



Distribution Network Options Assessment

February 2022

WESTERN POWER 
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Serving the Midlands, South West and Wales

Foreword

With the government's commitment to end the UK's contribution to carbon emissions by 2050, and in the wake of the COP26 UN climate change conference in Glasgow, the role of electricity in helping to facilitate net zero is becoming increasingly important. As our customers shift to electrify their heating and transport needs, our network will need to be smarter and more flexible than ever.

At Western Power Distribution we have a strong track record of delivering best in class service and as we take a more active role in managing the electricity distribution system, we will continue to develop our business and remain at the forefront of Distribution Systems Operations.

Building on our strong background of planning and operating networks, we have been opening opportunities for distributed energy resources to help support our network. Developing successful markets also requires confidence in those opportunities continuing in the future and the market needs to have transparency in the process and outcomes of our decision making.

This iteration of the Distribution Network Options Assessment (DNOA) builds upon the previous DNOA published in August 2021 by outlining the flexibility and reinforcement schemes which have changed over the last six months after our reassessment and Cost Benefit Analysis.

By providing more information to the growing distribution flexibility market about current and future network requirements across our region, we can help flexibility providers identify the opportunities to support the electricity system and bring forward investment in green technologies.

A smarter network needs smarter decisions: this DNOA outlines the options considered to provide the best consumer value in investments made on the distribution network.

The DNOA methodology describes how we have refined and improved our DNOA process since the last iteration, as well as changes to WPD's other processes such as the Distribution Future Energy Scenarios (DFES) upon which the decisions made in the DNOA are based.

The decisions made within this DNOA will show how we are optimising our investment to deliver secure, sustainable and affordable electricity to meet the changing needs of the areas we serve.

We welcome any feedback that will help us to push the DNOA even further to drive value and benefit for our customers.



Ben Godfrey
Distribution System
Operator Manager

Executive summary




Since the publication of the last Distribution Network Options Assessment (DNOA) in August 2021 a number of new schemes have been created, and the investment decisions for some of the existing schemes have also changed after reassessment.

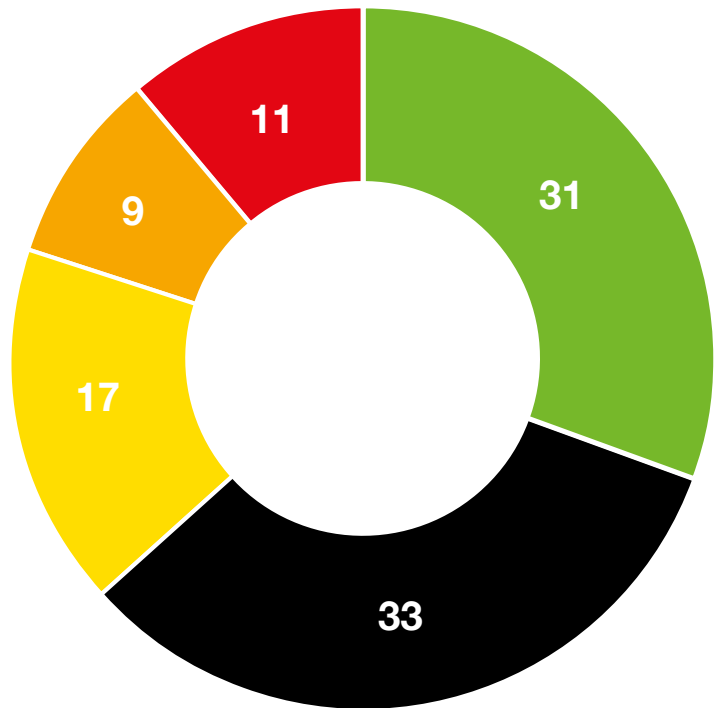
Two schemes which were previously out for signposting have transitioned to flexibility, and a new flexibility scheme has also been created.


11 flexibility/reinforce with flexibility schemes from the previous DNOA have now been removed.

13 existing reinforce schemes have been completed and seven new reinforce schemes have been created.


Below is a summary of the new breakdown of the investment decisions for all of the schemes across all four of WPD's licence areas.

 Total schemes assessed	101
 Flexibility	31
 Reinforce	33
 Reinforce with flexibility	17
 Signposting	9
 Remove	11




 **Flexibility**


Flexibility indicates a decision to procure flexibility or to maintain the flexibility contracts currently in place to defer reinforcement.

 **Reinforce**


Reinforce indicates a decision to pursue traditional network reinforcement immediately.

 **Signposting**

Signposting signals a decision to inform potential providers of future flexibility requirements whilst the need requirement is monitored.

 **Reinforce with flexibility**




Reinforce with flexibility is when reinforcement is set to begin immediately, but flexibility is required to deal with the constraint in the interim.

 **Remove**

Remove signals a decision to remove the scheme from consideration in future DNOAs. All schemes will be re-assessed in future DNOAs until there is no option value left to realise.

Executive summary

The tables below shows the schemes for which the DNOA decision has changed since the publication of the August 2021 DNOA for each of the four licence areas, as well as the new schemes.

<p>Proposed scheme closure </p> <p>The proposed scheme closure is the year when a constraint no longer requires intervention, after which the scheme is removed from future DNOAs.</p>	<p>Flexibility start year </p> <p>The flexibility start year is the first year that flexibility is required to address a constraint, under WPD Best View and the other DFES scenarios.</p>	<p>DNOA decision </p> <p>The DNOA decision is the outcome recommended by this iteration of the DNOA to manage each constraint most economically. These different possible outcomes are described above.</p>
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<p>Looking backwards</p> <p>Looking backwards identifies the proposed scheme closure dates based on the DNOA decision and the outcome of flexibility tenders. A proposed scheme closure date earlier than the CBA forecasts occurs where flexibility is not available.</p> 	<p>Looking forwards</p> <p>Looking forwards identifies the proposed intervention technique using estimated flexibility market information.</p> 
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Table 1: Summary of investment decisions in the East Midlands

Scheme	Constraint	Proposed Scheme Closure	WPD Best View flexibility start year	DFES scenarios flexibility start year	DNOA decision
Grendon - Corby	An SCO on two of the 132kV circuits between Grendon GSP and Corby BSP could overload the remaining two.	2025	2022	2022	Flexibility
Woodhall Spa	Woodhall Spa PSS was exceeding the N-1 firm capacity which was limited by 11kV backfeeds.	-	-	-	Remove
Lincoln - North Hykeham	Lincoln - North Hykeham 33kV circuit is currently overcommitted with demand.	-	-	-	Remove
Lincoln - Beevor Street	Lincoln - Beevor Street 33kV circuit is currently overcommitted with demand.	-	-	-	Remove
Mantle Lane	One of the 33kV circuits between Coalville BSP and Mantle Lane becomes overloaded for an N-1 circuit outage.	-	-	-	Remove
Crowland	Crowland 33/11kV PSS is expected to exceed its firm capacity.	-	-	-	Remove
Coventry GSP	Fault level restriction on the 132kV switchgear at Coventry GSP.	2026	-	-	Reinforce
Spondon 132kV	Fault level restriction on the 132kV switchgear at Spondon BSP.	2024	-	-	Reinforce

Executive summary

Table 2: Summary of investment decisions in the West Midlands

Scheme	Constraint	Proposed Scheme Closure	WPD Best View flexibility start year	DFES scenarios flexibility start year	DNOA decision
Donnington	Load likely to exceed firm capacity of Donnington PSS.	-	-	-	Remove
Oldbury	Oldbury GSP was close to P2/7 N-2 non-compliance.	-	-	-	Remove
Meaford	33kV voltages drop to below 0.9 per unit in N-1 scenarios.	-	-	-	Remove
Wolverhampton 33kV	Fault level restriction on the 33kV switchboard at Wolverhampton BSP.	2024	-	-	Reinforce
Halesowen 11kV	Fault level restriction on the 11kV switchboard at Halesowen 11kV.	2024	-	-	Reinforce
Sutton Coldfield 11kV	Fault level restriction on the 11kV switchboard at Sutton Coldfield 11kV.	2024	-	-	Reinforce
Coseley 11kV	Fault level restriction on the 11kV switchboard at Coseley 11kV.	2024	-	-	Reinforce
Hereford Protection	Protection requires installing/relocating at Hereford BSP.	2022	-	-	Reinforce

Table 3: Summary of investment decisions in South Wales

Scheme	Constraint	Proposed Scheme Closure	WPD Best View flexibility start year	DFES scenarios flexibility start year	DNOA decision
Cardiff North	N-2 outage conditions and SD11 requirements.	-	-	-	Remove

Table 4: Summary of investment decisions in the South West

Scheme	Constraint	Proposed Scheme Closure	WPD Best View flexibility start year	DFES scenarios flexibility start year	DNOA decision
Laneast	N-1 restoration capacity for Laneast PSS restricted by 11kV backfeeds.	2026+	2022	2022	Flexibility
Stokenham	N-1 restoration capacity for Stokenham PSS restricted by 11kV backfeeds.	2026+	2022	2022	Flexibility
Radstock	Circuit overload following a 33kV bar outage; 5km of 33kV overhead line overloaded.	-	-	-	Remove
Padstow	Overloading of transformers at Padstow PSS.	-	-	-	Remove

Document overview

This DNOA aims to update the previous iteration of the DNOA published by WPD in August 2021. This includes updates to WPD’s Distribution Future Energy Scenarios (DFES) process, the Common Evaluation Methodology (CEM) Cost Benefit Analysis tool used and the schemes captured in the previous DNOA.

For a more comprehensive overview of the DNOA process this document should be read in conjunction with the August 2021 DNOA which can be found on WPD’s website using the link below.



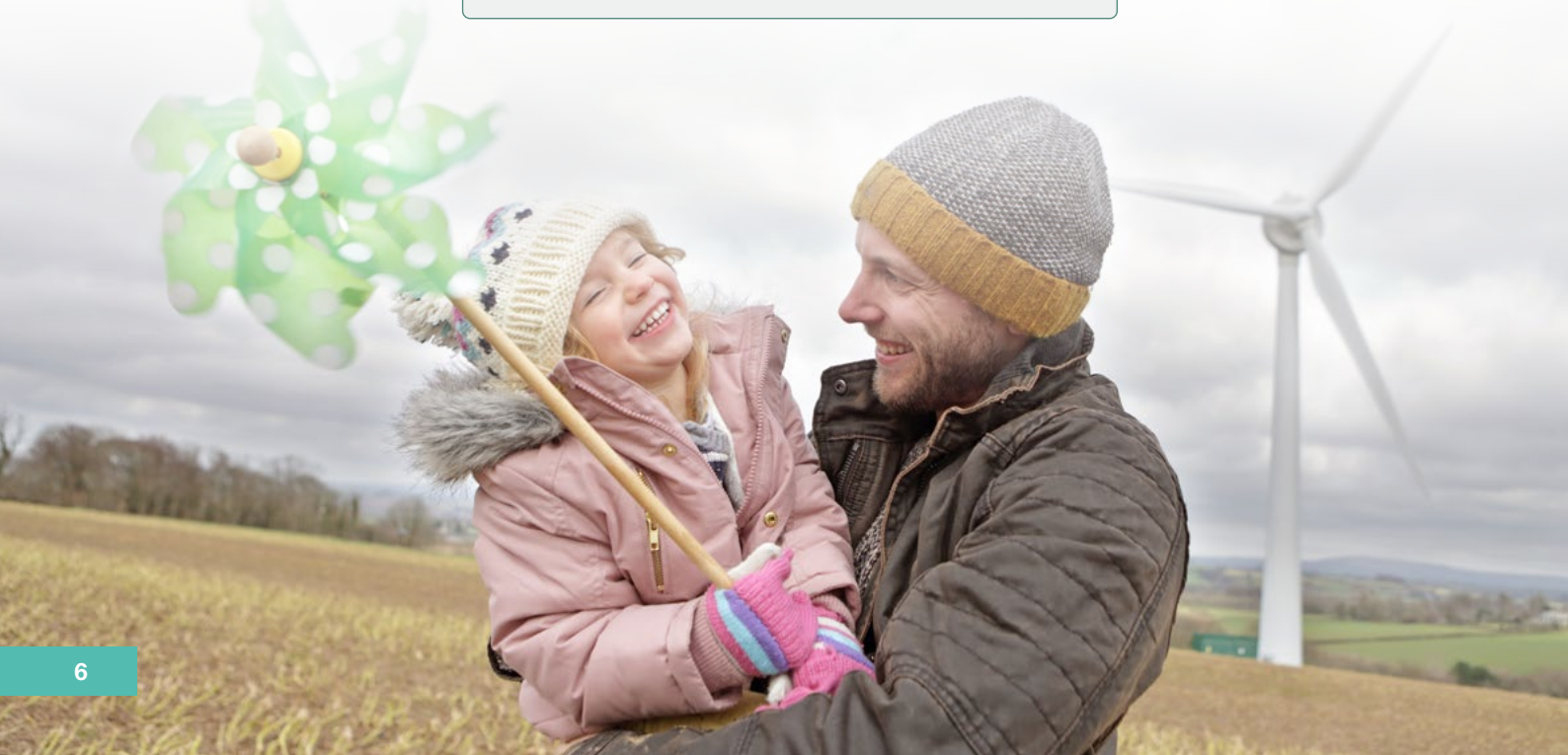
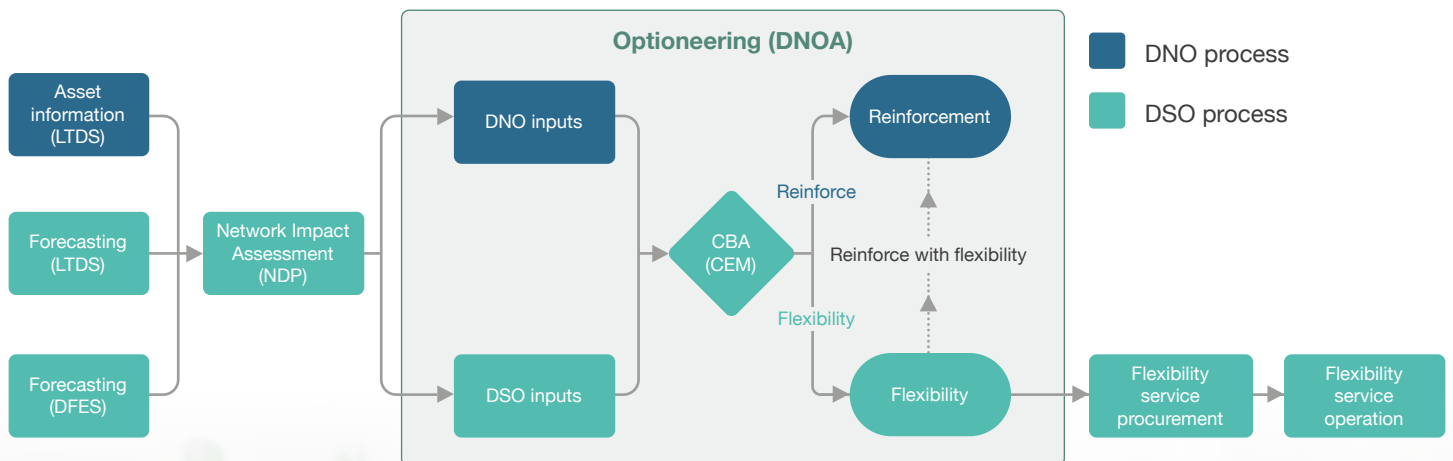
www.westernpower.co.uk/distribution-network-options-assessment

As with previous iterations of the DNOA, the decision making process for determining the optimal solution for each constraint begins with the forecasting data produced by WPD as part of the DFES process. This scenario growth data allows areas on the network expected to be constrained to be identified.

Forecasts carried out using this data are then used to plan conventional network build solutions and/or flexibility procurement based on system needs.

The next DNOA will be based on a new set of constraints identified as part of WPD’s upcoming Network Development Plan (NDP).

WPD’s overall DNOA process from forecasting through to procurement is shown in the figure below, including the upcoming NDP. This process is carried out every six months to both look forward and identify which constraints should have services procured to help mitigate them, as well as looking backwards to ensure they continue to provide value.



Methodology

Distribution Future Energy Scenarios

The Distribution Future Energy Scenario (DFES) used as the basis for this DNOA were taken from the 2020 DFES for all four licence areas. The 2020 DFES study undertook all licence areas at the same time to allow greater consistency and comparability between licence areas.

Since the 2019 DFES data used in the August 2021 DNOA there have been a number of updates to the DFES methodology, primarily undertaking the analysis at a more granular level.

This allowed aggregation of results up to a primary substation or local authority area and will result in greater accuracy of forecast growth for each constraint management zone (CMZ).

The four base 2020 DFES scenarios are Consumer Transformation, Leading the Way, Steady Progression and System Transformation. As before a fifth scenario is created by amalgamating the four base scenarios which represents WPD's expectation of the most likely future growth, called WPD Best View, which is used to inform investment decisions.

A more comprehensive description of the DFES process can be found on the DFES page on the WPD website:



www.westernpower.co.uk/distribution-future-energy-scenarios-regional-information

Flexibility services

WPD's understanding of flexibility service procurement continues to grow, with new flexibility products being considered and existing products being refined to help manage the needs of the distribution network more effectively.

An overview of how WPD's flexibility processes are expected to develop in the near future can be found in the Evolution of Distribution Flexibility Services Procurement document:



www.westernpower.co.uk/downloads-view-reciteme/445993

Common Evaluation Methodology

Since the publication of the August 2021 DNOA significant work has been carried out by Baringa Partners to improve the Common Evaluation Methodology (CEM) Cost Benefit Analysis tool used to assess the net benefit of flexibility against a baseline of conventional reinforcement for each scenario over a number of years as part of the DNOA process. This work was carried out under the Open Networks project under Workstream 1A. The new version of the CEM tool includes additional functionality to allow the impacts of the embedded emissions associated with conventional reinforcement to be considered as well as new options to assess the uncertainty benefit of different investment decisions.

A more detailed description of the CEM tool can be found in WPD's August 2021 DNOA and on the Energy Networks Association's website.



www.energynetworks.org

Interpretation of DNOA outcomes

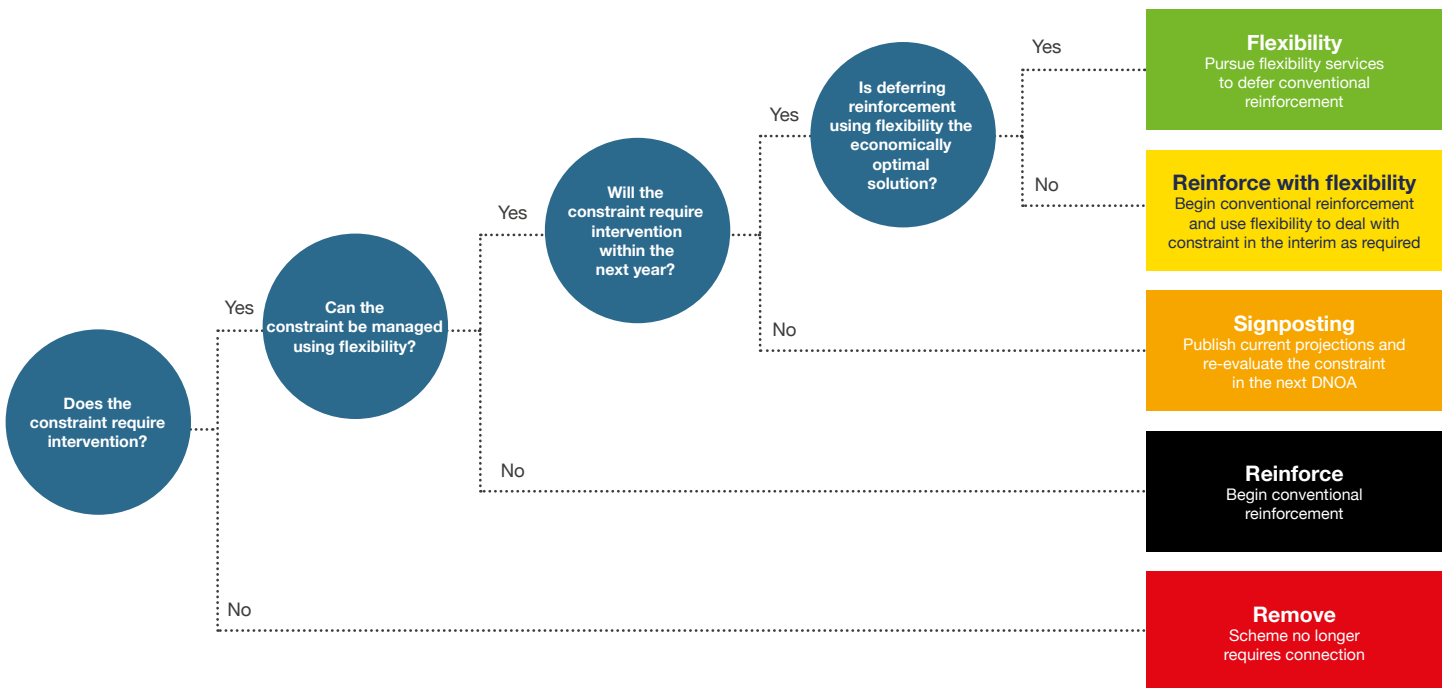
In this section the investment decisions taken on each of the schemes which have changed since the publication of the August 2021 DNOA across WPD’s four licence areas are given. This includes information on the proposed reinforcement schemes and Cost Benefit Analysis results showing across which years and which scenarios is flexibility procurement the optimal economic choice.

The decision tree below demonstrates the different choices our analysis can lead to. Firstly, the schemes that do not require any intervention are removed from future DNOAs.

Among the schemes which do require intervention, if the constraint cannot be managed using flexibility then reinforcement is pursued. If the constraint can be managed using flexibility but no intervention is required within the next year signposting is published.

The schemes which require flexibility services within the next year are put through Cost Benefit Analysis to determine if flexibility can be used to defer reinforcement. If CBA indicates reinforcement should not be deferred, reinforcement works will begin as soon as possible.

For these schemes flexibility is used as required to manage the constraint and provide additional network security before the reinforcement is completed.



Interpretation of DNOA outcomes

Scheme description
 For each scheme presented in this DNOA the description will outline the constraint on the network that is being addressed, along with an overview of the proposed or ongoing reinforcement works to deal with said constraint.

For reinforcement schemes that are currently underway, the expected completion date will be given.

For reinforcement works that have not begun yet, the time it would take to complete said works is given in the EPRC.

EPRC: Earliest Possible Reinforcement Completion
 This date shows when conventional reinforcement could be completed by if it were to begin immediately. For projects that have already begun, the expected end date is given.

If reinforce or reinforce with flexibility are chosen, this will reflect when the reinforcement will be completed in reality. If flexibility or signposting are chosen this date will not reflect the actual reinforcement completion timeline, as deferral will be taking place.

Scenario Key:

BV: Western Power Distribution's Best View	CT: Consumer Transformation	LTW: Leading the Way	ST: System Transformation	SP: Steady Progression
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Optimal flexibility duration
 For each scenario the years flexibility is expected to be required are shown, along with the estimated utilisation that will be required.

The start of this period will be triggered when the constraint begins to need management and usually end with reinforcement.

Estimated flexibility utilisation required per year table
 The estimated flex utilisation required per year for every scenario is given for each scheme in MWh.

This should give an idea of the expected annual flexibility energy requirements across the optimal flexibility duration for each scenario. For more detailed data on this, a link to WPD's network flexibility map is provided on each scheme page.

Constraint management timeline
 For each scheme the constraint management timeline shows what decision has been made for that scheme in each procurement cycle from when the scheme was created up to the upcoming procurement cycle.

Justification for decision
 For each scheme the reasoning behind the DNOA decision is described. For schemes where flexibility is an option this decision is usually driven by the Cost Benefit Analysis; if this is not the case then this will be discussed.

For reinforce schemes the reason why flexibility was not viable will be given. For remove schemes the reasons why the constraint no longer needs intervention are given (e.g. reinforcement works have been completed).

Other information
 Also provided is the season (or seasons) the constraint being addressed is expected to arise (and therefore the season in which flexibility services are required) and the flexibility product expected to be utilised (secure or dynamic). Alongside the secure and dynamic products, the restore product will also be used.

Outcomes East Midlands

Grendon - Corby



Scheme description

Under an SCO on two of the 132kV circuits between Grendon GSP and Corby BSP the remaining two 132kV circuits could potentially overload.



Constraint Season
Summer

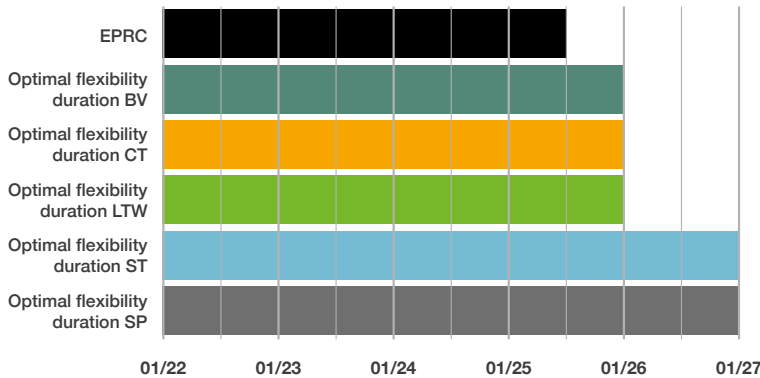


Flexibility Product
Secure



Estimated flex utilisation required per year (MWh):

	2022	2023	2024	2025	2026
BV	136.01	405.35	647.06	1114.34	
CT	166.80	542.12	988.81	1909.21	
LTW	161.23	569.94	987.36	1965.69	
ST	92.39	231.25	278.38	363.92	486.83
SP	70.89	172.94	196.02	216.27	242.81



DNOA decision



Flexibility



Justification for decision

Flexibility procurement is necessary. Cost Benefit Analysis indicates flexibility is the optimum solution until at least 2025.



Constraint management timeline

2022 H1 Procurement



For more information visit: www.westernpower.co.uk/network-flexibility-map-application

Outcomes East Midlands

Woodhall Spa



Scheme description

Woodhall Spa is a single 33/11kV transformer site with firm capacity that was limited by 11kV backfeeds. Under a transformer outage, the site demand was anticipated to exceed its firm capacity. Initial plans were to install a second 33/11kV transformer, however 11kV works were done instead.



Constraint Season
Winter

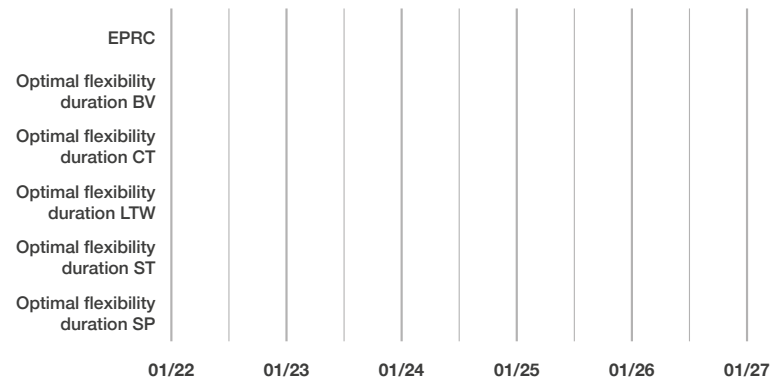


Flexibility Product
Dynamic



Estimated flex utilisation required per year (MWh):

	2022	2023	2024	2025	2026
BV					
CT					
LTW					
ST					
SP					



DNOA decision



Remove



Justification for decision

11kV works at Woodhall Spa have been completed, resolving the constraint.



Constraint management timeline

2022 H1	None
2021 H2	Maintain Active
2021 H1	Maintain Active
2020 H2	Procurement
2020 H1	Procurement
2019 H2	Procurement
2019 H1	Procurement



For more information visit: www.westernpower.co.uk/network-flexibility-map-application

Outcomes East Midlands

Lincoln – North Hykeham



Scheme description

There is a high amount of distributed generation in the area and high demand growth is expected. Potential shortfall for 11kV backfeed of North Hykeham PSS. A new 33kV circuit between Lincoln BSP and Waddington PSS is the proposed reinforcement to resolve this constraint.



Constraint Season
Winter

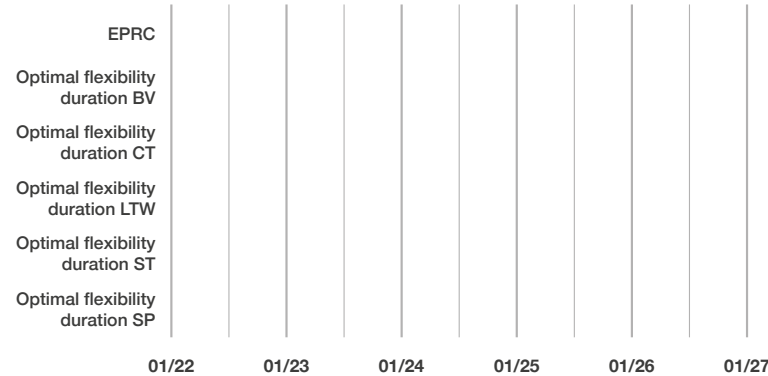


Flexibility Product
Dynamic



Estimated flex utilisation required per year (MWh):

	2022	2023	2024	2025	2026
BV					
CT					
LTW					
ST					
SP					



DNOA decision



Remove



Justification for decision

Reinforcement works to install a 33kV circuit from Lincoln BSP to Waddington PSS are due for completion in 2022 Q1, which will remove the constraint.



Constraint management timeline

2022 H1	None
2021 H2	Maintain Active
2021 H1	Maintain Active
2020 H2	Procurement
2020 H1	Procurement
2019 H2	Procurement
2019 H1	Procurement



For more information visit: www.westernpower.co.uk/network-flexibility-map-application

Outcomes East Midlands

Lincoln – Beevor Street



Scheme description

The Lincoln - Rookery Lane/Beevor Street/Ruston & Hornsby 33kV group was due to exceed its ratings due to demand growth in the area. 11kV backfeeds are primarily between Beevor Street and Rookery Lane. A new 33kV circuit between Lincoln BSP and Rookery Lane PSS is the proposed reinforcement to resolve this constraint.



Constraint Season
Winter/Summer

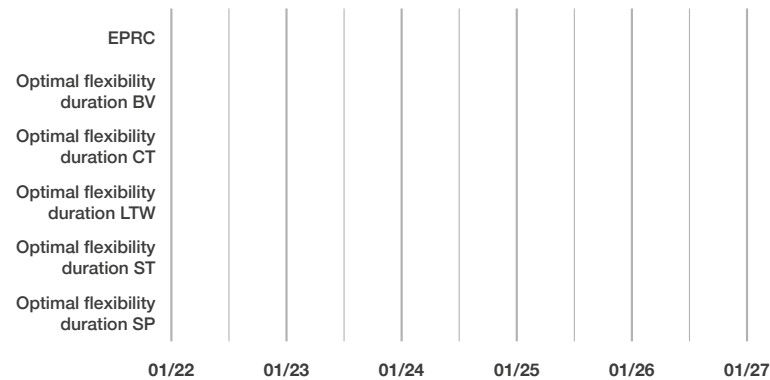


Flexibility Product
Dynamic



Estimated flex utilisation required per year (MWh):

	2022	2023	2024	2025	2026
BV					
CT					
LTW					
ST					
SP					



DNOA decision



Remove



Justification for decision

Reinforcement works to install a 33kV circuit between Lincoln BSP and Rookery Lane PSS are due for completion in 2022 Q1, which will remove the constraint.



Constraint management timeline

2022 H1	None
2021 H2	Maintain Active
2021 H1	Maintain Active
2020 H2	Procurement
2020 H1	Procurement
2019 H2	Procurement
2019 H1	Procurement



For more information visit: www.westernpower.co.uk/network-flexibility-map-application

Outcomes East Midlands

Mantle Lane



Scheme description

Reinforcement is currently underway which involves overlaying of the Mantle Lane T1 33kV circuit to the tee position with Worthington. For the section of cable which passes Bardon Road and ends at Mantle Lane, an 11kV cable shall be included to allow 2MVA of 11kV load to be transferred onto Bardon Road. These circuit works will remove the circuit restriction and ensure continued P2/7 compliance.



Constraint Season
Winter/Summer

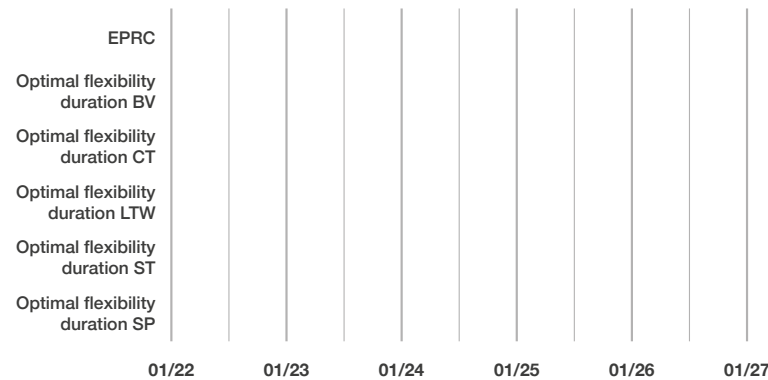


Flexibility Product
Dynamic



Estimated flex utilisation required per year (MWh):

	2022	2023	2024	2025	2026
BV					
CT					
LTW					
ST					
SP					



DNOA decision



Remove



Justification for decision

Reinforcement works to overlay a section of the 33kV circuit to Mantle Lane T1 are due for completion in 2022 Q1, which will remove the constraint.



Constraint management timeline

2022 H1	None
2021 H2	Maintain Active
2021 H1	Maintain Active
2020 H2	Procurement
2020 H1	Procurement
2019 H2	Procurement
2019 H1	Procurement



For more information visit: www.westernpower.co.uk/network-flexibility-map-application

Outcomes East Midlands

Crowland



Scheme description

Crowland PSS currently has a single 33/11kV transformer but the site's firm capacity is limited by the 11kV backfeed capability for a loss of the transformer. It is proposed to install a second 33/11kV transformer and perform minimal 33kV works to facilitate the installation of the second transformer.



Constraint Season
Winter

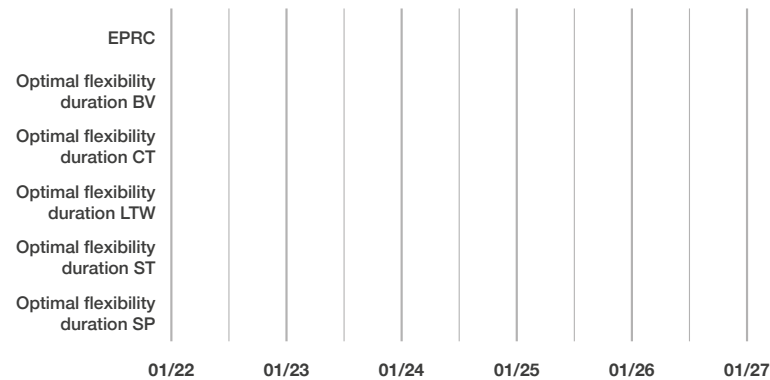


Flexibility Product
Secure



Estimated flex utilisation required per year (MWh):

	2022	2023	2024	2025	2026
BV					
CT					
LTW					
ST					
SP					



DNOA decision



Remove



Justification for decision

Reinforcement works to install a second 33/11kV transformer at Crowland PSS are due for completion in 2022 Q1, which will remove the constraint.



Constraint management timeline

2022 H1	None
2021 H2	Procurement
2021 H1	Procurement
2020 H2	Signposting
2020 H1	Signposting



For more information visit: www.westernpower.co.uk/network-flexibility-map-application

Outcomes East Midlands

Coventry GSP



Scheme description

Rebuild the 132kV switchgear at Coventry GSP to increase fault rating.



Justification for decision

Flexibility is not suitable to deal with this constraint as it is a fault level restriction.

Reinforcement information

Completion year - 2026

Current status - Preliminary

DNOA Decision



Reinforce

Spondon 132kV



Scheme description

Replant Spondon 132kV fully including changing infrastructure and earthing.



Justification for decision

Flexibility is not suitable to deal with this constraint as it is a fault level restriction.

Reinforcement information

Completion year - 2024

Current status - Preliminary

DNOA Decision



Reinforce

Outcomes West Midlands

Donnington



Scheme description

Donnington PSS is a single 33/11kV transformer site fed via a single teed circuit between Ketley and Sankey substations. It relies on limited 11kV interconnections for backfeed under the loss of the transformer. The proposed reinforcement was to install a second 33/11kV transformer at Donnington PSS, and a second 33kV circuit from Ketley BSP supplying the new transformer.



Constraint Season
Winter/Summer

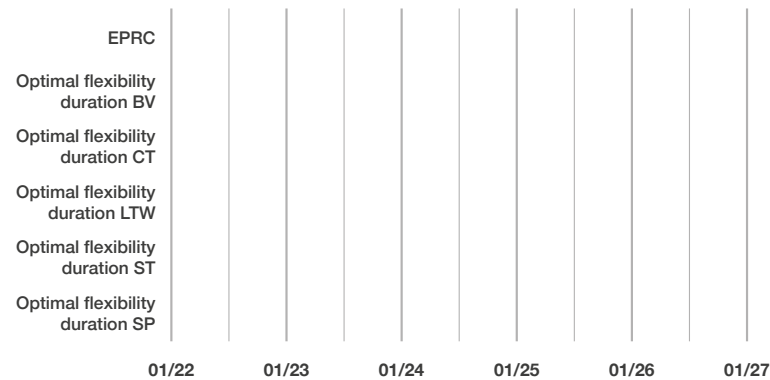


Flexibility Product
Dynamic



Estimated flex utilisation required per year (MWh):

	2022	2023	2024	2025	2026
BV					
CT					
LTW					
ST					
SP					



DNOA decision



Remove



Justification for decision

Reinforcement works to install a second 33/11kV transformer at Donnington PSS have been completed, resolving the constraint.



Constraint management timeline

2022 H1	None
2021 H2	Maintain Active
2021 H1	Maintain Active
2020 H2	Maintain Active
2020 H1	Maintain Active
2019 H2	Maintain Active
2019 H1	Procurement



For more information visit: www.westernpower.co.uk/network-flexibility-map-application

Outcomes West Midlands

Oldbury



Scheme description

Oldbury GSP is supplied via two 275/132kV SGTs. The demand occasionally exceeds 100MVA triggering a SCO study under P2/7 class of supply D. There is very limited 11kV interconnection; this has been calculated to be 7.7MVA. The conventional solution therefore is to request for a third SGT to be installed by National Grid at Oldbury GSP.



Constraint Season
Winter

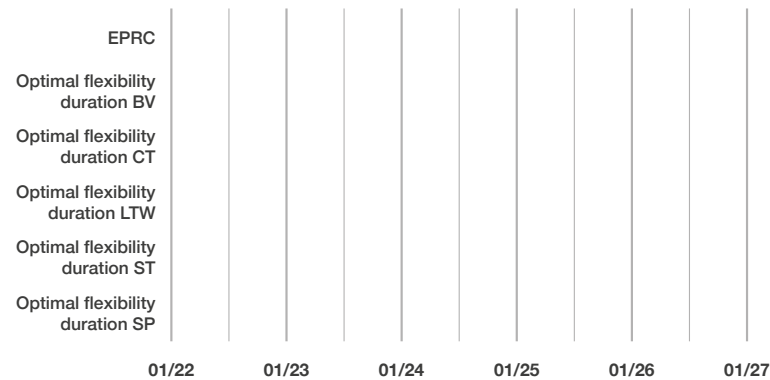


Flexibility Product
Dynamic



Estimated flex utilisation required per year (MWh):

	2022	2023	2024	2025	2026
BV					
CT					
LTW					
ST					
SP					



DNOA decision



Remove



Justification for decision

Reinforcement works to install a third SGT at Oldbury GSP have been completed, resolving the constraint.



Constraint management timeline

2022 H1	None
2021 H2	Maintain Active
2021 H1	Maintain Active
2020 H2	Procurement
2020 H1	Procurement
2019 H2	Signposting
2019 H1	Signposting



For more information visit: www.westernpower.co.uk/network-flexibility-map-application

Outcomes West Midlands

Meaford



Scheme description

Meaford BSP supplies multiple primary substations, most of which are fed via four meshed 33kV circuits. Due to the meshed nature of the circuits, the distances involved, and the high impedance of some of the circuits, the voltages drop below statutory limits following a first circuit outage. The proposed reinforcement is to install a new 33kV circuit from Meaford to Eccleshall. New circuit breakers will also be installed at Meaford and Eccleshall.



Constraint Season
Winter/Summer

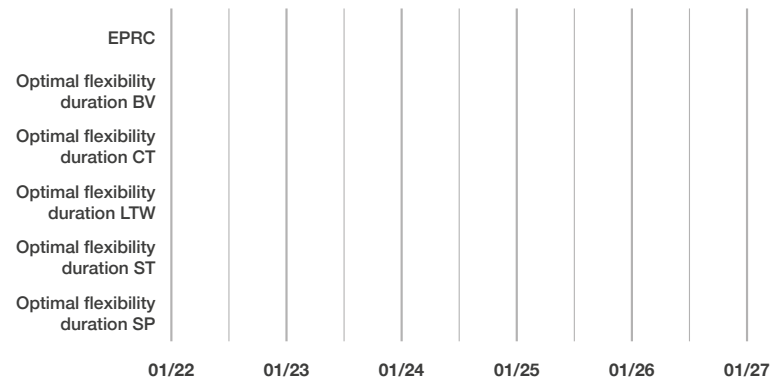


Flexibility Product
Dynamic



Estimated flex utilisation required per year (MWh):

	2022	2023	2024	2025	2026
BV					
CT					
LTW					
ST					
SP					



DNOA decision



Remove



Justification for decision

Reinforcement works to build a new 33kV circuit from Meaford BSP to Eccleshall PSS are due for completion in 2022 Q1, which will remove the constraint.



Constraint management timeline

2022 H1	None
2021 H2	Maintain Active
2021 H1	Maintain Active
2020 H2	Maintain Active
2020 H1	Procurement






For more information visit: www.westernpower.co.uk/network-flexibility-map-application

Outcomes West Midlands




Wolverhampton 33kV

<p> Scheme description Replace the 33kV switchboard at Wolverhampton BSP.</p> <p> Justification for decision Flexibility is not suitable to deal with this constraint as it is a fault level restriction.</p>	<p>Reinforcement information</p> <p>Completion year - 2024</p> <p>Current status - Preliminary</p>	<p>DNOA Decision</p> <p></p> <p>Reinforce</p>
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Halesowen 11kV

<p> Scheme description Replace the 11kV switchboard at Halesowen 132/11kV.</p> <p> Justification for decision Flexibility is not suitable to deal with this constraint as it is a fault level restriction.</p>	<p>Reinforcement information</p> <p>Completion year - 2024</p> <p>Current status - Preliminary</p>	<p>DNOA Decision</p> <p></p> <p>Reinforce</p>
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Sutton Coldfield 11kV

<p> Scheme description Replace the 11kV switchboard at Sutton Coldfield 132/11kV.</p> <p> Justification for decision Flexibility is not suitable to deal with this constraint as it is a fault level restriction.</p>	<p>Reinforcement information</p> <p>Completion year - 2024</p> <p>Current status - Preliminary</p>	<p>DNOA Decision</p> <p></p> <p>Reinforce</p>
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Outcomes West Midlands

Coseley 11kV



Scheme description

Construct a new switchroom and replace the existing 11kV switchgear.



Justification for decision

Flexibility is not suitable to deal with this constraint as it is a fault level restriction.

Reinforcement information

Completion year - 2024

Current status - Preliminary

**DNOA
Decision**



Reinforce

Hereford Protection



Scheme description

Installing distance and busbar protection and relocating/replacing the 66kV panels at Hereford PSS.



Justification for decision

Flexibility is not suitable to deal with this constraint as it is a protection issue.

Reinforcement information

Completion year - 2022

Current status - In construction

**DNOA
Decision**



Reinforce

Outcomes South Wales

Cardiff North



Scheme description

A second circuit outage (SCO) condition resulting in both 132/33kV grid transformers at Cardiff East BSP being out of service, leaving the group demand supplied via the single GT at Cardiff North BSP. Proposed reinforcement is to install a 132kV outdoor circuit breaker bay and a 132/33kV GT to reinforce the Cardiff East/Cardiff North group.



Constraint Season
Winter/Summer

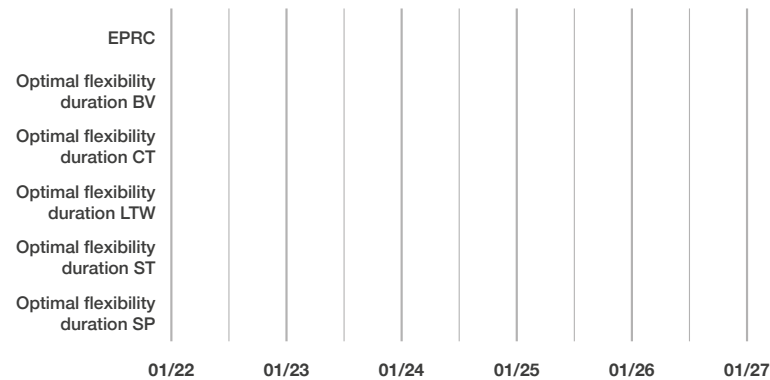


Flexibility Product
Dynamic



Estimated flex utilisation required per year (MWh):

	2022	2023	2024	2025	2026
BV					
CT					
LTW					
ST					
SP					



DNOA decision



Remove



Justification for decision

Reinforcement works to install a second 132/33kV transformer at Cardiff North BSP are due for completion in 2022 Q1, which will remove the constraint.



Constraint management timeline

2022 H1	None
2021 H2	Procurement
2021 H1	Procurement



For more information visit: www.westernpower.co.uk/network-flexibility-map-application

Outcomes South West

Laneast



Scheme description

Laneast PSS is a single 33/11kV transformer site with restricted FCO restoration capacity. The capacity under an outage is limited by the 11kV backfeeds to neighbouring substations.



Constraint Season
Winter

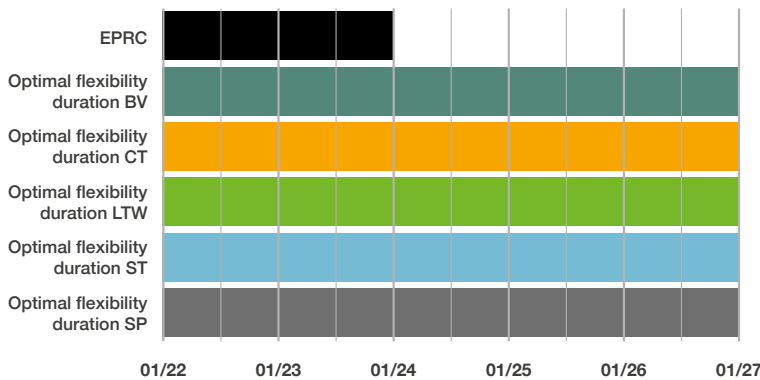


Flexibility Product
Secure



Estimated flex utilisation required per year (MWh):

	2022	2023	2024	2025	2026
BV	9.20	12.12	16.20	21.99	33.86
CT	14.83	24.01	36.84	60.75	109.33
LTW	14.37	23.79	38.49	65.83	122.05
ST	6.73	7.24	7.97	8.88	11.49
SP	4.35	4.40	4.08	3.69	3.36



DNOA decision



Flexibility



Justification for decision

Flexibility procurement is necessary. Cost Benefit Analysis indicates flexibility is the optimum solution until at least 2026 under all scenarios.



Constraint management timeline

2022 H1 Procurement
2021 H2 Signposting



For more information visit: www.westernpower.co.uk/network-flexibility-map-application

Outcomes South West

Stokenham



Scheme description

Stokenham PSS is a single 33/11kV transformer site with restricted FCO restoration capacity. The capacity under an outage is limited by the 11kV backfeeds to neighbouring substations.



Constraint Season
Winter

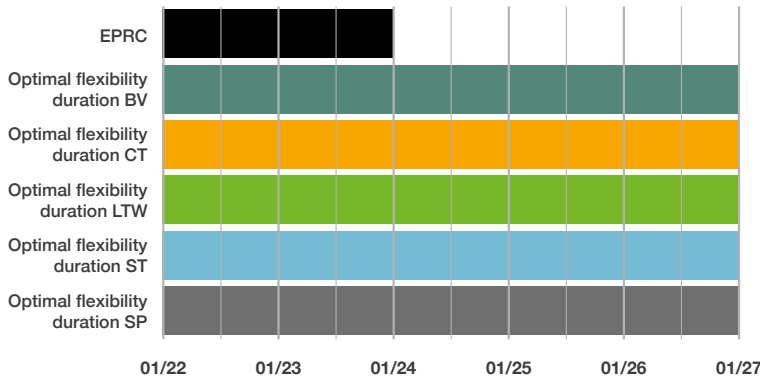


Flexibility Product
Secure



Estimated flex utilisation required per year (MWh):

	2022	2023	2024	2025	2026
BV	11.22	14.27	18.23	23.87	35.51
CT	15.54	23.98	36.07	58.15	105.16
LTW	14.19	22.54	35.94	60.53	114.16
ST	9.60	10.16	10.98	12.00	14.87
SP	7.25	7.31	6.92	6.43	6.03



DNOA decision



Flexibility



Justification for decision

Flexibility procurement is necessary. Cost Benefit Analysis indicates flexibility is the optimum solution until at least 2026 under all scenarios.



Constraint management timeline

2022 H1	Procurement
2021 H2	Signposting
2021 H1	Signposting
2020 H2	Procurement
2020 H1	Procurement



For more information visit: www.westernpower.co.uk/network-flexibility-map-application

Outcomes South West

Radstock



Scheme description

Radstock 132/33kV substation currently has a 33kV outdoor busbar split into two sections. For an outage on one section of the 33kV busbar an overload may occur on the 3L5 circuit. It is proposed to replace the 33kV busbar indoors in three sections which will be financed by National Grid as part of the Hinkley Point C connection as seven 33kV circuit breakers require replacement due to increased fault levels.



Constraint Season
Winter/Summer

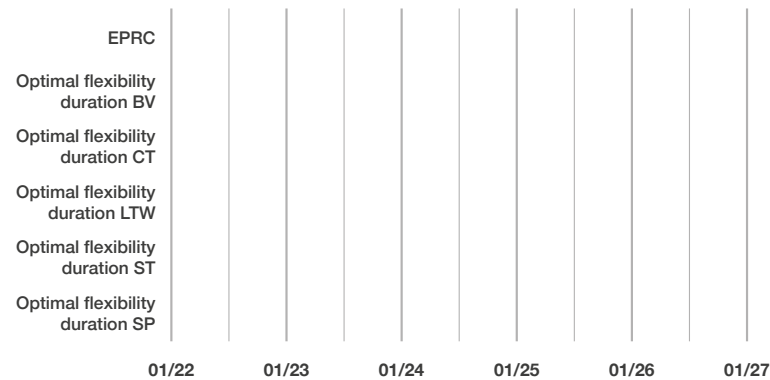


Flexibility Product
Dynamic



Estimated flex utilisation required per year (MWh):

	2022	2023	2024	2025	2026
BV					
CT					
LTW					
ST					
SP					



DNOA decision



Remove



Justification for decision

Reinforcement works to install a new 33kV bar at Radstock BSP have been completed, resolving the constraint.



Constraint management timeline

2022 H1	None
2021 H2	Maintain Active
2021 H1	Maintain Active
2020 H2	Procurement
2020 H1	Procurement
2019 H2	Procurement
2019 H1	Procurement



For more information visit: www.westernpower.co.uk/network-flexibility-map-application

Outcomes South West

Padstow



Scheme description

The 33/11kV transformers at Padstow PSS were close to becoming overloaded. The proposed reinforcement was the replacement of both transformers.



Constraint Season
Winter/Summer

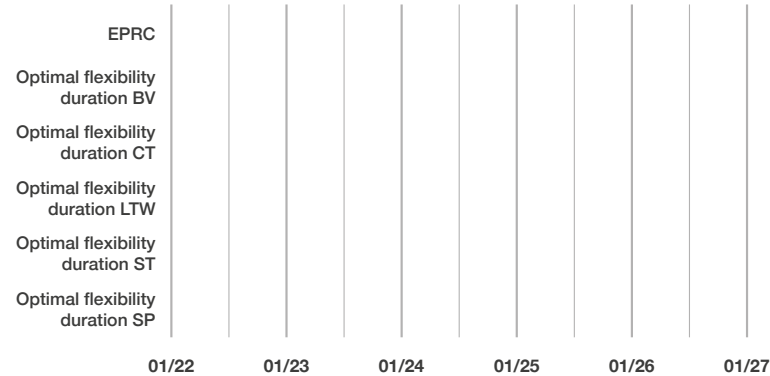


Flexibility Product
Secure



Estimated flex utilisation required per year (MWh):

	2022	2023	2024	2025	2026
BV					
CT					
LTW					
ST					
SP					



DNOA decision



Remove



Justification for decision

Reinforcement works to replace the 33/11kV transformers at Padstow PSS have been completed, resolving the constraint.



Constraint management timeline

2022 H1	None
2021 H2	Maintain Active
2021 H1	Maintain Active
2020 H2	Procurement



For more information visit: www.westernpower.co.uk/network-flexibility-map-application

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.

In order to do this we aim to collect feedback after every publication and use this to improve the DNOA process and ensuring the data we publish is relevant and valuable.

A number of questions on the DNOA process can be found on WPD's website:



[www.westernpower.co.uk/
distribution-network-options-assessment](http://www.westernpower.co.uk/distribution-network-options-assessment)

**We are keen to
get your feedback**



Any other general feedback should be sent to the address below:

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Or emailed to:
wpdnetworkstrategy@westernpower.co.uk



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