Ofgem Sector Specific Methodology Consultation Response

Q62. What additional data, digital tools, or visibility improvements are needed to enable DSOs to deliver proactive, spatially targeted network planning in ED3? Please provide examples of gaps or best practices.

At the distribution level, DNOs tend only to have oversight at the primary substation level. At the low voltage level, where most EVs, heat pumps and smaller distributed renewables installations connect, they have little real time data. This has led to engineering assumptions, which may be increasingly outdated as the energy transition progresses, and relying on customer connection applications and customer complaints to flag capacity issues reactively. This increases the risk of local overloads being identified late and thwarting customer connections, adding constraint costs, limiting uptake of distributed energy resources and capacity utilisation, as insufficient visibility requires more conservative capacity margins.

Ofgem, DESNZ and NESO recognize that greater visibility on the distribution system is needed to enable flexibility and to enhance network planning, including determining network business plans that determine costs through the price control. The Clean Flexibility Roadmap proposes steps to develop a visibility policy framework, although focused on the asset level, by mid-2027[1]. Rather than addressing this at the asset level, however, a more efficient approach would be to digitalize the secondary substation level, which would also allow network operators greater real-time data directly, and a greater understanding of the network capacity for connections.

Finally, digital tools should extend beyond measurement and modelling. A fully digital, software defined system, like a modern telecoms network or oil field, uses digital technology to control the system as well as to measure it. Electricity digitalisation efforts should seek to prioritise digital assets that enable remote and autonomous management of the network, like smart substations.

Q67. Are further incentives required to incentive and encourage the use of flexibility in line with our approach for ED3?

Whilst we agree that encouraging DNOs to maximise their flexibility opportunities is the right approach, we do not believe that the approach within ED3, as a departure from the approach taken in ED2, is the right one. We acknowledge that Ofgem has moved from a 'flexibility first approach' to a 'flex and build' approach, stating: "In relation to the DSO's role in using flexibility, we particularly want network companies to build - to ensure the network can accommodate the increase in distributed energy resources and enable them to be utilised by the wider system. But we also want them to flex." Whilst we understand that in order to reach the Clean Power 2030 target, networks will inevitably build new traditional infrastructure, we believe that this approach does not

[1] https://www.gov.uk/government/calls-for-evidence/improving-the-visibility-of-distributed-energy-assets

appropriately reflect the potential of flexibility. The assumptions appear to be that flexibility cannot be an enduring solution, with the consultation stating 'there may be some instances where flexibility is identified as the permanent alternative to network reinforcement. In practice, we expect this to be rare in ED3 and would expect DNOs to identify and justify these instances in their business plan submissions.'

We believe this view undervalues the potential of enduring sources of flexibility. The CLASS trial demonstrated that assets with a lifespan of around 25 years can provide sustained flexibility, and the BEET trial has demonstrated a similar principle. Since the completion of the CLASS trial, new innovations in network flexibility with lifespans of greater than two decades have become commercially available. The growth of DSO Flexibility markets over the last price control also demonstrates the value of flexibility

On this point, in the RIIO-ED2 price control, the role of the DSO was envisaged as:

- **Role 1 - Planning and Network Development**
  - ○ Plan efficiently in the context of uncertainty, taking account of whole System promote planning data availability.
- **Role 2 - Network Operation**
  - ○ Promote operational network visibility and data availability.
  - ○ Facilitate efficient dispatch of distribution flexibility services.
- **Role 3 - Market Development**
  - ○ Provide accurate, user-friendly and comprehensive market information.
  - ○ Embed simple, fair and transparent rules and processes for procuring distribution flexibility services.

We believe that this appropriately reflected the DSO's role as both the organization responsible for understanding the system's need, given the focus on planning in the context of uncertainty and the promotion of data availability, and procuring the resources to supply these needs through the role of market developer. However, in ED3 we note that Ofgem has moved the focus away from the market development side, and towards the more general objective of dispatching flexibility services.

DSO flexibility markets are reaching maturity, with figures from NGED recently revealing that every dispatched flexibility service in 2025 has been zero carbon. This is due to the market incentives of smaller assets, with most coming from low carbon technologies installed in homes across National Grid's region. Over the last year, National Grid has doubled the number of assets registered to provide flexibility services. The outcomes include 'manag[ing] the network more efficiently, prolonging it's life and keeping costs down for customer. Secondly, flexible power from homes and local businesses is predominantly zero carbon, helping to reduce overall emissions and accelerate progress towards national clean energy goals. Finally, with so many assets now registered, [there is] a big increase in market competition, enabling…access to flexibility

services that are up to 34% lower than the ceiling prices[2].' We are concerned that, with the focus on market development removed, DSOs will rely instead on procurement tenders and traditional infrastructure build, which may have adverse cost implications for consumers.

In a similar vein, we do not believe that voltage management should be a specific and prescriptive duty placed on the DSO in the way it is set out in the consultation. We know, though conversations with DNOs, that there are significant concerns with the way in which voltage management is mandated, through the use of equipment at the primary substation. An approach that allows system operators to use a variety of approaches to system management, including voltage management, through a combination of their own assets, markets and flexible resources, and cooperation with asset owners and other operators should be adopted.

From a technical perspective, voltage management at the primary substation level risks failing to deliver on the technical potential of this technology. The complexity of the network typology below the primary substation means that voltage reductions at the primary substation must be small enough to ensure that the customer furthest from the primary substation still receives electricity within the regulated voltage boundaries. In practice, this either limits the scale of voltage reduction that can be delivered or, if network modelling and visibility are imperfect, risks unintended violations of the customers conditions of supply. A more flexible mandate would enable DNOs and innovators to deploy technologies, whether at the customer supply point or the secondary substation level, that could provide more granular voltage management. This could allow for voltage management to deliver greater benefits at lower risk.

68. Do you agree with the proposed voltage management responsibilities, for DSOs? Are there any aspects you disagree with, or any additional responsibilities we should consider?

Voltage control for frequency services is a concept that has been proven through UK network innovation trials. Customer Load Active System Services (CLASS) refers to voltage control services that can make small, real-time adjustments to electricity demand by altering distribution network voltage. Customers do not notice these changes, but they help to keep the system balanced. Trials by Electricity North West Limited in 2014–15 showed that CLASS could save customers around £100 million over 25 years[3], enable greater use of renewable generation, and defer costly network reinforcement. At national scale, Ofgem has estimated CLASS could deliver up to 3 GW

[2] National Grid DSO - Household heroes – affordable clean flexibility starts at home
[3] What is CLASS?

of flexible demand reduction, providing consumer benefits worth £1.8 billion in net present value[4].

In December 2022, Ofgem decided that DNOs could deploy CLASS in the balancing services market, with costs and revenues reported through the Directly Remunerated Services category[5]. This recognised that CLASS is one of several low-cost and low-carbon flexibility tools that will be required for system balancing. However, Ofgem assumed that CLASS could only be provided by DNOs since it involves voltage adjustments on distribution assets. This assumption effectively excluded other potential providers, even though Ofgem also acknowledged that DNOs would have to invest in separate technology, software and expertise to deliver the service[6].

The RIIO-ED2 decision created barriers both for DNOs and for innovators. For DNOs, the need for additional investment and new expertise made CLASS unattractive. For innovators, exclusion from the market removed the ability to access stable balancing service revenues, undermining business models for technology deployment in the UK. This combination has left the service largely undeveloped despite its proven value. This also makes the UK a relatively unattractive market for these technologies compared to the EU and the US, where these limits do not exist.

The limited development of CLASS since RIIO-ED2 should not be interpreted as evidence that voltage-based demand reduction lacks merit, or that responsibility for delivering it ought to be placed solely on DSOs. Instead, the lack of uptake reflects the fact that DSOs are not structurally the most effective actor to invest in, operate or optimise such services. CLASS-type actions primarily benefit the whole electricity system through lower balancing costs and reduced carbon intensity. These benefits are largely external to the DSO business model, and DSOs lack the commercial incentives, the operational visibility and the technology capabilities that specialist providers or aggregators could bring to this area.

In this context, defining voltage management for flexibility as a DSO responsibility risks cementing an approach that is neither efficient nor future proof. It could lead to uneven national capability, introduce barriers to innovation and hardwire a single-provider model into a context where multiple parties are capable of delivering value. It could also reduce transparency for consumers by integrating a system-wide balancing function into DSO price control allowances, rather than exposing it to market competition.

A more effective approach is to retain these services within the balancing and frequency markets and to remove the structural barriers that prevent non-DSO participation. Third-party providers can deploy technologies that utilise existing and

---

[4] https://www.ofgem.gov.uk/sites/default/files/2022-03/Consultation%20-%20Regulatory%20treatment%20of%20CLASS%20as%20a%20balancing%20service%20in%20RIIO-ED2.pdf

[5] Decision on the Regulatory treatment of CLASS as a balancing service in RIIO-ED2 network price control | Ofgem

[6] Decision

new and innovative distribution assets with the consent and oversight of DSOs, while delivering benefits both for DSOs and for the national system operator. If Ofgem wishes to unlock the full potential of this flexibility, the focus should be on designing an open and non-discriminatory framework that allows DSOs to facilitate access to the necessary network functions while enabling third parties to compete to provide the service. This would align with broader policy objectives around whole-system optimisation, transparent price signals and the development of a diverse flexibility sector.

For these reasons, we do not believe that voltage management for frequency services should become a prescribed DSO responsibility. Instead, it should remain within the market framework, with steps taken to broaden participation and support efficient system-wide outcomes.

70. How can we support DSOs in getting access to useful 3rd party voltage data from assets such as EV chargers?

Supporting DSOs in obtaining useful third-party voltage data from assets such as EV chargers can provide additional insight, but it is unlikely to be the most dependable or scalable basis for operational network management. In practice, voltage data from consumer devices tends to be inconsistent, uncalibrated and influenced by installation quality. It is also fragmented across many manufacturers and platforms, each of which handles measurement and data access differently. This creates challenges for standardisation, long-term data availability, cybersecurity and privacy. As a result, relying on customer-side asset data would not give DSOs the consistent, system-wide voltage visibility they require.

Secondary substations are usually the more appropriate point from which to manage voltage on the low voltage network. They act as a natural point of aggregation for multiple feeders, and they offer a stable and controllable environment for high-quality measurement and control equipment. They are also subject to fewer data-privacy concerns, which supports the development of standardised, reliable telemetry. Using accurate and frequent measurements at the secondary substation provides DSOs with a robust and operationally sound view of network conditions.

Concerns about potential blind spots between the secondary substation and individual consumers are understandable, but these can generally be addressed through modelling and analytics. Although voltage will vary along the feeder, these variations are predictable when combining high-quality substation data with established network models. Customer-side data can still be useful for diagnostics or planning in localised cases, but it is not essential for effective operational voltage management and often introduces more uncertainty than it resolves.

Given the potential advantages of voltage data at secondary substation level, DSOs should be free to source voltage data in the manner that best meets their network monitoring and planning needs while complying with UK data privacy requirements.

71. Do you support our proposal to include the reduction of reactive power injection on the transmission from distribution networks? Are there additional implications of this on the operation of distribution networks we should consider?

We agree with the principle of reducing unnecessary reactive power injection from distribution networks onto the transmission system. Managing reactive power locally can reduce transmission system losses, support voltage stability and avoid unnecessary reinforcement. However, we do not support embedding this requirement within the Grid Code as a prescriptive obligation on DSOs or distribution-connected assets.

Reactive power is inherently locational and time-varying, and the most efficient way to secure optimal outcomes is to treat it as a market-based ancillary service. A market framework would allow DSOs and distribution-connected DER to provide reactive support when and where it is needed, rather than enforcing a static compliance envelope. The design could also incentivise customers to improve their equipment and management to reduce reactive power injections. This approach would preserve system-level efficiency, drive innovation in flexible provision and avoid the operational distortions that mandatory power factor constraints can create.

There is already clear evidence that distribution-connected assets can provide effective and controllable reactive services to the transmission system. The UKPN and NGESO Power Potential project demonstrated that DERs can offer dynamic voltage control, absorb or generate reactive power on instruction, and operate reliably under coordinated dispatch from the transmission system operator. This shows that a competitive service model is both feasible and beneficial.

Introducing a formal Grid Code requirement risks several unintended consequences at distribution level. First, it could constrain how DSOs manage local voltage if they are required to prioritise compliance at the transmission boundary above efficient operation of the LV and HV networks. Second, a rigid power factor envelope could result in increased tap-changing, unnecessary curtailment or suboptimal use of distribution-connected flexibility. Third, it may undermine the development of commercial markets for reactive support by removing the incentives for DER to invest in controllable power factor capability.

Instead, we recommend a framework in which DSOs are incentivised to manage reactive power locally where economic, and in which both DSOs and DER can be commercially rewarded for providing reactive power services to the transmission

system when required. Coordination arrangements between the transmission system and DSOs should be strengthened where necessary, but without locking specific technical obligations into the Grid Code that may become outdated as the system transitions and new flexibility products emerge.

Finally, Ofgem should ensure that the introduction of reactive power markets or reactive power requirements does not inadvertently impact or limit the ability of voltage control technologies to vary the active power consumption of the customer load to provide flexibility or frequency services.

72. For each of the options outlined for Providing Flexibility what are the advantages and disadvantages, and which would be your preferred option, including any that we have not considered?

As discussed above, our preferred approach, which Ofgem has not considered in this consultation, is an open and non-discriminatory market framework for voltage control for flexibility. DSOs would facilitate access to the necessary network functions under appropriate technical and safety conditions, and third parties would be free to compete to provide voltage-based flexibility to NESO. This model would deliver lower system costs, accelerate innovation, and properly align incentives, ensuring that investment and operational expertise develop where they are most effective.

74. Do you support the requirement for a published voltage management strategy from each DSO, with an annual reporting requirement?

We do not support this requirement, as we believe this is an excessively onerous requirement to place on DSOs, and we believe that a framework approach to system services, including voltage management, is the best approach as outlined above.

Q76. Do you support Ofgem's focus on loss optimisation over loss reduction in ED3? Why?

We wish to note that it is not a given that an increase in flexibility necessarily leads to an increase of losses in the system. We understand that, in principle, more unpredictable usage of third part assets, inverter-based resources and bi-directionality for the network can lead to increased losses due to increased utilisation of network assets and resistance. However, as Northern Powergrid's BEET programme demonstrates, certain types of flexibility including that offered by voltage management, can reduce network losses.

Q81. Do you agree that the proposed aims for the DSO incentive framework appropriately reflect the core functional areas for ED3 (flexibility services, network planning, voltage and loss management)? Are there any additional priority areas that should be included, and how should these be measured?

We do not agree that the proposed aims for the DSO incentive framework appropriately reflect the core functional areas for ED3. In particular, we are concerned that the treatment of voltage management in the consultation is overly prescriptive and risks constraining the development of efficient flexibility markets.

Voltage-based demand reduction and other forms of voltage optimisation are system-balancing tools whose benefits primarily accrue at national level rather than within individual distribution networks. Prescribing these activities as DSO responsibilities, and embedding them within the DSO incentive framework, blurs the boundary between local network management and wider system operation. This risks creating distortions in incentives, diverting DSO focus away from core distribution functions and limiting the scope for innovation in how voltage-related services are delivered.

Secondly, the proposed approach represents a material shift away from the direction set under ED2, where Ofgem explicitly sought to develop flexibility markets and promote participation from a diverse range of providers. The ED3 proposals risk reversing this progress by placing greater emphasis on DSO-delivered solutions and limiting opportunities for new market entrants. This could slow the growth of local flexibility markets at precisely the moment when these markets need to scale to meet whole-system needs.

A healthy and competitive flexibility sector is essential for securing least-cost outcomes for consumers. If the incentive framework encourages DSOs to rely on prescriptive operational tools rather than competitive procurement, consumers may face higher system costs, slower innovation and reduced transparency over the true value of flexibility services.

We therefore recommend that the DSO incentive framework should retain a strong focus on market development. This should include measurable outcomes relating to market liquidity, the diversity of participating providers, the volume and value of services procured competitively, and the extent to which DSOs facilitate rather than replace market-based solutions. Ensuring that DSOs act as neutral market facilitators, rather than default service providers, would help maintain a clear separation of roles while supporting lower-cost and more innovative flexibility provision.