



INNOVATION
ZERO WORLD
CONGRESS

Whitepaper



SCALING FLEXIBLE, CONSUMER-LED GRIDS

Working Group Summary Report

Hosted by Laura Sandys CBE at Innovation Zero World Congress
May 2025

Executive Summary

As the UK accelerates toward its Clean Power 2030 and net zero goals, one truth is becoming clear: flexibility is not a side-feature of the energy transition but the bedrock of the future grid. With demand-side flexibility targets of 15GW by 2030 (and up to 50GW by 2040), consumer-led solutions need to scale fast if their economic and environmental benefits are to be unlocked at the pace required.

To meet this challenge, we require a systemic shift from siloed, incremental actions to coordinated, cross-sector delivery. This is what the 'Scaling a Flexible, Consumer-Led Grid' working group, held during the Innovation Zero World Congress in April 2025, hoped to facilitate.

Convened by Laura Sandys, 31 leaders from across the UK energy system met to define the actions needed to operationalise consumer-led flexibility at scale. They developed 14 priority actions across four themes: Create policy & regulatory coherence; simplify consumer participation; accelerate deployment of digital infrastructure; and innovate market design & operation.



Recommendations for DESNZ, Ofgem & NESO

The recommendations below further reinforce those published in ADE: Demand's upcoming report 'Consumer-Led Clean Power: How to Unlock Consumer-Led Flexibility for Clean Power 2030'.

DESNZ | Lead from the Centre

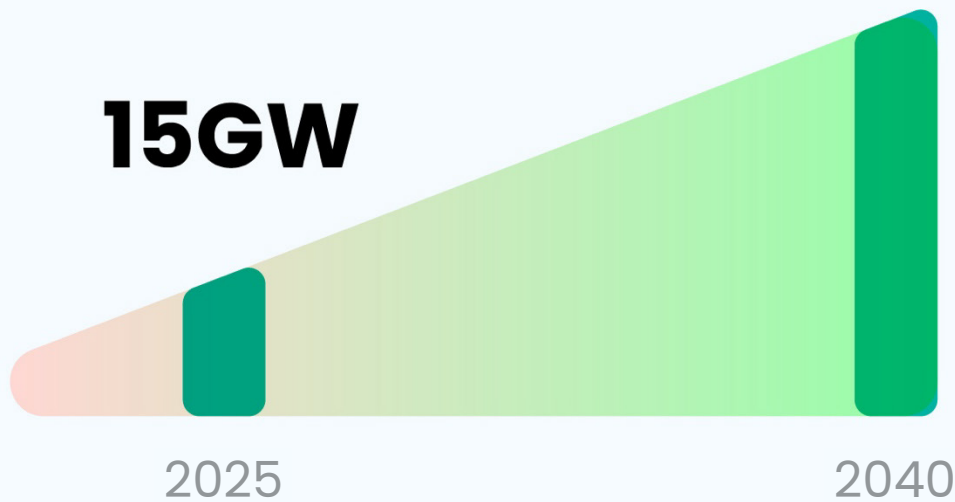
- Establish a **Flexibility Delivery Unit** with authority to coordinate across the system.
- Drive coherence through **clear KPIs, shared definitions**, and a **rebooted Digital Sharing Infrastructure**.
- **Update cost-benefit methodologies** to reflect the true system value of flexibility.
- Appoint a **digital coordinator** to unify fragmented asset development.

Ofgem | Redesign the Rules of the Game

- **Standardise DNO contracts** to unlock market access and reduce barriers for new providers.
- **Reform standing charges and curtailment cost allocation** to reward flexibility.
- Protect consumers by **shifting risk to those best placed to manage it**.
- Enable **new business models** by modernising the **Supplier Hub** and fostering propositions that **bundle energy with services**.

NESO | Orchestrate Whole-System Integration

- Champion **consistent flexibility definitions** across networks and markets.
- Lead **transparent, system-wide cost allocation** for flexibility contributions.
- Accelerate integration of **digital tools, AI and open data** to enable interoperability.
- Drive the **reform of flexibility markets** in tandem with policy and regulatory frameworks.

50GW**15GW**

Demand-side flexibility needs to more than double in the next 15 years to meet net zero targets

Overview: Why we Need Flexibility at Scale

As global energy systems face mounting pressure from climate targets, rising demand and increasing electrification, flexibility has moved from a technical nice-to-have to a national imperative.

In the UK, achieving the Clean Power 2030 (CP2030) target- and the broader goal of a net zero electricity system by 2035- will depend on scaling demand-side flexibility to at least 15GW by 2030, and up to 50GW by 2040. Achieving this not only requires new technologies, but a fundamental shift in how we plan, coordinate and govern a grid that is rapidly becoming more decentralised, consumer-led and data-driven.

While the UK energy system is taking steps to respond to this challenge with increasing focus and ambition, progress on consumer-led flexibility remains slow. Organisations are currently working in isolation, with unclear responsibilities and conflicting incentives. If we want to deliver an energy system that is flexible, affordable, resilient and net zero-aligned, we must urgently clarify who does what, by when, and in what sequence.

Working Group Overview: Prioritising Industry Actions

The priority actions highlighted in this report were identified during an industry working group, hosted by Laura Sandys during the Innovation Zero World Congress 2025.

31 invite-only attendees represented voices across the energy system, including policy makers, regulatory bodies, utilities, network operators, market operators, technology providers and consumer advocate groups.

After a brief overview of 'the state of flexibility', group discussion was anchored around the following guiding themes:

- **Are we speaking the same language on flexibility?** Is there a clear, shared definition of flexibility across the system that supports aligned action and targeted investment?
- **Are today's market models and incentives fit to scale flexibility across all user types?** Do business models, tariffs, protections and rewards work for all consumers? What changes are needed to deliver mass participation?
- **Are we building the digital and physical infrastructure fast enough?** From smart appliances to interoperability, is our digital readiness matching the pace of asset deployment? Are coordination gaps holding us back?
- **Who's orchestrating this system-wide transformation and how do we ensure delivery?** Do we have the right leadership, sequencing and governance in place? Is a dedicated flexibility architect or delivery unit needed to coordinate action?

Barriers identified were then discussed in relation to a specific action that can be undertaken to overcome them, and the primary organisations needed to lead on this.

Priority Industry Actions

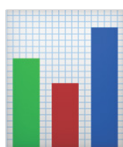
The group identified 14 key actions needed to accelerate progress towards scaling a flexible, consumer-led grid. These actions fall under four main categories:



**Create Policy &
Regulatory Coherence**



**Simplify Consumer
Participation**



**Accelerate Deployment
of Digital Infrastructure**



**Innovate Market
Design & Operation**





Create Policy & Regulatory Coherence

There is an urgent need for clearer leadership, consistent definitions and aligned regulatory frameworks to support the UK's flexibility ambitions. Without coordinated policies and standardised approaches, flexibility markets risk fragmentation, inefficiency, and underinvestment, jeopardising progress towards CP2030 and net-zero goals.

1. Strengthen leadership, accountability and KPIs for CP2030

Fragmented leadership, dissipated roles and weak accountability mechanisms hamper progress towards whole system flexibility. This is leading to slower progress on net-zero targets, lost investor confidence and public disengagement.

- **Action:** Appoint a clear senior leader within DESNZ and a Delivery Unit for flexibility, which has the authority and skills to coordinate all actions currently underway. Introduce aligned strategy and KPIs across organisations to drive collective, coherent action throughout the sector.
- **Who:** DESNZ to establish a Delivery Unit to coordinate all the varied bodies and actions.

2. Reform cost-benefit analyses (CBAs) to accurately value flexibility

Traditional CBAs undervalue adaptability, long-term resilience and operational savings from flexibility. Investments therefore continue to favour conventional infrastructure over smart, dynamic alternatives.

- **Action:** Create one "truth" across all organisations valuing flexibility by embedding flexibility metrics across whole system costings. Long-term systems value should be considered within regulatory investment decision tools.
- **Who:** DESNZ to leverage the modelling function that has already measured the value of flexibility and roll this out as the core value of flexibility as referenced by Frontier Economics and LCP report.

3. Develop clarity around what is meant by "flexibility"

Currently, different types of flexibility are both conflated and described differently, with little distinction given to their value or function within the system.

- **Action:** Accurately define the four accepted categories of flexibility that need to be used in common terms across the sector, with flexibility markets developed to reflect their different characteristics.
- **Who:** DESNZ, NESO, Elexon, DNOs.

4. Standardise contracts for flexibility providers across network operators

Bespoke distribution network operator (DNO) & systems operator contracts delay market entry and exclude smaller players. The resulting market fragmentation increases transaction costs, reduces competition and hinders scaling.

- **Action:** Develop nationally standardised flexibility service agreements with common data flows to unlock market fluidity.
- **Who:** Ofgem, ENA, NESO, DSOs.





Simplify Consumer Participation

Embracing flexibility services needs to become simple, intuitive and rewarding for consumers. By streamlining customer journeys and enabling innovative business models, the energy system can boost participation, build trust and unlock the full value of demand-side flexibility at scale.

5. Simplify the consumer journey

At present, domestic and commercial consumers face fragmented, technical and disjointed processes when engaging with flexibility schemes. This complexity deters uptake and raises customer service costs.

- **Action:** Design frictionless, standardised customer experiences with clear incentives and integrated technologies, which reflect the customer journey.
- **Who:** Energy suppliers, technology providers, Citizens Advice and Ofgem to embed this into the Low Carbon Roadmap.

6. Make flexibility attractive via new business models

Flexibility schemes are too complex, failing to adequately communicate and deliver long-term value to consumers. A lack of flourishing new business models stifles system-level benefits and perpetuates fossil-based grid operations.

- **Action:** Simplify propositions and develop engaging products, models and communications to build trust and participation.
- **Who:** Ofgem to promote and remove barriers to new business models, working with the energy suppliers, technology providers, and consumer groups that are developing new propositions that appeal to consumers, i.e. financial services and energy service options.



Accelerate Deployment of Digital Infrastructure

Creating a golden thread through the development of the UK's digital energy infrastructure is essential to creating a streamlined, future-proof digital backbone. Coordinated action on data sharing, smart meter connectivity and interoperable digital tools is core to enabling a consumer-focused, flexible grid.

7. Coordinate work on digital asset development into one, consumer facing proposition

At present, twelve different organisations are developing the digital assets that will need to work interoperability as part of a coherent system. A number of overlapping, consultations however reveal a lack of coordination. This has caused development to become dispersed, leading to silos, duplication and assets being designed around function as opposed to the user.

- **Action:** As part of the Flexibility Delivery Unit, a digital coordinator should unify these assets into coherent set of functional, useful and consumer-friendly designs.
- **Who:** DESNZ.

8. Reboot the UK's Digital Sharing Infrastructure

The UK Digital Sharing Infrastructure is the core digital platform that can be designed to rationalise and coordinate all the data flows across a multi-actor framework supporting the transition to a smart, flexible and decarbonised energy system- at lowest cost and with least friction. Currently, focus on technology is greater than on the policy work needed to deliver protocols that unlock the right data to the relevant actor.

- **Action:** Reshape the Digital Sharing Infrastructure programme around delivering the functionality of the future by March 2026.
- **Who:** DESNZ, Ofgem and NESO.

9. Integrate fibre broadband into smart meter infrastructure

Legacy reliance on mobile networks limits smart meter reliability and data access. Poor mobile coverage disrupts data collection and grid visibility, increasing costs and inefficiencies. With the discontinuation of 2g and 3g networks, 90 million smart meters are now being forced offline.

- **Action:** Leverage fibre broadband to ensure secure, high-bandwidth smart meter communication at scale.
- **Who:** Ofcom, Ofgem Smart DCC, telecom providers, DESNZ.

10. Learn from international best practices on energy data infrastructure

A lack of structured international learning leads to duplicated effort and missteps, resulting in slower innovation and avoidable failures in policy and infrastructure design.

- **Action:** Build a centralised mechanism to assess and adapt global approaches to UK context.
- **Who:** DESNZ, innovation agencies, regulators.



Innovate Market Design & Operation

Modernised market design will underpin the shift to a modern, equitable and flexible energy system. By reforming standing charges, reallocating system costs, managing consumer risk and revisiting outdated supplier models, the UK can unlock greater participation and innovation while protecting vulnerable consumers.

11. Reduce standing charges on flexibility uptake

High fixed costs reduce financial returns from investing in flexibility technologies. This disincentivises adoption, disproportionately affects low-income consumers and hinders grid optimisation.

- **Action:** Reform standing charge methodologies to better reflect usage, enabling equitable and efficiency-driven uptake.
- **Who:** Ofgem, Citizens Advice, energy suppliers.

12. Reallocate whole systems benefits to reward flexibility

Costs are currently socialised, offering limited benefit to those who support grid stability. Whole system benefits need to be reflected in the rewards for flexibility and the overall cost of the sector will reduce for all customers as a result.

- **Action:** Create transparent cost allocation systems that reward flexibility contributions.
- **Who:** NESO, Ofgem, DESNZ.

13. Ensure consumers aren't exposed to financial risk

Consumers are often expected to absorb volatility and risk in flexibility markets, dissuading participation and potentially deepening energy inequality.

- **Action:** Transfer risk to market actors which have greater capacity to manage any negative impacts, protecting consumers and enabling participation.
- **Who:** Ofgem, aggregators, energy suppliers.

14. Reduce reliance on a single regulated supplier

Dependence on a single energy supplier creates systemic risk and limits innovation, leading to vulnerabilities in cost, supply security and sustainability. This model is not reflective of a market in which services and assets are linked to financial service products.

- **Action:** Review the Supplier Hub model and encourage new propositions that link assets with energy supply.
- **Who:** Ofgem.

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