



SSEN Distribution

DISTRIBUTION NETWORK OPTIONS ASSESSMENT (DNOA) METHODOLOGY

April 2025



Scottish & Southern
Electricity Networks

DSO Powering Change



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Foreword

Last year we published our first Distribution Network Options Assessment (DNOA) methodology, initially as a consultation with a final version published in March 2024 informed by stakeholder feedback. Since then, we have used the methodology to publish 91 outcomes, of which 34 include the use of flexibility.

We've also established an independent review process with engineering consultancy, Threepwood, which has driven further incremental improvements. Threepwood's third assurance report will be published shortly.

We've learnt a lot in the last 12 months including feedback from our Distribution System Operator (DSO) Advisory Board, Threepwood and our stakeholder base. We have continued to make incremental improvements such as indexing DNOA outcomes and adding postcodes to aid your use.

The DNOA methodology now forms part of our strategic development process and relevant outcomes are included within published Strategic Development Plans (SDP). Going forwards we will be referencing relevant SDPs in each DNOA outcome.

We've used feedback received so far to inform our revised methodology and made several key changes. These include;

- Extending the DNOA methodology to our High Voltage (HV) and Low Voltage (LV) networks. Recognising the number of assets are considerably higher at lower voltage levels, we have intentionally taken a different approach. This includes consideration of vulnerable communities and how we can provide targeted support with measures such as energy efficiency.
- Increasing the DNOA outcome timescales from seven to ten years, which will enable us to take a view that extends through the next Regulatory period, ED3, and ensure we are building the networks our communities needs for net zero.
- Introducing our DNOA review process ensuring our decisions remain timely and that stakeholders have an up-to-date view of future flexibility opportunities and investment requirements.
- Expanding the description of our approach to transparent decision making and how we manage any perceived conflict between DSO and wider DNO functions.

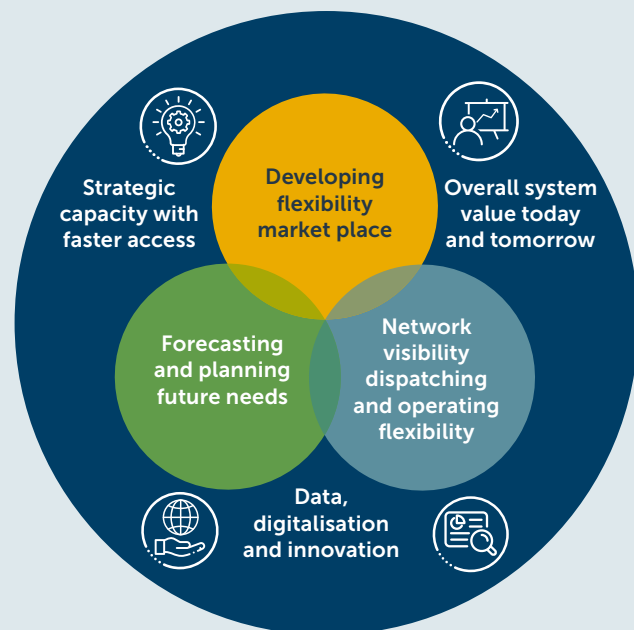
We've also taken this opportunity to make the DNOA methodology and outcome report template more accessible for stakeholders.



ANDREW WAINWRIGHT
Whole Systems Manager



Distribution system operation in SSEN



Our DSO team **strategically plan** and efficiently provide **capacity and faster access** to a **smart energy network, enabling services** from Distributed/Consumer Energy Resources to create a net zero world at optimal **whole system value** for our **customers** today and tomorrow.

- We provide information to customers and enable capacity through our toolbox of **strategic investment, flexibility services** and access products.
- We help improve time to connect and keep costs down using **flexibility** and innovation.
- We have aligned our DSO organisation to deliver the Ofgem defined **DSO functions, whole system**, innovation and open data requirements to enable **competition**.
- Our DNO organisation has a **separate DSO function** for managing capacity. Our decision-making **governance frameworks** enable **transparency** and SSEN to effectively mitigate any **perceived conflicts of interest**.
- We utilise the RIIO-ED2 **Totex Incentive Mechanism (TIM)** to incentivise **efficient investment** and the DSO incentive to drive outcomes delivering **customer and societal benefit**.

Our Stakeholder Priorities

- ✓ **Enable** decarbonisation through strategic investment and the application of flexibility, releasing capacity quickly and efficiently
- ✓ **Improve** the connections experience by offering; more options, more choice, and more insights driving faster decisions
- ✓ **Grow** the number of customers participating in flexibility services, simplifying the process and increasing possible revenues
- ✓ **Drive** economic growth by supporting local area energy plans and engaging on strategic development plans
- ✓ **Support** a smart and fair transition





Governance that delivers

Our governance arrangements ensure transparent, unbiased actions that accelerate towards net zero.

We believe that close working between DSO, Asset, Customer and Delivery teams is critical to efficiently achieving net zero. Under our governance model, DSO functions are separate from our Asset, Customer and Delivery functions but remain part of the same organisation enabling efficient end to end processes and systems.

There are clear decision-making accountabilities for load (DSO) and non-load (Asset). We mitigate any potential conflicts of interest through additional assurance and independent oversight of our DSO function. Our integrated business model enables us to operate efficiently by sharing data between functions to deliver our connections pipeline and LCT uptake more quickly.

Our DNOA methodology is a critical part of our governance, demonstrating transparency as a neutral market facilitator. In this report we provide further detail on both how we achieve transparency but also the role the wider DNO organisation plays within the process.

Further details on our governance processes can be found in our DSO service statement.

Transparent Decision Making



Our DSO Function is **accountable** for all **capacity (load)** decisions within SSEN.

We consult on how we make our decisions and publish all our decisions. Our **methodologies, roadmaps** and **development plans** are all available on our website.

We use targeted and intentional engagement that best meet our **stakeholder's** needs. We seek independent assurance. We communicate our decisions and outcomes and **publish** key operational and performance indicators.


Functional separation, with independent challenge



DSO teams are functionally separate from other DNO activities (such as asset management or delivery). The Director of DSO has specific, **independent accountability** at executive level. The DSO Subcommittee reports directly to the Distribution Executive Committee and is independent from Asset and Delivery functions.

Our **DSO Advisory Board** is fully independent and competitively selected to provide challenge and scrutiny across our DSO activities.

Functional accountability and responsibility to manage conflict



SSEN operates to the **Distribution Governance and Investment Framework (DGIF)**. This sets out formal interaction and decision-making between DSO and wider DNO activities (such as asset management, connections and delivery).

Stage gated decisions consciously manage handover of **requirements** from DSO to Asset/Delivery teams for design and delivery choices, modification to requirements and other areas of **potential conflict or change**.



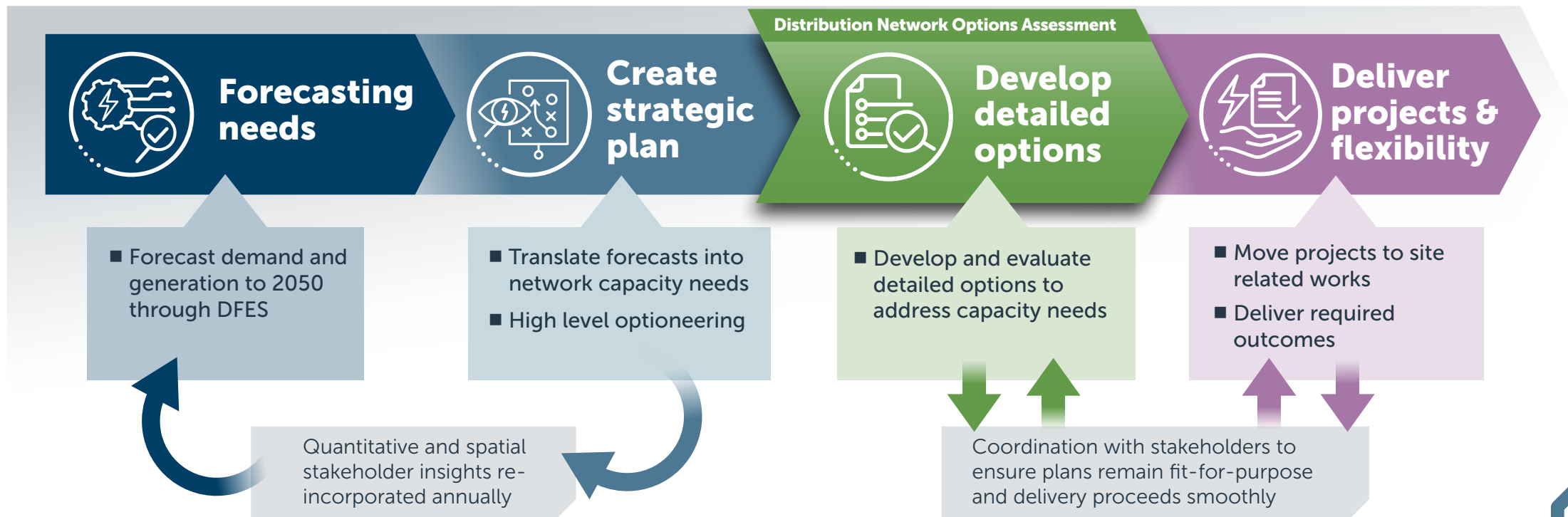
Our Strategic Development process

Our Strategic Development process provides the capacity on the network to deliver Net Zero by 2050 while retaining a clear focus on safety and reliability. Our approach:

- Ensures that we're making appropriate use of flexibility services to deliver efficient whole system solutions at the optimum time.
- Considers future investment needs at all voltage levels and the appropriate processes at HV and LV.
- Facilitates stakeholder collaboration to ensure the network develops to meet the needs of our customers of today and tomorrow.

Our strategic approach consists of four stages. You can find out more about forecasting needs through our Distribution Future Energy Scenarios (DFES) publications and how we create a strategic plan through our Strategic Development Plan (SDP) methodology.

This methodology focuses on how we develop detailed options. We refer to this process as the Distribution Networks Options Assessment (DNOA) process.

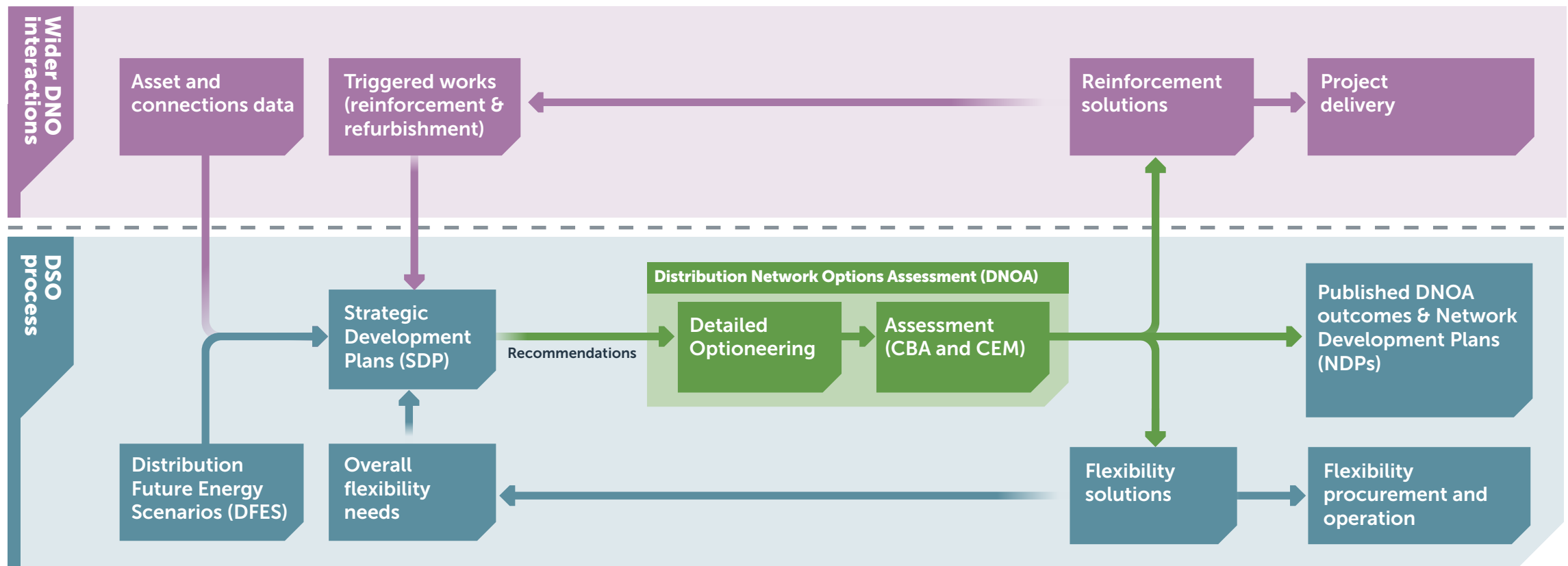




DNO / DSO interfaces in the strategic development process

All stages of our Strategic Development Process are led by our DSO function. This ensures we are acting as a neutral market facilitator that is transparently considering flexibility and asset solutions in our optioneering. It corresponds to the 'Opportunity Assessment' phase of the DGIF process as described in our DSO service statement.

The wider DNO organisation is a critical friend throughout the process ensuring we are accounting for relevant data inputs and future work on the networks, including non-load related. This allows us to build up an accurate picture of future network needs and thereby a plan that meets the requirements of stakeholders. Further information on our governance process can be found in our DSO service statement.





The DNOA process

This methodology report provides further context on our system development process and how we make transparent decisions on the use of flexibility.

The DNOA processes forms an integral part of our approach to strategic development.

There are three stages to the DNOA process;

- Development of options – developing detailed network and flexibility options to resolve future needs.
- Assessment of options – transparently quantifying the costs and benefits of options to maximise consumer value.
- Communication of plans – making stakeholders aware of our future developments and opportunities for flexibility provision.

We provide further context on each phase in the report. Including how our DNO function feeds into the process.

Works are triggered through the DNOA process up to 10 years ahead of need. These can either be through incremental changes driven in response to specific needs, or through the recommendations of our strategic development plans.



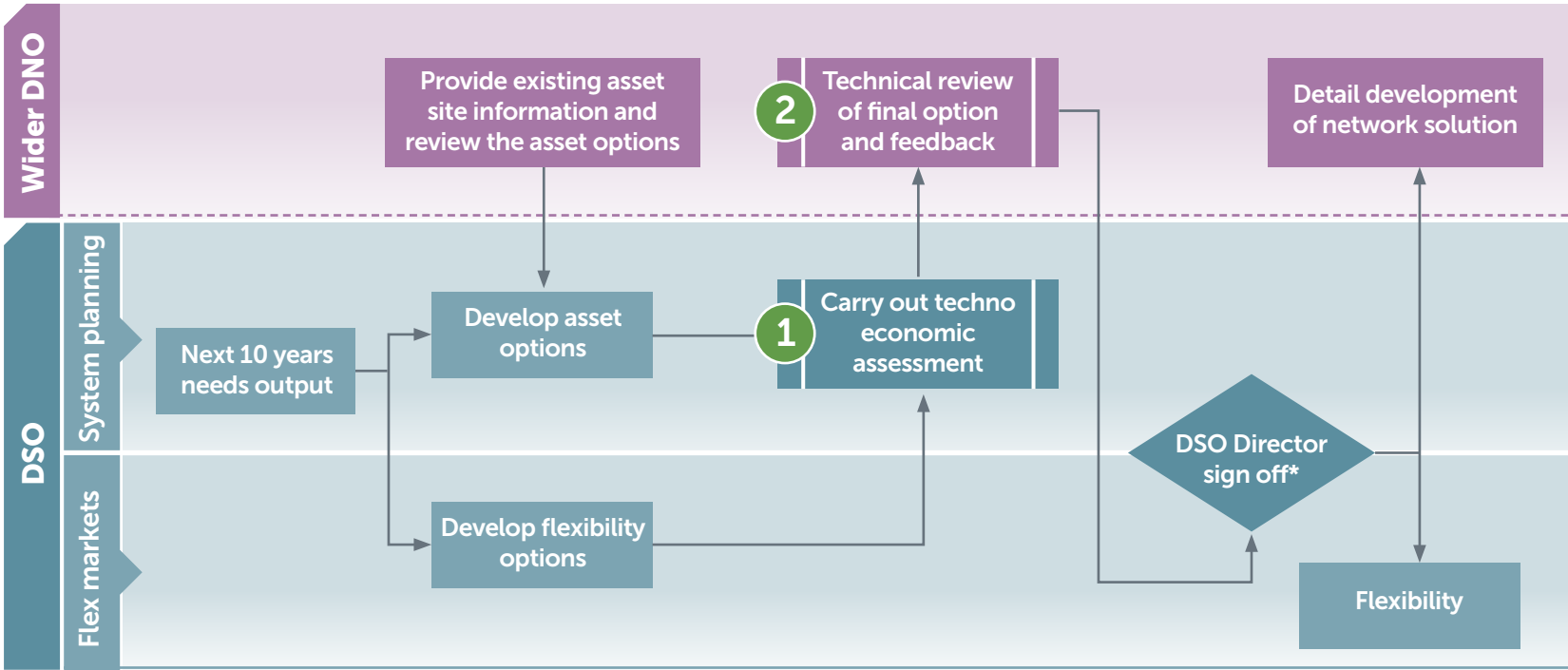
Incremental change triggers	Scenario-based triggers
<i>The need arises from a specific driver during the year.</i>	<i>The need is identified through our annual strategic development plans.</i>
New connection(s) triggers work	Analysis indicates investment required within next ten years
Asset condition triggers work	
Third party works trigger work (e.g. diversions)	



Ensuring transparency in the DNOA process

We have introduced proportionate measures at the appropriate steps in the DNOA process to facilitate decision-making, manage conflict resolutions and increase transparency to our stakeholders.

These are embedded within the Distribution Governance and Investment Framework (DGIF). Further details on this framework can be found in our DSO service statement.



*DSO Head Of for <£4m

The simplified view of the key decision points in this process is presented in the flow chart on the right. 1 and 2 are the two steps within the process that may require additional measures to form a resolution. The path of escalation at each point is described below:

	Resolution required when	Escalation path
1	In developing options to resolve constraints, system planning and flexibility market functions have differing views over the flexibility service solutions.	DSO Steering committee.
2	In reviewing DSO’s recommendations for constraint removal, the DNO provides feedback on deliverability as well as operational and safety of the scheme and a common solution cannot be reached.	SSEN Executive through Director of DSO or Asset



Independent assurance

We have implemented independent assurance on our DNOA process for DNOA outcomes of value greater than £2m.

The independent assurers select a number of DNOA outcomes from each quarterly report for review. These are selected to cover both SSEN licence areas and includes a range of outcome decisions.

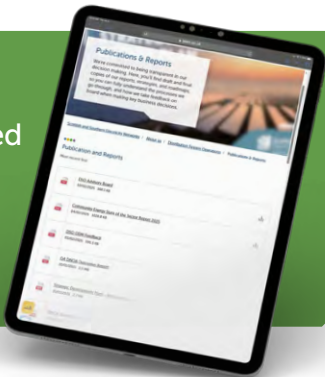
The independent assurance consists of two types of review;

- A 'sample' review focused on reviewing the detailed technical reports and cost-benefit analysis undertaken
- A 'deep dive' review which also includes interviews with those involved in the development of the DNOA outcome.

Assurers assess whether DNOA outcomes have adhered to the DNOA methodology and make recommendations for improvements.

The outcomes of the assurance process are shared with the DSO Advisory Board for further scrutiny and published online in DSO Publications & Reports found here:

Publications & Reports - SSEN.

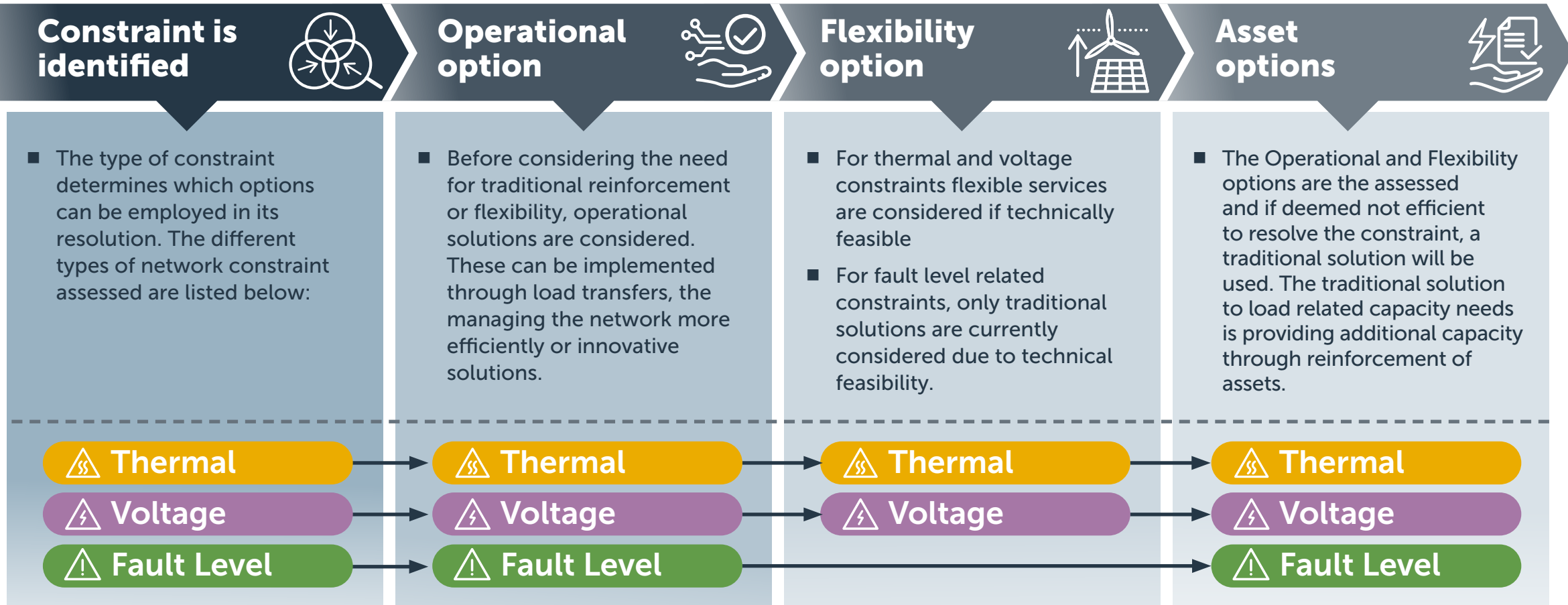


Thresholds (option approval stage)	Proposal approved by	Independent assurance
Between £500k and £2m	Head of System planning	No
Between £2m and £4m	Head of System planning	Yes
Above £4m	Director of DSO	Yes





Developing options to resolve



Hybrid options considering operational, flexibility and asset requirements are frequently used to manage constraints which evolve over time.

Wider DNO input

The wider DNO organisation provides input on asset and operational options through geographic, operational and safety considerations but the development of flexibility services is completed separately with consideration of other market needs and interactions.

Assessment of options



Cost – benefit analysis (CBA)

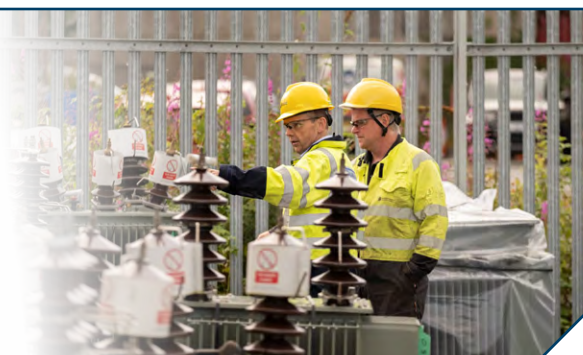
We have three CBA tools which are employed to support the assessment of options developed through the DNOA process. The table below shows how these help us make transparent decisions.

Tool	Purpose
Deterministic Cost Benefit Analysis (CBA)	Used by all DNOs to develop reinforcement options and the basis of regulatory submissions. This is used to compare technically feasible network options to determine the optimum solution.
Common Evaluation Methodology (CEM) CBA	The CEM tool is used to quantify the benefit of flexibility services and determine the number of years for which flexibility services could be used to defer the identified reinforcement. Relative benefits are compared against the optimum network option to understand if flexibility can deliver greater value.
The Strategic CBA	This new tool leverages the Social Return on Investment (SROI) framework developed by the ENA. It can help identification of the optimum timing of an intervention by considering requirements under multiple DFES scenarios. It can also consider the size and scope of solution required, i.e. whether there is benefit on a broader more strategic solution implementation rather than an incremental approach. It is used in cases where there is believed to be broader benefit in a more strategic approach.



Market viability assessment

- An assessment is carried out to determine whether there are sufficient assets that could participate in Flexibility Services to resolve the constraint.
- The assessment process is informed by many data sources. First, historic Flexibility Service procurement in SSEN and all other DSOs and the NESO. Also captured is any data from Flexibility Service Providers given through the procurement process and uptake of Low Carbon Technologies. This is complemented by ongoing engagement through activities such as bespoke RFIs for those potential providers who are not ready to participate in service but may in future wish to do so.



DNO Asset & Delivery Input

The wider DNO will provide relevant information to allow us to complete relevant Cost Benefit Analysis (CBA). This can include cost information, condition and fault data, and numbers of customers connected in network areas.

The resulting recommended option from CBA will be subject to an internal check by DNO Asset and Delivery functions to ensure the solution met, is deliverable and maintains safety and security of supply. The DNO Asset function ensures the solution is optimised for efficient delivery within the current portfolio of plans including asset driven works.

If an asset build solution cannot be efficiently delivered in time to meet a constraint or connection timeline, the DNO Asset function will request options from DSO to procure additional flexibility to support efficient delivery. These are options that would not have been economic in initial assessment but may be economic when considering updated project delivery information.

Additional flexibility services may also be requested to enable outages to take place.



Communication of plans

We publish DNOA outcomes on a quarterly basis ensuring stakeholders receive our decisions in a timely manner.

Having access to this data helps strategic planning provides relevant information for customers and local communities.

Each DNOA decision is accompanied by a clear, standard outcome (see below). We have refreshed and simplified this list to provide greater clarity to stakeholders of where we are intending to procure flexibility services and where we will be investing in our networks over the next 10 years. We also list below how our DNOA outcomes have been spread against these categories through 2024/25.

DNOA outcome	Description	Subject to annual review	% of 2024/25 DNOA outcomes that related to this solution
Flexibility	Where deferring reinforcement with flexibility is feasible and the economically optimal solution considering the networks short-term and long-term needs, and where it is necessary to enable construction.	Yes to signal latest views of flexibility needs	5%
Asset solutions	Where traditional asset solutions (upgrading, replacement etc) have been assessed to be the most efficient. This includes strategic solution sized to meet future needs.	Not typically, unless a review is triggered by the DNO function	30%
Operational management	Where the constraint does not require planning interventions as the need can be met with operational solutions or innovative technologies that are economically viable.	Yes to confirm continued operational viability	0%
Flexibility followed by asset solutions	Where deferring reinforcement with flexibility is feasible but for a limited time, after which network reinforcement is more economical.	Yes to signal latest views of flexibility needs	32%
Operational management followed by asset solutions	Where a constraint can be managed for operational solutions for a limited time, after which network reinforcement is needed.	Yes to confirm continued operational viability	33%
Signpost	Optioneering has concluded that flexibility will be required but not in this current procurement cycle.	Yes to signal latest views of flexibility needs	0%



DNOA outcome review process

We have also identified which of our decisions will be subject to annual review. Review is required to ensure we are utilising the latest information on flexibility unit costs and may result in acceleration or deferral of strategic investment and / or changes to the timing or extent of flexibility needs.

This information will also be published for specific DNOA outcomes in our annual summary report.

Communication of plans – DNOA outcomes

We have made a number of improvements to the way we present DNOA outcomes and would value your feedback as to the merits of these changes.

We would also value your views on further adaptations.

1

The DNOA Outcome is now made clearer at the top of the page.

2

Time horizons have been extended to 10 years to allow longer term visibility of plans.

3

Removed areas of duplication to allow more space to describe the proposed interventions.

4

Addition of the DNOA's corresponding SDP in the title.

1

Area Served (GSP/BSP/PSS)

DNOA outcome: Operational management followed by asset solution.

Scheme description

- The reinforcement of the XXXX PSS/BSP/GSP will increase capacity in the XXX area. Postcode(s): [insert].
- Local authority:
- Load related – substation/circuit thermal overload/voltage issues during FCO/SCO/intact conditions due to forecasted demand growth.

Proposed option

- Flexibility/Asset Solution: Describe reinforcement works
- This option addresses the forecasted thermal overload/voltage issues at XXXX PSS/BSP/GSP out to 20XX.
- Capacity released: XXMVA

Indicative flexibility price (if available)

Availability price: £ MWh Utilisation price : £ MWh

3

System need requirement

J	F	M	A	M	J	J	A	S	O	N	D

DNOA History

2024/25	2025/26	2026/27	2027/28	2028/29
Initial assessment				

2

Estimated peak MW outside firm network capacity under each scenario

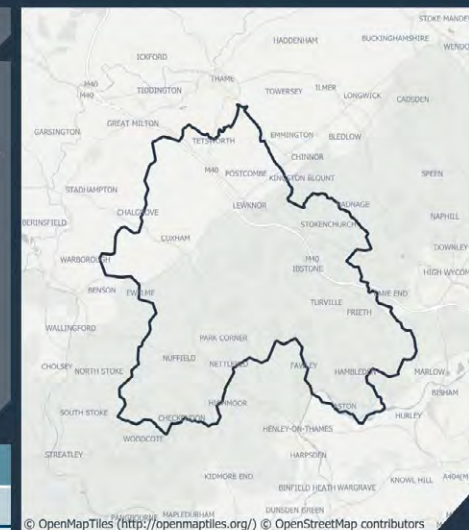
	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33	33/34	34/35
CT	-	-	XX	XX	XX	XX	XX	XX	XX	XX
ST	-	-	-	-	XX	XX	XX	XX	XX	XX
LTW	-	-	XX	XX	XX	XX	XX	XX	XX	XX
FS	-	-	-	-	-	XX	XX	XX	XX	XX

Constraint management timeline



DNOA Outcome Report Related SDP: Cowley

4





Providing insights at HV/LV

This year we will be introducing HV/LV DNOA outcomes within our published material. This will look at the lower voltage networks that supply our homes and businesses.

Given the volume of HV/LV decisions made we are taking a different approach. *In total there are approximately 88,000 secondary substations that have been assessed over the Southern Central England and North of Scotland licence areas.*

We are therefore proposing to provide summary DNOA outcomes for each Local Authority area. We also intend to build on the strategic insights developed through our Vulnerability Future Energy Scenarios (VFES) project and will summarise the number of sites affecting most vulnerable consumers.

Our proposed format is shown on this slide. We would welcome views on this approach and any potential enhancements.

We will be using data on substations affecting vulnerable communities to target areas for support mechanisms such as energy efficiency measures.

Area	Local Authority	Number of sites assessed	
		Percentage of sites situated in vulnerable communities (e.g. classified as very high or high vulnerability)	Percentage of sites recommending flexibility
SHEPD	xxxxxx	xxxx	
		xx%	xx%
xx	xxxxxx	xxxx	
		xx%	xx%
xx	xxxxxx	xxxx	
		xx%	xx%
xx	xxxxxx	xxxx	
		xx%	xx%
xx	xxxxxx	xxxx	
		xx%	xx%
xx	xxxxxx	xxxx	
		xx%	xx%



Want further information?

We provide a significant amount of data and information relating to our future energy insights, network needs, flexibility opportunities and investment decisions.

You can find out more in the links below along with timings of our publications.



Forecasting needs

Our DFES publications provide insights on future energy needs

These are updated annually following NESO FES production.

Publication in Q1 each calendar year.

 [ssen.co.uk
forecasting-future-needs](https://ssen.co.uk/forecasting-future-needs)



Create strategic plan

Our Strategic Development Plans provide an overview of the spatial requirements of our network and high level options.

The SDP methodology is reviewed annually each Autumn through industry consultation.

 [Strategic Development Plans Methodology](#)

SDPs are published on an annual basis through the year. A timetable can be found in the methodology.



Develop detailed options

Our DNOA outcomes summarise our future flexibility and investment needs.

The DNOA methodology is consulted on with stakeholders annually in Q1 of each calendar year.

DNOA outcomes are published quarterly in reports.



Deliver projects & flexibility

- Opportunities for flexibility services can be found on our flexibility website here:

 [ssen.co.uk
flexibility-services](https://ssen.co.uk/flexibility-services)

- Sign up to be a flexibility provider on the electron connect platform here:

 ssen.electronconnect.io



Glossary

Term	Description
Aggregators	A new type of energy service provider which can increase or moderate the electricity consumption of a group of consumers according to total electricity demand on the grid.
BAU	Business As Usual
CMZ	Constraint Managed Zones . These zones make use of technologies providing flexibility to alleviate network constraints, deploying them as an alternative to traditional network reinforcement in the management of peak demand.
Data triage	Systematically find issues which should inhibit open data, identify the 'least impact' mitigation technique(s) and make the process transparent.
Decarbonisation	Reducing the carbon intensity in terms of emissions per unit of electricity generated.
DER	Distributed Energy Resources. Any resource on the distribution system that produces or stores electricity. This can include distributed generation, storage, heat pumps and electric vehicles as well as other technologies.
Digital System Map/ Digital Twin	A digital representation of a real-world entity or system.
DNO	Distribution Network Operator
DNOA	Distribution Network Options Assessment
DSO	Distribution Systems Operator. The directorate within SSEN that supports a more flexible network operation. Uniquely placed to ensure simple and consistent access to new markets for our active customers through maximising the utilisation of our existing electrical and communication networks.
DSOAB	DSO Advisory Board
DSAP	Digital Strategy and Action Plan
ESO	Electricity System Operator. The electricity system operator for Great Britain, making sure that Great Britain has the essential energy it needs by ensuring supply meets demand.
EV	Electric Vehicle
FSO	Future System Operator. Ofgem intend to set up an expert, independent FSO with responsibilities across both the electricity and gas systems and the ability to expand its remit to additional energy vectors when needed. The FSO will be in the public sector, with operational independence from government.
GDN	Gas Distribution Network
GIS	Geographic Information System
GW	Gigawatt
HV	High Voltage
IDNO	Independent Distribution Network Operator
kWh	Kilowatt hour

Term	Description
LAEP	Local Area Energy Plan. 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.
LCT	Low Carbon Technologies
LENZA	Local Energy net zero Accelerator. SSEN's tool for supporting local authority LAEPs.
LEO(N)	Local Energy Oxfordshire (Neighbourhood)
LTDS	Long Term Development Statements. Designed to help to identify and evaluate opportunities for entering into arrangements with us relating to use of system or connection.
LV	Low Voltage
MW	Megawatt
NDP	Network Development Plan
NeRDA	Near Real-Time Data Access
NIA	Network Innovation Allowance
NMF	Neutral Market Facilitator will provide a market for trading use of Distributed Energy Resources (DERs).
Open Data	Data in a machine-readable format that can be freely used, shared and built on by anyone, anywhere, for any purpose.
PSR	Priority Services Register. Our register of vulnerable customers.
RIIO-ED2	Price control for Electricity Distribution (2023-2028)
RSP	Regional System Planner. Ofgem proposal for regional energy system planning bodies.
SDG	Sustainability Development Goals
SEPD	Southern Electric Power Distribution
SHEPD	Scottish Hydro Electric Power Distribution
SIF	Strategic Innovation Fund
SME	Small Medium Size Enterprise
SSE	Scottish and Southern Electricity
TO	Transmission Owner
TOM	Target Operating Model
VFES	Vulnerability Future Energy Scenarios
VIVID	Vulnerability Identification Via Informative Data

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stakeholder.engagement@sse.com



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