

# Operational Agreement between the **Distribution Network Operator** and the **Distribution System Operator**

**DSO**  
DISTRIBUTION SYSTEM OPERATOR

UK  
Power  
Networks  
Delivering your electricity



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# Section 1

## Executive Summary



# Section 1

## Executive Summary

As part of our vision to enable the energy transition for all, UK Power Networks established an independent Distribution System Operator (DSO) on 1 April 2023.

UK Power Networks must provide the lowest cost, fit-for-purpose electricity network across London, the East and the South East of England to facilitate the decarbonisation of our communities and customers. In doing so, the DSO will decide how to provide that capacity most efficiently – leveraging data to maximise the use of existing infrastructure, using customer flexibility and energy efficiency to reduce peak demands on the network. Where those approaches are not viable, investment in additional network infrastructure may be necessary.

We expect the DSO to have a significant impact on the size and cost of the network required, delivering customer benefits of more than £400m over 2023-28. For the DSO to deliver, it will rely on data and support from the wider Distribution Network Operator (DNO). Similarly, the DNO will depend on the DSO to fulfil its obligations to customers and the regulator. These interactions are critical and underpin the single accountability for ‘keeping the lights on’. Critically, these interactions must also be transparent and governed independently, to develop the trust of our stakeholders that the DSO is delivering in their best interests.

We will deliver this transparency through clarity of roles, independent oversight, and publication of additional data for our stakeholders to inspect and assure our decision-making.

The guiding principle of our governance proposal is to visibly demonstrate a set of arrangements that will ensure that all traditional and flexible options are considered on a level playing field, and the distribution network customers in our region get the best possible value from UK Power Networks. Our operating model for the beginning of RIIO-ED2<sup>1</sup> is based on the following key foundational actions:

- **Key organisational changes** to create an agile, transparent, and customer-focused DSO business unit within UK Power Networks on Day 1 of RIIO-ED2 with clear accountabilities, set-up as a separate legal entity within UK Power Networks Group with appropriate governance and controls. This new organisation will have clear objectives, representation at Executive level and appropriate culture and capabilities to fulfil its objectives.
- Development and publication of a **DSO:DNO Operational Agreement** (this document) setting out key interactions and encompassing our transparent process across all roles and how they are governed.
- An **independent DSO Supervisory Board**, which will provide assurance of our compliance with the DSO:DNO Operational Agreement. The independent DSO Supervisory Board will review and approve key DSO investment decisions to provide extra assurance that the best-value solutions for all customers are taken forward.

### Reference

<sup>1</sup> This is the price control from 2023-2028 for all DNOs

In this Operational Agreement we set out the respective roles of DSO and DNO and their key interactions, including Service Level Agreements (SLAs) where appropriate.

To promote comparison and alignment across DNOs, we have based this on Ofgem's three DSO roles and baseline expectations.

For **Role 1 (Planning and Network Development)** we have clarified the collaboration between DNO and DSO to establish future capacity needs, facilitate connections (including through coordination with the transmission network), and determine the most cost-effective means to expand distribution network capacity where required. This requires significant exchange of data and review processes which must meet SLAs. Similarly, for **Role 2 (Network Operation)** we have set out how we will work together to manage network outages, efficiently dispatch customer flexibility and assure the performance of the systems which underpin our Flexible Connections. **Role 3** covers our interactions in the procurement of flexibility, to ensure that the flexibility we buy is fit-for-purpose and that the DNO is aware of the flexibility that has been contracted.

The DNO remains responsible for delivering additional network infrastructure where required, for managing connections, for improving

the health, reliability, and resilience of the network. The DNO and DSO have a shared responsibility for the safety of staff and public and for delivering excellent customer service.

We have also set out the corporate services shared between DSO and DNO (for example HR). These shared services leverage the scale of UK Power Networks to enable us to operate the DSO cost efficiently. Finally, where conflicts arise, we have set out the routes of escalation and the role of the Supervisory Board in overseeing and auditing adherence to the responsibilities and SLAs set out here. We are targeting 90% SLA compliance across 100% of the requirements documented here.

We are publishing this Operational Agreement and will publish details of our adherence to it, to promote transparency, share practice across the industry and invite feedback from stakeholders to improve it.

The effectiveness of the DSO is absolutely founded on our relationships with stakeholders and our ability to secure their trust. In combination with the establishment of our Supervisory Board and publication of key documents and data such as our Distribution Network Options Assessment (DNOA), we hope that this Operational Agreement, helps to build that trust.

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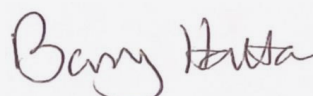
### This Operational Agreement has been reviewed and agreed by:

For the DSO:



Sotiris Georgiopoulos  
Director of DSO

For the DNO:



Barry Hatton  
Director of Asset Management

# Section 2

## Introduction



# Section 2 Introduction

The purpose of this document is to share how the UK Power Networks Distribution System Operator (DSO) and Distribution Network Operator (DNO) will work, including their roles and interactions. Our intent is to build the trust of our stakeholders through transparency, share our best practices with our DSO peers and elicit feedback on how we can improve our approach to governance.

The DSO is responsible for ensuring there is enough electricity distribution capacity at the lowest cost across London, the East, and the South East of England to facilitate the transition to Net Zero. Its activities can be broken out according to the three roles defined by Ofgem, as illustrated below.

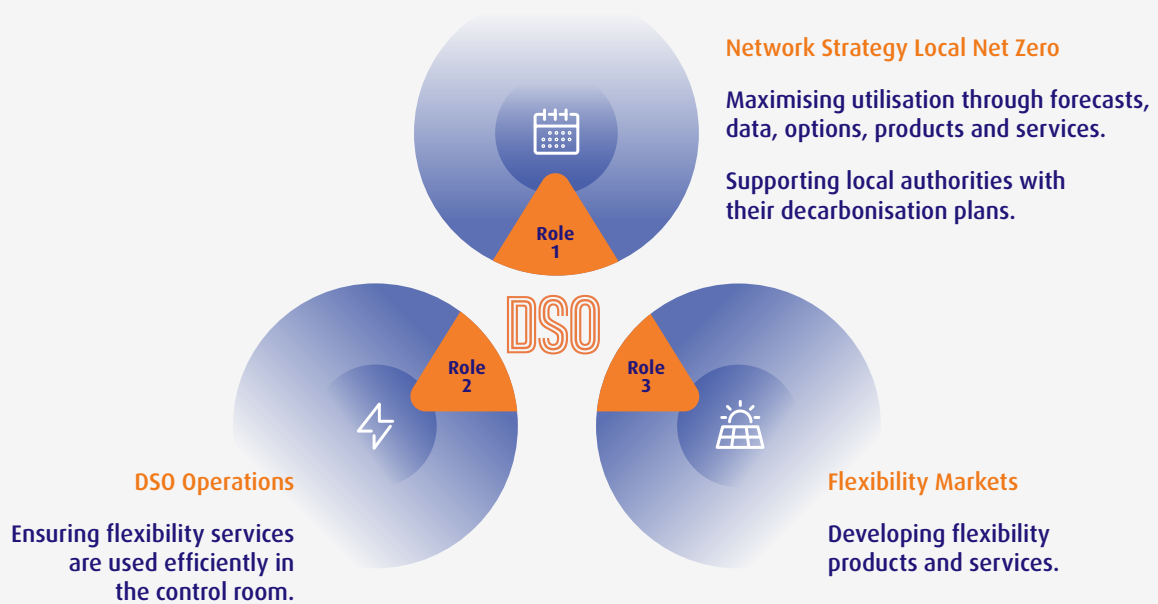


Figure 1 – Core DSO Roles

The DNO remains responsible for delivering additional network infrastructure where this is justified, for managing connections, for improving

the health, reliability, and resilience of the network, looking after the safety of staff and public and for delivering excellent customer service.



Figure 2 – Core DNO Roles

The remainder of this document outlines how the two parties will work together to deliver against their distinct but interdependent objectives. It is structured as follows:

- Section 3 provides general principles for how the DSO and DNO should work together, for example in sharing data and in reviewing one another's work.
  - Section 4 provides an overview of the key interactions between the two parties. This section provides a high-level insight into the key functions, SLAs, and activities across business areas, and provides an overview of the roles of the DSO and the work carried out within the DNO. The roles captured here align to the roles Ofgem identified (as above).
  - Section 5 documents the escalation process for any DSO:DNO issues which cannot be resolved at working level, including oversight by the independent DSO Supervisory Board.
  - Section 6 describes the shared corporate services (e.g., HR) that are available to the DSO.
- An Appendix covers:
    - A summary of the SLAs described in Section 4
    - A glossary of terms
    - A simplified organisational structure for UK Power Networks, highlighting the key DSO and DNO teams referred to in this document.

# Section 3

## General Principles



## Section 3

# General Principles

### 3.1

#### Status of this Agreement

This agreement sets the requirements of the DSO and DNO ('the parties') key interactions in relation to the quality and timeliness of responses provided.

This agreement does not limit the exercise of the powers, duties, and other functions of either party in accordance with law or other relevant legislative provision or otherwise.

This agreement is anticipated to be reviewed and updated at a frequency of between 1 and 3 years. The review of the agreement will be carried out by both parties and the independent DSO Supervisory Board with changes being signed off by the Director of the DSO and Director of Asset Management after approval by the independent DSO Supervisory Board, or by alternative representatives identified by the Chief Executive Officer of UK Power Networks.

Where further developments or agreements are made between the DSO and DNO these should be reflected in this agreement at its next review point.

### 3.2

#### Data Sharing

The DNO shall provide to the DSO any information required that better facilitates the planning and development of an efficient and economic electricity network, in line with UK Power Networks statutory licence conditions. The DNO may require the DSO to ensure suitable data protections are in place, including data security measures and training for staff in the use of sensitive data.

### 3.3

#### Accountability

The DSO is accountable for areas defined within this agreement or specified within the RII0-ED2 business plan DSO Strategy annex. Where these two documents conflict, this agreement shall take precedence.

The DNO is accountable for all areas not identified above.

### 3.4

#### Review Periods

Review periods for specific outputs are defined within Section 4 of this document. In all cases both parties should allow each other reasonable time for the review of documents ahead of submission. Where comments are provided, they should also be responded to in sufficient time to allow for escalations should a disagreement occur.

### 3.5

#### Network Standards Ownership

The DNO shall be responsible for all standards relating to physical assets on the network, the operation of the network and those that are required to meet statutory or regulatory requirements, for instance those related to planning or connections.

The DSO shall hold responsibility for all standards and policies relating to the operation of a dynamic and economically efficient distribution system, including policies on flexibility, local area energy planning and the development of long-term forecasts.

# Section 4

## Key DSO: DNO Interactions

## Section 4

# Key DSO:DNO Interactions

This section covers the key areas where the DNO and DSO will be interacting with SLAs defined for the key activities where applicable. In summary the key areas are:

### Long Term Forecasting and Collation of Future Capacity Needs

Within Ofgem's DSO Role 1 as 'planning and network development', the DSO has a key responsibility to assess how the distribution network is utilised to produce well-informed future scenarios of demand and generation per network asset.

### Assessing Network Options

Within Ofgem's DSO Role 1 as 'Assessing Network Options', the DSO has a key responsibility to establish and operate the governance process that explores and assesses all available options, including flexibility, to address future capacity needs and recommends the most economic ones to be taken forward.

### Procurement and Operation of Flexibility

Procurement and operation of flexibility spans Ofgem's DSO Roles 2 and 3. It takes capacity needs from our network options assessment (DNOA) and engages customers connected to our network to submit offers to change their patterns of generation or demand to smooth network peaks. These 'flexibility services' are agreed contractually before being available for use as required by the DSO.

### Management of Transmission and Distribution Interface

Within Ofgem's DSO Role 1 as 'Management of Transmission and Distribution Interface', the DSO has a key responsibility to facilitate coordinated activities between all parties to deliver whole system benefits through securing network capacity and customer access efficiently.

### Support to Connections Activity

The 'Support to Connections Activity' is part of Ofgem's Role 1 and ensures non-firm access arrangements can be offered to demand and generation applications triggering network constraints, identified by the DNO. This will allow customers to benefit from earlier and cheaper access to the network through non-firm access arrangements facilitated by UK Power Networks' DERMS system.

### Managing Operations

Ofgem's role 2 focuses on the use of flexibility services in the control room the DSO has the responsibility to ensure that flexibility solutions are dispatched effectively and in a transparent way. To do this it needs to work in a clear and open way with the DNO Operational Control room and Outage Planning teams to ensure accurate and up to date DER information is used.

### Management of Operational Systems

To ensure that flexibility services are used effectively within the Control room, the DSO team will rely on a robust operational technology infrastructure. The DNO Control Systems and Operational Telecoms team will be responsible for ensuring that the infrastructure is maintained and operational whilst remaining the point of reference for development and problem solving. The DSO team will be responsible for supporting the development and implementation of new technologies.

## 4.1

### Long Term Forecasting and Collation of Future Capacity Needs (DSO Role 1)

#### What is this interaction about?

The DSO will publish forecast data and provide sufficiently transparent information to allow third parties including National Grid ESO and National Grid Electricity Transmission to understand UK Power Networks' network. The DSO will also use this data for investment planning purposes both on the flexibility and the asset side. Local Authority planning for decarbonisation is a new key customer segment for DSO/DNO and a new dedicated team to serve this segment has been created, which is covered under this interaction.

#### How does it work?

The DSO Network Insights team has accountability for the collation of data and information that enable internal and external reporting on historic network usage, and for scenarios relating to the future use of the distribution network by demand and generation customers. Each year, the DSO Network Insights team will deliver an annual review of demand against capacity for all network assets. The DSO will use this as the baseline for reporting long term forecasts of demand for all network assets. This long-term forecasting identifies capacity needs.

The DSO Network Insights team will use this data and information to produce the Distribution Future Energy Scenarios (DFES), the Long-Term Development Statement (LTDS), Week 24/50 submissions to National Grid ESO, the Network Development Plan (NDP), the Planning Load Estimates (PLEs) and input to the Load Index (LI) submission. The DNO is responsible for provision of input data, and for reviewing and sense-checking long-term forecasts. Following the review, the DSO will publish the respective documents.

The DSO will carry out proactive engagement with Local Authorities to improve accuracy of long-term forecasting and deliver the Local Area Energy Planning outcomes as set out in the ED2 Business Plan. The DSO will provide information on the outcome of discussions with local authorities to the DNO to support its ongoing interaction. The DNO will inform the DSO of relevant discussions it has with Local Authorities.

The DSO Local Net Zero team will collate information from Local Authorities regarding their mid to long term Net Zero plans. The Local Net Zero team will feed the Network Insights team with data that captures the changes in load and generation that will connect to the network as a result of Local Authority Net Zero plans. The data input captures the locational evolution of demand and generation over time. The DNO will deal with any new connections or service alterations (i.e., short term plans).

The DSO will maintain a public record of outcomes of Local Area Energy Planning to keep stakeholders of UK Power Networks informed.

The DNO will provide, where required, technical support to the DSO in order to establish the technical requirements on the network of Local Authority plans.

The DNO will identify potential solutions for constraints identified within long-term forecasts, indicating anticipated timescales and costs for their resolution to allow for their inclusion within the Distribution Network Options Assessment (DNOA).

## Key Roles for Long Term Forecasting and Collation of Future Capacity Needs

DSO Key Roles	DNO Key Roles
Specifying the information requirement including sources, methods and accuracy	Provision of accurate and timely information to the DSO, according to the specification
Collation of information and data from DSO, DNO and third-party sources	Review of DSO forecasts and feedback to the DSO to help it improve accuracy
Data cleansing and validation (including statistical evaluation and comparison with external sources)	Continued engagement with local authorities on areas not related to climate plans and Local Area Energy Plans
Documentation of forecasts/network utilisation data	Sharing of relevant long term planning information with the DSO
Publication, accessibility and transparency of forecasts and network data	
Proactive engagement with local authorities to understand climate plans and support the development of Local Area Energy Plans	
Validate with external sources and comparisons across LAs	

## Long Term Forecasting and Identification of Capacity Needs

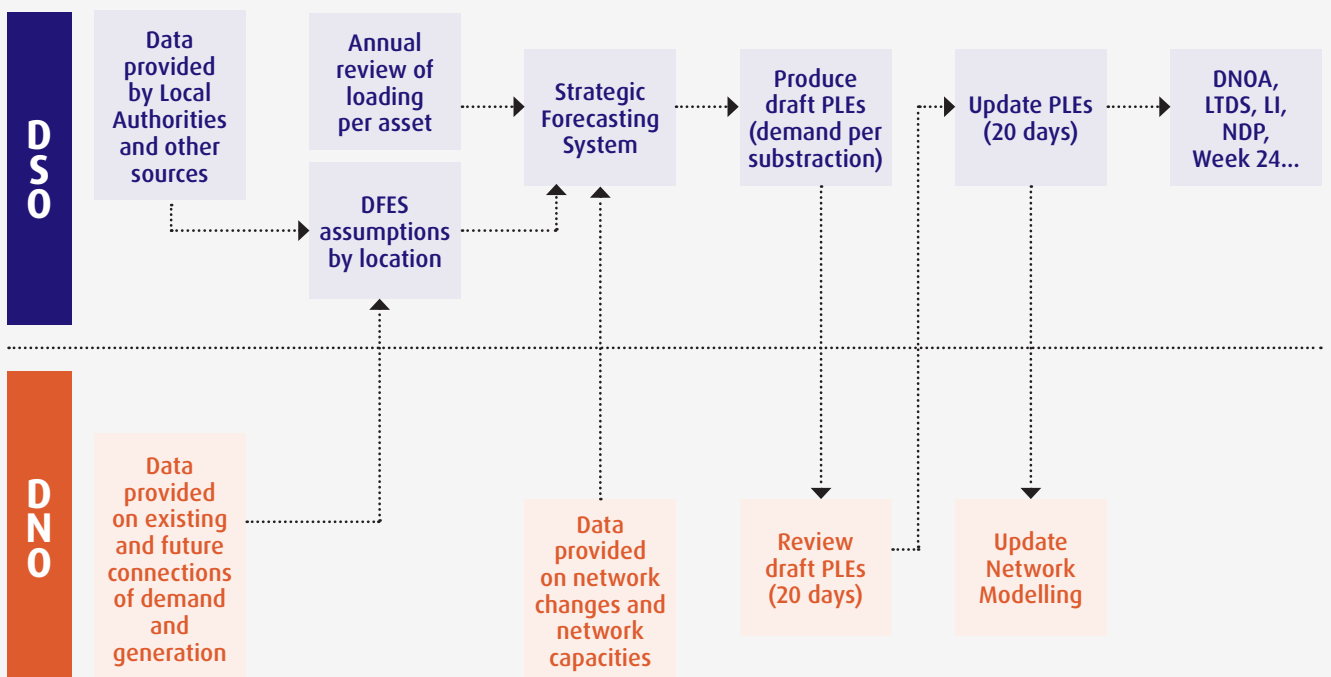


Figure 3 – Process diagram for Long Term Forecasting and Identification of Capacity Needs

## Key activities for Long Term Forecasting and Identification of Capacity Needs

Task	Carried out by	Delivered to	Regulatory or Business Plan Requirement	SLA	Accountable Party
Review draft outputs shared by DSO Network Insights team: PLEs, LTDS, NDP, LI inputs, LV network utilisation	DNO Network Planning	DSO Network Insights	Regulatory (Licence condition 25)	20 working days	DNO
Update outputs based on feedback received (PLEs, LTDS, NDP, LI inputs, LV network utilisation)	DSO Network Insights	DNO Network Planning	Regulatory (Licence condition 25)	20 working days	DSO

### 4.2

#### Assessing Network Options (DSO Role 1)

##### What is this interaction about?

The Network Options process enables the DSO to ensure that the new capacity that is built is at the lowest cost, all solutions including flexibility have been properly assessed and the most economical solution is being taken forward. Whilst part of this process has existed throughout the last 6 years, it is now an end-to-end formal process through the introduction of the Network Options Assessment report.

##### How does it work?

The DSO will carry out an annual review of DNO load related investments. This review will be delivered as part of the annual cost benefit assessment. The outcome of this assessment will be recommendations on the approach to delivering individual projects (nominally projects greater than £1.5m) or a procedural approach to specific programmes of work.

The DSO will provide information related to the preparation and outcome of the Distribution Network Options Assessment (DNOA) to the DNO in sufficient time to allow review and feedback.

The DNO will to the best of its ability provide insight to ensure the most efficient outcome for customers.

The DSO will carry out a Cost Benefit Analysis (CBA) to support all recommendations. This CBA will be shared with the DNO for comment as part of the review of outcomes prior to publication.

The DNO will provide estimates of the cost and timescales to resolve issues identified within the system needs document. These estimates will be based on the best available knowledge available to the DNO at the time and will not, unless previously agreed with the DSO, require further investment to define or estimate costs prior to its inclusion within the DNOA.

If things change due to updated forecasts, then we will update the process, e.g., if new PLEs come and/or a new reinforcement scheme is considered.

The DSO shall prepare and share a schedule of dates for the annual collation of the DNOA. The DNO shall review and agree to these dates, subject to resolution of issues identified. Both parties shall make endeavours to meet the timescales set within the agreed schedule of dates. Where the schedule of dates cannot be agreed this will be escalated through the escalation process.

The DSO has accountability for the identification of system needs and subsequent optioneering and market testing for potential solutions, recommendations of the optimal investment decisions, and for publication of the relevant DNOA methodology and reports.

The DNO has accountability for providing (i) information to the DSO Network Options team to verify the identified system needs and (ii) cost information for network reinforcement schemes that would resolve the verified system needs. The DNO also maintains the investment plan, in the form of the Asset Portfolio Plan (APP).

The DSO Network Options team produces and updates the DNOA Methodology on an annual basis. The DNO Network Planning team reviews and provides feedback on the methodology.

The DSO Network Options team uses the PLEs from the Long-Term Forecasting to identify future system needs. The DNO reviews these and confirms the system needs that would require intervention. Additionally, the DNO provides cost information for network reinforcements. The DSO Network Options team uses the cost information to verify and establish the flexibility needs in terms of budget and technical requirements (e.g., capacity shortfall, duration of shortfall, etc.). The DSO Network Options team provides these to the DSO Flexibility Markets team who publishes the information and market tests for potential solutions to the system needs through a tender process. Following the completion of the flexibility tender, the DSO Network Options team reviews and compares the available options (e.g., flexibility bids and reinforcement interventions) to recommend the optimal solution. Following the approval of the recommendation, the DSO Network Options team publishes the DNOA reports. The DNO updates the Investment Plan.

## Summary of Key Roles for Assessing Network Options

DSO Key Roles	DNO Key Roles
Collation and identification of system needs	Annual analysis of statutory and regulatory compliance issues (Security of Supply, Voltage etc.) to be consulted on by the DSO for identifying system needs
Application of Cost Benefit Analysis to establish budget for flexibility options	Review and verification of system needs identified by the DSO
Recommend the optimal solution for individual schemes	Provide costing/budgeting for network solutions to identified system needs
Production of the annual DNOA report	Provision of details regarding network solutions for identified needs to be included in the DNOA reports
	Provision of information to allow the technical specification of flexibility requirements and products (where not already provided within DNOA process)

## DNOA Process

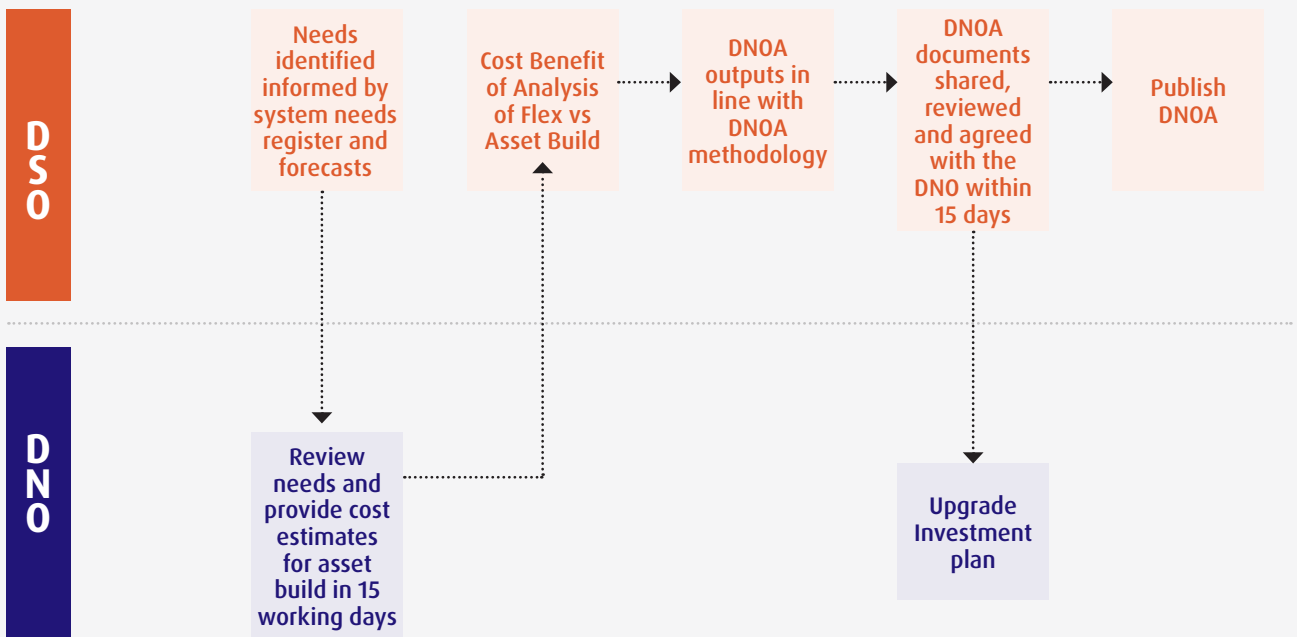


Figure 4 – Process diagram for Assessing Network Options

## Key Activities for Assessing Network Options

Task	Carried out by	Delivered to	Regulatory or Business Plan Requirement	SLA	Accountable Party
Maintain register of system needs across all voltage levels	DSO Network Options	DNO Network Planning	Regulatory (Licence Condition 31.E)	Online shared tracker updated once a month	DSO
Verify network needs and cost network (or other non-flex options e.g., load transfers) solutions to system needs identified plus time to deliver them	DNO Network Planning	DSO Network Options	Regulatory (Licence Condition 31.E)	20 working days from request	DNO
DNOA documents shared before publication, and outputs reviewed and agreed with DNO	DSO Network Options	DNO Network Planning	ED2 Business Plan Commitment	20 working days	DSO

## 4.3

### Procurement and Operation of Flexibility (DSO Role 2 & 3)

#### What is this interaction about?

Flexibility is a non-asset solution that can provide network capacity as an alternative to the traditional network solutions (i.e., asset network reinforcement). The DSO is accountable for sourcing flexibility through a series of flexibility tenders.

The DSO Flexibility Markets team is responsible for flexibility product development, flexibility pricing structure, market engagement and the overall procurement process. They will engage with the DNO to ensure that products are fit for purpose.

#### How does it work?

The procurement of flexibility will generally be aligned to the system needs highlighted by the Distribution Network Options Assessment. Flexibility can also help manage temporary network outages at a lower cost. From time to time, the DNO Outage Planning team will provide technical specifications and flexibility requirements, as well as the cost of a traditional network solution on the outage.

To support the flexibility procurement process, the DNO will share with the DSO registers of customer assets connected to the network. Where requested by the DSO, the DNO Network Planning team will provide data and technical support to verify that flexibility proposed to be procured by the DSO is electrically connected to the relevant part of the network.

The award of flexibility contracts will be subject to normal UK Power Networks

procurement governance, requiring sign off from representatives of the DSO and DNO. The DSO will provide the DNO with details of contracted flexibility so the DNO can manage the network accordingly.

To ensure operational resilience the DNO may identify and procure mitigation measures in order to limit the impact of the failure of a flexibility provider to provide services on request. These measures are to be made at the discretion of the DNO, who should seek feedback on the measures made from the DSO on an annual basis.

The DSO will carry out near term forecasting to provide insight into the immediate needs of the network to efficiently manage network capacity and the most efficient use of available flexibility services e.g., to provide capacity in a fault related scenario. The DSO will publish this Operational Schedule of service dispatch through the Open Data Portal.

On review of data provided by the DSO against the agreed DNOA, the DNO will inform the DSO of the need to operate flexibility contracts for planned outages from the day-ahead to real-time.

Where emergency conditions or unplanned events cause network constraint conditions, the DNO will liaise with the DSO to discuss network switching and the available flexibility service options to ensure network security. In the event of any flexibility service being required for network security under "Primacy Rules" the DSO will liaise with NGE50, where required.

## Summary of Key Roles for Procurement and Operation of Flexibility

DSO Key Roles	DNO Key Roles
Commercial and technical specification of flexibility products (including contract terms)	Provision of information to allow the technical specification of flexibility requirements and products (where not already provided within DNOA process)
Coordination of flexibility products with NGENSO and other DSOs through the Electricity Network Association Open Networks programme of works	Provision of network connectivity information and connectivity assessments for flexible assets
Market engagement – development of a pipeline of potential flexibility providers	Maintain registers of embedded generation capacity and low carbon technologies
Procurement of flexibility – including publication of requirements by location and assessment of bids from flexibility providers	Development and implementation of contingency plans in case the flexibility contracts fail to deliver
Dispatch of flexibility and monitoring of performance	Raise requirements for flexibility to support management of network outages, unplanned events or emergency conditions
Sharing of information with DNO on flexibility contracts in place	
Calculation of benefits delivered through provision of flexibility	

### Flexibility Procurement

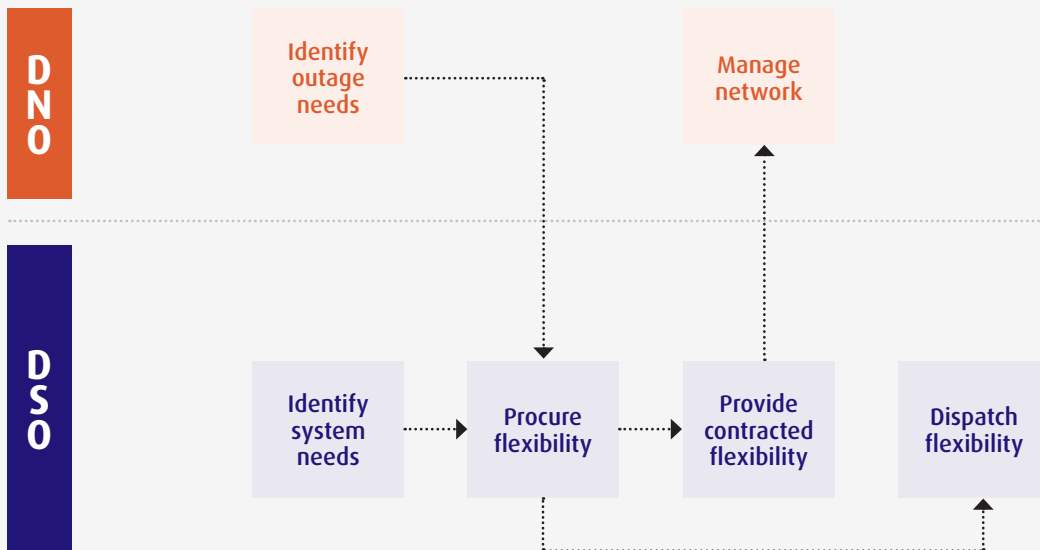


Figure 5 – Process Diagram for Flexibility Procurement

## Key Activities for Procurement of Flexibility and Operation of Flexibility

The table below provides the list of the activities for the DNO and DSO to ensure the process is followed in figure 5 and where there are key activities for which SLAs have been provided to ensure they are delivered within the remit set.

Task	Carried out by	Delivered to	Regulatory or Business Plan Requirement	SLA	Accountable Party
Provide technical requirements outages and unplanned events identified within by the Network Options team	DNO Network Planning and DNO Outage Planning	DSO	Regulatory (Licence Condition 31.E)	Not Applicable	DNO
Identify flex contingency plans where the contracted flex has not been able to be provided following request from DSO	DNO Network Planning	DSO	ED2 Business Plan	Not Applicable	DNO

### 4.4

#### Management of Transmission and Distribution Interface (DSO Role 1)

##### What is this interaction about?

Distribution networks have contractual agreements in place with NGEESO for access to the transmission network. This enables distribution customers to import or export power to the transmission network. This process focuses on the management of these contractual arrangements across the transmission – distribution boundary.

##### How does it work?

The DSO Regional Development team is responsible for managing the contractual relationship with National Grid ESO.

The DNO has accountability for (i) provision of connections and network data to the DSO (ii) provision of up to date network models (iii) notifying the DSO of DER connections cancellations following notification from the customer.

The DNO is responsible and accountable for preparing Modification Applications

for demand connections and other network development requirements.

The DSO Regional Development team is responsible and accountable for using the provided information and network models to meet our obligations under the Connection and Use of System Code (CUSC), for (i) managing the Appendix G process and the DER capacity queue (ii) initiation, preparation, and submission of Modification/Project Progression applications.

The DSO Regional Development team is responsible and accountable for sharing Appendix Gs, CUSC offers, all CUSC notices and signed UKPN/ESO bi-lateral agreements (Bilateral Connection Agreements and Construction Agreements) with the DNO and ensuring that all existing and new bi-lateral contracts with the ESO are maintained and updated as required, in accordance with CUSC and the Grid Code.

# Key Roles for Management of Transmission and Distribution Interface

DSO Key Roles	DNO Key Roles
Day to day interaction between the DSO and ESO related to network access, bi-lateral connection agreements and connection offers (i.e., Appendix Gs, Project Progressions)	Provision of connections and network data, with timely updates of any changes
Responsible for real time and planning data exchange policies and submissions including our obligation under CUSC and Grid Code Operation Code 6	Provision of up to date network models
Deliver whole system benefits via initiatives such as Regional Development Programmes e.g., acceleration of connections	Preparation of Modification Applications for demand connections and other network development requirements
Facilitation of coordinated activities between all parties (inc. Joint System Development Liaison (JSDLs))	Working with the DSO, ESO and TO to develop Regional Network Development Strategies and optimise investment opportunities to realise whole system benefits
Working with the DNO, ESO and TO to develop Regional Network Development Strategies (whole system investment planning/optioneering)	Interaction with DSO, ESO and TO for operational (Grid Code OC2, OC6) and metering purposes

## Management of Transmission and Distribution Interface

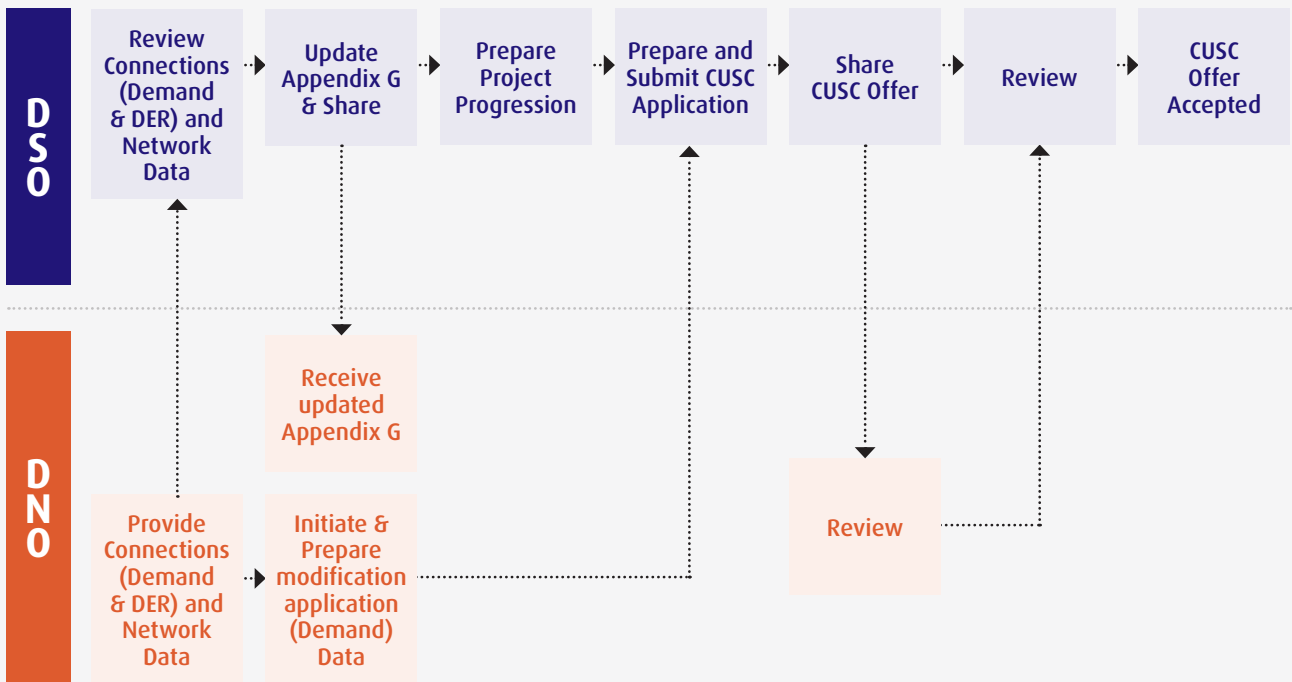


Figure 6 – Process Diagram for Management of Transmission and Distribution Interface

## Key Activities for Management of Transmission and Distribution interface

	Task	Carried out by	Delivered to	Regulatory or Business Plan Requirement	SLA	Accountable Party
<b>CUSC (Appendix G process)</b>	Provision of connections and network data	DNO Major Connections	DSO Regional Development	Regulatory - CUSC (CMP298) and Grid Code	Monthly or within 3 working days following breach of a materiality trigger, customer cancelling the work or acceptance of new connection	DNO
<b>Bi-Lateral Connection Agreements (CUSC)</b>	Provision of latest status of GSPs	DSO Regional Development	DNO Network Planning	Regulatory - CUSC (CMP298)	Monthly	DSO

### 4.5

#### Support to Connections Activity (DSO Role 1)

##### What is this interaction about?

The provision of new connections is a core distribution network activity and in UK Power Networks is led by the UK Power Networks Connections directorate that owns the end to end customer journey for the majority of the connection customers. This remains the case following the establishment of the DSO. The DSO will work with the DNO to make sure that the use of flexible arrangements is maximised to benefit connections customers through faster and lower cost connection offers. Customers could benefit from earlier or cheaper access to the grid by the use of flexible access connections product or flexibility services.

##### How does it work?

The DNO Network Planning team is accountable for identifying the network constraints triggered by demand and generation applications and for assessing their estimated level of curtailment.

The DSO Network Access team uses this information as well as other information coming from the DNO Outage Planning team such as planned outages and credible abnormal running arrangements, to configure Flexible Connection schemes into UK Power Networks Distributed Energy Resources Management System (DERMS).

The DSO Network Access team is responsible and accountable for designing the constraint management system ensuring that network constraints can operationally be removed by curtailing Flexible/Curtailable Connection customers and ensuring safe and secure network operation. The DSO Operations team will review this configuration.

The DERMS flexible connection scheme configuration files are then passed to the Control Systems and Automation team within DNO Network Operations which is accountable for configuring Flexible Connection schemes into

DERMS and into UK Power Networks' Advanced Distribution Management System (ADMS).

Once the scheme has been built into ADMS and DERMS, and the Flexible Connection customers have been commissioned, the DSO Operations team is responsible for the day-to-day operation of Flexible Connection customers.

The DSO Network Access team is accountable for providing the system and capabilities to operationally manage non-firm access arrangements, which includes existing capabilities as well as enhancements based on emerging network and system needs.

## Summary of Key Roles for Connections Activity

DSO Key Roles	DNO Key Roles
Flexible connection scheme design	Delivery of connections quotations and the physical connection post acceptance
Flexible Connection product development and DERMS enhancements	Configuration of DERMS schemes into ADMS and DERMS
Manage Flexible Connection customers operationally	

## Connections Activity at Acceptance Status

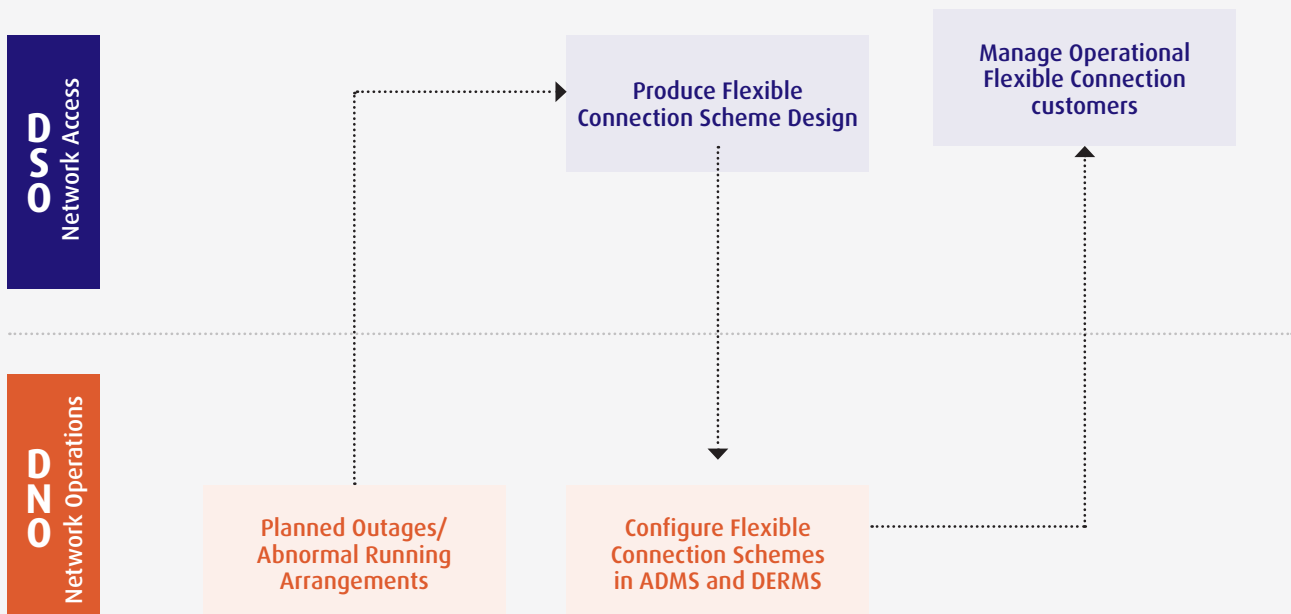


Figure 7 – Process for Connections Activity

## Key Activities for Connection Activity

	Task	Carried out by	Delivered to	Regulatory or Business Plan Requirement	SLA	Accountable Party
<b>Scheme Design</b>	Provide Flexible Connection Scheme Configuration when the customer has accepted their new connection offer (acceptance status) and build the scheme in ADMS/DERMS	DSO Network Access	DNO Network Operations	Regulatory (DCUSA DCP406)	10 working days from date of request	DSO
<b>Scheme Build</b>	At acceptance status build the scheme into ADMS/DERMS to allow Flexible Connection customer to be managed by DERMS	DNO Network Operations	DSO Network Access	Regulatory (DCUSA DCP406)	Not applicable	DNO

### 4.6

#### Managing Operations (DSO Role 2)

##### What is this interaction about?

A new DSO capability is the creation of a dedicated DSO Operations team based in UK Power Networks Control Room. The DSO Operations team will ensure that the use of flexibility is maximised in the Control Room in accordance with UK Power Networks Flexibility Dispatch Framework. The DSO Operations team is also responsible for providing best-in-class service to flexible customers and flexibility providers in operational timescales and to actively coordinate regional system operation with the NGENSO.

##### How does it work?

The DNO has accountability for the safe and effective operation of the distribution network at all levels and outages are planned to ensure the network remains secure for the next single event. The DNO will approve all outages planned on the Extra High Voltage (EHV) network.

DNO Outage planning shall provide the visibility of the Outage plan and identify if there is

a flexibility service required to support an outage to DSO Operations. DSO Operations will confirm if there are Flexibility Services available to meet Outage Plannings request. Upon approval of the outages DNO control will produce schedules to allow safe switching of the network to meet system requirements.

The DSO Operations team will work with the DNO Outage Planning to assure the network is arranged to ensure the system is secure for both faults and planned outages with the DNO being the final approver. Where the DNO in collaboration with the DSO have identified a flexibility service is required the DSO Operations team will confirm and dispatch in real time. If any switching operations are required to facilitate the dispatch of the flexibility service, the DSO Operations team will highlight this to the DNO Control team who will then carry out those operations.

In the event of a service becoming unavailable after being identified as required, the DNO and DSO will work together to see if there are any other options available, but the DNO will retain the final decision as to whether the outage can proceed.

If the DNO identifies either through network checks or through the Outage Planning process, that following an outage a DER is not available, they will inform the DSO Operations through the shared system (Network Vision). The DSO Operations team will review all flexibility services that have been procured daily and

produce a schedule of dispatch. The DSO team will check this schedule of dispatch and where a specific DER has been marked as unavailable, they will then remove it from the schedule.

During exceptional events, e.g., storms or load related scenarios, the DNO and DSO both have responsibility to keep the lights on and therefore the SLA's do not apply in the circumstances. Once it is officially communicated that the event is over, then all SLAs apply. The independent DSO Supervisory Board shall be informed should these exceptional events occur.

## Summary of Key Roles for Managing Operations

DSO Key Roles	DNO Key Roles
Analysis of fault data to identify opportunity for the use of flexibility to keep the light on	Planning of the network to ensure compliance with P2 which is the security of supply engineering recommendation
Dispatch flexibility identified to maintain network security	Medium term outage planning to ensure compliance
Develop criteria and process for review	Ownership of P2 derogation process
Review of DNO outage plan to identify interaction with DER customers	Reporting as required under the Electricity Safety, Quality and Continuity Regulations
Challenge DNO where necessary on elements of outage plan	Ensure outage plans are available for review at least 8 weeks in advance
Update/Finalise Operational Plan and Flexibility Service Schedule	Review and respond to DSO challenges
Produce day ahead operational plan for the DSO stakeholders i.e., DER customers	Ensure outage plan is updated based on forecasted needs
Produce day ahead operational forecast for flexibility dispatch	Produce Switching Schedule
Review switching schedules for DER interaction	Attach necessary running arrangements
Highlight schedules which include DER Dispatch	Monitor the network at all times (24/7)
Issue curtailment and service dispatch instructions	Respond to any issues occurring on the network
Monitor system for emerging system constraints	Carry out switching actions as required
Request network switching operations	Decide the best running for optimum network security
Access service and technical options	Prepare contingencies for network security
Day ahead forecasting to identify flexibility requirements	Complete fault reports where required
Ownership of dispatch framework	Management of wider Outage Planning requirements
Production of dispatch schedules and activation of flexibility for the DNO	Management of Network Control Systems to deliver customer outputs, including minimal levels of Customer Interruptions and Customer Minutes Lost

# Managing Operations

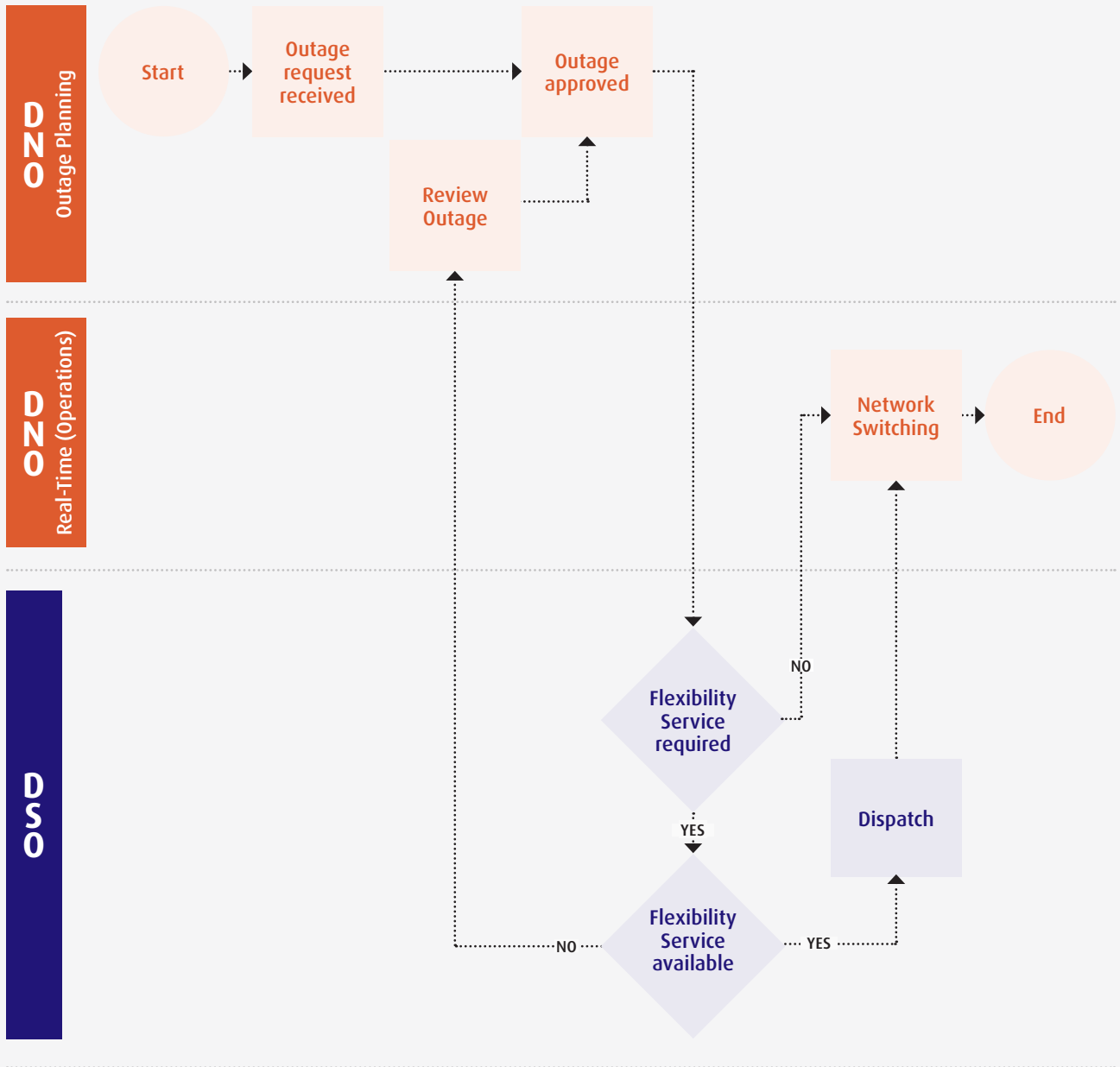


Figure 8 – Process for Managing Operations

## Activities for Managing Operations

The table below provides the list of activities of the activities for the DNO and DSO and where they are key activities SLAs have been provided to ensure they are delivered within the remit set.

Task	Carried out by	Delivered to	Regulatory or Business Plan Requirement	SLA	Accountable Party
<b>Security of Supply</b>					
Analyse fault data to identify opportunities for flexibility to keep the lights on	DSO Operations	DNO	RIIO-ED2 Business Plan	Not Applicable	DSO
Procurement of flexibility to support security of supply	DSO Flexibility	DNO	RIIO-ED2 Business Plan	Not Applicable	DSO
Sharing of fault related data	DNO	DSO	RIIO-ED2 Business Plan	Not Applicable	DNO
Produce the outage plan	DNO Outage Planning	DSO Operations	RIIO-ED2 Business Plan	8 weeks ahead of the planned outage to enable the DSO to inform DER customers	DNO
<b>Switching Schedules</b>					
Create Switching Schedule to compile and attach running arrangements	DNO Control	DSO Operational Planning DSO Power Systems Operations	Distribution Code	Not Applicable	DNO
Review Switching Schedules	DSO Operations	DNO Outage Planning	Distribution Code	Not Applicable	DSO
Highlight DER interaction	DSO Operations	DNO Control	Distribution Code	Not Applicable	DSO
<b>Real Time Operations</b>					
Issue curtailment and service dispatch instructions	DSO Operations	DNO Control	Distribution Code	Happens in real time	DSO
System alerts monitor for emerging system constraints	DSO Operations	DNO Control	Distribution Code	Not Applicable	DSO
Produce network switching instruction for constraints and flexibility services	DSO Operations	DNO Control	Distribution Code	Not Applicable	DSO
Request post fault options under fault scenarios	DNO Control	DSO Operations	Distribution Code	Not Applicable	DNO
<b>Flexibility Service Scheduling and Co-ordination</b>					
Report all DER unavailability	DNO Control	DSO Operations	Distribution Code	Within 2 hours ***	DNO

\*\*\* during periods of abnormally high workload such as system prepare, system emergency or major faults the SLA will be reasonable endeavours.

## 4.7

### Management of Operational Systems (DSO Role 2)

#### What is this interaction about?

Both the DSO and DNO operations depend on shared operational technology infrastructure.

#### How does it work?

Operational Telecoms, Control Systems and Automation (CSA) and Control System Infrastructure (CSI) all sit within the DNO and work together to deliver the communications and systems for Operational DERs in conjunction with the DSO Operations team.

The DNO has accountability for the installation, commissioning and maintenance of all SCADA and telecoms related activities relating to the use of Distributed Energy Resources (DERs) and Distributed Energy Resource Management System (DERMS).

The DNO Operational Telecoms team will provide technical capabilities and experience to build and manage the interface between systems. They also install and maintain the necessary DERMS equipment and Remote Terminal Unit (RTU) at DERs premises and commission these in to DERMS and ADMS. The team is responsible and accountable for ensuring this is done to correct procedures. The DNO Operational Telecoms team will also work with the DNO CSA team to ensure that all relevant telecoms solutions are integrated into ADMS. The DSO Operational team is responsible for working with DNO CSA to check any updates that impacts DER sites and highlighting where they believe there may be an error.

The DSO Operations team will also work with the DNO Operational Telecoms team and the DNO CSA team to commission any new DER interfaces on ADMS.

The DNO Operational Telecoms team is responsible for responding to any faults raised on the communications systems by either DNO Control or DSO Operations as soon as reasonably practical depending on if the issue is service impacting to DER customers. DNO Operational Telecoms will lead any repairs and may need to also work with DNO CSA and DNO CSI to ensure resolution of the fault. When any fault is fixed, DNO Operational Telecoms will work with DSO Operations to test any equipment affecting a DER.

The DNO CSI team is responsible for owning and maintaining the core DERMS servers. They will ensure that any work that is required on the servers or associated equipment and the ICCP link is carried out with minimal disruption to connected DERs. DNO CSI is responsible for communicating with the DSO Operational team if any work is required on the servers and the impact it may have on DERMS DER's and request approval for the work to take place at an agreed time suitable for both the DNO and DSO Operations.

# Key Roles for Management of Operational Systems

DSO Key Roles	DNO Key Roles
Report any DERMS Comms issues	Respond to and take lead in repairing any DERMS Telecontrol Equipment Control (TEC) panel issues on site
Support OPS Telecoms with commissioning of DERs in to ADMS	Take lead in commissioning of new DERs to DERMS
Report any issues regarding DERMS core servers	Own the telecoms solution for all DERMS customers
Respond to Control Systems Infrastructure to assist with any issues	Be point of reference for all technical issues between IT vendors and UK Power Networks
Work with CSA to identify and deliver system improvements	Maintain core DERMS servers to ensure the continuous running of DERMS and to ensure any downtime is kept to an absolute minimum
Report any issues with DERMS in a timely manner	Support infrastructure required for ADMS
Review any DERMS related diagram updates	Ensure IT security is maintained
	Respond to reports of issues with DERMS and ADMS
	Maintain key DERMS systems
	Support development of new DER management processes
	Deliver, maintain & support smart meter systems & data
	Deliver, maintain & support SCADA systems
	Maintain and update ADMS Diagram plus the associated asset register

## Management of Operational Systems

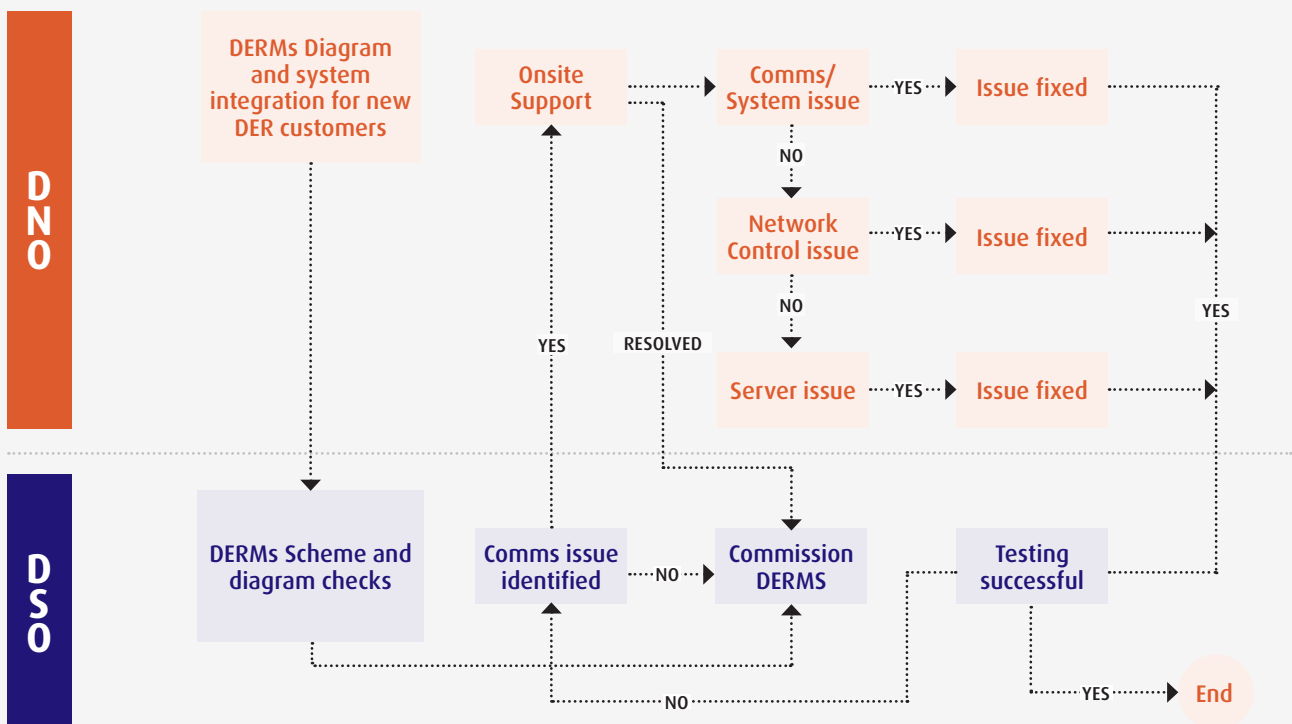


Figure 9 – Process for Management of Operational Systems

## Key Activities for Management of Operational Systems

	Task	Carried out by	Delivered to	Regulatory or Business Plan Requirement	SLA	Accountable Party
<b>Operational Telecoms</b>	Respond to and take lead in any DERMS hardware issues in substations	DNO OPS Telecoms	DSO Operations	Distribution Code	Within 5 working days	DNO
<b>Control System Infrastructure</b>	Maintain DERMS Servers	DNO Control System Infrastructure team	DSO Operations	Distribution Code	Material operational issues resolved within 1 working day which impacts DERMS	DNO

# Section 5

## Escalation Process

## Section 5

# Escalation Process

The ongoing development of the DSO will lead to a constructive level of challenge and review between the DSO and DNO. Where issues are not deemed to be fully addressed

by either party, they should be raised with the appropriate manager within the seven areas covered in section four and after a discussion has occurred between the relevant teams.

### Escalation Process

1. Capture the unresolved issue in writing, ensure both parties understand and agree (where possible) what the other expects.
2. Raise through regular monthly liaison meetings, or if not normally in attendance, escalate to a manager or head of function within own organisation for the issue to be raised at the meeting.
3. Where issues have not been resolved through a liaison meeting the issue should be tabled at a meeting to review with the Director of Distribution System Operator and Director of Asset Management.
4. Where the issue continues to be unresolved the issue should be tabled at a meeting between the Director of Distribution System Operator, Director of Asset Management, and Chief Executive Officer.

Items raised through either 3 or 4 above are to be formally recorded and reported to the DSO Supervisory Board.

# Section 6

## Shared Services

## Section 6

# Shared Services

### 6.1

#### Regulatory

All DSO Regulatory Submissions to be sent to the UK Power Networks Regulatory team for review prior to being submitted to the Regulator, as part of a UK Power Networks shared services between the DSO and DNO.

### 6.2

#### Legal

The DNO shall provide legal advice and services to the DSO as part of the processes that currently exist, as part of a shared service between the DSO and DNO.

### 6.3

#### Finance

The DNO will provide Finance support and guidance to the DSO as part of the processes that currently exist, as part of a shared service between the DSO and DNO.

### 6.4

#### Human Resources

The DNO shall provide a shared Human Resources service to the DSO as part of this agreement, as part of the current processes that exist.

### 6.5

#### Information Systems

The DNO shall provide a shared Information System service to the DSO as part of this agreement, as part of the current sub processes that exist. The details of the IS infrastructure management and operating model including data management will be captured in a separate DSO IS solution document.

# Service Level Agreement Table



## Service Level Agreement Table

Task	Carried out by	Delivered to	Regulatory or Business Plan Requirement	SLA	Accountable Party	Reporting
<b>Long Term Forecasting</b>						
Review draft outputs shared by DSO Network Insights team: PLEs, LTDS, NDP, LI inputs, LV network utilisation	DNO Network Planning	DSO Network Insights	Regulatory (Licence Condition 25)	20 working days	DNO	Quarterly
Update outputs based on feedback received (PLEs, LTDS, NDP, LI inputs, LV network utilisation)	DSO Network Insights	DNO Network Planning	Regulatory (Licence Condition 25)	20 working days	DSO	Quarterly
<b>Distribution Network Options Assessment</b>						
Maintain register of system needs across all voltage levels	DSO Network Options	DNO Network Planning	Regulatory (Licence Condition 31E)	Online shared tracker updated once a month	DSO	Quarterly
Verify network needs and cost network (or other non-flex options e.g., load transfers) solutions to system needs identified plus time to deliver them	DNO Network Planning	DSO Network Options	Regulatory (Licence Condition 31E)	20 working days from request	DNO	Quarterly
DNOA documents shared before publication, and outputs reviewed and agreed with DNO	DSO Network Options	DNO Network Planning	ED2 Business Plan	15 working days	DSO	Bi - Annually
<b>Bi-Lateral Connection Agreements (CUSC)</b>						
Provision of connections and network data	DNO Major Connections	DSO Regional Development	ED2 Business Plan	Monthly or within 3 working days following breach of a materiality trigger, customer cancelling the work or acceptance of new connection	DNO	Quarterly

## Service Level Agreement Table

Task	Carried out by	Delivered to	Regulatory or Business Plan Requirement	SLA	Accountable Party	Reporting
<b>Bi-Lateral Connection Agreements (CUSC)</b>						
Provision of latest status of GSPs	DSO Regional Development	DNO Network Planning	CUSC	Monthly	DSO	Quarterly
<b>Scheme Design</b>						
Provide Flexible Connection Scheme Configuration to build the scheme in ADMS/DERMS	DSO Network Access	DNO Network Operations	Regulatory (DCUSA DCP406)	10 working days from date of request	DSO	Monthly
<b>Flexibility Service Scheduling and Co-ordination</b>						
Report all DER unavailability	DNO Control	DSO Operations	ED2 Business Plan	Within 2 hours <sup>1</sup>	DNO	Quarterly
<b>Security of Supply</b>						
Produce the outage plan	DNO Outage Planning	DSO Operations	ED2 Business Plan	8 weeks ahead of the planned outage to enable the DSO to inform DER customers	DNO	Quarterly
<b>Operational Telecoms</b>						
Respond to and take lead in any DERMS hardware issues	DNO OPS Telecoms	DSO Operations	Distribution Code	Within 5 working days	DNO	Monthly
<b>Control System Infrastructure</b>						
Maintain DERMS Servers	DNO Control System Infrastructure team	DSO Operations	Distribution Code	Material operational issues resolved which impacts DERMS within 1 working day	DNO	Monthly

<sup>1</sup> during periods of abnormally high workload such as system prepare, system emergency or significant major faults the SLA will be reasonable endeavours.

# Glossary of Terms

## Glossary of Terms

Term	Definition
<b>ADMS</b>	Advanced Distribution Management System is the software platform that is used by both DNO and DSO Control to monitor and operate the electricity distribution network.
<b>ANM</b>	Active Network Management Network operation practice where power flows are monitored in real time and network assets are controlled (e.g., generators, batteries, specific types of loads, capacitor banks) according to network and/or economic conditions. Monitoring and control system is autonomous (i.e., automatic) and is supported by a communication infrastructure.
<b>CBA</b>	Cost Benefits Analysis It estimates the net present value of deferring capex for a period of time, e.g., five years. This net present value becomes the benchmark to establish the flexibility budget for tenders.
<b>CMP</b>	CUSC Modification proposal is the process to raise to changes for the CUSC.
<b>CSA</b>	Control Systems Architecture.
<b>CSI</b>	Control Systems Infrastructure.
<b>CUSC</b>	Connections and Use of System Codes the contractual framework for connecting to and using the National Electricity Transmission System (NETS).
<b>DER</b>	Distributed Energy Resource Demand and generation parties who are connected to the Distribution Network including Distributed Generation (DG), Electric Vehicles (EV), and Battery Electricity Storage System (BESS), and excluding domestic, industrial, and commercial customers.
<b>DERMS</b>	Distributed Energy Resources Management System – a suite of software-based systems that help manage the operation and impact of the DER within the distribution network, such as solar, wind, and battery storage, amongst others. DERMS can enable an automated control of DERs or dispatch of flexibility services to maintain reliability and quality of supply.
<b>DFES</b>	Distribution Future Energy Scenarios is the annual publication of four ‘scenario worlds’ with assumptions about changes to the energy system by geographical area e.g., heat pumps in an area by year. Input to network forecasts.
<b>DNO</b>	A company licensed to distribute electricity in Great Britain by the Office of Gas and Electricity Markets.
<b>DNOA</b>	Distribution Network Options Assessment is the framework for establishing and coordinating the options to manage and develop the distribution system.
<b>DSO</b>	A Distribution System Operator (DSO) securely operates and develops an active distribution system comprising networks, demand, generation, and other flexible distributed energy resources (DER).
<b>EHV</b>	Extra High Voltage. In the context of this document, EHV refers to voltages above and including 22kV up to 132kV.
<b>ESO</b>	Electricity System Operator.
<b>Flexibility Services</b>	Flexibility Services are commercial agreements formed with distributed energy resources (such as demand-side response, generation, or energy storage) to help manage constraints on the distribution network.
<b>Government Growth Rates</b>	Housing forecasts from the Department of Levelling Up, Housing & Communities.
<b>HV</b>	High voltage. In the context of this document, HV refers to 20kV, 11kV, 6.6kV, 3kV and 2kV.

## Glossary of Terms

Term	Definition
<b>IS</b>	Information Systems.
<b>LAEP</b>	Local Area Energy Planning A data driven and whole energy system, evidence-based approach that sets out to identify the most effective route for the local area to contribute towards meeting the national net zero target, as well as meeting its local net zero target.
<b>LI</b>	The Load Index is the annual report to Ofgem on the peak demand versus capacity of primary and grid substations.
<b>LTDS</b>	The Long-Term Development Statement is in accordance with Licence Condition 25, UK Power Networks publishes network data to assist any person who might wish to enter arrangements with UK Power Networks; or may wish to identify and evaluate opportunities for doing so.
<b>NDP</b>	Network Development Plan.
<b>NGESO</b>	National Grid Electricity System Operator for Great Britain, responsible for ensuring supply meets demand every second of the day.
<b>OC6</b>	Operating Code No.6 ("OC6") is concerned with the provisions to be made by Network Operators, and in relation to Non-Embedded Customers by The Company, to permit the reduction of Demand in the event of insufficient Active Power generation being available to meet Demand, or in the event of breakdown or operating problems (such as in respect of System Frequency, System voltage levels or System thermal overloads) on any part of the National Electricity Transmission System.
<b>Open Data</b>	Data Assets, their associated Metadata and Software Scripts used to process Data Assets that are made available for anyone to use, modify, and distribute without restrictions.
<b>PLE</b>	The Planning Load Estimate is the annual internal report sharing past and future peak annual demand and capacity on all primaries, grids and GSPs (plus groups and splits).
<b>Primacy Rules</b>	Rules governing the exchange of data between ESO and DSO and their priority access to assets connected to the distribution network.
<b>Project Progression</b>	Project Progression (PP) is the data and information a DNO submits to the NGESO following a Statement of Works (SoW), or the exceedance of headroom in an Appendix G. This is essentially a lot of data tables, showing NGESO where in the DNO's network the generators will connect, and the characteristics of the generators. It can be quite a lot of work for a DNO to pull together all the relevant information, and NGESO can be quite strict in determining whether a PP is technically competent or not.
<b>RDP</b>	A Regional Development Programme (RDP) is a project or study that looks at the complex interactions between distribution and transmission networks in areas with large amounts of distributed energy resources (DERs). RDPs are designed to look at the whole electricity system and assess a variety of options to resolve specific network needs.
<b>R110-ED2</b>	Revenue = Incentives + Innovation + Outputs' Electricity Distribution. This is the business plan agreed with Ofgem which covers the five-year period from 1 April 2023 to 31 March 2028.
<b>RTU</b>	Remote Terminal Unit.
<b>SFS</b>	Strategic Forecasting System.
<b>SLA</b>	Service Level Agreement.
<b>TEC</b>	Telecontrol Equipment Control.
<b>TEC</b>	Telecontrol Equipment Cubicles.
<b>UKPN</b>	UK Power Networks.
<b>Week 24</b>	The week by which the DSO is required to submit Standard Planning Data to the ESO, with a second submission to following Week 50.

# Operational Agreement Organisational Structure



# Operational Agreement Organisational Structure

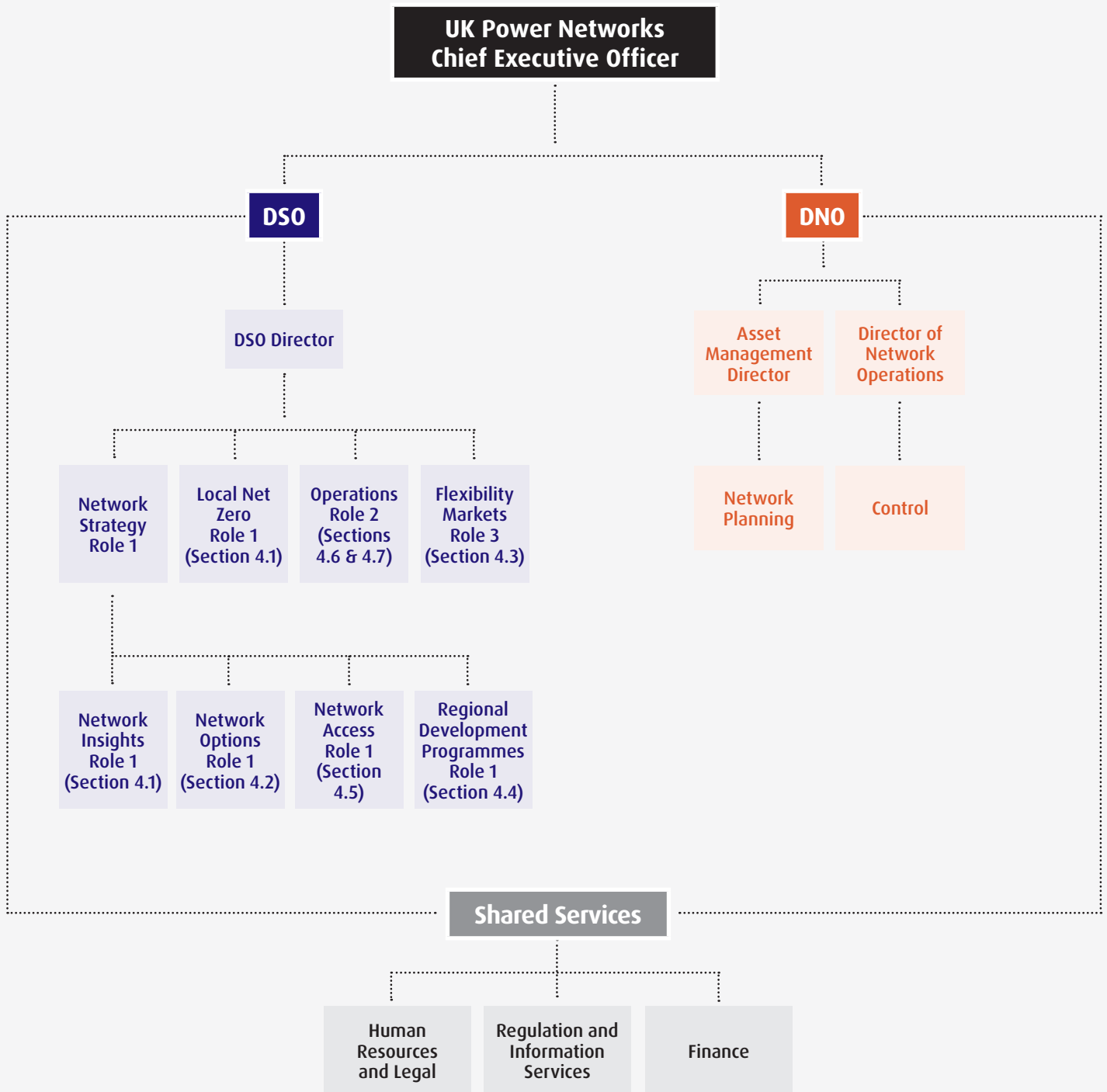


Figure 10 – UK Power Networks Operational Agreement Organisational Structure

UK Power Networks (Distribution System Operator) Limited.

Registered in England and Wales.

Registered No. 14591999.

Registered Office:  
Newington House, 237 Southwark Bridge Road, London, SE1 6NP

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