NESO DER/CER Visibility and Access Roadmap

Consultation Report

March 2026

NESO
National Energy System Operator

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Foreword

Great Britain's energy system is transforming at pace as we move away from fossil fuels and towards low carbon sources of generation in our pursuit of a cleaner, more secure and affordable power system by 2030.

One of the biggest shifts we are seeing is in the increasing uptake of Distributed Energy Resources (DERs) and Consumer Energy Resources (CERs) connected to the distribution network. These distributed energy assets include everything from commercial batteries and small-scale wind to domestic energy sources, such as electric vehicles (EVs), rooftop solar panels, and home batteries.

NESO gaining visibility and access to the increasing volumes of DERs and CERs is critical to operating a safe and cost-efficient power system in line with Clean Power ambitions. The comprehensive integration of these assets to NESO's system operations offers a huge opportunity to cut carbon, strengthen resilience, and give consumers the chance to play a much more active role in the energy system.

We have taken positive steps forward in recent years - we have opened more of our markets to DER and CER participation, like the Balancing Mechanism, Quick Reserve and the Demand Flexibility Service – but we still have a long way to go.

Currently, we can only see a small proportion of these assets, which can lead to real challenges to how we operate the system. As volumes of DERs and CERs rise, associated blinds spots also grow and become increasingly difficult to manage.

Without access to such a rapidly increasing and significant source of energy, we risk failing to help consumers, society and the economy navigate a transition to clean energy that is secure, reliable and affordable for all.

Our vision is that by 2030, DERs and CERs are integrated into how we operate the electricity system every day. As a result, NESO will be able to plan and operate the system more efficiently, reducing carbon emissions, balancing costs, and network investment to deliver consumer savings, while also strengthening system resilience.

This consultation sets out our roadmap for tackling the challenge, and how NESO and wider industry will work together; sharing data, using digital tools that connect smoothly, and creating market arrangements that make it easy for everyone to take part.

The scale of change required and the benefits it will unlock cannot be delivered by NESO alone. We need to work closely with energy sector partners to deliver this vision and are therefore looking to colleagues across our industry to help shape the direction we take. Your critical insight and valuable experience are crucial to making sure the solutions we put in place are practical, proportionate and effective.

We invite you to challenge our assumptions, highlight gaps, and help shape a shared pathway towards a system where distributed energy assets play a full, reliable, and trusted role in supporting Great Britain's clean energy future. Together, we can deliver the visibility, co-ordination and confidence required to make DERs and CERs a cornerstone of a resilient and affordable power system for all.

Julian Leslie
Director of Strategic Energy Planning and Chief Engineer, NESO

Executive Summary

Great Britain's electricity system is decarbonising at pace and becoming more decentralised. Distributed Energy Resources (DERs) and Consumer Energy Resources (CERs) form a significant and growing share of system capacity and will be critical to delivering a secure, affordable and clean power system by 2030.

Today, NESO has limited visibility of these distributed energy assets to inform operational decision making and can access services from only a small subset of these assets to support with our system operations. This is already leading to operability challenges and higher balancing costs, undermining confidence that distributed flexibility can reliably support decarbonisation. Comprehensive delivery of DER/CER visibility and access would not only mitigate these impacts, but also offer a significant opportunity to enhance system resilience, reduce costs for consumers, and support the delivery of renewable energy solutions.

This report sets out NESO's vision for visibility of, and access to, DERs and CERs across all necessary timescales, to support the delivery of consumer benefits as part of a clean power system. In this vision, distributed energy assets are safely integrated into power system operations, including activities such as energy balancing, constraint management, restoration, resilience and planning. To deliver this vision, NESO, Distribution System Operators (DSOs) and market participants must co-ordinate through data sharing and standardisation, interoperable digital architecture, and aligned operational and market frameworks. Support from the Market Facilitator, Electricity Distribution Price Control 3 (ED3) arrangements, and emerging initiatives such as the Data Sharing Infrastructure (DSI) and primacy rules will be critical enablers.

Vision for Distributed Energy in GB

By 2030, NESO will have proportionate visibility and access to DERs and CERs across all necessary timescales, supporting the delivery of consumer benefits as part of a clean power system. Visibility and access to distributed energy will contribute to reductions in cost and carbon intensity of the wider GB electricity system, avoided network investment, and increased system resilience.

Beyond 2030, NESO will continue scaling and optimising enduring solutions to meet the long-term requirements for DER and CER visibility and access in line with evolution of the power system.

We have identified five core capability areas that NESO must develop to realise our vision:

Real-time operations: The ability to see the real-time status of distributed energy assets to improve situational awareness, to access services from these assets either directly or via an intermediary (aggregators, DSOs, suppliers, etc.) and to co-ordinate dispatch instructions with DSOs to operate the electricity system safely, cost-efficiently, and in line with clean power targets.

Forecasting and network planning: The ability to use distributed energy asset locations, capacity, planned availability, and historic behaviour, as well as visibility of distribution network connections and constraints, to improve the accuracy of forecasting and network planning ahead of real-time.

Market facilitation and procurement: The ability to understand distributed energy asset behaviour, agree an approach to co-ordination with DSOs in market operation, design appropriate market services, and procure services from distributed energy assets either directly or via an intermediary (aggregators, DSOs, suppliers, etc.).

Restoration and resilience: The ability to understand the interaction of distributed energy assets with system restoration and resilience, to be able to identify, prepare for, and respond to risks, and the ability to access post-event data to investigate incidents.

Transparency and compliance monitoring: The ability to validate delivery and compliance of distributed energy assets against market and operational requirements, to provide transparent reporting that supports accurate settlement, and deliver regulatory assurance and confidence on DER/CER participation.

To develop these capabilities, NESO will require proportionate sharing of data across the following five categories:

1. **Static asset data:** Static information about distributed energy assets (e.g., location, installed capacity, asset type, electrical parameters).
2. **Real-time metering:** Live telemetry from distributed energy assets (e.g., real-time MW and MVAr outputs).
3. **Distribution network model and flow data:** Network topology (e.g., network models), running arrangements, and network flow data (e.g., busbar voltages, and MW/MVAr flows and real-time running arrangements)
4. **Market and dispatch data:** Commercial and operational data for market participation (e.g., Physical Notifications, dispatch instructions, service commitments, planned availability).
5. **Settlement and post event data:** Data captured after market and operational events (e.g., settlement outcomes, imbalance charges, performance metrics for services and assets).

To enable sharing of data across these categories, we will support two-way data sharing where it provides broader benefits and welcome input on further opportunities to do so.

We have defined a delivery roadmap which sets out the activities NESO will undertake to build the above capabilities and data infrastructure for visibility and access. Most of these activities are already in-flight and have been prioritised as part of our recent NESO1 business plan.[1] There are a small number of new activities which will be scoped and planned in detail before we hold regulatory discussions on inclusion in our business plan and funding mechanisms. We propose the delivery of this roadmap across three phases to provide a clear structure for NESO delivery whilst remaining flexible to wider uncertainties. For example, there are a spectrum of options for the chosen transmission-distribution co-ordination model, from centralised to decentralised, and including 'hybrid' models where centralisation of system operations varies by function.

Although this roadmap focuses on NESO activities to deliver DER/CER visibility and access, successful delivery will require strong and sustained collaboration with industry. A wider ecosystem of industry decisions and outcomes (such as primacy rules and Reformed National Pricing) will influence the end-state of NESO's visibility and access and require co-ordination of the roadmap with future changes.

For this reason, we are now consulting on the level of ambition, practicality and completeness of the actions, and how best to work together to deliver DER/CER visibility and access and realise the opportunities to improve system efficiency, resilience, and use of renewable generation that this will provide.

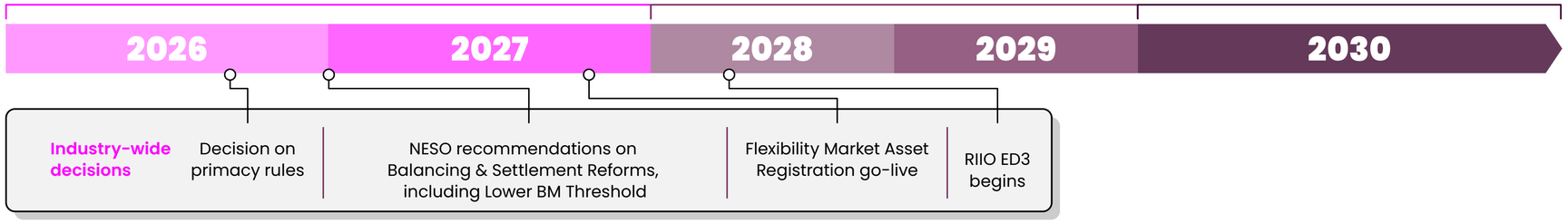
1 Our regulatory business plan for 2026-2028 | National Energy System Operator

High-level view of the NESO DER/CER Visibility and Access Roadmap

Phase 1
Foundation building for enduring solutions
Ongoing and planned activities will address urgent operability challenges and provide key insights to inform wider cross-industry decisions (e.g., RIIO ED3, Primacy Rules, Reform National Pricing), and guide future changes to business, technology, and policy.

Phase 2
Delivery of business, technology, and policy changes
Delivering policy, business and technology changes needed within NESO to stand up enduring solutions, utilising insights from Phase 1 and working closely with industry to ensure alignment.

Phase 3
Implementation of enduring solutions
We expect NESO to be ready to adopt enduring solutions, which will informed by Phase 1 and 2 outputs, and collaboration with industry. Activities will continue beyond 2030 to continue optimising these solutions.



Capability development
Near-term improvements in NESO's capabilities will be achieved through the delivery of Minimum Viable Products and widening market access. By the end of Phase 1, NESO will have the ability to...

The development of these capabilities will continue throughout Phase 2 and Phase 3 in light of insights from Phase 1, and industry-wide decisions

Progress is underpinned by cross-industry collaboration and alignment throughout all Phases

Introduction

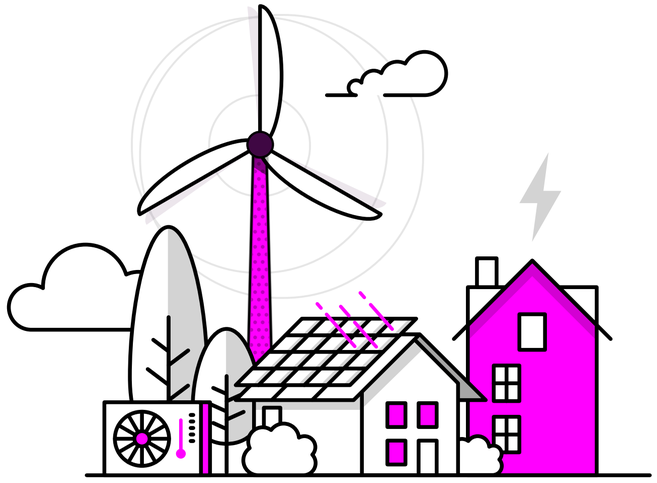
This roadmap presents a view of the activities NESO will undertake to deliver DER and CER visibility and access.[2] This includes both in-flight and planned activities. These activities are intended to both improve visibility and access in the near-term and gather evidence which will enable longer-term decision making.

The DER/CER Visibility and Access roadmap complements other NESO publications, such as the *Markets Roadmap* and the *Operability Strategy Report*.[3] We have included relevant activities captured in other documents where they may contribute to DER and CER visibility and access, even if that is not their primary goal. This consolidated view ensures that progress towards visibility and access across programmes can be tracked and sustained, enabling gaps to be identified while avoiding duplication.

We are launching this consultation because, although this roadmap focuses on the NESO activities which will deliver DER and CER visibility and access, successful integration of DERs and CERs to the power system will require alignment and support across industry. For example, delivering improved visibility and access to DERs and CERs will require increased data sharing and the co-creation of new cross-organisation processes. Key energy sector colleagues include Distribution System Operators (DSOs), Distribution Network Operators (DNOs), Transmission Owners (TOs), central bodies, trade associations, flexibility service providers, suppliers, aggregators, technology providers, and asset operators.

We gained valuable insights from responses to our report in 2022,[4] where we set out our initial case for change, benefits assessment and roadmap. Since then, we have engaged extensively with industry on this topic - through NESO events, Open Networks activities, other publications such as *Enabling Demand-side Flexibility in NESO Markets* (EDSF)[5] and *Clean Power 2030* (CP30),[6] and collaborative projects with industry that have informed this roadmap, such as Fractal Flow.[7]

We are seeking your feedback on the level of ambition outlined in this roadmap, views on how we can work together to deliver these goals, and input on whether anything is missing or if amendments are required to specific timelines and activities.



2 Delivering on the commitment from the *Clean Flexibility Roadmap* Clean flexibility roadmap - GOV.UK
3 Markets Roadmap and Operability Strategy Report 2026 | National Energy System Operator
4 Operational Visibility of DERs | National Energy System Operator
5 Enabling Demand-Side Flexibility in NESO Markets | National Energy System Operator
6 Clean Power 2030 | National Energy System Operator
7 SIF R3 Discovery - Fractal Flow (Partner) | National Energy System Operator

NESO Publication Map

The updated Publication Map can also be viewed here.

	Strategy	System Need	Policy & Procurement
Electricity	Holistic Network Design DER/CER Visibility and Access Roadmap Beyond 2030 Balancing Costs Report Operability Strategy Report	Summer Outlook Winter Outlook Resource Adequacy Study Electricity Ten Year Statement Transitional Centralised Strategic Network Plan	Frequency Risk and Control Report Electricity Markets Roadmap
Whole Energy	Clean Power 2030 Strategic Spatial Energy Plan Centralised Strategic Network Plan Regional Energy System Plans Innovation Strategy Sector Digitalisation Plan	Future Energy Scenarios	
Gas	Gas Options Advice Document	Gas Network Capability Needs Report	Gas Future Markets Plan

HND

Holistic Network Design

Cadence: Standalone

The HND and HNDFUE work is concluded apart from the environmental assessments we are completing on these. We have recently carried out a public consultation on the HND implementation plan, which is a retrospective environmental assessment. Offshore assessments will now be part of the CSNP.

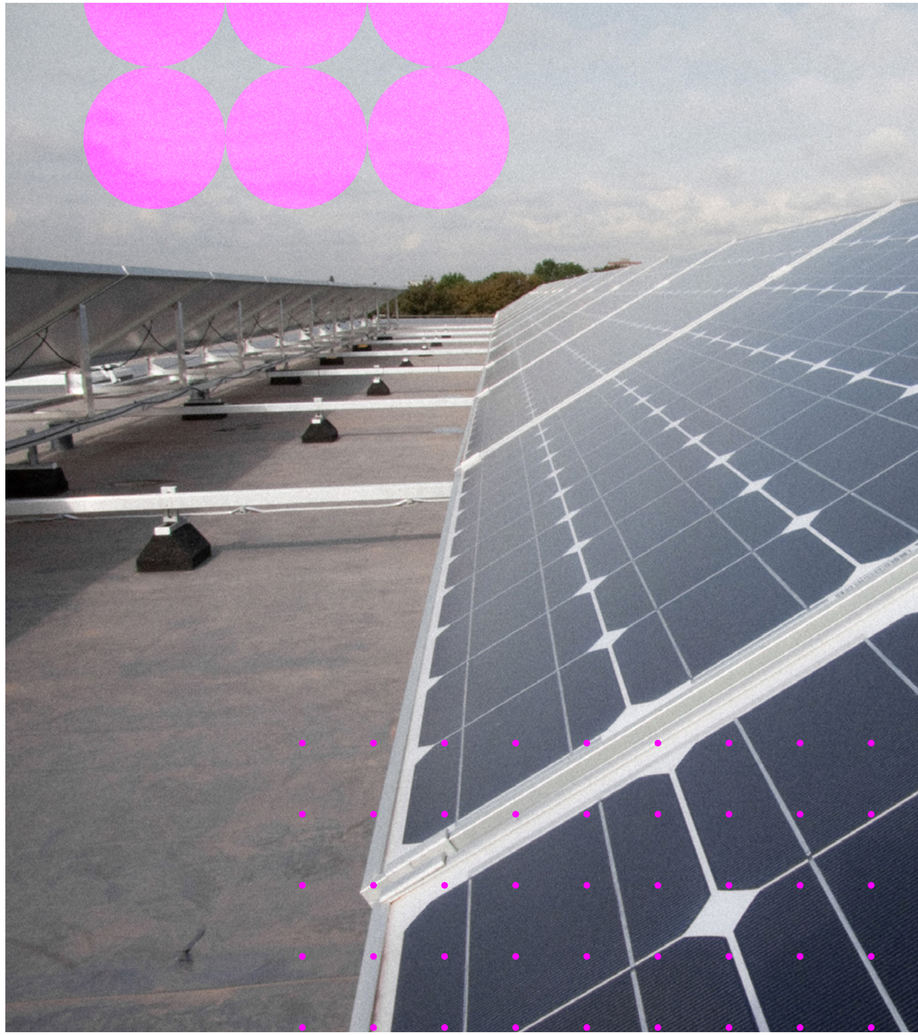
For more information click here.

01

Background

The Increasing Importance of DERs and CERs

Great Britain's electricity system is undergoing a rapid transformation as we progress towards Clean Power 2030 and Net Zero. Increasing decentralisation, significant growth in renewables, and a shift towards asynchronous generation (such as wind, solar and batteries) is resulting in an increasingly complex supply mix, connected at all levels of the network and comprising a diverse set of technologies and intermittency. Demand patterns are changing as heat and transport become increasingly electrified, with demand also becoming more flexible as consumers and smart devices respond to price signals and participate in flexibility markets.



Volumes of DERs and CERs are rapidly increasing

As part of this transformation, DERs (Distributed Energy Resources) and CERs (Consumer Energy Resources) have become a significant and rapidly growing component of Great Britain's electricity mix.

- DERs are business-owned small-scale power generation, storage, and demand devices connected to the distribution grid and located close to where electricity is consumed – for example, wind, solar, and battery energy storage systems (BESS).
- CERs are consumer-owned assets that are connected to the distribution grid at consumer premises. Common examples include rooftop solar, batteries, and EV chargers.[8]

As of February 2026, 44.1 GW of distributed energy capacity (≥50 kW assets) was registered on the distribution network.[9] Distributed capacity figures from 2024 indicate that approximately 80% of this capacity is provided by DERs, and around 20% by CERs.[10]

8 Transformation to Integrate Distributed Energy | National Energy System Operator
9 National Embedded Capacity Register | Northern Powergrid
10 Future Energy Scenarios 2025: Pathways to Net Zero | NESO – FES 2025 showed 41.1 GW total distribution-connected energy in 2024. Of this, 33.1 GW was categorised as 'distributed' connection (non-transmission sites greater than 1 MW and typically connected to one of the 14 distribution networks), and 8.1 GW as 'micro-distributed' connection (less than 1 MW, the smallest of which may be connected directly to properties behind the meter').

The *2025 Future Energy Scenarios* (FES) report indicates that, under a Holistic Transition pathway, distributed energy capacity could scale to approximately 65 GW by 2030 to support a clean power system – an additional c.20 GW of capacity.[11] The latest Connections Reform data goes further, identifying 30.8 GW of embedded generation as part of Phase 1 projects required for 2030.[12] This includes 16.3 GW of solar photovoltaic (PV), 10.2 GW of battery storage, and 4.3 GW of onshore wind.

These figures, alongside wider global trends of increased integration of DERs and CERs into power systems,[13] suggest that the rapid growth of DERs and CERs connecting to the GB power system will continue.

Distributed flexibility from DERs and CERs will be critical to achieving a clean and affordable electricity system

The distribution network is expected to play an increasingly important role in the deployment of renewable generation and flexibility assets, which will support the decarbonisation of the GB power system. For example, around 90% of future solar capacity is expected to be connected to the distribution network.[14]

DERs and CERs can provide an important source of distributed flexibility as part of this transition.[15] Distributed flexibility can help manage intermittency and enable more efficient use of renewable energy sources, reducing reliance on expensive and fossil-intensive back-up plants.[16]

Consumer-led flexibility enabled by DERs and CERs can reduce system costs. Shifting demand in response to system needs reduces balancing interventions and wholesale market pressures. This also results in lower costs of energy use for the consumer.[17]

Greater DER and CER visibility and access will improve GB electricity system operability

Improved DER and CER visibility will enable optimised system operation. For example, enhanced visibility should improve forecasting by allowing models to be trained on richer DER and CER data. This helps the models learn generation and consumption patterns, as well as underlying human behaviours. Improved forecasts are essential to optimal utilisation of infrastructure and efficient scheduling of resources. During real-time operations, improved visibility enhances situational awareness of the underlying network's generation and demand, which supports optimised dispatch decisions.

Greater access to services from DERs and CERs should also improve operability of the GB electricity system. DERs and CERs can be used to reduce peak electricity demand, help manage power flows and absorb excess renewable generation, which improves thermal operability and within day flexibility.[18]

11 Future Energy Scenarios 2025: Pathways to Net Zero This includes distributed' and 'micro-distributed' connection. Note that this figure is for embedded onshore wind, batteries, and solar only. This does not include other technologies (such as offshore wind).
12 Connections Reform Detailed Results Data | National Energy System Operator
13 DER Integration | ISON
14 Clean Power 2030 | National Energy System Operator
15 The Future of Distributed Flexibility | Ofgem
16 Clean Power 2030 | National Energy System Operator
17 Demand Flexibility Service Winter Review, July 2025 | National Energy System Operator
18 Markets Roadmap and Operability Strategy Report 2026 | National Energy System Operator

DER and CER Visibility and Access should deliver significant benefits

An assessment of the quantitative benefits of comprehensive delivery of DER and CER visibility and access found that consumer costs could be reduced by up to £292 million per annum, up to a cumulative £3 billion by 2035.[19] This aligns with other benefits assessments relevant to DER and CER visibility and access. The government and Ofgem's *Smart Systems and Flexibility Plan* estimates that data-enabled flexibility can cut system costs by up to £10 billion per year by 2050,[20] and the National Infrastructure Committee found that higher flexibility driven by asset visibility could reduce distribution reinforcement needs by up to 15%.[21]

In terms of cost assessment, we recognise that delivery of activities on the roadmap will lead to costs for stakeholders across industry, including NESO, DER and CER Operators, Flexibility Service Providers and Aggregators, DNOs and DSOs, and TOs. Generally, these stakeholders are best placed to assess the costs of changes within their own organisations, as these will vary by institution and solution.

For NESO, a 2024 assessment estimated that the delivery of NESO technology changes required to achieve DER and CER visibility and access would require around £100 million of investment. This figure is indicative and would need to be refined based on specific solutions once agreed. Additionally, in 2022, the Energy Networks Association estimated that £25 - 42 million of investment would be needed to deliver enhanced visibility for DERs (>1 MW).[22]

Although these benefit and cost assessments were conducted on a range of use cases without clarity on exact solutions to meet them, and implementation of enduring solutions would require a specific Cost Benefit Analysis to be conducted, these previous analyses clearly indicate that the benefits of DER and CER visibility and access outweigh the expected costs.

Integration of DERs and CERs through visibility and access is therefore critically important to delivering NESO's statutory duties of enabling Net Zero, ensuring security of supply, and promoting an efficient and economic power system.[23]

19 DER & CER visibility benefits | LCP Delta
20 Upgrading our Energy System – smart systems and flexibility plan | Ofgem The Smart Systems and Flexibility Plan estimated £30 billion to £70 billion of cumulative savings to 2050, contingent on digitalisation and open market access to flexible resources.
21 Electricity distribution networks: Creating capacity for the future | National Infrastructure Committee National Infrastructure Committee modelling estimated a reduction in required distribution investment from £45 billion to £38 billion.
22 Operational DER Visibility and Monitoring | Energy Networks Association
23 RIIO-2 Business Plan 3 | National Energy System Operator

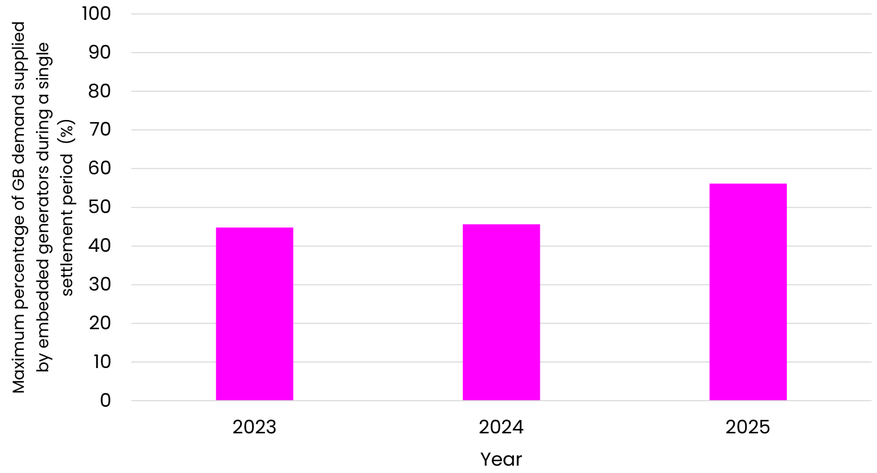
Operational Challenges of Limited Visibility and Access

System resilience is already being impacted by limited DER and CER visibility and access

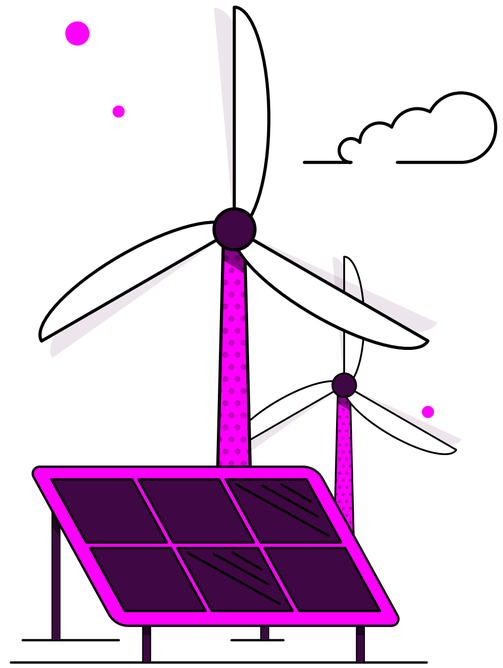
The generation from DER and CER is highly variable, and challenges for system operation tend to occur at the extremes. These extremes are becoming more pronounced; the maximum share of national demand that is provided by DERs and CERs has been growing rapidly in recent years and exceeded 50% for the first time in 2025 (see Figure 1).

However, around three quarters of these assets don't share operational data with NESO or participate in NESO's markets, and so aren't visible or accessible to NESO. This poses significant challenges to the operability of the GB electricity system. Without action to increase NESO's visibility of and access to DERs and CERs, these challenges will continue to grow and impact system resilience (see Table 1).

Figure 1: **The highest percentage of non-BMU intermittent generation for one settlement period**



Source: NESO analysis of DUKES.[24]



24 Digest of UK Energy Statistics (DUKES) | GOV.UK On Sunday 25 May 2025, non-BMU intermittent generation reached 56% of total GB demand.

Table 1: DER and CER Operability challenges and their impacts

Examples of operability challenges associated with DERs and CERs	Impacts on system resilience
Large frequency swings caused by step demand changes	Large step demand swings have occurred when large volumes of assets simultaneously responded to an external signal (for example, tariff or price). These demand swings could not be explained by conventional consumption/production patterns and forecasts and have resulted in large frequency swings.
Challenges to system security during times of low demand and high DER and CER generation	During low demand and high DER and CER generation hours (for example, windy nights or sunny bank holidays) NESO must operate the system with sufficient downward margins. Some generators, often synchronous, also need to be run to meet stability, voltage and inertia requirements. DER and CER visibility and access (mainly downward regulation) is needed to safely operate the system during these conditions. Demand, especially low demand during weekends and summer nights, doesn't grow at the same rate as DER/CER generation. This exacerbates the frequency and size of associated challenges, requiring increased actions to be taken by NESO at a higher cost to consumers.
Reactive power spill from distribution networks caused by uncompensated cable networks, high embedded generation, or low demand	Cable networks are increasingly being deployed to connect demand and generation customers, but these cable networks are not reactively compensated. As a result, periods of high distributed generation or low demand can result in localised high voltage challenges. Regions such as the Southwest of England are particularly susceptible to reactive power flowing from distribution to transmission. This spill requires additional reactive power capabilities to ensure voltage remains within safe operating limits.
Limited accuracy and efficacy of post-event analysis due to lack of data	Post-event analysis of system incidents is important to ensure that we learn from these events and improve system resilience. The lack of visibility of DERs and CERs provides challenges for accurate and comprehensive post-event analysis. Recent incidents, where DERs tripped unexpectedly, highlighted the importance of investigating and learning from these incidents especially with the growth in system complexity.
Challenges to effective system restoration following a National Power Outage	Without increased visibility of DERs and CERs, NESO's ability to restore 60% of the demand per region within 24 hours of a national power outage, and full restoration within 5 days, is challenging. A sufficient understanding of demand of DER and CER output levels in the early phases of restoration is critical for the speed and stability of restoration activities. Deeper visibility of DERs and CERs and better co-ordination with DSOs will therefore help to make the Distributed ReStart service a more valuable component in overall system restoration plans.

Protecting system security against these operability challenges increases system operation costs

Operability challenges related to a lack of DER/CER visibility and access contribute to higher costs of running the GB electricity system. For example, reactive power spill from distribution networks drives up purchases of additional reactive power from conventional plants, frequently at a high cost.[25] Similarly, poor near-real time visibility of distributed energy assets reduces the accuracy of forecasted behaviour and therefore national demand forecasts. This creates significant power requirement accuracy errors and hard-to-predict demand swings, particularly at settlement period boundaries.[26] As a result, NESO must procure and activate more reserve (e.g., Balancing Reserve) and hold more operating reserve in the BM, increasing balancing costs.

Ultimately, insufficient visibility of DERs and CERs increases the likelihood of inefficient dispatch decisions being made and that there will be poor co-ordination between wholesale and balancing markets, at further consumer cost.[27]

25 Clean Power 2030 | National Energy System Operator
Continued use of unabated gas to address reactive power spill also risks not meeting Clean Power 2030 ambitions.

26 Energy Forecasting Strategy & Delivery Plan | National Energy System Operator

27 Reformed National Pricing Call For Input | National Energy System Operator
This Call For Input is live until 14 April 2026.

Co-ordinated changes are required across the full system operations value chain

The operability challenges arising from a lack of DER and CER visibility and access are extensive, and manifest across NESO's full system operations value chain. Addressing these issues will require co-ordinated enhancements of core power system capabilities to ensure that NESO can continue to operate a secure electricity system (in line with license obligations and statutory duties) as DER and CER penetration grows.

Long-term planning

Enhanced transmission-distribution co-ordination will be essential to support long-term operational planning. Infrastructure must be co-developed to connect both demand and generation customers and ensure optimised and secure operation across all timescales. Sharing of static data for new connections will be critical for this, so that NESO's network modelling tools are updated with high quality models of connected equipment. These network modelling tools are vital to ensuring that NESO's planning and operational studies (e.g., voltage and stability studies) provide accurate results. Visibility of transmission and distribution constraints, Active Network Management schemes (ANMs), and Load Management Schemes (LMSs) will be important for operating the future electricity system.

Resilience and emergency management

For resilience and emergency management, distribution networks connect critical national infrastructure loads and a significant amount of future generation. With a high percentage of DERs and CERs supplying GB electricity demand, enhanced real-time visibility of distribution networks is needed to ensure security and quality of supply for these critical loads.

Short-term planning and forecasting

NESO must also enhance short-term operational planning and forecasting capabilities. DERs and CERs are often weather-dependent or driven by external optimisation signals (such as market prices, tariffs, or self-consumption of renewable energy), resulting in increased variability and uncertainty in system behaviour. Understanding how weather conditions and price signals influence demand and generation patterns will be essential to mitigating operability risks, for which increased real-time visibility of DER and CER data will be a critical enabler.

Additionally, most DERs and CERs utilise Inverter-Based Technologies (IBTs) which behave differently compared to synchronous generators and don't provide stability services (such as inertia). These different characteristics, behaviours, and weather dependencies require continuous refinement of the frequency response and reserve products to reduce frequency variability. Advanced modelling capabilities and expanded studies will be required to maintain converter-driven stability and validate fault ride through characteristics of DERs and CERs. Next generation IBTs with grid forming capabilities will also be required to provide system services to enhance system stability (for example, inertia and fault current injection).

Real-time operations

NESO will need to improve real-time operational processes and systems to integrate and utilise greater visibility and access to DERs and CERs. NESO will increasingly draw on DERs and CERs for distributed flexibility, to meet system demand requirements, manage power flows, absorb excess renewable generation, and for restoration. Transmission-distribution co-ordination will be critical to managing reactive power spill and meeting *Clean Power 2030* ambitions, under which our modelling suggests that voltage regulation should be maintained solely using clean power sources.[28] This co-ordination must begin during planning timescales and continue into real-time operations, consistent with the ED3 framework's emphasis on proactive, long-term, and integrated network planning for the 2028–2033 period.[29]

Post-event analysis

Improved sharing of post-event analysis data regarding system incidents and events is also critical to ensure learnings are captured and incorporated into future processes and tools.

Resolving these operability challenges will be vital to mitigate risks to system resilience, and to ensure that NESO and GB can achieve a cost-effective clean power system by 2030.

28 Clean Power 2030 | National Energy System Operator
29 ED3 Framework Decision | Ofgem

Where We Are Today

We have improved DER and CER visibility and access since our last report in 2022,[30] primarily through widening market access to non-BM units, and expanding access to the BM for DERs and CERs.

Multiple new markets have been launched, and existing markets have been expanded to create new routes to market and lower barriers to entry for distributed flexibility:

- The Demand Flexibility Service (DFS) was initially developed in winter 22/23 to lower demand during evening peak periods. It now makes it simpler for homes and businesses to join the electricity flexibility market. Through DFS, we have increased visibility of participating DERs and CERs and can increasingly access services to reduce or shift demand and support national system balancing during periods of peak demand.[31]
- Participation in Quick Reserve (NESO's bi-directional reserve service that rapidly restores system balance) was opened to DERs through a non-BM dispatch route via the Open Balancing Platform (OBP) in late 2025, expanding access to aggregated non-BM flexible assets.[32]
- A Local Constraint Market (LCM) is being trialled on one of GB's most constrained boundaries to boost access to new sources of embedded flexibility and manage constraints.[33] The trial has been extended to January 2027.
- The MW Dispatch constraint management service has provided greater real-time operational access to DERs (down to 1 MW) by enabling NESO to issue curtailment (including turn-down to zero output) instructions via DSOs to manage transmission constraints.

30 Operational Visibility of DERs | National Energy System Operator
31 Demand Flexibility Service (DFS) | National Energy System Operator
32 Quick Reserve | National Energy System Operator
33 Local Constraint Market | National Energy System Operator
The B6 boundary separates the transmission network at the SP Transmission and National Grid Transmission interface, running roughly along the border between Scotland and England.

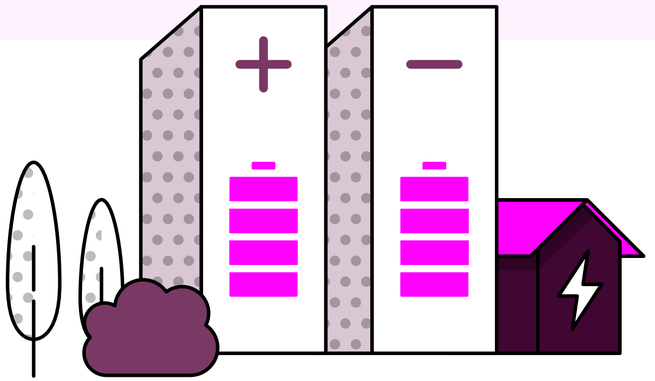
Early in 2026, we introduced changes to operational metering requirements for the BM, fulfilling our commitment to make participation in the BM more accessible to aggregated small scale assets, such as EVs.[34] In parallel, we will launch an innovation project to investigate the feasibility and relative performance of synthetic meter feeds being created by NESO and aggregators as an enduring solution.[35]

To support the expanding suite of DERs and CERs participating in market services and the BM, NESO has been working with DNOs/DSOs to refine primacy rules. Primacy rules (now governed and maintained by the Market Facilitator as part of the Flexibility Market Rules) are arrangements for coordinating access to distributed flexibility in a way that accounts for distribution network capacity. This prevents conflicts and ensures that flexibility from DERs and CERs can be used safely and efficiently across transmission and distribution systems.[36] We have collaborated with DNOs/DSOs to develop integrated processes for DSOs to actively reflect their network needs into the procurement process. The implementation of DFS v.4 will see the introduction of primacy rules with DSOs as a demonstration of primacy before rollout to wider services. This will implement 'risk of conflict' reporting, which involves the exchange of market and network data to identify and mitigate potential conflicts in NESO and DSO requirements.

However, further action is needed to unlock the full opportunities of DERs and CERs for GB, and to address the risks created by limited visibility and access. NESO has some real-time visibility of an estimated 13.8 GW of distributed energy assets, through assets registered in the BM and ancillary services.[37,38,39] This means that more than half of distributed energy asset capacity is not visible to NESO. This is even more stark when considering CERs specifically, as these currently have relatively few opportunities to participate in the BM or ancillary services. By contrast, DSOs have relatively good visibility of DERs in their networks with approximately 80% of capacity monitored.[40] This indicates that improved visibility could be obtained through data sharing with DSOs, or greater direct participation of DERs and CERs in NESO's market services.

Question 1:

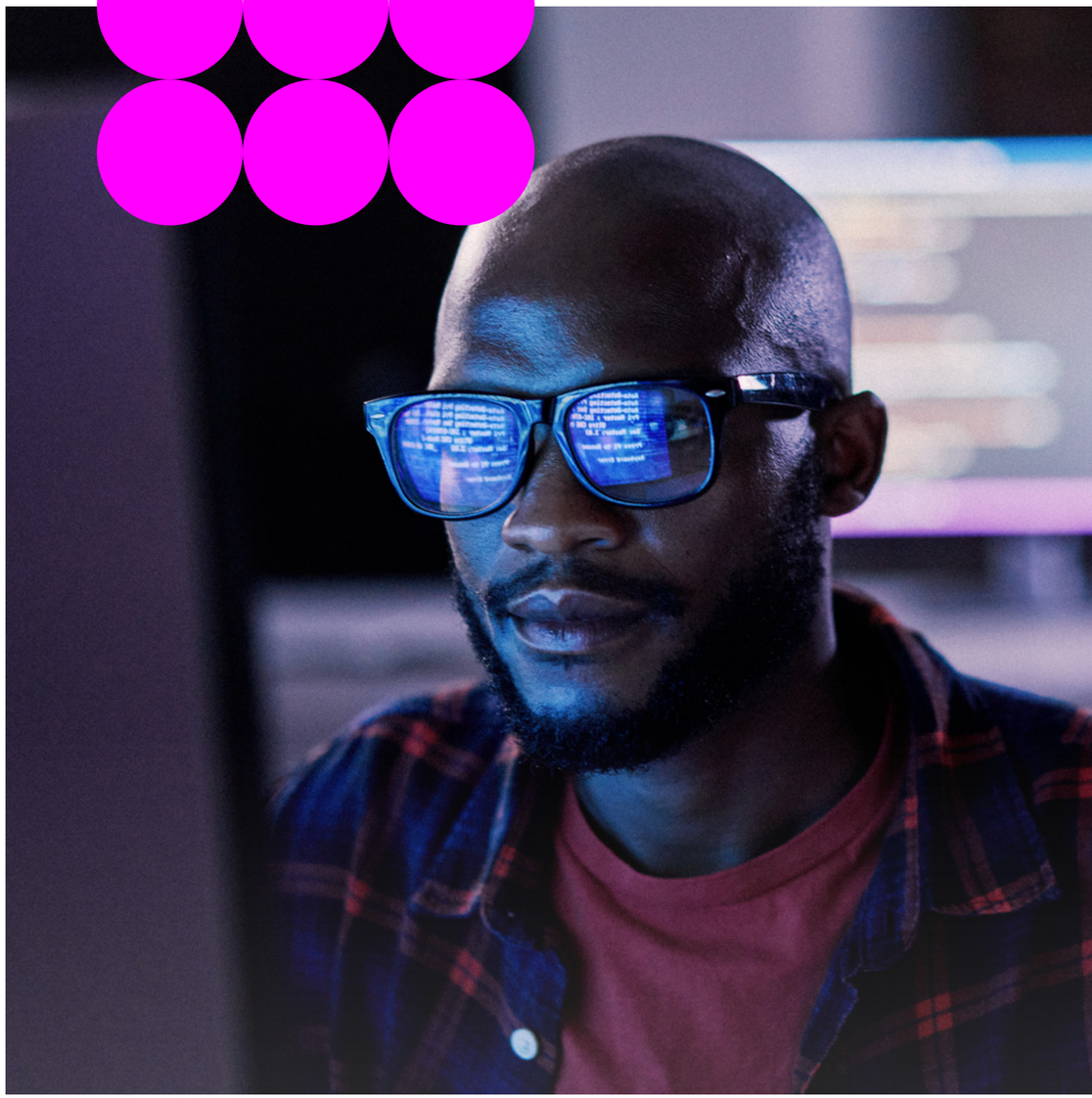
Do you agree with our assessment of the current state of DER/CER visibility and access and the case for change?

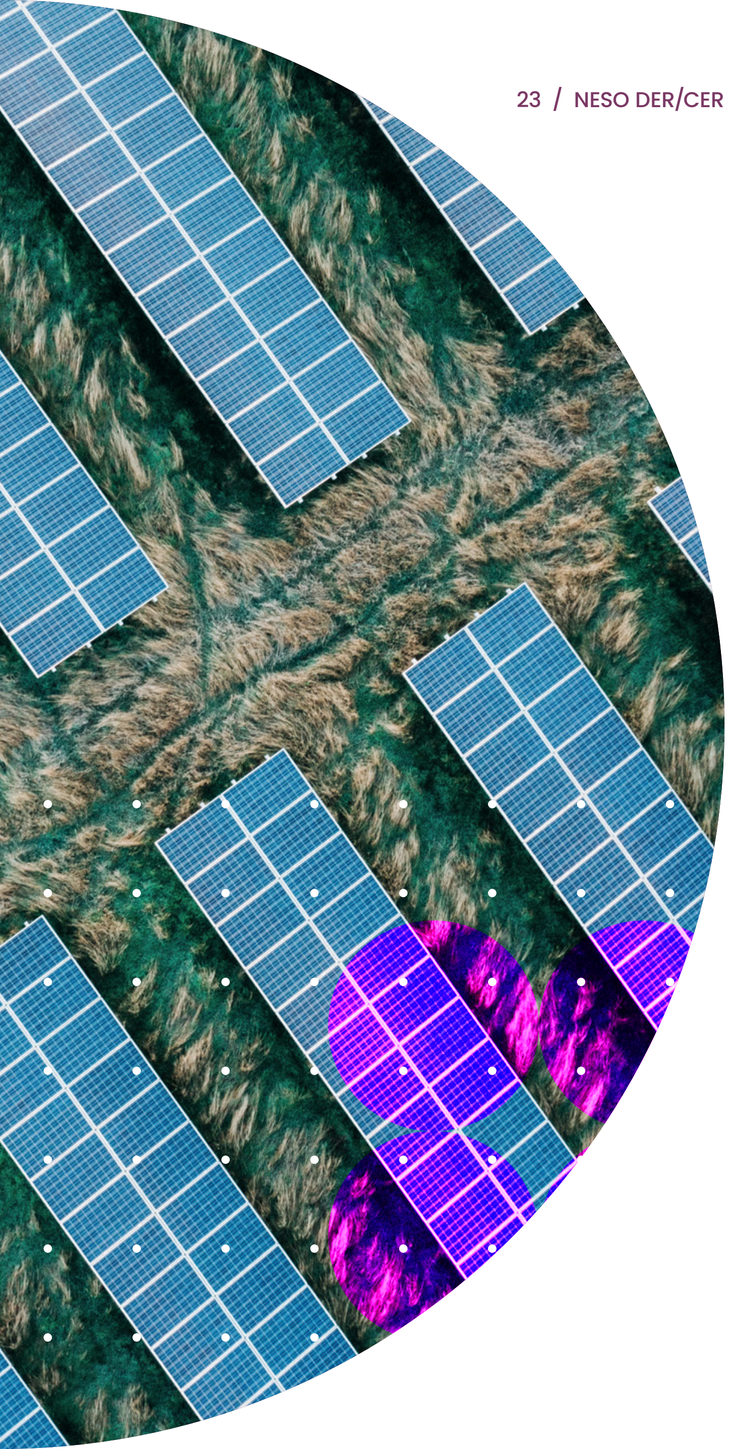


34 Briefing Note: BM Operational Metering Changes
35 Power Responsive Autumn Event 2025 | National Energy System Operator
36 Primacy Rules | Elexon
37 Elexon Portal | Registered BM Units
Around 8.3 GW of embedded assets are registered with Elexon in the Balancing Mechanism. It should be noted that not all these assets are necessarily also registered with NESO, so the actual visibility to NESO may be lower.
38 Single Markets Platform (SMP) data indicates visibility of up to 13.8 GW of embedded assets registered across NESO services. However, not all fields in SMP are mandatory so this number should be considered indicative.
39 Ancillary services vary in the visibility requirements, i.e., what signals are shared. Visibility also might only be provided when the unit is under the service provision.
40 Operational DER Visibility and Monitoring | ENA
2022 analysis showed that across all DNO networks, 28.4 GW of DER capacity out of 35.8 GW total capacity had some form of monitoring.

02

Future of Distributed Energy in GB





Vision for Distributed Energy in GB

In line with NESO's central role in the energy system, we have developed a high-level vision for the end-state of distributed energy in GB for consultation. This vision largely reflects the existing strategic analysis and plans produced by NESO, including in the Clean Power 2030 Action Plan and the Future Energy Scenarios (FES), but is framed through a distributed-energy-focused lens to identify the most relevant enablers. Our ambition for the end state of distributed energy will guide our work in the coming years by providing a long-term direction while near-term details develop. The estimated £3 billion in consumer benefits from delivering comprehensive DER and CER visibility by 2035 (as outlined in the Background) underscores the case for action. We expect details to evolve as we incorporate emerging insights, and we actively encourage feedback through this consultation to refine our approach.

By 2030, NESO will have proportionate visibility and access to DERs and CERs across all necessary timescales, supporting the delivery of consumer benefits as part of a clean power system. Visibility and access to distributed energy will contribute to reductions in cost and carbon intensity of the wider GB electricity system, avoided network investment, and increased system resilience.

Beyond 2030, NESO will continue scaling and optimising enduring solutions to meet the long-term requirements for DER and CER visibility and access in line with evolution of the power system.

This vision is made up of these key components:

The electricity system

By 2030, clean sources will produce at least 95% of Great Britain's electricity generation.[41] As part of this transition, DER and CER capacity has scaled, and enables optimised use of renewable energy sources, including through distributed flexibility. NESO will have proportionate visibility of and access to DERs and CERs, and operational challenges associated with limited visibility and access will be avoided. The increasing volumes of DERs and CERs on the distribution network will play an active role in managing increasing volatility with greater agility. System resilience will have increased, supported by improved confidence in DER and CER behaviour during faults, and improved integration of distributed assets within restoration plans.

Consumer benefits

By 2030, DERs and CERs will actively support balancing, alleviate system constraints, and provide flexibility that lowers the costs of running the system. Consumers will see direct financial benefits as a result, with hundreds of millions per year in reduced consumer costs and Great Britain on track to realise £3 billion in cumulative consumer savings by 2035.[42] These savings will be realised through multiple routes, from reduced balancing and system management costs to improved constraint management and competition from distributed flexibility. Households and businesses will gain opportunities to participate actively in energy markets, increasing competition and liquidity in the market, and industry innovations will increase consumer choice in how energy is consumed.

Market access and design

By 2030, reformed market mechanisms will have increased the participation of distributed energy assets in NESO's markets, including the BM, enabling more efficient balancing actions.[43] The Market Facilitator's Flexibility Market Rules will support aligned operation of NESO and DSO markets, allowing participants to operate seamlessly between local and national opportunities through co-ordinated service design and ways of working.[44] NESO will have visibility and access to all assets above 10 MW through mandatory participation in the BM (consistent with GC0117,[45] which is currently at workgroup) and a phased and proportionate approach will be in the process of being delivered to lower the threshold to 1 MW (subject to the ongoing *Reformed National Pricing Call For Input*).[46] Once complete, most active energy participants will be fully integrated into NESO system operation. Participation of smaller assets in the BM will also be supported by relaxed Operational Metering standards for CERs.[47]

41 Clean Power 2030 | National Energy System Operator
42 DER & CER visibility benefits | LCP Delta
43 Reformed National Pricing Call For Input | National Energy System Operator
44 Market Faciliator Delivery Plan 2026-2028 | Elexon
45 GC0117: Improving transparency and consistency of access arrangements across GB by the creation of a pan-GB commonality of Power Station requirements | National Energy System Operator
The aim of GC0117 is to standardise access arrangements for Power Station connections across GB by creating a common threshold for requirements, addressing current regional inconsistencies. The outcome of this harmonisation would be mandatory participation in the BM for all assets above 10 MW, which would increase NESO's visibility of and access to DERs and CERs.
46 Reformed National Pricing Call For Input | National Energy System Operator
47 Briefing Note: BM Operational Metering Changes

NESO/DSO co-ordination

By 2030, the ED3 distribution price control will encourage whole-system planning, ensuring that NESO and DSO system plans are aligned and reducing the likelihood of operational and planning conflicts.[48] Within this, transmission-distribution co-ordination will be actively supported by the Market Facilitator through the specification of primacy rules. NESO's visibility of DERs and CERs will include distribution network models, so that NESO instructions respect local constraints and are not counteracted by ANMs or other conflicting instructions.

Data sharing and future system architecture

By 2030, data sharing and digital infrastructure will have enabled scaled integration of DERs and CERs to support a reliable and resilient power system.[49] Future system architecture will be supported by Data Sharing Infrastructure (DSI)[50,51] to improve visibility of DERs and CERs across all timescales, co-ordinating asset, operational, and market data. ED3 distribution price control mechanisms will drive investment in smarter, digitalised networks and system operation
co-ordination processes. New and uplifted NESO technology platforms will enable secure and scalable interoperable data exchange. NESO and DSOs will be able to procure, store, analyse, and make decisions using data relevant to DERs and CERs and improve the operation of the whole-energy system through enhanced real-time operations, forecasting, modelling, and planning

To deliver this vision, NESO will need to engage actively in key industry decisions and build several core capability areas, supported by access to, and the effective use of, distributed energy data.

48 ED3 Framework Decision | Ofgem
49 DER Integration | ISON
50 Energy Digitalisation Framework | Department for Energy Security and Net Zero
Including alignment with the wider Energy Digitalisation Framework.
51 Data Sharing Infrastructure (DSI) | National Energy System Operator

Key Decisions and Uncertainties

Achieving NESO's vision for distributed energy in GB will occur as part of a wider ecosystem of decisions and changes, each of which will have a major impact on how visibility and access to DERs and CERs is achieved. These decisions will be driven by multiple actors: some are closer to NESO's own scope to design and operationalise, while others lie primarily with external bodies, where NESO will seek to inform and shape the design through evidence and analysis.

- **Primacy –** A model will be chosen to co-ordinate access to flexibility from distributed energy assets by NESO and DSO, led by the Market Facilitator.[52] This model will become increasingly important as the number of distributed energy assets within NESO's markets increases and will have significant implications for the approach taken by NESO to access distributed energy assets.
- **New licence conditions for DSOs on embedded asset registers –** Ofgem have recently consulted on the potential introduction of a licence condition placing new requirements on DSOs with respect to maintaining embedded asset registers.[53] If introduced, this would increase the scope of static asset data that NESO is able to access beyond current Embedded Capacity Registers.
- **Electricity Distribution Price Control (ED3) –** The ED3 price control will determine the requirements and incentives placed on DSOs with respect to facilitating asset visibility and access, as well as the resources provided to enable this.[54] Given the critical role that DSOs have in supporting our vision, this will be a significant enabler.
- **Flexibility Market Asset Register (FMAR) –** The FMAR will represent a 'single source of the truth' for assets registered in either DSO or NESO flexibility markets.[55] The precise data and scope of assets to be covered by FMAR is still to be determined, but this will ultimately provide a useful source of asset visibility data for NESO.
- **Data Sharing Infrastructure (DSI) -** The DSI aims to transform the energy sector by providing a solution that makes it easier to share data in a scalable, secure, and resilient way.[56] The DSI will be a critical enabler for delivering the capabilities needed to achieve distributed energy asset visibility and access.
- **Reformed National Pricing (RNP) –** Following DESNZ's Review of Electricity Market Arrangements outcome and the July 2025 decision to retain a single national price, RNP aims to modernise the GB electricity market arrangements through a series of reforms. This includes a proposal to lower the mandatory BM threshold, with current options of 10 MW or 1 MW and a phased rollout under assessment.[57] NESO's recommendation to Ofgem and DESNZ is expected in H2 2026. If approved, this would significantly increase the scope of distributed energy assets within the BM, increasing NESO's visibility of and access to these assets.

52 Primacy Rules | Elexon
53 Enhancing asset visibility: Distribution Network Operator options | Ofgem
54 Framework decision: electricity distribution price control (ED3) | Ofgem
55 Decision: flexibility market asset registration | Ofgem
56 Data Sharing Infrastructure (DSI) | National Energy System Operator
57 Reformed National Pricing Call For Input | National Energy System Operator

Ahead of these decisions and initiatives being implemented, there remains uncertainty around the precise form that the solutions to achieve NESO's visibility and access will take. This is illustrated by the spectrum of future system operation models indicated in Figure 2.

Figure 2: **The spectrum of future system operation models**

Decentralised System Operation

- Forecasting undertaken by a range of organisations including suppliers, DSOs, aggregators and NESO
- Suppliers, aggregators and DSOs submit accurate PNs to NESO
- Participation in NESO markets for DERs/CERs managed through aggregators and DSOs
- Balancing instructions to DERs/CERs sent via aggregators and DSOs

Centralised System Operation

- Forecasting undertaken primarily by NESO
- Asset owners and intermediaries submit PNs to NESO
- DERs/CERs participate directly in NESO markets or via intermediaries
- Balancing instructions sent directly to DERs/CERs or via intermediaries, with agreed primacy rules to manage conflicts with DSOs

The diagram shows two extremes, from decentralised to centralised, but there are many options in between, including options that are more decentralised for some functions and more centralised for others. For example, a 'hybrid' model could be adopted, where visibility of DERs and CERs is achieved through enhanced forecasts from several organisations (NESO, DSOs, aggregators, suppliers etc.) which enables NESO to access some assets directly for some markets in co-ordination with other actors (DSOs, Suppliers, Aggregators), who instruct other assets in other markets without NESO involvement. Models across this spectrum are equally valid, each come with their own advantages and disadvantages, and will be informed by the decisions outlined above.

We have sought to develop a roadmap which, so far as possible, avoids pre-empting the outcome of these decisions which require industry consensus. This roadmap will therefore require review as and when decisions are made which influence the enduring solutions for distributed energy visibility and access (see Next Steps for more detail).

Question 2

Do you have any comments on NESO's vision for distributed energy in GB, or on the key decisions and uncertainties influencing the roadmap?

NESO Capabilities for Visibility and Access of DERs and CERs

Delivering the vision and enabling NESO to continue to fulfil our role in an energy system with increasing volumes of DERs and CERs will be achieved in practice by developing a set of core capabilities. The capability definitions provided here are based on our working assumptions and may develop following consultation. For example, the need for NESO to see and understand distribution network connections and constraints as part of the Forecasting and Network planning capability description assumes that NESO will obtain visibility directly from assets. However, there are other options to achieving this capability for some asset groups, for example with DNOs sharing an aggregated view with NESO.

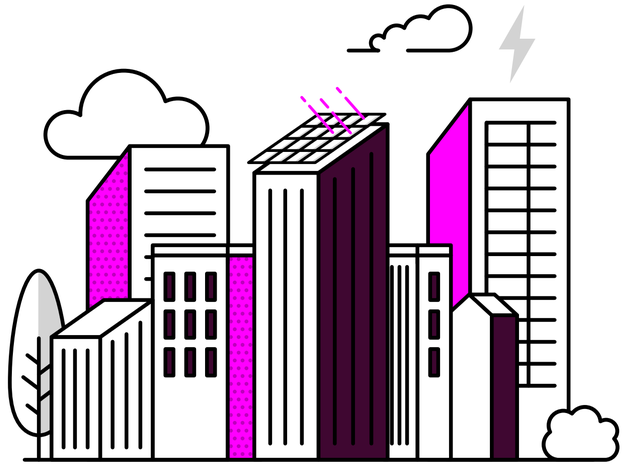
+ Real-time operations

+ Forecasting and network planning

+ Market facilitation and procurement

+ Restoration and resilience

+ Transparency and compliance monitoring

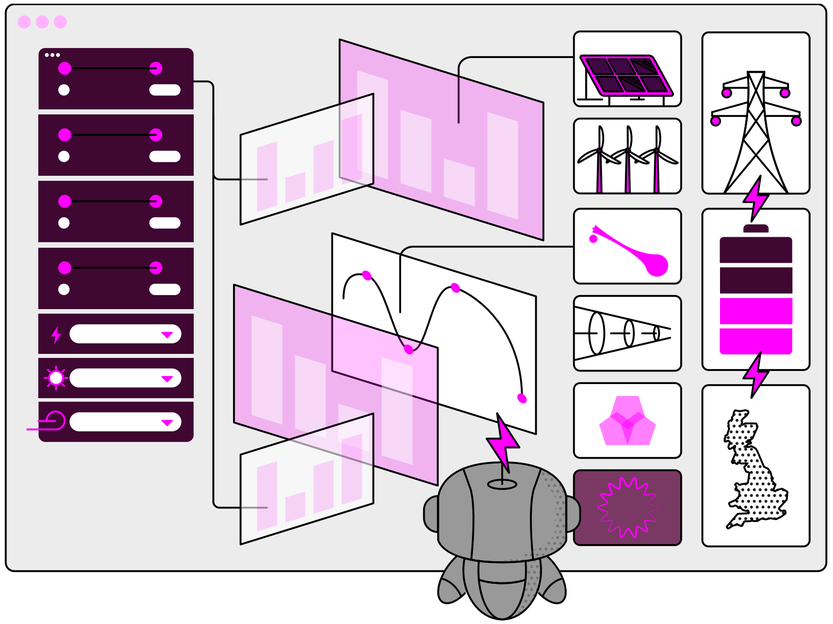


Distributed Data Requirements

To develop these core capabilities and deliver our vision for distributed energy in GB, NESO will require increased access to data across five key categories. These categories are types of data which are supported by several more granular data groups and will serve a range of functions. For example, a combination of these data categories will provide the data required for energy forecasting, or network planning. The precise data points required may vary based on the outcome of key forthcoming decisions, but the data categories will be consistent.

Distributed data categories

1. Static asset data
2. Real-time metering data
3. Distribution network-model and flow data
4. Market and dispatch data
5. Settlement and post-event data



58 Energy Forecasting Strategy & Delivery Plan | National Energy System Operator
59 Energy Forecasting Strategy & Delivery Plan | National Energy System Operator
60 Operational Visibility of DERs | National Energy System Operator
61 Energy Forecasting Strategy & Delivery Plan | National Energy System Operator

In addition to these high-level target data requirements, we will set out specific data requirements on an activity-by-activity basis, aligned to specific use cases and programme phases. Each activity will have its own target data sets based on the operational capability being developed. These activity-specific requirements will be supported by accompanying technical materials that describe the relevant data attributes, structures and exchange mechanisms, ensuring that stakeholders have clarity on the underpinning data points required.

We are considering a range of routes for data exchange between NESO and DSOs including Inter-Control Centre Protocol links, Application Programming Interfaces (APIs), and via the DSI. Precise data exchange processes will be determined on a case-by-case basis.

Question 3

Do you have any feedback on NESO's capabilities and data requirements and how we have determined them?

Question 4

Are there more effective ways for NESO to achieve these capabilities in order to meet its duties which don't require sharing of the identified data?

The wider benefits of two-way data sharing

The focus of this roadmap is on establishing NESO's requirements with respect to the sharing of distributed energy data to enable DER and CER visibility and access. However, we recognise there are opportunities to deliver broader benefits through two-way data sharing, including the sharing of transmission data with DNOs/DSOs, Flexibility Service Providers and other stakeholders.

We expect that there will be opportunities for two-way data sharing to unlock broader benefits as part of many of activities on the roadmap, for example, ODS and PODE:

Operational Data Sharing (ODS)

NESO is progressing work on harmonising and standardising data sharing across the transmission-distribution boundary as part of the ODS Minimum Viable Product (MVP). As part of this work, we are also actively seeking to make key datasets available to DNOs to support their operational visibility needs (particularly on the high voltage side of GSPs) and to enable the development and refinement of DNO and ANM systems. This activity is designed to ensure that data flows are efficient, interoperable, and aligned with operational needs across both transmission and distribution networks.

Planning and Outage Data Exchange (PODE)

As part of our PODE data sharing solution being implemented with UKPN, we are delivering the capability and processes to share regular NESO system performance reports (e.g. Operating Code No. 2)[62] with UKPN via an API-enabled data exchange, rather than the previous provision of this information via a pdf file. This will allow UKPN to feed this data into their planning systems directly and digitally and avoid the current manual entry process.

We want to continue working with stakeholders to consider the wider benefits of our roadmap and identify further opportunities to facilitate NESO/DSO data sharing. We welcome feedback on what future data sharing would be most valuable.

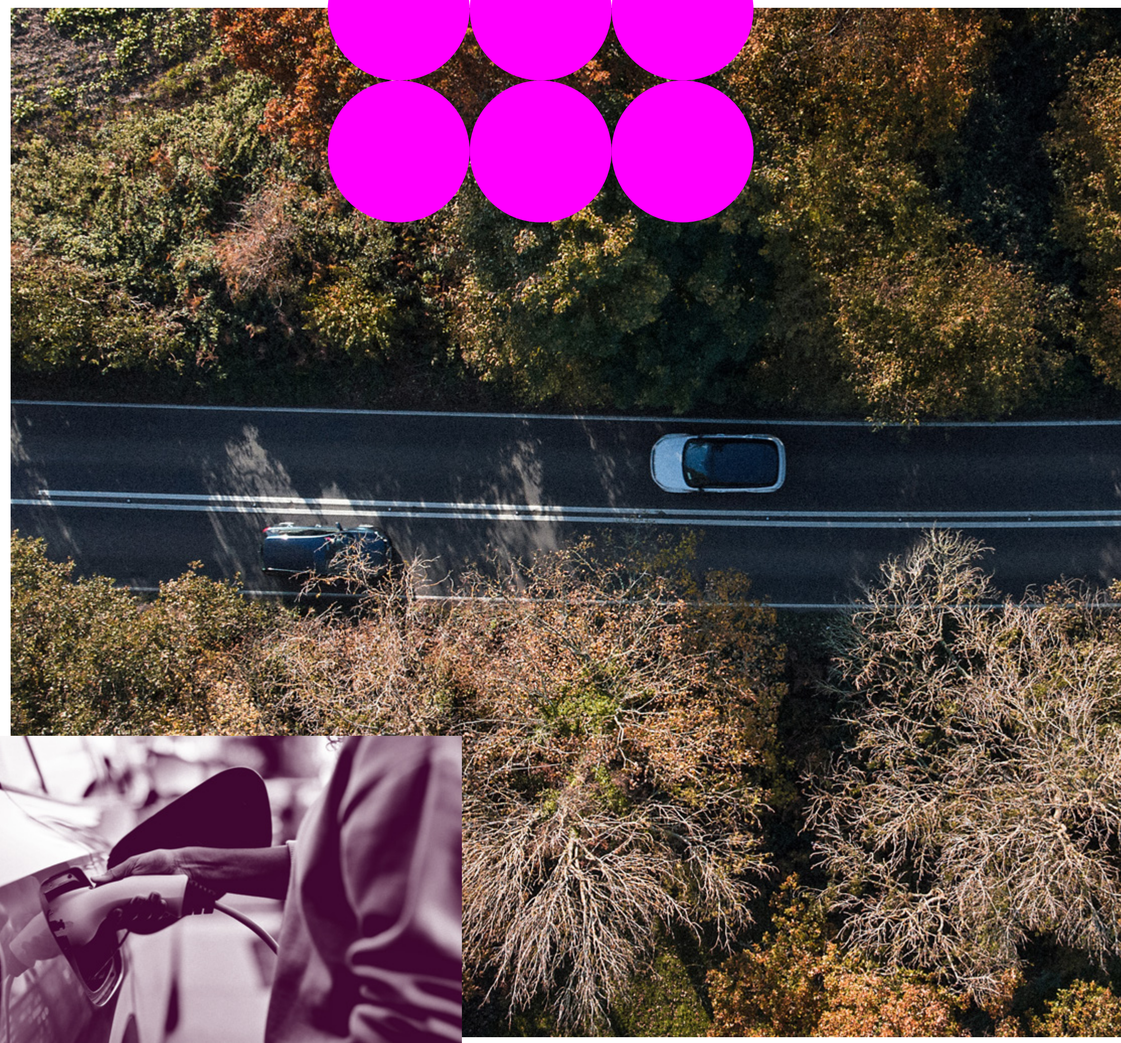
Question 5

Do you support our general approach to identifying opportunities for two-way data sharing on a case-by-case basis as part of the delivery of roadmap activities? Are there additional data sharing opportunities you would like us to explore further or that we should prioritise?

62 Operating Code No. 2 | National Energy System Operator

03

NESO DER/CER Visibility and Access Delivery Roadmap



Our Approach

This roadmap presents our view of the in-flight and planned activities NESO will undertake to deliver DER and CER visibility and access. These activities are intended to both improve visibility and access in the near-term and gather evidence which will enable longer-term decision making.

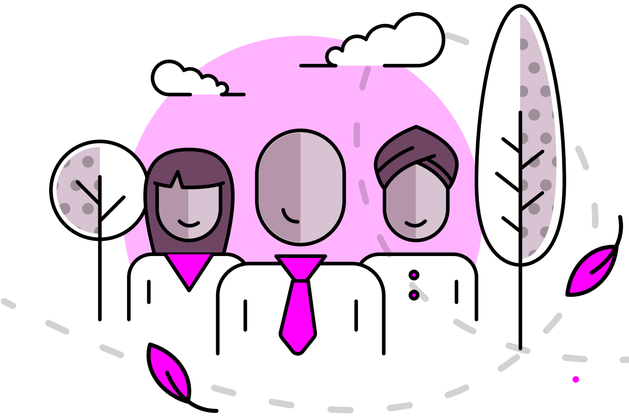
To develop it, we first defined the capabilities that NESO will need to achieve our vision for distributed energy in GB. We then identified the activities required to develop these capabilities, aligning these with existing initiatives where appropriate, and outlining additional initiatives to address any gaps.

We also mapped each activity to the data we expect it to facilitate access to, to determine how they collectively meet NESO's distributed energy data requirements. Meeting these requirements is fundamental to developing the capabilities needed to realise the vision for distributed energy in GB.

Although this roadmap focuses on NESO activities to deliver DER and CER visibility and access, success depends on strong collaboration across the industry. Many of these actions cannot be achieved by NESO alone and have significant dependencies on wider industry decisions (see Key Decisions and Uncertainties).

We recognise that there is therefore optionality in how improved visibility and access could be delivered, and different design pathways come with different costs and benefits. For this reason, the long-term design will require industry input and alignment, ensuring that the chosen approach is both proportionate and deliverable.

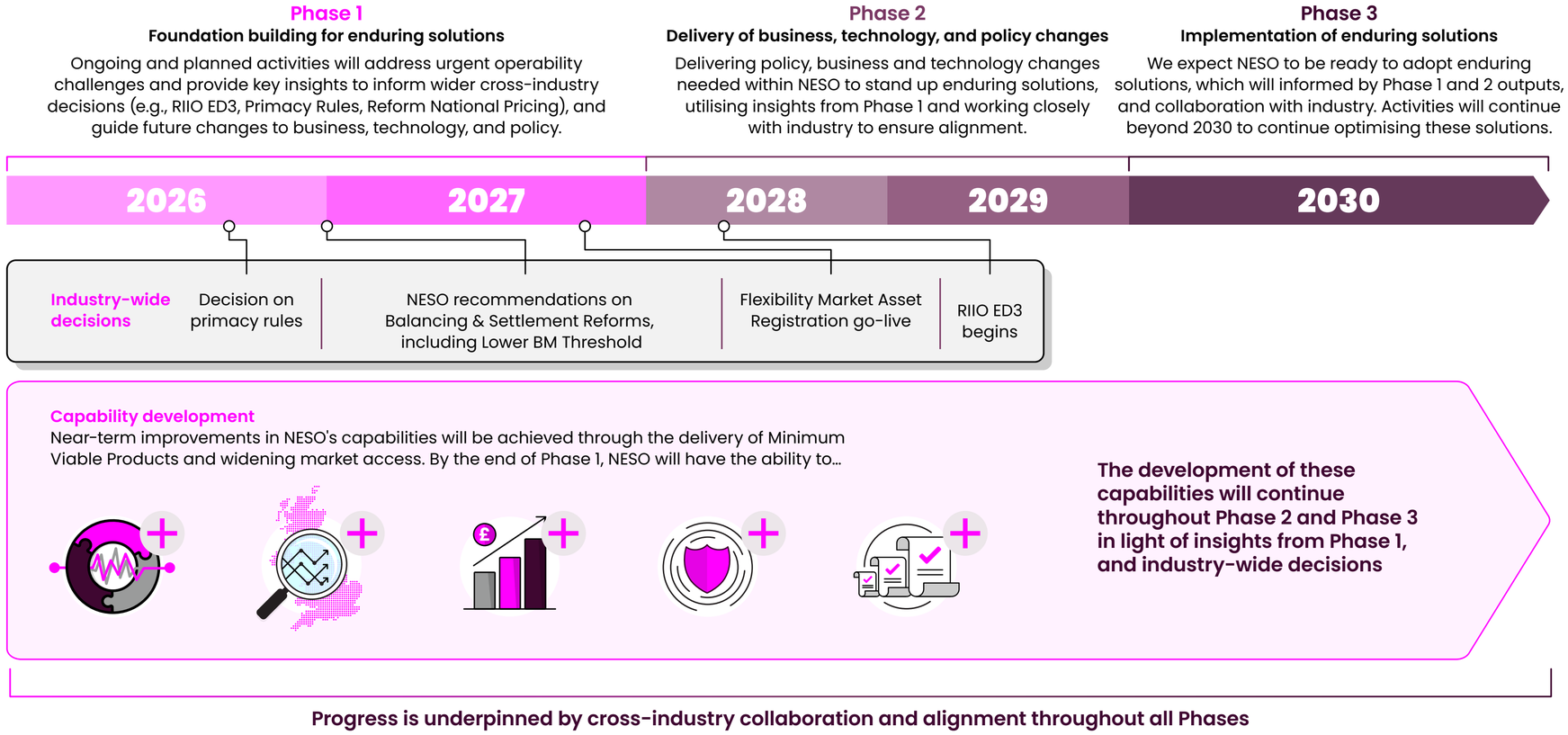
We will continue working closely with stakeholders to support delivery of the activities within the roadmap and to ensure it remains responsive to system needs and market developments. The material in this report and roadmap has already been strengthened through an Industry Challenge Group and supporting engagement held ahead of this consultation which provided early feedback on our proposed content, and we intend to adopt a similar approach in future. Further detail on our planned stakeholder engagement and roadmap governance, including an opportunity to share your views, can be found in Next Steps.



High-level View of the Roadmap

We have articulated three key delivery phases through which the roadmap activities will deliver the capabilities and data required to achieve the vision. These phases reflect the relatively high level of certainty over nearer term activities, and lower certainty related to longer term activities. Although a rough timeline for these phases is provided, this is indicative and subject to wider dependencies.

Figure 3: High-level view of the NESO DER/CER Visibility and Access Roadmap



01

Phase 1: Foundation building for enduring solutions

Phase 1 represents the activity planned for delivery ahead of key industry-wide decisions being made. The focus of this phase will be a continuation of the gradual opening of NESO's markets to a wider pool of distributed energy assets, as well as the delivery of a set of critical Minimum Viable Products (MVPs) to demonstrate the data sharing and processes needed to integrate distributed energy assets into NESO's systems. This includes Operational Data Sharing (ODS), the real-time data sharing MVP, Fractal Flow, and CASCADE innovation projects, among others.

This phase will provide immediate value by addressing urgent operability challenges caused by limited visibility of and access to DERs and CERs. These activities will also support long-term success; Phase 1 outputs will provide key insights to guide the policy, technology, and business changes needed for enduring solutions, and will provide the inputs required to conduct cost benefit analyses on enduring solutions. NESO will proactively work with industry to utilise these insights and inform the wider decision landscape.

02

Phase 2: Delivery of business, technology, and policy changes

By Phase 2, we expect to have largely completed the Phase 1 MVPs, and to have used the results of these projects to inform the cross-industry decisions being taken (which will inform NESO's enduring form of DER/CER visibility and access). The focus of Phase 2 will be delivering the policy, business and technology changes needed within NESO to adopt these enduring solutions, working closely with industry to ensure alignment.

03

Phase 3: Implementation of enduring solutions

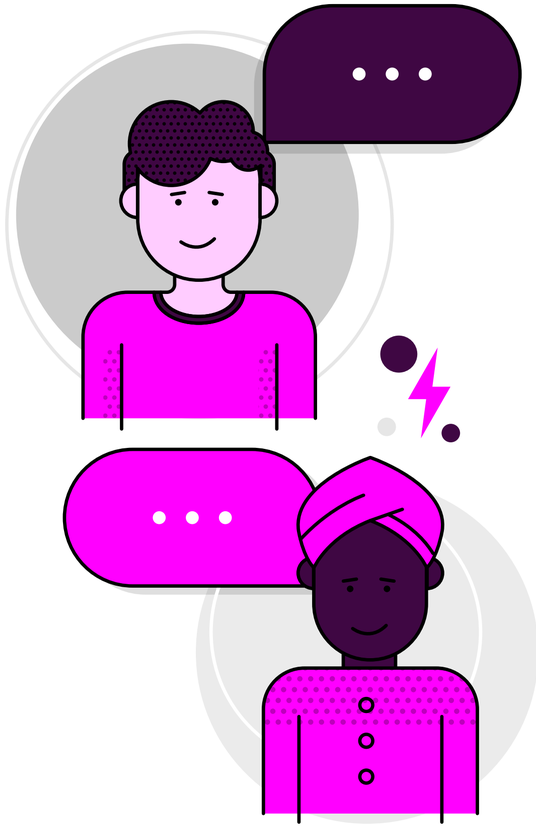
Phase 3 represents the point at which NESO is ready to adopt enduring solutions, informed by the activities conducted in Phase 1 and 2 and close collaboration with industry. By this point, many of the key decisions and uncertainties outlined in 'Key Decisions and Uncertainties' are expected to have concluded and there will be greater clarity on the precise form that NESO's visibility of and access to DERs and CERs will take. Activities to deliver visibility and access for NESO will continue beyond 2030 to continue optimising and scaling enduring solutions and meet long-term power system requirements.

Delivery Roadmap

The delivery roadmap represents our view of the activities which will deliver the capabilities and data required for NESO to achieve sufficient visibility of and access to DERs and CERs. Improved visibility and access to distributed energy assets will enable NESO to better understand and respond to their behaviour and ultimately operate an increasingly decentralised power system safely, reliably and efficiently. By establishing interoperable and standardised data sharing arrangements across the transmission-distribution boundary, the activities directly support real time operations, network planning and effective use of distributed flexibility, in line with Clean Power objectives.

We are confident that these activities will progress us towards our vision for distributed energy in GB and provide greater clarity on future requirements. We will develop the vision in line with insights emerging from these value-adding activities in Phase 1 and wider feedback from industry. Most of these activities are already in-flight and have been prioritised as part of our recent NESO1 business plan.[63] We have also identified a small number of new activities which will be scoped and planned in detail before we hold regulatory discussions on inclusion in our business plan and funding mechanisms.

While the roadmap focuses on NESO activities to deliver visibility of and access to DERs and CERs, there are dependencies on industry action and engagement to achieve these goals. We welcome industry views on the delivery of actions to support the roadmap, any concerns, or any suggestions to address concerns while achieving the same aims.



63 Our regulatory business plan for 2026-2028 | National Energy System Operator

Question 6

Do you have any suggestions for additional activities we can deliver with you to improve DER & CER Visibility and Access? Are there any specific gaps you see within the roadmap?

Question 7

Do you have concerns about feasibility for any specific activities, or for the overall roadmap?

Question 8

What challenges or barriers do you see in being able to work with NESO to deliver improved visibility of and access to distributed energy assets?

Question 9

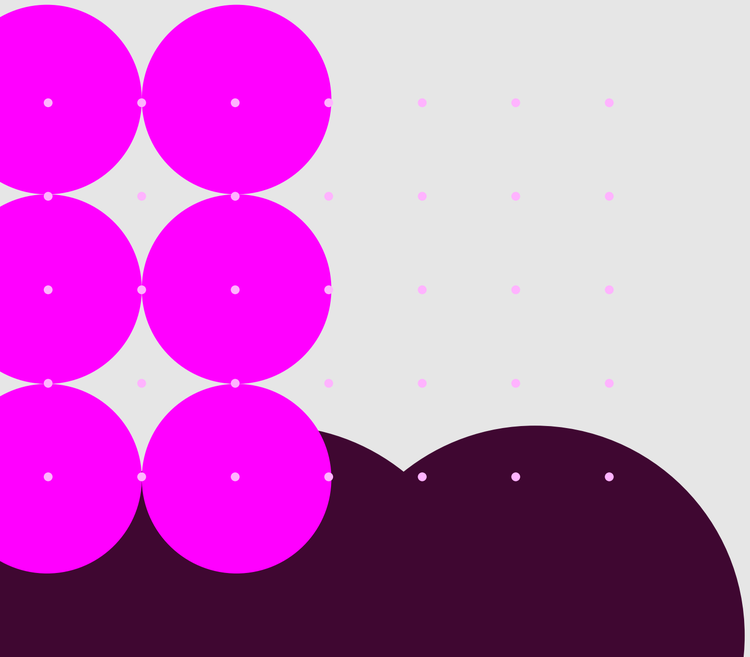
Are there alternative approaches (either at the overarching roadmap level or at an individual activity level) that you believe could address the identified issues more effectively? What would the benefits of these alternative proposals be?

View NESO's interactive DER/ CER Visibility and Access roadmap here

Next Steps

We recognise that the successful delivery of this roadmap is highly dependent on co-ordination with industry. This section sets out our proposal for how we will work with industry during and following this consultation to achieve this co-ordination.

The roadmap itself will be updated following consultation to reflect industry input, ensuring we have balanced ambition and deliverability appropriately. Looking ahead, it is important that we implement appropriate stakeholder engagement and governance arrangements.



Stakeholder engagement and governance

We recognise that close and constructive collaboration across the energy sector is essential to successful delivery of the activities in this roadmap. Our stakeholder engagement approach has been designed to enable stakeholders to provide meaningful input and ensure that feedback actively shapes both the development and implementation of the roadmap.

To support this consultation and roadmap, NESO will facilitate:

- Targeted engagement during the consultation period to explore detailed implications, assess feasibility, and identify opportunities for co-ordination, ultimately ensuring stakeholders' questions are addressed prior to submission of consultation responses.
- Engagement via existing forums where possible to link in with relevant initiatives and engagement campaigns, minimising the impact on stakeholders' time.
- Final publication of the roadmap post consultation, setting out what has changed based on feedback during the consultation and how we plan to communicate updates going forward.

These engagement activities are intended to capture a broad and representative range of perspectives, so that the roadmap reflects the needs, experiences and expectations of stakeholders across the sector.

Looking beyond the consultation, our initial view is that an annual review of the roadmap is an appropriate frequency. This would be designed to ensure that our work remains aligned with system needs, policy developments and industry feedback, while avoiding the burden that more frequent reviews place on all parties. As part of these reviews:

- We expect to publish an updated roadmap on our website, with a supporting report to share progress made and identify what has changed and why.
- For each update, we would expect to also deliver a supporting webinar to talk through progress made and updates, discuss emerging findings, and invite feedback on the next steps. This could be supported with optional bilateral engagements. These activities are aimed at supporting transparency and structured engagement.
- We will take a proportionate approach to engaging with industry, depending on the nature and scale of changes. Our expectation is that subsequent updates will be less significant than this initial development of the roadmap. If we identify a significant level of change to the roadmap, we would look to engage with industry in advance of publication through an appropriate forum, which may include a challenge group or other targeted engagement, to seek deeper industry input, as we are with this inaugural publication.

- Individual activities on the roadmap (e.g. Balancing Programme) will additionally provide updates and relevant developments via their individual stakeholder engagement activities.

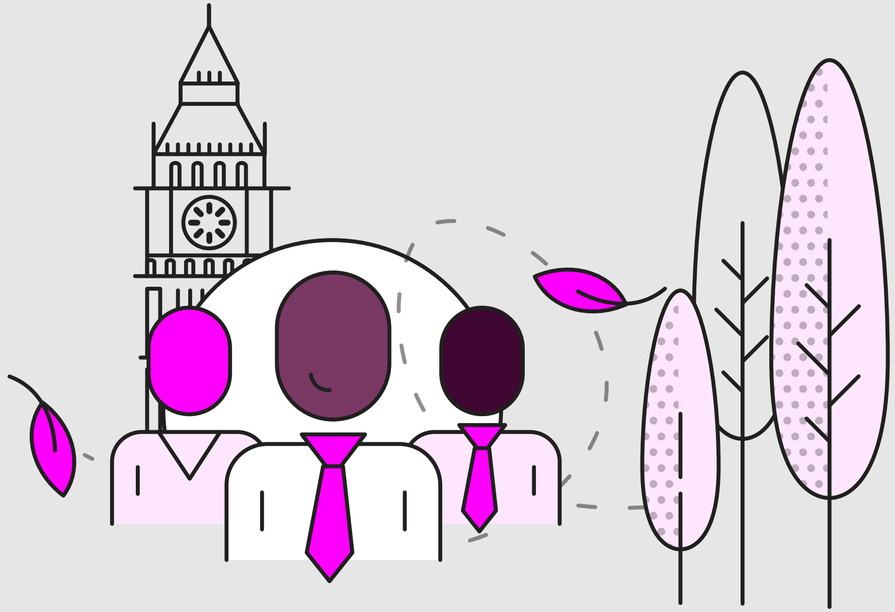
Delivery of activities contained within the roadmap will utilise the most appropriate existing industry governance routes. For example:

- Delivery of MVPs will generally be undertaken subject to the agreement and creation of working groups between the relevant industry participants.
- Longer term changes will be implemented through existing industry governance structures, for example, through the Market Facilitator or code modification processes.

Governance will be managed activity-by-activity to stay proportionate and traceable. In-flight activities will have existing governance arrangements (e.g., working group, code change) and engagement routes for industry involvement. New activities will establish accountabilities and implement proportionate governance at mobilisation and, where relevant, build to MVP first before scaling via established industry processes.

Question 10

Do you have any views on our stakeholder engagement and governance proposals for the roadmap going forward? How would you like to be kept up to date with progress?



Consultation Questions

The consultation questions are embedded throughout this document and summarised below:

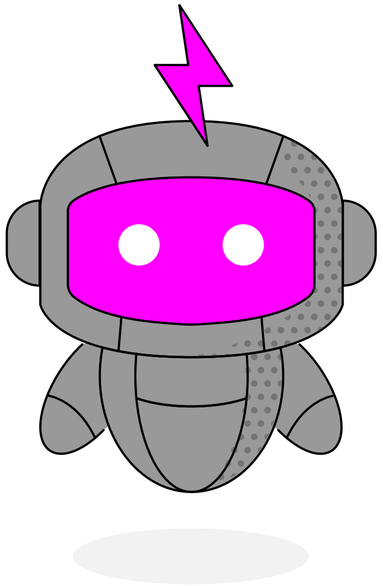
1. Do you agree with our assessment of the current state of DER/CER visibility and access and the case for change?
2. Do you have any comments on NESO's vision for distributed energy in GB, or on the key decisions and uncertainties influencing the roadmap?
3. Do you have any feedback on NESO's capabilities and data requirements and how we have determined them?
4. Are there more effective ways for NESO to achieve these capabilities in order to meet its duties which don't require sharing of the identified data?
5. Do you support our general approach to identifying opportunities for two-way data sharing on a case-by-case basis as part of the delivery of roadmap activities? Are there additional data sharing opportunities you would like us to explore further or that we should prioritise?
6. Do you have any suggestions for additional activities we can deliver with you to improve DER & CER Visibility and Access? Are there any specific gaps you see within the roadmap?
7. Do you have concerns about feasibility for any specific activities, or for the overall roadmap?
8. What challenges or barriers do you see in being able to work with NESO to deliver improved visibility of and access to distributed energy assets?
9. Are there alternative approaches (either at the overarching roadmap level or at an individual activity level) that you believe could address the identified issues more effectively? What would the benefits of these alternative proposals be?
10. Do you have any views on our stakeholder engagement and governance proposals for the roadmap going forward? How would you like to be kept up to date with progress?

We encourage all stakeholders to provide feedback via these consultation questions. We will review all responses and incorporate input to the NESO DER/CER Visibility and Access Roadmap.

Please provide all feedback via the response form by Thursday 30th April 2026.

The use of Artificial Intelligence (AI)

AI will be used to help summarise the consultation responses we receive and identify actionable insights. All responses will also be read by a human in both its original and summarised form. AI's ability to handle diverse data sources and formats enhances our capacity to take on board responses from a wide range of customers and stakeholders. Additionally, AI can identify patterns and trends within the responses that might not be immediately apparent to human reviewers alone.



AI will not be used to make decisions autonomously, but serve as a tool to enhance, rather than replace, human judgement and support our decision-making. AI will help to highlight important issues and common themes. This approach will help ensure that the final roadmap is informed by the broad spectrum of views we expect to receive. We will regularly review our use of AI in interpreting consultation responses, and we will be able to track any insight identified by AI to its original source. We acknowledge the potential for biases in AI platforms and we will incorporate bias mitigation strategies into our AI planning processes. This proactive approach will help us to ensure that the actionable insights our AI systems provide are fair, unbiased and reflective of the diverse range of our customer's and stakeholders' views.

Additionally, we recognise our responsibility to maintain transparency and due diligence in all of our AI-related activities. Our use of AI will strictly adhere to NESO's relevant policies, including AI, data management, data privacy, data classification and data sharing. These policies ensure that our AI practices are aligned with our commitment to ethical standards and regulatory compliance.

Key Terms and Acronyms

Term	Description
Access	Ability for NESO and DSOs to make changes to the input or output of units
ANM	Active Network Management
API	Application Programming Interfaces
BESS	Battery Energy Storage System
BM	Balancing Mechanism
BMU	Balancing Mechanism Unit
CER	Consumer Energy Resources **Definition:** Consumer-owned assets that are connected to the distribution grid at consumer premises.
CP30	Clean Power 2030
DESNZ	Department for Energy Security and Net Zero
DER	Distributed Energy Resources **Definition:** Business-owned small-scale power generation, storage, and demand devices connected to the distribution grid and located close to where energy is consumed.
DFS	Demand Flexibility Service
Distributed energy assets	This phrase refers collectively to Distributed Energy Resources (DERs) and Consumer Energy Resources (CERs)
DNO	Distribution Network Operator
DSI	Digital System Infrastructure

Term	Description
DSO	Distribution System Operator
DUKES	Digest of UK Energy Statistics
ECR	Embedded Capacity Register
EDSF	Enabling Demand-side Flexibility
ED3	Electricity Distribution Price Control 3
EV	Electric Vehicle
FES	Future Energy Scenarios
FMAR	Flexibility Market Asset Registration
GB	Great Britain
GW	Gigawatt
GSP	Grid Supply Point
HVDC	High Voltage Direct Current
IBT	Inverter-Based Technology
LCM	Local Constraint Market
LMS	Load Management Scheme
MVAr	Megavolt ampere reactive, a unit used to measure reactive power
MVP	Minimum Viable Product
MW	Megawatt

Term	Description
NESO	National Energy System Operator
NESO1	NESO's business plan for April 2026 to March 2028
OBP	Open Balancing Platform
Ofgem	Office of Gas and Electricity Markets
PN	Physical Notification
PODE	Planning and Outage Data Exchange
RNP	Reformed National Pricing
SMP	Single Markets Platform
Solar PV	Solar photovoltaic
TO	Transmission Owner
Visibility	Awareness for NESO and DSOs of units

NESO

National Energy
System Operator