nationalgrid

2017/18 Network Development Policy Output

29th June 2018

About this document

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

Background

2. There is significant uncertainty around the quantity, type and location of future generation, demand, and interconnector connections. As these connections may lead to the need to provide additional capacity on the wider transmission network, the nature of the wider works required is also uncertain. This uncertainty is compounded by the lead-time for some transmission reinforcements often being greater than the lead-time for the development of new connections.

3. For wider works, this uncertainty is managed through our Network Development Policy. The purpose of this 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.

4. The NDP provides the framework on which National Grid's TO decides to proceed, not start or to delay wider investment in an economic, efficient and coordinated manner. The analysis is conducted annually so that investment options are reviewed for the coming year.

5. Each year, a range of Future Energy Scenarios are developed by the SO following extensive stakeholder consultation. These scenarios are then used in the Electricity Ten Year Statement (ETYS) to establish the future need for boundary reinforcements in each of the scenarios. Against these needs, the TO has identified investment options that can meet the possible future needs of the network.

6. The SO compares the expected congestion costs against the cost of the investment options 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.

7. The TO uses the NOA output to make investment decisions to ensure that the transmission part of the industry provides the best value outcome for existing and future consumers.

2017/18 Network Options Assessment

8. The 2017/18 NOA results[1] were published in January 2018. As part of this year's NOA, National Grid's TO submitted 55 investment options for economic analysis. Of these, 46 options were considered to provide an economic benefit in the future by the SO, with 18 being recommended

[1] https://www.nationalgrid.com/sites/default/files/documents/Network-Options-Assessment-2017-18.pdf

to be progressed in 2018/19. Two investments received a stop or do not proceed recommendation having previously been recommended to be progressed in the 2016/17 NOA.

2017/18 Network Development Policy Outputs

9. We have reviewed the recommendations the SO has made as part of the 2017/18 NOA. The following table provides a summary of our conclusions. For most investments our NDP decisions align with the SO's NOA recommendation.

10. The table shows for each investment option, the earliest date the investment could be completed by the TO, the so called earliest in service date (EISD). It also shows the optimal year for completing the investment in each of the four future energy scenarios, as well as a scenario based on locally contracted generation.

Option	EISD	NOA Optimal Investment Timing					NOA 2017/18 Recommendation	NDP 2017 Output
		Two Degrees	Consumer Power	Slow Progression	Steady State	Local		
E4DC Eastern subsea HVDC Link from Peterhead to Hawthorn Pit (Potential SWW)	2028	2028	2028	2028	2028	N/A	Proceed	Proceed (See commentary below)
E2DC Eastern subsea HVDC Link from Torness to Hawthorn Pit (Potential SWW)	2027	2027	2027	2027	N/A	N/A	Proceed	Proceed (See commentary below)
TLNO Torness to north east England AC reinforcement	2030	N/A	N/A	N/A	N/A	N/A	Hold for SWW	Hold
HAEU Harker SGT6 replacement	2021	2029	2021	2021	2021	N/A	Proceed	Proceed
WHTI Turn-in of West Boldon to Hartlepool circuit at Hawthorn Pit	2021	2021	N/A	2021	N/A	N/A	Proceed	Proceed
NOR1 Reconductor 13.75km of Norton to Osbaldwick 400kV double circuit	2021	2021	2021	2021	2023	N/A	Proceed	Proceed (See commentary below)
CPRE Reconductor sections of Penwortham to Padiham and Penwortham to Carrington	2021	2021	N/A	N/A	N/A	N/A	Proceed	Proceed

Option	EISD	NOA Optimal Investment Timing					NOA 2017/18 Recommendation	NDP 2017 Output
		Two Degrees	Consumer Power	Slow Progression	Steady State	Local		
MRUP Uprate the Penwortham to Washway Farm to Kirkby 275kV double circuit to 400kV	2023	N/A	N/A	N/A	N/A	N/A	Proceed	Hold (See commentary below)
LDQB Lister Drive quad booster	2020	N/A	N/A	2021	N/A	N/A	Proceed	Proceed (See commentary below)
OENO Central Yorkshire reinforcement	2026	2027	2027	2027	N/A	N/A	Hold	Hold
TDH1 Drax to Thornton 2 circuit thermal uprating	2019	2019	2020	2019	N/A	N/A	Proceed	Proceed
BMMS 3X225MVAr MSC at Burwell Main	2023	2023	2023	2023	2023	2023	Proceed	Proceed
BTNO Bramford to Twinstead OHL	2025	2027	2029	2030	N/A	2025	Delay	Delay
WYTI Wymondley turn-in	2021	2021	2021	2021	2023	2021	Proceed	Proceed
ESC1 New Second Elstree to St John's Wood 400kV cable circuit	2022	2022	2025	2025	2032	2022	Delay	Delay
TKRE Tilbury to Grain and Tilbury to Kingsnorth upgrade	2025	2025	2025	2027	2025	2025	Proceed	Proceed
KLRE Kemsley–Littlebrook circuits reconductoring	2020	2020	2020	2020	2020	2020	Proceed	Proceed
FLR2 Fleet–Lovedean reconductoring	2020	2020	2020	2020	2023	2020	Proceed	Proceed
SCN2 New Transmission Route between south London and the South East Coast	2027	N/A	N/A	2027	2027	2027	Proceed	Proceed (See commentary below)

Option	EISD	NOA Optimal Investment Timing					NOA 2017/18 Recommendation	NDP 2017 Output
		Two Degrees	Consumer Power	Slow Progression	Steady State	Local		
Indicative Option 2 (Potential SWW)								
SCRC South East Coast reactive compensation	2018	2018	2018	2018	2018	2018	Proceed	Proceed
SEEU Reactive Compensation Auto-Switching Scheme	2021	2021	2021	2021	2022	2021	Proceed	Proceed
BNRC Bolney and Ninfield additional reactive compensation	2022	2022	N/A	2023	N/A	2022	Proceed	Proceed

11. Having reviewed each investment in line with our investment process, we have adapted our approach to proceeding with some investments to ensure the solutions progressed are in the best interest of consumers. The remainder of this section provides a summary for each.

12. Before proceeding further with developments on the **Eastern HVDC links** (E2DC and E4DC), we are investigating potential alternative solutions with the Scottish TOs. The two investments recommended in the 2017/18 NOA (whilst not mutually exclusive) were submitted by National Grid TO as potential alternative options to provide capacity to facilitate new generation in Scotland. The results of the 2017/18 NOA show that the need for new capacity is greater than expected in the previous NOA analysis. The two subsea HVDC links both landing at Hawthorn Pit has resulted in the need for additional network investment in the future. We will therefore assess the merit of alternative options and minimise spend on the recommended options in a manner that preserves the EISD.

13. Similarly, for the **new transmission route between south London and the South East Coast** (SCN2) we will assess the benefit of potential alternative options, whilst seeking preserve the existing EISD.

14. The economic analysis within this year's NOA suggested that the installation of a new quadrature booster at **Lister Drive** (LDQB) should be put on hold for a year; and the delivery of the uprating of the **Mersey Ring** Penwortham to Washway Farm to Kirkby 275kV double circuit (MRUP) should be stopped. This is driven by several reasons such as the year-to-year differences in east and west flows in the North of England area and the location of the critical limiting fault. As the balance of flows between the East and West are now such that congestion occurs more often on the on the East Coast, the benefit of both investments (which are on the Western part of the network) is reduced. Further investigation by the SO showed that the results of the analysis were marginal and additional flows of 100MW to the west would trigger a proceed recommendation for both investments. On this basis, the NOA Committee overturned the results of the economic assessment.

15. Due to the marginal nature of the decision regarding the Lister Drive and Mersey Ring investments, we have taken steps to minimise the potential impact of the associated uncertainty. For Lister Drive, the SO's economic analysis indicated a one year delay in delivery was optimal. After reviewing our investment programme, we will seek to minimise spend on this project in a

manner that maintains the EISD until we have visibility of the initial results of next year's NOA analysis, which we will use to determine whether to commence asset procurement.

16. For Mersey Ring, the NOA economic analysis indicated stopping the investment was optimal, but the NOA Committee recognised this was not a clear decision. To increase our confidence in this recommendation, we have undertaken our own analysis. This was completed both with the NOA information from 2017 and also with our forecast updated to account for the latest intelligence. This analysis indicates that the benefit of the investment remains marginal after generation background changes are taken into account. We therefore do not intend to proceed with this investment. Should the initial results of the 2018/19 NOA analysis indicate a benefit, we will seek to progress the investment with a view to maintaining the existing EISD, subject to outage availability.

17. Prior to proceeding with investment on the reconductoring of the **Norton - Osbaldwick** 400kV double circuit (NOR1), we will review the viability of potential reduced build options and the impact of alternative running arrangements at Thornton 400kV substation. Should this provide a benefit or indicate a later need for the investment, we will include these in the 2018/19 NOA, whilst seeking to minimise investment on the reconductoring work to preserve the EISD.

We welcome your feedback

18. 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.

19. We would welcome you views on the contents of this document. Please send any feedback to Wayne Mullins, Load Related Forecasting and Intelligence Manager (wayne.mullins@nationalgrid.com).