



Smart and Fair 2024-2026

Outcomes and Insights



Foreword from NGED & SSEN

As Distribution Network Operators, we have long recognised that the transition to a smarter, more flexible energy system must also be a fair one.

When NGED and SSEN first supported the Smart and Fair programme in 2018, our shared ambition was to understand what the commitment to “leave no one behind” would mean in practice. That ambition remains as important today as it was then, but the context has become more urgent. In the last two years, households have faced sustained pressure from rising costs, increasing complexity in the energy market and widening differences in who can access the benefits of new technologies and smart energy services.

This report provides evidence on how well the smart energy market is working for different types of households. There are some very positive signs, with evidence of diverse households engaging positively with flexibility, and realising benefits. This is matched by encouraging progress across policy, regulation and market innovation. Significant gaps remain. The report highlights emerging risks of exclusion and inequality, but also provides practical mitigating interventions that can be led by network operators and other industry stakeholders. As we prepare for a step change in the pace of the transition, we will continue to make sure the smart energy system offers real opportunities for all of our customers.

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Structure of this report

Chapter	Focus
1	An introduction to Smart and Fair, our aims , and the evolution of our work alongside a rapidly developing smart energy market. It explores what outcomes we want to see to achieve fairness, the progress that has been made, and what is left to do.
2 - 4	We then review the external context, our insights and learning from the last two years, and key recommendations, for each of our Smart and Fair work programmes: - Tracking inclusive innovation in the smart energy market - Understanding participation in the changing energy system - Supporting individuals through smart energy advice
5	Summary of recommendations
6	Next steps for Smart and Fair and the actions needed from others in the smart energy ecosystem.



Introduction

The Smart & Fair programme was born in 2019. Funded by Scottish & Southern Electricity Networks and National Grid Electricity Distribution, we set out to ensure that the transition to a smart, flexible energy system would be equitable for all.

In 2019, CSE published the first Smart & Fair report warning about the emergence of a two-tiered energy system that works well for some but leaves other behind. Our work since then has continued to show that fairness is not emerging naturally from the developing smart energy market and, as evidenced throughout this report, we are seeing disparities in access and participation for different types of households.

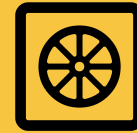
The transition to a clean and smart energy system offers an unprecedented opportunity to improve both the social and environmental impacts of our energy use.

Done in a fair way, this could help to **deliver less inequality in the energy market**; and **widen public support for the low carbon transition** and **enable decarbonisation of the energy system at a faster pace and a lower cost**.

But achieving broader participation and a fair distribution of costs and benefits will require structural change and action from across the energy system. Smart and Fair is a research programme designed to support this change.

This report sets out what a fair transition looks like, how far we've come, and what needs to change next.

What the smart energy transition means to consumers



Low Carbon Heating

To move away from fossil fuel based heating systems, we will have to switch to heat pumps to heat our home and water. Heat networks, electric boilers and solar thermal will also play a role.



Solar and Batteries

As we move away from gas, we need to generate and store more low-carbon electricity to meet our energy needs – through technology like solar panels and batteries.



Dynamic tariffs

Dynamic tariffs offer cheaper rates when there is plenty of energy in the grid - when the sun is shining or the wind is blowing. If people can shift their usage, they can make significant savings.



Smart technologies

Smart appliances, plugs, and immersion heaters can turn on when energy prices are low, reducing usage during peak times. Smart heating controls allow remote heating adjustments.



Smart and Fair approach

To address these challenges, Smart and Fair focuses on three system levers: markets, participation, and advice.

 **Inclusive innovation:** We scrutinise emerging markets to ensure smart energy propositions **serve a broad range of consumers.**

 **Data analytics for understanding participation:** We use advanced data analysis to accurately capture the impacts of individual choices and policy interventions on different consumer groups and **use this data to support network planning.**

 **Supporting the energy advice sector:** We **develop resources, tools and training** to help energy advisors navigate the increasingly complex energy market.

We use our insights from all three themes to explore fairness in emerging policy and engage with policymakers.



Smart and Fair approach

To understand who benefits and who is at risk of being left behind, we developed the Smart Energy Capabilities Lens.

This theoretical framework describes the factors that affect a household's ability to access different smart energy offers and effectively participate in emerging energy markets. The Capabilities Lens comprises five clusters of capabilities:

- **Energy & tech usage** – How well a household's energy usage profile and existing energy technology and appliances enables them to participate in and benefit from an offer.
- **Financial** – The financial status, money-managing, and decision-making skills required to engage in an opportunity.
- **Personal & social** – The personal factors, mindset, values, social connections, and living circumstances that enable a consumer to hear about, trust, and engage in an opportunity and be able to make appropriate behaviour changes.
- **Digital tech readiness** – The digital technology hardware and connectivity, skills readiness, and level of digital engagement of a household to enable them to participate in, and benefit from, opportunities.
- **Dwelling & local area** – The suitability or readiness of a dwelling in its location for the occupant to participate in an opportunity which offers electricity system benefits.

This framework is used throughout our work. Each of our three focus areas engages with different aspects of the Capabilities Lens: Inclusive innovation asks what capabilities offers require. Understanding Participation explores how capabilities shape real-world engagement. Advice aims to address capability gaps.





Smart and Fair approach

As the market has developed, Smart and Fair has shifted from identifying risks to driving practical solutions.

2019-21 Concepts and analytical frame:

Developing an analytical framework to assess social impacts and understand who is at risk of being 'left behind'.

2022-24 Applying the framework:

Building a shared understanding within industry and government of risk factors, and mitigation opportunities.

2024-26 Evidencing and embedding fairness:

Building an evidence base and using it to support system wide changes.

At the same time, many of the aims of Smart and Fair have started moving into the mainstream as government drives forwards plans for domestic demand flexibility to be central to managing the energy system.



Smart and Fair aims

Through our work over the last seven years, we have identified four outcomes that define a fair smart energy transition:

-  **Responsible networks:** System operators support access to cheaper, greener electricity while keeping network costs as low as possible and protecting consumers.
-  **A diverse market:** Products and services that work for a wider range of households, with oversight to ensure fair access and outcomes.
-  **Good customer outcomes:** Suppliers and service providers provide good support and actively get customers on a combination of technology, tariff and behaviour that is right for them, with strong protections in place.
-  **Confident consumers:** People are informed and able to make decisions that help manage their energy costs. They can access advice and support, and know they are protected if things go wrong.

We have seen positive progress in recent years, with several consumer fairness developments driven by government and regulatory intervention, we have also seen some have emerge from the market. But significant gaps remain. These are explored in the next few pages.



Responsible networks

System operators are supporting access to cheaper, greener electricity through flexibility, with growing evidence of value for bill payers but gaps remain in ensuring this value is delivered consistently and fairly across all consumers.

Positive progress

The Energy Networks Association estimates that **bill payers saved more than £300m through energy flexibility in 2024**, with over £3bn in savings projected in the next three years. This is driven by lower contributions to infrastructure costs, reduced connection charges and the increased use of low-carbon energy sources¹. ED3 also recognises the role of flexibility in minimising grid reinforcement costs.

Through ED2 DNOs have been incentivised to provide low carbon transition support services and help customers overcome barriers to adoption of low carbon technologies. This has **enabled the provision of smart energy and low carbon technology advice** such as NGED's Smart Energy Action Plans pilot.

Ofgem-funded network innovation includes strands that are required to involve consumer groups to ensure solutions are inclusive, accessible, and designed around user needs. **We have continued to see inclusive innovation from networks**, for example the Flex Assure code of conduct for flexibility service providers was launched in 2025 (previously HOMEflex), led by SSEN and informed by the Smart and Fair capability approach.

Remaining gaps

Flexibility defers and avoids some system costs that would otherwise be incurred, but delivering flexibility is not free and a household's ability to accrue value depends on a range of social, technical and spacio-temporal factors². This means that **some households, in some areas, at some times can benefit more than others**. DSOs report on average costs and savings incurred by domestic consumers, without reporting on the distribution of those costs and savings across consumer groups. This presents a real risk that **value is being redistributed from all bill payers to a smaller group with the right circumstances to benefit**.

Despite improvements in reporting around innovation funding, Citizens Advice report that **there is still more to be done 'to ensure that benefit claims are well-substantiated'**, that there is insufficient emphasis on deployment of innovations that provide direct benefits to consumers, and that consumers bear a disproportionate share of project cost and risk³.

¹ ENA, June 2025, Latest flexibility figures, <https://www.energynetworks.org/newsroom/gb-cements-status-as-world-leader-in-energy-flexibility-with-estimated-gbp-300m-savings-for-bill-payers-energynetworks-gb-energy-flexibility-leader>

² Michael Fell, March 2026, Why consumer-led flexibility needs a strategic focus on inclusion, Not published

³ Citizens Advice, August 2025, Making Innovation Count - A Transparency Review of NIA and SIF Projects, <https://www.citizensadvice.org.uk/policy/publications/making-innovation-count-a-transparency-review-of-nia-and-sif-projects/>



A diverse market

The market is beginning to expand access to smart energy offers, with some progress in supporting a wider range of consumers but significant gaps remain in ensuring access and benefits are distributed fairly.

Positive progress

Inclusive innovation is central to Ofgem's consumer vulnerability strategy, providing a framework for regulatory oversight.

Ofgem also **plans to monitor the availability of load control offers and levels of consumer uptake**. This could provide an important step towards greater oversight of market offerings. However, proposals to potentially exempt parts of the market from this regulation could undermine this attempt to increase transparency.

There are growing consumer numbers for smart energy **including more than 2.6 million customers now on time of use tariffs¹**.

The Warm Homes Plan and Warm Homes Fund propose to **expand access to lower-cost technologies** through grant and loan funding respectively, though details on delivery and impact remain unclear.

Remaining gaps

There is a lack of systematic tracking of 'winners' and 'losers' in the smart energy market and a **lack of data about who exactly is using smart energy propositions**, and their outcomes.

Complexity and confusion about smart energy options remain **significant barriers** to uptake for prospective consumers.

Despite positive signs in 2025, government appears to be **limiting its approach to market oversight**. DESNZ has recently confirmed it will not take forward the consumer-led flexibility engagement framework consulted on, and proposed regulation for load control services will now potentially exempt a significant proportion of the market. This weaker approach to oversight **misses an opportunity to build a diverse and competitive market that works for more customers** and enables people to make informed decisions about taking up new tech and services.



Good customer outcomes

There has been some progress around smart meters and data access that can support better decision making and outcomes but significant gaps remain in ensuring households consistently receive the right combination of support, technology and tariffs.

Positive progress

High-quality data is essential for helping consumers and service providers identify suitable offers that will work for them. Two key developments could support this: the **Smart Metering Policy Framework post-2025**, which aims to ensure all households have a working smart meter by 2030, and the upcoming **consumer consent solution** to enable smart meter data sharing for better comparisons and more tailored advice.

Retrofit advice is now required for households receiving grant-funded low carbon technologies. However, **implementation remains uneven**, with funding and skills shortages posing significant barriers.

A Warm Homes Agency is provided as part of the Warm Homes Plan, including an internet and phone advice line for the general public. The scope of advice and onward referral processes to scheme delivery are unclear, but it opens up the **opportunity for smart energy advice** to be provided.

Remaining gaps

We lack understanding of how the **changing energy market can exacerbate or mitigate existing vulnerabilities**, and metrics in place to monitor this.

Suppliers and service providers are **not collecting the right information** about customer capabilities and circumstances to understand which options are right for people.

A disjointed approach to technology installs means that **nobody is actively trying to get customers on a combination of technology, tariff and behaviour** that is right for them.

Whilst the Warm Homes Fund (loan scheme for low carbon technologies for self-funding households) and the introduction of plug-in technologies could address barriers to LCT uptake, there are also **potential risks around mis-selling and gaps around follow-on support**.



Confident consumers

There has been some progress in building consumer confidence, but gaps remain in ensuring households have the information, support and protections needed to engage with confidence.

Positive progress

DESNZ and Ofgem's final **consultation on licensing for load controllers and flexibility service providers introduces customer protections** and a requirement to treat customers fairly. Alongside this, Ofgem has published best practice guidance for service providers on customer protection, informed by Smart and Fair principles.

More and more **advice organisations are able to provide in-depth smart energy advice**. CSE has contributed to this at the national level through events, training and support networks, but it also demonstrates some natural progress in advice keeping up with market developments.

Remaining gaps

There is **little communication of the need for change in our energy system**, how forthcoming changes could alter the public's use of energy and the positive outcomes this could provide for customers.

Suppliers and service providers generally **don't provide adequate information and advice** to those that need more support to engage or participate effectively in smart energy options.

There is a significant **lack of funding and skills for delivering good retrofit advice**.

As discussed on page 10, government appears to be **limiting its approach to market oversight** by not taking forward the consumer-led flexibility engagement framework and reducing the scope of the load control service regulation. This weaker approach **misses an opportunity to implement advice, support and customer protection that would support consumer confidence**.



Focus areas

The following chapters explore these gaps in more detail, drawing on our research and setting out the actions needed to deliver these outcomes.

They are aligned with our three Smart and Fair focus areas. These three areas are interdependent: market design shapes participation opportunities, research to understand participation reveals gaps, and advice helps bridge them.



Inclusive innovation in the smart energy market.



Understanding participation in the changing energy system.



Supporting individuals through smart energy advice.

Each chapter provides an overview of the external context, our insights, learning and key recommendations for moving closer to [our four aims](#).



Responsible Networks



Diverse Market



Good Customer Outcomes



Confident Consumers



Inclusive Innovation





Together, these chapters show how market design, real-world engagement and support systems interact to shape fairness.

1. Inclusive innovation - Shapes what is available



2. Understanding participation - *Explores who engages and benefits*



3. Smart Energy Advice - *Shapes how people engage and outcomes achieved*





Introduction

In our 2020 report we recommended that government analysed distributional impacts across the retail market to understand 'winners' and 'losers'. We recommended that the regulator monitors data on participation rates and the benefits and costs being experienced by different types of customer, and that industry supplied this data to Ofgem. In our 2024 report we again asked for this evidence. Though some policy proposals are emerging that may partly fill this gap, these plans are not yet in place, their scope is not confirmed, and they are unlikely to be implemented for some years. In the absence of this activity from government, we have continued to develop our market monitoring and offer profiling to help track and encourage inclusive innovation across the smart energy market.

Systematic market analysis supporting advice work

Since our last report in 2024, there has been continued growth in the smart energy market. We have seen more market offerings, more offer providers, as well as some new types of propositions being made available for consumers. We have searched for new market trends through a combination of desk research, engaging with industry and liaising with CSE's smart energy advisors. We have used collected evidence to maintain a database of individual branded smart energy products, tariffs and services ('offers') available to UK consumers. We also have also categorised each individual offer by 'offer type'. Individual branded offers within an offer type will vary to some degree, but their core components and the requirements they place on consumers are the same. We determine this by profiling each offer type using CSE's Capabilities Lens, which helps us to understand what consumers need to be able to take up and benefit from different offer types.

Accurate, up-to-date information on offer types is crucial for supporting our smart energy advice work allowing us to match consumers with smart offers that match their capabilities. We use this approach for our [Smart Energy Action Plan](#) (SMEAP) advice as well as our online, self-service [Energy Choices Tool](#). Our advisors have also started using our smart offers database. Whilst developments in Flex Assure and load controller regulation in the last two years both help to support inclusive innovation by protecting customers if things go wrong, providing this advice to households *before* they get involved with the smart energy market is also a crucial piece of the puzzle we have been helping to tackle.



Introduction

Sharing insights across the smart energy sector

Another gap we wanted to address with our market monitoring work was a lack of clear information and communication across the smart energy sector. Our biannual [Smart Energy Market Review](#) webinars (four delivered since September 2024) have helped to fill this gap, providing regular updates on fairness developments across the market for smart energy offer providers, policymakers, advisors and practitioners. Webinars include a market 'dashboard' overview and deeper analysis on emerging issues or progress. We've recently been encouraged by [other organisations doing similar research work](#),¹ as well as proposals in the [Consumer-Led Flexibility consumer engagement framework](#) to convene more forums such as this.²

Understanding how the market is delivering for different consumer types

Given the lack of systematic tracking of 'winners' and 'losers' in the smart energy market, a key aim of our webinars has been to demonstrate how the market is working for different consumers. As the following pages show, the last two years have been a mixed picture. The market is still delivering the most options and potential benefits for a particular subset of customers, especially owner-occupiers and low-carbon technology (LCT) users. Nonetheless, as the market continues to mature, we have also seen significant strides forward in terms of market access for other groups. More widely-available time of use tariffs, demand shifting schemes, and the new potential of plug-in solar are all important here. We continue to stress that smart offer providers bringing forward more inclusive innovation - as well as data about *who* exactly is using their propositions, and their outcomes - will be crucial for building and tracking market fairness moving forward.



Introduction

Tracking market complexity

With growing numbers of smart energy offers and consumers, the way offer providers communicate with potential customers is increasingly crucial. A key ask in our previous report was for more detailed information for consumers to be able to assess how and if an offer might work for them. The financial analysis presented in our webinars has offered a potential way forward here. We are able to clearly show the range of potential benefits that are achievable by different types of consumers, and we can break this down into the benefits that result from switching tariffs, those that come from optimising LCT usage or those that come from changing behaviour (described in more detail on page 46). This work has also underlined the value of providing bespoke financial impacts information about smart offers, helping demonstrate that good advice delivers savings to households and more flexibility to networks.

More generally, our market monitoring work has also surfaced emerging areas of potential complexity and confusion for prospective smart energy consumers – particularly around interoperability. The proposed consumer consent solution may in future help customers to understand the combination of technology, tariff and behaviour that is right for them. Emerging regulation around interoperability will also be key for enabling more inclusive customer participation via automation. But our work suggests there is more for offer providers to do in terms of continuing to innovate inclusive products and services and develop communication that supports clarity of choice.

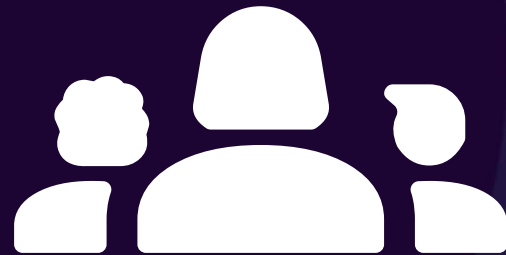
One route is to help households experiment before they take up new offers. For example, our [Flexibility Explorer](#), created in December 2025, is a simple online tool lets consumers see if they could save money by shifting use of different appliances on a time-of-use tariff. A future aim for our market monitoring work is to produce more resources like these that can engage consumers and advice providers while helping them get to grips with new smart energy concepts and offer types.

The following pages outline our key insights from delivering this work, and our recommendations for progressing inclusive innovation in the smart energy market in the coming years.



Inclusive Innovation:

Insights and Recommendations





Smart energy market growth

Our regular market monitoring has revealed a **sustained growth in the size and diversity of the smart energy market over the last two years**. We have tracked **102 new individual offers** (taking the total on our database to 213, see right). Using our Capabilities Lens introduced earlier, we have also identified **9 new offer types**: market propositions that require different or new capabilities of consumers in some way.

Our webinars have also evidenced **growing consumer numbers for smart energy**. We were grateful to see presentations from Octopus Energy and OVO at our October 2025 webinar. LCP Delta have also recently published some data from a broader range of smart energy suppliers. Taken together, these highlight that more market options are translating to more consumer numbers in the UK, and an emerging mass market: e.g. there are now more than **0.6 million customers on smart time of use tariffs**.¹

But our last webinar (March 2026) highlighted that conflict in the Middle East has contributed to the **first contraction in the smart energy market since 2022**. This has seen some major offer types such as heat pump type of use tariffs removed, other popular individual tariffs paused, and less competitive rates being offered.

Implications

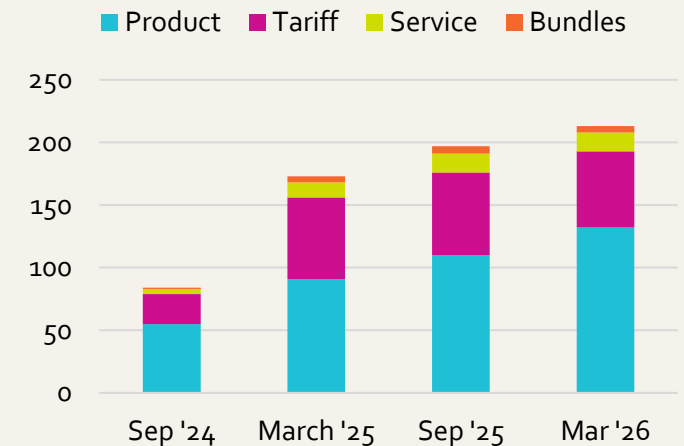
It is good news that the smart energy market is continuing to deliver innovation, and that this innovation is supporting growing consumer numbers. This is a sign that more customers feel confident enough to participate in smart. But also reflects this is a crucial juncture: **mistakes that undermine trust now could be costly**. This is particularly relevant for the Warm Homes Fund which proposes to offer middle income households loan finance to fund LCTs. This may broaden access to the smart energy market even further, but it is essential this is accompanied by the right offers and support to deliver good financial outcomes.

As the market continues to mature, we think it's more important than ever to be monitoring developments, ideally supported by more mandated sharing of data such as customer numbers. Tracking how recent volatility impacts consumer options and confidence will be key moving forward.

Recommendations

Government to provide **more formal market monitoring** of smart energy offers.

Individual branded offer tracked by webinars



¹ Plus a further 2 million on Economy 7/10 tariffs. <https://insights.lcp.com/rs/032-PAO-331/images/LCP-Delta-Beyond-Tariffs-GB-household-flexibility-propositions-Dec-2025.pdf>, 5-6.



Uneven access and potential benefits...

Despite growth, the smart energy market is **still delivering primarily for a small group of consumers**. This is most clearly seen in terms of **market access**. By profiling offer types using the Capabilities Lens, we can see how many offer types are available for consumers with different needs and attributes. We developed some personas (see right) to visualise some of the asymmetries between different consumer types. Access continues to be driven by key capabilities like LCT and home ownership, meter type and payment method.

We've also presented some analysis at our webinars looking specifically at smart tariffs. Again, this shows **disparities in access**: users with certain LCTs have a much larger choice of tariffs. Whilst an EV and PV owner currently has a choice of 52 different smart tariffs, a heat pump owner has 15, a consumer with no LCTs has 9.

We've also tracked **large inequalities in potential savings**. Using domestic consumer archetypes we developed for NESO, we analysed how much personas could save on their most competitive smart tariff options. There are big differences between personas (see right). Nonetheless, some savings have been impacted by recent volatility: a heat pump user could save £504 in March 2025, but with the withdrawal of heat pump type of use tariffs, their savings are now £180.

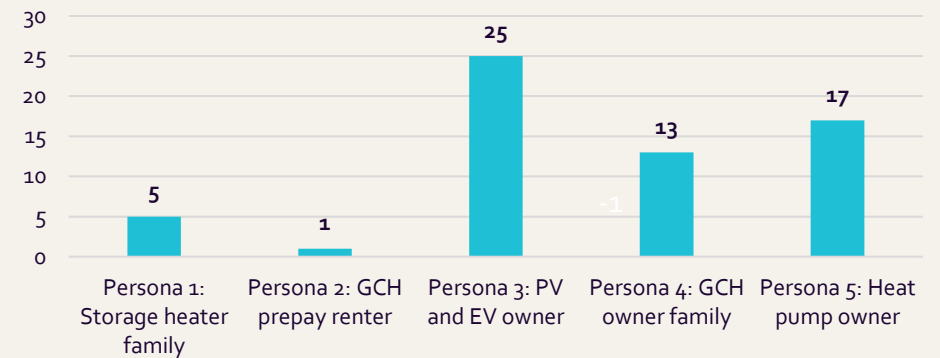
Implications

This data suggests **the current market for smart energy in the UK is two-tiered**. Smart and Fair has warned of the danger of this pattern becoming rooted in the future energy system. This would not only be **unfair** but **risks undermining the effectiveness** of the whole transition if ordinary consumers lose faith. Being able to track fairness metrics (as above) is a key first step for preventing this. More data from offer providers on exactly *who* is using their offers, and their outcomes, would improve these metrics. High savings for LCT owners also suggests there would be value in focussing advice for this group.

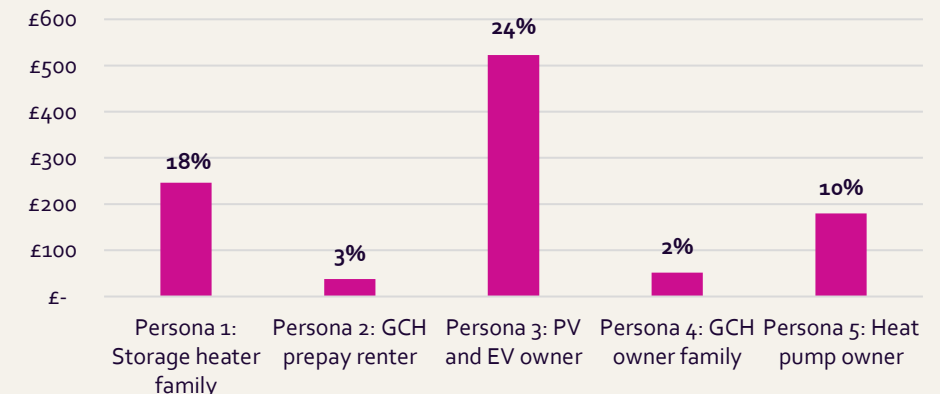
Recommendations

Regulator to mandate smart offer providers **to share more data about offer users and outcomes**.

Number of smart offer types available to personas



Savings for personas on optimal tariffs (total savings = bar, % = proportion of total electric bill saved)





...but signs of narrowing gaps

Although the smart energy market is still unbalanced in terms of the consumers it is serving, we have nonetheless seen some encouraging signs in the last two years that **the market is delivering more for ordinary consumers**.

There are now **more smart tariff options for those without an LCT**. There were 5 individual smart tariffs for these consumers in March 2024. There are now 12 (see 'no LCT' band right). A new offer type – smart storage heater time of use tariff – is also offering **more competitive savings to a traditionally underserved group**.

Following the success of NESO's Demand Flexibility Service, we've also seen a flourishing of demand shifting schemes (that incentivise users to flex without signing up to a tariff), including year-round schemes. This is an area where we have seen **mass participation**: with more than 2.5 million customers, most of whom have no LCTs. The experience of these consumers will be explored more in the following section.

Finally, the recent announcement that plug-in solar is to be made available to UK consumers may also help **break down capability barriers to smart products** for renters and those with less disposable income.

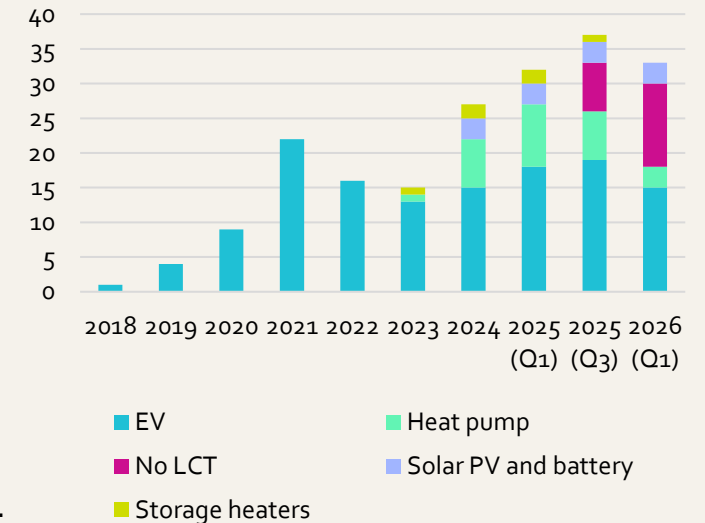
Implications

The popularity of demand shifting schemes reflects the potential and appetite for customers without LCTs to participate in flex. It's positive that we are now seeing the retail market cater more to this interest, but there is still lots that could be done. A new smart tariff for the c.4 million prepay households in the UK would be one welcome addition. As well as delivering **system value** and **customer savings**, more of these tariffs would valuably build **consumer flex awareness** before LCT ownership becomes more widespread. The potential for plug-in solar to benefit previously excluded groups will need to be monitored closely.

Recommendations

Offer providers should develop further inclusive innovation aimed at everyday consumers.

Smart tariff availability by technology type over time





Growth = opportunity = complexity

Continued development of the smart energy market has delivered: **more opportunities for savings**, but **increased complexity for consumers** to manage.

The increasing number of 'bundled' smart tariffs – that have preferential rates for, for example, those with certain import suppliers, brands/combinations of technology installed, or installers – is a good example. This is a positive development for many, delivering **ease of choice** and **more competitive rates** (see right). But it also presents **'lock-in'/'lock-out' challenges** for those without the specific technology, or who like to shop around.

At a recent webinar, we also discussed the potential of Home Energy Management Systems (HEMS) to help consumers manage technical and market complexity. There are promising developments, but there is still a way to go on **interoperability** and **useability** before these are suitable for the mainstream.

More generally, consumers still face a **lack of crucial information** when navigating the market, particularly around financial savings (and optimum tariff combinations) for different consumer situations and a lack of comparative detail. This absence is becoming more keenly-felt as market options continue to increase.

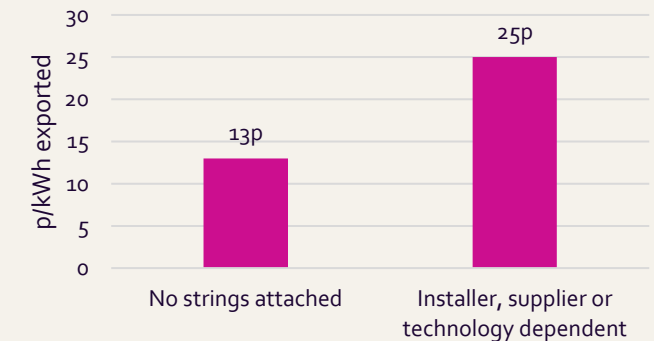
Implications

There is little evidence that the customer journey is getting simpler as the smart energy market grows – the opposite is true in many cases. This **risks further entrenching current market inequalities**, leaving only the energy- or tech-savvy able to engage. There is little point in developing new inclusive options that are too confusing for most to consider. Better communication with consumers is key here. This needs to come primarily from offer providers. Smart energy advice – like through CSE's Smart Energy Action Plans and Energy Choices Tool, is also important for matching consumers with suitable offers ([see Chapter 4](#)). Ongoing work on improving interoperability across the smart energy ecosystem will also benefit inclusion, enabling easier automation through tech like HEMS.

Recommendations

Designated CLF engagement organisation to work with offer providers to improve the clarity of offer information and government to expedite regulation aimed at improving interoperability.

Highest Smart Export Guarantee rates available to different types of domestic exporter (April 2026)





Conclusion

It is good news that the smart energy market is continuing to deliver innovation, and that this innovation is supporting growing consumer numbers. This is a sign that more customers feel confident enough to participate in smart energy. But also reflects this is a crucial juncture: **mistakes that undermine trust now could be costly**.

The evidence above suggests **the current market for smart energy in the UK is two-tiered**. Viewed through the Capabilities Lens, these trends show a market increasingly shaped by pre-existing advantages in income, technology, and housing. Smart and Fair has warned consistently of the danger of this pattern becoming rooted in the future energy system. This not only creates a fairness risk as it is skewed towards rewarding wealthier consumers for mitigating constraints they have helped embed, but **risks undermining the effectiveness** of the whole transition if ordinary consumers lose faith. The Warm Homes Fund proposes to offer middle income households finance to fund low carbon technologies. This may broaden access to the benefits of smart energy technologies and make things fairer, but it is essential finance offers are accompanied by impartial advice to prevent mis-selling.

The popularity of demand shifting schemes reflects there is potential and appetite for customers without LCTs to participate in flex. It is positive we are now seeing the retail market cater more to this interest, but there is still lots that could be done to widen access.

There is little evidence that the customer journey is getting simpler as the smart energy market grows – the opposite is true in many cases. This **risks further entrenching current market inequalities**.

These risks will particularly limit two key outcomes:



Confident consumers: Complexity and lack of trust undermine consumer confidence and will limit engagement.



A diverse market: If the market continues to be skewed towards the energy- or tech-savvy this will undermine fairness and limit the reach and effectiveness of the energy transition.

The market trends explored in this chapter shape who can participate in smart energy offers in practice (explored in the next chapter), and the type of advice needed to support households to engage effectively (chapter 4).



Recommendations



Government to [provide more formal market monitoring](#) of smart energy offers.

Regulatory oversight should be established to provide a single source of truth about what's coming onto the market, and what consumers are being served, to track market fairness.



Regulator to mandate smart offer providers [share more data about offer users and outcomes](#).

This will be crucial for helping to track how market developments are delivering for different consumer groups in practice.



Offer providers to develop [further inclusive innovation](#) aimed at everyday consumers.

Recent trends suggest there is a mass market interest in flexibility – one focus for future work should be new smart tariff options for prepay consumers who are currently excluded.



Designated CLF engagement organisation to work with offer providers to [improve the clarity of offer information](#).

This should focus on providing tailored financial calculations for different consumer types, details about how different offers may work together, and better comparison across offer providers.



Government to expedite [regulation aimed at improving interoperability](#) across the smart energy ecosystem.

Reducing friction in the communication across and between smart tariffs and smart products will be key to facilitating a more inclusive customer experience through automation and HEMS.



Responsible Networks



Diverse Market



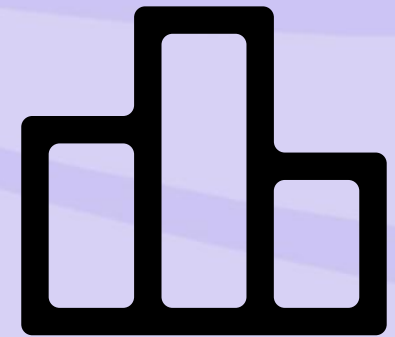
Good Customer Outcomes



Confident Consumers



Understanding Participation





Together, these chapters show how market design, real-world engagement and support systems interact to shape fairness.

1. *Inclusive innovation* - *Shapes what is available*



2. Understanding participation - Explores who engages and benefits



3. *Smart Energy Advice* - *Shapes how people engage and outcomes achieved*





Introduction

Building on the market trends identified in the previous chapter, this section explores how these opportunities translate into real-world participation.

A central theme of Smart and Fair remains that the smarter, more flexible energy system impacts households differently. Understanding these differences is essential to delivering an effective, least-cost transition. This insight is becoming increasingly important as policy places a growing emphasis on flexibility.

For example, the [Clean Flexibility Roadmap](#) has stretching targets for domestic flexibility, based on modelled evidence of what is technically feasible through the electrification of domestic heat and transport. However, these targets implicitly assume widespread and effective household participation - an assumption that is not yet well evidenced.

Underpinning these targets is a requirement that consumers will engage positively with the smart energy market, take up low carbon technologies, use them optimally (accepting automation for example), and will be willing to pay for the expansion of the electricity network through their electricity bills. But our research has shown that households have different capabilities to take up and optimise their use of low-carbon technologies (LCTs), or manage additional fixed costs on their energy bills.² This is supported by recent research from across the energy sector including the MCS Foundation¹ and Energy Systems Catapult², highlighting that engagement is shaped by socioeconomic and technical factors, with persistent risks of unequal participation and outcomes. These differences not only create uncertainties over where, when and how much flexibility will be available, but also raise questions over the public acceptability of the low carbon transition and the need to think differently about household vulnerability and risk in energy markets.

¹ [Unlocking Flexibility: How to Engage Households in Demand Side Response](#), 2025, MCS Foundation

² [Inclusive Smart Solutions: Final Report](#), 2025, Energy Systems Catapult



Introduction

To address this evidence gap, we have analysed participation across several large-scale flexibility trials and datasets, combining behavioural insight, household characteristics, and real energy outcomes. This has included:

- Gathering feedback from 37,000 participants in the CrowdFlex domestic flexibility trial, a NESO-led innovation project investigating the potential of domestic flexibility for system balancing and decarbonisation. CSE carried out customer feedback research throughout the trial to explore the experiences of different consumer groups. By linking people's feedback with information about their homes, circumstances and their actual energy data, we were able to identify specific factors that influence effective participation and the barriers that get in the way.¹
- Working with National Grid DSO to review their current flexibility markets and identify tangible steps for widening participation. This included analysis of flexibility procurement in low voltage constraint managed zones; a review of market rules and innovations that minimise barriers; and exploring practical solutions that could be led by DSOs to widen participation.
- Working with NESO to evaluate participation in the second year of the Demand Flexibility Service. ~15,000 domestic consumers completed our evaluation survey, sent through their DFS provider. At the same time, we ran a nationally representative opinion poll on consumer flexibility to allow us to compare these results to those consumers who participated in DFS.²

Throughout this work, we apply the Smart Energy Capabilities Lens to understand how different households engage with flexibility in practice. Our analysis shows that while participation is often positive and scalable, disparities remain in both access and outcomes. It also highlights how participation can interact with existing vulnerabilities, reinforcing the need to better understand risk and fairness in the evolving energy system.

¹ [CrowdFlex customer feedback reports](#), CSE / NESO, 2024-2026

² [Smarter networks project page](#), NESO, 2025



Introduction

We have used this evidence to improve how household behaviour and capability are represented in energy system analysis and planning. We have:

- Refreshed and updated the **domestic energy consumer archetypes** used by NESO (original set created in 2023 as part of the “[Consumer Building Blocks](#)” NIA funded project), adding in two new heat pump archetypes.
- Developed 18 distinct **flexibility archetypes** describing how GB households differ in their ability and willingness to provide energy flexibility. Each archetype is characterised using 18 indices and summarised via traffic light ratings across capacity, abilities, and engagement, for both user-managed and externally managed flexibility scenarios.
- Developed the **Building Heat Model** designed for NESO to assess the overall system cost impact of decarbonising residential heating in Great Britain. As well as inputs such as weather, heating system, and building heat loss, it also requires consumer behaviour inputs: most notably, occupant thermostat preferences and hot water tank heating schedule.

These tools move beyond average assumptions to better reflect the diversity of households in the energy system. Capturing these differences is critical to designing a system that is both efficient and fair.

The next few pages outline our key insights from delivering this work, and our recommendations for increasing participation and good customer outcomes from smart energy offers.



Understanding Participation:

Insights and Recommendations





Positive participation and sustainable engagement

As we have seen, there has been growth in offers for households without LCTs. Our evaluations of two such schemes – the DFS and CrowdFlex – provide evidence that participation in flexibility services is both feasible and broadly positive for a significant proportion of households.

In the CrowdFlex trial, **69% of participants reported a positive experience overall, and 60% said that “changing my energy demand felt good”**. Participation was not limited to more advantaged groups: **households with vulnerabilities engaged and took part in events at similar rates to others**, suggesting that low-barrier schemes can reach a wide audience when designed appropriately.

Participation also appears to support behaviour change. Participants in both CrowdFlex and the DFS reported **increased awareness of their energy use and growing confidence in demand shifting**, and there is evidence of **increasing openness to automation**, suggesting potential for progression to more advanced forms of flexibility over time.

Implications

These findings provide evidence that consumer-led flexibility is viable at scale. There appears to be a substantial base of willingness and capability that can support the

expansion of flexibility markets.

However, more needs to be done to communicate key concepts such as the benefits of using flexibility in managing the grid (including turning up demand when clean energy is abundant) and that participation is about shifting rather than destroying or creating demand. We also need to support the transition to automation, ensuring it is accessible and trusted across different user groups.

This evidence supports our recommendation that **further inclusive innovation aimed at everyday consumers** should be encouraged.

69% of participants reported a positive experience.

60% said that “changing my energy demand felt good”.



But disparities still persist

Despite overall positive engagement, participation and benefits are unevenly distributed.

Our analysis of DSO LV flexibility markets shows that procurement outcomes correlate clearly to household income levels. Where constraints zones exist **in low-income neighbourhoods the DSO struggles to procure flexibility** (see chart below right).

Flexibility rewards are strongly influenced by technology ownership. In the CrowdFlex trial, **EV owners shifted more than three times as much energy as the average participant**, allowing them to receive significant financial benefits. This pattern reflects the market access issues highlighted in [Chapter 2](#).

Implications

Smart and Fair was established in response to the risk of structural inequalities developing in the smart energy market. This research provides further evidence that this structural inequality is emerging as households with greater resources, particularly those able to invest in low-carbon technologies, are better positioned to access opportunities and maximise benefits. Without intervention, this dynamic risks embedding a **two-tier system**, where advantages accumulate to already well-served groups, while others are left with limited access and lower returns. This mirrors existing inequalities in the retail energy market and could undermine long-term public support for the energy transition.

This uneven participation also means that network operators face uncertainties in location and volume of flexibility, and uncertainties over the scale, timing and enduring need for network reinforcement.

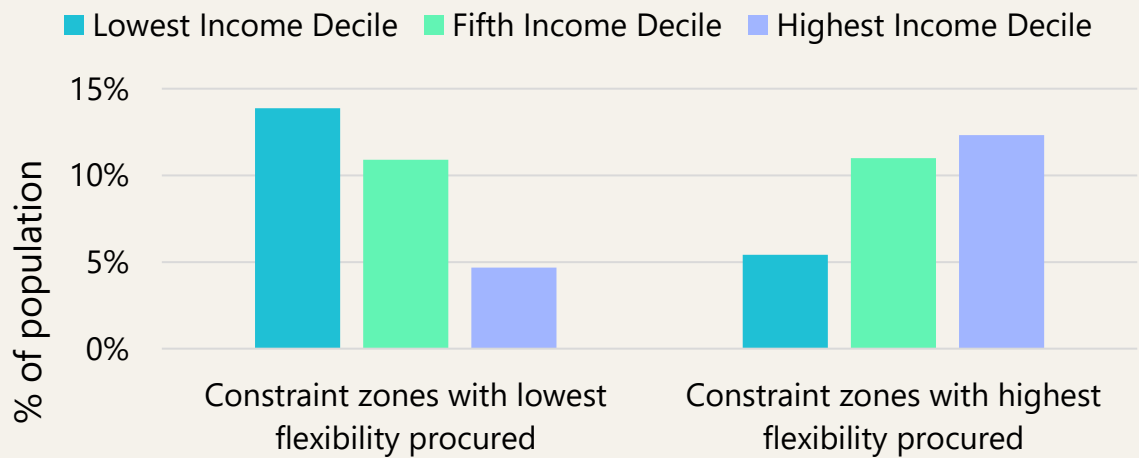
Recommendations

As recommended in our previous chapter, to avoid this risk we need to see more **formal monitoring** of the smart energy market and more flexibility services **designed for households without low-carbon technologies**.

As some households may always be limited in their flexibility participation (for example very low energy users or small households) we also need a better understanding of how using flexibility to manage the grid impacts all bill payers. This will require **greater understanding of the system-wide costs and savings from consumer-led flexibility**, how these costs are being recouped, and assessment of distributional impacts. It will also require transparency about what this means for customers including those who are not directly earning rewards.

Areas with lower access to flexibility have lower average incomes

In constraint-managed zones, successful flexibility procurement was associated with a higher share of higher-income households. In contrast, areas where the DSO struggled to procure flexibility had a higher share of lower-income households.



Data: [Access to Flexibility](#) p16, 2025



Risks for those with existing challenges

While most participants engage safely in flexibility services, the evidence highlights important risks for a subset of households. In CrowdFlex, some participants reported behaviours such as reducing electricity use below what they felt was necessary, turning off essential appliances, or altering care routines in order to participate.

These behaviours were most commonly reported among households already rationing energy use due to financial constraints, who therefore have limited flexibility in their consumption. For these households, even small incentives can become a driver to reduce essential usage further.

Although the number of households reporting negative impacts was relatively small, these cases are significant because they demonstrate how participation can interact with existing vulnerabilities.

Implications

Widening access to flexibility markets can **deliver benefits to individual households who would otherwise be at risk of exclusion**, but this evidence underscores the need for safeguards to ensure that participation is both safe and beneficial.

Flexibility services are not risk-neutral. For households with limited energy use, participation can inadvertently lead to harmful outcomes, including reduced comfort or wellbeing.

Recommendations

In the context of new and more complex smart energy services where we ask people to use energy in new ways, service providers must take responsibility for ensuring good customer outcomes. To do this will require better understanding of existing personal and household circumstances that may impact participation.

Developing this understanding and mitigating the risk of unsuitable services causing harm or reducing comfort will require action from both industry and policymakers:

- Service providers need to collect the right data at sign up to understand if a service is right for a customer and identify those that might require additional assistance.
- Service providers should be responsible for ensuring services are delivering as anticipated, including regular checks on customer outcomes and taking action if benefits are not being realised.
- At the policy level, new indicators should be created to better capture how vulnerability interacts with flexibility, as the current Priority Services Register is not designed for this purpose.

Service providers should also provide **clear guidance on safe participation**, particularly for low-income and vulnerable households.

Holistic, impartial energy advice is also essential to complement provider communications and mitigate the risk of mis-selling. Demand flexibility asks people to interact with energy in a new way, and this means we will need to **engage and support some customer groups in new ways**. This offers a positive opportunity as the right support could help mitigate existing energy related vulnerabilities.

Targeted advice and support is explored in detail in [Chapter 4](#).



Untapped potential

Our research has shown that current flexibility markets do not fully utilise the potential of existing technologies. In the CrowdFlex winter trial 36% of the 179 home battery owners stated that they never used them to participate in CrowdFlex events, despite batteries being among the most capable assets for demand shifting. Barriers included lack of awareness of this functionality and conflicting incentives such as prioritising self-consumption of solar generation. Baselining creates further challenges: households with solar-plus-battery systems often have **low or flat baselines**, making it difficult to demonstrate measurable reductions and therefore reducing their ability to earn event rewards.

Similarly, storage heaters represent a significant but under-recognised source of flexibility. Our analysis of National Grid DSO LV flexibility data showed 2.3 GW of capacity in clusters of storage heaters within constraint-managed zones, suggesting opportunities for both turn-down services overnight and turn-up services during the day, which could simultaneously increase comfort and reduce reliance on more expensive forms of heating. In response, National Grid DSO have added storage heaters as a new asset category in their Market Gateway to monitor and improve use of storage heater flex¹.

Implications

Existing storage heaters are not included in CP2030 flexibility capacity targets as they are considered to not operate as flexibly as other sources of demand side flexibility.² This underutilisation represents a missed opportunity. Markets are currently focused on capturing high volume flexibility, but technologies such as storage heaters and hot water storage could potentially provide a broader spread of low volume flexibility throughout the network. More effective use of existing assets like this could reduce network costs, increase flexibility capacity, and extend participation to a wider range of households.

Unlocking this potential requires innovation in flexibility products, services and tariffs, as well improved support for households to use their technologies effectively. The potential for policy and regulatory mechanisms such as default or 'opt-out' flexibility participation also warrant investigation.

Recommendations

Networks, FSPs and customer advocates to explore technical and commercial opportunities for driving a broader spread of low volume flexibility throughout the network, making best use of underutilised existing domestic assets.

Support households with clear guidance and tools to optimise technology use. As evidenced in our next chapter, recurrent theme across the retrofit and advice sectors is that **households with low carbon technologies need support to use their technologies optimally**. This means setting preferences and using controls appropriately, getting on the right tariff and opting into demand shifting services. This support helps households to manage their running costs, but it also means the low carbon technology can be controlled and respond to prices signals providing flexibility to the network, creating more flexibility.

**In the CrowdFlex winter trial
36% of the 179 home battery
owners stated that they never
used them to participate in
CrowdFlex events³**

¹ NG DSO, 2026, Making flexibility more accessible: National Grid DSO's response and actions to CSE recommendations, <https://dso.nationalgrid.co.uk/resource-centre/publications-library>

² NESO, 2025, Clean Power 2030 Annex 1: Electricity demand and supply analysis, <https://www.neso.energy/document/346791/download>

³ [CrowdFlex Utilisation Summer Trial 2025: Customer feedback](#), CSE / NESO, 2024-2026



Unlocking potential through effective partnerships

Targeted partnerships can increase participation by reducing barriers and improving engagement.

In our analysis of access to DSO flexibility services we explored how Motability Operations supports disabled EV drivers. Our research with ev.energy showed that their Motability Scheme EV drivers met all the technical requirements for different flexibility services at higher rates than ev.energy's wider customer base. This was echoed in CrowdFlex as another Motability partner, Ohme, enabled thousands of disabled EV drivers to successfully take part in the CrowdFlex EV flexibility trial. This shows the effectiveness of the customer journey that Motability Operations' has developed for their EV drivers to participate in flexibility markets.

Place-based partnerships can also reach those otherwise left behind. CSE is a delivery partner in SNUG, a SIF Beta project led by UK Power Networks. SNUG is developing a scalable route for social landlords to access flexibility markets while retrofitting homes. It addresses a key gap: while the grid needs flexibility, social tenants are often excluded. Yet landlords are already delivering upgrades that could reduce peak demand.

Implications

Barriers to low-carbon technology and flexibility uptake are not purely technical - they can be reduced through better customer journeys and targeted support. Trusted

intermediaries and coordinated partnerships are key to widening access. This approach is recognised in the [Warm Homes plan](#) which emphasises that uptake will be driven through trusted, locally led partnerships, and the enhanced co-ordinator role that Ofgem has assigned to DNOs¹. However, scaling will require sustained investment and capacity building, particularly for organisations supporting underserved groups.

Recommendations

Embed trusted intermediaries: Through their enhanced coordinator role, DNOs should partner with community organisations. Where area-based approaches reduce costs versus network reinforcement, DNOs should fund these partners.

Target specific groups: Partner with organisations serving particular groups (as in the Motability example) to identify and address participation barriers.

¹ Ofgem, 2026, ED3 Sector Specific Methodology Decision <https://www.ofgem.gov.uk/sites/default/files/2026-05/ED3%20Sector%20specific%20methodology%20decision%20core%20document.pdf>



Better consumer representation can support network planning

Energy system planning has historically relied on modelling simplified or 'average' consumers¹ which don't always explicitly represent consumer behaviour and choices. This can be seen from national system models (e.g. UK TIMES, NESO Future Energy Scenarios²) to granular building-level models such as EPCs and SAP that rely on standardised assumptions about household behaviour and energy use. This simplification means that models do not account for how real households behave – reducing forecast accuracy and obscuring impacts on different types of household.

The data analysis undertaken throughout Smart and Fair has enabled us to develop new analytical tools that better represent consumer behaviour and choices in system planning. As described on [page 29](#) this includes new flexibility archetypes for NESO; and the Building Heat Model which integrates behavioural factors into demand projections.

Implications

Capturing customer diversity can support **more accurate system modelling and better network planning**. For example better reflecting the variation in future technology mix and consumer behaviour provides NESO with more accurate modelling of decarbonised heating scenarios, helping to understand future system-level peak demand and system costs³.

Better representation of different consumer types helps **identify sources of flexibility and system value that are currently overlooked** (e.g. flexibility from [storage heaters as described on page 34](#)), ensuring the benefits of a smarter energy system reach more consumers.

Without visibility of consumer diversity in network planning we also have a poorer understanding of how network decisions might impact different types of people and households. For example, our work has shown that people will have different heat decarbonisation pathways and different mobility needs which will affect how they transition between energy networks and the costs they will need to pay. Ignoring these differences creates a risk that that distributional fairness is not considered from the outset in planning and policy.

Recommendations

Network and system operators to incorporate more granular data on consumer choices and behaviour into forecasting and scenario modelling, particularly within RESPs, improving accuracy, supporting fairness by design and unlocking additional system value.

¹ Energy Modelling in the UK Briefing paper 2: Strengths and weaknesses, 2021, UKERC, <https://ukerc.ac.uk/publications/modelling-strengths-weaknesses/>

² Consumer archetypes: why you matter, 2023, NESO, <https://www.neso.energy/document/275316/download>

³ Consumer Building Blocks Phase 2, ENA, https://smarter.energynetworks.org/projects/nia2_nes0078/



Conclusion

Our work provides evidence that consumer-led flexibility is viable at scale. Households that invest in low-carbon technologies are better positioned to access opportunities and maximise benefits, but many different types of households are able to participate easily and effectively, sustaining their engagement over time. We have found consistent evidence that taking part in demand shifting schemes builds smart energy capabilities as households become increasingly aware of their energy use and consider new controls or technologies to manage their demand and take advantage of the financial benefits on offer. This includes an increasing openness to automation.

We have also identified interventions that could widen or improve effective participation, both increasing system efficiency and delivering consumer benefits.

We have identified an emerging structural inequality as households with low energy use have little to gain from taking part in the smart energy market, but they still contribute to the costs of electrification and the development of flexibility markets, with these fixed costs potentially becoming an increasing part of their electricity bill. In some extreme cases, we have found participation can inadvertently lead to harmful outcomes. These extreme cases need to be anticipated and acted on.

Trusted intermediaries and coordinated partnerships can play a critical role in widening access to flexibility markets but scaling this approach will require sustained investment and capacity building, particularly for organisations supporting vulnerable or underserved groups.

Without action, these dynamics will particularly impact two key outcomes:

 **Responsible networks:** Uneven participation currently presents a risk of unfair redistribution of network costs from lower- to higher-income households.

 **Good customer outcomes:** Without proactive efforts to deliver good outcomes we risk undermining trust and confidence for consumers which is key to broad participation.



Recommendations

-  **Government to establish mechanisms to share flexibility benefits.** Clear mechanisms are needed to measure and distribute the savings from consumer-led flexibility to those who are not directly earning rewards.
-  **Ofgem to develop new metrics for vulnerability.** New indicators should be created to capture how vulnerability interacts with flexibility, as the current PSR is not designed for this purpose.
-  **Service providers to strengthen outcomes monitoring and tailored support.** Service providers should implement systems to assess whether customers are participating safely and effectively, intervening where needed, while government should ensure access to tailored energy advice based on household circumstances.
-  **Networks, FSPs and customer advocates to explore opportunities for driving a broader spread of flexibility throughout the network,** making best use of underutilised existing domestic assets and supporting households with clear guidance and tools to optimise technology use.
-  **Enable trusted intermediaries through DNO coordination roles.** Where area-based approaches reduce costs versus network reinforcement, DNOs should fund these partners.
-  **Network and System operators to incorporate more granular data on consumer choices and behaviour** into forecasting and scenario modelling, particularly within RESPs.



Responsible Networks



Diverse Market



Good Customer Outcomes



Confident Consumers



Smart Energy Advice





Together, these chapters show how market design, real-world engagement and support systems interact to shape fairness.

1. Inclusive innovation - *Shapes what is available*



2. Understanding participation - *Explores who engages and benefits*



3. Smart Energy Advice - Shapes how people engage and outcomes achieved





Introduction

As seen in the previous chapters, both market design and participation outcomes depend heavily on whether households receive the right support. This section explores the role of advice in bridging that gap.

Smart energy options remain extremely complex for many, requiring people to engage with and understand their energy use in a significantly different way than before. In this complex and rapidly evolving market, **accessible and trustworthy advice is essential** to help people identify which options are suitable for their circumstances and overcome capability barriers identified through the Capabilities Lens.

Over the past two years, CSE has expanded its **Smart Energy Action Plan** service to provide **national support** across England and Wales for fuel-poor and vulnerable households: so far reaching 2,680 households. Alongside this expansion, our advice delivery has increasingly focused on supporting households through **grant-funded retrofit journeys**, including those receiving electric heating systems and renewable technologies like solar panels and battery storage. This shift reflects a growing recognition that advice is essential to ensure these interventions deliver their intended outcomes: reducing bills, improving comfort, and supporting the transition to a cleaner energy system.

In practice, this changing focus has been driven by several key challenges:

- A rising number of households are seeking support after experiencing **no improvement, or even negative impacts, on energy bills and comfort** following installation of low carbon technologies.
- A clear need for **more comprehensive post-installation handover and guidance**, particularly for people who are not digitally confident or able.
- Limited access to **meaningful smart energy options and financial incentives** for households unable to invest in, or access grants for, low-carbon technologies.



Introduction

Encouragingly the Warm Homes Plan positions [advice as essential infrastructure](#) in the home upgrade journey rather than an optional extra. It emphasises the [need for clear and accessible guidance](#), simpler and [more joined-up access routes](#), strong [links between advice, funding and delivery](#), and [targeted support](#) for those most at risk of fuel poverty.

There has also been important progress on smart metering policy. [Smart meters](#) are [foundational infrastructure](#) for the smart energy transition, [but many households still do not have working smart meters](#). Without equal access, households [risk being left behind](#) and unable to access smarter tariffs and energy services that can cut energy bills. The introduction of Guaranteed Standards of Performance will require suppliers to compensate households when meters are not installed or repaired in a timely way, while the Smart Metering Policy Framework beyond 2025 aims to ensure that every household that wants a smart meter can access one. If implemented effectively, these measures have the potential to rebuild trust and increase uptake. However, much of the detail behind these proposals is still to be confirmed.

CSE has been at the forefront of smart energy advice delivery for 5 years, building on learning from the Smart and Fair programme and underpinned by the Smart and Fair Capabilities Lens introduced earlier. We are committed not only to improving our own services but also to supporting the wider advice sector. To this end, we have convened two national advice forums – bringing together 176 attendees supporting vulnerable households to share insights, identify barriers, and co-develop solutions. We have also launched an [Energy Support Network](#) to strengthen collaboration across the sector and expanded our training provision to build capability and confidence among advice providers, with 207 advisors already trained through the network and training provision.

The next few pages highlight our key learnings from delivering this work.



Smart Energy Advice:

Insights and Recommendations





Enduring financial barriers

Financial barriers remain a significant constraint on participation in the smart energy transition.

Our advice work continues to show that many households are unable to afford the upfront costs associated with technologies. This is echoed in [Ofgem's recent flexibility and net zero survey](#) as cost is reported as the primary barrier to adopting electric vehicles and heat pumps¹. Though grant schemes are available, they can be difficult to access, and too small in scale – as shown in research by the Joseph Rowntree Foundation (see chart right). With the removal of ECO funding, there is now no *national* grant funding available for low-carbon technologies aimed at low-income and fuel-poor households.

Even when these are successful, people are wary of the higher cost of heating their homes using heat pumps. Those that do opt to have new technology installed through a grant often don't get the support they need post-installation to understand how best to use their new device.

At the same time, although smart tariffs do not require upfront investment, they are often perceived as risky. Features such as peak pricing, variability in costs, and exclusion from the price cap make these offers difficult to understand and harder to trust, especially for low- and middle-income households.

Implications

Without addressing these barriers, participation will remain skewed towards households with greater financial capacity, limiting both fairness and overall system impact.

Grant funding via the Warm Homes Plan and lower interest lending available through the Warm Homes Fund represent significant opportunities to address these barriers, but their effectiveness will depend on how funding, delivery, and advice are

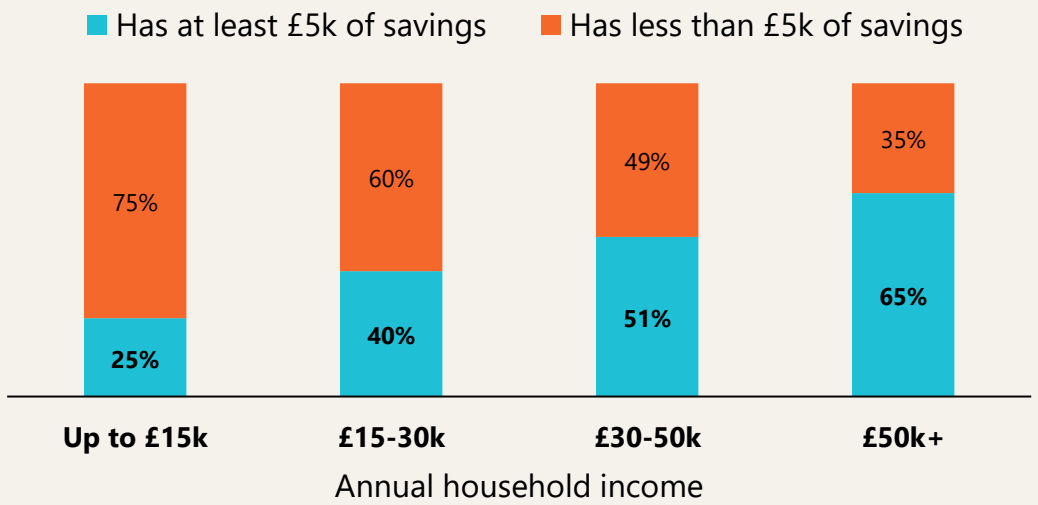
integrated.

Recommendations

Greater, targeted and long-term funding is needed for people in fuel poverty and vulnerable situations to increase access to low-carbon technologies and unlock the benefits of flexibility.

Who has enough savings to upgrade their heating?

[Eon estimates](#) that for a medium sized 3 bed home, you'd still need £5k to upgrade your heating - in addition to the Boiler Upgrade Scheme grant.



Data: [JRF Analysis of Financial Lives Survey](#), 2024



Limited understanding of impacts on bills

There remains limited understanding of the impact on bills from smart energy technologies and tariffs, particularly for households in fuel poverty. For example, for people who are only heating their homes for an hour or two a day, one room at a time, switching to a heat pump will likely lead to greater bills, and it is unclear what would be the most cost-effective way to operate their heat pump within their limited budgets. Where bills increase following installation, it can be difficult to determine whether this is due to system design, user behaviour, or external factors. Access to post-install commissioning and monitoring is limited, particularly in grant-funded programmes. As a result, households often lack support to optimise system performance or identify issues early.

Our recent modelling work using the Building Heat Model demonstrates that **relatively simple changes in behaviour, tariff choice and system use** can **significantly reduce costs** – see figure (right). However, access to this knowledge is not widespread, and relies on consumers having the capability to research their options themselves, or be supported by a suitably trained, impartial advice organisation.

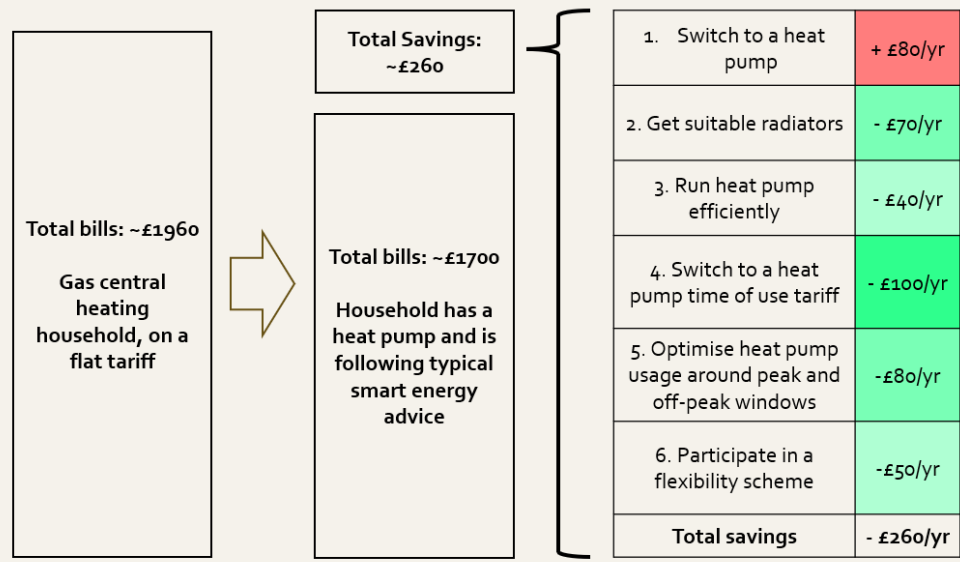
Implications

Uncertainty around bill impacts undermines confidence in low-carbon technologies and smart energy offers and can reduce uptake¹. Improving understanding of financial outcomes is therefore essential for both consumer protection and market development. This evidence is also essential for improving market transparency and supporting more inclusive innovation (see Chapter 2).

Recommendations

Require all grant-funded installations to include a suitable tariff offer, tailored and impartial advice and follow-up support, helping households get the best outcomes through the best mix of technology, tariffs, and behaviours. Finance offers through the Warm Homes Fund should also be integrated with independent consumer facing advice to help consumers choose the measures most suitable and cost effective for their property and personal circumstances.

¹ In Ofgem’s [Flexibility and Net Zero survey](#), among the 41% of households unlikely to switch to a Time of Use tariff, uncertainty about guaranteed savings and lack of awareness and understanding were cited as key barriers



Our analysis – shown above - highlights the value of good advice for heat pump users. Using the Building Heat Model we developed with NESO, we modelled the potential benefits associated with 6 key actions for getting the best out of heat pump use. Information like this is key for building consumer confidence in the clean heat transition.



Addressing complexity and lack of trust

Complexity and lack of trust remain significant barriers to engagement with smart energy technologies and markets. Evidence from the advice sector highlights that many households are wary of adopting new technologies due to perceived financial risks, time commitments, and uncertainty about outcomes. These concerns are particularly pronounced among those in vulnerable circumstances.

Barriers are further reinforced by negative experiences with the energy market. For example, at CSE we continue to see:

- Low confidence in suppliers' ability to manage complex billing.
- Ongoing issues with smart meter functionality, with **millions of meters not communicating properly**.

These challenges contribute to scepticism and misinformation, limiting willingness to engage with new offers for some.

The Smart Export Guarantee (SEG) illustrates how complex process design can obstruct benefits reaching customers. Advisors report that some suppliers still require digital-only applications, while social landlords face barriers to setting up SEG payments for installed solar systems in bulk. This can leave SEG payments unclaimed, benefiting suppliers rather than households. Page 25 highlights the significant potential benefits customers are missing out on through not receiving SEG payments.

Implications

Trust is a foundational requirement for participation in the smart energy system.

Without it, even well-designed products and services will struggle to achieve widespread uptake.

Complexity amplifies this issue. As systems become harder to understand, households are more likely to disengage or default to familiar, but potentially less optimal, choices.

Addressing these barriers requires coordinated action across advice provision, industry practice, and public communication.

Recommendations

Government to develop a **coordinated national communication strategy** covering smart meters and low-carbon technologies, and key concepts around time of use and demand flexibility.

Government to review the Smart Export Guarantee process and take action to ensure system benefits are fairly passed on to customers, with straightforward customer journeys.

"...there was nothing that physically stopped me from [taking up the recommendations] apart from costs or not wanting a smart meter. The smart meter would be an intrusion for me, as it's information gathering."

- SMEAPS Client



Impartial advice drives action, but further support is needed

Evaluation of our Smart Energy Action Plan service demonstrates the significant impact of impartial, tailored advice on consumer understanding and behaviour.

Our findings show that:

93% of participants reported increased knowledge of smart energy options

75% planned to take at least one recommended action

Households reported tangible benefits, including cost savings, increased comfort, and greater energy awareness.

Advice was consistently valued for its independence and trustworthiness, particularly by households wary of commercial providers. Many participants reported the importance of personalised support in helping them navigate complex choices. This highlights the vital role of impartial advice in enabling effective participation in smart energy offers, as discussed in Chapter 3.

However, the evaluation also identified a persistent need for **ongoing support**, including follow-up advice, assistance with accessing funding, and help with using installed technologies including home visits and hands-on guidance.

Implications

Impartial advice is highly effective in supporting engagement and improving outcomes, but current provision is insufficient to meet demand.

Without the ability to scale advice services, there is a risk that only a subset of households will benefit from the support needed to participate effectively in the smart energy system. This undermines both fairness and system efficiency.

Recommendations

Government to fund impartial local energy advice. Provide funding for trusted local organisations to deliver independent advice and integrate advice more fully into **policy and programme design**, including the online and phone advice to be provided through the Warm Homes Agency.

Policymakers and advice organisations to provide **follow-up support** as a standard component of advice provision and increase capacity for **in-depth support**, including home visits.

“The help and advice provided will be very helpful to **enable us to maximise the savings in costs** and reduce unit consumption.”

- SMEAPS client

“Some options suggested were **very new and unknown**. Would like **more information and average costs**. While it would cost more to do home visits, **face to face** and the ability to look together at the property and potential **would help hugely**.”

- SMEAPS client



Further support needed for advisors

In feedback from our two smart energy advice forums, advice organisations have welcomed CSE sharing expertise and insights, reporting that this has strengthened their ability to support households, and they felt better equipped to navigate smart energy advice. But the **scale of challenge around engaging clients** on smart energy and low-carbon technologies means that there remains a significant demand for sustained support for advice providers.

Alongside this type of support, better tools are also required to support people with smart tariff comparison. Although advisors can explain the different types of smart tariffs that might be suitable for a client, people invariably want more specific advice on which tariff they should switch to. An **up-to-date, practical comparisons of smart and time-of-use tariffs** comparison tool that advisors can use with a client's smart meter data would help give people confidence with a switch to a smart tariff.

Implications

The effectiveness of the advice sector depends not only on funding, but on ongoing capability development. CSE is playing a part: we have established our energy support network with a focus on smart energy advice, supporting 120 members from 76 advice organisations in its first 4 months. We are also expanding our training provision, with our CPD-accredited Retrofit and Smart Energy Essentials course available nationally. But without sustained investment in training and tools, the advice sector will struggle to keep pace with the evolving energy system.

Recommendations

Upskill energy advice providers. Deliver targeted training on low-carbon technologies and smart energy systems that is tailored to people in fuel poverty and vulnerable situations, enabling advisors to provide reassurance and clarity to people they support.

Develop new tools for advice organisations. Including tools that enable advisors to access a customer's smart meter data and carry out tariff comparisons on their behalf. This is particularly relevant for those that are digitally excluded – who are more likely to include low-income households, older people, disabled people, people experiencing unemployment and seeking work.¹

“Nice to feel part of a wider network. I attended the smart energy / smart meter workshop and was useful to **hear more about issues and new compensation scheme,** which I've been able to let people know about within company and when discussing home energy advice at events etc.”

- Buckinghamshire Community Energy

¹ <https://www.gov.uk/government/publications/digital-inclusion-action-plan-first-steps>



Conclusion

Participation in the smart energy system is out of reach for many households currently, due to the high cost of entry, high complexity, enduring failures of the smart meter rollout, uncertainties around the impact on bills, and the erosion of trust in the energy industry.

Advice plays a critical role in helping households overcome capability barriers identified throughout this report. Impartial advice is highly effective in supporting engagement and improving outcomes. Without the ability to scale advice services, there is a risk that only a subset of households will benefit from the support needed to participate effectively in the smart energy system. This undermines both fairness and system efficiency.

The effectiveness of the advice sector depends not only on funding, but on ongoing capability development.

Without action, these risks will particularly limit three key outcomes:

-  **A diverse market:** Without greater funding, people with lower incomes will remain excluded from the smart energy market.
-  **Good customer outcomes:** Without tailored support there is a risk that good outcomes are not achieved from technology installs. This not only undermines trust and confidence, but misses an unprecedented opportunity to tackle existing inequality and challenges faced by fuel poor households.
-  **Confident consumers:** Without support, many households will not have the confidence, trust and willingness to engage in the smart energy market.

The next pages summarise our recommendations for avoiding these risks and moving closer to our four outcomes.



Recommendations



Government to ensure that the Warm Homes Plan delivers greater, targeted and **long-term funding for people in fuel poverty and vulnerable situations** to increase access to low-carbon technologies and unlock the benefits of flexibility.



Government to require all grant or finance-funded installations to include a suitable tariff offer, tailored advice and follow-up support, helping households get the best outcomes through the best mix of technology, tariffs, and behaviours. This will require a **better understanding of the impact on bills of smart energy options for fuel poor and vulnerable households**.



Government to create a national energy transition **communications strategy**: Develop a clear, coordinated approach to explain the need for and benefits of new tariffs and technologies (for bills, energy security and the environment), actively addressing misinformation and misconceptions (including smart meters).



Government to fund impartial **local energy advice**. Provide the funding and tools required for trusted local organisations to deliver impartial advice on smart energy options.



Government to **review the Smart Export Guarantee process** and take action to **ensure system benefits are fairly passed on to customers**, with straightforward customer journeys.



Responsible Networks



Diverse Market



Good Customer Outcomes



Confident Consumers



Recommendations & next steps



Recommendations: Key outcomes

To ensure a smart and fair energy transition leaves no one behind, it's vital that we achieve the four key aims set out in this report. In this section, we have put together our top short-term and medium-term recommendations that will ensure these outcomes are realised.

A smart and fair transition needs:

 **Responsible networks:** System operators supporting access to cheaper, greener electricity while keeping network costs as low as possible and protecting consumers.

 **A diverse market:** Products and services that work for a wider range of households, with oversight to ensure fair access and outcomes.

 **Good customer outcomes:** Suppliers and service providers provide good support and actively get customers on a combination of technology, tariff and behaviour that is right for them, with strong protections in place.

 **Confident consumers:** People are informed and able to make decisions that help manage their energy costs. They can access advice and support, and know they are protected if things go wrong.



Recommendations: Responsible Networks

To help strengthen outcomes around responsible networks, whereby system operators are delivering greener electricity at costs as low as possible and are responsible in their procurement of flexibility, we recommend:

Short Term (Next 12 months)

1. DNO's to develop their enhanced co-ordinator role to enable trusted intermediaries in promoting flexibility, storage and demand side management, actively identifying underutilised sources. Where area-based approaches reduce costs versus network reinforcement, DNOs should fund these partners.
2. Network and System operators to integrate consumer capability data into system modelling. Incorporating more granular data on consumer diversity to improve accuracy and evidence the distribution of network costs and benefits.

Medium Term (1 – 3 years)

3. Government to establish mechanisms to share flexibility benefits. Clear mechanisms are needed to measure and distribute the savings from consumer-led flexibility to those who are not directly earning rewards.



Recommendations: A Diverse Market

To help progress towards a diverse market in which we see smart tariffs, products and services that work for people with a variety of needs, or less income, we recommend:

Short Term (Next 12 months)

1. Government to ensure that the Warm Homes Plan delivers greater, targeted and long-term funding for people in fuel poverty and vulnerable situations to increase access to low-carbon technologies and unlock the benefits of flexibility.
2. Government to provide more formal market monitoring of smart energy offers.
3. Offer providers to develop further inclusive innovation aimed at everyday consumers. Recent trends suggest there is a mass market interest in flexibility – one focus for future work should be new smart tariff options for prepay consumers who are currently excluded.



Recommendations: Good Customer Outcomes



To help improve customer outcomes through support and customer protection we recommend:

Short Term (Next 12 months)

1. Offer providers to strengthen outcomes monitoring and tailored support, implementing systems to assess whether customers are participating safely and effectively and intervening where needed.
2. Ofgem to mandate smart offer providers to share more data about offer users and outcomes.
3. Government to expedite regulation aimed at improving interoperability across the smart energy ecosystem.
4. Government to require that all grant and finance funded installations include a suitable tariff offer, tailored advice and follow-up support, helping households get the best outcomes through the best mix of technology, tariffs, and behaviours.
5. Government to review the Smart Export Guarantee process and take action to ensure system benefits are fairly passed on to customers, with straightforward customer journeys.

Medium Term (1-3 years)

6. Ofgem to develop new metrics to capture how vulnerability interacts with flexibility, as the current PSR is not designed for this purpose.



Recommendations: Confident Consumers

To help move us closer to confident consumers who are better informed about their choices we recommend:

Short Term (Next 12 months)

1. Government to establish a designated consumer-led flexibility engagement organisation to work with offer providers to improve the clarity of offer information including tailored financial calculations, how different offers may work together, and comparison across offer providers.
2. Government to create a national energy transition communications strategy to explain the need for and benefits of new tariffs and technologies and actively addressing misinformation and misconceptions.

Medium Term (1 – 3 years)

3. Government to provide funding and enabling to upskill energy advice providers and develop new tools for advice organisations enabling advisors to provide reassurance and clarity to people they support.



Next steps for Smart and Fair

To help deliver these outcomes, over the next two years Smart and Fair will focus on:

Responsible Networks

To continue to support system operators deliver fairness and value for money, we will:

- Help networks to **identify households at risk of being left behind**, to target support and plan more fairly.
- **Explore how low-carbon technologies can support power resilience** for vulnerable customers while strengthening system performance.



A Diverse Market

To help progress towards a diverse market of products and services that work for different types of people we will:

- **Continue and expand market monitoring, webinars and sector resources**, building evidence on who participates and benefits, enabling regulators and industry to identify gaps and drive more inclusive offers.



Good Customer Outcomes

To help improve customer outcomes we will:

- Shape options to **optimise customer outcomes** through tech, tariffs & advice in Warm Homes Plan and Fund installs.
- **Develop new approaches to understanding vulnerability**, enabling better identification of risk and more targeted support.
- **Provide guidance on safe and effective participation** in flexibility services.



Confident Consumers

To support consumer confidence we will:

- Explore ways to make **smart energy advice more widely available and accessible**.
- **Improve financial analysis of smart energy options** and translate this into customer support.
- Continue to **scale advice sector capacity** through training & knowledge sharing.



All of this work will be supported by **ongoing engagement** to:

- **Embed the Capabilities Lens across the sector**, ensuring consumer needs shape design and delivery.
- **Strengthen partnerships with market actors and consumer organisations**, improving coordination and delivery of better outcomes.
- **Represent consumer needs in policy and regulation**, driving system-wide change aligned with Smart and Fair outcomes.
- **Increase uptake and use of tools and insights**, translating evidence into real-world impact.



Conclusion

This report shows clearly that the transition to a smart, flexible energy system is underway - and that it carries significant opportunities to deliver improved outcomes for households. But it also confirms a central finding of the Smart and Fair programme since 2019: **fairness is not emerging naturally from the market and must be actively designed and delivered.**

Across all three chapters, a consistent picture emerges. The smart energy market is growing rapidly, with more offers, more participants, and early signs of mass-market engagement. Participation in flexibility is feasible and often positive, advice can significantly improve outcomes, and innovation is beginning to reach a wider range of households. These are important foundations for a fair transition.

However, this progress is uneven. Access to smart energy offers, the ability to participate effectively, and the benefits achieved remain **strongly shaped by household capabilities, resources, and circumstances.** Households with low-carbon technologies, higher incomes, or greater digital confidence are better positioned to engage and benefit, while others face barriers to access, increased complexity, and greater risk of poor outcomes.

The result is a system that is evolving, but not yet delivering consistently fair outcomes. Participation is often **conditional rather than universal**, advice is **valuable but not available at scale**, and consumer confidence remains **fragile and uneven**. At the same time, gaps in data and monitoring mean we still lack a comprehensive understanding of how the market is working for different groups and where intervention is most needed.

Without change, these dynamics risk becoming embedded. A two-tier market could emerge more firmly, where benefits accrue to those already well-served, while others are left behind or exposed to greater risks. This would not only undermine fairness, but also limit the effectiveness of the wider energy transition - reducing participation, weakening trust, and constraining the system benefits that flexibility can deliver.



Conclusion

The four Smart and Fair outcomes set out a clear framework for addressing these challenges. Delivering a fair transition requires:

-  **A Diverse Market**, where innovation works for a broader range of households and is supported by strong regulatory oversight
-  **Good Customer Outcomes**, with coordinated support to ensure households are on the right combination of technology, tariffs and behaviours
-  **Confident Consumers**, with access to clear information, trusted advice, and effective protections
-  **Responsible Networks**, embedding fairness into planning, procurement, and system design

What is now needed is a shift from recognising the problem to **embedding solutions across the system**. This means strengthening oversight, improving transparency, scaling high quality trusted advice, designing more inclusive offers, and ensuring that participation is both accessible and safe. It also requires stronger coordination between government, regulators, networks, market actors, and the advice sector. Smart and Fair will continue to play a role in supporting this transition through evidence, tools, and engagement but delivering these outcomes will depend on sustained action across the energy system.

With the right interventions, the smart energy transition can deliver both efficiency and equity. Without them, it risks reinforcing existing inequalities and missing a critical opportunity to build a fairer energy system for all.



Advisory board

The Smart and Fair programme is guided by a distinguished Advisory Board, ensuring the credibility and real-world relevance of our work.

Smart & Fair Advisory Board members include:

- SSEN (funder), NGED (funder)
- Citizens Advice
- Department for Energy Security and Net Zero
- Energy Demand Research Centre (EDRC)
- Energy UK
- Flex Assure
- Low Carbon Hub
- National Energy System Operator (NESO)
- Northern Powergrid
- Octopus Energy
- Ofgem
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