Innovate UK

CATAPULT Digital

CATAPULT Energy Systems

GridFlex
Year Two Report

Accelerating Deep Tech in Energy Flexibility

2026 Report



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Executive summary

Consumer Led Flexibility (CLF) is highly valuable to the UK economy and to consumers through lower energy bills and better services. The UK has a growing pool of innovators and improving conditions for realisation, but there is still a significant gap to bridge to reach a low cost, resilient, decarbonised energy system.

This report brings together the evidence, insights and tools developed through GridFlex programme to understand what is holding back CLF and what is needed to help it scale. The programme was delivered jointly by Digital Catapult and Energy Systems Catapult, funded by the UKRI R&D Missions Accelerator Programme. It adopted a systemic approach to the challenge of scaling CLF to the 10-12 GW the energy system requires to achieve Clean Power 2030.

GridFlex investigated CLF from three perspectives:

1. The future energy system that the UK should look to build.
2. The barriers that slow innovation and progress to CLF.
3. The practical tools that could help innovators and investors move faster.

The programme combined strategic foresighting, policy and regulation review, engagement with a cohort of 17 deep tech innovators and two Lighthouse companies, investor engagement, systems mapping, and proof-of-concept tool development to create a consolidated evidence base.

The major findings are as follows:

CLF is a whole-system challenge

Scaling flexibility is not simply a technical issue. It depends on coordination across markets, policy, regulation, digital infrastructure, investment and consumer participation. GridFlex's foresighting work **developed four scenarios for the future flexibility system**. These show that the risk is not only failing to reach the Clean Power 2030 target, but reaching it in ways that are fragile, exclusive or dependent on conditions that do not yet exist.

Structural barriers are slowing innovation

A Market Failure Analysis identified **48 discrete policy and regulatory gaps** across six areas: wholesale and flexibility markets; network regulation; testing and trials; governance; data privacy and trust; and standards and interoperability. The most important barriers are fragmented market design, uncoordinated governance, under-representation of innovators in governance processes, and fragmented funding pathways between innovation trials and business-as-usual deployment.

The energy flexibility system is difficult to navigate

Across the 17-company cohort, common barriers included regulatory complexity, unclear routes to market, poor digital interoperability, proprietary control systems, inconsistent service definitions, high compliance costs, limited investor understanding of flexibility value, and difficulty recruiting specialist talent.

The two Lighthouse case studies reinforce this picture.

- Olsights, founded in 2020, has six employees and revenues of between £500,000 and £1 million, but still faced slow procurement cycles and limited access to decision-makers.
- Wondrwall, with 28 employees and revenues exceeding £1 million, faced the capital demands of an asset-heavy model, consumer inertia, and the challenge of integrating multiple assets.



Investment barriers are as important as technical ones

GridFlex mapped **156 investors** and prioritised **79 for deeper focus**, then gathered evidence through interviews with **13 investors**, a questionnaire and a roundtable. Investors pointed to five main constraints: weak proof points and limited repeatability; complex and fragmented revenue models; long utility and corporate sales cycles of **12-24 months**; an investor education gap; and poor alignment between grant funding and follow-on commercial investment.

Practical tools can help address these barriers

The programme shows that practical support can reduce these barriers. GridFlex developed a reusable Flexibility Systems Map to give innovators and policy makers a structured and traceable view of the GB electricity flexibility system. The map enables users to explore the policy and regulatory landscape, navigate the range of mechanisms for monetising flexibility, identify which parts of the system are open to new entrants, and understand value flows. By making the flexibility system less opaque and more navigable, it reduces the time and cost of reaching informed decisions, whether investigating market entry, policy implications, or investment readiness.

It also identified and validated four tool concepts: a Knowledge Navigator; a Partnership Matchmaker Hub; Investor & Value Toolkit; and a Flexibility Systems testbed. The programme also delivered a live alpha AI decision-support tool, a flexibility system testbed proof of concept for testing and evidencing asset flexibility performance, and two serious games designed to widen understanding of the sector. These solutions address some of the biggest challenges by improving access to reliable information and evidencing impact of products and services.

Innovator support should be tailored, expert led, and delivered primarily in person

Future innovator support programmes should be expert-led and delivered primarily in person, with content tailored to the specific conditions of the flexibility market rather than generic innovation advice. Distinct support pathways for early-stage and scale-up companies are needed, alongside regulatory navigation as a core component. Programmes must connect innovators directly to the data environments, test infrastructure, and customers and investors required to build credible evidence and progress toward commercial deployment. A clear pathway beyond any innovator support programme is needed to guide innovators to further deployment and scaling.



What we can do next

The report recommends action at three levels.

1. At the **system level**, the priority is to focus research and innovation efforts on high-impact policy and regulatory gaps, particularly where no clear solution yet exists, and to create a stronger policy-ready feedback loop through the proposed insights engine.
2. At the **innovator level**, future support should focus on access to real-world data and test environments, stronger commercialisation support and regulatory navigation, together with flexibility market literacy for new entrants.
3. To unlock **commercialisation** across different levels of innovator maturity, the programme proposes creating a letter of intent and pilot factory, developing investor-grade evidence packs and revenue calculators, and targeting international investor pools where appetite is stronger.

The expected impact of future work from the programme is a clearer route between mid-stage innovation and commercial scale-up. GridFlex concludes that targeted research and innovation, backed by coordinated policy, industry intervention and focused support, can help deliver additional flexibility to the energy system by 2030. The immediate next step is to sustain, test, integrate and scale the most promising approaches.

Introduction

Role of Consumer Led Flexibility

Great Britain (GB) is facing a fundamental shift in how it manages energy. The growth of weather-dependent renewable generation, the electrification of heat and transport, and the increasing digitalisation of homes and businesses is changing the structure of the energy system, at every level. Managing that change effectively requires a new approach to operating the energy system.

The National Energy System Operator's (NESO) Clean Power 2030 advice set out specific innovation requirements that must be addressed to achieve the Clean Power 2030 target. These include more automated system optimisation and advanced forecasting capabilities to predict both renewable generation patterns and flexible demand availability. Importantly, this also included the requirement for a step change in new forms of energy flexibility within the GB energy system, including the need to deliver 10-12 GW of Consumer Led Flexibility (CLF). To respond to this, the Clean Power 2030 Action Plan, published in December 2024 sets out the actions required to deliver on the target.

Building on this, the Department for Energy Security and Net Zero (DESNZ), Ofgem and NESO jointly published the Clean Flexibility Roadmap in July 2025. The roadmap sequences the actions needed to scale clean flexibility across the UK across digital infrastructure, market reform, consumer protections and supply chain enablement.

Realising energy flexibility at scale is, however, more than a technical challenge. It requires coordinated systems change across policy frameworks, regulation, markets digital infrastructure, and consumer propositions to create the conditions in which new service offerings and business models can emerge and scale. The fragmented nature of current approaches means that potential market entrants face uncertainty about market participation requirements, unclear revenue stacking opportunities, and varying service terms across platforms.

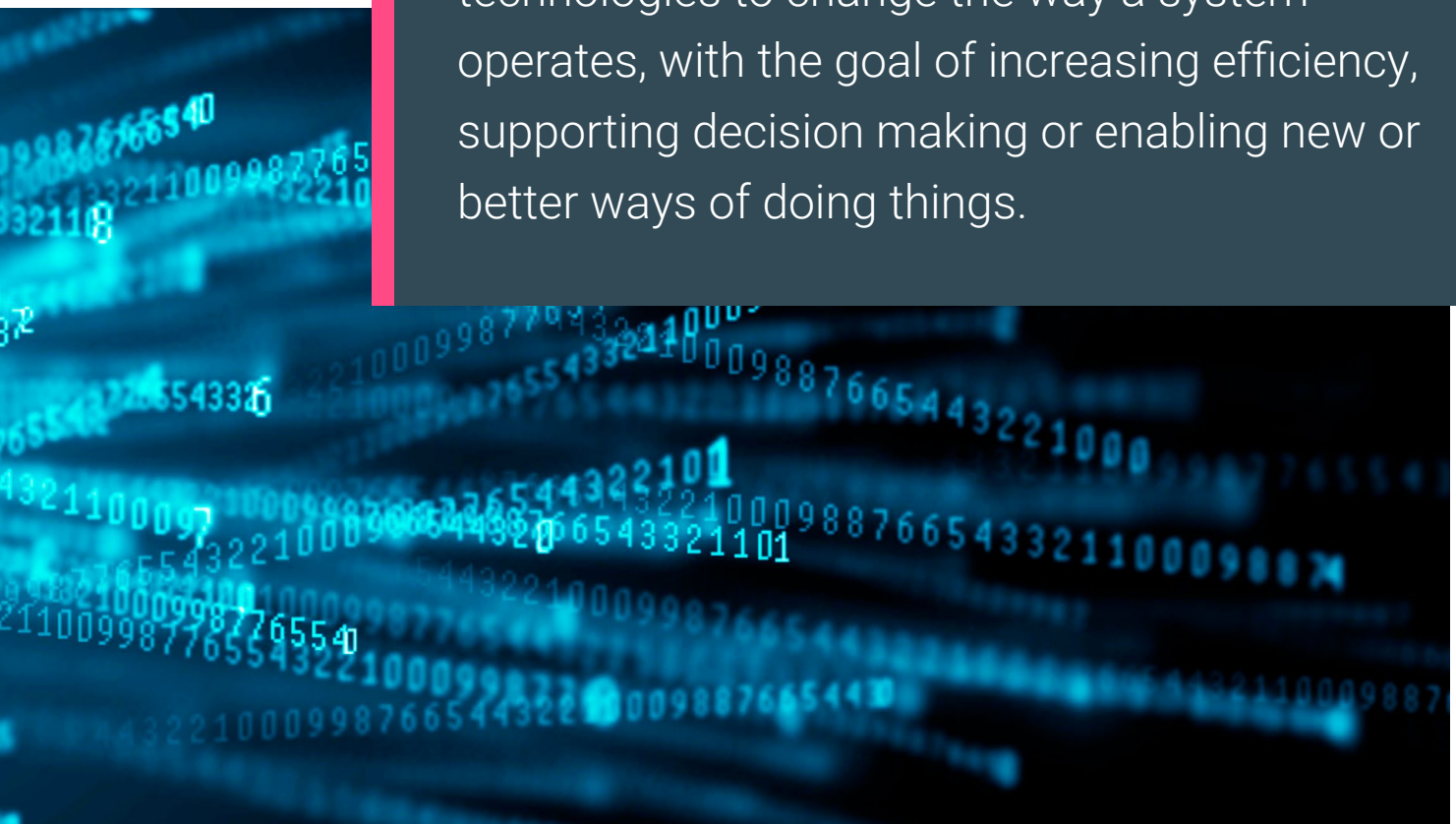
These barriers increase cost, reduce efficiency and constrain the pace of innovation. Deep technologies, including artificial intelligence (AI) and Internet of Things (IoT), present a significant opportunity to address these challenges and accelerate the delivery of CLF at the scale the system requires.

Role of deep tech and digitalisation

The transformative potential of digitalisation is visible in other sectors. In financial services, clear policy directives established expectations for interoperability, mobile and cloud infrastructure reduced the cost of deployment, and open application programming interfaces (APIs) enabled integration between services. These foundations allowed deep tech innovation to follow – machine learning now powers fraud detection, investment management and personalised financial products that did not exist a decade ago. The same logic applies to the energy system.

The energy sector is already well underway on its own digitalisation journey. The Energy Data Taskforce and Energy Digitalisation Taskforce initiated industry-wide programmes to address data and digitalisation challenges. Ofgem has defined Data Best Practice, Digitalisation Strategy Action Plan regulatory requirements, and the energy digitalisation framework, whilst DESNZ has funded innovation programmes developing foundational digital infrastructure. Numerous digital technology projects have been explored by energy networks through the Energy Networks Association's Open Networks programme and Ofgem's innovation funding. Deep tech presents promising opportunities to accelerate deployment of CLF.

Digitalisation is the act of using digital technologies to change the way a system operates, with the goal of increasing efficiency, supporting decision making or enabling new or better ways of doing things.





Deep tech refers to advanced technologies that require significant research and development investment before commercialisation, characterised by high technical risk and the generation of hard-to-reproduce intellectual property.

- AI, including machine learning and reinforcement learning, offer near-term opportunities for forecasting and assisted system operation, enabling automation of flexibility actions and more customised service offerings.
- IoT technologies provide the sensing capabilities and control systems needed to coordinate distributed assets at scale, creating the real-time visibility that effective flexibility coordination requires.
- Quantum technologies present longer-term opportunities for the complex optimisation problems inherent in managing an increasingly distributed energy system.

The convergence of energy system digitalisation, with urgent national priorities (Clean Power 2030) and deep tech innovation makes focused investment in deep tech applications essential. For industry, it represents an opportunity to manage a more complex system efficiently. For innovators, it opens new routes to market and new commercial models. For consumers, it offers the prospect of lower bills and greater control over how they participate in the energy system.

GridFlex was designed to accelerate that convergence by understanding the barriers standing in the way, building the evidence base to target intervention effectively, and developing the tools that innovators and investors need to navigate the system with greater confidence.

Programme delivery

Partnership and team

GridFlex was a joint programme delivered in partnership between Digital Catapult and Energy Systems Catapult, funded by Innovate UK. Together, the two Catapults brought complementary strengths in digital technology and energy systems to take a genuinely systemic approach to the challenge of scaling CLF. The programme built on an earlier seed phase and then operated as a bridge phase, focused on mobilisation, strategic oversight and targeted support for innovators in alignment with key policy objectives.

The programme aimed to deliver three core outcomes to demonstrate how future innovator support programmes can be designed unlock innovation within energy flexibility. Specifically, these included:

1. **Outcome 1:** Demonstrate the Lighthouse and innovator support model, which aims to show that a cohort-based approach meaningfully improves innovators' understanding of the energy system, their ability to position solutions within it, and their readiness to act.
2. **Outcome 2:** Establish the value of a digital tooling approach to flexibility development, demonstrating that a suite of deep tech tools can be used to address real barriers faced by innovators.
3. **Outcome 3:** Understand the value of system mapping and foresighting, showing that GridFlex's Flexibility Systems Map and Foresight Lab create a clear, more coherent understanding of the flexibility ecosystem and the changes required to scale it. This, in turn, helps innovators to develop products and services, and policy makers to develop policy and address barriers to innovation.

The original scope was deliberately broad, engaging innovators across a wide range of technology and commercial readiness levels to capture the full diversity of the CLF innovation landscape. The programme was structured around four core objectives:

1. **System foresighting, policy and regulation:** Exploring the possible futures the flexibility system faces, stress-testing today's decisions against a range of long-term scenarios to help the programme and its stakeholders navigate an uncertain and complex environment, and to support enabling policy and regulatory development.
2. **Understanding barriers to innovation:** Surfacing and examining the barriers facing digital and deep tech innovators that prevent them from developing and scaling CLF solutions, with a deep dive on two Lighthouse innovators as a beacon and/or inspiration.

3. **Understanding barriers to commercialisation:** Engaging directly with investors and innovators to understand the factors limiting the flow of private capital into the CLF sector.

4. **Developing tools to unlock innovation:** Identifying, designing and building digital tools that can unlock innovation and help ecosystem participants navigate the flexibility market with greater confidence.

Figure 1 below outlines the overall structure of the programme.

Foresighting lab, and policy and regulation research	• Strategic foresight and futures thinking • Policy and regulation research • Cyber security guidance and insight papers
Lighthouse pilots, innovator support	• Innovator cohort identification, selection and support • Lighthouse pilots, innovator support • Wider ecosystem engagement
Commercialisation	• Commercial landscape mapping • Investor and innovator engagement • Handbook develop and guidance
Tools to unlock innovation developing	• User-centred approach to product development • Proof of concept creation • Serious gaming flexibility system introduction
Flexibility system mapping	• Mapping the flexibility actors, introductions and infrastructure and their interdependencies • Visualisation of the system map • Testing the system map with users

Figure 1: Programme overview

Structure of this report

This report draws together the insights generated across the GridFlex programme into an evidence base. The detail underlying this report is captured in a range of supplementary publications.

- **The future energy system we are anticipating -** sets out the flexibility system we are targeting and presents the foresighting work undertaken to understand the range of futures it may face, capturing insights from the foresighting lab, policy and regulation research activity.
- **Our understanding of the barriers and what we learned -** examines the barriers identified through the programme, spanning innovation, commercialisation and policy, regulation and system-level constraints, capturing insights from Lighthouse pilots, innovator support and commercialisation activity.
- **Building infrastructure, tools and assets for innovation** - details the tools and resources the programme has developed, highlighting what is reusable and impactful for the wider ecosystem, capturing insights from the Tools to Unlock innovation and flexibility system mapping activity.
- **Conclusions** - presents the conclusions and the targeted actions needed to bridge the gap between the current state and a scaled CLF system by 2030.



The future energy system we are anticipating

The UK energy system is undergoing a major transformation. The vision for the future energy system is one that is clean, digital, flexible and resilient, where millions of distributed assets work together seamlessly to balance supply and demand in real time, with coordination across technology, markets, regulation, investment and consumer behaviour. Energy flexibility is now widely recognised as essential to keeping our energy system affordable and secure.

This section describes the future system that we are targeting, why a systemic and forward-looking approach is critical, and how the programme has put that approach into practice through strategic foresighting and a series of targeted insight papers.



The future flexibility system is complex

The future flexibility system is not simply a more efficient version of today's energy system. It represents a structural shift. Achieving it requires coordination and collaboration across an array of actors, technologies, policies and markets. Siloed interventions will not be sufficient to meet the current and future needs.

This systemic complexity creates an environment of significant and non-linear uncertainty. Responding to that uncertainty requires any future innovator support programme to do more than react to present-day challenges. It must anticipate the future energy system, manage uncertainty proactively, and define the interventions needed today to prepare for the range of plausible futures ahead.

AI and deep tech are central to this. The innovations being developed across the flexibility ecosystem, from AI-driven demand-side response to IoT-enabled asset orchestration, are not incremental improvements. They are foundational to, and necessary for, the transition to a renewables-led, digitally coordinated energy system.





GridFlex's strategic foresighting approach

GridFlex has applied futures thinking and strategic foresighting approach to navigating this complexity. These are distinct but complementary disciplines:

- Futures thinking is a way of thinking about what is possible rather than forecasting, which projects existing trends forward. It recognises the systems themselves and considers a wide range of possible futures, their consequences and potential responses.
- Strategic foresighting is a structured and systematic approach to exploring plausible futures to anticipate and prepare for change. It cultivates the capacity to imagine multiple, possible consequences and to act with greater resilience and intentionality today.

The aim of strategic foresighting is not to prepare for every scenario, but to consider any. This focus on resilience and long-term sustainability distinguishes this from traditional strategy and planning. Within this, there were two workstreams:

1. **Applied foresighting** to anticipate possible futures, identify risks and opportunities, and help teams make better decisions about the future today.
2. **Development of insights papers** to explore present and future threats and opportunities across the system.

Applied foresighting

GridFlex's applied foresighting work was delivered in four phases:

1. **Horizon scanning:** Drawing on literature and stakeholder engagement to identify today's key drivers of change across the energy system.
2. **Sense making:** Analysing connections between these drivers to identify leverage points and systemic interdependencies.
3. **Visioning:** Developing four scenarios for the future energy flexibility system:
    a. **Growth:** Flexibility is seamless and celebrated, but dependent on tightly interconnected systems.
    b. **Transformation:** AI-run systems operate invisibly, with total trust placed in complex algorithms.
    c. **Decline:** Flexibility exists but feels unstable, undermined by cyber conflict, weak oversight and fragile systems.
    d. **Discipline:** Flexibility is stable and tightly regulated, reliable but constrained.
4. **Strategic action:** Foresighting outputs were embedded into each scenario to optimise current work and identify emerging risks.



Insight papers

Alongside the foresighting work, GridFlex developed a series of insight papers designed to provide deeper research into specific challenges facing the flexibility system .These papers provide targeted intelligence on emerging risks and systemic issues that innovators, operators and policymakers will need to navigate:

Cyber Security Guide: To address the cybersecurity risks associated with the growing adoption of deep tech in the flexibility sector, an introductory guide to cyber security was developed. The guide offers general guidance and signposting to relevant frameworks, technical standards and best-practice resources, supporting innovators in building secure-by-design solutions.

Digitalisation Landscape: A report providing an overview of the digitalisation landscape across the energy sector, including a high-level summary of key activities and initiatives underway.

NESO-DSO Coordination: A short paper on NESO-DSO coordination highlights that while DERs create system value, they are held back by fragmented coordination. Current exclusion-based primary rules reduce system operational risk but also restrict participation, creating an inherently exclusionary system. The paper proposes a “coordination ladder” of policy reforms that moves from basic feasibility checks to timing alignment, layered integration and, ultimately, a fully coordinated future model. Reforming coordination through this ladder could open markets, reduce uncertainty and improve access for a wider range of flexibility providers.



Outcomes and recommendations

Outcomes

The phased applied foresight identified emerging forces of change across social, technological, economic, environmental, and political dimensions. On the cyber security front, AI is lowering the barrier for threat actors while increasing the effectiveness of attacks. Geopolitical non-cooperation and reduced global coordination on standards further threaten to slow the energy transition. While domestically high electricity prices continue to act as a barrier to clean heat adoption. Mapping these drivers and their causal relationships allowed us to identify the system change levers most likely to determine the pace and direction of transition:

1. The degree of political consensus and level of agreement around goals for technology development.
2. Electricity price dynamics.
3. The maturity of flexibility solutions.
4. Momentum within the energy technology investment community.
5. Demand for flexibility during peak times, shaped by smart meter rollout, consumer choice, public interest, and wider perceptions of energy flexibility.

The foresighting work in this section contributes to Outcome 3: that the Flexibility Systems Map and Foresight Lab enable a clearer, more coherent understanding of the flexibility ecosystem, helping innovators and stakeholders identify partners, opportunities, barriers, and future pathways.

To test this, 9 participants of the foresighting workshop were asked to report on the extent to which the foresighting scenarios improved their ability to think about future challenges and opportunities for their organisation or for the GridFlex programme. In the post workshop survey, 80% of participants found the workshop valuable against a target of 75%.

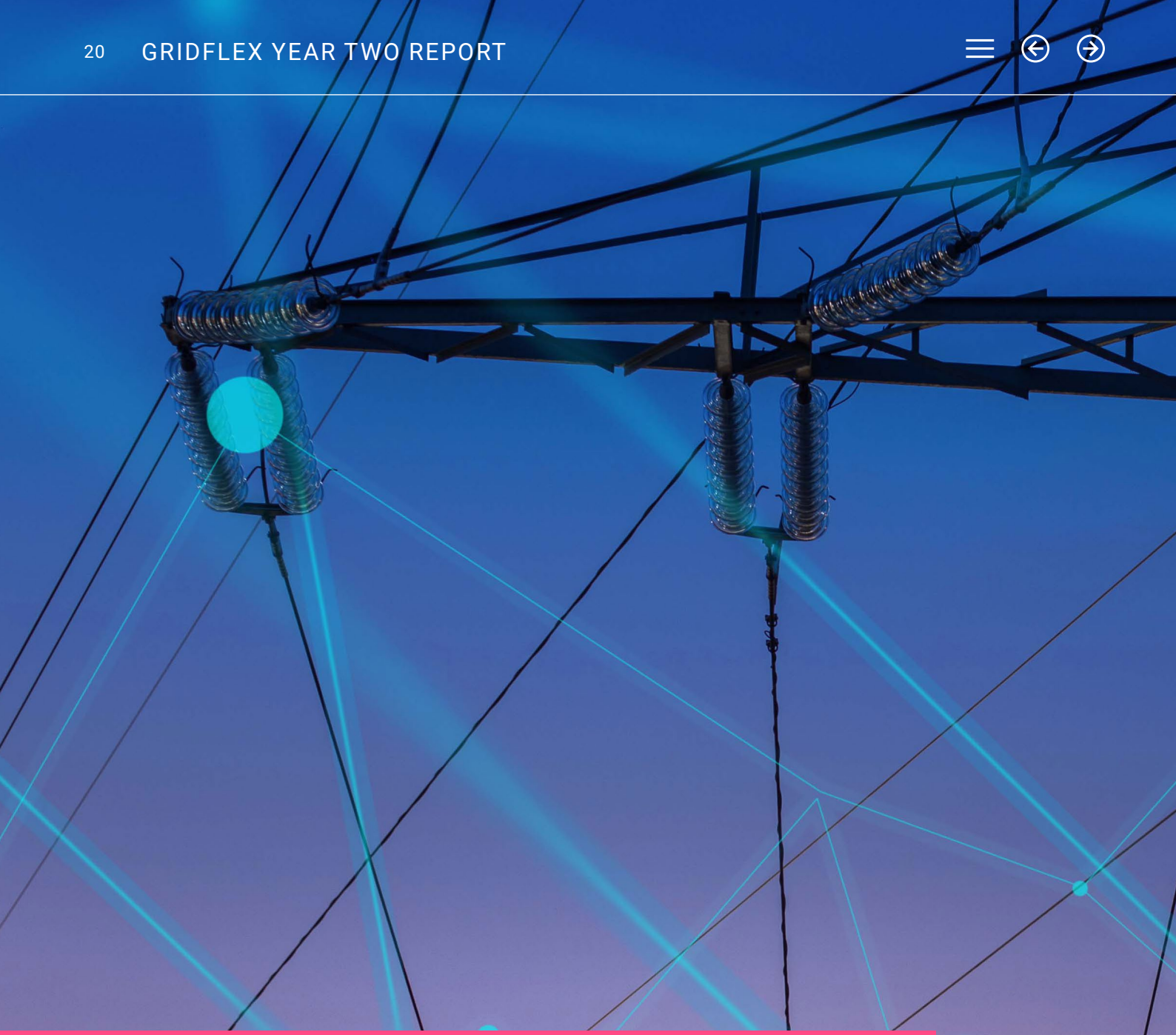
Recommendations

The foresighting work delivered during the GridFlex programme has mobilised a methodology that is robust and repeatable. The pace of change in the energy system, driven by AI advancement, geopolitical dynamics and evolving regulatory frameworks, means that this cannot be a one-time exercise.

Future iterations of this approach should build on two lessons from this phase of the programme. First, participants should be formally resourced to the foresighting activity rather than engaged on a voluntary basis to ensure accountability and consistency of contribution. Second, the horizon scanning should extend to a broader and more diverse set of participants to improve the range of insights captured.

Future iterations should capture emerging risks not fully represented in the phase. These include the evolution of cyber threats as the system becomes more distributed, the implications of AI for market operation and grid control, and the longer-term consequences of flexibility market reform.





The barriers to flexibility innovation

GridFlex has approached the challenge of identifying barriers to flexibility innovation from three perspectives:



1. **System level:** Through mapping the value chain, policy landscaping and flexibility innovation gaps (FIGs).
2. **Innovator level:** Through engagement with a cohort of 17 innovators and two Lighthouse organisations, and the mapping of the wider innovator ecosystem.
3. **Unlocking commercialisation:** Through structured interviews, surveys and a mapped landscape of investors and innovators active in the sector.

These three lenses have allowed us to highlight the barriers to flexibility deployment and where targeted intervention will have the greatest impact.



System-level barriers

Innovator ecosystem and value chain mapping

A flexibility value chain was developed as part of the programme's landscape mapping work (Figure 1). It maps innovators and actors across the commercial and industrial (CI) and residential sectors, covering the journey from distributed energy resource (DER) asset installation to flexibility procurement, and mapping financial, data and service flows between key roles. It categorises market entrants into four archetypes: incumbent flexibility players; flexibility innovators; digital innovators; and deep tech new entrants, each with a distinct route to market. This view provides a robust basis for identifying gaps and areas requiring further innovation input.



Flexibility value chain

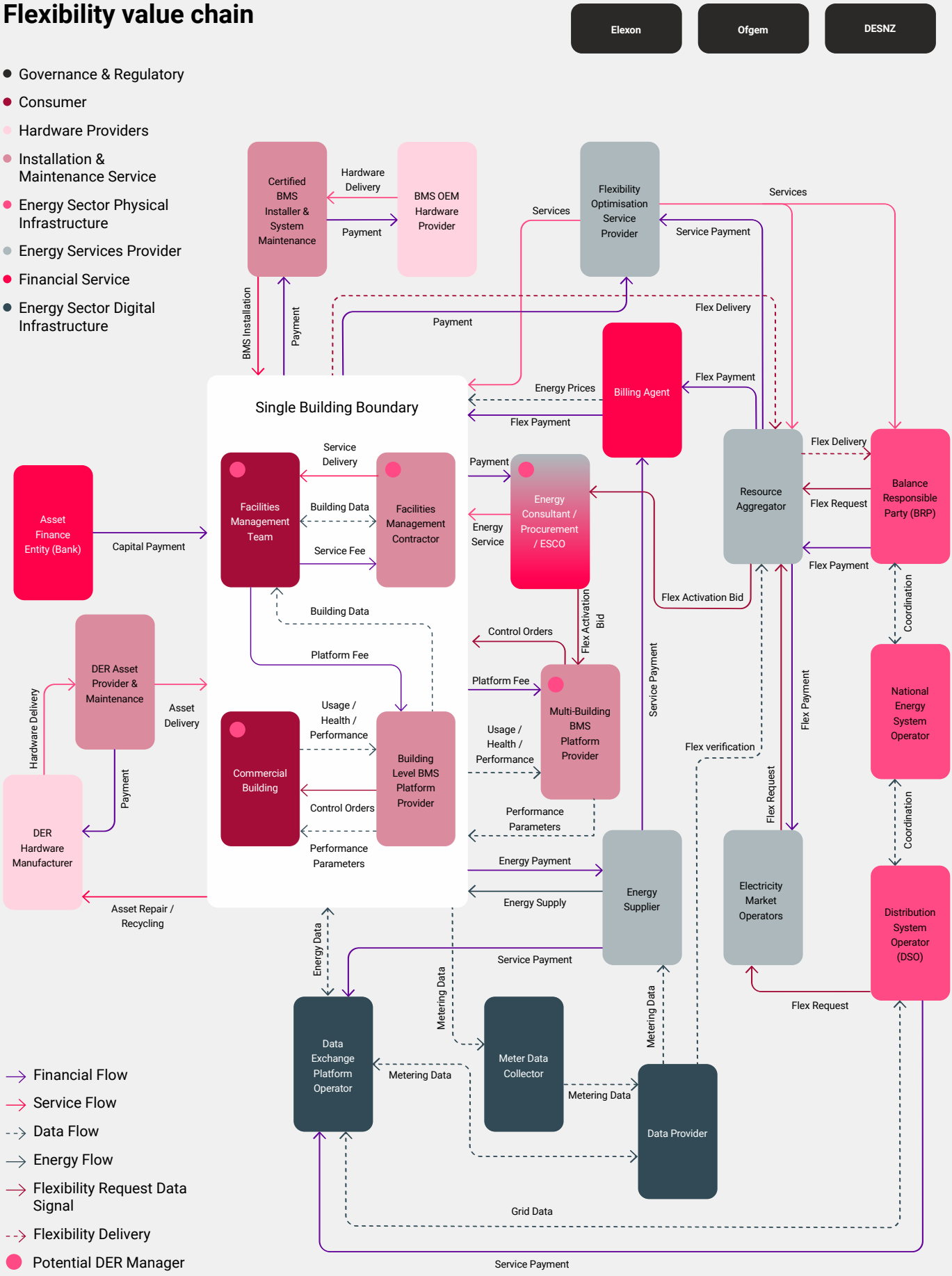


Figure 2: Value chain mapping



Market failure analysis

A market failure analysis identified 48 discrete policy and regulatory gaps across six areas: wholesale and flexibility markets; network regulation; testing and trials; governance; data privacy and trust; and standards and interoperability. Each gap was rated by its contribution to the Clean Energy Superpower Mission (CESM), the maturity of available solutions and the opportunity for research and innovation to support resolution. Key system-level barriers identified include:

1. **Fragmented market design:** Inconsistent baselining methods and rules across wholesale, balancing, reserve and local flexibility services prevent consistent, auditable participation. This forces flexibility service providers (FSPs) to build bespoke processes for each service, thereby increasing cost and limiting scale.

2. **Uncoordinated governance:** Energy digitalisation responsibilities are spread across DESNZ, Ofgem, NESO, system operators, code bodies and wider government actors. This creates a fragmented landscape that is costly and slow for innovators and delivery organisations to navigate.

3. **Under-representation of innovators in governance:** Innovators often lack the time and resources to attend multiple working groups, respond to consultations, and track parallel code changes. This creates structural disadvantage relative to larger incumbents that can engage continuously and shape detailed design.

4. **Fragmented funding pathways:** For innovators, the hardest step is often the handover from a successful trial to business-as-usual deployment. A solution proven under an innovation competition may still require a separate funding decision for adoption at scale, creating stop-start delivery and duplicated integration effort.

Flexibility innovation gaps (FIGs)

The FIGs synthesise this analytical work into structured problem and opportunity statements, organised across six thematic areas: multi-market co-optimisation; portfolio reliability and risk transfer; AI forecasting; feeder-level resilience; EV smart charging; and heat flexibility. They provide a shared language across workstreams and can directly inform the design of future innovation calls.

Flexibility innovation gaps

Multi-market co-optimisation

- Inconsistent market design limits scalable value stacking
- Uncoordinated scheduling undermines system reliability

Portfolio reliability and risk transfer

- Inconsistent delivery verification reduces confidence and utilisation
- Limited visibility of operational risks restricts investment

Confidence building AI forecasting

- Gaps in data and limited representativeness reduce forecasting confidence
- Forecasts lack uncertainty quantification and explainability

Feeder-level flexibility and resilience

- Limited automation constraints LV resilience and recovery
- Behaviour-led responses are unreliable at street scale

EV smart charging and V2X utilisation

- Limited settlement-grade control reduces dependability and value
- Poor visibility and limited automation constrain verified flexibility
- Mobility-aware control not integrated with telematics and routing

Heat flexibility with comfort and wellbeing guarentees

- Lack of proven service models aligning consumer and system incentives
- Limited evidence of reliable automated heat flexibility

Themes

- Markets and financial
- Forecasting and automation
- Forecasting and automation

Figure 3: Flexibility innovation gaps (FIGs)

Innovator barriers

GridFlex's innovator cohort

GridFlex's innovator engagement revealed a system that is full of opportunity but deeply difficult to navigate in practice. Through a competitive open selection process in September 2025, 17 deep tech innovators were selected for the Innovator Cohort, representing a broad spectrum of technology types, commercial and technical readiness levels, company sizes, and flexibility applications. These innovators spanned domestic energy management, commercial and industrial optimisation, data and analytics, and smart-grid technologies.

Support needs by TRL-CRL*

*This denotes technology and commercial readiness levels

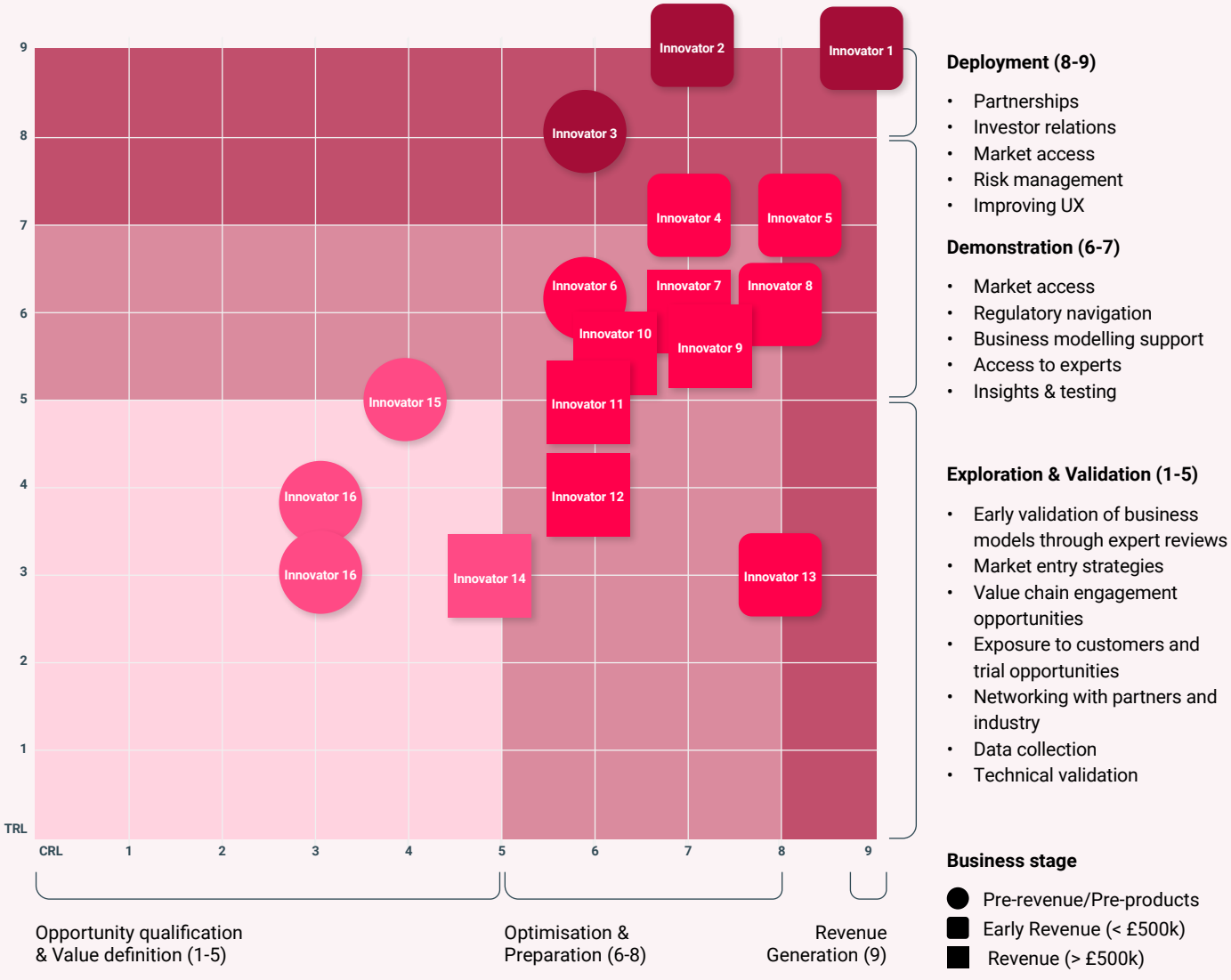


Figure 3: Flexibility innovation gaps (FIGs)

Across the cohort, common barriers emerged consistently. These included understanding of the flexibility markets, access to trustworthy data, navigating complex policy and regulation, gaining access to test sites, awareness of market and readiness, networking, and having a refined value proposition for funders.

"The current environment is 'an old boys club' so disruptive entrants struggle to gain traction" **– GridFlex cohort innovator**

These challenges should inform the programme design for future innovator support programmes.

Introducing the Lighthouses

Two organisations were selected as the programme's Lighthouse deep dives (Olsights and Wondrwall). These Lighthouses provided a richer, more nuanced view of what these barriers look like in practice.

Innovator	Journey and barriers
Olsights is a London-based data and analytics company that automates the ingestion, mapping, and fusion of electricity, hydrogen, heat and carbon datasets to accelerate grid connection planning and asset clustering decisions. Founded in 2020, the company has six employees and has generated revenues of between £500k and £1m, operating at CRL/TRL 7/6.	Its journey illustrates how a technically strong solution can still face significant barriers to market access in a conservative industry. Slow procurement cycles, a structural preference for incumbent consultancies, and the difficulty of reaching the right decision-makers without costly events have constrained the company's route to scale. Early traction relied heavily on serendipitous visibility, including a LinkedIn demonstration that caught the attention of The Crown Estate, highlighting the challenge of systematically replicating market access.
Wondrwall is a Manchester-based company offering a home energy management and battery storage system, an energy-as-a-service financing model, and distributed grid flexibility. Founded in 2014 with a commercial launch in 2018, the company has 28 employees and revenues exceeding £1m, at CRL/TRL 7/6.	Key barriers have included securing the capital needed to finance large-scale installations ahead of revenue, overcoming consumer inertia despite demonstrable bill savings, and managing the complexity of multi-asset integration across heating, hot water, EV charging and storage. Wondrwall's journey reflects the complexity of scaling an asset-heavy model in a rapidly shifting market.

Table 1: The Two Lighthouse innovators

These two innovators were selected as Lighthouses to offer a balanced view across system-level planning and domestic flexibility.

Learnings from the Lighthouses

To translate findings into action, the programme consolidated themes from innovator engagement activities and customer interviews into a behaviour-focused view of what helps or holds innovators back. This was structured using the COM-B framework, a behaviour model built on the three conditions required for change – capability, opportunity and motivation.

Across both Lighthouses and their customers, consistent patterns emerged across all three dimensions.

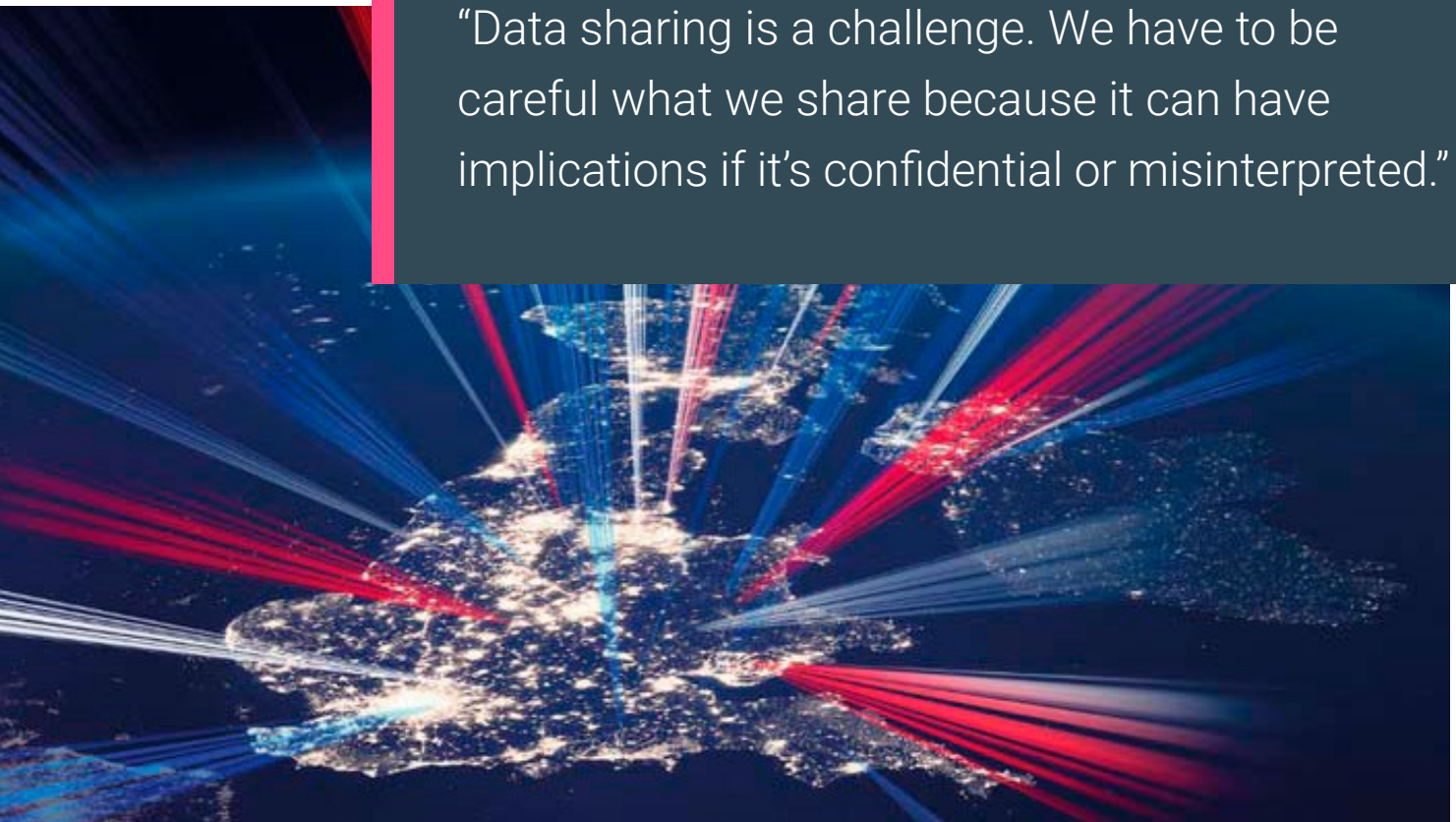
On **Capability**, the most significant gaps centred on stakeholder navigation, data translation and value communication.

Innovators and their customers alike struggled to identify the right decision-makers, turn complex datasets into outputs that build trust, and demonstrate value in terms beyond return on investment, such as faster decisions, reduced risk and improved outcomes.

> "Finding the right people to talk to in different organisations… is difficult, [we] bumped into many barriers by talking to the wrong people."

On **Opportunity**, the primary constraints were access-related: routes into decision-making environments; timely and reliable data; capital for asset-heavy deployment models; and the ability to maintain momentum through long procurement and funding cycles. Customer organisations faced parallel constraints, including data-permission barriers, slow internal cycles and regulatory limits on when and how innovation can scale.

> "Data sharing is a challenge. We have to be careful what we share because it can have implications if it's confidential or misinterpreted."



On **Motivation**, both innovators and customers responded strongly to visible progress, social proof and values alignment. Teams needed credible, co-signed examples to build confidence and product identity, while customer organisations favoured solutions that demonstrably improved decision quality and were backed by responsive, trust-based relationships.

"Demonstrating the tool was probably one of the best ways of getting engagement. Better than a few slides."

From this analysis, nine behavioural goals emerged as the foundation for future programme design:

1. Operate confidently within the conditions of the energy flexibility system.
2. Engage the right decision-makers early and effectively.
3. Turn complex data into simple, credible outputs.
4. Test, iterate and learn quickly with real-world feedback.
5. Communicate value clearly and build a strong product identity.
6. Build a mature, aligned team culture that supports sustained progress.
7. Access the environments, data and finance needed to scale.
8. Build trusted, values-aligned relationships that support adoption.
9. Navigate policy and regulatory requirements effectively.

These goals directly inform the 10 focus areas for future programme support, which span positioning and access, learning and evidence, commercialisation, and team capability. The findings point clearly to where future cohort support is most needed: understanding flex markets; accessing reliable data and test environments; refining commercial models; securing warm introductions to partners and customers; and navigating regulatory requirements.

What the cohort experience tells us about programme design

Four systemic barriers emerged consistently across the 17-company cohort:

1. Regulatory fragmentation.
2. Data and integration complexity.
3. Slow procurement processes.
4. Limited access to real-world testing environments.

These barriers did not affect all companies equally. Early-stage companies found regulatory complexity most debilitating, while more mature scale-ups encountered entrenched procurement behaviours and organisational inertia with target customers.

Three features of the programme support delivered the greatest value. Expert-led content gave participants clarity unavailable elsewhere. In-person engagement created conditions for peer learning, trust-building and direct connection with customers, investors and technical specialists. The SME Manager model offered bespoke guidance and warm introductions that frequently moved companies past barriers. In contrast, generic content was seen as insufficiently tailored to the specific needs of innovators working in flexibility.

Commercialisation barriers

GridFlex mapped the global and UK landscape of capital active across the energy flexibility sector, starting from a long list of 156 investors and refined to 79 priority investors based on repeat activity in grid flexibility, sector conviction and relevance to scaling CLF solutions. Structured engagement covered interviews with 13 investors, a questionnaire to cohort innovators and a roundtable in February 2026. From this activity, five barriers to investment emerged:

1. **Proof points and repeatability:** Investors consistently prioritise visible pilots, letters of intent (LOIs), and early revenue – but current LOIs often lack the substance (scope, conditions, willingness-to-pay signals) that would meaningfully de-risk investment decisions. A single customer win raises scepticism unless the route to market is clearly replicable.
2. **Complex and fragmented revenue models:** Flexibility value is commercially diffuse. It is stacked across multiple markets and mechanisms, sensitive to changing rules and difficult to underwrite using traditional approaches. Investors emphasised that the lack of a single, stable anchor revenue stream increases perceived risk and slows due diligence.
3. **Long sales cycles:** Procurement timelines into utilities and large corporates typically run 12-24 months, involve multiple decision-makers and require integration with incumbent systems.
4. **Investor education gap:** Innovators spend significant time explaining flexibility concepts to generalist VCs who are unfamiliar with the landscape. European investors are frequently perceived as more receptive than UK counterparts. Digital-only solutions are easier to fund than those linked to physical assets or infrastructure.
5. **Grant misalignment:** Grant processes are widely perceived as an administrative burden, poorly timed relative to equity rounds and, for early-stage digital innovators, often irrelevant. There is no clear and structured pathway linking successful grant-funded trials to follow-on commercial investment.

Outcomes and recommendations

Outcomes

The barrier analysis in this section contributes to the Outcome 1: That the GridFlex Lighthouse, cohort and incubation model meaningfully improves innovators' understanding of the energy system, their ability to position solutions within it, their readiness to act, and the value of engaging with targeted support to enable growth.

Seventeen SMEs joined the innovator cohort, and the programme engaged 13 investors through interviews, surveys and a roundtable. The programme attended and presented at seven external events against a target of five. Innovator engagement across cohort sessions tracked at 73% against a target of 75%.



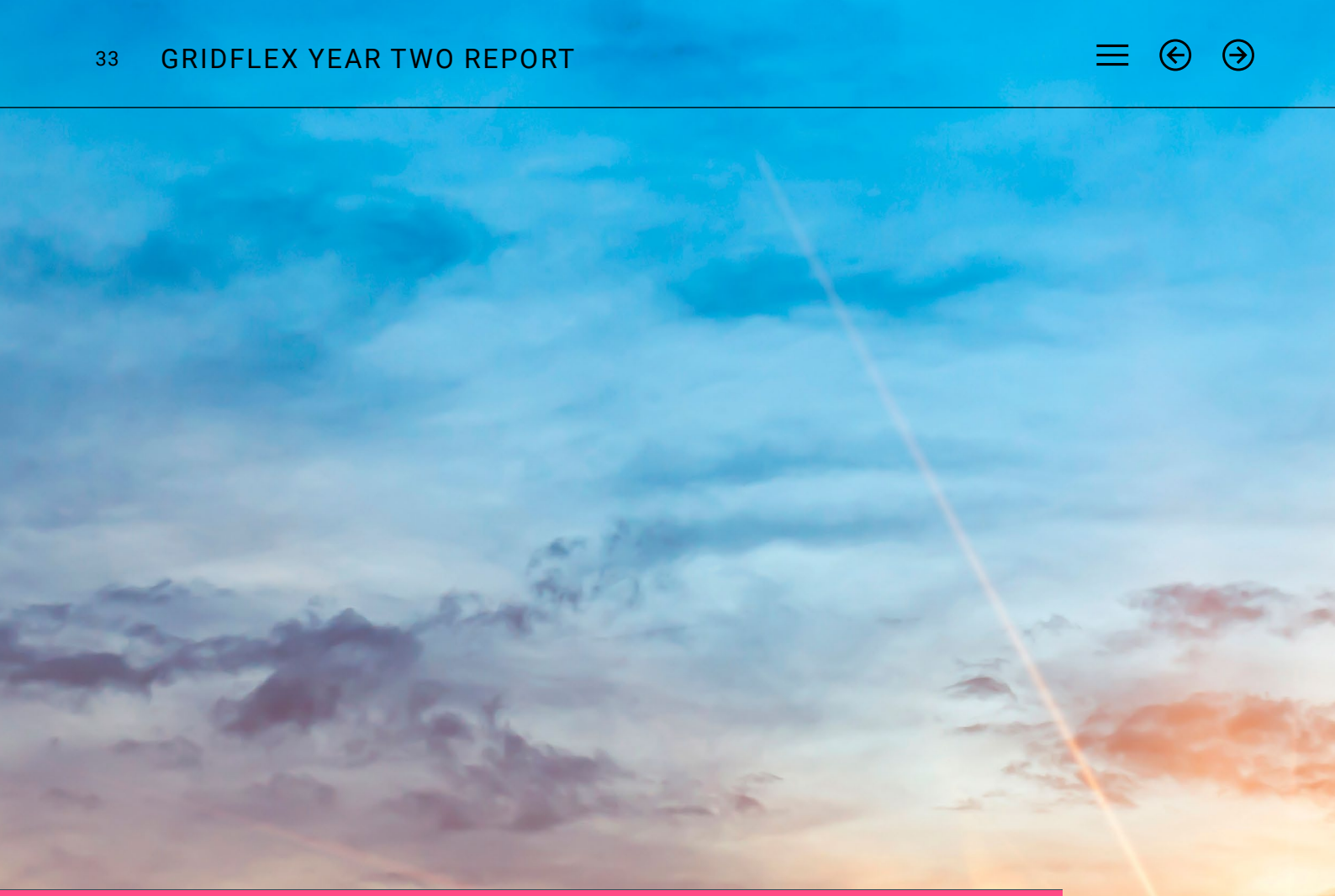
Recommendation

At the **system level**, the programme should prioritise its research and innovation contribution to the policy and regulatory gaps where it can have highest impact, particularly those where no solution has yet been identified, including NESO-DSO coordination, supplier hub reform and locational pricing, and where GridFlex evidence can directly inform regulatory design. A structured mechanism to capture and feed programme insights into policy processes, in a policy-ready format, should be established within the insights engine.

At the **innovator level**, future cohort support should prioritise flex market literacy, access to real-world data and test environments, structured commercialisation support such as business model refinement and ecosystem introductions, and in-person engagement formats, which have consistently proved most valuable across the Lighthouse cohort. The programme evidence supports three design principles for future programmes:

- Regulatory support should be a core programme offering. This includes structured regulatory navigation support and access to subject-matter experts.
- Future cohort programmes should offer distinct pathways for early-stage and scale-up companies. The Lighthouse cohort demonstrated that companies at different maturity levels have different support needs.
- A defined post-programme progression pathway should be embedded into programme design, guiding companies into follow-on pilots, collaborative R&D or advisory support.

To unlock commercialisation, the most impactful actions are: standing up an LOI and pilot factory to generate substantive, commercially grounded proof points; developing investor-grade evidence packs and revenue calculators that translate flexibility value into cashflow terms; running curated, theme-based roundtables that mix operators, innovators and investors; and mapping and targeting international investor pools, particularly in Europe, where CLF investment appetite is demonstrably stronger.



Building infrastructure, tools and assets for innovation

The barriers to innovation identified through the programme's engagement with innovators and stakeholders are not solely structural or policy related. Many reflect the practical difficulty that innovators face in **navigating a complex**, **fragmented** and **fast-moving flexibility** system.

GridFlex has focussed on three areas:

1. **Flexibility system mapping:** Creating a representation of the energy flexibility system that enables the navigation and interaction.
2. **Tools to unlock innovation:** Developing tools in response to that challenges and issues raised by innovators.
3. **Assets for innovators and investors:** The GridFlex programme has developed assets to support innovators and investors.



Flexibility Systems Map

A foundational output of the programme is the Flexibility Systems Map (FSM). Innovators and policy makers consistently reported that the flexibility system is difficult to navigate, with multiple bodies including Ofgem, DESNZ, NESO, DNOs/DSOs and Elexon holding overlapping responsibilities and inconsistent terminology. Built using a model-based systems engineering approach in Sparx Enterprise Architect, the FSM is a structured representation of the GB electricity flexibility system. It captures the relationships between stakeholders, markets, services, processes, digital platforms and physical infrastructure, and is underpinned by a common ontology.

Flexibility Innovator Overview

Navigation page for flexibility innovators - provides a journey from understanding what energy flexibility is through to identifying the roles in the value chain that they could fulfil. Click on the links to navigate through the architecture. To Get back here use the links at the top left of each diagram.

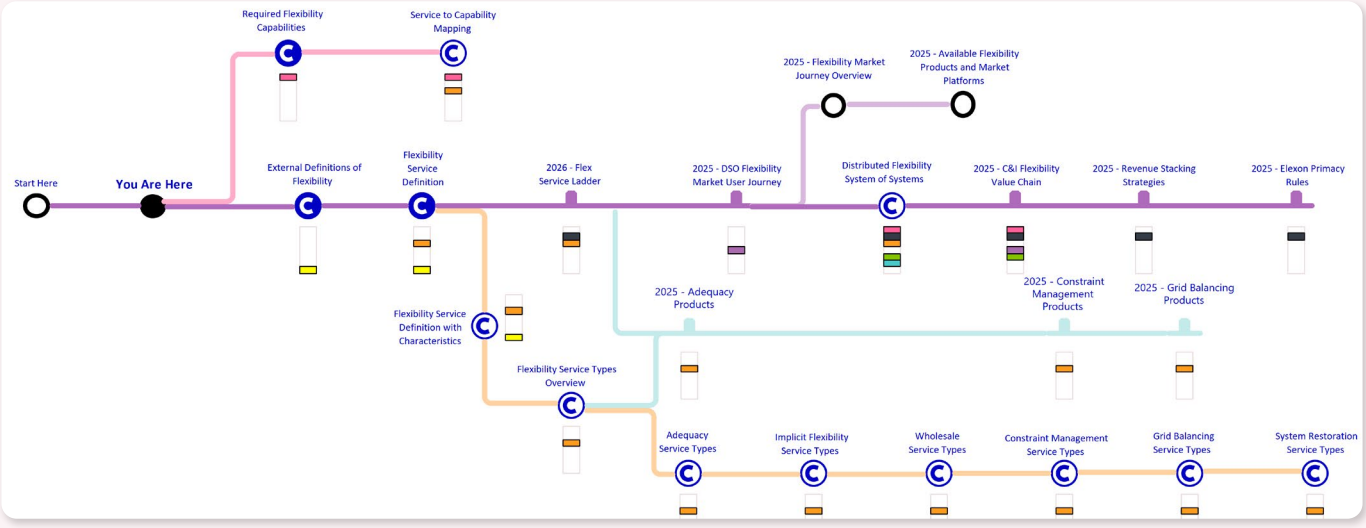


Figure 4: Flexibility system map innovator journey overview

The FSM serves three specific functions:

1. **Visibility:** Demystifies the energy system by providing a common structure and view. This supports innovators and policy makers in their understanding of the different structures and interaction.
2. **Traceability:** Every element is traceable to a source document, countering the lack of accessible reference material.
3. **Common terminology:** Enforces common terminology across the sector. Gives teams a shared reference point for assessing the impact of new ideas on the system.

FSM visualisation

A web-based visualisation has been developed as part of the programme, including a macro system overview, a clickable guided innovator journey, and zoomed-in views across markets, value chains and governance structures.



Figure 5: Visualisation of the UK's physical energy system from the system map

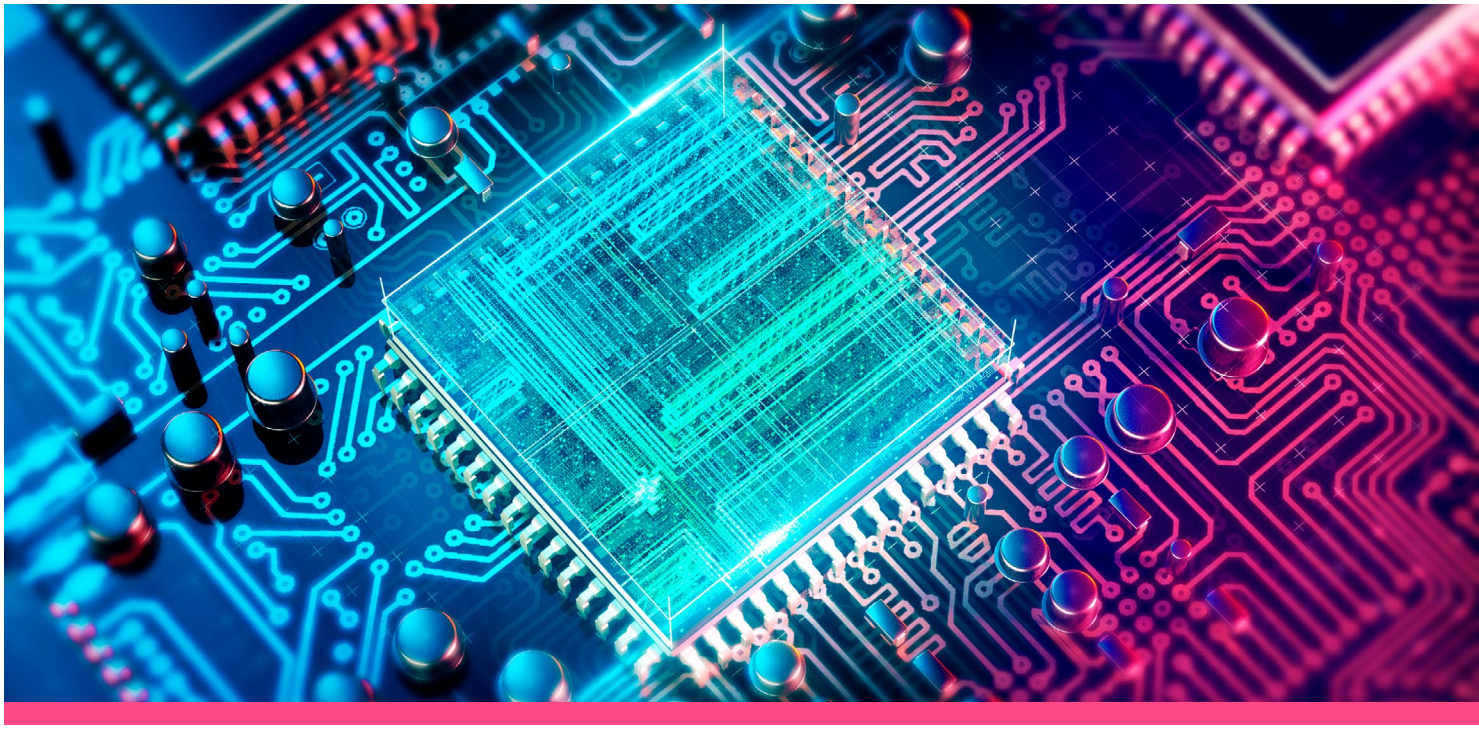
Tools to unlock innovation

The programme's approach to tool development followed a product design methodology. Structured workshops with innovators were used to surface and prioritise challenges, develop high-level tool concepts and validate those concepts with stakeholders before development. This process drew on engagement with 26 innovators over five workshops, supplemented by seed-phase research.

Tools roadmap

The road mapping process followed a three-stage methodology – ideation, qualification and prioritisation, with iteration built in throughout. Through this process, 70 High-level needs were identified across 17 challenges which resulted in 9 high-level tools.

The highest priority tool families for development are: the Knowledge Navigator; the Matchmaker Hub; Investor & Value Toolkit; and the Flexibility Systems Testbed.



Tool	Description	Barrier addressed	Innovation stage
Knowledge Navigator	A digital navigator helping innovators and investors understand the GB flexibility landscape	System complexity; fragmented market information	Early and growth stage
Matchmaker Hub	A platform to build partnerships and consortia with a focus on scaling projects	Fragmented value chain access; difficulty connecting with partners, customers, and investors	Growth and mature stage
Investor & Value Toolkit	A modelling and narrative workspace where innovators plug in a few core assumptions and get standardised value stacks, scenarios and investor-ready elevator pitches and materials	Lack of visibility and understanding of flexibility value for investors	All stages
Flexibility Systems Testbed	A flexibility-focused testbed to bring more flexible assets online faster and at lower cost	Absence of neutral test environments; inability to validate asset performance at scale	Mature stage

Table 2: Roadmap outlining the four tools, and the barriers and stage of innovation they are targeting

For these tools, a shared architecture programme was developed showing delivery across four stages: Proof of Concept; Minimum Viable Product; Version 1.0; and Version 2.0.

Within the existing programme, two proofs of concept (PoC) were built that developed and tested solutions for some of the challenges raised.

Flexibility Systems Testbed PoC

Overview of the PoC

The PoC aims to create a foundation for the Flexibility System Testbed to demonstrate, with data, how much reliable flexibility an energy asset can provide. It provides an end-to-end digital and physical infrastructure to simulate load control events, monitor asset performance during the event, and capture and calculate flex specific performance metrics such as flex capacity, response and recovery time. These metrics could inform flexibility service providers decisions about maximising secondary revenue streams and inform system wide modelling with greater accuracy.

The Flexibility Systems Testbed PoC was developed in response to two barriers identified through innovator engagement: the absence of accessible test environment; and the difficulty of evidencing asset flexibility performance to the standard required for market entry.

The concept was tested with a broad range of stakeholders including energy networks, system operators, aggregators, consultancies and innovators. Key findings from this engagement include:

Aggregators identified the greatest unmet need in evidencing the reliability of industrial and commercial loads such as HVAC, refrigeration and pumps, describing this as “very hard to measure and meter” with “very little data out there on those sorts of asset classes”.

DSOs identified the tool’s primary value for aggregators building business cases, and flagged that baseline accuracy tracking is now a mandatory requirement under new industry methodology from the market facilitator.

Innovators see the PoC as a risk-free sandbox to validate bidding strategies and avoid penalties, noting: “this platform would give us the confidence that whatever our bidding strategy can be fulfilled”.

The engagement also identified several distinct interpretations of what a testbed could mean in practice: a lab for industry and non-domestic sites; an environmentally controlled facility for individual assets; a risk-free sandbox for software or hardware interface testing; and a compliance environment to verify standards conformance.

Recommended next steps for the Flexibility Systems Testbed PoC:

- Reproduce flexibility events across all markets and extend remote hardware monitoring via APIs.
- Integrate data outputs with market and revenue forecasting models.
- Build a load profile catalogue for priority site archetypes (leisure centres, data centres, offices, hospitals).
- Work with OEMs to extend asset datasheets for use by accredited site consultants.

AI PoC

Overview of the PoC

The programme developed a chat interface that innovator can interact with to understand energy flexibility. The PoC developed several features including:

- A live alpha AI decision-support tool that guides innovators through opportunity identification, business case development, market entry and scaling.
- A structured flexibility market dataset, expert-validated and incorporating non-public data from DSOs and other stakeholders, addressing areas where off-the-shelf AI tools underperform.
- Interaction tracing capabilities to support continuous improvement and generate meta insights that can inform future programme design.
- A reusable and scalable framework that can be applied to other AI tool use cases across the energy sector and beyond.

The AI PoC, as part of the knowledge navigator tool, addresses the challenge of market opacity and complexity. Innovators consistently described difficulty identifying which flexibility services to target, how to qualify and how to model potential returns.

The PoC tests the hypothesis that an AI assistant, tuned to energy flexibility market and structural data, can provide tailored, reliable and timely insights on energy flexibility markets. The team followed an iterative, agile methodology, defining the user journey, testing with prospective users, and developing requirements and propositions throughout.

Three user insights shaped the product: innovators need support in knowing what questions to ask; access to unique, non-public data is a critical differentiator over generic AI tools; and a strong, widespread demand for a single, curated source of market information. As one DNO stakeholder noted: “SMEs find it hard to get a good understanding of how different flex markets work as information is really spread out, so one source of truth for all of the markets in one place would be super useful.”

> “I want to know what the revenue potential of a battery is per MW. Nobody can tell you that; it takes six months of finding out. You need to pay a consultant £30,000 to tell you”
>
> **– Innovator**

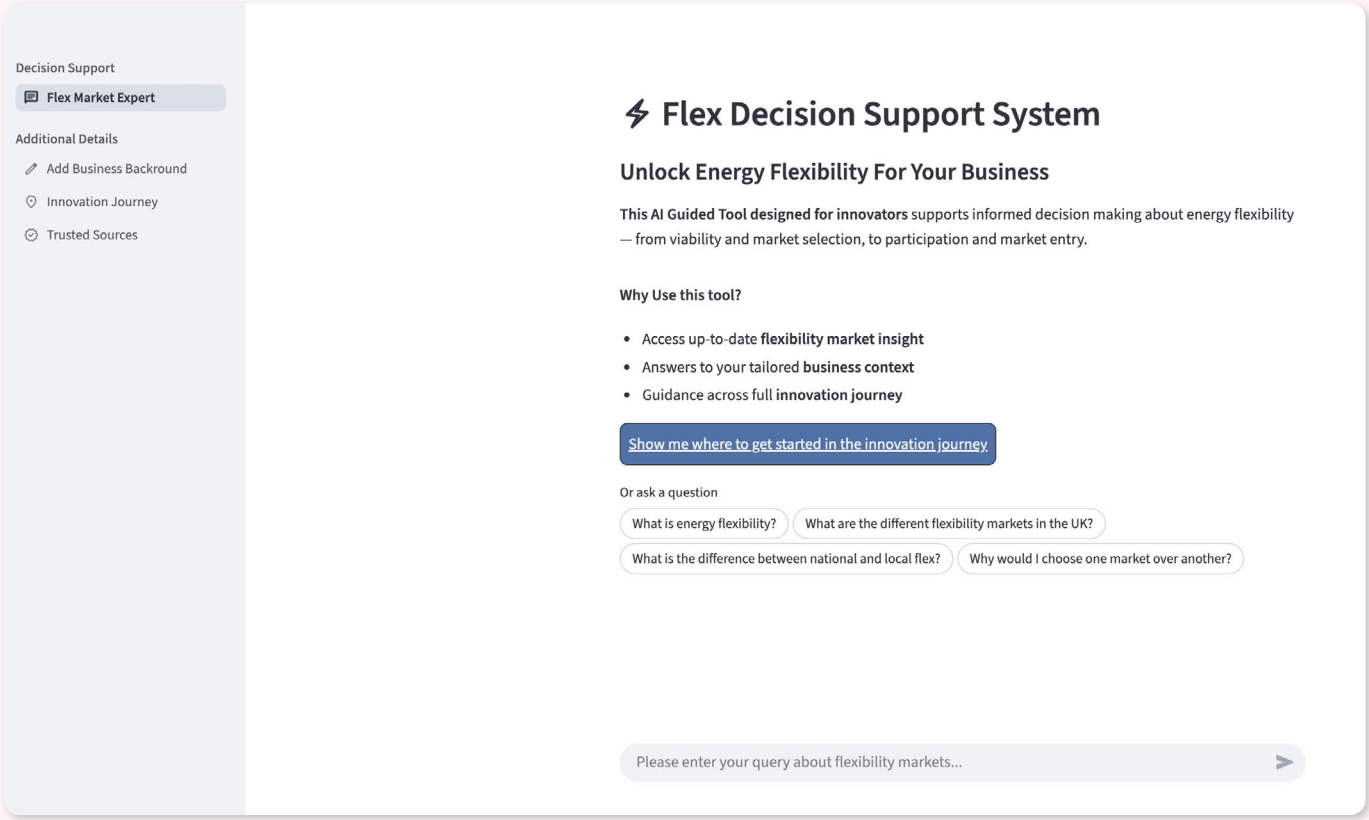


Figure 6: AI PoC created during GridFlex

The tool is designed primarily for growth and mature-stage innovators at TRL 6 to 7, providing guidance on market selection, revenue stacking, business model structuring, and the step-by-step registration and compliance requirements for entering specific flexibility markets.

Recommended next steps for the AI PoC:

- Undertake wider user testing to generate credible evidence of the tool's advantages over generic AI solutions.
- Strengthen trust and credibility by making data sources, validation and reliability more visible to users.
- Define a pathway for scaling, including integration with the FSM and the Flexibility System testbed.



Stakeholder engagement tools – serious gaming

In addition to the two PoCs, a serious gaming board game tool was investigated to address to unlock and demystify energy flexibility for energy curious innovators. Two workshop-based tools were developed to introduce potential innovators to how the energy flexibility system works.

GridFlex is a cooperative hybrid physical-digital board game designed for deep tech innovators new to the energy flexibility sector, new entrants to energy companies, and investors unfamiliar with the landscape. Players take on one of four roles (policy maker, forecaster, supplier, balancer) and work together across four rounds to keep the grid in balance while pursuing net zero and public support outcomes. The game uses an Android tablet, RFID scanner and physical components, and is designed to be played as the introductory session of a one-day innovation workshop.

Its three learning outcomes are:

- Understanding how the flexibility system works and is balanced.
- Understanding who the main actors are and how they interact.
- Identifying where innovation opportunities exist.

GridFlex LITE is a lighter weight engagement version designed to introduce the core concept of balancing supply and demand to broader audiences including conference attendees and policy stakeholders.

Both tools demystify the sector and widen the pipeline of innovators, organisations and individuals who can meaningfully engage with energy flexibility, serving as the entry point to the wider GridFlex tool suite.

Assets to support innovators and investors

Alongside its tools and systems mapping work, GridFlex developed assets designed to build capability across the innovator and investor community. These resources have been developed in response to the barrier a key barrier preventing the scaling of CLF is gaps in knowledge and shared understanding across the sector.

Video library and support materials

GridFlex developed 40 hours of structured content to support innovators looking to deploy flexibility solutions. The masterclasses provide accessible, reusable learning materials that can continue to serve future cohorts and are designed to address the barriers and knowledge gaps identified through the programme's innovator engagement.

Investor and investment handbook

The investor and investment handbook serves a dual purpose. For investors, it builds understanding of the energy flexibility landscape: the revenue models that exist, how value is created and stacked, and the conditions under which flexibility businesses can scale. For innovators, it sets out what investment-readiness looks like in this sector and what investors need to see to progress a decision. The handbook responds directly one of the barriers identified through the programme, the investor education gap.

DNO GIS Framework for Industrial Flex Assets

DNOs are increasingly using flexibility services to manage rising demand and support. However, there remain barriers to the adoption of industrial and commercial (I&C) participation in flexibility markets. There is a lack of clear visibility of where local market opportunities exist and what revenue streams are accessible to I&C organisation, leaving a significant information gap on both sides of the market.

To bridge this divide, the programme developed a GB-wide GIS dataset that overlays constraint management zones (CMZs) with industrial site data, pinpointing industrial assets with the strongest potential for future flexibility tenders. The tool maps over 3,000 CMZs across GB's DNOs against more than 8,000 industrial sites across 20-plus sectors, delivering an interactive capability with two distinct functions:

1. It enables DNOs to locate and assess flexible assets within their networks.
2. It provides industry with an accessible view of the local flexibility markets available to them and the revenue opportunities within reach.

Consumer views on flexibility and dynamic load averaging

As part of GridFlex, the consumer research team explored the opportunity to engage homeowners in energy flexibility services and reduce electricity demand through Demand Load Averaging[1] (DLA) services. Through four focus groups with homeowners, the research evaluated the appeal of DLA services based around blended ownership and resident-owned technology models. The work identified the benefits, drawbacks, and uncertainties within these DLA operating models and assessed their potential uptake.

Findings show that deep-seated mistrust in energy companies strongly shapes consumer attitudes. This drives a desire for simplicity and transparency in energy services, alongside a strong need for control. Homeowners have a distinct preference to own any low carbon technology installed in their homes and are unwilling to enter contracts that exceed five years in length.

The DLA propositions evaluated highlighted that consumers value the ease of installation and maintenance where this can be managed by the service provider. Consumers also value the enhanced bill savings and quicker payback that a DLA service can offer beyond standard behind-the-meter flexibility services. Community and environmental benefits were less motivating to homeowners, whose primary driver is to reduce their monthly energy bills and protect against future bill shocks. However, a Community Interest Company governance model helped build trust in the proposition and can encourage the adoption of energy services. The research highlights a near-term opportunity for DLA services, particularly in new-build homes where the disruption of retrofitting low carbon technologies is removed.

[1] Dynamic Load Averaging (DLA) services are a grid connection approach that manages and averages electrical demand over time, across multiple demands, to allow new connections in congested parts of the grid without waiting for infrastructure upgrades.

Outcomes and recommendations

Outcomes

The tools described in this section contribute to Outcome 2: that GridFlex's deep tech tooling approach addresses real barriers faced by innovators; and Outcome 3: that the Flexibility Systems Map creates a clearer, more coherent understanding of the flexibility ecosystem.

1. Roadmap validation workshops engaged 13 innovators across one in-person and four hybrid workshops.
2. The AI PoC concept performance was benchmarked against publicly available models (ChatGPT 5.2) using the LLM as a Judge methodology. The final version of the AI PoC outperformed the public tools available at the time of writing.
3. The Flexibility Systems Map was accessed by 17 innovators, 3 internal reviewers, 1 external reviewer and 3 contributors during this phase of the programme.

Flexibility System Map usability

To measure how effectively the platform improved users' understanding of the flexible energy system, participants completed comprehension ratings before using the platform and after completing the scenario-based usability tasks.

Ratings were collected on a 1–5 Likert scale (1 = strongly disagree, 5 = strongly agree).

Across the six participants, the data shows consistent comprehension gains across all core areas, with average improvements ranging from +0.2 to +0.6 points.

Comprehension Dimension	Before (Avg.)	After (Avg.)	Difference
1. Understanding different actors	4.6	4.8	+0.2
2. Knowing which types of organisations to partner with	3.8	4.1	+0.3
3. Understanding areas of the market to focus on	4.4	4.6	+0.2
4. Understanding revenue-making opportunities	3.7	4.3	+0.6

Table 3: Flexibility System Map visualisation comprehension metrics

Recommendations

Flexibility Systems Map: Maintain and extend the FSM as a living reference asset, ensuring it is updated as market rules, governance structures and regulatory frameworks evolve. Prioritise integration with the AI PoC so that FSM content can be surfaced directly within the tool›s guided journeys.

AI PoC: Proceed to wider user testing, strengthen data source transparency and define the scaling pathway including integration with other programme assets. Maintain the embedded energy flexibility expert model that proved central to the quality of the outputs.

Flexibility System Testbed PoC: Proceed with the five-priority development phase: reproducing flexibility events across markets; remote hardware monitoring via APIs; integrating data outputs with forecasting models; building a site archetype load profile catalogue; and partnering with OEMs to extend asset datasheets.

Serious games: Develop a facilitation and deployment strategy to maximise reach across innovation workshops, investor engagement events and policy forums. Explore digital distribution options for GridFlex LITE to extend access beyond in-person settings.





Conclusions

The GB energy system requires 10-12 GW of CLF by 2030. GridFlex was designed to understand what is blocking innovation and to build the evidence and tools needed to close that gap. What the programme has found is that the challenge is not a shortage of innovative ideas or willing innovators. Instead, it is a shortage of the conditions in which those ideas can be developed, tested, financed and scaled at the pace that Clean Power 2030 demands.

GridFlex was structured around three questions:

1. What does the future system look like and what does it require?
2. What are the barriers standing between the current system and that future?
3. What can be built now to help innovators and investors navigate those barriers?

These were not treated as independent challenges. The programme worked across them in parallel, using foresighting to anchor the work in the future, engagement with innovators and investors to identify the most important points of intervention, and tool development to translate that analysis into re-usable tools to unlock innovation.



What we have built

The programme has produced more than analysis and stakeholder engagement. It has created a reusable infrastructure that the sector can continue to build on:

- The **Flexibility Systems Map** provides a structured, traceable representation of the GB flexibility system, underpinned by a common ontology and designed to be maintained as a living reference asset to underpin innovator support and policy decision making.
- **The tool roadmap** sets out the evidence base for the next generation of tools: the Knowledge Navigator, Partnership Matchmaker Hub, Policy Collaboration Hub, and Flexibility Systems Testbed, each mapped directly to barriers surfaced through the programme.
- The **AI PoC** delivered a live alpha decision-support tool, with a validated flexibility market dataset incorporating non-public data from DSOs, directly addressing the market opacity that innovators consistently identified as a primary barrier to market entry.
- The **Flexibility Systems Testbed PoC** provides an end-to-end digital and physical infrastructure to simulate load control events, capture flexibility performance metrics, and build the evidence base that aggregators and investors need to make credible investment decisions.
- The **serious games** (GridFlex and GridFlex LITE) provide accessible entry points to sector knowledge for innovators, investors, and policy stakeholders who are new to the flexibility landscape.



What we found

The flexibility system is full of opportunity but structurally difficult for innovators to access. This is not primarily a technology gap. The 17 deep tech innovators engaged through the innovator cohort, and the two Lighthouse companies studied in depth, are developing solutions across domestic, industrial and commercial, and grid-level applications. The barrier is the opportunity to scale to widespread adoption.

- At the system level, fragmented market design, uncoordinated governance, and the absence of a clear pathway from successful trial to commercial deployment mean that innovators face a complex, difficult to navigate journey with no predictable route to scale.
- At the innovator level, regulatory complexity, limited access to reliable data and test environments, and opaque revenue models make it difficult for innovators to build investment-ready business cases.
- At the commercial level, the absence of substantive proof points, difficulty underwriting revenue stacked across multiple markets, and long sales cycles into utilities create a persistent investment gap that grant funding alone cannot close.

The 17-company cohort demonstrates that the UK's flexibility innovation pipeline spans the full value chain. The cohort's solutions point to near-term flexibility potential in domestic battery optimisation and AI-driven HVAC control and longer-term potential in integrated heat solutions, home energy management, and electric HGV and bus fleet flexibility. This breadth reinforces that the barrier is not a shortage of innovative solutions. It is the challenging conditions in which those solutions can be trialled, commercialised and scaled at the pace.

The foresighting work adds a further dimension. Across four future scenarios for the GB flexibility system in 2035, a consistent pattern emerges: the risk is not that the system fails to reach its target, but that it reaches it in a way that is fragile, exclusive or dependent on conditions that do not yet exist. Addressing this risk requires intervention at the system level, not just the innovator level, and it requires that intervention to begin now.

What needs to happen next

The value of the tools and evidence built through GridFlex can be sustained and built upon. As such, the following next steps are proposed:

1. **Future innovator support programmes:** Build on the insights developed from delivering the GridFlex programme and working with Lighthouses, the wider innovator ecosystem and investors to inform the design and development of future innovator support programmes.
2. **Build the commercialisation infrastructure:** Work to address the barriers preventing commercialisation at scale including the LOI Factory, providing revenue visibility.
3. **Implement feedback loops:** The future innovator support programmes should include working feedback loops to capture programme learning in a policy-ready format and actively feed the GridFlex evidence and insight into policy makers and regulators.
4. **Continued foresighting:** This is critical to anticipating changes. The pace of change across AI, cyber security and regulatory reform means the scenarios developed in this phase of the programme will need updating. Future iterations should formally resource participants and extend horizon scanning to a broader and more diverse set of voices.





The evidence gathered through GridFlex points to a clear opportunity. The UK has a growing cohort of innovators developing solutions that span the full CLF value chain application. Realising that potential at scale requires deliberate and coordinated action. The path to 10-12 GW of CLF by 2030 is technically achievable, but the gap to the target remains significant, and the innovation ecosystem needs the right conditions to bridge it. GridFlex has shown that targeted research and innovation, supported by coordinated policy, practical tooling, industry engagement and focused innovator support, can support the transition from mid-stage innovation to commercial scale-up.

The programme has built an evidence base and a structured view of innovation and investment within the flexibility system. Future innovator support programmes can build on these foundations. This positions GB to meet its Clean Power 2030 commitments, as well as establish the UK as a leader in how deep tech innovation and whole-system thinking can together deliver a lower-cost, more resilient and consumer-centric energy system.

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