Energy Systems Catapult: Consultation response

Enabling the DSO transition: A consultation on National Grid ESO's approach to the Distribution System Operation transition

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Energy Systems Catapult supports innovators in unleashing opportunities from the transition to a clean, intelligent energy system.

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About Energy Systems Catapult

Energy Systems Catapult was set up to accelerate the transformation of the UK's energy system and ensure UK businesses and consumers capture the opportunities of clean growth. The Catapult is an independent, not-for-profit centre of excellence that bridges the gap between industry, government, academia and research. We take a whole-system view of the energy sector, helping us to identify and address innovation priorities and market barriers, in order to decarbonise the energy system at the lowest cost.

Our Position

Energy Systems Catapult broadly supports the proposals to enable the DSO transition. Increasing communications and data exchange between the ESO and DSOs is a necessity as we move towards a power system based on variable renewable energy, distributed energy resources and active energy demand.

The distinction between transmission and distribution is somewhat arbitrary (as demonstrated by the different allocation of the 132kV system north and south of the Anglo-Scottish border) hence we believe that any differences between how the DSO and ESO relate to connected parties needs to be justified. It is also important that the combined ESO/DSO function can operate the system securely at the lowest cost with no distortion/inefficiency being introduced by the ESO/DSO interface.

We welcome the proposed measures as necessary steps towards the DSO transition, but we would urge National Grid ESO to consider some important factors in developing its future business plans as outlined below:

- The role of Active Network Management (ANM) on the distribution system is well established. Today DER within an ANM scheme have limited opportunities to provide services to the ESO. As ANM schemes are rolled out more widely by the DNOs and the ESO has an increasing need to procure services from DER, we would welcome further development and details on how DER can provide services to ESO from within an ANM area.
- Tertiary connections are a new type of connection to the transmission system which will change the classification of the assets at the grid supply point (GSP) and reduce the available capacity across all super grid transformers (SGTs). We would welcome further development and details on the impact of tertiary connections on asset utilisation, interaction with ANM and ability for DER to provide services to the ESO at these sites.
- How assets are classified at a GSP, connection or infrastructure, impacts how costs are charged back to customers and consumers, via DUoS and BSUoS, and the cost incurred by the connecting party. With the number of infrastructure sites increasing, due to tertiary connections, we would welcome further development and details on how consistency will be achieved in developing new market and asset solutions across the different classification of assets.
- The resilience of communication systems between the ESO, DSO's and DER providers will play an important role in the transition to net zero. We would welcome development and details on the consequences of a communication failure and the impact on the operability of the system.

Consultation Questions

1. The ESO's principles to enable the DSO transition.
    - Do you support our proposed principles and approach to the DSO transition?

Energy Systems Catapult broadly supports the proposed principles and approach to the DSO transition. In addition to the principles proposed we see a need to ensure consistency across the

ESO/DSO interface for connected parties. This need is highlighted with different definitions of transmission and distribution voltages in Scotland compared to England and Wales. We see a need for a further principle for defining how the joint system operation function will operate.

2. Our proposed 2025 vision
    - Do you agree with our proposed high level vision?
    - Do you have any comments on our proposed high level vision?
    - Do you believe that there are any further co-ordinating functions between ESO and DSO that we should be considering?
    - Do you have any comments on the draft vision for each of the 10 co-ordinating functions as described in annex 1?
    - What additional activities do you believe the ESO needs to undertake to facilitate our 2025 vision?

We broadly support the high-level vision presented which is a natural evolution of today's roles and responsibilities. We would welcome further thought beyond 2025 and how system operation will change to meet the demands of new and changing technology mixes and how roles and responsibilities across the ESO and DSO's will change.

We believe three further co-ordinating functions are required to enable the 2025 vision;

- Innovation – co-ordination of innovation (i.e. research, demonstration) is required and should identify impacts across the transmission and distribution boundary, ensure maximum benefit is realised and unintended consequences are minimised.
- Future development of system operability beyond 2025 – consideration and co-ordination of how big changes could potentially advance and impact system operability and roles and responsibilities between ESO and DSO's is necessary. For example, changes like independent system operator (ISO), locational energy pricing, local energy/flexibility markets.
- Open data and creation of single source data – there needs to be consistency in management/format of data made available across ESO and DSO and data should be provided through a single source e.g. a single data portal to provide network development plans from 11kV to 400kV.

Long term energy scenarios – we welcome the standardisation of Distribution Future Energy Scenarios (DFES) and alignment with ESO's Future Energy Scenarios (FES). The vision is to keep the documents and data separate for FES and DFES but we would like to see consistency in use of data sources and assumptions that facilitate ease of use and provide a coherent picture.

System development – roles and responsibilities across the transmission and distribution interface are unclear with regards to which party carries out CBA analysis for connection and infrastructure sites. The vision is to keep documents and data separate for transmission and distribution but we would like to see a single data source to provide a coherent picture and facilitate ease of use.

Customer connections – Appendix G and transmission impact assessment has not been adopted by all DNOs or in all areas. We would welcome further information and plans on its intended roll out. Information on future operability needs on a regional basis will be welcomed. Its inclusion in system development documents, rather than a stand-alone document, will provide a clear picture for future connections. We hope that a DER connections seminar will address how ANM, tertiary connections and asset classification (connection and infrastructure) now and in the future will impact the ability for DER to provide services as well as how the different needs of DSO and ESO will be met.

Network access planning – the roles and responsibilities across TO, DNO, ESO and DSO are unclear. It is not clear who would procure services to secure network outages and if they would be compensated or not and if compensated, how costs would be recovered through DUoS or BSUoS.

For example, for an SGT outage at a connection site with an ANM, the DER would not be compensated. For an SGT outage at an infrastructure site, the DER would be compensated and if the DSO procured the service, the costs would be recovered through DUoS charges but if the ESO procured the service then the costs would be recovered through BSUoS charges. All three actions provide the same benefit, but the costs are recovered differently and will therefore impact the market and market actors differently.

Service procurement – we welcome the standardisation of DSO and ESO services and standards. We would welcome further information on how market platforms will work alongside the balancing mechanism and wider access and the requirements that will be placed on DER, eg settlement requirements. We would welcome further information on how technical challenges like ANM and tertiary connections will impact a DER's ability to provide services.

Charging and access – we believe an electricity market reform is required to meet the zero-carbon ambition and have recently published a report called Rethinking Electricity Markets: EMR2.0. We would welcome a more ambitious exploration of options and plan looking beyond 2025 to Net Zero in this area. In particular, improving the quality of price signals by time and location so that all market actors are efficiently incentivised, including locational energy pricing and what this would mean for system and market operation.

Codes and framework – we support the digitalisation of the grid code. Operating a zero-carbon network will look and feel different from today. We would welcome further insight into which operational standards are fit for purpose or not for 2025 and beyond, e.g. could frequency standards be relaxed beyond 5%. ESC strongly promotes reform of governance arrangements for industry codes, based on its work with the Institute of Engineering & Technology (IET) through the Future Power System Architecture System (FPSA).

Service dispatch – the role of the balancing mechanism, wider access, flexibility platforms and Distributed Energy Resources Management Systems (DERMS) is unclear and how they will evolve and work together in future. Linked to the need for a longer term vision and outlook, alternatives that might be considered for Net Zero (e.g. nodal pricing with centralised dispatch and combined market/system operation) should also be mentioned. We would welcome further information on which services will be dispatched via which route and the requirements on DER, for example the role of physical notifications in baselining.

Operational liaison – we welcome the increase in operational liaison as a key enabler for 2025. We would welcome further development and information on the roles and responsibilities, along with a framework showing how service conflict and hierarchy of needs will be resolved.

Incident planning – we welcome increased communication between ESO and DSOs for incident planning. The overall responsibility for system restoration is unclear and we would welcome further information and development in this area.

3. Proposed next steps
    - Do you support our proposed next steps?
    - Is there anything more you believe we should be doing to facilitate the DSO transition?

We broadly support the high-level vision presented which is a natural evolution of today's roles and responsibilities. We would welcome further thought beyond 2025 and how system operation could change to efficiently meet the demands of new and changing technology mixes and what this could mean for the roles and responsibilities across the ESO and DSOs.