Electricity Distribution

Distribution Network Options Assessment

August 2023

Overview

This Distribution Network Options Assessment (DNOA) report outlines any changes made since the publication of the previous DNOA report by National Grid Electricity Distribution (NGED) in February 2023. This publication should therefore be read alongside the February 2023 DNOA where the full load related planning process from forecasting through to flexibility procurement and dispatch is outlined.

NGED is committed to continually reassessing the distribution network to identify any new areas where flexibility can be utilised, or any existing areas where our strategy needs updating. The flexibility requirements for the new scheme introduced in this DNOA have been calculated with the same Distribution Future Energy Scenario (DFES) data used for the analysis carried out for the February 2023 DNOA. The flexibility volumes and ceiling prices for all of the existing schemes have not changed.

Moving forward the DNOA process is being streamlined to ensure we are able to engage as efficiently and transparently with the market as possible. This will involve publishing a main DNOA earlier each year with a full refresh of the flexibility requirements and DNOA decisions for all existing zones and new zones created to manage any new constraints which have been identified. A second report published later in the year will then be used to assess the viability of using flexibility based on the response to the procurement triggered by the first DNOA.

We welcome any feedback as we continue to evolve our process going forward to drive value and benefit for our customers.

Executive Summary

The table below gives a summary of the investment decisions made for all schemes which have changed DNOA decision since the February 2023 publication (or had a material change in reinforcement strategy). The justification for these changes along with a more in-depth description for each constraint is given in the associated scheme pages. Any scheme not listed here has not been altered since the publication of our February 2023 DNOA, which should be referred to for details on these schemes.

Fifteen schemes are covered in this DNOA, of which thirteen are existing schemes and two are new schemes introduced in this report. Among the existing schemes nine were classed as Flexibility and are now moving to Reinforce with Flexibility. Two further schemes are being removed as there is no value in continuing to pursue flexibility or the constraint is not projected to be an issue in the foreseeable future based on the latest analysis. One of the remaining schemes has been moved to Reinforce from Signposting as flexibility has been deemed not technically viable and the final scheme is remaining as Reinforce but the proposed reinforcement strategy is changing.

Scheme	Licence Area	Constraint	Proposed scheme closure	Best View Flexibility Start Year	DFES Scenarios Flexibility Start Year	DNOA Decision
Staythorpe	East Midlands	For an N-1 condition for the loss of an SGT the other SGT carries the full group demand.	2027	2023	2023	Reinforce with Flexibility
Shrewsbury GSP	West Midlands	Arranged outage of Shrewsbury SGT followed by a fault outage on a 132 kV circuit between Ironbridge and Ketley.	2027	2023	2023	Reinforce with Flexibility
Hinksford – Wribbenhall 33 kV	West Midlands	Thermal overloads projected on the Hinksford-Wribbenhall 33 kV network along with voltage constraints.	2025	-	-	Reinforce
Shelton	West Midlands	Limited capacity on the Shrewsbury 33 kV meshed network.	2026	-	-	Reinforce
Aberaeron	South Wales	Capacity at Aberaeron primary is limited by the 11 kV backfeeds.	2026	2023	2023	Reinforce with Flexibility

Scheme	Licence Area	Constraint	Proposed scheme closure	Best View Flexibility Start Year	DFES Scenarios Flexibility Start Year	DNOA Decision
Milford Haven BSP	South Wales	An N-2 condition on the Pembroke-Waterston-Milford Haven and the Pembroke-Golden Hill-Milford Haven 132 kV circuits heavily loads the remaining Pembroke-Golden Hill-Milford Haven circuit.	2026	2023	2023	Reinforce with Flexibility
Ashgrove	South Wales	An N-1 condition for the loss of either transformer at Ashgrove primary will overload the remaining transformer in the near future.	2025	2023	2023	Flexibility
Cardiff North	South Wales	An N-2 condition resulting in both GTs at Cardiff East BSP being out of service leaves the entire BSP's load supplied via the interconnecting 33 kV circuits to Cardiff North BSP.	-	-	-	Remove
Haverfordwest – Brawdy	South Wales	An N-1 condition for an outage on the Haverfordwest to Fishguard 33 kV circuit heavily loads the Haverfordwest to Brawdy 33 kV circuit.	2027	-	-	Reinforce
Plymouth / South Hams	South West	Multiple complex 132 kV network constraints.	2027	2023	2023	Reinforce with Flexibility
Mullion	South West	Capacity at Mullion primary is limited by the 11 kV backfeeds.	2025	2023	2023	Reinforce with Flexibility
Probus	South West	Capacity at Probus primary is limited by the 11 kV backfeeds.	2025	2023	2023	Reinforce with Flexibility
Camborne Treswithian	South West	Under intact running the peak load at Camborne Treswithian primary is near to the rating of its transformer.	2025	2023	2023	Reinforce with Flexibility
Feeder Road BSP	South West	Feeder Road BSP has limited capacity for an N-2 outage on two of its four GTs.	2026	2023	2023	Reinforce with Flexibility
Woodcote to Chard	South West	An N-1 condition for the loss of one of the 33 kV circuits to Chard primary heavily loads the remaining circuit.	-	-	-	Remove

Secondary Network Flexibility

In order to expand opportunities for engaging in flexibility markets to the secondary network we opened up 1359 LV sustain zones for procurement between June and August 2023. No flexibility providers were contracted as part of this procurement round, but we are still committed to utilising flexibility wherever possible and economic at each voltage level. We therefore plan to offer more opportunities to the market in future procurement rounds, and will continue to evolve our processes to ensure we are able to engage with the market as efficiently as possible. In the short term we will continue to carry out secondary reinforcement as normal to ensure the needs of the network are met.

Strategic Asset Replacement

Condition based replacement of assets is carried out routinely by NGED across our licence areas to maintain the safety and operability of the network. As outlined in the February 2023 DNOA flexibility is not suitable for deferring works triggered by asset condition. There is also an opportunity to install larger/higher rated equipment when asset replacement is carried out. This prevents having to uprate these assets at a later date when load growth occurs. By utilising our long term DFES forecasts NGED is able to strategically uprate assets where load growth is projected. This incurs a slightly larger initial investment but means the assets will not have to be uprated again in the future, leading to significant overall savings for customers. A case study will be included in the next DNOA publication to demonstrate the economic benefits of this strategic uprating, and to discuss why this expenditure is not usually suitable for deferral using flexibility and thus schemes are not covered individually in the DNOA.

Stakeholder Engagement

We want to hear your views on the DNOA process and our report format as feedback from stakeholders will be valuable in shaping future publications. Any feedback should be emailed or mailed to the addresses below:

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