The Great Grid Upgrade

Grimsby to Walpole

Grimsby to Walpole

Addendum to the Strategic Options Report

January 2024

nationalgrid

Contents

Executive Summary

Purpose of this Report

This document is an Addendum to the Strategic Options Report (SOR) published in May 2023 in relation to the North Humber to High Marnham and Grimsby to Walpole projects.

Since the publication of the SOR it has become clear that increased customer demand has made a new substation at Weston Marsh necessary. This Addendum considers the implications of the requirement for a new Weston Marsh substation for the strategic option recommended in the SOR.

As such, the primary purpose of this Addendum is to address a material change of circumstances that has arisen since the publication of the SOR.

In addition, revised versions of National Policy Statements EN-1 (Energy) and EN-5 (Electricity Networks Infrastructure) have been issued since the SOR was published in May 2023, with the revised versions due to be designated and hence come into force in early 2024. Until the revised versions are designated, the previous, 2011 versions remain in force. Further, since the publication of the SOR, the Levelling Up and Regeneration Act 2023 amended the duty on relevant authorities in respect of Areas of Outstanding Natural Beauty under section 85 of the Countryside and Rights of Way Act 2000 (CROW Act) so that they must now further the purpose of conserving and enhancing natural beauty, in exercising their functions.

The consideration of strategic options reported in the SOR was based on the versions of EN-1, EN-5 and the CROW Act in force at the time. As EN-1 and EN-5 are due to be designated in early 2024, this Addendum provides an update to the summary of EN-1 and EN-5 at Appendix B to the SOR[1]. It describes the change to section 85 of the CROW Act[2] and confirms that the policy appraisals and wider conclusions as to strategic options for the Grimsby to Walpole project reported in the SOR and further considered in this Addendum would not be altered when the revised versions of EN-1, EN-5 are designated and the amendments to section 85 of the CROW Act are taken into account.[3]

This Addendum should be read in conjunction with the SOR. Other than as set out in this document, the contents of the SOR remain as published in May 2023.

Background

The consideration of strategic options is part of an iterative process in response to interaction between a range of emerging energy projects and customer requirements.

The SOR identified preferred strategic options that would meet the needs case for the two areas identified within the Humber/Trent (Creyke Beck area generation group) and Lincolnshire (East Coast generation group) regions. The preferred strategic options were identified as:

[1] See section 7.2 of this Addendum, as well as the Appendix to this Addendum

[2] See section 7.3 of this Addendum

[3] See section 7.4 of this Addendum

- To resolve Issue (a)[4] - Creyke Beck substation to new High Marnham substation (ECO 1) (assigned the project title of “North Humber to High Marnham”)
- To resolve Issue (b)[5] - New Grimsby West to new Lincolnshire Connection substation(s), new Lincolnshire Connection substation(s) to new Walpole (ECO 5) (assigned the project title by NGET of “Grimsby to Walpole”), which is the particular focus of this Addendum.

Following the publication of the SOR, the ESO and NGET customer connections teams have confirmed multiple additional customer connection drivers, including connection offers that make a new 400 kV substation (nominally designated as Weston Marsh substation) necessary. These changes are relevant to the strategic solutions to Issue (b) in the SOR, and the selection of option ECO 5. The changes to the connections background do not affect strategic solutions relating to Issue (a) in the SOR, and the selection of option ECO 1 in respect of the North Humber to High Marnham project.

Options considered

Following the confirmation of customer connection drivers at Weston Marsh substation, a backcheck exercise was completed in relation to the selection of strategic option ECO 5. This confirmed that the range of strategic options considered in relation to Issue (b) remained appropriate and did not result in any additional options being identified or previous discarded options being reconsidered.

Of the strategic options considered in addition to ECO 5, which was initially preferred, ECO 6 included an additional 400 kV substation at Weston Marsh, based on an emerging customer requirement that had not been confirmed when the SOR was initially developed. This meant that at the time, ECO 5 was preferred over ECO 6. The reason for ECO 6 being less favoured was due to the additional costs and impacts of construction of the new substation at Weston Marsh. Since at this time the customer connection needs were unconfirmed, these additional costs and impacts for an additional substation could not be justified.

However, the evolving customer requirements in the Lincolnshire region as detailed in Section 2 of this Addendum mean that a new Weston Marsh substation is now required. It is considered that this substation should form part of the Grimsby to Walpole project.

Preferred option

The SOR initially concluded that ECO 5 was to be preferred over ECO 6. It was acknowledged that ECO 5 and ECO 6 offered similar technical performance, with the key difference being the requirement for an additional substation at Weston Marsh for ECO 6, with associated costs and impacts.

The new customer connection drivers mean that there is a need for a new 400 kV Weston Marsh substation, and the costs and impacts associated with that substation and a turn in of the overhead line are now justified. Therefore, the preferred strategic option for the Grimsby to Walpole project is now ECO 6.

[4] See paragraph 6.1.4 of the SOR

[5] See paragraph 6.1.4 of the SOR

1. Introduction

1.1 In May 2023 National Grid Electricity Transmission plc (NGET) published a joint Strategic Options Report (SOR) for the development of the 'North Humber to High Marnham' and the 'Grimsby to Walpole' projects. That document provided an overview of the options that NGET had identified and subsequently evaluated for the two projects, taking into account the likely environmental and socioeconomic effects, technical issues and costs associated with each strategic option for the two component projects. It identified preferred strategic options to address the identified transmission system reinforcement needs.

1.2 The needs case for the two projects was set out in the SOR and was driven by a requirement to address the connection of new generation identified within the Humber/Trent and Lincolnshire regions (Figure 1.1 - Generation Groups referenced in SOR), as well as a need to reinforce two boundaries[6] within the transmission system, specifically boundaries B8 and B9. The preferred strategic options that would meet the needs case for the two areas identified within the Humber/Trent (Creyke Beck area generation group) and Lincolnshire (East Coast generation group) regions were identified as:

- To resolve Issue (a)[7] - Creyke Beck substation to new High Marnham substation (ECO 1) (assigned the project title of "North Humber to High Marnham")
- To resolve Issue (b)[8] - New Grimsby West to new Lincolnshire Connection substation(s), new Lincolnshire Connection substation(s) to new Walpole[9] (ECO 5) (assigned the project title by NGET of "Grimsby to Walpole").

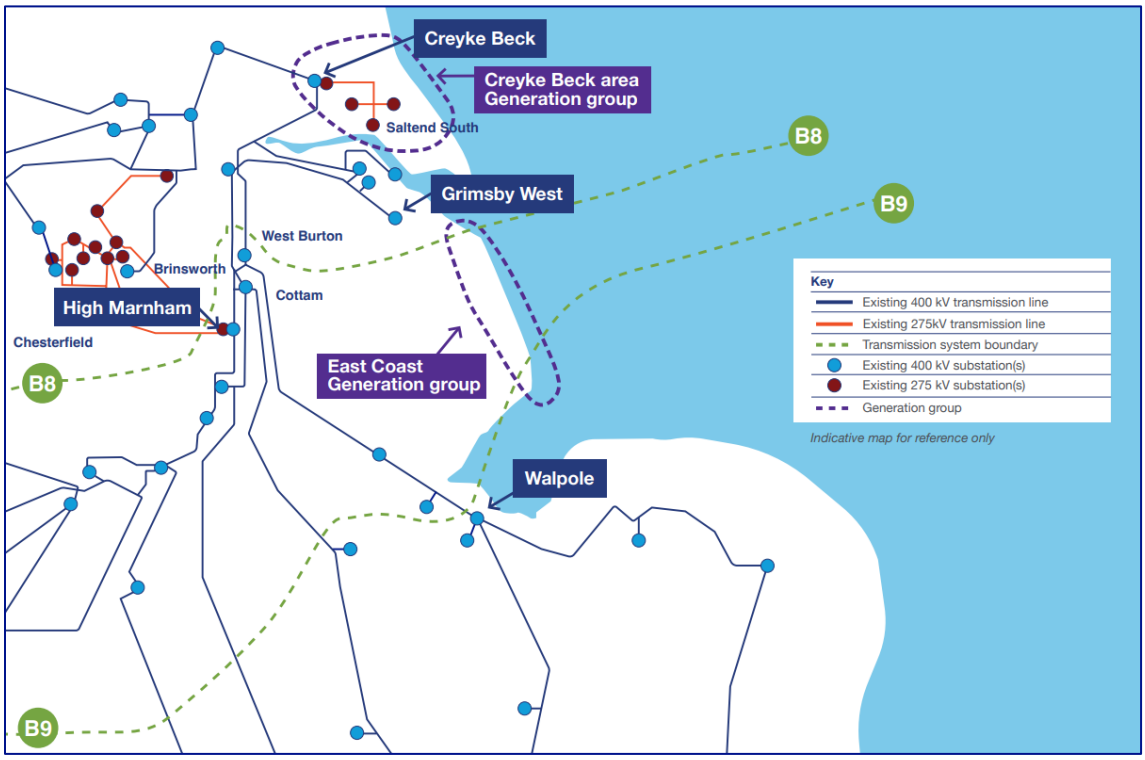
[6] A "boundary", in this context, splits the system into two parts, crossing critical circuit paths that carry power between areas and where power flow limitations may be encountered.

7 See paragraph 6.1.4 of the SOR

8 See paragraph 6.1.4 of the SOR

[9] New Walpole refers to a proposed new substation in the regional vicinity of the existing Walpole substation to provide additional connection capacity in the area. It should be noted that the new substation would not replace the existing Walpole substation and both substations will be operational following the completion of the Grimsby to Walpole project.

Figure 1.1 - Generation Groups referenced in SOR



1.3 Since publication of the SOR, the need case has changed due to the evolving contracted generation along the east coast. This has, in turn, triggered a backcheck of the preferred option noted within the SOR in relation to Issue (b). An updated list of signed connections in relation to the East Coast Generation Group is provided within Section 2. The backcheck considered – amongst other things – the other potential options that could address Issue (b).

1.4 A new Weston Marsh 400 kV substation formed part of option ECO 6, which was considered in the SOR but was discounted in favour of ECO 5. This additional substation did not directly result in an improvement in the performance of the Grimsby to Walpole project against its need case and would have resulted in additional costs and environmental impacts, and as such was discounted at the time of the SOR's completion. Since then, additional drivers have demonstrated the need for the Weston Marsh substation, which has resulted in a need to revisit the decision to recommend ECO 5 in preference to ECO 6.

1.5 The purpose of this document is to address material change since the publication of the SOR. **This Addendum should be read in conjunction with the SOR. Other than as set out in this document, the contents of the SOR remain as published in May 2023.**

2. Need Case

2.1 Following the publication of the SOR, the need case relating to the Project has changed.

2.2 The ESO and NGET customer connections teams have confirmed that multiple customer connection drivers now exist for a new 400 kV substation (nominally designated as Weston Marsh substation) to be located in the vicinity of the Spalding Tee.

2.3 The generation contracted to connect to the East Coast Generation Group has changed since the publication of the SOR. Table 2.1 below indicates the contracted generation at each substation and replaces Table 3.2 within the SOR.

Table 2.1 – East Coast Connections between South Humber to North Wash (From TEC Registers Nov 23)

Project Name	Type	Capacity (MW)	Connection Year	New substation
Race Bank Extension	Offshore Wind	565 MW	2030	LCN A/B
Outer Dowsing Offshore Wind Project	Offshore Wind	1500 MW	2030	Weston Marsh
EcoGrimsbyWest	Energy Storage/Solar	249 MW	2031	Grimsby West
Mablethorpe Storage	Energy Storage/CCGT	1500 MW	2031	LCN A/B
Aminth Energy Ltd	Interconnector	1400 MW	2031	LCN A/B
SENECA	Interconnector	1200 MW	2031	LCN A/B
Mablethorpe Green Energy Centre	Energy Storage/Solar	1025 MW	2033	LCN A/B
Walpole Flexible Generation	Energy Storage/CCGT	2000 MW	2033	Walpole
Spalding PV & BESS Station	Energy Storage/Solar	480 MW	2033	Weston Marsh
Holbeach Marsh Energy Park	Energy Storage/Solar	750 MW	2033	Weston Marsh
Carbon Free 2030	Energy Storage/Solar	500 MW	2034	Grimsby West
Stallingborough PV & BESS	Energy Storage/Solar	500 MW	2034	Grimsby West
EcoMablethorpe	Energy Storage/Solar	249 MW	2034	LCN A/B
Stallingborough Carbon Capture CCGT	Energy Storage/CCGT	906 MW	2035	Grimsby West
Total		**12,824 MW**		

Table 2.1 shows that:

- The overall connection volume for the East Coast Generation group has increased substantially since the publication of the SOR. The total capacity highlighted in the SOR equalled 7614.9 MW. The total capacity highlighted in Table 2.1 is now 13,074 MW. This equates to an increase in volume of 5,458.1 MW.

- There are three customer connection drivers for connections to Weston Marsh substation, being:
  - Outer Dowsing 1500 MW Offshore Wind Farm
  - Holbeach Marsh Energy Park 750 MW PV and BESS Station
  - Spalding 480 MW PV and BESS Station
- As detailed in Section 3.5 of the SOR, the need case highlights the importance to reinforce across the B8 and B9 boundary. The increase in connection demand has further strengthened this need.

3. Identification of Strategic Options

3.1 Following the change in the need case in relation to the East Coast Generation Group, a back-check exercise was completed in relation to the strategic options considered in relation to issue (b) (as set out in the SOR). The back check exercise confirmed that the range of strategic options considered in the original SOR in relation to options which could deliver B8 and B9 boundary uplift remained appropriate, and did not result in any new strategic options being identified that could meet the revised need, nor any previously discarded options being reconsidered.

3.2 As strategic option ECO 6 included a new Weston Marsh substation, this accommodates the additional connection requirements. No further strategic options were identified or considered.

4. Options Assessment Process

4.1 The same options assessment process was used as in the SOR process. For further information, refer to Section 5 of the SOR.

5. Appraisal of Strategic Options

5.1 As strategic option ECO 6 included a new Weston Marsh substation, the additional connection requirements do not change the appraisal of strategic options. The appraisal of strategic options is set out in Sections 7 - 14 of the SOR.

6. Strategic Options Appraisal Conclusions

6.1 Paragraph 15.4.6 of the SOR stated that "*In terms of the East Coast generation group onshore options, ECO 5 and ECO 6 offer similar technical performance, and the transmission circuits are similar in length. This means that the levels of environmental and socio-economic effects associated with the transmission circuits would be expected to be similar. However, a key difference between these options is that an additional substation at Weston Marsh would be required for ECO 6. The additional substation has potential to result in long term landscape and visual effects due to the introduction of new substation infrastructure in a landscape which currently has little major development, as well as incurring additional cost that could be avoided with ECO 5. ECO 5 is therefore the preferred onshore option".*

6.2 ECO 5 is a new primarily overhead line connection between new Grimsby West substation to new Walpole via new Lincolnshire Connection substation(s). It has a high level assessment capital cost of **£1,000.5m** and lifetime circuit cost of **£958m**.

6.3 ECO 6 is a new Grimsby West to new Lincolnshire Connection substation(s), Lincolnshire Connection substation(s) to new Weston Marsh, new Weston Marsh to new Walpole. It has a high level assessment capital cost of **£1,074m** and lifetime circuit cost of **£958m**

6.4 As explained in Section 2, the new Weston Marsh substation is now required due to contracted generation at the substation.

6.5 It was decided that new Weston Marsh substation should be included within the Project's scope as it would provide benefits such as a coordinated approach to consenting and delivery efficiencies. Furthermore, situating the new Weston Marsh substation in the vicinity of the Spalding Tee, and turning the existing circuits into it would reduce network complexity.

6.6 Option ECO 5 therefore no longer meets the need case for the Grimsby to Walpole project, whereas ECO 6 does. As a result, the preferred onshore option is now ECO 6.

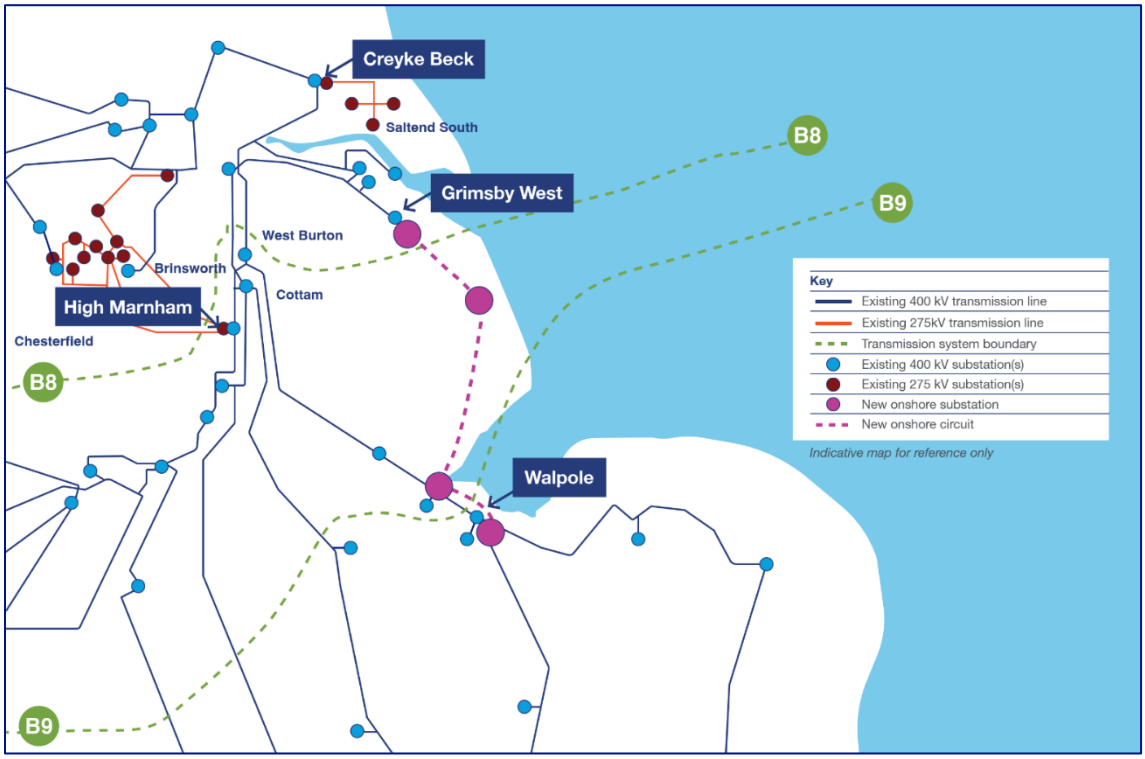
6.7 It was determined that this substation would be delivered as part the Grimsby to Walpole Project as it would provide benefits such as a coordinated approach to consenting and delivery efficiencies.

6.8 As set out in paragraph 15.5.6 of the SOR, an offshore option, ECSS 2, was also assessed. Overall, technical, environmental and socioeconomic factors are not considered to differentiate between onshore and offshore options for the purposes of option selection. However, ECSS 2 was substantially more expensive than either of the onshore options. This means that onshore options are preferred.

6.9 For the above reasons, ECO 6 now represents the most advantageous strategic option for the Project, when balancing cost, technical performance, environmental and socio-economic differentiators. NGET is therefore proposing to take forward ECO 6 as the preferred option.

6.10 Figure 6.1 below shows the proposed option ECO 6 "Grimsby to Walpole" project.

Figure 6.1 – ECO 6 - new Grimsby West to new Lincolnshire Connection substation(s), new Lincolnshire Connection substation(s) via new Weston Marsh to new Walpole



7. Policy and Legislative Changes

7.1 Overview

7.1.1 Revised versions of National Policy Statements EN-1 (Energy) and EN-5 (Electricity Networks Infrastructure) have been issued since the SOR was published in May 2023, with the revised versions due to be designated in early 2024. Until the revised versions have been designated, the previous 2011 versions would remain in force. Similarly, since the publication of the SOR, the Levelling Up and Regeneration Act 2023 (LURA) amended the duty in respect of Areas of Outstanding Natural Beauty (AoNBs) under section 85 of the Countryside and Rights of Way Act 2000 (CROW Act).

7.1.2 This section of this Addendum provides a summary of the relevant amendments, before confirming that the policy appraisals and wider conclusions as to strategic options for the Grimsby to Walpole project reported in the SOR and further considered in this Addendum would not be altered when the revised versions of EN-1, EN-5 are designated and the amendments to section 85 of the CROW Act are taken into account.

7.2 National Policy Statements EN-1 and EN-5

7.2.1 The analysis of strategic options reported in the SOR was based on a consideration of the versions of EN-1 and EN-5 published in 2011, with Appendix B to the SOR providing a summary of the key provisions and acknowledging the upcoming revision of EN-1 and EN-5. Revised versions of EN-1 and EN-5 have since been published, in November 2023. While the 2011 versions of EN-1 and EN-5 remain in force until the 2023 versions are designated, an updated version of Appendix B to the SOR is appended to this Addendum. In anticipation of the designation of the 2023 versions in early 2024, this provides an update to the summary of the key provisions of EN-1 and EN-5, with reference to the 2023 versions.

7.3 Section 85 of the CROW Act

7.3.1 Section 245 of the LURA amended the duty in respect of AoNBs under section 85 of the CROW Act, with those amendments coming into force from 26 December 2023. This introduces a duty to *further* the purpose of conserving and enhancing natural beauty In exercising or performing any functions in relation to, or so as to affect, land in an AoNB, with further details to follow in regulations. This goes beyond the previous duty to *have regard to* the purpose of conserving and enhancing natural beauty.

7.3.2 The duty applies to ”relevant authorities”, including decision-makers on applications for DCOs and to National Grid itself when exercising or performing any functions in relation to, or so as to affect, land in an AoNB. As a result, it is relevant to the consideration of strategic options, as reported in the SOR and this Addendum.

7.4 Conclusion

7.4.1 Having reviewed the changes referred to in this section, NGET has concluded that the policy appraisals and wider conclusions as to strategic options for the Grimsby to

Walpole project reported in the SOR and further considered in this Addendum would not be altered when the revised versions of EN-1, EN-5 are designated.

7.4.2 Further, having considered the amendments to section 85 of the CROW Act, NGET has concluded that, had the enhanced duty applied at the time the SOR was published, the conclusions as to strategic options for the Grimsby to Walpole project reported in the SOR would not have altered. This is due to the principle of avoidance of the AONB having been a starting principle for the development of strategic options for the project and therefore the changes to the CROW Act do not alter the overall approach the project has taken.

8. Conclusion and Next Steps

8.1 Overview

8.1.1 Since the publication of the SOR in May 2023, there have been material changes to the customer connections background in the East Coast Connections Group. Increased customer demand has made a new substation at Weston Marsh necessary. This Report has considered the implications of the requirement for a new Weston Marsh substation for the strategic option recommended in the SOR.

8.1.2 Given the additional connection requirements in the Lincolnshire region as detailed in Section 2, a new Weston Marsh substation is required regardless of the Grimsby to Walpole project.

8.1.3 Following the confirmation of the additional connection requirements at Weston Marsh substation, a backcheck exercise was completed. This confirmed the change did not result in any additional options being identified or previous discarded options being reconsidered.

8.1.4 It was determined that this substation would be delivered as part the Grimsby to Walpole Project as it would provide benefits such as a coordinated approach to consenting and delivery efficiencies.

8.1.5 Furthermore, including the new Weston Marsh substation within the scope of the Grimsby to Walpole project has the potential to improve network resilience due to the additional network node. Locating the new Weston Marsh substation in the vicinity of the Spalding Tee, and turning circuits into the substation would also mitigate the need for a separate project to reconductor the Spalding North Spur circuit.

8.1.6 Strategic Option ECO 6 includes a new Weston Marsh substation. The SOR concluded that ECO 5 was preferred over ECO 6. It was acknowledged that ECO 5 and ECO 6 offered similar technical performance, with the key difference being the requirement for an additional substation at Weston Marsh for ECO 6. Given the customer connection driver for a new 400 kV Weston Marsh substation, the preferred strategic option for the Grimsby to Walpole project is therefore now ECO 6.

8.2 Next steps

8.2.1 The Grimsby to Walpole project will now be taken forward to the next stage of development. This involves identification of a preliminary route corridor and graduated swathe, which indicates a more likely location for the development. This will be consulted on at non statutory consultation to seek feedback from consultees and help shape the further development of the projects.

8.2.2 This document forms part of the materials publicly available at non statutory consultation.

Appendices

Appendix A - Requirement for Development Consent Order

1.1 Electricity Network Infrastructure Developments

1.1.1 Developing the electricity transmission system in England and Wales subject to the type and scale of the project, may require one or more statutory consents which may include:

- planning permission under the Town and Country Planning Act 1990;
- a marine licence under the Marine and Coastal Access Act 2009;
- a Development Consent Order ("DCO") under the Planning Act 2008, and/or
- a variety of consents under related legislation.

1.1.2 The Planning Act 2008 defines developments of new electricity overhead lines of 132kV and above as nationally significant infrastructure projects ('NSIPs') requiring a DCO. Such an order may also incorporate consent for other types of work that are associated with new overhead line infrastructure development, and these may be incorporated as part of a DCO that is granted. Applications for a DCO have to be determined in accordance with National Policy Statements ("NPS") in most cases.

1.1.3 Six NPSs for energy infrastructure were designated by the Secretary of State for Energy and Climate Change in July 2011. The relevant NPSs for electricity transmission infrastructure developments are the Overarching National Policy Statement for Energy (EN-1) and the National Policy Statement for Electricity Networks Infrastructure (EN-5), which is read in conjunction with EN-1. In November 2023, Government published revised versions of NPS EN-1 to EN-5. The revised versions include clear linkages with policy objectives in respect of achieving net-zero by 2050 and the Government's ambition to deploy up to 50 GW of offshore wind capacity by 2030. While the 2011 versions of the NPSs remain in force until the 2023 versions are designated, the 2023 versions are expected to be designated in early 2024. As such, the references to EN-1 to EN-5 in this Appendix are to the 2023 versions.

1.1.4 Section 104(3) of the Planning Act 2008 states that the decision maker must determine an application for a DCO in accordance with any relevant NPS, except in certain specified circumstances (such as where the adverse impact of the proposed development would outweigh its benefits). The energy NPSs therefore provide the primary policy basis for decisions on DCO applications for electricity transmission projects. The NPSs may also be a material consideration for decisions on other types of development consent in England and Wales (including offshore wind generation projects) and for planning applications under the Town and Country Planning Act 1990.

1.2 Demonstrating the Need for a Project

1.2.1 Part 3 of EN-1 sets out Government policy on the need for new nationally significant energy infrastructure projects. Paragraph 3.2.1 confirms that the UK needs a range of the types of energy infrastructure covered by the NPS to ensure the supply of energy

always remains secure, reliable, affordable, and consistent with achieving net zero emissions in 2050 for a wide range of future scenarios. Paragraph 3.2.7 states that "substantial weight" should be given to the urgent need for the types of infrastructure covered by the NPS when considering applications for DCOs.

1.2.2 Description of the need for:

- new electricity transmission infrastructure is set out in EN-1 and EN-5
- new offshore/onshore wind generation is set out in EN-1 and EN-3, and
- new nuclear generation is set out in EN-1 and EN-6.

1.2.3 The need for new transmission infrastructure for this project is described in section 3 of the SOR.

1.3 Assessment Principles Applied by Decision Maker

1.3.1 Part 4 of EN-1 sets out the general policies that are applied in determining DCO applications relating to new energy infrastructure. Part 2 of EN-5 sets out the assessment principles in the specific context of electricity networks infrastructure.

1.3.2 Principles of particular importance for transmission infrastructure projects include:

1.3.3 Presumption in Favour of Development

- Section 4.1 of EN-1 confirms that the Secretary of State will start with a presumption in favour of granting consent for energy NSIPs. This presumption applies unless any more specific and relevant policies set out in the relevant NPS clearly indicate that consent should be refused. The presumption is also subject to the exceptions set out in Section 104(2) of the Planning Act 2008.
- In assessing any application, the Secretary of State should take account of potential:
  - benefits (e.g. the contribution to meeting the need for energy infrastructure, job creation, reduction of geographical disparities, environmental enhancements, and long term or wider benefits), and
  - adverse impacts (including on the environment, and including any long-term and cumulative adverse impacts, as well as any measures to avoid, reduce, mitigate or compensate for any adverse impacts, following the mitigation hierarchy).

1.3.4 The critical national priority for low carbon infrastructure

- Section 4.2 of EN-1 states that there is a critical national priority (CNP) for the provision of nationally significant low carbon infrastructure. EN-1 confirms that the CNP extends to all power lines in scope of EN-5 (including network reinforcement and upgrade works, and associated infrastructure such as substations), CNP is not limited to infrastructure associated specifically with a particular generation technology.
- Paragraph 4.2.7 explains that the CNP policy is relevant during Secretary of State decision making in reference to any residual impacts. Where the required assessment has been provided by an applicant, the CNP policy applies a starting assumption that CNP Infrastructure will meet tests such as:

- where development within a Green Belt requires very special circumstances to justify development,
- where development within or outside a Site of Special Scientific Interest (SSSI) requires the benefits (including need) of the development in the location proposed to clearly outweigh both the likely impact on features of the site that make it a SSSI, and any broader impacts on the national network of SSSIs,
- where development in nationally designated landscapes requires exceptional circumstances to be demonstrated, and
- where substantial harm to or loss of significance to heritage assets should be exceptional or wholly exceptional.

- Paragraphs 4.2.18 to 4.2.22 set out the approach to be taken to CNP Infrastructure in the context of a Habitats Regulations Assessment (HRA) or a Marine Conservation Zone Assessment (MCZA):
  - Any HRA or MCZA residual impacts will continue to be considered under existing frameworks.
  - Where, following Appropriate Assessment or MCZA, CNP Infrastructure has residual adverse impacts on the integrity of sites forming part of the UK national site network, either alone or in combination with other plans or projects, or which significantly risk hindering the achievement of the stated conservation objectives for the MCZ (as relevant) the Secretary of State will consider making a derogation.
  - In that consideration, the Secretary of State will start from the position that energy security and decarbonising the power sector to combat climate change:
    - requires a significant number of deliverable locations for CNP Infrastructure and for each location to maximise its capacity, with the fact that there are other potential plans or projects deliverable in different locations to meet the need for CNP Infrastructure being unlikely to be treated as an alternative solution and the existence of another way of developing the proposed plan or project which results in a significantly lower generation capacity being unlikely to meet the objectives and therefore be treated as an alternative solution, and
    - are capable of amounting to imperative reasons of overriding public interest (IROPI) for HRAs, and, for MCZ assessments, the benefit to the public is capable of outweighing the risk of environmental damage, for CNP Infrastructure.
  - For HRAs, where an applicant has shown there are no deliverable alternative solutions, and that there are IROPI, compensatory measures must be secured as part of a derogation.
  - For MCZs, where an applicant has shown there are no other means of proceeding which would create a substantially lower risk, and the benefit to the public outweighs the risk of damage to the environment, the Secretary of State must be satisfied that measures of equivalent environmental benefit will be undertaken.

1.3.5 Consideration of Alternatives

- Section 4.3 of EN-1 states that, from a planning policy perspective alone, there is no general requirement to consider alternatives or to establish whether the proposed project represents the best option. However, in relation to electricity transmission projects, paragraph 2.9.14 of EN-5 states,

  " *Where the nature or proposed route of an overhead line will likely result in particularly significant landscape and visual impacts, as would be assessed through landscape, seascape and visual impact assessment, the applicant should demonstrate that they have given due consideration to the costs and benefits of feasible alternatives to the overhead line. This could include – where appropriate – re-routing, underground or subsea cables and the feasibility e.g. in cost, engineering or environmental terms of these.*"

- Section 4.3 of EN-1 also makes clear that there will be circumstances where an applicant is specifically required to include information in their application about the main alternatives that were considered. These circumstances may include requirements in relation to compulsory acquisition and habitats sites.

1.3.6 Good Design

- Section 4.7 of EN-1 stresses the importance of 'good design' for energy infrastructure, explaining that this goes beyond aesthetic considerations as fitness for purpose and sustainability are equally important. It is acknowledged in EN-1 that the nature of much energy infrastructure development will often limit the extent to which it can contribute to the enhancement of the quality of the area. Section 2.4 of EN-5 highlights that the Secretary of State should bear in mind that electricity networks infrastructure must in the first instance be safe and secure, and that the functional design constraints of safety and security may limit an applicant's ability to influence the aesthetic appearance of that infrastructure.

1.3.7 Climate Change Adaptation and Resilience

- Section 4.10 of EN-1 explains how climate change adaptation and resilience should be taken into account, requiring the assessment of the impacts on and from the proposed energy project across a range of climate change scenarios. Section 2.3 of EN-5 expands on this in the specific context of electricity networks infrastructure. This states that DCO applications are required to set out the vulnerabilities / resilience of the proposals to flooding, effects of wind and storms on overhead lines, higher average temperatures leading to increased transmission losses, earth movement or subsidence caused by flooding or drought (for underground cables) and coastal erosion (for the landfall of offshore transmission cables and their associated substations in the inshore and coastal locations respectively).

1.3.8 Networks DCO Applications Submitted in Isolation

- Section 2.7 of EN-5 confirms that it can be appropriate for DCO applications for new transmission infrastructure to be submitted separately from applications for the generation that this infrastructure will serve. Section 8 of EN-5 explains that, where an application is a reinforcement project in its own right and does not accompany an application for a generating station, or is not underpinned by a "contractually-supported agreement" to provide an as-yet-unconsented generating station with a connection, the Secretary of State should have regard to the need case for new electricity networks infrastructure set out in Section 3.3 of EN-1.

1.3.9 Electricity Act Duties

- Paragraphs 2.8.4 and 2.8.5 of EN-5 recognise developers' duties pursuant to section 9 of the Electricity Act to bring forward efficient and economical proposals in terms of network design, as well as the duty to facilitate competition and so provide a connection whenever and wherever one is required.

1.3.10 Adverse Impacts and Potential Benefits

- Part 5 of EN-1 covers the impacts that are common across all energy NSIPs and sections 2.9-2.15 of EN-5 consider impact in the specific context of electricity networks infrastructure.
- Those impacts identified in EN-1 include air quality and emissions, greenhouse gas emissions, biodiversity and geological conservation, civil and military aviation and defence interests, coastal change (to the extent in or proximate to a coastal area), dust, odour, artificial light, smoke, steam and insect infestation, flood risk, historic environment, landscape and visual, land use, noise and vibration, socio-economic impacts, traffic and transport, resource and waste management and water quality and resources. The extent to which these impacts are relevant to a particular stage of a project, or are a relevant differentiator at a particular stage of the options appraisal process, will vary. In particular, some of these impacts are scoped out of this stage of the options appraisal process for this project.
- EN-5 considers specific potential impacts associated with electricity networks, including the following topics: biodiversity and geological conservation, landscape and visual, noise and vibration, electric and magnetic fields and sulphur hexafluoride.
- Landscape and Visual impacts are of particular relevance for electricity transmission infrastructure projects. Paragraph 2.9.7 of EN-5 states that the Government does not believe that development of overhead lines is incompatible in principle with the statutory duty under section 9 of the Electricity Act 1989 to have regard to visual and landscape amenity and to reasonably mitigate impacts. While paragraph 2.9.20 of EN-5 states that use of overhead lines as transmission technology should be the strong starting presumption for electricity networks developments, EN-5 recognises that in practice overhead lines can give rise to adverse landscape and visual impacts, dependent upon their type, scale, siting, degree of screening and the nature of the landscape and local environment through which they are routed. It also confirms that the presumption is reversed when crossing part of a nationally designated landscape.
- In relation to alternative technologies for electricity transmission projects, paragraph 2.9.22 of EN-5 states in relation to developments crossing a nationally designated landscape that,

  "undergrounding will not be required where it is infeasible in engineering terms, or where the harm that it causes (see section 2.11.4) is not outweighed by its corresponding landscape, visual amenity and natural beauty benefits."
- Similarly, paragraph 2.9.24 of EN-5 states in relation to developments that do not cross a nationally designated landscape that,

  "*taking account of the fact that the government has not laid down any further rule on the circumstances requiring use of underground or subsea cables, the Secretary of State must weigh the feasibility, cost, and any harm of the undergrounding or subsea option against: the adverse implications of the overhead line proposal; the cost and feasibility of re-routing overhead lines or mitigation proposals for the*

relevant line section; and the cost and feasibility of the reconfiguration, rationalisation, and/or use of underground or subsea cabling of proximate existing or proposed electricity networks infrastructure."

- Paragraph 2.9.16 of EN-5 confirms that the Holford Rules, which are a set of "common sense" guidelines for routeing new overhead lines should be embodied in applicants' proposals. The Horlock Rules deal in a similar fashion with the siting of new substations and similar infrastructure. Paragraph 2.11.2 goes on to state that the Secretary of State should be satisfied that the development, so far as is reasonably possible, complies with the Holford Rules and Horlock Rules.

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