

# A FAIR ENERGY FUTURE

Unlocking a just transition  
for consumers

March 2023



Scottish & Southern  
Electricity Networks



## ABOUT SSEN

We are the electricity Distribution Network Operator (DNO) responsible for delivering power to 3.9 million homes and businesses across central southern England and the north of Scotland.

Our network serves some of the UK's most remote communities and also some of the most densely populated. Our two networks cover the greatest land mass of any of the UK's DNOs, covering 72 local authority areas and 75,000km<sup>2</sup> of extremely diverse terrain. Through our Priorities Services Register, we help customers who may need additional support and partner with trusted and expert organisations in a range of initiatives to assist those living in fuel poverty.

SSEN is part of SSE plc, a UK-listed energy company that operates throughout the UK and Ireland. SSE develops, owns and operates low carbon energy assets including onshore and offshore wind, hydro power, electricity transmission and distribution networks (SSEN), alongside providing energy products and services for businesses.

As a provider of critical national infrastructure, SSE and its businesses play a vital role in accelerating the transition to a net zero world at a national and local level.

## A SNAPSHOT OF OUR NETWORKS

### North of Scotland

**780,000** homes and businesses connected (2% of UK population) living in 25% of the land mass

**28.3%** of customers considered to be fuel-poor

Approximately **0.7%** of all vehicles are EVs

**44%** of homes are off-grid gas

**168,500+** PSR customers registered

### Central Southern England

**3.1m** homes and businesses connected

**9.3%** average rate of fuel poverty

Approximately **1.1%** of all vehicles are EVs

**23%** of homes are off-grid gas

**669,500+** PSR customers registered



*\*Figures accurate to February 2023*



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## A FAIR ENERGY FUTURE FOR CONSUMERS

The UK and Scottish governments have committed to reaching net zero by 2050 and 2045 respectively, with the energy system targeted for earlier decarbonisation by 2035. Distribution networks are at the forefront of enabling this transition; delivering a safe, secure supply of electricity to today's consumers, and developing the smart services, functionality and infrastructure needed to support the next generation in a net zero world.

Our Delivery Plan for 2023 - 2028 sets out a core pathway to net zero which is underpinned by the assertion that net zero can most credibly be achieved by a transformation in consumer behaviour, characterised by new ways of interacting with the energy system, and the holistic adoption of new low carbon technology to manage energy use and reduce household bills.

The imperative for this behaviour change forms the central dichotomy of realising a just transition for consumers: people may be willing to change their behaviour, but they may be prevented from doing so because of where they live, how much they earn or how digitally engaged they are. These inequalities could undermine the legitimacy of the transition, with net zero 'winners' and 'losers' emerging – those who benefit and those who pay the price. For disadvantaged households, who arguably stand to gain the most from the opportunities the net zero transition will create, it's vital that these capability gaps are identified and action taken to mitigate them.

The cost of living crisis has magnified and deepened the fissures in our society and brought into sharp focus the acute levels of fuel poverty affecting so many. It has also altered political agendas, with household budgets and businesses under significant pressure.

Despite these immediate challenges, we firmly believe that the transition to net zero should not be compromised.

In fact, future-proofing the energy system and achieving net zero are more vital than ever to protect future consumers from experiencing the kinds of societal crises we find ourselves in today.

As a business we have been navigating these issues for some time, undertaking a range of projects to begin to unpick the complexities involved in delivering a cost-effective and equitable net zero. Working with experts across the industry and beyond, we are focusing a lens on fairness in the electric vehicle and heat revolution, investigating how new energy services can be both smart and fair, and confronting the unique challenges faced by our most remote and rural communities.

With relative uncertainty around future patterns of supply and demand, charging mechanisms, and new technology, we are in the process of refining our thinking in this space and collaborating with as many stakeholders as possible to create meaningful solutions. Most importantly, we are committed to being a force for fairness in our actions, our advocacy, and our innovations to ensure we deliver a just transition for everyone - regardless of circumstance.



**Chris Burchell**  
MD SSEN Distribution



# 1 ABOUT THIS REPORT

SSE's Net Zero Acceleration Programme has set a clear agenda for transforming the energy system, with investment of over £12.5bn by 2026 (on average £7m a day) in low-carbon energy and electricity infrastructure. As a principal delivery mechanism for net zero, SSE is committing to ensuring the transition is fair and socially just.

SSE published its Just Transition Strategy in November 2020 setting out the company's pioneering plan for an equitable transition to net zero. As part of this strategy, SSE committed to releasing a series of reports each focusing on a different aspect of achieving fairness in the future energy system – for workers, consumers, suppliers, and communities.

The first report in this series was published in September 2021, detailing what actions SSE is taking to support workers transition from high to low-carbon careers. You can access the report [here](#).

SSE's Just Transition Strategy outlines 20 principles for fairness in the future energy system, with four principles focused specifically on consumers. These four consumer fairness principles are highlighted below:



## SSE'S 20 PRINCIPLES FOR A JUST TRANSITION

TRANSITIONING INTO A NET-ZERO WORLD			TRANSITIONING OUT OF A HIGH-CARBON WORLD	
<p><b>SSE'S PRINCIPLES FOR GOOD, GREEN JOBS</b></p>	<p><b>SSE'S PRINCIPLES FOR CONSUMER FAIRNESS</b></p>	<p><b>SSE'S PRINCIPLES FOR BUILDING AND OPERATING NEW ASSETS</b></p>	<p><b>SSE'S PRINCIPLES FOR PEOPLE IN HIGH-CARBON JOBS</b></p>	<p><b>SSE'S PRINCIPLES FOR SUPPORTING COMMUNITIES</b></p>
<ol style="list-style-type: none"> <li>1. Guarantee fair and decent work</li> <li>2. Attract and grow talent</li> <li>3. Value employee voice</li> <li>4. Boost inclusion and diversity</li> </ol>	<ol style="list-style-type: none"> <li>5. Co-create with stakeholders</li> <li>6. Factor-in whole-system costs and benefits</li> <li>7. Make transparent, evidence-based decisions</li> <li>8. Advocate for fairness</li> </ol>	<ol style="list-style-type: none"> <li>9. Support competitive domestic supply chains</li> <li>10. Set social safeguards</li> <li>11. Share value with communities</li> <li>12. Implement responsible developer standards</li> </ol>	<ol style="list-style-type: none"> <li>13. Re-purpose thermal generators for a net-zero world</li> <li>14. Establish and maintain trust</li> <li>15. Provide forward notice of change</li> <li>16. Prioritise retraining and redeployment</li> </ol>	<ol style="list-style-type: none"> <li>17. Deliver robust stakeholder consultation</li> <li>18. Form partnerships across sectors</li> <li>19. Promote further industrial development</li> <li>20. Respect and record cultural heritage</li> </ol>

In this report by SSEN Distribution we explore how net zero can be delivered fairly for consumers, with SSE's principles for a just transition driving our approach. As an electricity distribution network operator (DNO) we interact with the complex issues surrounding the consumer transition and the barriers faced by many in our communities who will struggle to engage positively with the future energy system unless thoughtful consideration is given, and meaningful interventions made.

The problems we face are complex and we do not have all the solutions. In this report we will share our 'learning by doing' approach, through our innovation programme, collaborations and research, to demonstrate how we will play our part in delivering a just transition for consumers.

### THE PURPOSE OF THIS REPORT IS TO:

- Outline the priorities that are driving our engagement with stakeholders and decision makers
- Provide a summary of our research and collaborative initiatives exploring the challenges of a fair transition to net zero for consumers
- Set out affirmative actions as a business that will mitigate potential negative socio-economic impacts of transitioning to net zero
- Make realistic recommendations for industry and government that will support a fairer net zero for all

## 2 SUPPORTING CONSUMERS NOW AND IN THE FUTURE

In exploring how we best support a just transition, our starting point is the work that is already embedded in our services for consumers and communities. As a network operator, we have thousands of touchpoints with the people we serve and are committed to providing support where we can identify a specific vulnerability.

### ADDRESSING EXISTING AND EMERGING VULNERABILITIES

Our Priority Service Register (PSR) is a free to join service that helps us provide adapted services and additional support to individuals in potentially vulnerable situations. Customers are categorised in terms of their specific need from those who require electricity to power medical equipment and lower priority categories relating to features such as age. Later in the report we consider how the PSR might be used to support consumers with new energy-related vulnerabilities, such as disabled EV drivers (see page 20).

Our teams are also trained to understand where financial vulnerabilities may exist and, alongside the work of trusted partners, provide support for those who are in fuel poverty. Since 2016 we have increased our support year on year through diverse measures such as referrals for energy support agencies to explore financial remedies and gap funding schemes for customers to undertake loft clearance to allow access to wider home insulation grants.

### SSEN DEFINITION OF 'CONSUMER'

We define consumers as the end-users, existing and in the future, of our distribution network service who pay through their energy bills, for the service they receive from SSEN.



### DOUBLING OUR FUEL POVERTY SUPPORT

In October 2022, we committed to doubling the financial support we provide for fuel poverty initiatives over the next 48 months.

### ADAPTING FOR THE COST OF LIVING CRISIS

At the end of 2021, with the cost of living crisis emerging, we commissioned research to identify the impact of rising commodity costs for consumers. This insight was used to review existing and well-established fuel poverty programmes and partnerships to ensure they were fully optimised for the cost of living crisis and included income maximisation and benefit entitlement checks. This revised approach has led to a year-on-year increase of 131.1% more households being supported with energy efficiency and fuel poverty measures. Growing levels of fuel poverty will widen the capability gap for consumers to participate in and benefit from the net zero transition. That's why we have committed to direct support for 50,000 households in fuel poverty over the next five years and are working closely with consumer interest agencies to provide tailored support. As the journey to net zero gathers pace, we will continue work closely with our stakeholders to help those most in need.

### OUR CURRENT SUPPORT INITIATIVES:



Energy Advisory programme in partnership with Citizens Advice Scotland, tackles fuel poverty by improving energy efficiency and income maximisation.



The Fuel Bank Foundation has received support from SSEN for two years, alongside gas distribution networks. This reached over 2,300 customers by January 2022.



The Enabling Fund in partnership with both Warmworks and Centre for Sustainable Energy has provided third parties to support with household tasks that allow efficiency measures - such as loft insulation - to be completed.



Energy Advisor initiative in partnership with CSE, which supported 1,130 households with specialist advice in the past year, 640 of whom were off the gas grid.



Our new Vulnerability Impact Assessment Tool embeds consumer fairness into project decisions from the outset and our Customer Mapping Tool (CMT) identifies off-gas grid areas most at risk from the cost of living crisis.



Our £500,000 annual 'Powering Communities to Net Zero' fund will support LCT accessibility for those in vulnerable situations.

### 3 A DECADE OF NET ZERO INNOVATION

For the past decade SSEN has been exploring the issues associated with our transition to net zero. As a network operator, this work has helped us to build a picture of how patterns of supply and demand will change, how new technology will impact the electricity network and how network design can accommodate the flexibility needs of the future.

More recently, our attention has increasingly turned to the impact of the transition on consumers. This is reflective of the evidence base we have gathered which confirms that changes in consumer behaviour will be the driving force of net zero, and that we therefore have a growing role to play in advocating for consumer needs in a net zero context, particularly those who may find themselves with new energy-related vulnerabilities. The timeline below plots SSEN's journey to net zero so far and demonstrates how we are using technology and innovation to place people and fairness at the very centre of the transition:



## 4 TAKING A LEAD FROM CONSUMERS AND STAKEHOLDERS

As part of the co-creation process for our Business Plan for 2023-28, we engaged extensively with stakeholders over a two-year period, conducting over 250 separate events and roundtables and listening to over 20,000 voices.

How we embed fairness, both in our business plan and the wider energy system, was a common thread throughout, guided by a strategic aim that all our actions 'deliver a positive impact on society'.

Understanding the consumer experience will also be integral to driving the behaviour changes needed to achieve net zero. Whether through domestic market trials, consumer surveys or qualitative workshops, we are building direct consumer insights into our future plans. This includes Citizens Juries, conducted in 2021, where we undertook deliberative discussions to address how fairness could be built in to our Sustainability and Innovation strategies.

The overarching themes gathered from this extensive stakeholder and consumer engagement are outlined below, and form the basis of our forward action plan to help enable a just transition for consumers.



### STAKEHOLDER-LED THEMES FOR A FAIR ENERGY FUTURE:



#### Education and Collaborative Action

Consumer awareness of the benefits of decarbonisation - and the steps required to get there - is low, particular for those most vulnerable. Much more must be done to educate on the practical measures and funding mechanisms that can support consumers, with collaborative effort between industry and policy-makers to ensure fairness is built in.



#### Equal Access to Infrastructure and Services

The scale of change required to reach net zero is huge and will require local action and planning. It is vital this is conducted on a basis of equality and opportunity for all, mitigating financial or social barriers. More must also be done for those with physical barriers to adopting low carbon technologies, with practical steps to provide equal access.



#### Supporting Remote and Rural Communities

Communities of place will be crucial to the success of the net zero transition. This includes communities not to connected to the gas grid and remote areas where an increase in electricity demand can help support wider decarbonisation goals.



#### Tackling Emerging Vulnerabilities

Consumer vulnerability is far from static and, in the road to net zero, existing factors will change and new energy-related barriers will emerge. Regular engagement, partnerships, and innovation must be encouraged and sustained to ensure the policy environment keeps pace with change and solutions evolve to support consumers.

### POWERING CUSTOMERS TO NET ZERO GROUP

As part of the business plan process, we created an independent Customer Engagement Group (CEG) to help embed consumer and stakeholder views into our Plan and provide robust challenge to our proposals. The CEG has become a valued and trusted advisory body for SSEN, so will continue in the form of our newly established 'Powering Customers to Net Zero' Group. This independent panel will offer the same rigorous scrutiny of our work as we continue our journey to net zero to ensure every consumer is considered and accounted for. This will include specific scrutiny of the action plan contained in this report and our wider work on supporting a just transition.

*SSEN has been especially focused on the impact of enhanced network performance and consumer services commitments on rural and off-gas grid consumers, fuel poor and those with reduced access to opportunities for decarbonisation. Delivering a just transition means making a real difference for these consumers in particular.*

*We will continue to encourage SSEN to demonstrate accessibility and affordability of decarbonisation choices for all their customers. There are a number of innovations that should start to deliver benefits in the next few years and we will be very keen to monitor and record how these support their just transition commitments.*

**Tracey Matthews**  
Chairperson  
SSEN Powering Customers to Net Zero Group





## 5 FAIR ENERGY FUTURE ACTION PLAN

Committed and collaborative action from industry, government, and individual organisations such as SSEN, will be vital if we are to achieve a just and inclusive transition to net zero. To guide our ongoing work in advocating for a consumer just transition, we have made a series of commitments as a business with additional recommendations for industry and government to galvanise wider action at national level.

### FAIR ENERGY FUTURE ACTIONS

THEME



#### EDUCATION AND COLLABORATIVE ACTION



#### TACKLING EMERGING VULNERABILITIES

SSEN COMMITMENTS

##### LEAD THE INDUSTRY

Take an industry-leading role in advocating for fairness in the future energy system, ensuring a just transition is embedded in our actions and initiatives.

##### SHARE REAL WORLD LEARNING

Contribute to the development of consumer protections by sharing learnings from active market trials.

##### EMBED CONSUMER INSIGHTS

Proactively engage with consumer interest groups, community organisations and fuel poverty support agencies to raise the issues associated with the consumer just transition and embed direct consumer insights.

##### CULTIVATE INCLUSIVE INNOVATION

We will launch industry leading projects to identify the sections of society most likely to be excluded from the net zero transition and to find credible mitigation strategies to help them realise the many benefits it will bring.

##### IMPLEMENT SAFEGUARDS

Develop tools to forecast energy-related vulnerabilities within local communities, working with trusted partners and academia to understand emerging trends and optimise solutions.

RECOMMENDATIONS FOR INDUSTRY

##### DEFINE ROLE OF NETWORKS

Working with the regulator, define clear lines of responsibility for network operators and what role they can play in supporting consumers to take part in the net zero transition.

##### SIGNPOST INDEPENDENT ADVICE

Consistent and collaborative signposting of routes to independent customer advice and intermediaries to help customers make appropriate choices on low carbon heat solutions.

##### ESTABLISH BEST PRACTICE

Creation of industry-led best practice principles for all DNOs to embed consumer fairness in network design. Use of the 'Smart and Fair' toolkit should become industry standard tool for all network operators when planning projects and developing mitigation strategies to ensure that inclusivity is built in from the outset to ensure all types of households are accounted for.

RECOMMENDATIONS FOR GOVERNMENT

##### STEP-CHANGE IN ENERGY EFFICIENCY

Improving the energy efficiency of UK housing stock is essential to the success of a consumer-led net zero transition. A targeted awareness and education campaign, backed up by tangible funding, needs to happen at scale and pace, starting with those most vulnerable.

##### ADDRESS BARRIERS TO ENTRY

Ensure policies do not inadvertently act as barriers to consumer participation i.e housing sector regulations and building standards, or by focusing on one technology over another. This is particularly important for those in social housing and densely populated urban areas.

##### REDEFINE VULNERABILITY

Recognising the findings of the CSE Smart and Fair report, review how definitions of consumer vulnerability should be updated to reflect potential new risk factors introduced by the transition to a smarter energy system.



The actions have been set out across the four key themes which emerged during our stakeholder sessions: Education and Collaboration; Emerging Vulnerabilities; Accessible Infrastructure; and Remote and Rural Communities. The rapid pace of change in both our operational and societal environments means that we will continually review, enhance and adapt the actions in collaboration with our stakeholders.



## EQUAL ACCESS TO INFRASTRUCTURE AND SERVICES

### ADVOCATE EV EQUALITY

Continue to advocate for accessible EV charging in partnership with DMUK and investigate barriers for a broad spectrum of vulnerable groups.

### CHAMPION WHOLE-SYSTEMS THINKING

Roll out learnings from the RESOP systems trial to all Local Authorities and industry partners to support planning for heat projects and deployment.

### UNLOCK LOCAL FLEXIBILITY

As a neutral market facilitator, unlock the benefits of low carbon technology to a much broader geography of communities by stimulating applications to our flexibility schemes.

### STANDARDISE LOCAL AUTHORITY SUPPORT

Network operators to provide a standardised service to Local Authorities across the UK with expert support for better informed local whole system energy planning to optimise and accelerate equitable access and uptake of low carbon technologies for all households.

### ACCELERATE ENABLING TECH

Recognising the additional benefits smart meters bring to those most vulnerable, government should further accelerate the domestic smart meter roll-out to ensure inclusive participation in smart energy services will be possible, sooner, with a strong focus on replacing restricted meters. Similarly, they must fulfil their Project Gigabit projections for nationwide broadband coverage by 2030, with a credible pathway for the 1% of households not included in the roll out.



## SUPPORTING REMOTE AND RURAL COMMUNITIES

### DEVELOP OFF-GRID FLEXIBILITY

Within our network, 23% of households in our central southern England region and 44% of households in our north of Scotland region are off-grid. We will support off-grid households and island communities with market enabling innovation and encouraging the wind industry to explore new market mechanisms to include residential demand side flexibility.

### SHARE OUR ASSETS

Mitigate digital exclusion by enabling island communities to access and benefit from fibre telecommunications where they are installed in our subsea cables.

### STRATEGIC COLLABORATION ON OFF-GRID

Collaborative industry approach to ensure off-grid households are fully considered in the net zero transition, including co-ordinated campaigns, projects and policy influencing.

### BOOST THE HEAT ROLL-OUT

Target delivery of heat pump accelerators where the benefit will be felt most. Schemes should focus on fuel poor and off-gas grid communities first, helping reduce the barriers to moving away from expensive or unregulated heat sources.

## 6 CREATING A FRAMEWORK FOR FAIRNESS

SSEN was a primary partner of the Smart and Fair research programme which forms the foundation of much of our work in supporting a just transition for consumers. Smart and Fair was created by the Centre for Sustainable Energy (CSE) to address the critical question of how shifting to a net zero energy system can happen whilst considering the needs of energy users, particularly, how the costs and benefits of net zero will be distributed amongst consumers.

The report, published in 2020, revealed stark realities about the potential trajectory of fairness in a smarter energy system, and in doing so, proposed the kind of interventions needed to ensure costs and benefits are distributed fairly.

This analysis was 'greenfield' in nature, smart energy services are still an emerging market and uncertainties persist around future charging mechanisms and the types of benefit that different consumer groups can expect.

### SMART AND FAIR REPORT KEY FINDINGS:

- **The consumer capabilities and attributes** that will be needed to take up smart energy services
- **The types of smart energy services** that are/may be on offer and how they create new categories of unfairness and vulnerability
- **Recommendations to policy-makers, regulators and practitioners** to facilitate a smart and fair transition for consumers

### CAPABILITY LENS

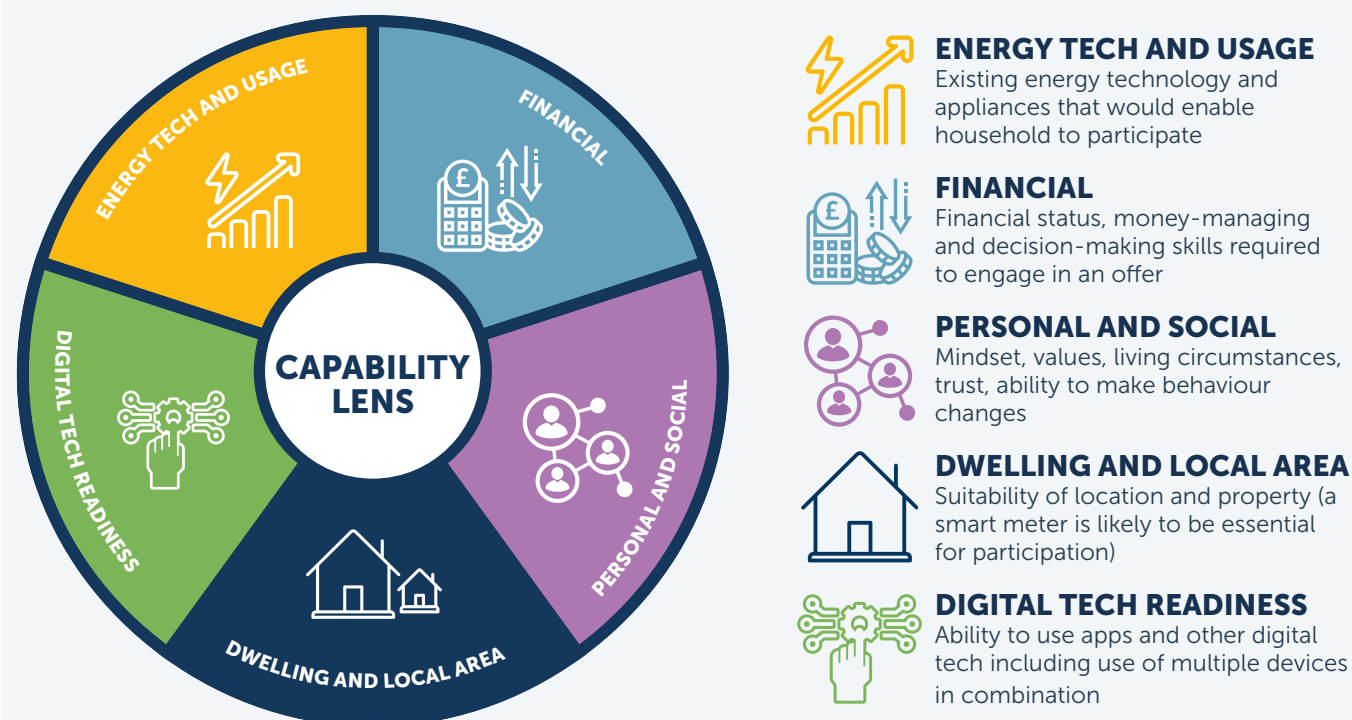


Figure 1: Capability Lens

Smart and Fair developed a framework of three interdependent tools that would help energy practitioners to determine the relative accessibility of emergent smart energy services for consumers. The creation of this framework involved extensive research and two workshops held with 60 sector stakeholders and industry specialists.

The first of the tools, the **Capability Lens** (Figure 1), sets out six key characteristics which dictate a household's suitability, ability and willingness to participate in a smart energy service. The **Offer Profiling Tool** then applies these six capabilities to individual smart energy services to assess what 'types' of consumer can make use of them. Finally, the **Consumer Classification Model**, an address-level dataset profiles households based on their energy efficiency, type of heating system, broadband speed, estimated gas/electricity use, as well as a range of socio-economic factors.

In terms of the 'when', the Technology Adoption Curve (Figure 2) can be overlaid with the Consumer Classification Model to build a picture of how the density of consumer participation could evolve over time.

### WHEN IS 'FAIR'?

Smart and Fair makes it clear that as we work towards a smarter energy system and net zero, 'fairness' will not happen straight away, this is inevitable...and conversely, better for consumers in the long run. Innovation, as the main driver of net zero, is inherently propelled by a smaller number of participants at the outset. Those who have an appetite, and can afford, to change their behaviours and lifestyle. We need these 'pioneers' because they help to refine the new services on offer through a process of trial and error which in turn reduces the risk factor for more vulnerable participants further down the adoption line.

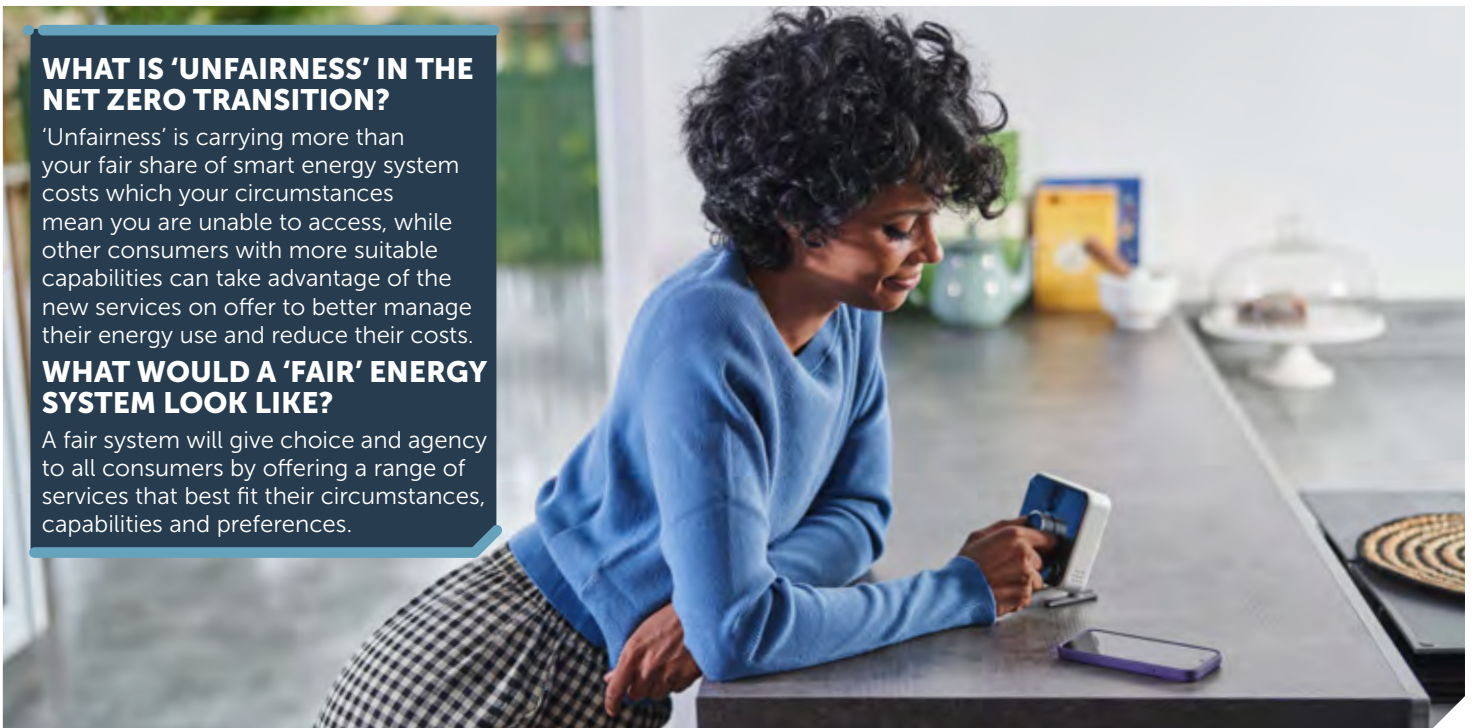


## WHAT IS 'UNFAIRNESS' IN THE NET ZERO TRANSITION?

'Unfairness' is carrying more than your fair share of smart energy system costs which your circumstances mean you are unable to access, while other consumers with more suitable capabilities can take advantage of the new services on offer to better manage their energy use and reduce their costs.

## WHAT WOULD A 'FAIR' ENERGY SYSTEM LOOK LIKE?

A fair system will give choice and agency to all consumers by offering a range of services that best fit their circumstances, capabilities and preferences.



## TECHNOLOGY ADOPTION LIFECYCLE

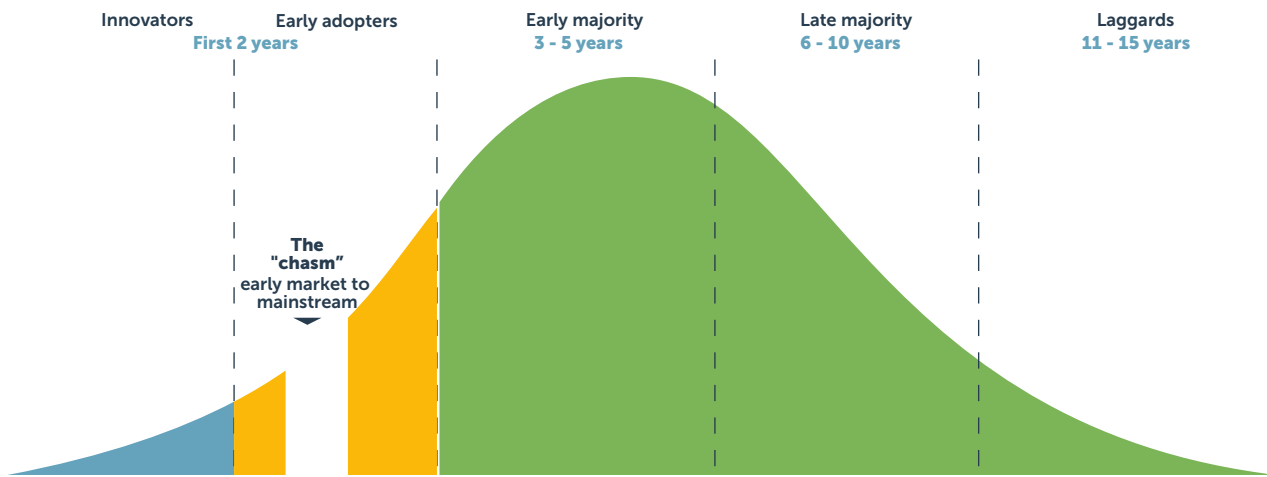


Figure 2: Technology Adoption Curve (Rogers, Everett. 1962. Cited in CSE's Smart and Fair?)

The Smart and Fair framework allows energy practitioners to understand more about who is most likely to benefit from the future energy system and who is not. In particular, it can identify what kinds of vulnerabilities mean consumers are less likely to be able to engage with smart energy services sooner. Often these will be what are considered to be 'new' energy-related vulnerabilities such as slow broadband or poor mobile signal (and notably the majority of consumers in the 'Laggards' and 'Late Majority' phases live in remote and rural areas where mobile signal and broadband is poor).

## RECOMMENDATIONS FOR PRACTITIONERS

In its conclusion, Smart and Fair sets out a series of 21 recommendations for BEIS, Ofgem and energy system practitioners including suppliers, network operators, smart energy innovators, consumer support and advocacy agencies which will support an inclusive consumer transition to net zero. Several of these recommendations relate to network operators specifically, which SSEN has already taken definitive action against:

SMART AND FAIR RECOMMENDATION	SSEN ACTION
Ensure that the interests of current and future generations of consumers are reflected in advocacy for better consumer protections to enhance participation in smarter energy markets	SSEN is taking a leadership role in advocating for fairness in the future energy system, this report is testament to the importance SSEN places on giving voice to the issues that face consumers in engaging positively with the net zero transition
Actively and constructively engage with initiatives to pilot and test interventions to increase and widen participation in smart energy services	Through Project LEO, SSEN is collaborating on a number of market-based trials to better understand 'real world' smart energy scenarios (see page 16)
Use innovation allowances to design, test and evaluate interventions to enable wider participation in smart energy initiatives associated with innovative approaches to network management	SSEN is applying for Strategic Innovation funding to implement a package of new projects that will support consumers to take part in smart energy services (see page 14)

# HOW INCLUSIVE ARE SMART ENERGY SERVICES?

A set of five smart energy services were analysed using the Smart and Fair capability toolkit. SSEN anticipates these services may be of greatest interest to consumers in future, although the opportunities will be provided by third parties.

SERVICE	SERVICE DESCRIPTION	REQUIREMENTS FOR PARTICIPATION	MOST LIKELY TO BENEFIT
 <p><b>DYNAMIC TIME OF USE TARIFF</b></p>	Households can already sign up to energy tariffs which incentivises them to increase or decrease electricity use at key points during the day. In future, a ToU tariff would be updated daily and be accessible via a smart phone app.	<ul style="list-style-type: none"> <li>• Digital literacy (smart meter, phone)</li> <li>• High speed broadband and mobile phone connection</li> <li>• Ability to flex energy use (see CROWDflex project on page 14 for real world testing example)</li> <li>• Trust in energy suppliers</li> </ul>	Households who are digitally engaged and consumers who have greater ability to flex use of devices e.g EV or battery.
 <p><b>ENERGY STORAGE AS A SERVICE</b></p>	Households are paid to host a battery that is installed and managed by an aggregator. The battery provides flex service to the network, being charged at times of low demand / high supply and being discharged during peak to mitigate the household's consumption at that time.	<ul style="list-style-type: none"> <li>• Digital literacy (smart meter, phone)</li> <li>• Sufficient space to store a battery</li> <li>• Trust in energy suppliers</li> </ul>	Home owners in larger properties (to accommodate the battery) and with higher electricity use that falls in the peak, which they are unwilling or unable to flex.
 <p><b>EV SMART CHARGING WITH TIME OF USE TARIFF</b></p>	Electric vehicle (EV) owners will be able to sign up to an energy tariff bundle which includes a smart EV charger and a mobile phone app, allowing users to set specified charging schedules. The will allow owners to charge when electricity is cheaper.	<ul style="list-style-type: none"> <li>• Digital literacy (smart meter, phone)</li> <li>• Reliable broadband</li> <li>• EV ownership/lease</li> <li>• Off street parking</li> <li>• A private charging point or the ability to have one installed on their property</li> </ul>	Drivers able to afford an electric vehicle, with a predictable yet moveable energy use profile. They may also be attracted by the ability to charge when electricity is particularly low carbon.
 <p><b>PV STORAGE ISLAND</b></p>	Householders purchase and install a PV system. An integrated battery storage unit is paid for and installed by an aggregator. The aggregator buys the surplus electricity generated by the PV system from the householders and then controls when the battery storage unit discharges (e.g. at times of peak value).	<ul style="list-style-type: none"> <li>• Suitability of property for PV</li> <li>• Space to install a battery storage system</li> <li>• Sufficient funds to install a PV system</li> <li>• Good credit rating</li> </ul>	Owner occupiers rather than renters.
 <p><b>V2G EV LEASING</b></p>	The vehicle-to-grid (V2G) leasing bundle includes leasing a V2G electric vehicle, a smart charger, an app to control the charging schedule, signing up to a time of use tariff and installing a smart meter (if households do not already have one). When plugged in, EVs can export electricity back to the grid at peak times and charge their batteries when grid demand is low (e.g overnight).	<ul style="list-style-type: none"> <li>• Digital literacy (smart meter, phone, interaction with app)</li> <li>• Reliable broadband</li> <li>• EV ownership/lease</li> <li>• Off street parking</li> <li>• A private charging point or the ability to have one installed on their property</li> </ul>	Those able to afford an electric vehicle, with a flexible lifestyle that allows them to shift charging times. This is likely to work best in areas with network constraints.





## WHAT HAVE WE LEARNED FROM THIS?

Smart and Fair profiled these five smart energy services against the capabilities of all households in England. The resulting analysis suggests that approximately half of English households would be willing or able to take up at least one of the services, leaving the other 50% of the population unable or unwilling to participate in any smart energy service set out in the table on page 12.

Some of the particular attributes of the nonparticipation group were striking in this context. These households are characterised by high fuel poverty rates, low average household income, and the highest proportion of social housing tenants. Consumers in this group are also more likely to include those reporting financial stress, those without formal qualifications and those with severe health conditions. Using Smart and Fair's definition of vulnerability, the majority of this group would be considered 'vulnerable' in a smart energy context. Even when certain mitigations were applied to this group, only a further 8% were then able to participate in one of the services.

In the future energy system, an inability to participate as a result of the conditions set out above could create further social and economic equalities for these consumers, particularly if they must carry a relatively larger share of system costs in contrast to those able to take up financially advantageous energy services.

While this paints a potentially negative outlook, it is important to remember that this modelling is largely theoretical and based on these initial smart energy services only. A diverse range of new services will likely emerge, with a much greater range of accessibility. However, this will not happen on its own and is likely to require significant interventions at a higher level to implement them.

## SMART AND FAIR DEFINITION OF VULNERABILITY

The purposes of developing Smart and Fair, vulnerability was defined as one or more of the following criteria:

- Being on a low income (less than 60% of median household income).
- Being in bad or very bad health.
- Being in fuel poverty.

## WHO IS RESPONSIBLE?

A frequent question raised by Smart and Fair is 'who is responsible for ensuring fairness?'. For smart energy service providers, it is a difficult balance to ensure the energy service is viable, whilst also making the service inclusive for everyone. And as the report makes clear, so many of the attributes required to engage with smart energy services are dictated by a consumer's housing, income, and technology - which is beyond the control of the market.

It is therefore surmised in the report that, alongside interventions from energy practitioners, achieving fairness in the future energy system will require effort from 'beyond the normal scope of the energy system' - from changing landlord regulations to rolling out rural high-speed broadband, it will be a collective cross-sector effort to enact the mitigation strategies needed.

## THE NEED FOR INTERVENTION

The Smart and Fair report proposes three key intervention strategies that would successfully mitigate barriers to participation:

- **Fill in capability gaps**  
Offer grants or loans for smart technologies, under-write technology/ service performance to reduce perceived risks, and provide easily accessible advice to help consumers make informed choices.
- **Adapt the system and energy services**  
Introduce lower thresholds for demand response services, and by compelling policy makers to review private and social landlord regulations to allow tenant participation.
- **Infrastructure outside the energy system**  
Some of the biggest barriers faced by consumers involve out-of-date infrastructure that needs to be modernised (high speed broadband and 4G mobile signals).



Opportunities like Time of Use Tariffs will unlock savings for consumers but only if the tools needed to participate can be accessed

## 7 INNOVATING FOR AN INCLUSIVE ENERGY FUTURE

Ofgem has emphasised a key focus for DNOs is to encourage positive and inclusive innovation benefiting consumers with vulnerabilities, including new energy-related vulnerabilities that are becoming more prevalent.

The Smart and Fair report echoes this petition, calling for energy practitioners to use innovation allowances to design, test and evaluate interventions to enable wider participation in smart energy initiatives associated with innovative approaches to network management.

Our current innovation portfolio has been strongly influenced by this recommendation, with a package of Strategic Innovation projects in the pipeline that will support potentially excluded consumers to take part in the net zero transition.



### CROWDflex

In 2022, SSEN partnered with National Grid ESO, Octopus Energy and Ohme on the CROWDflex project. This was the largest domestic flexibility study ever undertaken in the UK, assessing how the impact of EV charging, heat pumps, and other emerging low carbon technologies on customers electricity bills can be reduced when consumers participate in domestic flexibility. The 25,000 participating households represented the full breadth of household types and market segments in the UK. The data collected assessed the opportunities created in the net zero transition for properties with high to low energy efficiency ratings, homes in rural and coastal locations, and across Scotland and England's cities. It also highlighted the ways in which domestic demand side response can reduce energy bills, carbon footprints, and create new revenue streams for households. Those on ToU tariffs significantly reduced their evening peak demand by 15-17%, maintaining that reduction over six months. Households with an EV showed greater ability to flex demand, achieving reductions of up to 23% of their daily demand during the evening peak.



### HOMEflex

HOMEflex (Household Or Microbusiness Energy flexibility) will build on the learnings from CROWDflex, while responding directly to the findings of the Smart and Fair report, to address fairness in the smart energy services marketplace by embedding inclusive practices from the outset. It will achieve this by developing a Code of Practice for Domestic Flexibility Services, including a framework and business case for an accompanying Compliance Scheme. HOMEflex will ensure the domestic flexibility market has clear lines of accountability to ensure smart energy service providers abide by their commitments and to guarantee customers are protected and rewarded. It will also benefit flexibility service providers, who will be able to demonstrate their credibility to customers.



### Vulnerability Future Energy Scenarios

The Vulnerability Future Energy Scenarios (VFES) will identify consumers in vulnerable positions and forecast how those communities and their needs may change in the transition to net zero. VFES seeks to better understand how societal changes will give rise to new forms of vulnerability in the future and allow us to develop tools to identify which customers and communities are most likely to be impacted, and in what way. The project will test for the first time if combining these will give a clearer, and more reliable, forecast of Vulnerability Future Energy Scenarios which can be used to provide insights to allow for appropriate solutions to be developed. The VFES will build on the annual publication of SSEN's Distribution Future Energy Scenarios (DFES), which are scenario forecasts of future energy supply and demand that help SSEN to understand how customers' use of the network is likely to change. The VFES by comparison, will focus on customers and communities and deploy foresighting, machine learning and expert validation to test whether a reliable forecast of vulnerability trends can be developed. The aim is to support better-informed operational practices and investment planning which in future will be able to take vulnerable communities into account.



### Harnessing smart meter data for social good

Working with industry partners we are looking to utilise information from smart meters alongside other social data to identify people who would benefit from greater support, more accurately than ever before. Working with carefully selected partners, the project will then identify avenues of help which could be delivered by the local authority or a third party, where appropriate. The focus will be on the decarbonisation of heat and transport for the rural and fuel poor consumers, or those with other forms of reduced access to the opportunities of decarbonisation.



### Trialling Vehicle to Home (V2H) technology

We are forming partnerships to trial V2H technology with the following aims:

- Understand and define the DNO and consumer requirements during an outage and consumer willingness to take up of the V2H technology.
- Enable better understanding of how V2H could be utilised during and following outages, and considerations needed for cold start events via small real life trial of the V2H technology.
- Understand business model for V2H, end to end value chain for all participants and identify opportunities for revenue stacking.
- Assess regulatory and policy barriers and possible commercial models for implementation of V2H and deployment at scale.
- Understand the interface and comms needed for customers to fully utilise the capabilities of their V2H setup during an outage and for DNOs to communicate with customers.





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## 8 CASE STUDY: ROSE HILL OXFORDSHIRE

SSEN is a founding partner of Project LEO (Local Energy Oxfordshire), a collaborative initiative between SSEN, Low Carbon Hub, Oxford Brookes University, and multiple other partners which seeks to understand how the future energy system will operate in practice. Since 2019 Project LEO has been undertaking pioneering market-based trials to assess how increased take up of electric vehicles, small-scale renewables, batteries, and flexible smart technologies will impact the electricity network by simulating real demand-side scenarios, and building an evidence base to inform policy decisions.

Rose Hill Smart and Fair Neighbourhood is one of the trials underway as part of Project LEO. Rose Hill is a largely residential community with approximately 3,400 residents in the south-east of Oxford. Parts of the estate are in the most 20% deprived nationally, with high domestic electricity and gas consumption, and fuel poverty levels above the national average.

Oxford Brookes university carried out spatial analysis of Rose Hill in 2022 to provide data that could be used to help inform the creation of an initial community 'roadmap' to determine the best options for its residents to benefit from new smart energy services and achieve net zero. Local Area Energy Mapping (LEMAP), a tool being developed by the university, and the Capability Lens created as part of the Smart and Fair project, were used to inform the analysis.

The results contributed towards the rich data profile which is needed to reveal the unique characteristics of a defined locality in terms of its baseline energy use, energy resources and potential for low carbon technology adoption.

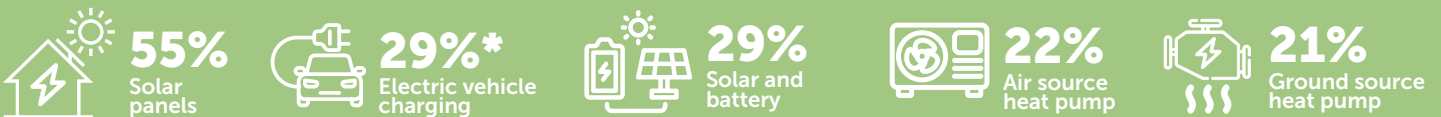
This data is important because it has the potential to:

- Support the creation of bespoke smart energy offers to reflect the particular needs of the community
- Allow stakeholders (local authority, community energy project developers) to tailor their plans for smart and fair initiatives at Rose Hill
- Develop an energy needs profile to inform SSEN's design of the local electricity network in the flexible system of the future



Rose Hill Oxfordshire

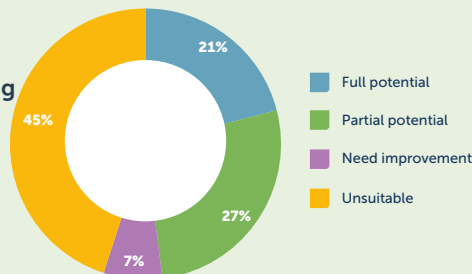
### LEMAP PREDICTION OF ROSE HILL DWELLINGS SUITABLE FOR LOW CARBON TECHNOLOGIES



An analysis of likely capabilities relating to the uptake of low carbon technologies by Rose Hill residents based on geo-demographic profiling:

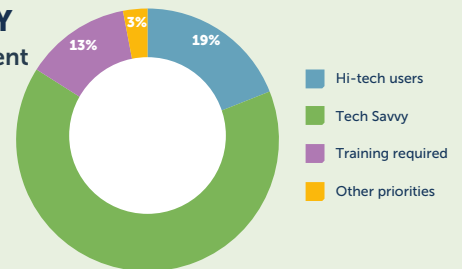
#### TECHNICAL CAPABILITY

Suitability of dwelling type and location



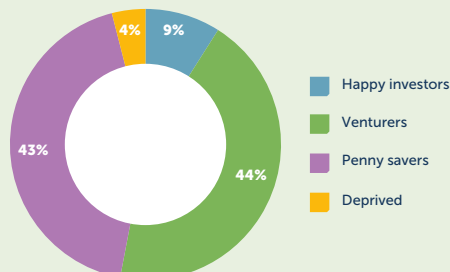
#### DIGITAL CAPABILITY

Level of digital engagement (use of smartphones, computers, broadband)



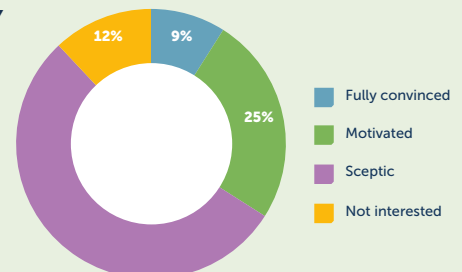
#### FINANCIAL CAPABILITY

Ability to invest, take financial risk or access to funding



#### SOCIAL CAPABILITY

Motivation, skills and awareness to understand the value low carbon technology could bring to their lifestyle





## 9 EMPOWERING RURAL COMMUNITIES

SSEN's operational area covers some of the most remote and challenging locations in the UK, including 59 islands in our north Scotland network alone. This puts us in a unique position as a DNO, with an additional role to play in empowering remote and rural communities to be fully included in the net zero transition.

### SHARING OUR ASSETS

As determined in the Smart and Fair Capability Lens, location is a key determining factor in a consumer's ability to participate in the smart energy system. Coupled with this is the propensity for remote and rural areas to have poorer broadband speeds which is primary requirement for most smart energy services. Recently we have gone beyond our traditional DNO activities, partnering with Shetland Islands Council to use the fibre in our subsea cables to connect the island communities of Yell and Unst with superfast broadband for the first time.

We believe this model could be rolled out to other islands, not only creating benefits such as economic development, education, healthcare, and addressing depopulation, but also removing a key barrier to net zero participation.

### ENERGY SECURITY FOR REMOTE COMMUNITIES

Another issue that is particularly acute for our remote communities is security of supply. A lack of energy resilience should not become an additional barrier to participate in the net zero transition. The Resilience as a Service (RaaS) project, led by SSEN, Costain and E.ON, seeks to develop an innovative solution to improve energy security in our most rural and remote areas. The £9.5m project which will run until 2025, aims to combine battery storage with local energy resources to provide low carbon, cost effective network resilience in response to electricity faults. This innovative concept will deliver low carbon, cost effective network resilience to improve security of supply for communities in areas more susceptible to power cuts. Reliable electricity supply will increasingly become more critical for remote communities as we move to alternative low-carbon technologies and electrify the energy system.





## 10 HEAT AND TRANSPORT: THE TWIN CHALLENGE

The twin challenges of decarbonising heat and transport have often been described as the key to unlocking net zero, but what was once a distant prospect is now a very present reality.

### UNIVERSAL ACCESS TO EVS?

The UK Government's Ten Point Plan for a Green Industrial Revolution sets out a commitment to stop the sale of new petrol and diesel vehicles by 2030 and the sale of hybrids by 2035. To meet these ambitious targets, the growth in electric vehicles (EVs) has been exponential in recent years and is set to continue rapidly over the coming decade. Likewise, charging infrastructure is being rolled out across the UK at pace.

As one of the primary enablers of the EV revolution, SSEN is investing in infrastructure and innovative technology to accommodate the influx of charging points that connect to the electricity network. We believe the decarbonisation of transport is a vital component in achieving net zero, however, we also recognise that we cannot advocate for the mass roll out of EVs without acting responsibly to ensure everyone will benefit.

On pages 19-20, we will detail some of the issues facing disabled drivers which we explored in our recent Equal EV project. SSEN's understanding of consumers with a vulnerability means we are well placed to communicate their needs to the wider EV charging industry. The challenge is to ensure joined-up thinking so that strategies for consumers with a vulnerability and EV initiatives are linked.

It is important to note that while the Equal EV project focused on two key vulnerable groups, the enablers and barriers for the widest range of potentially vulnerable customers must be understood in order for mass scale EV take up to be successful and inclusive. For example, the needs of elderly people, those in remote rural areas, and drivers who may have difficulty understanding new technology (such as those who cannot speak functional English, drivers with learning difficulties and those who are digitally disengaged) must also be accounted for.

### ELECTRIFYING HEAT: COMPLEXITY AT THE CORE

The UK Government has set a date of 2035 from which point the installation of gas boilers will be phased out with a UK objective to have 600,000 heat pumps being installed per year by 2028. To meet this ambition, zero emissions heating systems must be rolled out exponentially - which in Scotland alone would mean that over one million homes and the equivalent of 50,000 non-domestic buildings must be converted to zero emissions heat by 2030.

The scale of this challenge cannot be underestimated and will not be solved with a single form of technology. There are currently a relatively small number of homes on low carbon heating systems, including Air Source Heat Pumps (ASHP), Ground Source Heat Pumps, Solid biomass fuelled heating systems (including wood pellets), and biofuels. Although these low carbon options tend to be more cost efficient in the long run, they represent high upfront costs which which may represent a real barrier for many households without significant funding support.

Furthermore, these technologies must be fitted with smart functionality so they can respond to requests from DNOs to manage demand across the electricity network. As highlighted in the Smart and Fair report, this requires certain capabilities that not all households possess.

As a DNO we are examining how the electricity network can enable, rather than hinder, widescale adoption of low carbon heat solutions. Particularly for our north of Scotland network area, which has the highest percentage of off-grid gas properties in the UK.

On page 21, we will detail some of the innovation projects underway to support a fair transition to low carbon heating.



# THE EQUAL EV PROJECT

There are over 2.3 million disabled parking badge holders in the UK, with approximately 630,000 vehicles registered through the Motability Scheme - a scheme focused on vehicle leasing for motorists with disabilities and their care providers. The potential difficulties that drivers with disabilities, particularly those with mobility impairments, will face in engaging with electric vehicles have begun to be recognised but steps to mitigate the unfairness that may arise have been slow to develop.

Moreover, Motability estimates that up to 50% of all drivers or passengers with a disability are expected to be partially or wholly reliant on public EV charging infrastructure yet disabled EV parking spaces are scarce, with the UK's first disabled EV parking space installed as recently as January 2019.

In October 2020 we launched Equal EV, a Network Innovation Allowance (NIA) funded project in collaboration with Disabled Motoring UK (DMUK) to identify the enablers and barriers for

EV adoption for drivers with disabilities, and to recommend traditional and innovative solutions for making EVs and EV infrastructure more accessible. The project also investigated the role DNOs can play in supporting disabled drivers, specifically what support and new services could be made available, such as installing V2G technology to offer at-home resilience for vulnerable customers.

The Equal EV project focused on two key vulnerable groups – those with mobility impairments and those with high levels of anxiety.

Many of the major pain points expressed during the workshops were those that are common to all drivers regardless of circumstances i.e cost, range anxiety and public charging point availability. However, there were several issues raised that were unique to the particular needs of the two vulnerable groups interviewed:

BARRIER TO PARTICIPATION	BARRIER DESCRIPTION	POTENTIAL MITIGATION
<b>LACK OF INFORMATION ON EVS AND ACCESSIBLE CHARGING</b>	<ul style="list-style-type: none"> <li>• Shortage of readily available information to encourage drivers with a mobility impairment to switch to an EV (especially for those that don't qualify for help from Motability or similar companies).</li> <li>• Without more widespread knowledge of and exposure to EVs, assumptions that EV charging isn't practical for disabled drivers will be difficult to address.</li> <li>• Digitally disengaged drivers are unlikely to be exposed to information about EVs and so other methods (such as more prominent signage in charging zones) need to be considered.</li> </ul>	<ul style="list-style-type: none"> <li>• Create an industry-agreed (ENA, Energy UK, automotive industry body like SMMT) knowledge hub and EV accessibility information pack including DNO Priority Services Register info.</li> <li>• Partner with EV manufacturers, Motability, dealerships and installers to promote.</li> <li>• Challenge existing charging apps to become more accessible for language accessibility and other barriers.</li> </ul>
<b>LACK OF DISABLED PUBLIC PARKING SPACES EQUIPPED WITH EV CHARGE POINTS</b>	<ul style="list-style-type: none"> <li>• Disabled EV charging bays are very scarce.</li> <li>• Few standard public charge points have been designed with the needs of people with mobility impairments in mind - they are unlikely to have dropped kerbs and may have impact-barriers around them making access difficult.</li> <li>• EV parking spaces are also not usually as large as disabled (Blue Badge) parking spaces.</li> </ul>	<ul style="list-style-type: none"> <li>• Collaborative effort is needed between local authorities, parking space owners/operators and charging point operators to make public charging points more accessible including making EV charging spaces the same size as Blue Badge spaces.</li> </ul>
<b>ISSUES WITH DOMESTIC CHARGING</b>	<ul style="list-style-type: none"> <li>• Potentially insufficient room to manoeuvre a wheelchair around the car to access the charge point and vehicle connection point.</li> <li>• If there's a power cut you would be unable to charge your car, during a health emergency this could be problematic.</li> <li>• Cost of installing an accessible domestic charger.</li> </ul>	<ul style="list-style-type: none"> <li>• Charging cables coming from higher access points so they aren't on the floor.</li> <li>• Having a charging insurance package that means car always charged to a minimum level (i.e. link with Charge Fairy or similar service).</li> <li>• Home chargers are key for many people but need to be more affordable or subsidized for those with additional needs. Motability offer this but awareness is low.</li> </ul>





## EQUAL EV NEXT STEPS

The insights gained from the Equal EV workshops demonstrate the additional considerations that disabled drivers must contemplate before considering switching to an EV – even beyond shared concerns around cost and range.

To enact real progress towards an inclusive and equitable EV roll out, a collaborative cross-industry approach with regulatory intervention at local and national government level and the commitment of the automotive industry to make positive inroads towards better accessibility, must happen collectively.

As a DNO, there are service improvements we can make and innovations we can explore that go some way to addressing the barriers that preclude disabled drivers from taking part in the EV revolution.

Through our Priority Services Register (PSR), we support people with a vulnerability or disability who are likely to be disproportionately affected by disruption to their home electricity supply. They may have additional electricity needs (e.g. powering medical or mobility equipment or requiring extra heating) and they may be less able to manage the impact of a power cut for numerous reasons. This important data puts SSEN in a good position to support disabled drivers as they transition to decarbonised transport.

During the workshops, the potential for the PSR to provide additional assistance for disabled EV drivers was discussed in detail. Specifically, what support that could be made available during a power cut when an inability to use transport when needed would make disabled EV drivers particularly vulnerable.

In actioning the insights gathered during the workshops, we are investigating the viability of adapting emergency welfare vans for mobile EV charging and are exploring options for engaging an official emergency EV partner during power cuts. This partnership would allow us to help PSR customers charge their car during a power cut, ensuring they would be able to travel if necessary.



## VEHICLE TO GRID TECHNOLOGY

Another potential mitigation raised during the Equal EV project was V2G technology. Vehicle to Grid (V2G) and Vehicle to Home (V2H) enable an EV battery to be charged when the price of electricity is low, and discharged to sell electricity back to the grid, or to provide power to the rest of the home, when electricity prices are high. This reduces a customer's energy costs and helps to manage demands on the electricity grid. This solution would give drivers with a mobility impairment peace of mind that the energy stored in their EV could be used to power their mobility aids, medical equipment, and other domestic needs as necessary.

It could, in addition, provide extra support for V2H adoption to households on the PSR, such as a grant or other subsidy to facilitate V2H adoption for these households given their additional vulnerability and domestic needs in power cuts.

SSEN hope to trial V2H technology through a new innovation project due to commence in 2023. The project will enable better understanding of how V2H could be utilised during and following power cuts to support vulnerable consumers, via small real life trials of V2H technology. More information can be found on page 14.

## WHAT PROGRESS ARE WE MAKING TO ENABLE EQUAL EV ACCESS?

- In 2019 SSEN entered a £7.5million strategic partnership with Transport Scotland and SP Energy Networks (SPEN) to deliver more electric vehicle charging points in Scotland with a specific focus on delivering inclusive universal access.
- Following engagement with the Equal EV project team and UK Government, a commitment to improve accessibility at public charge points for disabled users was included in the UK Electric Vehicle Infrastructure Strategy.
- The Equal EV project fed into the creation of the British Standard Institution (BSI) PAS 1899, a new specification on accessible public charge points for EVs covering the design of charge points, including the location spacing and surrounding environment, as well as the appropriate information, signals and indicators to be provided.
- Disabled Motoring UK (DMUK) has launched a parking standard called the Disabled Parking Accreditation (DPA) which signposts off-street car parks that are accessible to disabled people and will soon include a dedicated section on EV charge point provision.
- We are applying to Ofgem's Strategic Innovation Fund to assess the regulatory and policy barriers and possible commercial models for implementation of V2H and what device interface and comms are needed for customers to fully utilise the capabilities of their V2H setup during a power cut.
- SSEN is collaborating with the industry to implement the solutions identified by stakeholders, such as exploring the implementation of charging services for PSR customers in outages.



## TRANSFORMING HEAT

The complexity of the heat challenge means that the transport revolution has inevitably gained greater traction in recent years, with supportive policy and mature technology propelling faster EV adoption and scrutiny of the accessibility issues surrounding it.

While we are earlier in our journey to decarbonise heat, we have undertaken collaborative research to better understand the issues that face consumers in adopting low carbon heating, and are applying whole system insights to support more inclusive planning.

### AN ELECTRIC HEAT PATHWAY

It is often assumed that any electrified heat pathway is based around the use of heat pumps, but due to practical constraints around retrofitting existing properties, they have limited suitability for smaller or poorly insulated homes. An alternative to heat pumps is smartly controlled electric storage heating which could enable consumers to benefit from the use of electricity at off peak rates (typically overnight).

A report produced by SSEN and Grid Edge Policy examined the opportunities presented by the use of storage heating as a viable alternative to heat pumps, and the changing role DNOs may need to play to provide flexibility services to ensure value when adopting this type of technology. The report determined that storage heating with smarter controls could offer a suitable solution for many properties where heat pumps are unsuitable due to space, higher upfront costs and home efficiency (heat pumps are less efficient in poorly insulated homes). The report also noted that properties with storage heaters are overwhelmingly lived in by more vulnerable households on lower incomes who can be pushed into fuel poverty by the higher running costs of existing legacy electric heating systems. The report therefore recommended that a progressive strategy for these households should be a priority to ensure a fair transition to net zero.

The learnings from this project are being used to understand the specific impacts of flexible heating demand and to build safeguards for vulnerable customers when alternative technologies are being considered. Since the report was published, SSEN have included smartly controlled storage heating as one of its heat decarbonisation scenarios as part of the 4D Heat project. SSEN has also raised the issue with the Scottish Government through their Heat Electrification Partnership.

## 4D HEAT

4D Heat analysed an off-gas grid area in Skye to explore the benefit that electrified heating could deliver by matching flexible demand from domestic heat to occasions when wind farms were generating more energy than could be carried across the transmission network. The project found that if 4D Heat were scaled up across the parts of Scotland which are off the gas grid, by 2030 the programme could deliver a further £2m per year in social and environmental benefits, and save households 18% on their annual energy bill. These findings will help inform how we work with stakeholders across the energy market in the transition to decarbonised heat, particularly focusing on vulnerable customers who are currently more likely to be dependent upon electric heating.

## RESOP

Regional Energy System Optimisation Planning (RESOP) is a new tool that will help local councils to make better informed decisions about the location of low carbon infrastructure. The tool will incorporate social demographics and network data and can be broadened out to include information from gas and water utilities to provide council planners with whole system insights. This should make it easier for local authorities to plan future heat projects and other clean technologies with a clearer understanding of specific smart energy capabilities in their communities. We are trialling this with Oxford City Council, Oxfordshire County Council and Dundee City Council, ensuring the specific challenges of differing geographies are accurately mapped.

## RE-HEAT

The Re-Heat trial is installing 150 heat pumps in homes across Scotland, which will be connected to thermal storage units. Using smart grid controls and smart heating management with domestic heat storage, consumers will be able to be more flexible in the times they use electricity for heating. The project will also help identify the technical solutions that not only accelerate the deployment of low carbon electrified heating, but also reduce demand on the electricity network, in turn reducing or removing the need for traditional network reinforcement. More cost-effective network management benefits all customers, by reducing the impact on customer bills.



*The first Re-Heat heat pump installation underway in Inverness in November 2022*

## SEEKING YOUR VIEWS ON A FAIR ENERGY FUTURE

**SSEN IS AMBITIOUS FOR A JUST TRANSITION. WE ARE DETERMINED THAT IT SHOULD SHAPE THE FUTURE OF NET ZERO - A FUTURE IN WHICH SSEN IS A VITAL ENABLER.**

In this report we have set out the challenge of net zero, the work we are undertaking to understand how to make the transition 'just' for consumers, and an overview of the stakeholder engagement and projects informing our Consumer Just Transition Action Plan on pages 8-9.

Our work to date has put us in a strong position to understand some of the possible barriers to a 'just' transition and our Action Plan looks to address these barriers with clear business commitments for SSEN and additional recommendations for industry and government.

Please do get in touch to share your views on our progress or if you have suggestions for any additional activities that would support the just transition. We will continue to adopt an 'open book' approach, sharing knowledge and expertise with a wide spectrum of stakeholders to build a better collective view of the key challenges and solutions and will encourage our peers and partners to follow suit.

We hope that this report will act as a catalyst to stimulate further conversation around the challenges of achieving an equitable net zero for consumers and we welcome the views of our stakeholders and communities on our action plan as we continue to shape our thinking in this space.

**You can contact us at [stakeholder.engagement@sse.com](mailto:stakeholder.engagement@sse.com)**









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