

# A flexible future

Extending the benefits of energy flexibility  
to more households

**citizens  
advice**

August 2023



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# Executive summary

**Achieving the government's net zero commitments will require households and businesses to be more flexible with the times they use electricity.** To rise to this challenge, the products and services that companies develop and sell to us, such as time-of-use tariffs and smart appliances, will need to be accessible and appealing to more people.

At Citizens Advice, we believe that a successful net zero transition must be one that is fair and inclusive. Building a market for energy flexibility with fairness and inclusion at its core will not only help people to lower their energy bills and cope with the cost of living, it will help companies' products and services to reach more people and make their business more financially viable and scalable.

In this report, we share new research unpacking the barriers that many households are likely to face to participating in energy flexibility. We amplify their voices, highlighting the compounding nature of many of their barriers and sharing their views on potential solutions. We find a positive appetite among stakeholders from the smart energy and accessibility sectors for more support, guidance and funding for industry to develop easy-to-use products and inclusive consumer experiences.

**Our recommendations are based on insight from 2 stages of research.** Across these, we heard from people who are likely to struggle to participate in energy flexibility, either because they face barriers to technology or they face barriers to changing their energy usage due to their household circumstances. We also heard from smart energy and accessibility sector stakeholders, including smart technology companies.

The government rightly recognises that it needs to support people with barriers to taking part in and benefiting from energy flexibility.<sup>1</sup> **We need to see a clear plan for how this will be achieved, focusing on 3 main outcomes: better information, appropriate regulation and inclusive innovation.** We've set out our reasoning and proposed actions to help achieve each of these.

Alongside this report, we're publishing **Powering up participation**, our guide to making smart energy technology more inclusive. This expands on our call for more inclusive innovation, providing a resource to help the sector to put inclusivity at the heart of designing technology and the consumer journey as a whole. The guide shares learnings from usability testing of a smart thermostat and introduces a new interactive tool to support consideration of the variety of compounding barriers that people may face along their consumer journey with smart energy technology.



# Introduction

## Research approach

We carried out our research in **2 stages** to inform this report.

In the first stage, we heard from **30 people facing barriers to technology**: disabled people, neurodivergent people and people with additional literacy or language needs.



In the second stage, we heard from **48 people facing barriers to changing their energy usage**: people with young children or someone pregnant in their household, people living in privately-rented shared households and people with a health-related need for energy in their household.



We also heard from stakeholders in the smart energy and accessibility sectors, including smart energy companies.



More details on the research approach can be found in the appendix.

**By reducing the peaks and troughs in energy demand, the electricity grid can overcome constraints and reduce reliance on costly and non-renewable sources like coal or gas.** Modelling from Cornwall Insight predicts that, without household flexibility, the equivalent of four new gas-fired power stations would need to be built to meet peak demand in 2030.<sup>2</sup>

While energy flexibility services such as smart time-of-use tariffs have been available to businesses for a number of years, this is a fairly new and innovative concept for domestic households.<sup>3</sup>

Winter 2022/23 marked a significant milestone. National Grid ESO coordinated the largest flexibility service to date, with 1.6 million households signing up to the Demand Flexibility Service. A range of companies, from energy suppliers to third party aggregators, provided incentives for customers to shift their energy usage away from peak times.

For domestic flexibility to play a meaningful role in meeting net zero, National Grid ESO estimates that 3.7 million households must be flexible on a regular basis at times of peak demand by 2035.<sup>4</sup>

In an evaluation of the service, respondents were typically older, White British, on a higher income or homeowners.<sup>5</sup> In future, to reach the wider participation needed, flexibility services will need to be accessible and appeal to many more people, including those facing barriers to participation.

The government plans to regulate companies providing smart energy technology and flexibility services, which is welcome.

Citizens Advice has previously highlighted the consumer protection gaps in the domestic energy flexibility market.<sup>6</sup> And we have run comprehension tests with people after they'd read information about smart energy services, finding that 40% got something wrong in the tests.<sup>7</sup>

In **Smartening up** we proposed that, to improve consumer confidence in this market, people need to feel confident about the contracts they sign up to, know where to go for help and have control over their data.<sup>8</sup>

Prioritising these outcomes in the regulations is the first step. But without proactive initiatives to reach a more diverse audience, energy flexibility models are still only likely to reach people with fewer barriers - people on higher incomes, without vulnerable circumstances and with more "flexibility capital."

The government has committed to helping people who might find it hard to participate, but we need to see a clear plan setting out how its policies will achieve this.<sup>9</sup>

## Definitions

**Smart home technology** refers to energy-related products that can connect to a smart meter and the internet so they can do more things, such as respond automatically to price and other signals by modulating or shifting their electricity consumption. They can be controlled from a central hub - often a smartphone app or device.

**Energy flexibility** is about shifting energy usage to "off-peak" times of day when there is more renewable energy on the grid. Tariffs, products and services are increasingly available to domestic households, financially incentivising people to shift their electricity usage.

The term **flexibility capital** has been coined to describe a household's capacity to shift their energy usage.<sup>10</sup>

## What we found

**Sector stakeholders agreed that lowering barriers will involve more than just measures to improve product usability.** People will need support to understand the concept and potential benefits of energy flexibility, compare products and services, and confidently set up technology and services.

It was highlighted that the government has an important role in creating **the right market conditions** and providing **better support for industry**, for example more guidance on involving excluded groups such as disabled people in early design stages.<sup>11</sup>

The smart technology company representatives we heard from were keen to make their products as easy to use as possible and would welcome guidance on tackling accessibility barriers.

At the same time they emphasised that **innovation should not be hampered by standards or rules that are too stringent or prescriptive.** They'd like to see more funding to support research and development.

**Consumer participants envisioned a range of barriers at each stage of the consumer journey,** from first becoming aware of the concept of energy flexibility or smart energy technology, to fixing problems once they're on a tariff or after technology is installed in their home.

The majority felt that being able to **easily set up and update their preferences** would be important. They saw this as the best way of striking a balance between maintaining access to the appliances and energy usage needed by the household and benefiting from cheaper off-peak energy prices where possible.

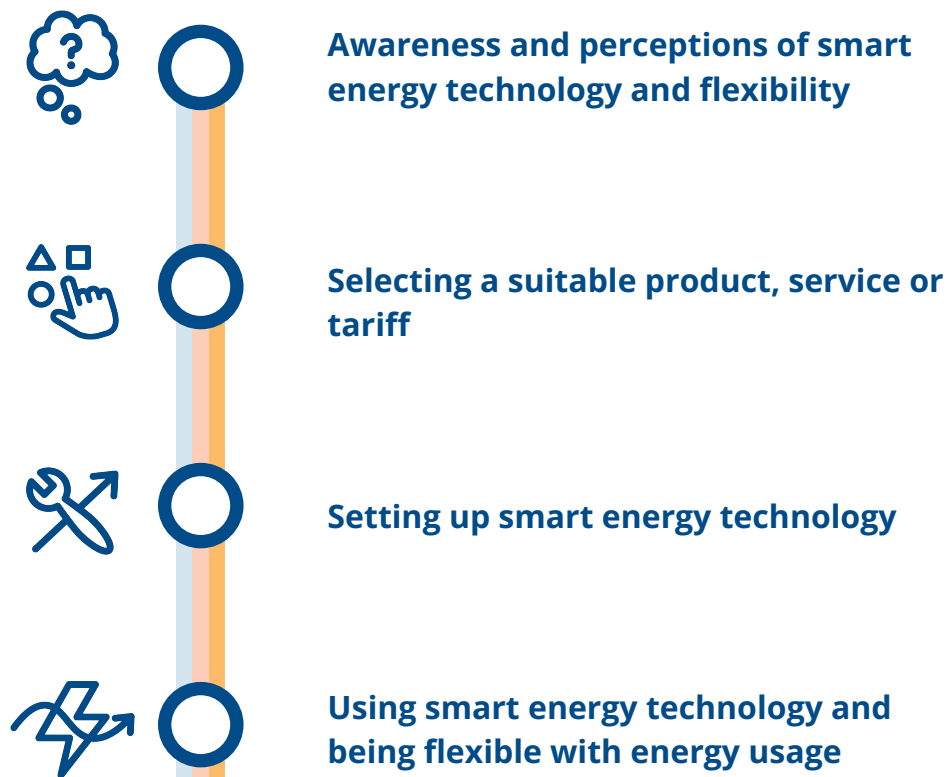
**Automation and minimal day-to-day interaction** with energy management systems was generally seen as preferable, rather than engaging with price signals and making regular decisions about usage.



# Unpacking the consumer journey

We agree with Ofgem’s view that “key to unlocking large-scale engagement is an attractive, simple, and seamless customer journey.”<sup>12</sup>

In the following section we unpack the findings in more detail, along 4 stages of interacting with smart energy technology and flexibility.



First, we set out **the consumer journey now** by plotting the barriers envisaged by the people we heard from.

Then, we set out **an inclusive consumer journey**, imagining the experience for people if various solutions are put in place.

At Citizens Advice, we believe it is social constructions that create barriers to accessibility and exclude people from products and services.

Adapted from the COM-B model of behaviour change, we have grouped the barriers and solutions under 3 different types of exclusion.<sup>13</sup>

Support	Exclusion from appropriate support to enable participation
Opportunity	Exclusion from the resources or actions required to participate (e.g. access to technology or household routine change)
Motivation	Exclusion from the benefits of participation

# The consumer journey now

## Key

Support

Opportunity

Motivation



## Awareness and perceptions of smart energy technology and flexibility

The majority felt that this places an **unfair burden on households** when energy companies, government and non-domestic consumers should do more



*"It's not consumers who are causing this, it's the big corporations. What are their obligations?"*

Participant with a health-related need for energy in their household based in Stockport

Participants **doubted whether the financial reward would be sufficient** for uprooting routines and investing in technology



*"It's not my cup of tea, I don't think you're going to save as much as they say."*

Digitally excluded participant with additional mobility needs based in Cardiff

The whole concept **felt overwhelming** to most participants and they weren't sure where they'd start



*"It's hard enough [to compare tariffs] now, this makes it 10 times more difficult!"*

Participant living in a privately-rented shared household in London



Key

Support

Opportunity

Motivation



## Selecting a suitable product, service or tariff

Smart technology was thought to be **too expensive**

The **unpredictability** of how a dynamic tariff might impact their bills felt like too much of a **financial risk**

Many participants **didn't have a smart meter**

For those in privately-rented shared households, there were concerns that **landlords wouldn't support a change in tariff**



*"We have no control over the thermostat, it's controlled by the landlord."*

Participant living in a privately-rented shared household in London

Understanding and selecting the right tariff felt like a **significant mental load**, particularly for neurodivergent people, those with symptoms like 'brain fog' or additional literacy needs



*"Once I start to go wrong, then my brain stops functioning"*

Participant living with a mental health problem based in London



*"I would want a number to contact if I get stuck and find out more information... I'd want them to explain the language options available."*

Participant with English as an additional language based in Leeds



## Setting up smart energy technology

Worries about **setting up technology correctly** concerned some, particularly disabled and neurodiverse people

## Key

Support

Opportunity

Motivation

There were concerns, particularly from disabled and neurodivergent participants, that if anything went wrong with technology then they **wouldn't know how to fix it**



## Using smart energy technology and being flexible with energy usage

Households with young children felt that **childcare routines would be difficult to shift** without investment in smart appliances or storage



*"It's difficult to change the times when you've got children, they have a routine."*

Participant with young children in their household in Swansea

Those in privately-rented shared households lacked confidence that housemates would shift usage and were concerned that **using shared appliances at optimum times would be challenging**

For people with a health-related need for energy, constant **ongoing energy usage can be necessary to operate medical equipment** such as CPAP machines or stairlifts and routines are aligned with carer visits



*"With stuff like having a shower, I have to wait until the carers are here."*

Participant with a health-related need for energy in their household in London

# An inclusive consumer journey

Here, we imagine what an **inclusive consumer journey** could look like.

## Key

Support

Opportunity

Motivation



## Awareness and perceptions of smart energy technology and flexibility

A **national information campaign** highlights the benefits of energy flexibility and helps people feel that 'we're in this together' <sup>14</sup>



*"With all the tech you're a bit scared when you first use it but you overcome the fear when you see how it improves your life."*

Disabled participant based in London

There are **research and evaluation projects**, backed by appropriate government funding, that aim to **understand what would motivate people to participate, including the right level of financial incentive**



*"I want to trust it will make a difference."*

Digitally excluded participant based in Leeds

People are **familiar with the concept of energy flexibility**, thanks to a national information campaign



*"We should be taught more about this."*

Participant living in a privately-rented shared household in Stockport

Key

Support

Opportunity

Motivation

**Comparison of smart tariffs is simple**, because price comparison websites and advice services have the tariff information they need to support people with selecting a tariff



## Selecting a suitable product, service or tariff

People can leave contracts with **no exit fees if the product or service isn't right for them**



*"Try before you buy ... Try it out for 6 months and see if you benefit."*

Participant living in a privately-rented shared household in Stockport



## Setting up smart energy technology

**Industry standards** for designing accessible products and services mean that more people can feel confident about setting up new technology



*"All these things are challenging when you first look at them as I'm not brilliant with technology."*

Disabled participant based in London

- Key
- Support
- Opportunity
- Motivation



## Using smart energy technology and being flexible with energy usage

If anything goes wrong with technology, people can access tailored, impartial support through a **national independent net zero energy advice service**



*"Follow-up when you've bought the technology to see how you're getting on."*  
Digitally excluded participant based in London

People are more likely to **find something suitable for their household routine**, since they won't be penalised for leaving contracts so can try different options

# Recommendations for a flexible future

Energy flexibility can only play a meaningful role in the net zero transition if the government takes proactive actions to help more people participate. We need to see a clear plan that prioritises 3 main outcomes: better **information**, appropriate **regulation** and inclusive **innovation**. For each, we've set out our reasoning and proposed actions to help achieve them.

Recommendations	Why?	Actions
Better <b>information</b> about energy flexibility	To improve people's awareness of flexibility and support them to understand what might work best for them	<ul style="list-style-type: none"><li>● Introduce a national information campaign on how households can contribute to net zero</li><li>● Invest in and expand statutory advice designed to offer impartial support on topics like smart tariff comparison. This should complement a national independent net zero advice service.</li></ul>
Appropriate <b>regulation</b> of the smart energy sector	<p>To improve consumer confidence and avoid penalising households for trying out flexibility</p> <p>To provide clarity about the regulatory framework for companies</p>	<ul style="list-style-type: none"><li>● Require companies to provide enhanced protections against contract lock-in, in the government's forthcoming regulation of the smart energy sector</li><li>● Enable domestic consumers to compare tariffs easily, by ensuring that the requirement for providers to make smart tariff information publicly available benefits consumers as well as industry</li></ul>
Inclusive <b>innovation</b> from industry	To support companies to design accessible products and services that reach a more diverse population	<ul style="list-style-type: none"><li>● Provide dedicated funding for projects that aim to tackle barriers and achieve more diverse participation in energy flexibility</li><li>● Develop industry standards for designing accessible products and services</li></ul>

# Wider policy change

**Even with our proposed actions, barriers will remain.** The smart meter roll-out has not made enough progress, those in privately-rented households are less likely to have a smart meter and, for many, smart energy technology is currently unaffordable.

Remedies for these barriers go beyond the scope of this report, but it's clear that **policies to increase smart meter ownership and support people with the cost of living will have co-benefits for achieving an inclusive flexible energy future.**

Some people's barriers to energy flexibility are insurmountable. For example, without significant capital investment in things like home battery storage, households with a health-related need for high energy usage will struggle to access the value of models like smart time-of-use tariffs. **The government must ensure that people with a health-related need for energy don't lose out financially.**<sup>15</sup>

We've explored long-term options for protecting households from high energy bills and **we recommend providing targeted financial help** to households spending an excessive proportion of their income on energy bills.<sup>16</sup>

Participant with a health-related need for energy based in Swansea

*"People who have got health problems are being forgotten."*



Participant with a health-related need for energy based in Cheshire

*"If you can't afford to buy the equipment in the first place, you're stuck."*



Participant with a health-related need for energy based in Swansea

*"There should be a dispensation for the elderly and those reliant on energy medically."*



# Appendix

## Research approach

### Stage 1

#### Sample

30 people with barriers to using technology, including disabled people, neurodiverse people and those with additional literacy or language needs

10 stakeholders from the smart energy or accessibility sectors

- 4 from smart energy companies
- 6 from the smart energy or accessibility sectors (e.g. trade body, disability charity)

#### Approach

- Quick scoping review and interviews with smart energy sector stakeholders
- Qualitative in-person deliberative workshops and interviews
- In-home usability interviews (with 10 participants) based on interaction with illustrative smart energy technology

#### Fieldwork dates

November 2022 - February 2023

#### Research report

Collaborate Research (2023) **Barriers to participation in smart home technology**

### Stage 2

48 people with barriers to changing their household routines  
These were people with young children or someone pregnant in the household, people living in privately-rented shared households and people with a health-related need for energy.

- Quick scoping review on smart meter ownership
- Qualitative in-person deliberative workshops and interviews

March - April 2023

Collaborate Research (2023) **Barriers to changing energy usage behaviour to participate in domestic energy flexibility**

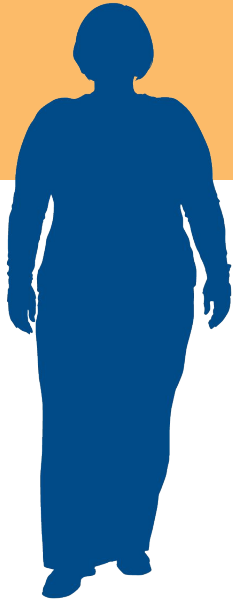


## Case studies

### Health-related need for energy

Harriet is 79, has the medical condition COPD and lives with her husband in Swansea. She needs energy to power essential medical equipment and to maintain a warm home as lower temperatures aggravate her condition. She has family living nearby, with several grandchildren, and she takes pride in having them around and helping with chores like laundry. She is anxious about changing when and how she uses energy.

*"At the end of the day when you're not well ... the last thing you need is to worry about is how am I going to live and have heating?"*



### Household with young children

Fabio is 39 and lives with his wife and 2 young children. He would like to be able to save money by using energy when it's cheaper but values their family routines.

*"There's only a small window because of school and children need structure and to get sufficient sleep. And I want time with my partner."*



## Case studies

### Digitally excluded

Robert is 58 and neurodivergent. He's not confident using technology and finds it daunting. He is interested in how flexible energy use could benefit him but is worried there isn't enough support available for him to make the right choices or understand how to use any necessary technology.

*"I would like one to one support or kind of coaching in you know, in in my own home, and not talking to me in jargon either ... they'd need to be patient as I may have misunderstood the instructions the first time round."*



### Shared private-rented household

Kalifa is 32, works as a barista and shares a privately-rented house with 6 others. She's not made any changes to tariffs or asked for a smart meter because of the hassle of getting her landlord and everyone she lives with to agree. There's not really a fixed routine in the household because several of them work shifts, meaning their energy usage is often at off-peak times.

*"We have no control over the thermostat, it's controlled by the landlord. Everything's up in the air and uncertain because of shift work so the heating is on at different times."*



# References

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2. Cornwall Insight (2023) [The power of flex: Rewarding smarter energy usage](#)
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11. Some helpful work is ongoing in this space, for example: Energy Systems Catapult, Research Institute for Disabled Customers, [Disabled households to take part in zero carbon energy innovation trials for the first time](#) [accessed August 2023]
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13. See, for example, Social Change (2019) [A guide on The COM-B Model of Behaviour](#) and Scope's [Social model of disability](#) [accessed August 2023]. For this report, we have adapted the COM-B model of behaviour change to focus on exclusion created by social constructions, similar to the social model of disability.
14. Energy Saving Trust and Green Alliance refer to "the French example" of "a behaviour change campaign focused on engaging households and businesses with a national energy demand reduction target" in their report: Energy Saving Trust, Green Alliance (2023) [Climate policy that cuts costs: International policy comparison](#)
15. Marie Curie has called for improved support with the cost of running medical devices, as well as social tariff arrangements, in its report: Marie Curie (2023) [One charge too many: The impact of rising energy costs on people at the end of life](#)
16. Citizens Advice, Social Market Foundation and Public First (2023) [Fairer, warmer, cheaper: new energy bill support policies to support British households in an age of high prices](#)

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