of this research was to better understand households' attitudes towards low-carbon heating

Objectives of Customer Research:

- Evaluate general attitudes on low-carbon heating alternatives—especially heat pumps and flexibility offerings
- Decipher key drivers, enablers, and barriers to adoption
- Understand how to improve customer adoption
- Provide early learnings about attitudes to EQUINOX trial (communications, commercial arrangements, etc.).

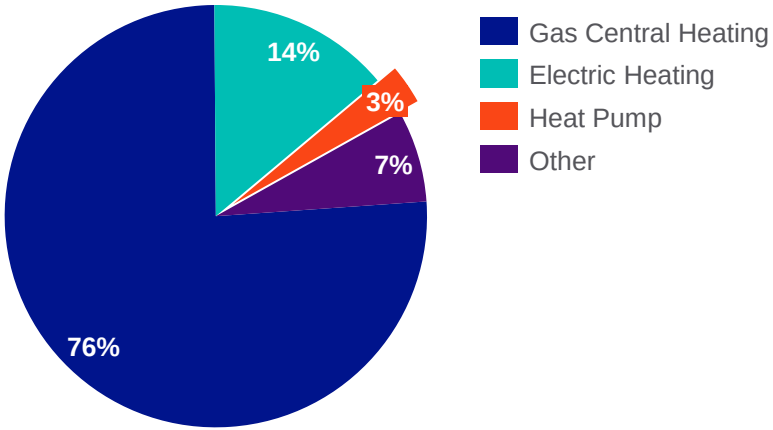
The Research Methodology:

- Quantitative survey (> 2,400 participants)
- 400 face-to-face surveys for digitally disconnected
- Representative of latest UK census data: age, gender, region, homeowner vs tenant status, financially vulnerable, age of property
- 18 qualitative focus groups / 91 participants / 6 interviews for digitally disconnected

Heating in the UK is characterized by gas boilers and old housing stock with installation challenges

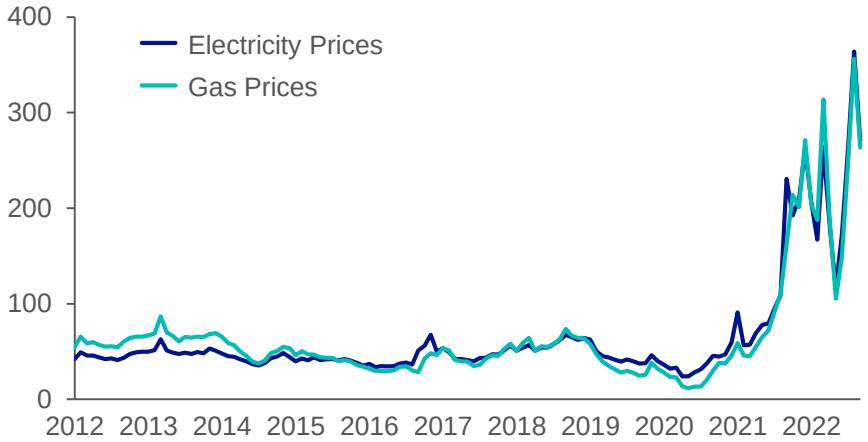
75% of home in the UK use gas boilers while only 3% use heat pumps

Heating Type in UK households, %



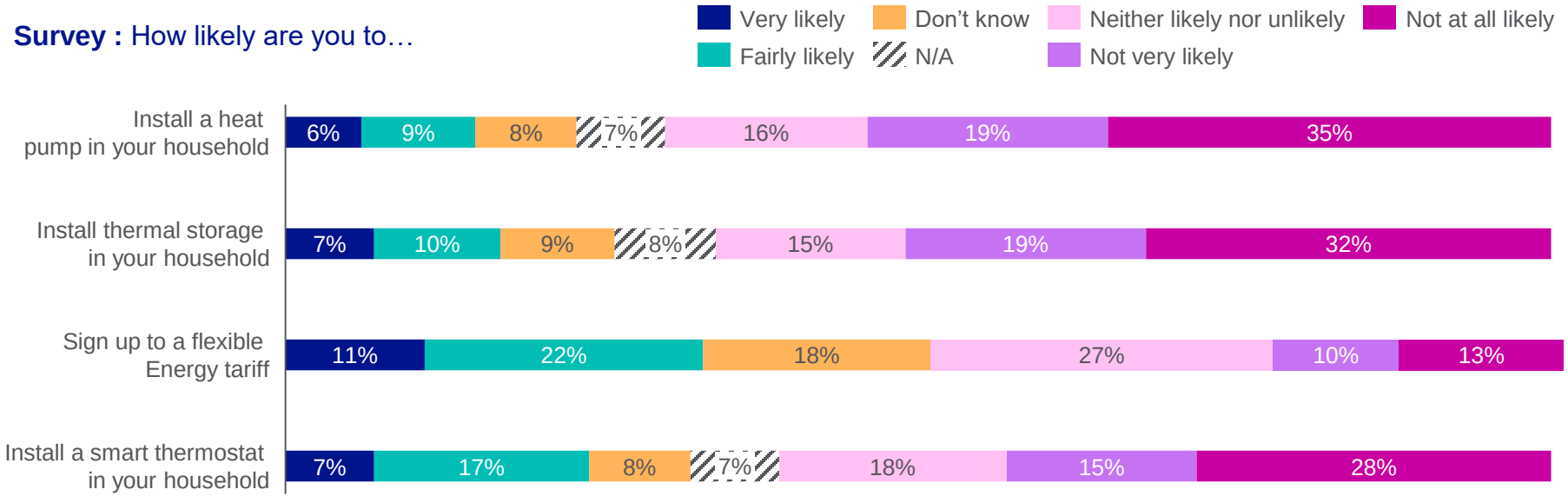
Gas heating has been a preferred heating method as it has traditionally been cheaper

Gas and Electricity Day Ahead Baseload Contracts, Monthly Average (GB)



Most UK households are reticent to install heat pumps

Survey : How likely are you to…

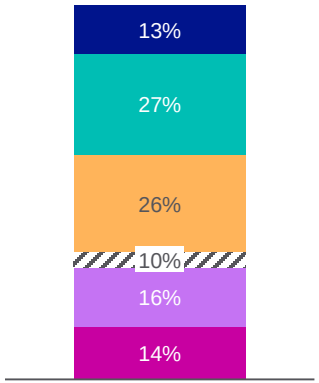


54% of households are unlikely to install a heat pump within the next 5 years

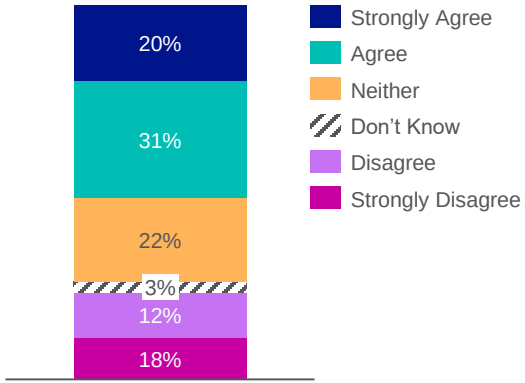
Customers don’t know where to find reliable information

More than 40% found heat pumps appealing and 51% were interested in learning more

Survey: Heat pumps are appealing and of interest to me:



Survey: I would like to learn more about heat pumps as a means for providing heating and hot water for my home:



But a lack of reliable information available allows misunderstanding of heat pumps

Focus Group quotes:

“You need something different for hot water”

“Cost is so expensive to install but cheaper to run”

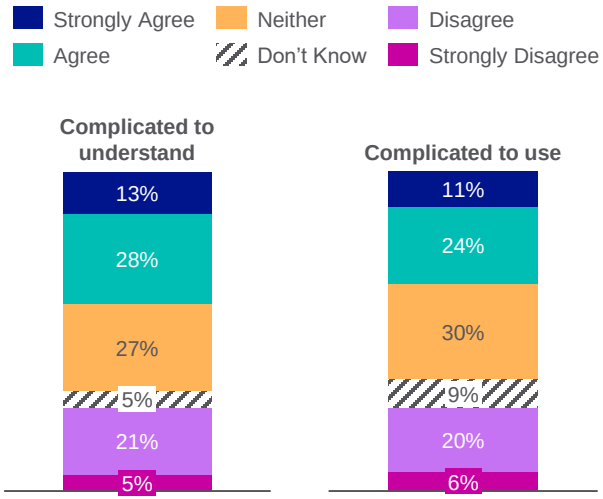
“You have to be in detached/semi/end of terrace”

“You would need to rip out your (new) radiators/underfloor heating”

Misinformation is contributing to a slow adoption

Lack of Information & Knowledge

Survey: Heat pumps seem…



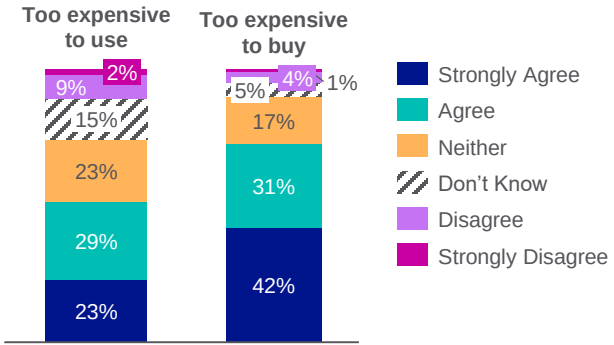
Lack of Trust

- Worries about frequent technology breakdown—lack of proven track record
- No trust in government-led initiative to install heat pumps
- Lack of equivalent to Gas Safety Register
- Given source of electricity **concerns** about true sustainability heat pumps

Financing

- Installation costs and running costs worrisome; many would need to insulate homes
- Government grant made proposition more attractive

Survey: Heat pumps seem…



Customers fear of disruption are also barriers

Installation and Maintenance

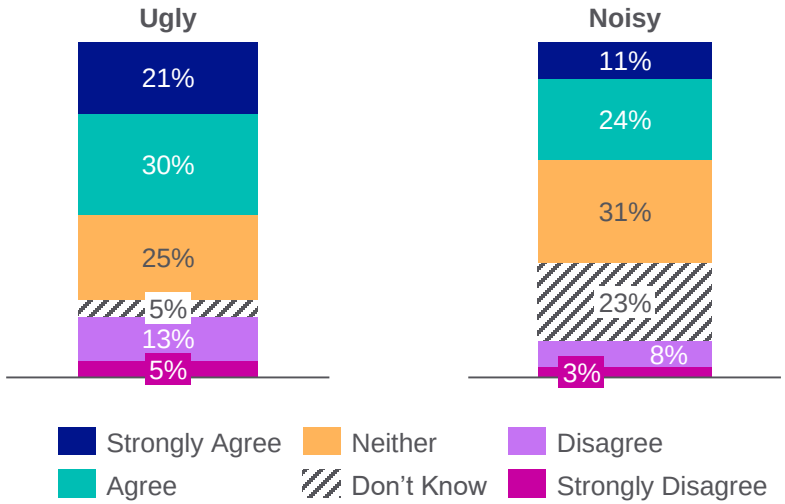
People are:

- Unsure about frequency of maintenance or availability of service contracts and engineers
- Did not want installation to cause disruptions; concerned whether additional changes needed to make existing heating system work with heat pump

What's the cost of that for a certified heating engineer to test it once a year? What's their charge? Is it going to be more expensive [cf. gas boiler]?"

Cosmetics and Comfort

Survey: Heat pumps seem..



But it is important to understand and consider household's difference in attitudes

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Type of owner and property:

- **Homeowners living in modern homes** are the most responsive to heat pumps as they have greater control over home-related decisions and benefits from high efficiency.
- On the contrary, **tenants living in apartment** are on the oppositive side of the spectrum

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Life Stages:

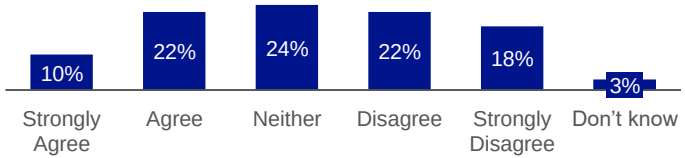
- **Pre-family households** are more open to heat-pumps as they face fewer constraints, are more conscious of prioritising costs, and are more digitally engaged
- On the contrary **families** and **empty nesters/retirees** are more resistant to change.

3

Attitudes Towards the Environment

- High engagement with climate topics did **not** translate into willingness to invest in heat pumps
- Environmental story **must** be coupled with economic incentives and value proposition

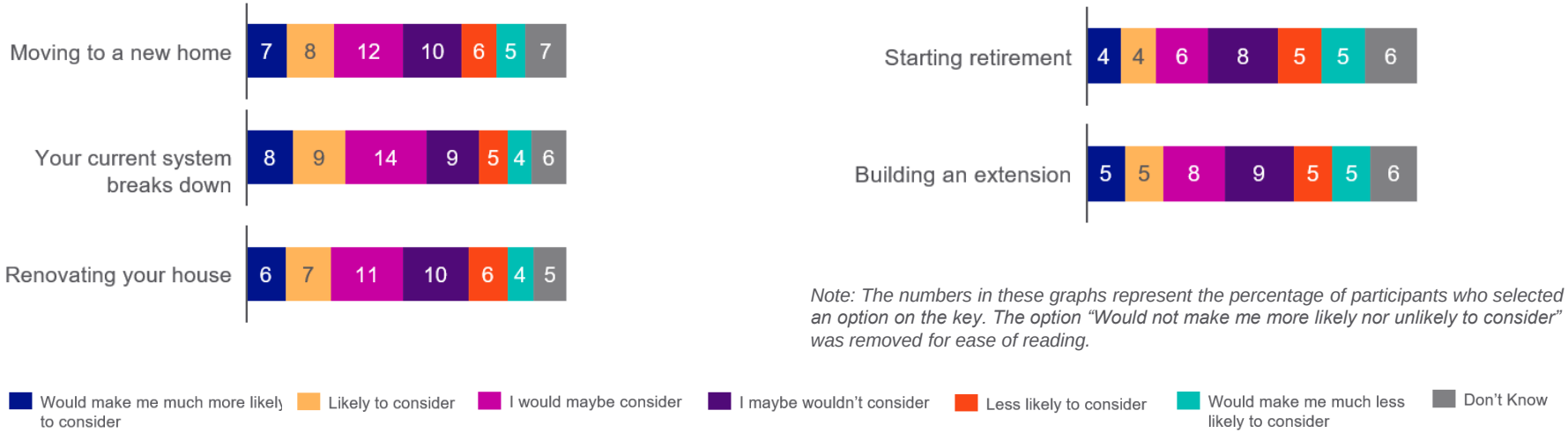
Survey: I would pay more for electricity produced from green technologies:



And to target households when they are more likely to install a heat pump, such as during a life trigger events

Many households would be more likely to install a heat pump during a life trigger events, with 31% of households when current heating system breaks down

Survey: How much impact would the following events have on your decision to install a heat pump?



Note: The numbers in these graphs represent the percentage of participants who selected an option on the key. The option "Would not make me more likely nor unlikely to consider" was removed for ease of reading.

Key takeaways related to heat pump adoption

Findings

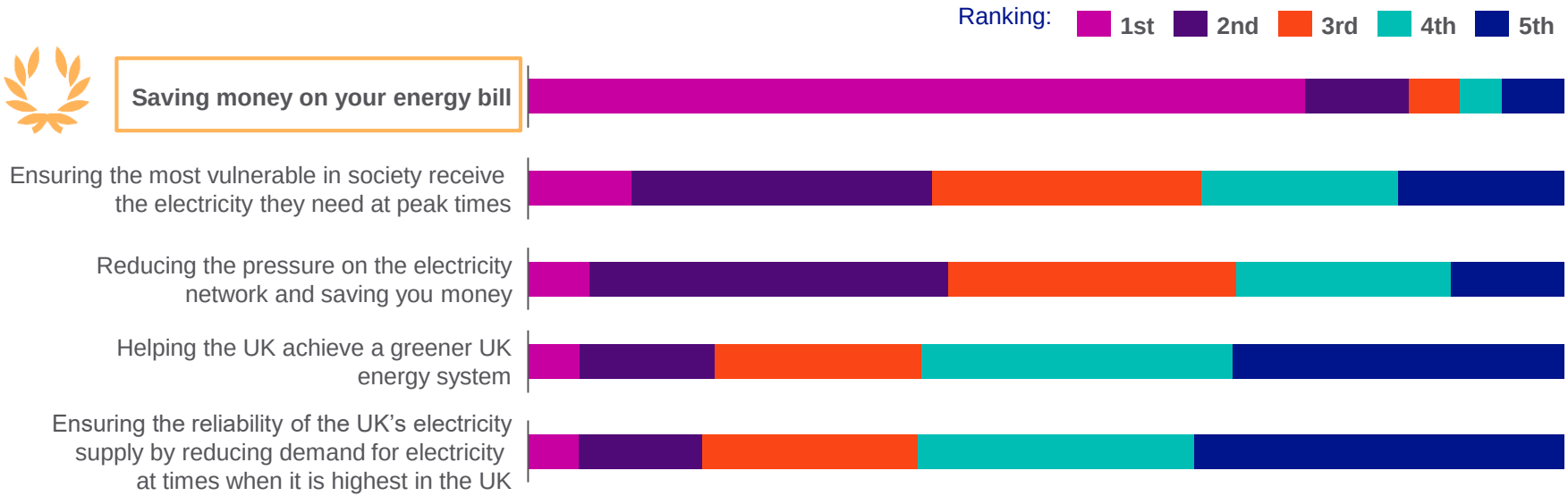
1. Currently, affordability more important than sustainability
2. Focused on covering bills in short term instead of making long-term capital investments in changing heating systems
3. Feel uneducated, struggling to find trusted sources of information
4. Think about heating system when they break, but increase in energy costs driving consumers to save

Implications

- Consumers need a trigger to change heating systems
- Absent triggers, governments and utilities must incentivise customers; grants are helpful, but not enough for people to feel heat pumps are affordable
- Appetite for bundled solutions to make adoption easier
- Energy providers and government can do more to provide trustworthy information on low carbon heating
- Middle ground is undecided; initiatives must focus on making heat pumps an easier choice to enable adoption

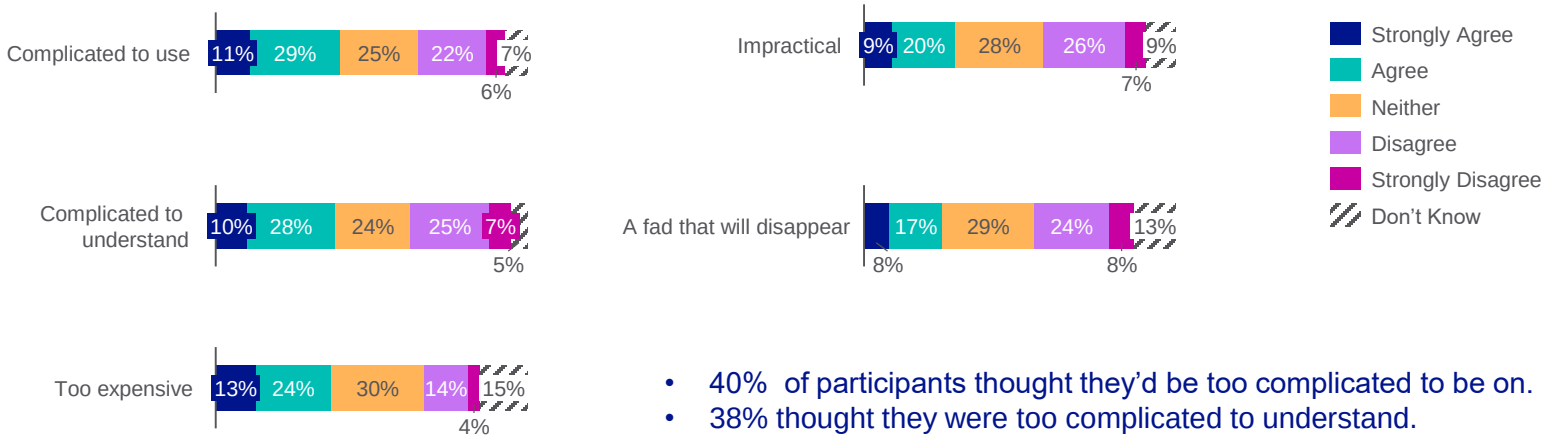
Cost is the most compelling driver for customers to offer flexible heating during winter months

Survey: In order of importance, which would most encourage you to alter the times when you heat your home in the winter months?



Many customers are concerned around the complexity of flexibility offerings

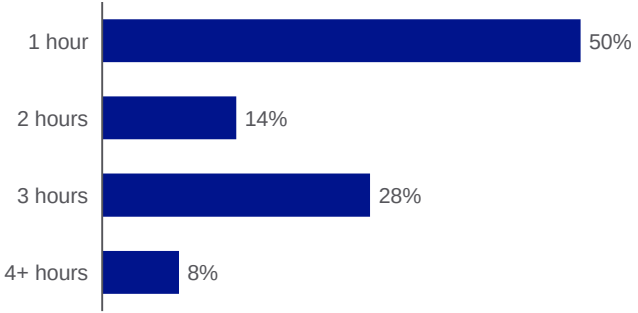
Survey Question: How much do you agree or disagree with the following statements? Flexible tariffs seem…



- 40% of participants thought they'd be too complicated to be on.
- 38% thought they were too complicated to understand.
- Expense was a concern to 37% of participants .

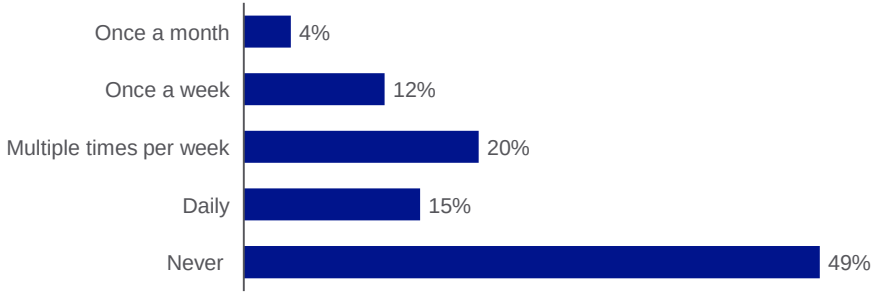
Attitudes towards third-party control were mixed

Survey Question: For how many hours at a time would you be willing to have your heating system controlled by a third-party?



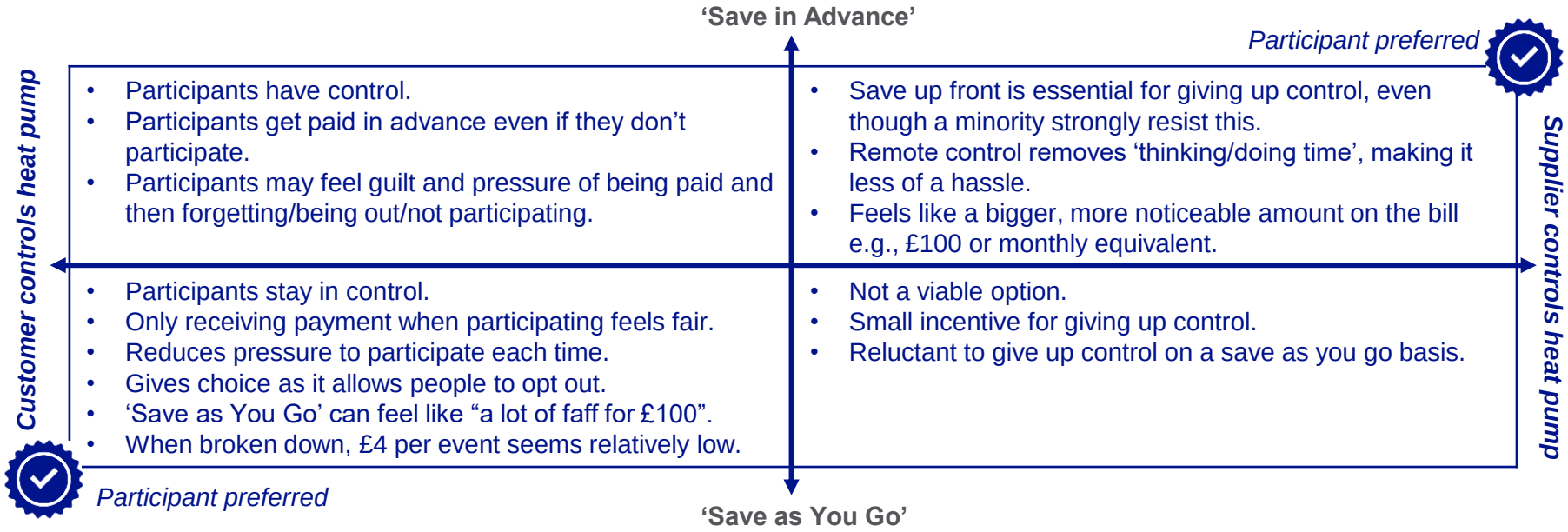
- 50% of participants said they would be willing to let a third-party control their heating for an hour at a time.
- When segmenting by likely flexible tariff adopters, more were likely to say 3 hours (41%).

Survey Question: How frequently throughout the winter months would you be willing to have your heating controlled by a third-party?



- Multiple times per week was the most common frequency reported (20%).
- When segmenting by likely flexible tariff adopters, 24% of flexible tariff adopters said ‘daily’ and 30% said ‘multiple times a week.’

Preferred payment differed by control method



Key takeaways for flexibility offering and EQUINOX design

Findings	Implications
1 Saving money on energy bills is motivating a customers to change their heating behaviours	Demand for flexibility offerings driven by the potential savings, especially due to cost-of-living crisis and rise in energy prices; opportune time to run flexibility trials
2 Many customers confused by flexibility and concerned about complexity of flexibility offerings	To maximise engagement, flexibility offerings must be simple and comprehensible; EQUINOX trial aims at this. We have gathered feedback from participants in this winter's trial to gauge success and understand areas for improvement
3 Responses to potential commercial arrangements and control methods for EQUINOX varied widely	
4 Customers unsure about level of temperature change they can tolerate and how much financial incentive needed to make participation in EQUINOX worthwhile	Customer choice must be prioritized; optionality is key to making sure different preferences can access benefits of flexibility

Q&A

We look forward to continuing to share with you!

Full research findings are available **here.**

We will also publish Trial 1 findings in July and host another webinar to share them.

If you have any additional questions, please feel free to contact us at **nged.innovation@nationgrid.co.uk.**

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