Electricity Transmission

Network Development Policy Decisions

30th June 2021

Purpose

This document describes the investment options National Grid Electricity Transmission (NGET[1]) has selected to progress under our Network Development Policy (NDP) dated 31st August 2017.

Background

The NDP provides the framework by which NGET decides to proceed, not start or to delay wider investment on the England and Wales Transmission Network to increase transmission capacity in an economic, efficient and coordinated manner. Analysis is conducted annually so that investment options are reviewed for the coming year.

This process manages the uncertainty future wider transmission network capacity requirements on our network that can result from uncertain quantities, types and locations of future generation, demand, and interconnector connections. This uncertainty can be compounded in cases where greater lead times are needed for the transmission reinforcements than for the development of new connections.

The purpose of the NDP framework is to balance the risks of investing too early, which include the risk of inefficient financing costs and an increased stranding risk, with the risks of investing too late, which include inefficient congestion costs.

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Each year, a range of Future Energy Scenarios (FES) are developed by the Electricity System Operator (ESO) following extensive stakeholder consultation. These scenarios are then used in ESO's Electricity Ten Year Statement (ETYS) to establish the future need for boundary reinforcements in each of the scenarios. For the England and Wales Transmission Network, NGET has identified investment options that can fulfil the possible future needs of the network against these boundary requirements.

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[1] The terms 'National Grid Electricity Transmission', 'NGET', 'we', 'our' and 'us' are used interchangeably in this document.

The ESO compares the expected congestion costs against the cost of the investment options proposed by NGET in an economic analysis as part of the Network Options Assessment (NOA) process. The purpose of this is to identify investments that have the least regret of proceeding.

NGET uses the NOA output to assist making investment decisions in NDP to ensure that transmission investment provides the best value outcome for existing and future consumers. Whilst our NDP decisions are aligned with NOA recommendations for most of our reinforcement projects, different outcomes can be justified by further scrutiny and analysis after ESO's NOA publication.

In some cases 'enabling works' in our customers' connection agreements include some of the same works as in this document which are subject to NDP assessment. The NDP assessment determines only if these should be progressed to support the wider transmission system. The delivery of these 'enabling works' is communicated and planned jointly with the relevant connection customer on a project by project basis.

Network Options Assessment 2020/21

The 2020/21 NOA results[2] were published by ESO in January 2021. As part of this NOA, 134 NGET options were assessed in ESO's economic analysis. Of these, 91 options were considered to provide an economic benefit in one or more scenarios in FES, with 32 (including 5 joint projects with other TOs) being recommended to 'Proceed' in order to meeting their Earliest In Service Dates (EISDs).

Network Development Policy Decisions (30th June 2021)

We have reviewed the NOA 2020/21 recommendations and made our investment decisions in line with the NDP framework. The table in Appendix 1 provides a summary of our conclusions. The majority of our NDP decisions align with the ESO's NOA recommendations this year. The only exceptions are reinforcements BRRE (Reconductor the remainder of the Bramford – Braintree – Rayleigh) and TKRE (Tilbury - Grain and Tilbury - Kingsnorth Upgrade) which are both concluded to 'Proceed' in the NDP instead of 'Hold' as recommended in NOA. BRRE is justified by further cost benefit analysis in collaboration with ESO after the NOA publication, and agreed conclusions are confirmed in a letter from ESO in May. TKRE was in optimal path in NOA 2020/21 for its delivery in 2028. Following review of the project development programme and given the requirement to support customer connections in the South East, we decided under NDP to 'Proceed' with early phase of TKRE works through 2021/22.

Latest commentary on some notable projects are provided as below.

Eastern HVDC Links and Central Yorkshire Reinforcement (E2DC, E4D3, E4L5, TGDC, OPN2)

There continues to be a strong driver to deliver an increased level of Scottish-Anglo transmission capacity. In NOA 2020/21, ESO has identified the requirement for Eastern Links with 'Proceed' signal being given to four projects:

- Eastern Link 1: Torness – Hawthorn Pit (E2DC)
- Eastern Link 2: Peterhead to Drax (E4D3)
- Eastern Link 3: Peterhead to South Humber (nominally Grimsby West) (E4L5)
- Eastern Link 4: from south east Scotland to south Humber area (TGDC)

[2] https://www.nationalgrideso.com/document/185881/download

Ofgem launched consultation on the initial needs case for the Eastern Link 1 and 2 in May 2021 and we are working with other two Scottish TOs for their final needs case submission. Eastern Link 3 and 4 are to go through strategic optioneering to further understand their system benefit and alternative options.

There also remains a strong driver to deliver the Central Yorkshire Reinforcement in all FES scenarios, regardless of where Eastern Link connects. OPN2 (A new double circuit between the existing Norton to Osbaldwick circuit and Poppleton and relevant 275kV upgrades) remains an optimal solution for transmission capacity and has been confirmed again in both NOA and NDP this year with a 'Proceed' recommendation.

East Anglia and South Coast Major Projects (SCD1, BTNO, AENC, ATNC, TENC)

A set of East Anglia and Thames Estuary major projects has been given 'Proceed' recommendation this year including

- HVDC Link from Suffolk to Kent (SCD1)
- New 400Kv double circuit from Bramford to Twinstead (BTNO)
- A new 400kV double circuit in north East Anglia (AENC)
- A new 400kV double circuit in south East Anglia (ATNC)
- Thames Estuary reinforcement (TENC)

We submitted these reinforcement projects for NOA 2020/21 assessment and ESO's NOA recommendations have confirmed the system benefit in delivering these projects for their EISDs. Strategic optioneering for the first four projects has been completed and we will make further progress in project design and development in the coming year.

Other Major projects (CGNC, GWNC, EDNC, CNMC)

NOA 2020/21 has further confirmed the need of reinforcements across the Humber and Lincolnshire area with 'Proceed' recommendation for two new circuits from last year's publication.

- New circuit from Creyke Beck to South Humber (CGNC)
- New circuit from South Humber to South Lincolnshire (GWNC)

Combined with a new reinforcement this year, EDNC (Uprate Brinsworth and Chesterfield double circuit to 400kV and a new 400kV double circuit between Ratcliffe and Chesterfield), the set of reinforcements provide network capacity across system boundaries. Further strategic optioneering work has been under development since NOA publication in January 2021 to continue to develop the most appropriate options for consumers.

NOA 2020/21 recommended that the TOs should 'Stop' development of TLNO (New 400kV double circuit from Torness to Lackenby), instead recommending that the TOs should 'Proceed' a new option CNMC (South east Scotland to north west England AC onshore reinforcement). We will work with Scottish Power Transmission to develop further understanding of the option.

We welcome your feedback

We believe that the above outputs from our Network Development Policy provide an appropriate balance between asset investment and operational costs to achieve the best use of consumers' money. We hope that

the information contained within this document provides a useful insight of how we are seeking to protect consumers' interests by ensuring that investment is made at an appropriate time.

We would welcome your views on the contents of this document. Please send any feedback to Owen Wilkes, Network Development Manager (owen.wilkes@nationalgrid.com).

APPENDIX 1

KEY

1. **PROCEED** – Work should continue, or start, to maintain the EISD.
2. **HOLD** - The option is optimal but not critical and an investment decision should be put on hold. Delivery of this option should be delayed by at least one year.
3. **DELAY** – The option is optimal and critical, but it is not economical to be delivered by its EISD. Delivery should be delayed by one year.
4. **DO NOT START** – The option is currently non-optimal. Delivery should not begin.
5. **STOP** - The option is currently non-optimal. Delivery should not be continued.

	NOA Option Code	Description	EISD	NOA 19/20	NOA 20/21	NGET NDP Decision (In coloured wordings)/Comments
Eastern Link						
1	E2DC	HVDC Link from Torness to Hawthorn Pit	2027	**Proceed**	**Proceed**	**PROCEED** in line with NOA recommendation, but continue to follow LOTI process to include further work to determine the optimal option for the Eastern Link projects.
2	E4D3	HVDC Link from Peterhead to Drax	2029	**Proceed**	**Proceed**	**PROCEED** in line with NOA recommendation, but continue to follow LOTI process to include further work to determine the optimal option for the Eastern Link projects.
3	E4L5	HVDC Link from Peterhead to South Humber	2031	**Proceed**	**Proceed**	**PROCEED** in line with NOA recommendation. This will require further work to be done to understand the driver and strength of need case, followed by Strategic Optioneering.
4	TGDC	Eastern subsea HVDC Link from south east Scotland to south Humber area	2031	**Not featured**	**Proceed**	**PROCEED** in line with NOA recommendation. This will require further work to be done to understand the driver and strength of need case, followed by Strategic Optioneering.
5	E2D2	HVDC Link from Torness to Cottam	2030	**Proceed**	**Stop**	**STOP** in line with NOA recommendation.
Central Yorkshire Reinforcement						
6	OPN2	A new double circuit between the existing Norton to Osbaldwick circuit and Poppleton and relevant 275kV upgrades	2027	**Proceed**	**Proceed**	**PROCEED** in line with NOA recommendation.
East Anglia and South Coast Major Reinforcement						
7	SCD1	HVDC Link from Suffolk to Kent	2029	**Proceed**	**Proceed**	**PROCEED** in line with NOA recommendation.
8	BTNO	New 400kV double circuit from Bramford to Twinstead	2028	**Proceed**	**Proceed**	**PROCEED** in line with NOA recommendation.
9	AENC	A new 400kV double circuit in north East Anglia	2030	**Not featured**	**Proceed**	**PROCEED** in line with NOA recommendation.
10	ATNC	A new 400kV double circuit in south East Anglia	2030	**Not featured**	**Proceed**	**PROCEED** in line with NOA recommendation.
11	TENC	Thames Estuary reinforcement	2030	**Not featured**	**Proceed**	**PROCEED** in line with NOA recommendation. Strategic Optioneering to understand the driver and strength of need case is ongoing, which will allow a Strategic Proposal to be brought forward.
Other Major Projects						
12	CGNC	New 400kV double circuit between Creyke Beck and South Humber	2031	**Proceed**	**Proceed**	**PROCEED** in line with NOA recommendation. Strategic Optioneering to understand the driver and strength of need case is ongoing, which will allow a Strategic Proposal to be brought forward.
13	GWNC	New 400kV double circuit between South Humber and South Lincolnshire	2031	**Proceed**	**Proceed**	**PROCEED** in line with NOA recommendation. Strategic Optioneering to understand the driver and strength of need case is ongoing, which will allow a Strategic Proposal to be brought forward.
14	EDNC	Uprate Brinsworth and Chesterfield double circuit to 400kV and a new 400kV double circuit between Ratcliffe and Chesterfield	2033	**Not featured**	**Proceed**	**PROCEED** in line with NOA recommendation. Strategic Optioneering to understand the driver and strength of need case is ongoing, which will allow a Strategic Proposal to be brought forward.
15	TLNO	New 400kV double circuit from Torness to Lackenby	2036	**Proceed**	**Stop**	**STOP** in line with NOA recommendation.
16	CNMC	South east Scotland to north west England AC onshore reinforcement	2033	**Not featured**	**Proceed**	**PROCEED** in line with NOA recommendation. Strategic Optioneering to understand the driver and strength of need case is ongoing, which will allow a Strategic Proposal to be brought forward.
Power Flow Control Devices						

17	NTP1	Power Flow Control Device on the North Tilbury Circuits	2023	**Proceed**	**Hold**	**HOLD** in line with NOA recommendation.
18	NEP1	Power Flow Control Device on the Blyth – Tynemouth/Blyth – South Shields	2024	**Proceed**	**Hold**	**HOLD** in line with NOA recommendation.
19	CTP2	Alternative Power Flow Control Device on the Creyke Beck – Thornton Circuit	2024	**Proceed**	**Proceed**	**PROCEED** in line with NOA recommendation.
20	MRP2	Additional Power Flow Control Devices at both Harker and Penwortham	2021	**Not featured**	**Proceed**	**PROCEED** - further work ongoing with ESO to establish an overall optimised solution given network changes in the region.
Substation Works						
21	SEEU	Reactive Series Compensation Protective Switching Scheme	2022	**Proceed**	**Hold**	**HOLD** in line with NOA recommendation.
22	HAEU	Harker supergrid transformer 5 and supergrid transformer 9A banking arrangement	2022	**Proceed**	**Proceed**	**PROCEED** in line with NOA recommendation.
23	BMM2	2 x 225MVAr MSCs at Burwell Main	2022	**Proceed**	**Proceed**	**PROCEED** in line with NOA recommendation.
24	THS1	Series reactors at Thornton	2023	**Proceed**	**Proceed**	**PROCEED** with alternative options due to environmental constraints on NOA solution.
25	HAE2	Harker SGT6 Replacement	2023	**Proceed**	**Proceed**	**PROCEED** in line with NOA recommendation.
26	BNRC	Bolney and Ninfield reactive Compensation	2024	**Proceed**	**Not featured**	
27	SHNS	Upgrade Substation in the South Humber (for new circuits/Eastern Link Connection)	2031	**Proceed**	**Proceed**	**PROCEED** in line with NOA recommendation.
28	PEM1	225MVAr MSCs at Pelham	2024	**Hold**	**Proceed**	**PROCEED** in line with NOA recommendation.
29	PEM2	225MVAr MSCs at Pelham	2024	**Hold**	**Proceed**	**PROCEED** in line with NOA recommendation.
30	RHM1	225MVAr MSCs at Rye House	2024	**Hold**	**Proceed**	**PROCEED** in line with NOA recommendation.
31	RHM2	225MVAr MSCs at Rye House	2024	**Hold**	**Proceed**	**PROCEED** in line with NOA recommendation.
Circuit Upgrades						
32	RTRE	Reconductor remainder of Rayleigh - Tilbury	2021	**Proceed**	**Proceed**	**PROCEED** in line with the NOA recommendation. However, system access constraints have resulted in the project delivery being delayed to October 2022 when system access can be made available to NGET.
33	WHTI	Turn in West Boldon - Hartlepool cct at Hawthorn Pit	2021	**Proceed**	**Proceed**	**PROCEED** in line with NOA recommendation.
34	NOR2	Reconductor 13.75km of Norton – Osbladwick 1 circuit	2022	**Proceed**	**Stop**	**STOP** in line with NOA recommendation.
35	SER1	Elstree – Sundon Reconductoring	2024	**Proceed**	**Proceed**	**PROCEED** in line with NOA recommendation.
36	MBHW	Bramley – Melksham Hotwiring	2023	**Proceed**	**Hold**	**HOLD** in line with NOA recommendation.
37	BRRE	Reconductor the remainder of the Bramford – Braintree – Rayleigh	2023	**Proceed**	**Hold**	**PROCEED** following further discussions with ESO on outage optimisation in the south east England area. Justification letter from ESO has been received following further cost benefit analysis.
38	BPRE	Reconductor the newly formed second Bramford – Braintree – Rayleigh Circuit	2028	**Proceed**	**Proceed**	**PROCEED** in line with NOA recommendation.
39	TKRE	Tilbury - Grain and Tilbury - Kingsnorth Upgrade	2027	**Proceed**	**Hold**	**PROCEED** given the requirement to deliver this project to support customer connections in the South East and given the NOA6 optimal path shows a requirement for the project in 2028, NGET has continued with some early phase works through 2021/22.
40	CDHW	Cellarhead to Drakelow circuits thermal uprating	2023	**Hold**	**Proceed**	**PROCEED** in line with NOA recommendation.

41	CTRE	Reconductor remainder of Coryton South to Tilbury circuit	2022	**Hold**	**Proceed**	**PROCEED** in line with NOA recommendation.
42	HWUP	Uprate Hackney, Tottenham and Waltham Cross 275kV to 400kV	2027	**Stop**	**Proceed**	**PROCEED** in line with NOA recommendation.