June 2026

Beyond 2030 – Electricity Transmission Update

Technical report

NESO
National Energy System Operator

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Introduction

Purpose of the technical report

Purpose of the technical report

We are required to set out our view of the suitability of reinforcement options to facilitate an efficient, co-ordinated and economical transmission system.

In March 2024, we published Beyond 2030. Many of the onshore reinforcement options in Beyond 2030 were at an early stage of development. To ensure their ongoing needs case, it was proposed that these should undergo further development to confirm their scope and be reassessed, alongside new reinforcement options. This follows changes to the coordinated offshore design, the latest Future Energy Scenarios and emerging insights from Connections Reform.

This technical report explains how we assessed reinforcement options to form the coordinated transmission network design presented in the Beyond 2030 - Electricity Transmission Update. This is an important bridge to the enduring Centralised Strategic Network Plan.

Firstly, we introduce our approach to network planning in accordance with our methodology. We then present the recommended design, ahead of a regional breakdown of our recommendations and those eligible for competition.

A comprehensive table of reinforcement options is also provided, specifying our recommendations and evaluations across our four assessment criteria.

Network design

Network planning
Recommended design

Network planning

To ensure access to reliable, clean and affordable electricity, the future transmission network needs upgrading.

The Future Energy Scenarios 2025 provide an independent view of a range of future pathways for the whole energy system. These explore the choices and uncertainty ahead in the future energy system.

In December 2025, the Transmission Owners then proposed reinforcement options, including those from Beyond 2030 and new options, to provide capability uplift across system boundaries and resolve future network constraints. Boundaries split the transmission network into multiple parts, crossing critical circuits that carry electricity between areas across Great Britain. These help us assess power flows and the capability of the network.

The reinforcement options were then collectively assessed to identify combinations that deliver the greatest transmission benefits. We evaluated these using our four assessment criteria to recommend an efficient, co-ordinated and economical transmission network design that considers impacts to the environment and communities as well as deliverability and operability.

Our recommendations provide clear signals to support further development ahead of transitioning to Strategic Energy Planning.

Future Energy Scenarios

Our analysis considers the Future Energy Scenarios pathways, exploring a range of routes to net zero in 2050.

Electricity Ten Year Statement

We assessed options to meet the future transmission requirements set out in the Electricity Ten Year Statement.

Beyond 2030 - Electricity Transmission Update

This report explains how we evaluated options to form the transmission network design presented in the Beyond 2030 - Electricity Transmission Update.

We have also published a Comprehensive List of the onshore and offshore network, including the planned network assumed in the background of our analysis.

Holistic Transition

This net zero pathway mixes electrification with hydrogen. It has the fastest renewable growth, particularly in Scotland.

Lower local demand and the highest interconnector exports in the 2030s drive the highest north to south power flows with constraints further north than the other net zero pathways.

Electric Engagement

The pathway meets net zero through electrified demand. It has the highest peak electricity demand, leading to lower relative constraints on northern boundaries and driving renewable dispatch.

By the 2040s, there are still north to south power flows to demand centres, but constraints are further south, below the boundary B7a.

Hydrogen Evolution

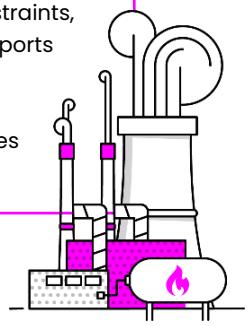
This pathway meets net zero through fast progress for hydrogen in industry and heat. It has slower renewable growth than the other net zero pathways but up to three times higher electrolysis capacity by 2045.

The Hydrogen Evolution pathway has reduced constraints, as local demand and electrolysis absorb renewable output.

Falling Behind

The Falling Behind pathway reflects decarbonisation, but at a pace not sufficient to meet net zero. It has a higher reliance on gas, the lowest demand and high exports in the 2040s.

This drives lower constraints, but interconnector exports increase pressure on southern boundaries, particularly boundaries B9 and LE1.



System needs

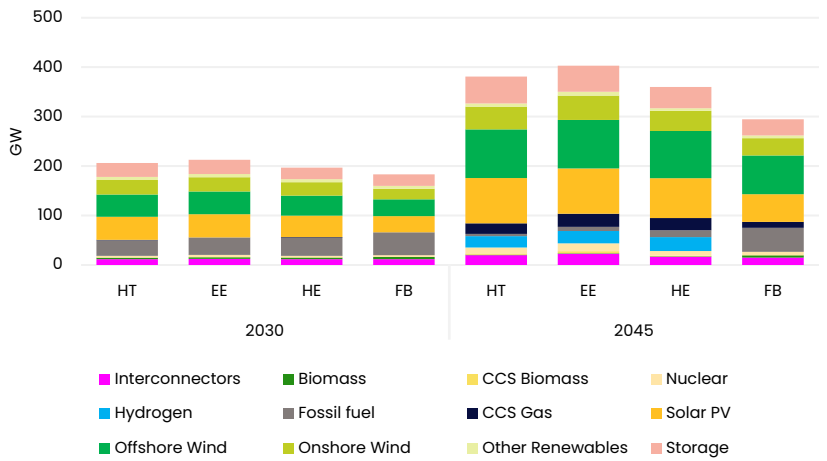
Annexes 1 and 2 of the Methodology provide further detail on our approach to inputs and system requirements.

We used the Future Energy Scenarios 2025 pathways to explore the choices that can be made and the uncertainty ahead in areas such as the speed of technology uptake, the role of both electrification and low carbon fuels and the level of consumer engagement. These pathways consider the government's Clean Power 2030 Action Plan and align with emerging insights from the Connections Reform Gate 2 to the Whole Queue process.

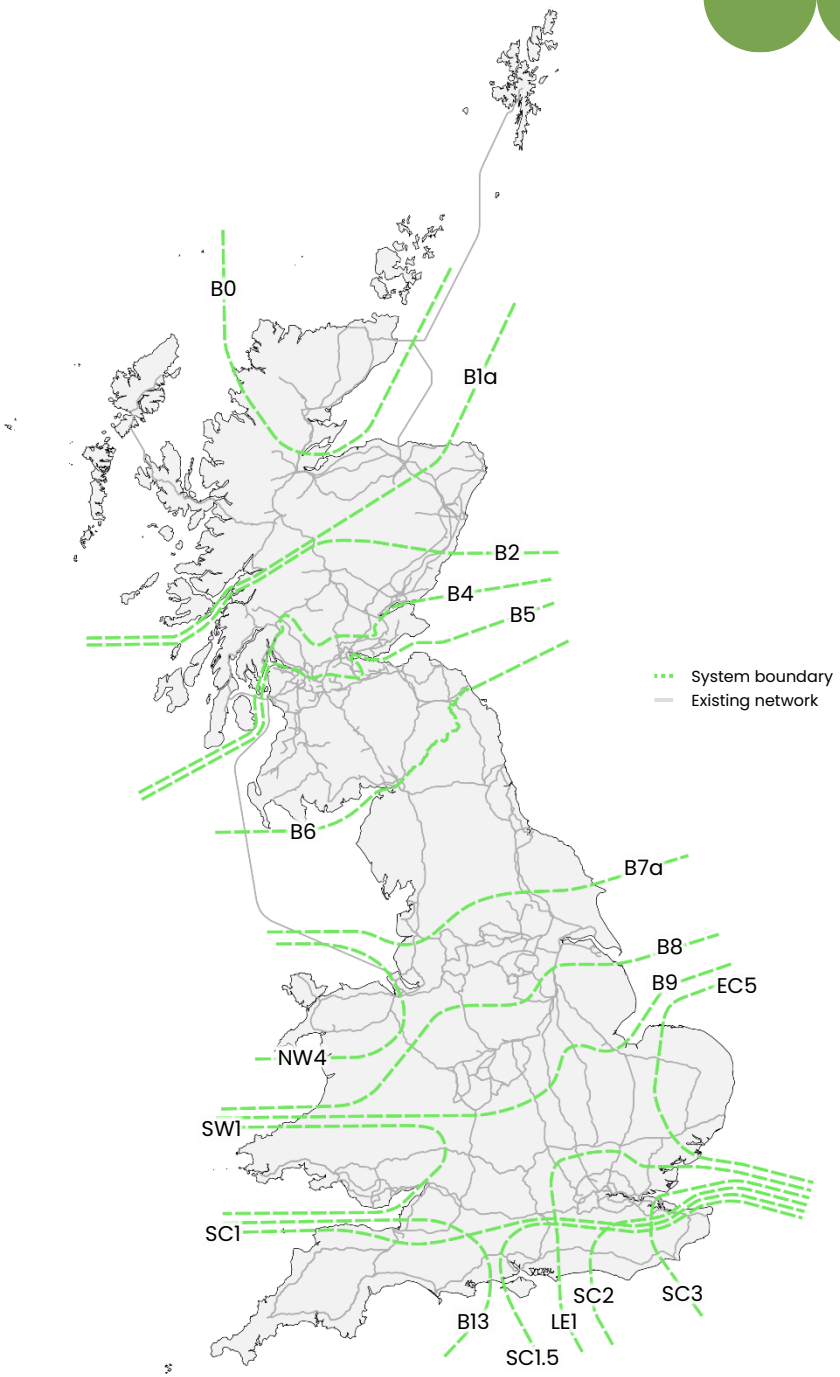
Since Beyond 2030, the coordinated offshore design has also evolved in response to inputs from delivery bodies and industry recommending a more simplified, staged design. Our analysis reflects the resulting changes to the location of offshore wind connections, particularly in Scotland, in both our power system studies and economic analysis.

The four pathways reflect a range of installed generation capacity and peak demand, enabling reinforcement options to be assessed against different system needs. These needs may further evolve following the Strategic Spatial Energy Plan and the outcomes of Connections Reform.

Figure 1: Installed generation capacity



Across the pathways, north to south power flows increase constraints across system boundaries through the 2030s, driven by renewable growth north of the boundary B9 and higher interconnector exports. In the three pathways achieving net zero, north to south power flows peak and constraints shift further south as interconnector exports reduce and domestic demand aligns more closely with supply. By contrast, the Falling Behind pathway sees constraints continue to increase to 2045, due to sustained exports and slower renewable expansion.



This map is illustrative only. Only studied boundaries are highlighted.

Reinforcement options

Annexes 3 and 4 of the Methodology outline how options are developed, along with our checks to ensure quality.

To meet these system needs, the Transmission Owners identified 102 reinforcement options, including options shared across Transmission Owners. Many of these were the outcome of further development following Beyond 2030, providing greater certainty on design scope, capital costs and delivery dates. We did not receive any suggested reinforcement options through academic and industry participation.

Our analysis then determines whether the investment required to increase the capability of the network is economic in consideration of transmission benefits. Therefore, it is important to assess a range of reinforcement options, including new infrastructure and network upgrades.

To support our cost benefit analysis, the Transmission Owners submit reinforcement options in line with the requirements set out in the methodology, including capital costs and delivery dates. We conduct additional checks to assure data quality. However, the analysis is ultimately informed by the information provided by the Transmission Owners.

Following Beyond 2030, several reinforcement options are also progressing towards construction or are no longer needed following further evaluation. These have not been reassessed. Additional network investments may also be needed for other network drivers, beyond providing boundary uplift.

43

New circuits or offshore links

We assessed 43 options proposing new onshore circuits or high voltage direct current offshore links. Generally, the Transmission Owners only consider new infrastructure once other options have been exhausted.

14

Power flow control devices

In England and Wales, we assessed 14 options involving quadrature boosters or other devices to manage power flows.

36

Upgrades to the existing network

The Transmission Owners also proposed 36 options involving replacing the conductors, increasing the voltage or tensioning and increasing the clearance of the existing network, alongside associated works.

09

New substations or substation upgrades

Additionally, we assessed nine options proposing new substations or to reconfigure existing substations.

Reinforcement options

Codes and descriptions

Each option is assigned a code, supported by a description.

Delivery dates

The Transmission Owners provided a deterministic earliest delivery date for each option, which is the date it could theoretically be delivered, assuming delivery risks do not apply. These ensure a full range of outcomes are considered.

National Grid Electricity Transmission also provided a probabilistic delivery date for each option. This is the date an option has a 50% likelihood of being delivered by, taking account of delivery risks, such as the supply chain, system access and planning and consenting. These provides a more realistic view of delivery.

As probabilistic delivery dates are not required per the methodology, they have not been provided by all the Transmission Owners. However, we will work with the Transmission Owners to agree a methodology for establishing them for the enduring Centralised Strategic Network Plan.

We determine optimal delivery dates for each option, considering the Treasury's social time preferential rate. These can be different across the four pathways and do not account for longer-term system access challenges.

Criteria ratings

For environmental and community impacts and deliverability and operability, each option is provided with a rating.

Investment signals

Depending on our analysis, we provide each option an investment recommendation.

Assessment criteria

Our analysis across the four assessment criteria was carried out in accordance with Annex 5 of the Methodology.

The four assessment criteria ensure we consider impacts to the environment and communities as well as deliverability and operability whilst determining an efficient, co-ordinated and economical transmission network design.

We only recommend reinforcement options which are needed to meet system needs in at least one pathway and then consider the four criteria in order to take a balanced approach when comparing different reinforcement options.

Our recommendations are also presented through multiple governance forums consisting of representation across industry to provide oversight, scrutiny, and advice, ensuring their robustness and collective agreement.

Economic case

Using the four Future Energy Scenarios pathways, we conducted a cost benefit analysis, comparing capital costs and monetised transmission benefits, including forecast reductions in constraint costs. To align with the Treasury's Green Book, the societal cost of carbon is also considered within the economic benefit for reinforcement options that reduce carbon emissions.

We assessed the net present value of different reinforcement option combinations to determine an efficient, co-ordinated and economical transmission network design. Following our assessment, we provided each reinforcement option with an investment recommendation, depending on if and when they are required in each of the pathways.

In this assessment, ahead of the Centralised Strategic Network Plan, we used the deterministic earliest delivery dates provided by all the Transmission Owners as per the methodology approved by the regulator. This is the basis for the recommendations in this report. These dates are the earliest a reinforcement option could theoretically be delivered and maximise the opportunity to identify reinforcement options to address network constraints – ahead of subsequent regulatory decisions. If a reinforcement option is needed on this date, it is considered critical.

These recommendations support decision-making but are subject to further development by the Transmission Owners and approval by the regulator. Regardless of our recommendations, reinforcement options may still be required to address other network drivers, including asset replacement, compliance or customer connections.

Our assessment does not determine individual customer connections or final outcomes for regulatory funding, infrastructure design or planning and consenting. These decisions are made separately by the regulator, Transmission Owners and relevant planning authorities.

Investment signals

Proceed (Critical)

This option is critical in all pathways, or at least one pathway and regrets analysis determines it is required on its deterministic earliest delivery date. Therefore, investment should be made to ensure its delivery date remains on course.

Proceed (Maintain)

This option is critical in at least one pathway or recommended within three years of its deterministic earliest delivery date. Hence, investment can be made to maintain momentum without any significant delay.

Hold

This option is important and recommended for the future in at least one pathway. It can be reviewed in the next network planning cycle.

Stop or Do not start

This option is not currently recommended. However, it may still be needed to meet other network drivers identified by the Transmission Owners or to maintain optionality in the enduring Centralised Strategic Network Plan, following the Strategic Spatial Energy Plan and the outcomes of Connections Reform.

Environmental and community impacts

To ensure the transmission network design considers impacts to the environment and communities, we and the Transmission Owners appraised each reinforcement option and provided each with a rating, considering ecology, geology and soils, landscape and visual, historic environment, air quality, noise, and socio-economic constraints.

Deliverability and operability

To consider deliverability and operability, we evaluated reinforcement options for their design complexity, technology readiness, supply chain, system access and other operability factors.

Rating	Description
Black	The option is not viable in its current state due to environmental and community issues or deliverability and operability challenges.
Red	The option has a high level of constraint or risk but is potentially viable. However, it will have to overcome many environmental and community issues or deliverability and operability challenges.
Amber	The option has a medium level of constraint or risk but is likely viable. However, it may have to overcome some environmental and community issues or deliverability and operability challenges.
Green	The option has no or a low level of constraint or risk. It is likely viable without any significant environmental and community issues or deliverability and operability challenges.

For both environmental and community impacts as well as deliverability and operability, we assigned each reinforcement option with either a *Black*, *Red*, *Amber* or *Green* rating. These criteria were not considered as monetised benefits.

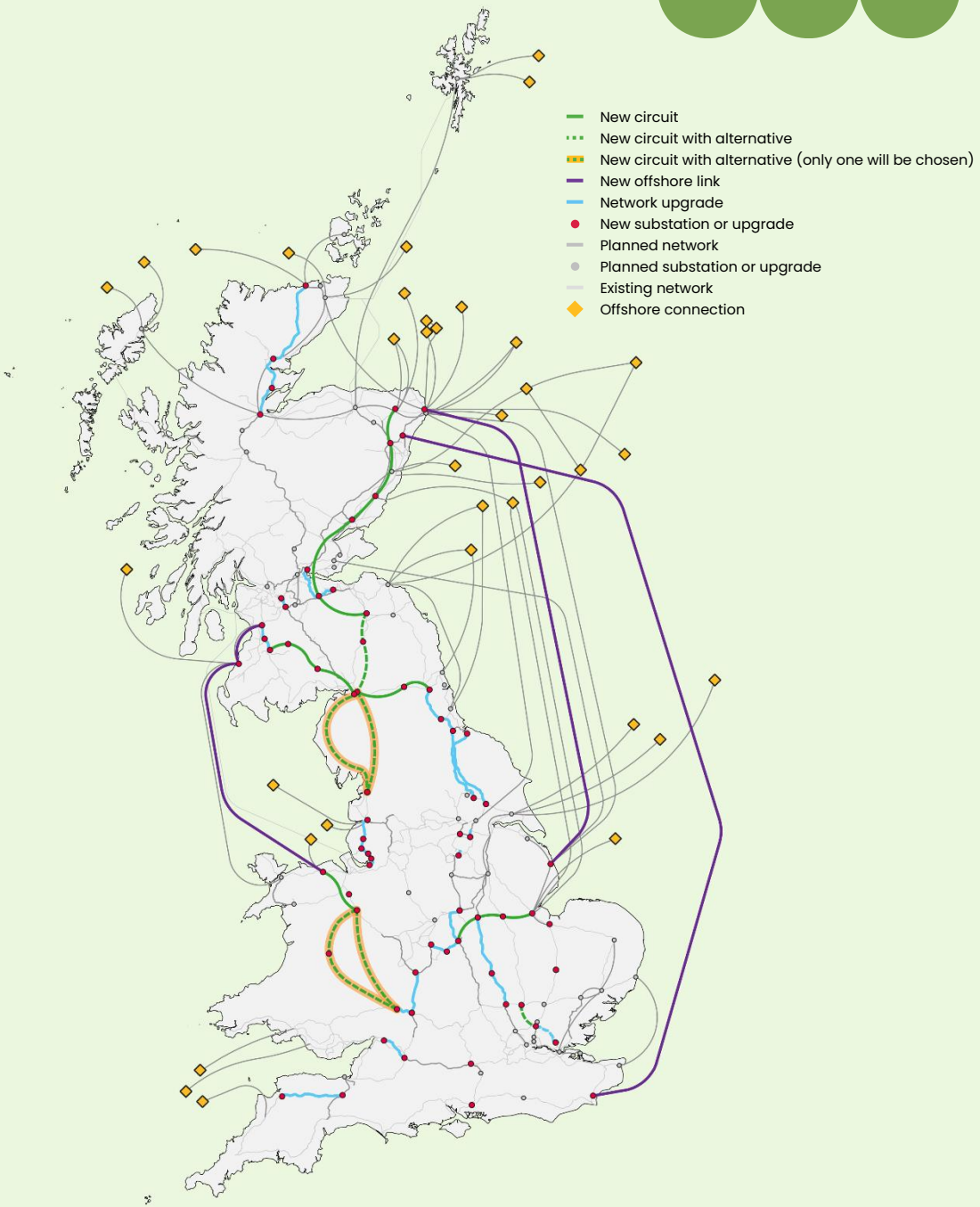
Recommended design

We assessed 102 reinforcement options, of which 43 are recommended to form a coordinated onshore and offshore transmission network design across Great Britain.

The transmission network design comprises 43 options, delivering net transmission benefits, including forecast reductions in constraint costs, of £58 billion to £82 billion.

Our analysis continues to recommend the majority of options from Beyond 2030, including the onshore spine from Scotland to the north of England and multiple offshore links.

We also recommend over 900km of upgrades to the existing network, maximising the capability of the current network and reducing the need for new infrastructure.



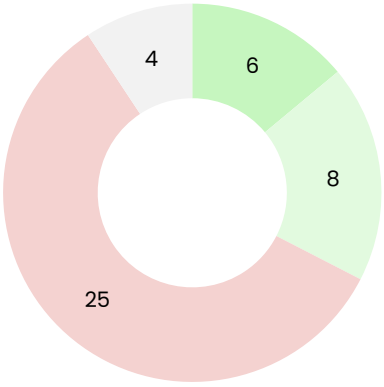
This map and the options shown are illustrative only. Amber dashed lines indicate options that cannot be chosen together.

Investment recommendations

The recommended transmission network design comprises 43* different reinforcement options, including those from Beyond 2030 as well as new options. Of the 43, we recommend that 38 reinforcement options should proceed with investment and that five options are important but are recommended to hold their development.

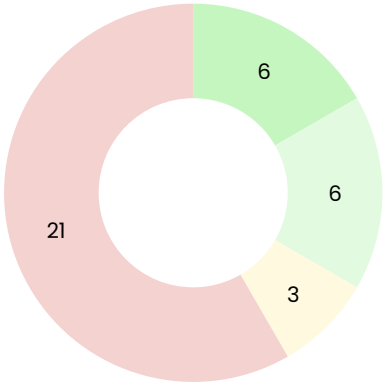
New circuits or offshore links

We recommend 14 new onshore circuits or high voltage direct current offshore links, including four with potential alternatives.



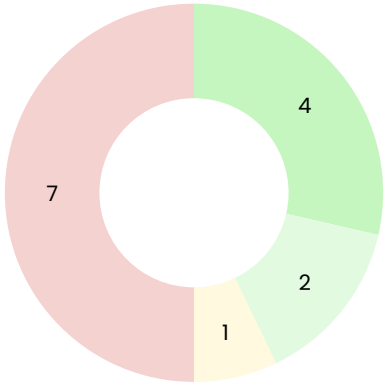
Upgrades to the existing network

Additionally, we recommend 15 upgrades to the existing network, including many new options.



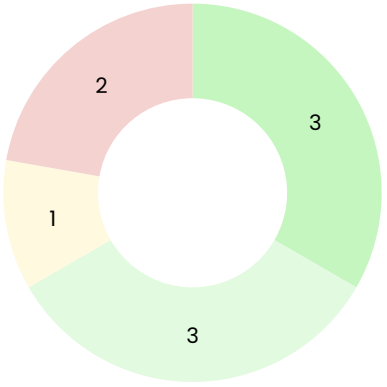
Power flow control devices

Our analysis also recommends seven power flow control options to manage flows across the network.



New substations or substation upgrades

We recommend seven options that are new substations or substation upgrades.



Proceed (Critical) *Proceed (Maintain)* *Hold* *Stop* *Alternative*

*Throughout this report, where options are recommended that cannot be chosen together, these are counted as single recommendations.

Comparison to Beyond 2030

We continue to recommend the majority of reinforcement options from Beyond 2030, many of which have been further developed or refined in scope. In addition, we recommend 16 newly identified reinforcement options.

27 from Beyond 2030, with four potential alternatives

We continue to confirm the need for 27 options from Beyond 2030. These include options where similar alternatives are now recommended and those that have evolved following Beyond 2030, such as options in Wales as well as EGL5 and EGL6 from the offshore design. These also include four options with potential alternatives.

16 new options

We also recommend 16 newly identified options or those not recommended through Beyond 2030 to meet system needs. Apart from WMU3, a reinforcement strategy in the West Midlands involving a section of new circuit, these are mainly upgrades to the existing network or power flow control devices.

55 not recommended

Whilst 55 options are not recommended, these may still be required to meet other network drivers identified by the Transmission Owners. Only DCR4, HNRE and TMPC from Beyond 2030 are no longer recommended, excluding options replaced by similar alternatives.

Analysis insights

The transmission network design results in net benefits* of between £58 billion and £82 billion, including forecast reductions in constraint costs, depending on the options optimal in each pathway. We conducted additional analysis to identify the underlying sensitivities of our recommendations.

Benefits of acceleration

Whilst we have assessed options based on their deterministic earliest delivery dates, additional transmission benefits could be realised if options are able to be accelerated. Advancing the delivery of the transmission network design by one, two or three years would increase total net benefits by up to £3.2 billion, £3.9 billion and £5.5 billion respectively, with the greatest value in the Hydrogen Evolution pathway.

In particular, our analysis identifies significant benefits from accelerating the delivery of EGL6.

Impact of delays

Our analysis indicates that delaying the recommended network design would increase net transmission costs by up to £7.5 billion, £15.4 billion and £24.8 billion if delayed by one, two or three years respectively.

In particular, options in England and Wales show the greatest sensitivity to delay, including BRQB, EGOS, LFQB, LRN7 and UWNC. The significant impact of delays associated with EGOS and LRN7 are driven by specific network conditions on the boundaries B9 and LE1.

Residual constraints

We find that the benefits of further reinforcement from the 2040s, relative to earlier years, reduces as residual constraints become more dispersed across multiple system boundaries. As a result, targeted options are less effective, particularly on the boundaries B6 and B9.

However, the outcomes of the Strategic Spatial Energy Plan and Connections Reform may change future system needs and the benefits of reinforcement from the 2040s. Therefore, we will continue to consider longer-term options through the Centralised Strategic Network Plan.

Cost sensitivity

We also assessed the sensitivity of options to variations in forecast capital costs relative to monetised transmission benefits. EGL6, MRU2 and WCN2 were identified as particularly sensitive to such changes, based on the submitted delivery dates.

However, our analysis is focused on transmission benefits, mainly the forecast reduction in constraint costs. It does not capture other network drivers, such as customer connections, which also contribute to their needs case.

In this report, net transmission benefits are presented in 2025 prices.

Regional analysis

Scotland
North West, North East and Yorkshire
Wales, West Midlands and East Midlands
Central England, East, Greater London and South

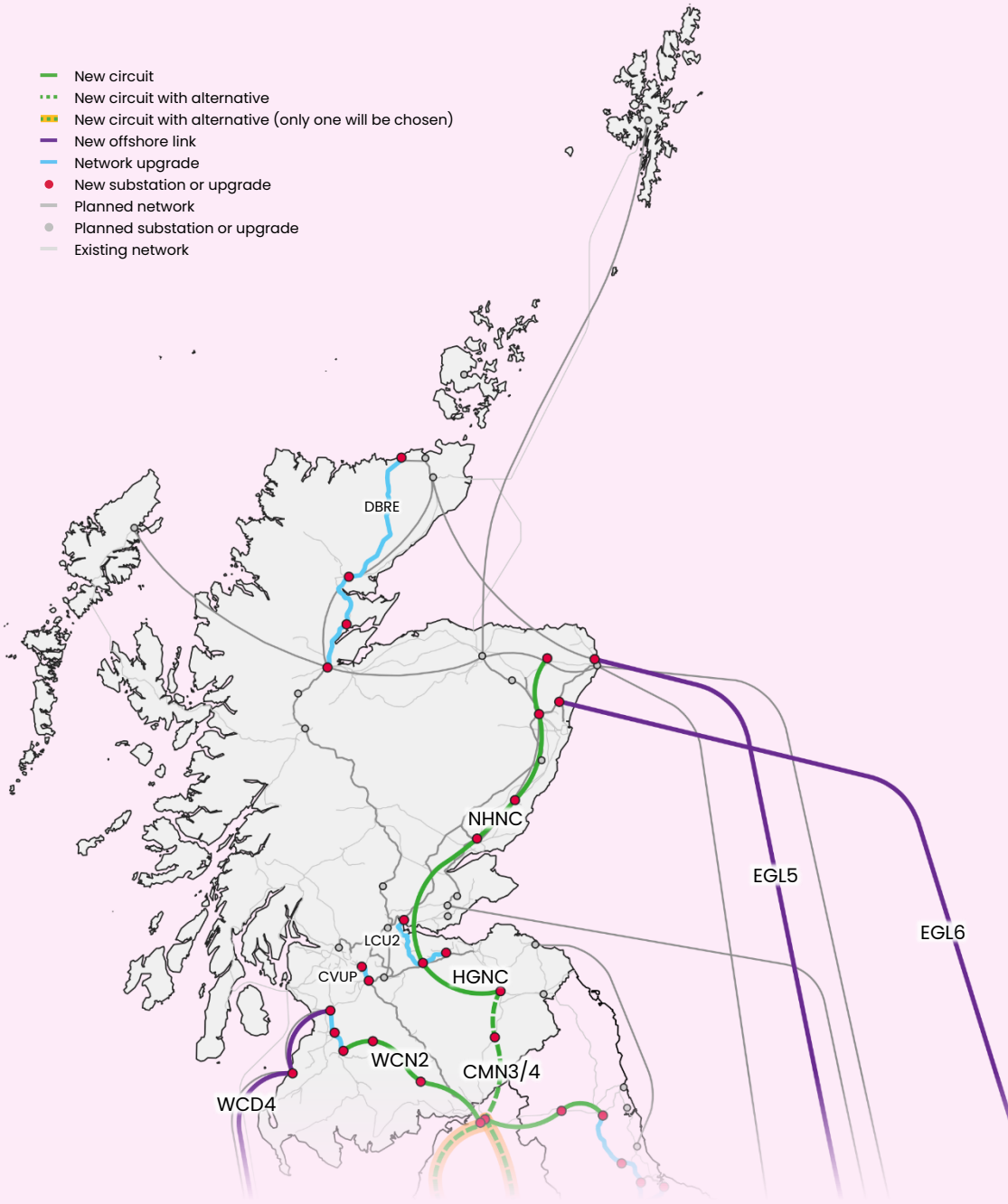
Scotland

The Scottish transmission network is owned and maintained by Scottish and Southern Electricity Networks Transmission and Scottish Power Transmission. The region has significant onshore and offshore wind generation, driving the need to upgrade the transmission network and allow power to flow south through coordination with National Grid Electricity Transmission.

In Scotland, we assessed 17 options. Of these, we recommend ten, including nine from Beyond 2030 and one newly identified option.

We continue to recommend NHNC, HGNC and CMN3/4 as part of the onshore spine, alongside EGL5, EGL6 and WCD4, which have been further developed from the coordinated offshore design.

Through our cost benefit analysis, we assessed a range of different reinforcement strategies, including additional offshore links and alternatives to NHNC. However, these were not found optimal.



This map and the options shown are illustrative only. Amber dashed lines indicate options that cannot be chosen together. Substation upgrades are not labelled.

Recommended options

We recommend ten reinforcement options in Scotland, including new circuits, offshore links and multiple network upgrades. Many of these, such as the offshore links, extend south into England and Wales.

New circuits or offshore links

Our analysis continues to confirm the need for a north to south onshore spine, extending from the north of Scotland to the north of England. The onshore spine comprises three options; NHNC, from north of Aberdeen to west of Edinburgh; HGNC, from west of Edinburgh to the Scottish Borders and CMN3/4, from the Scottish Borders to the Carlisle area. Together, these transfer the power generated by offshore wind in the north of Scotland south across the Anglo-Scottish border.

Code	Description	Needs case	Context
CMN3/4	Gala North to Teviot to North West England circuit via new Carlisle 400kV substation south (CMN3) or north (CMN4) of Carlisle	These alternative options reinforce the boundaries B5, B6 and B7a as part of the onshore spine. CMN3/4 is optimal in all four pathways and is critical in one pathway. Whilst our analysis finds CMN4 more economic, only one of CMN3 or CMN4 is required. This will be decided by National Grid Electricity Transmission, following further appraisal and consultation.	CMN3 was recommended through Beyond 2030. It has since been further developed to confirm its scope, alongside a potential alternative, and undergone consultation.
EGL5	New offshore HVDC link between North East Scotland and Lincolnshire	EGL5 enables north to south transfers from Scotland through a new subsea cable. It is needed in three of the four pathways, reducing the need for additional onshore reinforcement. EGL5 is needed on its earliest delivery date in one pathway.	This option was previously established through the coordinated offshore design, as AC3 and AC4.
HGNC	Harburn to Gala North 400kV Reinforcement	As part of the onshore spine from the north of Scotland to the north of England, HGNC reinforces the boundaries B5 and B6. HGNC is optimal in all four pathways and is critical in two pathways.	This option was originally recommended in Beyond 2030.
WCN2	New 400kV onshore reinforcement from Ayrshire to North West of England	This option reinforces the boundary B6 as well as local boundaries in the south west of Scotland designed to capture the impact of local power flows from demand and supply. It also facilitates potential customer connections in the south west of Scotland. WCN2 is optimal in the Hydrogen Evolution pathway.	WCN2 was recommended in Beyond 2030.

		Considering its needs case in Beyond 2030 and potential to facilitate customer connections, WCN2 was provided a *Proceed (Maintain)* signal.	
NHNC	Combination of new and replacement 400kV double circuit from north east Scotland to central belt Scotland	NHNC provides capability uplift across the boundaries B1a, B2, B4, B5 and B6. This is part of the onshore spine from the north of Scotland. NHNC is needed on its earliest delivery date in three pathways, moving the power generated from offshore wind in the north of Scotland further south.	This option was recommended in Beyond 2030.
WCD4	New 2GW offshore HVDC link between Ayrshire and North Wales	This option reinforces the boundaries B6 and B7a, enabling north to south transfers via a new offshore link. WCD4 is optimal in all four pathways, combining with onshore reinforcement in Wales to move power further south. It is needed on its earliest delivery date in all pathways.	This option was originally recommended in Beyond 2030.
EGL6	New offshore HVDC link between North East Scotland and the South East of England	This option enables north to south power flows via a new offshore link. It is critical in two pathways. In the Falling Behind pathway, EGL6 is driven by interconnector exports across the south coast.	This option was originally recommended through the coordinated offshore design, as R-link.

Network upgrades

Code	Description	Needs case	Context
CVUP	Clyde's Mill to Strathaven 400kV Reinforcement	CVUP reinforces the boundaries B5 and B6. It is needed in all pathways. This option further utilises the capability of the existing network.	CVUP was previously recommended as part of Beyond 2030.
DBRE	Re-conductor existing circuits between Dounreay, Loch Buidhe, and Beauly	This option provides capability uplift across the boundary B0. DBRE is needed in two pathways, maximising the capability of the existing network.	This is a newly identified option by Scottish and Southern Electricity Networks Transmission.
LCU2	Kincardine North to Harburn to Currie 400kV Reinforcement	This option uplifts the capability of the boundaries B5 and B6. It is optimal in each of the four pathways. This option further utilises the capability of the existing network. It is needed on its earliest delivery date in two pathways.	LCU2 was recommended in Beyond 2030.

Investment signals

For the recommended reinforcement options, the below chart highlights their optimal delivery dates in different colours for the different pathways, after their deterministic earliest delivery dates. Where applicable, the probabilistic delivery dates provided by National Grid Electricity Transmission are also listed.

Earliest delivery: This is the date an option could theoretically be delivered, assuming delivery risks do not apply.
Probable delivery: This is the date an option has a 50% likelihood of being delivered by, taking account of delivery risks.

Deterministic earliest delivery date • Holistic Transition • Electric Engagement • Hydrogen Evolution • Falling Behind

Code	Delivery	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	Signal
CVUP	Earliest: 2032													*Proceed (Maintain)*
CMN3/4	Earliest: 2034 Probable: 2038													*Proceed (Maintain)*
DBRE	Earliest: 2035													*Hold*
EGL5	Earliest: 2035 Probable: 2037													*Proceed (Maintain)*
HGNC	Earliest: 2035													*Proceed (Critical)*
LCU2	Earliest: 2035													*Proceed (Critical)*
WCN2	Earliest: 2036 Probable: 2039													*Proceed (Maintain)*
NHNC	Earliest: 2038													*Proceed (Critical)*
WCD4	Earliest: 2038 Probable: 2041													*Proceed (Critical)*
EGL6	Earliest: 2041 Probable: 2045													*Proceed (Maintain)*

Strategic appraisals

For some reinforcement options, further consideration was necessary across the assessment criteria to evaluate alternatives.

DBHW and DBRE

We evaluated two alternative reinforcement options to upgrade the existing network in the north of Scotland, DBHW and DBRE.

- DBHW involves reprofiling and increasing the clearance of the existing circuit from Dounreay to near Inverness.
- DBRE involves reconductoring the existing circuit from Dounreay to near Inverness.

Compared to DBHW, DBRE provides additional capability uplift across the boundary B0 in the north of Scotland. DBRE has a greater capital cost and a later delivery date. Our analysis determined DBRE to be advantageous and optimal in two pathways. However, DBHW is only economic in a single pathway.

Whilst both options are rated *Amber* for community impact, DBRE is rated *Red* for environmental impact, due to potential tower works.

DBRE is rated *Amber* for deliverability and operability, due to system access challenges, and DBHW is rated *Green*. However, the existing conductors likely require replacement in ~20 years. This may result in similar environmental impact and system access challenges.

Therefore, considering the economic needs case and the requirement to replace the conductors regardless, we provided DBRE with a *Hold* recommendation.

EGL6

EGL6 is an offshore link from Scotland to England. Our analysis indicated the potential for alternative onshore reinforcement in place of this offshore link. We also tested other offshore links. However, these were all found less optimal than EGL6 through our cost benefit analysis.

If EGL6 could be delivered earlier, it would also provide further transmission benefits. Taking this into account, we recommended EGL6 to *Proceed (Maintain)*. Though, we expect to assess EGL6, alongside potential alternatives, through the enduring Centralised Strategic Network Plan.

Code	Description	Earliest	Env.	Com.	Del. & Ope.	Signal
DBHW	Re-profile existing circuits between Dounreay, Loch Buidhe, and Beauly	2033	*Amber*	*Amber*	*Green*	*Stop*
DBRE	Re-conductor existing circuits between Dounreay, Loch Buidhe, and Beauly	2035	*Red*	*Amber*	*Amber*	*Hold*

BHN1, NHNC and WENC

We assessed three reinforcement options for a new 400kV double circuit in Scotland as part of the onshore spine, BHN1, NHNC and WENC. All three options transmit power from the north of Scotland to west of Edinburgh.

- BHN1 is from near Inverness, then west of the Cairngorms National Park to the west of Edinburgh.
- NHNC is from north of Aberdeenshire, along the east coast to the west of Edinburgh.
- WENC is from near Inverness, across to the east coast and then to west of Edinburgh.

These options provide different capability uplifts across the same system boundaries in Scotland. BHN1 and NHNC have a delivery date of 2038, whilst WENC has a later delivery date of 2040. WENC also has a greater capital cost due to its additional length. Our analysis found NHNC optimal in three of the four pathways, providing significant additional value compared to the other options.

BHN1, NHNC and WENC are broadly comparable for environmental and community impacts, each with a *Red* rating. The options are highly constrained and potentially impact on the Cairngorms National Park. In addition, both NHNC and WENC involve the upgrading of an existing overhead line.

For deliverability and operability, the options are consistently rated *Red*, considering their significant length and design complexity as well as associated challenges with system access and interactivity.

Taking all of this into account, we provided NHNC with a *Proceed (Critical)* recommendation. This option is preferred in consideration of our four assessment criteria, particularly given its strong economic needs case.

Note, dependent upon Connections Reform outcomes, components of BHN1 may be required to support potential customer connections. This will be considered by Scottish and Southern Electricity Networks Transmission, following the conclusion of Connections Reform. Equally, NHNC also has potential customer connections drivers.

Code	Description	Earliest	Env.	Com.	Del. & Ope.	Signal
BHN1	New 400kV double circuit from north west Scotland to central belt Scotland	2038	*Red*	*Red*	*Red*	*Stop*
NHNC	Combination of new and replacement 400kV double circuit from north east Scotland to central belt Scotland	2038	*Red*	*Red*	*Red*	*Proceed (Critical)*
WENC	Combination of new and replacement 400kV double circuit from north west Scotland to central belt Scotland via north east Scotland	2040	*Red*	*Red*	*Red*	*Stop*

North West, North East and Yorkshire

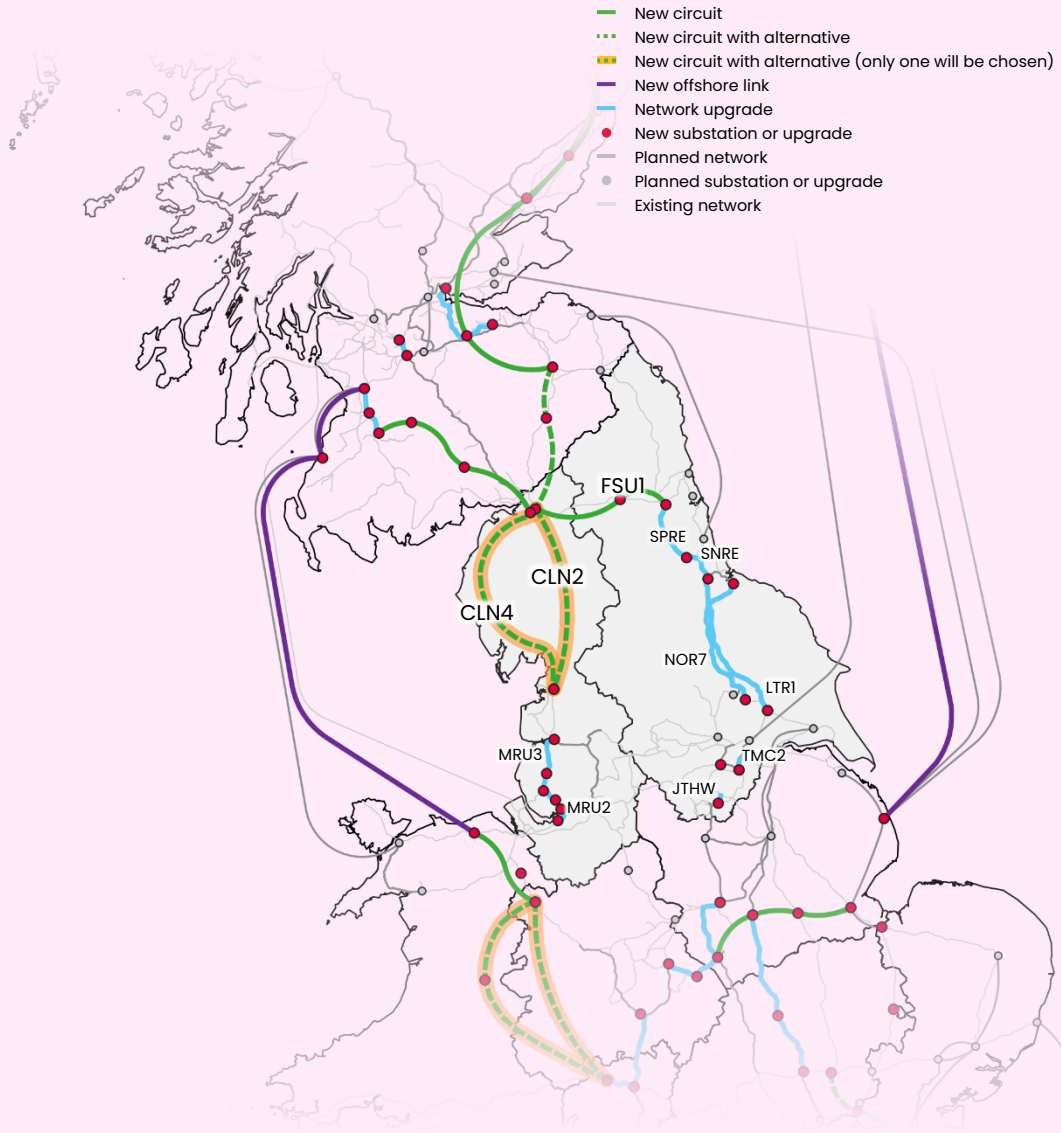
This region of transmission network is owned and maintained by National Grid Electricity Transmission. The North West, North East and Yorkshire regions predominantly transport power from Scotland south to demand centres.

We assessed 46 options in the north of England and recommend 14. Our analysis also identifies the need for one newly identified option.

Our analysis confirms the need for network upgrades from Beyond 2030, including FSU1, SPRE, SNRE, NOR7 and LTR1, and CLN2/4 from the north west to Lancashire.

We assessed the potential for further reinforcement, but the capital costs of these options were not economic relative to monetised transmission benefits.

We also considered innovative, longer-term options, including onshore high voltage direct current solutions to strategically move power south to demand centres. While these are not currently optimal, we support their continued development and expect to reassess them in the Centralised Strategic Network Plan.



Recommended options

We recommend 14 reinforcement options in the North West, North East and Yorkshire, including new circuits and multiple network upgrades.

New circuits

Code	Description	Needs case	Context
FSU1	Harker to Stella West upgrade from 275kV to 400kV	This option reinforces the boundaries B6 and B7a, removing and replacing the existing 275kV circuit. It is optimal in each of the four pathways. This option supports power flows from the Anglo-Scottish border towards other upgrades along the east coast.	FSU1 was previously recommended as part of Beyond 2030.
CLN2/4	New 400kV double circuit from North West England to Lancashire either directly (CLN2) or following the coast (CLN4)	These alternative options reinforce the boundaries B6 and B7a. They are only optimal in the Holistic Transition pathway, driven by renewable growth and significant north to south constraints. These are needed on their earliest delivery date but only one of CLN2 or CLN4 is required. Our analysis finds CLN4 more economic. The preferred option will be informed by further appraisal and consultation by National Grid Electricity Transmission.	CLN2 was recommended as part of Beyond 2030. It has since been further developed to confirm its scope, alongside potential alternatives.

Network upgrades

In the north of England, we continue to recommend a number of upgrades from Beyond 2030. These combine to support power flows from the Anglo-Scottish border down the east coast and towards demand centres in the south of England. These upgrades include FSU1, SPRE, SNRE, NOR7 and LTR1. A number of these upgrades have potential to support strategic network futureproofing with higher rated conductors; this will be considered through further development by National Grid Electricity Transmission.

Code	Description	Needs case	Context
JTHW	Hotwire route between Thurcroft and West Melton	JTHW reinforces the boundary B8. It is needed in each of the four pathways. This option further utilises the capability of the existing network.	This option was recommended in Beyond 2030.

TMC2	Reconductor Thorpe Marsh leg of Drax to Keadby to Thorpe Marsh 400kV circuit and Keadby 400kV substation running arrangement update	TMC2 uplifts the capability of the boundaries B7a and B8. TMC2 is needed in all four pathways. This option further utilises the capability of the existing network.	TMC2 was previously recommended as part of Beyond 2030.
NOR7	Reconductor Norton to Osbaldwick 400kV double circuit	NOR7 reinforces the boundary B7a. It is optimal in each of the four pathways, maximising the capability of the existing network. NOR7 is critical in all four pathways and forms part of a combination of options upgrading the network along the east coast.	A similar option was originally recommended in Beyond 2030, as NOR6.
SNRE	Reconductor Spennymoor to Norton 400kV double circuit	This option reinforces the boundaries B6 and B7a. SNRE is needed in all four pathways, maximising the capability of the existing network. This option is critical in one pathway.	This option was originally recommended in Beyond 2030, but a subsequent change control process found SNRE not to be optimal.
SPRE	Reconductor Spennymoor to Stella West 400kV double circuit	SPRE provides capability uplift across the boundaries B6 and B7a. It is optimal in all four pathways. This option further utilises the capability of the existing network. SPRE is critical in one of the four pathways and also forms part of the east coast upgrades.	SPRE was recommended in Beyond 2030, but a subsequent change control process found it was not optimal.
ESC3	New 400kV substation and power flow control devices within West Yorkshire region	This option provides capability uplift across the boundaries B7a and B8. ESC3 is needed in all four pathways, maximising the capability of the existing network.	A similar option was originally recommended in Beyond 2030, as ESCF.
TDP4	Installation of Power Flow control devices along Drax to Thornton 400kV double circuit	TDP4 reinforces the boundaries B7a and B8. It is optimal in all pathways. This option further utilises the capability of the existing network and is critical in all pathways.	TDP4 was recommended through Beyond 2030.
LTR1	Reconductor Lackenby to Thornton 400kV double circuit	LTR1 uplifts the capability of the boundary B7a. It is needed in each of the four pathways and is critical in two pathways. This option further utilises the capability of the existing network, reinforcing the network in combination with other options.	This option was recommended as part of Beyond 2030, as LTRE.
NES1	Series compensation strategy 1 across the North of England transmission network	NES1 reinforces the boundary B6. It is only optimal in the Holistic Transition pathway. This option further utilises the capability of the existing network and provides benefit in combination with CLN2/4, MRU2 and MRU3.	This is a newly identified option by National Grid Electricity Transmission, following Beyond 2030.

TMCF	Thorpe Marsh substation reconfiguration	TMCF provides capability uplift across the boundaries B7a and B8. TMCF is needed in each of the four pathways. This option is critical in one pathway.	TMCF was recommended through Beyond 2030.
MRU3	Mersey Ring Upgrade Stage 1: 275kV to 400kV upgrade retaining existing tower	This option reinforces the boundaries B6 and B7a. MRU3 is only optimal in the Holistic Transition pathway. It maximises the capability of the existing Mersey Ring, in combination with CLN2/4, MRU2 and NES1. Considering MRU3 is required for the delivery of MRU2, this option was provided a *Proceed (Maintain)* signal.	This option was previously recommended in Beyond 2030, as MRU1.
MRU2	Mersey Ring Upgrade Stage 2: 275kV to 400kV upgrade retaining existing tower	This option reinforces the boundaries B6 and B7a. MRU2 is needed on its earliest delivery date in the Holistic Transition pathway, increasing the capability of the existing network alongside other options in the north west of England.	This option was previously recommended through Beyond 2030.

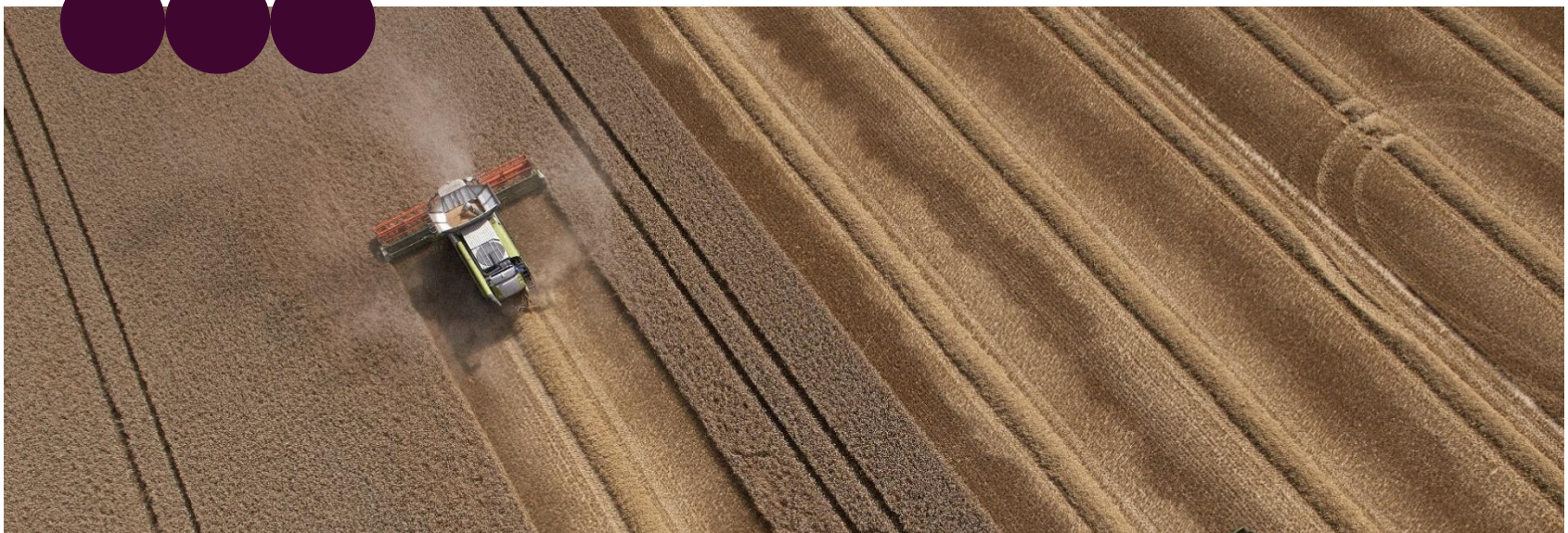
Investment signals

The optimal delivery dates for the recommended reinforcement options are highlighted in different colours for the different pathways. For each, their deterministic earliest delivery dates and probabilistic delivery dates are listed.

Earliest delivery: This is the date an option could theoretically be delivered, assuming delivery risks do not apply.
Probable delivery: This is the date an option has a 50% likelihood of being delivered by, taking account of delivery risks.

Code	Delivery	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	Signal
JTHW	Earliest: 2029 Probable: 2029													*Hold*
TMC2	Earliest: 2031 Probable: 2031													*Hold*
NOR7	Earliest: 2032 Probable: 2034													*Proceed (Critical)*
SNRE	Earliest: 2032 Probable: 2033													*Proceed (Critical)*
SPRE	Earliest: 2032 Probable: 2033													*Proceed (Critical)*
ESC3	Earliest: 2033 Probable: 2036													*Hold*
TDP4	Earliest: 2033 Probable: 2035													*Proceed (Critical)*
LTR1	Earliest: 2034 Probable: 2036													*Proceed (Critical)*
NES1	Earliest: 2034 Probable: 2036													*Hold*

FSU1	Earliest: 2035 Probable: 2038	*Proceed* *(Maintain)*
TMCF	Earliest: 2035 Probable: 2036	*Proceed* *(Critical)*
MRU3	Earliest: 2036 Probable: 2039	*Proceed* *(Maintain)*
CLN2/4	Earliest: 2038 Probable: 2042	*Proceed* *(Critical)*
MRU2	Earliest: 2039 Probable: 2043	*Proceed* *(Maintain)*



Strategic appraisals

We conducted further appraisals for the alternative options from the North West of England to Lancashire.

CLN2, CLN3 and CLN4

We evaluated alternative reinforcement options for a new 400kV double circuit from the North West of England to Lancashire. These interface with the same substations and provide consistent capability but have different capital costs and delivery dates.

- CLN2 is a direct option between the extents of the Lake District National Park and the Yorkshire Dales National Park.
- CLN3 follows the coast through the west of the Lake District National Park and crosses Morecambe Bay.
- CLN4 also follows the coast but avoids Morecambe Bay.

CLN3 and CLN4 have earlier delivery dates but greater capital costs. Whilst all three are economic, our analysis finds CLN4 advantageous due to its earlier delivery date. Although, subject to further development, there is potential to refine the scope of CLN2, which could change its delivery date.

All three options are rated *Red* for environmental and community impacts. Given the current stage of development, there is insufficient certainty to confirm whether CLN2 would pass through the Lake District National Park or the Yorkshire Dales National Park. However, CLN3 was discounted due to the potential for significant additional impacts associated with crossing Morecambe Bay. The options following the coast also have potential for additional impact on the Frontiers of the Roman Empire World Heritage Site and a greater area of the Lake District National Park.

The options are also consistently rated *Amber* for deliverability and operability. Although, due to its shorter length, CLN2 is slightly more favourable for design complexity. However, CLN4 also has potential to facilitate potential coastal customer connections whilst avoiding a section of subsea cabling.

Considering our four assessment criteria and the need for either option, we provided both CLN2 and CLN4 with a *Proceed (Critical)* signal, although only one option will ultimately be delivered. This will support opportunity for further evaluation.

Code	Description	Earliest	Env.	Com.	Del. & Ope.	Signal
CLN2	New double circuit between North West England and Lancashire directly	2040	*Red*	*Red*	*Amber*	*Proceed (Critical)*
CLN4	New 400kV double circuit from North West England to Lancashire following the coast	2038	*Red*	*Red*	*Amber*	
CLN3	New 400kV double circuit from North West England to Lancashire following the coast, crossing Morecambe Bay	2037	*Red*	*Red*	*Amber*	*Stop*

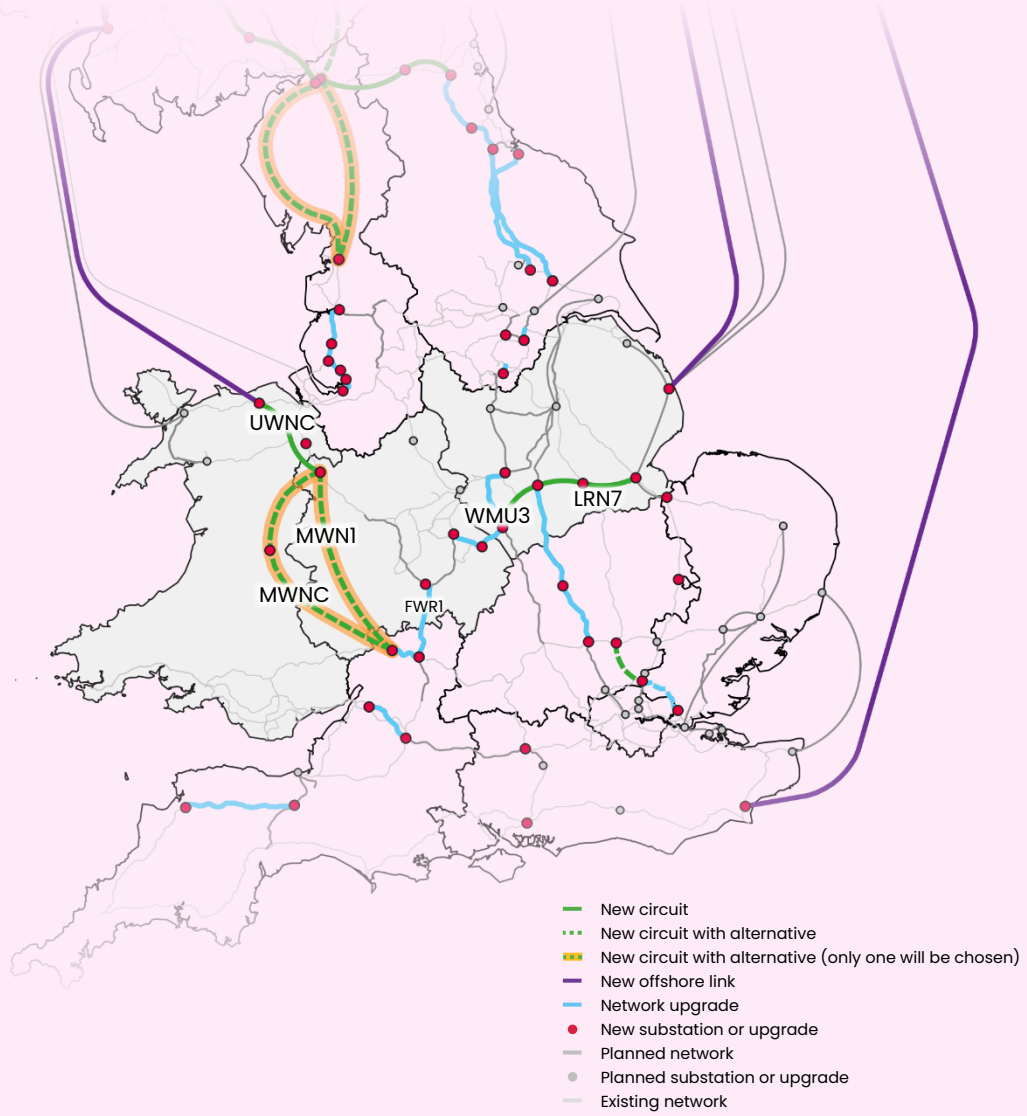
Wales, West Midlands and East Midlands

There is a need to transmit power from the north of Wales, towards demand centres in the Midlands. These regions also facilitate power flows south towards Greater London. National Grid Electricity Transmission maintain and own these parts of the transmission network.

In Wales and the Midlands, we assessed 25 options. Of these, we recommend nine, including six newly identified options.

We continue to recommend new circuits moving power from north to south, including reinforcement in Wales and a newly identified option, WMU3, involving a section of new circuit.

Additionally, we considered a range of alternative options. These included another east coast offshore link, further network upgrades and alternative new circuits. Our analysis did not find these optimal.



This map and the options shown are illustrative only. Amber dashed lines indicate options that cannot be chosen together. Substation upgrades are not labelled.

Recommended options

We recommend nine reinforcement options in Wales and the Midlands, including new circuits and numerous network upgrades.

New circuits

Following Beyond 2030, National Grid Electricity Transmission have developed PSNC, a new 400kV circuit between the north and south of Wales, through strategic optioneering. As a result, the proposed reinforcement has evolved into multiple options, alongside potential alternatives. These include UWNC, from the north of Wales to the West Midlands, and then MWNC/1 to the South West of England. Our analysis continues to confirm the need for this reinforcement.

Code	Description	Needs case	Context
LRN7	New 400kV double circuit from South Lincolnshire to East Leicestershire with two new substations. Reconductor one circuit of Cottam to Grendon 400kV route between new substation in East Leicestershire and Grendon substation	This option provides capability uplift across the boundaries B9 and LE1. LRN7 is optimal in all pathways. It helps move power away from the east coast, where a significant amount of generation capacity is connected, relieving network bottlenecks in the region.	A similar option was previously recommended in Beyond 2030, as LRN6. Since then, further development has been carried out to refine its scope per LRN7.
MWNC/1	New 400kV circuit between West Midlands and South West England either via a new substation in Wales (MWNC) or directly (MWN1)	These alternative options reinforce the boundaries B8, B9 and NW4, in combination with UWNC. They are optimal in each of the four pathways. Only one of MWNC or MWN1 is needed, depending on potential customer connections in Wales. The preferred alternative will be decided through further industry engagement and analysis.	These alternatives are developments of the southern section of PSNC, which was recommended in Beyond 2030.
UWNC	New double circuit from North Wales to West Midlands	This option provides capability uplift across the boundaries B8 and NW4. It is needed on its earliest delivery date in all pathways. UWNC supports an offshore link from Scotland (WCD4) and enables power flows from the north of Wales to the West Midlands.	Similarly, UWNC is an evolution of the northern section of PSNC, as recommended in Beyond 2030.

WMU3	New 400kV substation within West Midlands region and associated circuit reconfigurations	This option uplifts the capability of the boundaries B8, B9 and LE1. WMU3 is critical in all four pathways, maximising the capability of the existing network and involving a section of new circuit, which helps transfer power south to Greater London.	This is a newly identified option by National Grid Electricity Transmission, following Beyond 2030.

Network upgrades

Code	Description	Needs case	Context
FWR1	Reconductor Feckenham to Walham 1 400kV circuit	This option uplifts the capability of the boundaries B9 and SW1. It is optimal in two pathways, maximising the capability of the existing network.	This is a newly identified option by National Grid Electricity Transmission, following Beyond 2030. A similar option, FWRE, was previously identified but not recommended in Beyond 2030.
RWUP	Uprate cable section of Ratcliffe-on-Soar to Willington East 2 400kV circuit	RWUP uplifts the capability of the boundary B8. It is critical in all four pathways. This option further utilises the capability of the existing network.	This is a newly identified option by National Grid Electricity Transmission, following Beyond 2030.
BRQB	Installation of Power Flow control devices on new 400kV circuit across East Midlands	This option reinforces the boundaries B9 and LE1. BRQB is needed on its earliest delivery date in all four pathways, maximising the capability of the existing network.	This is a newly identified option by National Grid Electricity Transmission, following Beyond 2030.
LFQB	New power flow control device in West Midlands	This option provides capability uplift across the boundaries B8, B9 and NW4. It is needed in all pathways, maximising the capability of the existing network.	This is a newly identified option by National Grid Electricity Transmission, following Beyond 2030.
LQUP	Upgrade of the existing Quad Boosters to higher ratings at Legacy 400kV substation	This option reinforces the boundaries B8 and NW4. It is needed in all four pathways. This option further utilises the capability of the existing network. LQUP is critical in two of the four pathways.	This is a newly identified option by National Grid Electricity Transmission, following Beyond 2030.

Investment signals

The below chart highlights the optimal delivery dates for the recommended reinforcement options in different colours across the four pathways, following their deterministic earliest delivery dates. Alongside these, probabilistic delivery dates are listed.

Earliest delivery: This is the date an option could theoretically be delivered, assuming delivery risks do not apply.
Probable delivery: This is the date an option has a 50% likelihood of being delivered by, taking account of delivery risks.

Code	Delivery	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	Signal
FWR1	Earliest: 2032 Probable: 2033													*Proceed (Maintain)*
LRN7	Earliest: 2033 Probable: 2035													*Proceed (Maintain)*
RWUP	Earliest: 2033 Probable: 2035													*Proceed (Critical)*
BRQB	Earliest: 2036 Probable: 2038													*Proceed (Critical)*
LFQB	Earliest: 2036 Probable: 2038													*Proceed (Maintain)*
LQUP	Earliest: 2036 Probable: 2037													*Proceed (Critical)*
MWNC/1	Earliest: 2037 Probable: 2040													*Proceed (Maintain)*
UWNC	Earliest: 2038 Probable: 2044													*Proceed (Critical)*
WMU3	Earliest: 2038 Probable: 2042													*Proceed (Critical)*

Strategic appraisals

Further evaluation across the assessment criteria was needed for the reinforcement options in the West Midlands.

MWNC, MWN1 or SHNC

We evaluated alternative reinforcement options for a new 400kV double circuit in the West Midlands, MWNC, MWN1 and SHNC. These help transmit electricity from north of Shropshire differently.

- MWNC facilitates potential customer connections via a new substation in Wales, ahead of extending to near Gloucester.
- MWN1 is a direct option from north of Shropshire to near Gloucester.
- SHNC has a reduced length, extending eastwards to near Ironbridge.

Compared to SHNC, MWNC and MWN1 provide additional capability uplift across B9 but have significantly greater capital costs. MWN1 and SHNC have earlier delivery dates. We identified MWN1 to be optimal in all pathways, however MWNC has potential strategic benefits through facilitating customer connections.

SHNC is not advantageous due to providing limited uplift on B9, so was discounted.

MWNC and MWN1 are rated *Red* for environmental impact, whereas SHNC is rated *Amber*. Whilst MWN1 and SHNC received a *Red* rating for community impact, MWNC is rated *Amber*. All three options have the potential to impact on the Shropshire Hills National Landscape. However, with MWNC, there is greater opportunity for avoidance within the study area.

All three options are rated *Amber* for deliverability and operability, although SHNC has less design complexity due to its reduced length. They experience similar system access challenges, although MWNC performs slightly less favourably.

Taking all of this into account and given the economic case for either MWNC or MWN1, we provided both options with a *Proceed (Maintain)* recommendation. However, only one option will ultimately be delivered. This will allow opportunity for further engagement and analysis to determine the preferred option, considering potential customer connections in Wales.

Code	Description	Earliest	Env.	Com.	Del. & Ope.	Signal
MWNC	New 400kV circuit between West Midlands and South West England via a new substation in Wales	2038	*Red*	*Amber*	*Amber*	*Proceed (Maintain)*
MWN1	New 400kV circuit between West Midlands and South West England directly	2037	*Red*	*Red*	*Amber*	
SHNC	New double circuit within West Midlands	2037	*Amber*	*Red*	*Amber*	*Stop*

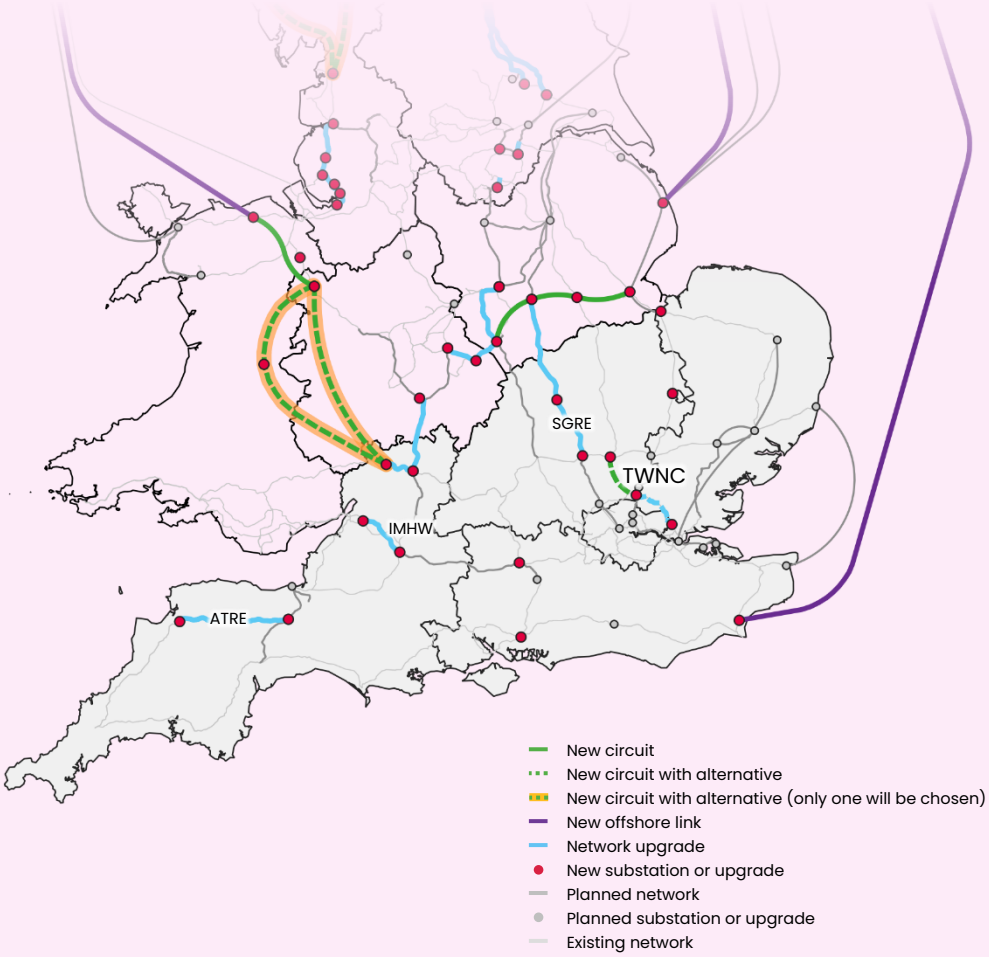
Central England, East, Greater London and South

These regions of the transmission network are owned and maintained by National Grid Electricity Transmission. In particular, the network is densely meshed in the high demand region of Greater London. The south coast also has several interconnectors that influence power flows.

In these regions, we assessed 14 options and recommend ten, including eight newly identified options following Beyond 2030.

Our analysis continues to confirm the need for TWNC/1 from Beyond 2030, a new circuit supporting power flows around Greater London, alongside a number of newly identified network upgrades.

We only identified a small number of options as not optimal, including network upgrades around Greater London. Though, these may still be needed to meet other network drivers.



This map and the options shown are illustrative only. Amber dashed lines indicate options that cannot be chosen together. Substation upgrades are not labelled.

Recommended options

We recommend ten reinforcement options in Central England, the East, Greater London and the South, including a new circuit and many network upgrades.

New circuits

Code	Description	Needs case	Context
TWNC/1	New Wymondley to Waltham Cross 400kV double circuit and Waltham Cross to Warley 275kV to 400kV upgrades with either a substation extension (TWNC) or new substation (TWN1) at Waltham Cross	These alternative options uplift the capability of the boundary LE1, supporting power flows into and around Greater London. They are optimal in three pathways. Whilst we find TWNC more economic, only one of TWNC or TWM1 is required. The preferred option will be decided through further development, considering potential resilience requirements and the need for a new substation at Waltham Cross.	This option was recommended as part of Beyond 2030. It has since been further developed to confirm its scope, with a potential alternative.

Network upgrades

In Central England, the East, Greater London and the South, National Grid Electricity Transmission have identified a number of new options following Beyond 2030 which we now recommend. These include numerous upgrades to the existing network and power flow control devices, maximising the capability of the existing network.

Code	Description	Needs case	Context
BUUP	Burwell Main substation upgrade	BUUP uplifts the capability of the boundary LE1. BUUP is needed in all pathways, maximising the capability of the existing network.	This is a newly identified option by National Grid Electricity Transmission, following Beyond 2030.
CLCU	Uprate cable section of Chilling to Lovedean 400kV circuit	CLCU reinforces the boundary SC1. It is optimal in all pathways. This option further utilises the capability of the existing network.	This is a newly identified option by National Grid Electricity Transmission, following Beyond 2030.

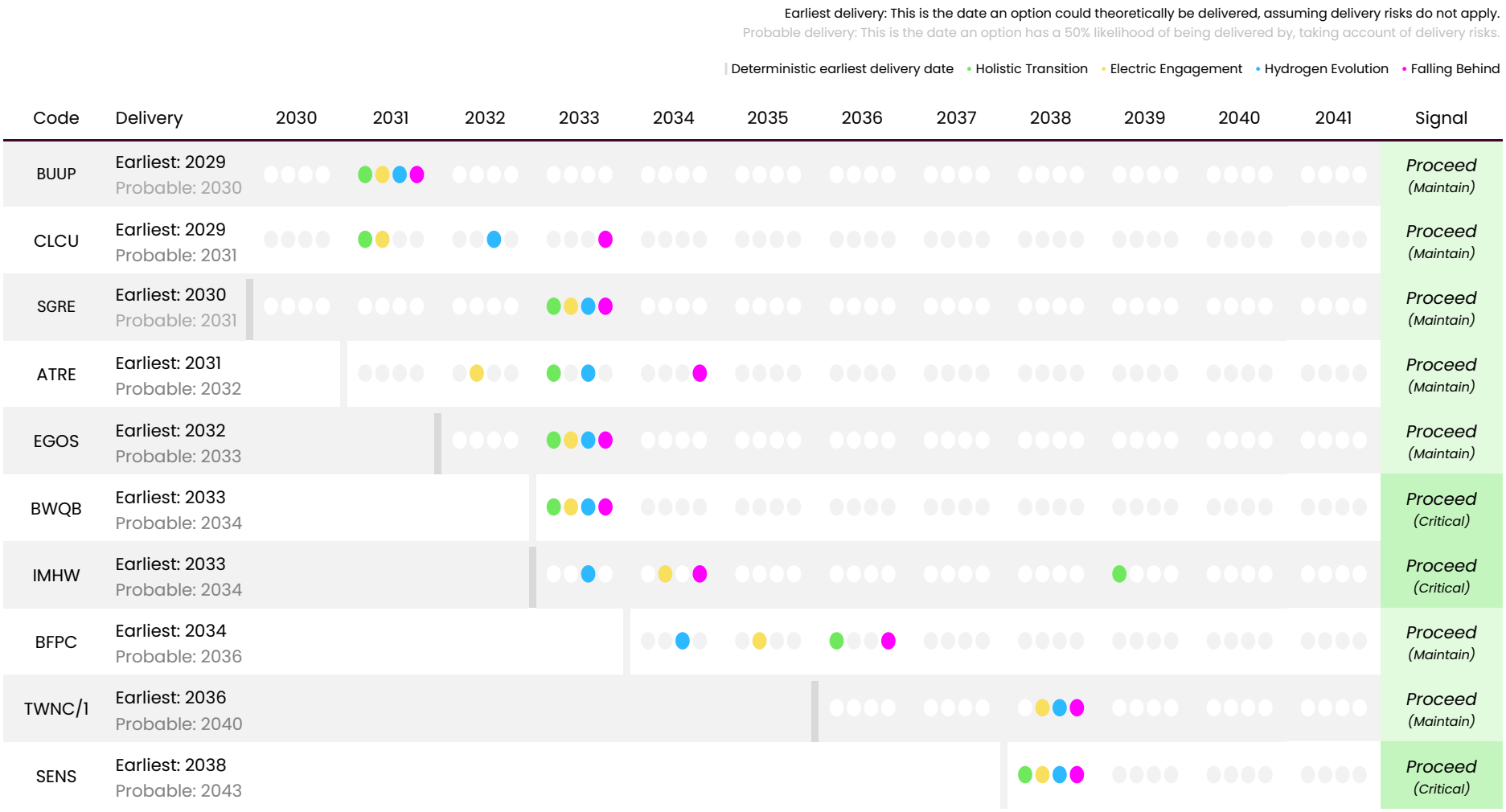
SGRE	Reconductor Grendon to Sundon 400kV double circuit	This option uplifts the capability of the boundaries B9 and LE1. SGRE is needed in all pathways, maximising the capability of the existing network and supporting the transmission of electricity south towards Greater London.	This option was originally recommended through Beyond 2030.
ATRE	Reconductor Alverdiscott to Taunton 1 400kV circuit	This option provides capability uplift across the boundary SC1. It is optimal in each of the four pathways, maximising the capability of the existing network.	This is a newly identified option by National Grid Electricity Transmission, following Beyond 2030.
EGOS	Operational tripping scheme on the East Coast	EGOS provides capability uplift across the boundaries B9 and LE1. It is optimal in all four pathways, maximising the capability of the existing network. This option helps ensure an operable, reliable network, managing power flows from two eastern offshore links.	This is a newly identified option by National Grid Electricity Transmission, following Beyond 2030.
BWQB	Installation of Power Flow control devices onto Burwell to Walpole 400kV double circuit	This option reinforces the boundaries B9 and LE1. It is needed in all pathways, maximising the capability of the existing network. This option is critical in all of the four pathways.	This is a newly identified option by National Grid Electricity Transmission, following Beyond 2030.
IMHW	Hotwire and substation cable uprate of Iron Acton to Melksham 275kV double circuit	This option reinforces the boundary SW1. It is needed in all pathways. This option further utilises the capability of the existing network in the South West. IMHW is critical in one pathway.	This is a newly identified option by National Grid Electricity Transmission, following Beyond 2030.
BFPC	Installation of Power Flow control devices on Bramley to Fleet 400kV double circuit	BFPC provides capability uplift across the boundaries SC1, SC1.5, SC2 and SC3. It is needed in all pathways. This option helps manage power flows across the South. It is needed on its earliest delivery date in one pathway.	BFPC was identified in a previous options assessment but not recommended in Beyond 2030.
SENS	New 400kV substation within South West region	SENS provides capability uplift across the boundaries B8, B9 and SW1. It is needed on its earliest delivery date in all pathways, maximising the capability of the existing network.	This is a newly identified option by National Grid Electricity Transmission, following Beyond 2030.

Investment signals

The following chart highlights the optimal delivery dates for the recommended reinforcement options in different colours for each pathway. For each reinforcement option, their deterministic earliest delivery dates and probabilistic delivery dates are also given.

Earliest delivery: This is the date an option could theoretically be delivered, assuming delivery risks do not apply.
Probable delivery: This is the date an option has a 50% likelihood of being delivered by, taking account of delivery risks.

Deterministic earliest delivery date • Holistic Transition • Electric Engagement • Hydrogen Evolution • Falling Behind



Code	Delivery	Signal
BUUP	Earliest: 2029 Probable: 2030	*Proceed (Maintain)*
CLCU	Earliest: 2029 Probable: 2031	*Proceed (Maintain)*
SGRE	Earliest: 2030 Probable: 2031	*Proceed (Maintain)*
ATRE	Earliest: 2031 Probable: 2032	*Proceed (Maintain)*
EGOS	Earliest: 2032 Probable: 2033	*Proceed (Maintain)*
BWQB	Earliest: 2033 Probable: 2034	*Proceed (Critical)*
IMHW	Earliest: 2033 Probable: 2034	*Proceed (Critical)*
BFPC	Earliest: 2034 Probable: 2036	*Proceed (Maintain)*
TWNC/1	Earliest: 2036 Probable: 2040	*Proceed (Maintain)*
SENS	Earliest: 2038 Probable: 2043	*Proceed (Critical)*

Network competition

Competition criteria

Competition criteria

As part of our assessment, we identify reinforcement options that could be put out to tender so that other parties, as well as the Transmission Owners, can own, operate and maintain parts of the transmission network.

There are two types of competition, known as early competition and late competition. These refer to the point in the development process at which the competition is run and have different eligibility criteria.

We describe our approach to assessing options eligible for competition in Annex 6 of the Methodology.

Further appraisal of the reinforcement options which meet the eligibility criteria for early competition will be carried out. The purpose of the appraisal will be to determine which of these reinforcement options may be suitable for delivery via the early competition model. The appraisal will consider a range of factors to establish whether a reinforcement option is likely to be successfully delivered through the early competition model and realise the anticipated benefits of competitive tender.

Criteria	Early	Late	Context
Network need	✓	✓	The option has a *Proceed (Critical)*, *Proceed (Maintain)* or *Hold* recommendation.
Novelty	✓	✓	The option is a completely new asset or a complete replacement of an existing asset.
Separability	✓	✓	The boundary of ownership between the option and other existing assets are clearly delineated.
High value		✓	The option has a capital cost of £100m or above. For early competition, there is no minimum value requirement.
Consumer benefit	✓		The option is economic to tender in consideration of benefits and disbenefits.

Eligible reinforcement options

The following reinforcement options meet the eligibility criteria.

Scotland

Code	Description	Early	Late	Context
CMN3/4	Gala North to Teviot to North West England circuit via new Carlisle 400kV substation south (CMN3) or north (CMN4) of Carlisle	✓	✓	This option requires the splitting of the new 400kV double circuit and new 400kV substation to be competed.
EGL5	New offshore HVDC link between North East Scotland and Lincolnshire	✓	✓	
EGL6	New offshore HVDC link between North East Scotland and the South East of England	✓	✓	
HGNC	Harburn to Gala North 400kV Reinforcement	✓	✓	
NHNC	Combination of new and replacement 400kV double circuit from North East Scotland to central belt Scotland	✓	✓	
WCD4	New 2GW offshore HVDC link between Ayrshire and North Wales	✓	✓	
WCN2	New 400kV onshore reinforcement from Ayrshire to North West of England	✓	✓	This option requires the splitting of the new 400kV substation and new 400kV double circuits to be competed.

North West, North East and Yorkshire

Code	Description	Early	Late	Context
CLN2/4	New 400kV double circuit from North West England to Lancashire, either directly (CLN2) or following the coast (CLN4)	✓	✓	
ESC3	New 400kV substation and power flow control devices within West Yorkshire region	✓	✓	This option requires the splitting of the new 400kV substation to be competed.
FSU1	Harker to Stella West upgrade from 275kV to 400kV	✓	✓	This option requires the splitting of the new 400kV substation and new 400kV double circuits to be competed.

MRU2	Mersey Ring Upgrade Stage 2: 275kV to 400kV upgrade retaining existing tower	✓	✓	This option requires the splitting of the new 400kV substations to be competed.
MRU3	Mersey Ring Upgrade Stage 1: 275kV to 400kV upgrade retaining existing tower	✓	✓	This option requires the splitting of the new 400kV substations to be competed.

Wales, West Midlands and East Midlands

Code	Description	Early	Late	Context
LRN7	New 400kV double circuit from South Lincolnshire to East Leicestershire with two new substations. Reconductor one circuit of Cottam to Grendon 400kV route between new substation in East Leicestershire and Grendon substation	✓	✓	This option requires the splitting of the new 400kV substations and new 400kV double circuits to be competed.
MWNC/1	New 400kV circuit between West Midlands and South West England either via a new substation in Wales (MWNC) or directly (MWN1)	✓	✓	
UWNC	New double circuit from North Wales to West Midlands	✓	✓	
WMU3	New 400kV substation within West Midlands region and associated circuit reconfigurations	✓	✓	This option requires the splitting of the new 400kV substations and new 400kV double circuits to be competed.

Central England, East, Greater London and South

Code	Description	Early	Late	Context
SENS	New 400kV substation within South West region	✓	✓	
TWNC/1	New Wymondley to Waltham Cross 400kV double circuit and Waltham Cross to Warley 275kV to 400kV upgrades with either a substation extension (TWNC) or new substation (TWN1) at Waltham Cross	✓	✓	This option requires the splitting of the new 400kV double circuits to be competed.

Next steps

Strategic Energy Planning

Strategic Energy Planning

Our recommendations provide clear signals to support further development by the Transmission Owners, subject to regulatory approval.

Strategic Spatial Energy Plan

Our investment recommendations are based on the Future Energy Scenarios pathways.

The Strategic Spatial Energy Plan will map potential zonal locations, quantities and types of electricity and hydrogen generation and storage. This will help accelerate and optimise the transition to clean, affordable and secure energy across Great Britain. In taking a zonal approach to locations, the Strategic Spatial Energy Plan will not identify or recommend specific projects to be delivered. Future versions may also have a broader scope to incorporate other vectors, like natural gas.

Therefore, we will revisit our recommendations to ensure these remain robust against the Strategic Spatial Energy Plan. This will inform subsequent regulatory decisions.

Centralised Strategic Network Plan

Alongside this, our network planning process is evolving to ensure network design and investment processes are fit for the future. The Centralised Strategic Network Plan will ensure efficient network development by holistically planning the onshore and offshore electricity networks alongside the strategic gas and hydrogen networks.

This will plan strategically, ahead of need, involving a consistent, robust and transparent assessment of a broad range of reinforcement options, considering multiple assessment criteria. We expect many of the reinforcement options assessed in the Beyond 2030 - Electricity Transmission Update to continue their development to maintain optionality in the Centralised Strategic Network Plan, alongside potential alternatives. Those which are reassessed will depend on their delivery date, maturity level and needs case.

Innovative reinforcement solutions

The range of innovative, longer-term options considered includes those that provide strategic and whole system benefits, such as onshore high voltage direct current solutions.

While the *Stop* signals presented are in accordance with our methodology, further development of these solutions would maintain optionality and ensure robust assessment through the Centralised Strategic Network Plan.

We therefore support their continued development and expect them to be reassessed through the enduring Centralised Strategic Network Plan, considering their strategic and whole system benefits.

Reinforcement options

Tables of reinforcement options

Tables of reinforcement options

In accordance with the methodology, we evaluated each reinforcement option across the assessment criteria and provided each an investment recommendation. The 102 reinforcement options span a range of maturity levels, from early scoping through to planning and consenting.

We only recommend reinforcement options which are needed to meet system needs in at least one pathway. However, those with *Stop* signals may still be required to meet other network drivers identified by the Transmission Owners or to ensure future optionality in the Centralised Strategic Network Plan, considering the outcomes of the Strategic Spatial Energy Plan and Connections Reform. Where applicable, the probabilistic delivery dates listed were provided by National Grid Electricity Transmission.

Scotland

Earliest delivery: This is the date an option could theoretically be delivered, assuming delivery risks do not apply.
Probable delivery: This is the date an option has a 50% likelihood of being delivered by, taking account of delivery risks.
Earliest optimal: This is the earliest of the four optimal delivery dates across the pathways.

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Code	Description	Env.	Com.	Del. & Ope.	Delivery		Optimal					Signal
					Earliest	Probable	HT	EE	HE	FB	Earliest	
BHN1	New 400kV double circuit from north west Scotland to central belt Scotland	*Red*	*Red*	*Red*	2038	-	-	-	-	-	-	*Stop*
CMN3	Gala North to Teviot to North West England circuit via new Carlisle 400kV substation south of Carlisle	*Red*	*Red*	*Amber*	2034	2038	-	-	-	-	-	*Proceed (Maintain)*
CMN4	Gala North to Teviot to North West England circuit via new Carlisle 400kV substation north of Carlisle	*Red*	*Red*	*Amber*	2034	2038	2035	2036	2034	2036	2034	
CVUP	Clyde's Mill to Strathaven 400kV Reinforcement	*Green*	*Amber*	*Amber*	2032	-	2035	2034	2033	2034	2033	*Proceed (Maintain)*

Code	Description	Env.	Com.	Del. & Ope.	Delivery		Optimal					Signal
					Earliest	Probable	HT	EE	HE	FB	Earliest	
DBHW	Re-profile existing circuits between Dounreay, Loch Buidhe, and Beauly	*Amber*	*Amber*	*Green*	2033	-	-	-	-	-	-	*Stop*
DBRE	Re-conductor existing circuits between Dounreay, Loch Buidhe, and Beauly	*Red*	*Amber*	*Amber*	2035	-	-	-	2041	2041	2041	*Hold*
EGL5	New offshore HVDC link between North East Scotland and Lincolnshire	*Amber*	*Amber*	*Red*	2035	2037	2035	-	2037	2036	2035	*Proceed (Maintain)*
EGL6	New offshore HVDC link between North East Scotland and the South East of England	*Red*	*Amber*	*Red*	2041	2045	-	-	2041	2041	2041	*Proceed (Maintain)*
EGL8	New offshore HVDC link between North East Scotland and North East England	*Red*	*Red*	*Red*	2040	2046	-	-	-	-	-	*Stop*
HGNC	Harburn to Gala North 400kV Reinforcement	*Amber*	*Amber*	*Amber*	2035	-	2035	2036	2035	2036	2035	*Proceed (Critical)*
LCU2	Kincardine North - Harburn - Currie 400kV Reinforcement	*Amber*	*Amber*	*Amber*	2035	-	2035	2036	2035	2036	2035	*Proceed (Critical)*
NHNC	Combination of new and replacement 400kV double circuit from North East Scotland to central belt Scotland	*Red*	*Red*	*Red*	2038	-	2038	2038	-	2038	2038	*Proceed (Critical)*
WCD4	New 2GW offshore HVDC link between Ayrshire and North Wales	*Amber*	*Amber*	*Red*	2038	2041	2038	2038	2038	2038	2038	*Proceed (Critical)*
WCD7	New offshore HVDC link between Western Isles and North West England	*Red*	*Red*	*Red*	2040	2046	-	-	-	-	-	*Stop*
WCD8	New offshore HVDC link between Western Isles and North West England	*Red*	*Red*	*Red*	2039	2045	-	-	-	-	-	*Stop*
WCN2	New 400kV onshore reinforcement from Ayrshire to North West of England	*Amber*	*Amber*	*Amber*	2036	2039	-	-	2038	-	2038	*Proceed (Maintain)*
WENC	Combination of new and replacement 400kV double circuit from north west Scotland to central belt Scotland via north east Scotland	*Red*	*Red*	*Red*	2040	-	-	-	-	-	-	*Stop*

North West, North East and Yorkshire

Earliest delivery: This is the date an option could theoretically be delivered, assuming delivery risks do not apply.
Probable delivery: This is the date an option has a 50% likelihood of being delivered by, taking account of delivery risks.
Earliest optimal: This is the earliest of the four optimal delivery dates across the pathways.

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Code	Description	Env.	Com.	Del. & Ope.	Delivery		Optimal					Signal
					Earliest	Probable	HT	EE	HE	FB	Earliest	
CETI	Circuit turn in and network reconfiguration within West Yorkshire area	*Amber*	*Amber*	*Green*	2036	2040	-	-	-	-	-	*Stop*
CLN2	New double circuit between North West England and Lancashire directly	*Red*	*Red*	*Amber*	2040	2044	-	-	-	-	-	*Proceed (Critical)*
CLN4	New 400kV double circuit from North West England to Lancashire following the coast	*Red*	*Red*	*Amber*	2038	2042	2038	-	-	-	*2038*	
CLN3	New 400kV double circuit from North West England to Lancashire following the coast, crossing Morecambe Bay	*Red*	*Red*	*Amber*	2037	2040	-	-	-	-	-	*Stop*
CMCF	Reconductoring and reconfiguration of 400kV circuits between Cellarhead, Dains and Macclesfield substations	*Amber*	*Green*	*Green*	2037	2042	-	-	-	-	-	*Stop*
DCR4	Reconductor Carrington to Daines 400kV single circuit	*Green*	*Green*	*Green*	2031	2031	-	-	-	-	-	*Stop*
DTQB	Installation of Power Flow control devices along Drax to Thornton 400kV double circuit	*Amber*	*Amber*	*Green*	2033	2034	-	-	-	-	-	*Stop*
ESC3	New 400kV substation and power flow control devices within West Yorkshire region	*Green*	*Amber*	*Green*	2033	2036	2038	2038	2039	2041	2038	*Hold*
EWD1	New East to West ultra-high voltage direct current (UHVDC) network utilising AC routes within North England	*Red*	*Red*	*Red*	2044	2053	-	-	-	-	-	*Stop*

Code	Description	Env.	Com.	Del. & Ope.	Delivery		Optimal					Signal
					Earliest	Probable	HT	EE	HE	FB	Earliest	
EWDC	New East to West ultra-high voltage direct current (UHVDC) network within North England	*Red*	*Red*	*Red*	2044	2053	-	-	-	-	-	*Stop*
FBN1	New 400kV route between North East England and North Yorkshire with new substations at both end	*Red*	*Red*	*Amber*	2041	2047	-	-	-	-	-	*Stop*
FBN2	New 400kV route between North East England and North Yorkshire with new substations at Northeast England only	*Red*	*Red*	*Amber*	2040	2046	-	-	-	-	-	*Stop*
FSU1	Harker to Stella West upgrade from 275kV to 400kV	*Red*	*Red*	*Amber*	2035	2038	2038	2037	2038	2038	2037	*Proceed (Maintain)*
GBNC	New 400kV circuit between Yorkshire and Humber region	*Red*	*Amber*	*Green*	2041	2046	-	-	-	-	-	*Stop*
HNRE	Reconductor Hawthorn Pit to Norton 400kV circuit	*Green*	*Amber*	*Green*	2030	2031	-	-	-	-	-	*Stop*
HONC	New 400kV circuit between County Durham and North Yorkshire - Stage 2	*Red*	*Red*	*Amber*	2039	2044	-	-	-	-	-	*Stop*
JTHW	Hotwire route between Thurcroft and West Melton	*Green*	*Green*	*Green*	2029	2029	2033	2033	2033	2033	2033	*Hold*
KENC	New 400kV circuit within North Yorkshire	*Red*	*Amber*	*Green*	2037	2040	-	-	-	-	-	*Stop*
LTR1	Reconductor Lackenby to Thornton 400kV double circuit	*Amber*	*Amber*	*Green*	2034	2036	2038	2034	2034	2036	2034	*Proceed (Critical)*
LTRE	Reconductor and tower reinforcement on Lackenby to Thornton 400kV double circuit route	*Amber*	*Amber*	*Green*	2034	2036	-	-	-	-	-	*Stop*
LYN1	New 400kV route between Lancaster and North Yorkshire	*Amber*	*Red*	*Amber*	2039	2043	-	-	-	-	-	*Stop*
LYN2	New 400kV route between Lancaster and North Yorkshire with new substations at North Yorkshire	*Amber*	*Red*	*Amber*	2039	2043	-	-	-	-	-	*Stop*
MRU1	Mersey Ring Upgrade Stage 1: 275kV to 400kV upgrade with new tower and bigger conductor for future network needs	*Amber*	*Amber*	*Amber*	2037	2042	-	-	-	-	-	*Stop*

Code	Description	Env.	Com.	Del. & Ope.	Delivery		Optimal					Signal
					Earliest	Probable	HT	EE	HE	FB	Earliest	
MRU2	Mersey Ring Upgrade Stage 2: 275kV to 400kV upgrade retaining existing tower	*Amber*	*Amber*	*Amber*	2039	2043	2039	-	-	-	2039	*Proceed (Maintain)*
MRU3	Mersey Ring Upgrade Stage 1: 275kV to 400kV upgrade retaining existing tower	*Amber*	*Amber*	*Amber*	2036	2039	2038	-	-	-	2038	*Proceed (Maintain)*
MSRE	Reconductoring Macclesfield to Stalybridge 400kV circuit route	*Amber*	*Amber*	*Green*	2031	2032	-	-	-	-	-	*Stop*
NBNC	New 400kV circuit within South Yorkshire	*Amber*	*Amber*	*Green*	2038	2042	-	-	-	-	-	*Stop*
NES1	Series compensation strategy 1 across the North of England transmission network	*Amber*	*Red*	*Amber*	2034	2036	2038	-	-	-	2038	*Hold*
NES2	Series compensation strategy 2 across the North of England transmission network	*Amber*	*Red*	*Amber*	2034	2036	-	-	-	-	-	*Stop*
NEUP	North East ring 275kV to 400kV upgrade	*Red*	*Amber*	*Amber*	2038	2041	-	-	-	-	-	*Stop*
NHDC	New ultra-high voltage direct current (UHVDC) network between North East England and Hertfordshire	*Red*	*Red*	*Red*	2043	2051	-	-	-	-	-	*Stop*
NOR6	Reconductor and tower replacement on Norton to Osbaldwick 400kV double circuit route	*Green*	*Amber*	*Green*	2035	2039	-	-	-	-	-	*Stop*
NOR7	Reconductor Norton to Osbaldwick 400kV double circuit	*Green*	*Amber*	*Green*	2032	2034	2032	2032	2032	2032	2032	*Proceed (Critical)*
NWD1	New ultra-high voltage direct current (UHVDC) network partly utilising AC route between North West England and Buckinghamshire	*Red*	*Red*	*Red*	2041	2048	-	-	-	-	-	*Stop*
NWDC	New ultra-high voltage direct current (UHVDC) network between North West England and Buckinghamshire	*Red*	*Red*	*Red*	2041	2048	-	-	-	-	-	*Stop*
OENC	New 400kV double circuit within North Yorkshire	*Amber*	*Amber*	*Amber*	2038	2043	-	-	-	-	-	*Stop*

Code	Description	Env.	Com.	Del. & Ope.	Delivery		Optimal					Signal
					Earliest	Probable	HT	EE	HE	FB	Earliest	
PCR2	Reconductor and tower replacement on Carrington to Penwortham and Padiham to Penwortham 400kV circuits	*Red*	*Amber*	*Green*	2037	2041	-	-	-	-	-	*Stop*
SNRE	Reconductor Spennymoor to Norton 400kV double circuit	*Amber*	*Amber*	*Green*	2032	2033	2032	2033	2033	2033	2032	*Proceed (Critical)*
SPRE	Reconductor Spennymoor to Stella West 400kV double circuit	*Amber*	*Amber*	*Green*	2032	2033	2032	2033	2033	2033	2032	*Proceed (Critical)*
TDP4	Installation of Power Flow control devices along Drax to Thornton 400kV double circuit	*Amber*	*Amber*	*Green*	2033	2035	2033	2033	2033	2033	2033	*Proceed (Critical)*
TMC2	Reconductor Thorpe Marsh leg of Drax to Keadby to Thorpe Marsh 400kV circuit and Keadby 400kV substation running arrangement update	*Amber*	*Amber*	*Green*	2031	2031	2038	2036	2038	2038	2036	*Hold*
TMC3	Reconductor and tower replacement on Thorpe Marsh leg of Drax to Keadby to Thorpe Marsh 400kV circuit and Keadby 400kV substation running arrangement update	*Amber*	*Amber*	*Green*	2035	2037	-	-	-	-	-	*Stop*
TMCF	Thorpe Marsh substation reconfiguration	*Amber*	*Green*	*Green*	2035	2036	2038	2035	2038	2038	2035	*Proceed (Critical)*
TMPC	Installation of Power Flow control devices along Thorpe Marsh to West Melton 1 275kV circuit	*Green*	*Amber*	*Green*	2031	2032	-	-	-	-	-	*Stop*
WYU1	West Yorkshire network upgrade and reconfiguration strategy 1	*Amber*	*Amber*	*Red*	2038	2043	-	-	-	-	-	*Stop*
WYU2	West Yorkshire network upgrade and reconfiguration strategy 2	*Amber*	*Amber*	*Amber*	2037	2040	-	-	-	-	-	*Stop*

Wales, West Midlands and East Midlands

Earliest delivery: This is the date an option could theoretically be delivered, assuming delivery risks do not apply.
Probable delivery: This is the date an option has a 50% likelihood of being delivered by, taking account of delivery risks.
Earliest optimal: This is the earliest of the four optimal delivery dates across the pathways.

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Code	Description	Env.	Com.	Del. & Ope.	Delivery		Optimal					Signal
					Earliest	Probable	HT	EE	HE	FB	Earliest	
BHSC	Installation of Power Flow control devices on the Yorkshire to East Midland new 400kV circuit	*Amber*	*Amber*	*Green*	2034	-	-	-	-	-	-	*Stop*
BQNC	New 400kV circuit between West Midlands and South East England	*Amber*	*Amber*	*Green*	2039	-	-	-	-	-	-	*Stop*
BRQB	Installation of Power Flow control devices on new 400kV circuit across East Midlands	*Green*	*Amber*	*Green*	2036	2038	2036	2036	2036	2036	2036	*Proceed (Critical)*
CDRE	Reconductor Cellarhead to Drakelow 400kV double circuit	*Amber*	*Amber*	*Green*	2032	2033	-	-	-	-	-	*Stop*
CWSC	Installation of Power Flow control devices on Cottam to West Burton 400kV double circuit	*Amber*	*Green*	*Green*	2034	2035	-	-	-	-	-	*Stop*
FSRE	Reconductor Feckenham to Seven Springs 1 400kV circuit	*Amber*	*Amber*	*Green*	2031	2032	-	-	-	-	-	*Stop*
FWR1	Reconductor Feckenham to Walham 1 400kV circuit	*Amber*	*Amber*	*Green*	2032	2033	-	2033	2033	-	2033	*Proceed (Maintain)*
LBNC	New 400kV circuit between East Midlands and East of England	*Amber*	*Amber*	*Amber*	2039	2044	-	-	-	-	-	*Stop*
LFQB	New power flow control device in West Midlands	*Amber*	*Amber*	*Green*	2036	2038	2038	2038	2038	2038	2038	*Proceed (Maintain)*
LGSC	Installation of Power Flow control devices across Northeast Lincolnshire network	*Green*	*Amber*	*Amber*	2037	2039	-	-	-	-	-	*Stop*
LQUP	Upgrade of the existing Quad Boosters to higher ratings at Legacy 400kV substation	*Green*	*Amber*	*Green*	2036	2037	2038	2036	2038	2036	2036	*Proceed (Critical)*

Code	Description	Env.	Com.	Del. & Ope.	Delivery		Optimal					Signal
					Earliest	Probable	HT	EE	HE	FB	Earliest	
LRN7	New 400kV double circuit from South Lincolnshire to East Leicestershire with two new substations. Reconductor one circuit of Cottam to Grendon 400kV route between new substation in East Leicestershire and Grendon substation	*Amber*	*Amber*	*Amber*	2033	2035	2036	2036	2036	2036	2036	*Proceed (Maintain)*
MWN1	New 400kV circuit between West Midlands and South West England directly	*Red*	*Red*	*Amber*	2037	2040	2038	2038	2038	2038	2038	*Proceed (Maintain)*
MWNC	New 400kV circuit between West Midlands and South West England via a new substation in Wales	*Red*	*Amber*	*Amber*	2038	2042	-	-	-	-	-	
NLSC	Installation of Power Flow control devices on the North Wales to West Midlands new 400kV circuit	*Red*	*Amber*	*Green*	2037	2039	-	-	-	-	-	*Stop*
RWUP	Uprate cable section of Ratcliffe-on-Soar to Willington East 2 400kV circuit	*Green*	*Green*	*Green*	2033	2035	2033	2033	2033	2033	2033	*Proceed (Critical)*
SCR1	Reconductor Cottam to Staythorpe 1 400kV circuit	*Green*	*Amber*	*Green*	2031	2032	-	-	-	-	-	*Stop*
SHNC	New double circuit within West Midlands	*Amber*	*Red*	*Amber*	2037	2041	-	-	-	-	-	*Stop*
SRRE	Reconductoring the Ratcliffe-on-Soar to Staythorpe 400kV circuit	*Amber*	*Amber*	*Green*	2031	2032	-	-	-	-	-	*Stop*
STNS	New 400kV substation within East Midlands region	*Amber*	*Amber*	*Green*	2039	2044	-	-	-	-	-	*Stop*
UWNC	New double circuit from North Wales to West Midlands	*Red*	*Red*	*Amber*	2038	2044	2038	2038	2038	2038	2038	*Proceed (Critical)*
WKDC	New offshore HVDC link between Yorkshire and South East of England	*Red*	*Amber*	*Red*	2040	2046	-	-	-	-	-	*Stop*
WMU1	West Midlands network upgrade and reconfiguration strategy 1	*Amber*	*Amber*	*Amber*	2039	2043	-	-	-	-	-	*Stop*
WMU2	West Midlands network upgrade and reconfiguration strategy 2	*Amber*	*Amber*	*Amber*	2035	2039	-	-	-	-	-	*Stop*
WMU3	New 400kV substation within West Midlands region and associated circuit reconfigurations	*Amber*	*Amber*	*Amber*	2038	2042	2038	2038	2038	2038	2038	*Proceed (Critical)*

Central England, East, Greater London and South

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Earliest optimal: This is the earliest of the four optimal delivery dates across the pathways.

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Code	Description	Env.	Com.	Del. & Ope.	Delivery		Optimal					Signal
					Earliest	Probable	HT	EE	HE	FB	Earliest	
ATRE	Reconductor Alverdiscott to Taunton 1 400kV circuit	*Amber*	*Amber*	*Green*	2031	2032	2033	2032	2033	2034	2032	*Proceed (Maintain)*
BFPC	Installation of Power Flow control devices on Bramley to Fleet 400kV double circuit	*Red*	*Amber*	*Green*	2034	2036	2036	2035	2034	2036	2034	*Proceed (Maintain)*
BWQB	Installation of Power Flow control devices onto Burwell to Walpole 400kV double circuit	*Green*	*Amber*	*Green*	2033	2034	2033	2033	2033	2033	2033	*Proceed (Critical)*
BUUP	Burwell Main substation upgrade	*Green*	*Green*	*Green*	2029	2030	2031	2031	2031	2031	2031	*Proceed (Maintain)*
CLCU	Uprate cable section of Chilling to Lovedean 400kV circuit	*Green*	*Green*	*Green*	2029	2031	2031	2031	2032	2033	2031	*Proceed (Maintain)*
EGOS	Operational tripping scheme on the East Coast	*Green*	*Green*	*Amber*	2032	2033	2033	2033	2033	2033	2033	*Proceed (Maintain)*
IMHW	Hotwire and substation cable uprate of Iron Acton to Melksham 275kV double circuit	*Green*	*Green*	*Green*	2033	2034	2039	2034	2033	2034	2033	*Proceed (Critical)*
SENS	New 400kV substation within South West region	*Amber*	*Red*	*Green*	2038	2043	2038	2038	2038	2038	2038	*Proceed (Critical)*
SMRE	Reconductor Minety to Severn Springs 1 400kV circuit	*Amber*	*Amber*	*Green*	2031	2032	-	-	-	-	-	*Stop*
SGRE	Reconductor Grendon to Sundon 400kV double circuit	*Amber*	*Amber*	*Green*	2030	2031	2033	2033	2033	2033	2033	*Proceed (Maintain)*

Code	Description	Env.	Com.	Del. & Ope.	Delivery		Optimal					Signal
					Earliest	Probable	HT	EE	HE	FB	Earliest	
TWN1	New Wymondley to Waltham Cross 400kV double circuit and Waltham Cross to Warley 275kV to 400kV upgrades with a new substation at Waltham Cross	*Red*	*Red*	*Amber*	2036	2040	-	-	-	-	-	*Proceed* *(Maintain)*
TWNC	New Wymondley to Waltham Cross 400kV double circuit and Waltham Cross to Warley 275kV to 400kV upgrades with a substation extension at Waltham Cross	*Red*	*Red*	*Amber*	2036	2040	-	2038	2038	2038	2038	
WLU1	West London network upgrade and reconfiguration strategy 1	*Amber*	*Amber*	*Amber*	2039	2043	-	-	-	-	-	*Stop*
WLU2	West London network upgrade and reconfiguration strategy 2	*Amber*	*Amber*	*Green*	2039	2044	-	-	-	-	-	*Stop*

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