The Great Grid Upgrade

Sea Link

Preliminary Environmental Information Report

Volume: 1

Part 1 Introduction

Chapter 3 Main Alternatives Considered

Version A

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1.3 Main Alternatives Considered

1.3.1 Introduction

1.3.1.1 The current stage of the Proposed Project design is the result of an iterative process that commenced at project inception, when the initial need to reinforce the network in the South East of England and East Anglia was identified. Environmental, engineering and economic considerations have influenced the optioneering and design evolution process. There have also been extensive discussions with the relevant stakeholders during the development of the Proposed Project, as well as a round of non-statutory consultation. The iterative design process will continue up to the application for development consent in parallel with, and informed by, the EIA process.

1.3.1.2 **Volume 1, Part 1 Chapter 2, Regulatory and Planning Context** sets out the overarching policy relevant to the Proposed Project, comprising National Policy Statement (NPS) EN-1 and NPS EN-5. These have been considered during the options appraisal process for the Proposed Project. A review of the NPS was announced in the 2020 Energy white paper: Powering our net zero future. This review was to ensure the NPSs were brought up to date to reflect the policies set out in the white paper. These updates are currently under consultation. With reference to the consideration of alternatives, paragraph 4.4.2 of EN-1 states that:

"*Applicants are obliged to include in their ES, as a matter of fact, information about the main alternatives they have studied. This should include an indication of the main reasons for the applicant's choice, taking into account the environmental, social and economic effects including, where relevant, technical and commercial feasibility*."

1.3.1.3 Whilst there is no statutory requirement to include alternatives within a Preliminary Environmental Information Report (PEIR) The Planning Inspectorate's Advice Note Seven (Ref 1.3.1) recommends that an Environmental Statement (ES):

"*explains the reasonable alternatives considered and the reasons for the chosen option taking into account the effects of the Proposed Development on the environment*".

1.3.1.4 This chapter should be read in conjunction with:

- **Volume 1, Part 1, Chapter 1, Introduction**;
- **Volume 1, Part 2, Chapter 1, Evolution of the Suffolk Onshore Scheme**;
- **Volume 1, Part 3, Chapter 1, Evolution of the Kent Onshore Scheme**; and
- **Volume 1, Part 4, Chapter 1, Evolution of the Offshore Scheme**.

1.3.1.5 This chapter is supported by the following figures:

- **Figure 1.3.1 Routeing and Siting Study Area**;
- **Figure 1.3.2 Suffolk Landfall Areas of Search**;
- **Figure 1.3.3 Kent Landfall Areas of Search**;
- **Figure 1.3.4 Suffolk Network Connection Points**;
- **Figure 1.3.5 Suffolk Converter Site Option Areas**;

- **Figure 1.3.6 Kent Converter Site Option Areas**;
- **Figure 1.3.7 Suffolk Terrestrial Route Corridors – Sizewell Connection**;
- **Figure 1.3.8 Suffolk Terrestrial Route Corridors – Proposed Friston Connection**;
- **Figure 1.3.9 Suffolk Terrestrial Route Corridors – New Connection**;
- **Figure 1.3.10 Kent Terrestrial Route Corridors**; and
- **Figure 1.3.11 Marine Alignments**.

1.3.2 National Grid Approach to Project Development and Delivery

1.3.2.1 As part of the first stage of project development National Grid undertakes options appraisal on each new project. There are often a number of different ways that a project needs case could be met which could involve different locations, technologies or designs. Each project requires judgements and decisions to be made about the best way forward to achieve the required outcome. The options appraisal process provides information to help inform those judgements.

1.3.2.2 Options appraisal is a robust and transparent process that is used to compare options and to assess the positive and negative effects. Options are appraised across a wide range of criteria including environmental, socio-economic, technical and cost factors, as set out in National Grid publication "*Our Approach to Consenting*" (Ref 1.3.2). The aim is to find a balanced outcome, bearing in mind the range of National Grid's statutory duties. The assessment is documented to provide, in a transparent manner, information upon which decisions are based.

1.3.2.3 At each stage of the options appraisal process, a clearly defined methodology has been used to inform the decision-making process. This has included technical inputs from engineers and environmental consultants to inform the decisions and design. The assessment has drawn on data and evidence collected from both desktop studies and site visits. Decision making has also taken into account the feedback from prescribed consultees, as defined in the PA2008 and the local community, and will continue to take account the feedback from the prescribed bodies alongside feedback from the local community through an extensive programme of engagement and consultation. In addition, the Proposed Project has been subject to periodic internal challenge and review process to ensure the robustness of the decision made in the light of a changing environmental baseline related to technical, physical and economic matters.

1.3.2.4 Image 1.3.1 shows where the options appraisal sits within National Grid's approach to project development and delivery, as set out in the National Grid publication "*Our Approach to Consenting*" (Ref 1.3.2).

1.3.2.5 The Proposed Project is currently at the Defined Proposal and Statutory Consultation stage.

Image 1.3.1: National Grid's approach to project development and delivery

1.3.2.6 Project decisions have taken into account National Grid's statutory obligations set out in Sections 9 and 38 of the Electricity Act 1989, its licence requirements and all other relevant considerations including the relevant NPSs. The options appraisal has also considered other policy and guidance when making judgements and decisions on the Proposed Project including the Horlock Rules (Ref 1.3.3) and Holford Rules (Ref 1.3.4).

1.3.2.7 The following sections describe the alternatives considered at each stage of the Proposed Project's development to date and the environmental and socio-economic factors that have been taken into account.

1.3.3 Alternatives Considered

1.3.3.1 Alternatives have been considered at each stage of the Proposed Project's development. They will continue to be considered in the development of the Proposed Project for which an application for development consent will be made to the Secretary of State (SoS).

1.3.3.2 The following sections provide a summary of the main alternatives that have been considered at each stage of the Proposed Project to date.

1.3.4 Strategic Proposal

1.3.4.1 A range of strategic options that might address the network reinforcement needs were identified and appraised at a strategic level. These appraisals considered the likely environmental and socio-economic effects, technical issues, and costs that would be associated with each strategic option. The network performance of each strategic option was also modelled to determine the benefits. The appraisal and modelling results informed judgements regarding the relative merits of the options and ensured that the final Strategic Proposal would meet National Grid's statutory duties under the Electricity Act, including the requirement to bring forward proposals that are efficient, co-ordinated and economical, have regard to the desirability of preserving amenity and that would comply with the relevant planning policies for which the consents would be granted.

1.3.4.2 A Strategic Options Report (Ref 1.3.5) has been published as part of Statutory Consultation which sets out the strategic options that have been considered for the Proposed Project and the reasons for the selection of the preferred strategic option.

Background to the Proposed Project

1.3.4.3 The need for the Proposed Project is presented in **Volume 1, Part 1, Chapter 1, Introduction**. Once the needs case to rationalise network reinforcement where possible, whilst ensuring compliance with National Grid's statutory duties, was established, the strategic options considered for the Proposed Project were developed and appraised.

1.3.4.4 The need to reinforce the transmission system is reviewed on an annual basis in response to predicted changes, such as new renewable and low-carbon energy generation forecasted to connect to the network. This review, which sets out the parts of the network that require reinforcing, is within the Electricity Ten Year Statement (Ref 1.3.6). Proposals that provide those reinforcements are then assessed through the Network Options Assessment (NOA) (Ref. 1.3.7) which is published annually.

1.3.4.5 The need to reinforce the network in the South East of England and East Anglia is driven by interconnection with mainland Europe as well as new renewable generation connecting to the network. This reinforcement was assessed in the 2018/2019 NOA and National Grid explored several strategic options that could deliver the required reinforcement. One of the strategic options that was considered was a nominal subsea High Voltage Direct Voltage (HVDC) link between the South East of England and East Anglia. This was included in order to appraise the performance of this strategic option, which crossed multiple system boundaries against others which just addressed the need in the South East of England. The appraisal identified that this strategic option provided the reinforcement required to the network in the South East of England as well as providing reinforcement to the network in East Anglia. The network in East Anglia was also identified in the 2018/2019 NOA as likely to need reinforcing in the future due to the volume of possible upcoming generation connecting within this region.

1.3.4.6 Strategic options were then developed that explored links between the South East of England and East Anglia that could provide the reinforcement required. This work identified that a connection between East Anglia and Richborough in Kent provided this reinforcement, this was then reflected in the 2019/2020 NOA.

1.3.4.7 Additional network studies in East Anglia were then undertaken to confirm which connection point provided the best value to customers whilst minimising potential environmental and socio-economic impacts. These studies identified that the link needed to connect into the Sizewell area in order to maximise the system benefit.

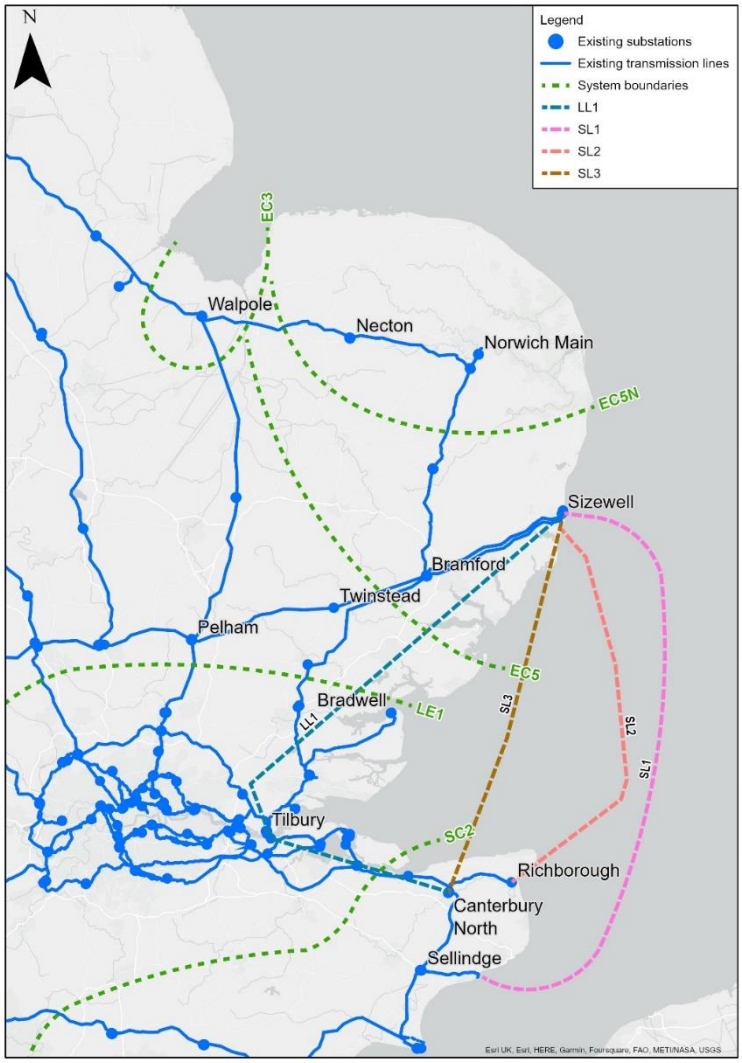
1.3.4.8 The 2020/2021 NOA (Ref 1.3.8) also identified the reinforcements that were required to the network in East Anglia and National Grid undertook a similar exercise to investigate solutions that could provide this wider reinforcement. The Sizewell to Richborough HVDC Link (by this point named the "*Sea Link Project*") was included as part of this exercise to confirm it remained the preferred solution under all scenarios. The Electricity System Operator (ESO) published the Holistic Network Design (HND) report in July 2022, accompanied by a "*NOA Refresh*" document (Ref 1.3.7). The HND sets out a single integrated transmission network design that supports the large-scale delivery of electricity generated from offshore wind, with the NOA Refresh indicating which options are "*HND critical*". The July 2022 NOA Refresh also identified reinforcements in the East Anglia and South East as HND essential options.

Strategic options considered for the Proposed Project

1.3.4.9 Following the identification of the need for the reinforcement to connect into the Sizewell area in East Anglia and into the South East of England four alternative strategic options were appraised these are listed below and illustrated on Image 1.3.2:

- SL1 – Sizewell Area to Sellindge subsea – approx. 180km;
- SL2 – Sizewell Area to Richborough subsea approx. 130km;
- SL3 – Sizewell Area to Canterbury subsea approx. 120km; and
- LL 1 – Sizewell Area to Canterbury onshore approx. 220km.

Image 1.3.2: Schematic of Strategic Options considered for the Proposed Project



1.3.4.10 As part of the Strategic Optioneering for the Proposed Project, National Grid considered the:

- technology options available for each potential Strategic Option for transmission system reinforcement;
- environmental and socio-economic constraints relevant to each option; and
- lifetime costs of each technology option as well as the initial capital cost.

Environmental and Socio-economic appraisal

1.3.4.11 As explained in the Strategic Options Report (Ref 1.3.5), following technical and benefits filtering, the CPRSS excluded the onshore option LL1 from environmental and socio-economic appraisal. Onshore option LL1 was subsequently included in the strategic options assessment exercise reported in the SOR for completeness, to assess whether the option offers any benefit over the offshore options SL1, SL2 and SL3. .

1.3.4.12 The following sections provide a summary of the environmental and socio-economic considerations taken into account for the remaining three options.

Sizewell Area

1.3.4.13 The coastal areas are part of the Suffolk Coasts and Heaths Area of Outstanding Natural Beauty (AONB), and the Suffolk Heritage Coast extends along the whole coastline within the Sizewell area. The existing Sizewell substation is within both designations.

1.3.4.14 Onshore at Sizewell, the Sandlings Special Protection Area (SPA), Leiston to Aldeburgh SSSI, the Alde-Ore and Butley Estuaries Ramsar, SPA and Special Area of Conservation (SAC) are located to the south and the Minsmere-Walberswick Ramsar, SPA and SAC, Minsmere – Walberswick Heaths and Marshes SSSI and Sizewell Marshes SSSI are located to the north, a large proportion of which is also designated as a Royal Society for the Protection of Birds (RSPB) reserve. Orford Ness National Nature Reserve (NNR) which is owned by the National Trust is located to the south.

1.3.4.15 There are a number of proposed developments in the Sizewell area including the proposed Sizewell C nuclear power station, Scottish Power Renewables (SPR), The East Anglia ONE North Offshore Wind Farm and The East Anglia TWO Offshore Wind Farm which included a proposed new substation at Friston and two National Grid Ventures (NGV) Interconnector projects, Nautilus and LionLink (formally known as EuroLink).

1.3.4.16 The area is relatively sparsely populated with the small settlements of Leiston, Knodishall and Friston. Blaxhall, Tunstall, Chillesford and Sudbourne.

1.3.4.17 It was considered likely that significant effects on the designated sites for nature conservation could be avoided or mitigated through construction techniques. Due to the extent of the AONB setting effects of a converter station or substation were considered likely to be a principal consideration.

1.3.4.18 In addition, as there is a significant amount of proposed development in the vicinity of Sizewell and the settlements of Leiston and Friston it was considered that cumulative effects would be a key consideration.

Sellindge Area

1.3.4.19 Thanet Coast and Sandwich Bay SPA, Ramsar and SAC are located along the north and east coasts of Kent with the Swale designated sites to the far northwest. Dungeness and Romney Marsh designated sites are present along the south Kent coast and all but the SPA could be avoided with a landfall along the south Kent coast.

1.3.4.20 Overall, the area is relatively sparsely populated but there are areas of higher population density around the settlements of Canterbury and Ashford and along the coastal strip including Herne Bay, Margate, Ramsgate, Deal, Dover and Folkstone.

1.3.4.21 Sellindge substation is located adjacent to the M20 and the High Speed 1 (HS1) corridor. The siting of a converter station close to the existing substation would be in keeping with existing infrastructure in this locality. The existing substation is located within Flood Zone 3 therefore any extension to this substation is likely to require an exception test to demonstrate no suitable alternatives, however as this is an existing substation this was considered unlikely to be a significant constraint.

1.3.4.22 There is designated Heritage Coast within this area at Dover and Folkstone which was considered to be avoidable, and the Royal Military Canal Scheduled Monument is located in this area. This latter designation would need to be crossed with a landfall on the south Kent coast, however, should standard trenchless construction techniques be used it was considered likely that any impacts on this designation could be avoided.

Canterbury Area

1.3.4.23 This area includes the settlement of Canterbury which includes the World Heritage Site of Canterbury Cathedral, St. Augustine's Abbey and St. Martin's. There is a large area of Ancient Woodland to the west and north of Canterbury which is contiguous with Blean complex SAC and West Blean and Thornden Woods Site of Special Scientific Interest (SSSI) with very limited opportunity to avoid all three if a landfall on the north Kent coast is made, in particular when considered in conjunction with other constraints. The Stodmarsh Complex of protected sites is located to the east of Canterbury and together with the existing settlement pattern in this locality could constrain potential route options.

1.3.4.24 Canterbury substation is within Flood Zone 3 therefore the extension to this substation is likely to require an exception test to demonstrate no suitable alternatives, however as this is an existing substation this was considered unlikely to be a significant constraint. Due to the extent of development around Canterbury Substation there are limited opportunities to site a converter station in close proximity.

1.3.4.25 Coastal designated sites include The Swale SPA/Ramsar/SSSI and Thanet Coast and Sandwich Bay SPA/Ramsar and Thanet Coast SSSI, when considered individually these designations are avoidable, however, when considered in-combination with other constraints avoidance is unlikely. The former of these designations is designated for both breeding and over wintering populations of bird species therefore the timing of cable installation was considered to be a principal consideration. Saltwater Levels and Blean Woods RSPB Reserves are located to the northwest of Canterbury and in-combination with other constraints were considered to be a principal consideration.

1.3.4.26 The main settlements in this area include Canterbury, Whitstable and Herne Bay. The Kent Downs AONB is located to the south of Canterbury but was considered likely to be avoidable. The area at Canterbury has a large amount of the Best and Most Versatile (BMV) agricultural land and in addition to this a large amount of high value agricultural land including orchards and vineyards.

Richborough Area

1.3.4.27 Richborough substation is located on the east Kent coast within Richborough Energy Park. The area around the substation is sparsely populated and the existing substation is surrounded by similar infrastructure.

1.3.4.28 The majority of the coastline at Richborough is designated as Thanet Coast and Sandwich Bay designated sites for nature conservation and where there are gaps in these designations there is a denser settlement pattern at Deal and Ramsgate. The Stodmarsh designated sites are located to the west of Richborough.

1.3.4.29 A large proportion of the area is sparsely populated however there is a denser network of settlements around the coast including Herne Bay, Birchington, Margate, Broadstairs, Ramsgate Sandwich and Deal.

1.3.4.30 Richborough substation itself is partly within Flood Zone 2 therefore the extension to this substation is likely to require an exception test to demonstrate no suitable alternatives, however as this is an existing substation it was considered unlikely to be a significant constraint. There are also large areas of Flood Zone 2 and 3 in the area associated with the low-lying coastal marshes and the River Stour which would be a key consideration for the siting of a converter station. The siting of a converter station close to the existing substation would be in keeping with existing infrastructure in this locality.

1.3.4.31 There is a large proportion of high value agricultural land within the area associated with vineyards and orchards.

Offshore Environment

1.3.4.32 Offshore there are number of designated sites including the Outer Thames Estuary SPA, Margate and Long Sands SAC, the Southern North Sea SAC and the Goodwin Sands, Kentish Knock East and Orford Inshore Marine Conservation Zones (MCZs). Whilst the Outer Thames Estuary SPA is likely to be unavoidable, it is likely that impacts could be managed through timing or construction practices and therefore this site was not considered to be a barrier to future development. Likewise, the Southern North Sea SAC is designated for harbour porpoise, and it is expected that any potential effects could be managed through timing or construction practices. Margate and Long Sands SAC was considered to be a principal consideration due to the potential for permanent habitat loss associated with cable crossings and protection however this site is avoidable. The offshore MCZs are avoidable when considered in isolation. Coastal designations include the Thanet Coast MCZ/SAC, Thanet Coast and Sandwich Bay SPA/Ramsar, Sandwich Bay SAC, Orford Ness – Shingle Street SAC, Alde-Ore Estuary SPA/Ramsar, Minsmere-Walberswick SPA/Ramsar and Minsmere to Walberswick Heaths and Marshes SAC/SSSI and Leiston to Aldeburgh SSSI, whilst unlikely that some degree of interaction with one or more of these sites is unavoidable, through appropriate routeing and mitigation it was considered likely that significant effect were likely to be avoidable.

1.3.4.33 The Outer Thames Estuary is a highly mobile environment. Mobile sediment is considered to be an important consideration as cable spanning or over burial could result in damage or potential operational performance issues. Within the area in the outer Thames there are extensive areas outside of the main shipping channels which are very shallow principally Kentish Flats, Goodwin Sands, and Sunk Sand. These shallow waters whilst not precluding placement of transmission infrastructure are a consideration for installation methods and in particular any rock placement required for crossings of other infrastructure. This was considered likely to be a determining factor where any rock placement would result in a reduction of water depth of 5% or more which is generally considered to be unacceptable. Within the area it is unlikely cable crossings could be avoided within the shallow waters of Kentish Flats with a north Kent landfall however it may be possible to avoid shallow water crossings at Goodwin Sands should an east Kent landfall be made.

1.3.4.34 The primary marine users within the area include shipping and navigation and fishing, with the most significant port area being the Port of London Authority (PLA). However, the Port of Ramsgate, is also present and the dredged channel for the Ports of Harwich and Felixstowe extend into the area. The main shipping channels into the Port of London include Princes, Black and Borrow Deep which converge into the Yantlet Channel that extends up the inner Thames. Due to the shallow and mobile nature of the seabed within the Thames Estuary a number of these channels are dredged to facilitate access for the larger vessels along with channels into both Ramsgate, Harwich and Felixstowe. Shipping channels, in particular, those which are dredged are considered to be a primary determining factor as dredging could result in the exposure and potential damage to a transmission cable.

1.3.4.35 Within the area other marine infrastructure is present including Kentish Flats, Thanet, London Array, Greater Gabbard and Galloper offshore wind farms and export cables, BritNed and Nemo Link interconnectors and the proposed NeuConnect and GridLink Interconnectors. Whilst the offshore wind farms are avoidable, it was considered unlikely that crossings of cables, could be avoided entirely. As discussed above where these crossings can't be avoided in shallow waters such as Kentish Flats this is considered to be a principal consideration due to potential reduction in water depth. Whilst (with the exception of the Outer Thames Estuary SPA, Southern North Sea SAC and cable crossings) most constraints in the marine area were considered avoidable when considered in isolation, when considered in combination avoidance may not be possible.

Environmental and Socio-economic Overview

1.3.4.36 Aligned with the technical and cost appraisal explained in the Strategic Options Report (Ref 1.3.5), the environmental and socio-economic appraisal highlighted constraints for each. However, none of the environmental and socio-economic constraints outweighed the most economical technical option being the right solution. The current evidence supports locating the option between the Sizewell area and Canterbury/Richborough (or a point in-between) that supports a solution based on the overall technical, cost, environmental and socio-economic considerations, for the connection to meet the need set out.

1.3.5 Options Identification and Selection

1.3.5.1 Having identified the preferred Strategic Option, National Grid undertook a Corridor and Preliminary Routeing and Siting Study (CPRSS) (Ref 1.3.9). This process is described below.

Approach to Routeing and Siting

1.3.5.2 A staged approach was adopted to identify corridors and preliminary routeing and siting options for the Proposed Project. This approach considered the potential effects on the environment, local communities, relevant spatial planning policy and planning applications, other existing and proposed developments, and technical and engineering design considerations.

1.3.5.3 The aim of the approach was to identify 'on-balance' preferences for landfalls, converter station sites and potential route corridors within which preliminary alignments could be developed.

1.3.5.4 Each of the options identified for the converter site option areas and cable route corridors were appraised in accordance with National Grid's approach to options appraisal (Ref 1.3.10) and back checked as required. This guidance was developed by National Grid to provide a thorough and consistent approach to the appraisal of network reinforcement options. It represents the best practice approach to inform the decision-making process. The aim of the guidance is to ensure that decisions regarding the technology options and/or location of infrastructure are based on a full understanding of the implications of each option using a wide range of criteria.

1.3.5.5 In addition to the above and in the absence of guidance for specific siting of converter stations, the Horlock Rules (Ref 1.3.3) have been applied. These were developed for the siting of substations, and were used when identifying and appraising converter site option areas.

1.3.5.6 The overarching principle of National Grid's approach is to follow a staged process for routeing and siting to identify preferred options. The steps undertaken for the Proposed Project in this staged approach are summarised below.

1.3.5.7 **Step 1 Identification of the Routeing and Siting Study Area:** This step sought to identify the extent of the study area within which route corridors and converter station site option areas could be developed. This was based on the study area used at the strategic option stage but widened out in places to ensure route corridors could be developed that avoided environmental and socio-economic constraints as far as possible. The routeing and siting study area is illustrated on **Figure 1.3.1 Routeing and Siting Study Area**.

1.3.5.8 **Step 2 Data Gathering:** This step sought to build on the constraints data already obtained through the strategic options process to ensure relevant baseline information from available sources was taken into consideration in the options appraisal process.

1.3.5.9 **Step 3 Identification of Landfall Areas of Search:** This step involved the identification of areas of potential landfall within the study area as this is the interface between the onshore and offshore elements of the Proposed Project and therefore form the start and end points from which corridor options could be identified. The landfall areas of search are illustrated on **Figure 1.3.2 Suffolk Landfall Areas of Search** and **Figure 1.3.3 Kent Landfall Areas of Search** and were identified based on the following criteria:

- Access to the proposed onshore grid connection point;
- Suitability of ground conditions (e.g. areas of low elevation, avoidance of estuarine habitats);
- Potential for site access;
- Avoidance of existing infrastructure; and
- High level consideration of potential key environmental and socio-economic constraints such as populated areas and ecological designations. Landfall areas of search were not necessarily ruled out on the basis of these potential constraints and were taken forward in order to be subjected to an initial routeing and siting environmental and socio-economic options appraisal.

1.3.5.10 **Step 4 Identification of Route Corridors and Site Option Areas:** This step involved the identification of marine route corridors and alignments between the landfall areas of search in parallel with the identification of terrestrial route corridors and converter station site option areas including the connection to the network.

1.3.5.11 **Step 5 Appraisal of Route Corridors and Site Option Areas:** This step involved an appraisal of the marine route corridors and alignments, terrestrial corridors, converter station siting areas and network connection options.

1.3.5.12 **Step 6 Identification of the Preferred end-to-end solution:** This step used the outcomes of the environmental and socio-economic and technical appraisal of the individual elements as well, as a consideration of cost, to identify an on-balance preferred end-to end solution for the Project.

Steps 3 – 4 Identification of Landfalls, Corridors and Site Option Areas

1.3.5.13 The sections below provide a summary of the options that were considered within steps 3-4 above.

Landfall areas of search

1.3.5.14 On the East Anglian coast in Suffolk five broad landfall areas of search were identified, these are illustrated on **Figure 1.3.2 Suffolk Landfalls Areas of Search** these were: an area to the south of Aldeburgh, north of the Alde and Ore River (S1); an area between Aldeburgh and Thorpeness (S2); an area between Thorpeness and Sizewell (S3); an area at Sizewell (S4); and an area to the north of Sizewell, south of Minsmere (S5).

1.3.5.15 On the Kent coast six landfall areas of search were identified, which were split geographically across the north Kent coast, Broadstairs and Pegwell Bay, these are illustrated on **Figure 1.3.3 Kent Landfall Areas of Search**. Four areas of search were identified along the north Kent coast between the settlements of Herne Bay and Birchington (K2-K5). One area was identified at Broadstairs at North Foreland between the settlements of Margate and Broadstairs (K1a). Within Pegwell Bay one area of search was identified that stretched across the area from the settlement of Ramsgate to the settlement of Deal (K1).

Converter station site option areas

1.3.5.16 The main search parameter for the converter station site option areas was that they should be within approximately 5 km of the network connection point, as a distance greater than this would trigger the need for reactive compensation equipment on the network resulting in additional land take and cost. This search parameter was however used as a guide, so as not to discount potentially suitable sites at a slightly greater distance where the benefits might outweigh the additional land take and cost.

1.3.5.17 Within Suffolk, the needs case identified that the network connection point needed to be in the Sizewell area, so all three strategic options were based on this. Three potential points of connection were identified and appraised as part of the routeing and siting appraisal. These connection points are illustrated on **Figure 1.3.4 Suffolk Network Connection Points** and were the existing Sizewell B substation or the new Sizewell C substation (part of the proposed Sizewell C Nuclear Power Station Project); the proposed Friston substation (forms part of the proposed SPR East Anglia One North and East Anglia Two Offshore Wind Farm Projects); or a new connection point directly onto the existing 400 kV overhead lines close to Sizewell.

1.3.5.18 Nine converter station site option areas were identified, these are illustrated on **Figure 1.3.5 Suffolk Converter Site Option Areas**. A number of which were in the search parameters for more than one connection point. Four site option areas within the 5 km search parameter for a connection to the Sizewell substations (option areas A, B, C and D), seven within the 5 km search parameter for the proposed Friston substation (option areas (B, C, D, E, G and H) and six within the 5 km search parameter for a new connection onto the existing 400 kV overhead lines (option areas B, D, E, F, H and I).

1.3.5.19 In Kent, the preferred strategic option included Richborough substation as the connection point and this was therefore used as the 5 km radius search parameter. Two converter site option areas were identified, one adjacent to Richborough substation and wider Richborough Energy Park and a second between the settlements of Minster and Birchington adjacent to some larger scale agricultural uses. These are illustrated on **Figure 1.3.6 Kent Converter Site Option Areas**.

1.3.5.20 There were few brownfield sites that could accommodate the technical parameters required for the converter station. Therefore, the identification of converter station site option areas was based on avoidance of designated sites as far as possible, landform, opportunities for natural screening and opportunities to limit visual impacts on nearby settlements.

Terrestrial route corridors

1.3.5.21 Once the landfall areas of search and converter station site option areas had been identified, terrestrial route corridors between the two were developed. Corridors were developed that could connect each of the landfall areas of search to each of the converter station site option areas.

1.3.5.22 Within Suffolk this process resulted in 15 corridors being identified, some of which could be used for multiple landfall/site permutations:

- five corridors from each of the five landfall areas of search to the four converter station site option areas that could connect into the existing and proposed Sizewell substations (see **Figure 1.3.7 Suffolk Terrestrial Route Corridors – Sizewell Connection**);

- five corridors from each of the five landfall areas of search to the seven converter site option areas that could connect into the proposed Friston substation (see **Figure 1.3.8 Suffolk Terrestrial Route Corridors – Proposed Friston Connection**); and
- five corridors from each of the five landfall areas of search to the six converter station site options that could connect into the existing 400 kV overhead lines (see **Figure 1.3.9 Suffolk Terrestrial Route Corridors – New Connection**).

1.3.5.23 Within Kent seven corridors were identified; three corridors connecting three of the four landfall areas of search along the north Kent coast to the two converter site option areas, one corridor from the landfall area of search at Broadstairs to the two converter station site option areas; and three corridors from the wide landfall area of search within Pegwell Bay to the two converter station site option areas. These are illustrated on **Figure 1.3.10 Kent Terrestrial Route Corridors**.

1.3.5.24 The terrestrial corridors were not developed to a specified width but were limited by larger constraints such as:

- Avoidance of designations where possible;
- avoidance of settlements; and
- consideration of traffic and access opportunities.

1.3.5.25 This was to allow for maximum flexibility also factoring in the potential technical constraints and avoiding prematurely discounting potentially favourable/feasible alignment options.

Marine route alignments

1.3.5.26 The very large geographical marine study area and large-scale nature of many of the constraint features meant that in order to undertake a meaningful routeing appraisal, it was necessary to identify indicative marine alignments within the broader corridors to appraise the feasibility of cable burial. Therefore, alignments are illustrated on **Figure 1.3.11 Marine Alignments**.

1.3.5.27 The marine alignments were split down into sections within three broad areas. These comprised sections that connected to each of the five Suffolk landfalls, sections that connected to each of the six Kent landfalls, and central sections. Due to the number of end-to-end marine alignments associated with multiple landfall connection points and central sections, the marine alignment sections were taken through the appraisal stage but whole marine end to end solutions were considered as part of the identification of the preferred end-to end solution.

1.3.5.28 The principal driver in defining the marine corridors and alignments between the landfall areas of search was to identify areas that would ensure the long-term integrity and security of the cable whilst also avoiding key constraints. The following design criteria were taken into consideration when developing the marine corridors and marine alignments:

1.3.5.29 Shortest route possible to minimise the cable length, which in turn reduces the manufacturing and installation cost as well as the environmental and security footprint;

- Avoidance of environmentally sensitive areas where possible;
- Avoidance of areas that have restricted movement i.e., anchorages;

- Avoidance of known wrecks and areas of archaeological importance;
- Avoidance of offshore installations (renewable, oil/gas, wells/platforms, etc.);
- Limiting the need to cross in-service cables and pipelines and, where crossings would be necessary, corridors and alignments were routed to ensure the crossing angle would be optimal and water depth would be sufficient for navigational safety;
- Routed to consider shipping density, i.e., anchorage areas, high density shipping lanes;
- Avoidance of hazardous seabed terrain (e.g., bedrock outcrop and mobile sediments) where possible, ensuring the cable would be protected by achieving an acceptable depth of burial; and
- Limiting the impact on third-party considerations including seasonal fishing activities, local tourist trade, and military practice zones.

Step 5 Appraisal of Landfalls, Route Corridors and Site Option Areas

1.3.5.30 Each of the elements described above was assessed individually. A separate assessment was not undertaken for each of the landfall areas of search as the performance of each landfall is influenced by both the marine and terrestrial corridor approach. The landfalls were therefore assessed as part of the assessment of both the terrestrial route corridors and the marine route alignments.

1.3.5.31 The sections below provide an overarching summary of the appraisal of the individual elements.

Converter station site option areas

Suffolk Onshore Scheme

1.3.5.32 Within Suffolk the appraisal of the three connection points was undertaken alongside that of the converter site option areas.

1.3.5.33 Of the possible connection points in the Sizewell area, only the Sizewell B substation is currently in existence; all the other proposed connection points would require the installation of a new substation, either proposed through another project in the area or installed as part of this Proposed Project. Connecting to the existing Sizewell B substation would require taking over two of the super grid transformer (SGT) circuits feeding the existing Leiston 132 kV substation, by connecting into the 400 kV circuits feeding the SGTs. This would require the installation of two new 400/132 kV SGTs in the converter station site with new 400 kV cables connecting into the existing Sizewell B substation and new 132 kV cables connecting the SGTs in the converter station with the Leiston 132 kV substation. The 400 kV cable route to the existing Sizewell B substation would require either using the corridor allocated to the existing 132 kV connection or routeing through Sizewell Marshes SSSI.

1.3.5.34 A connection into the proposed Sizewell C substation would also require using the corridor allocated to the existing 132 kV connection or require routeing through Sizewell Marshes SSSI. A connection into either, the existing or the proposed Sizewell substation would also need to take into account the works to construct the proposed Sizewell C Nuclear Power Station, as the works would overlap. This interaction with the proposed Sizewell C Nuclear Power Station could have programme implications on the delivery of this Proposed Project in line with the needs case due to construction sequencing.

1.3.5.35 At the time of the routeing and siting appraisal (and remains true as at the time of writing this chapter), the DCOs that would deliver the proposed Friston substation were advanced in the consenting process, and now development consent has been granted to SPR, pursuant to *"The East Anglia ONE North Offshore Wind Farm Oder 2022"* and *"The East Anglia TWO Offshore Wind Farm Order 2022"*.

1.3.5.36 A connection into the existing 400 kV overhead lines would require a new substation to be built. A new substation was assessed as being co-located within the converter site option areas (B, D, E, F, H and I) and would also require, either, the existing overhead lines to be diverted in and out of the new substation, or an underground cable (where economic and efficient) from a new substation to the existing overhead lines, with a cable sealing end compound located adjacent to the overhead lines.

1.3.5.37 A summary of the appraisal outcomes of each of the converter site option areas in Suffolk is presented in **Volume 1, Part 2, Chapter 1, Evolution of the Suffolk Onshore Scheme**.

Kent Onshore Scheme

1.3.5.38 Within Kent only two converter site option areas were identified and appraised. The area closest (Area A) to the connection point at Richborough substation was generally favoured as it minimised the connection back to the existing network and facilitated an opportunity to site a converter station close to similar existing infrastructure. A summary of the appraisal outcomes of each of the converter site option areas in Kent is presented in **Volume 1, Part 3, Chapter 1, Evolution of the Kent Onshore Scheme**.

Terrestrial route corridors

Suffolk Onshore Scheme

1.3.5.39 Within Suffolk none of the corridors avoided designated sites. The Suffolk Coasts and Heaths AONB extended across the full extent of the routeing and siting study area and was therefore unavoidable for all of the 15 corridors. Whilst the routeing and siting study area was drawn to provide opportunities to avoid designated sites and constraints, the AONB extends unbroken from Felixstowe and Harwich in the south to Kessingland in the north. It was not therefore possible to avoid this designation and meet the needs case without a significantly longer and indirect route that would not be in accordance with National Grid's statutory duties.

1.3.5.40 All three green corridors as shown on **Figure 1.3.7 Suffolk Terrestrial Route Corridors – Sizewell Connection** to **Figure 1.3.9 Suffolk Terrestrial Route Corridors – New Connection** that connect with the southernmost of the five landfall areas of search (S1), south of Aldeburgh, would have required an extensive crossing of the Alde-Ore Estuary, which is designated as a SAC and SPA. These corridors would also interact with the same designated sites around the settlements of Iken and Snape.

1.3.5.41 The three orange corridors as shown on **Figure 1.3.7 Suffolk Terrestrial Route Corridors – Sizewell Connection** to **Figure 1.3.9 Suffolk Terrestrial Route Corridors – New Connection** that connect the most northern landfall area of search (S5) to the north of Sizewell would have needed cross several sites designated for their ecological conservation value (including Minsmere RSPB Reserve) and would entail significant interaction with the proposed Sizewell C Nuclear Power Station Project.

1.3.5.42 The three blue corridors as shown on **Figure 1.3.7 Suffolk Terrestrial Route Corridors – Sizewell Connection** to **Figure 1.3.9 Suffolk Terrestrial Route Corridors – New Connection** that connect into the southern part of the landfall area of search (S3) between Thorpeness and Sizewell would have needed to cross a section of the Leiston Aldeburgh SSSI and would likely require interaction with the proposed cable routes for the SPR East Anglia One North and East Anglia Two Offshore Wind Farms.

1.3.5.43 The three purple corridors as shown on **Figure 1.3.7 Suffolk Terrestrial Route Corridors – Sizewell Connection** to **Figure 1.3.9 Suffolk Terrestrial Route Corridors – New Connection** that connect into the northern part of landfall area of search S3, when considered in isolation, provided an opportunity to avoid sites designated for nature conservation but would have entailed interaction with the proposed Sizewell C Nuclear Power Station Project. Routeing was also constrained by the presence of other cables that make landfall at this location.

1.3.5.44 The three red corridors as shown on **Figure 1.3.7 Suffolk Terrestrial Route Corridors – Sizewell Connection** to **Figure 1.3.9 Suffolk Terrestrial Route Corridors – New Connection** that connect to the landfall area of search between Aldeburgh and Thorpeness (S2) would also need to cross a section of the Leiston Aldeburgh SSSI as well as part of the North Warren RSPB Reserve.

1.3.5.45 Other areas considered included the three green corridors connecting into the southernmost landfall areas of search (S1), which would require the installation of cables in an extensive area of Flood Zones 2 and 3; these corridors would also have a longer length within the AONB compared with the other corridors

- Four pinch-points were identified within the route corridors.
- The first was at a crossing of Leiston Road close to Aldeburgh Golf Course, which would be crossed by all three red corridors connecting to the landfall area of search S2.
- The second of these was located between the B1353 and Leiston Road and would require cable routes to cross the Sandlings SPA, the Leiston Aldeburgh SSSI, and a section of the golf course, as well as having a pinch-point at the crossing of Leiston Road. This pinch-point would affect the three blue corridors connecting to landfall area of search S3.

- The third pinch-point was to the south of Aldringham at the crossing of the watercourse Hundred River. This area is constrained by the Hundred River itself, the crossing of the B1353 and the B1122, and an area of woodland and properties. In addition, the cables for the East Anglia One North and Two Offshore Wind Farms are proposed to be routed through this same pinch-point. This area would need to be routed through (depending on which converter station site option area is selected) by the three purple corridors connecting to landfall area of search S3N or by all three blue corridors connecting to landfall area of search S3 to avoid the second pinch point.
- The fourth pinch-point was to the northwest of Leiston and is associated with the offsite works for the proposed Sizewell C Nuclear Power Station including an area that has recently been established for ecological mitigation measures related to the project. This area would need to be routed through (depending on which converter station site option area is selected) by the three purple corridors connecting to landfall area of search S3N.

1.3.5.46 A summary of the appraisal outcomes of each of the route corridors in Suffolk is presented in **Volume 1, Part 2, Chapter 1, Evolution of the Suffolk Onshore Scheme.**

Kent Onshore Scheme

1.3.5.47 Within Kent none of the landfall areas of search avoided sites designated for nature conservation, albeit the designated features vary across the landfalls. The three route corridors (green, blue and red) connecting to the landfall areas of search (K2-K4) along the north Kent coast would all require the cable to be routed through an area of Flood Zone 2 and 3. Access to the landfall areas of search was also limited by the presence of a railway line, as construction access would need to cross this feature.

1.3.5.48 The green corridor connecting to the landfall area of search (K1a) at Broadstairs would need to cross North Foreland Golf Course. There is also a pinch-point along this corridor between the settlements of Margate and Ramsgate where there is a linear belt of settlement where cables would need to be routed within the public highway. This green corridor is further constrained by a site allocated for development in the Local Plan, avoidance of which would require a longer length of cable within the public highway.

1.3.5.49 The three corridors (green, red and blue) connecting to the landfall area of search (K1) in Pegwell Bay would all cross the Thanet Coast and Sandwich Bay designated sites, albeit the extent of the designated area crossed would reduce towards the south of this area of search. Crossing of a golf course would be unavoidable across all three of these corridors. The blue southernmost of the corridor would require routeing through an extensive area of Flood Zone 2 and 3 and the southern two corridors (blue and red) would require a crossing of the River Stour and several large waterbodies either to the north or south of Great Stonar. The northernmost of the three corridors (green) connecting to this landfall area of search would cross a greater extent of the designated sites for nature conservation but would avoid crossing the River Stour and other waterbodies.

1.3.5.50 A summary of the appraisal outcomes of each of the route corridors in Kent is presented in **Volume 1, Part 3, Chapter 1, Evolution of the Kent Onshore Scheme**.

Marine corridors and alignments

1.3.5.51 All marine approaches to the landfall areas of search along the Suffolk Coast would need to be routed through the Outer Thames Estuary SPA and the Southern North Sea SAC. The marine alignment connecting to the landfall area of search to the north of Sizewell (S5) would result in more cable crossings than the other alignments and would have potential to interact with the proposed Sizewell C Nuclear Power Station Project's offshore works. The marine alignments connecting to the southern part of the landfall areas of search (S3), between Thorpeness and Sizewell, were significantly constrained by the presence of rocky reefs in the nearshore area, although marine alignments to the northern part of this same landfall area of search could avoid this feature. The marine alignments to the two southernmost landfall areas of search (S1 and S2), between Aldeburgh and Thorpeness and to the south of Aldeburgh, were not significantly constrained.

1.3.5.52 All marine approaches to the north Kent coast landfall areas of search (K2 – K5) would have required routeing through the Margate and Long Sands SAC and would also interact with the Thanet Coast MCZ and Thanet Coast SAC. It is likely that any works required to protect the cable, where sufficient burial depth could not be achieved, could result in permanent habitat loss, affecting the interest features of Margate and Long Sands SAC. There is also an area of *"mobile sandbanks some of which may be exposed at low tide"*, off the north Kent coast. This area was unlikely to be avoidable for any option to a north Kent coast landfall area of search. This presented a considerable exposure and engineering risk. It was also likely that there would be some impact on key anchorage areas offshore off Margate.

1.3.5.53 The marine alignment to the landfall search area at Broadstairs (K1a) would interact with areas designated for nature conservation at the landfall but could avoid the Margate and Long Sands SAC and could also avoid routeing through the Goodwin Sands MCZ.

1.3.5.54 The marine alignments connecting to the Pegwell Bay landfall area of search (K1) could not avoid the nature conservation sites at the landfall; however, the length of the crossing would reduce for those marine alignments routed to the south of this landfall option area.

1.3.5.55 It was considered unlikely that marine alignments to this landfall could avoid the Goodwin Sands MCZ. This interaction is due to the routeing in this area being constrained, to the east, by the Goodwin Sandbank. Routeing over the Goodwin Sandbank would increase the risk of cable exposure during the lifetime of the cable and would subsequently likely to result in the need for additional rock protection to be put in place, potentially resulting in permanent habitat loss. Routes to the west were constrained by the Ramsgate dredged channel and an area of sandwave field. Additionally, when routeing east out from Pegwell Bay, the route must cross the Nemo Link cable and the Thanet Offshore Wind Farm export cables, requiring the placement of rock protection on the seabed at these locations and potentially resulting in permanent habitat loss, including within the Goodwin Sands MCZ. The water depths in this area are very shallow, slowly gaining depth moving to the east. To avoid unacceptable reductions in water depths that could pose a hazard to marine vessels, the proposed cable crossings would need to be located in areas with a suitable water depth.

1.3.5.56 In the central section of the marine alignments there was a pinch-point location where the northeastern extent of the Margate and Long Sands SAC abuts the Sunk Traffic Separation Scheme (TSS); there are also several aggregate extraction areas and deep-water shipping channels in this area. There are also three proposed projects in this area, including: the NeuConnect Interconnector, the Five Estuaries and the North Falls Offshore Wind Farms. The existing Greater Gabbard and Galloper Offshore Wind Farms also constrained marine alignments. Marine alignments through this area were considered to have suitable seabed conditions for cable installation and burial.

1.3.5.57 Due to the range of constraints in this area, engagement was undertaken with the relevant marine stakeholders. Concerns were raised by stakeholders about the need for rock placement for crossing of existing and proposed infrastructure within Margate and Long Sands SAC, both in terms of potential for permanent habitat loss and unacceptable reductions in water depth for shipping and navigation. Aggregate operators also expressed a preference for routeing to be located to the east in order to minimise impacts on their operations.

1.3.5.58 As a result, an alternative route was identified to the east of Margate and Long Sands SAC. This route is located close to the centre of the Sunk TSS approach channels where the shipping density was lower, and the crossing would be in deeper water.

1.3.5.59 A summary of the appraisal outcomes of each of the marine alignments is presented in **Volume 1, Part 4, Chapter 1, Evolution of the Offshore Scheme**.

Step 6 Identification of a Preferred End-to-end Solution

1.3.5.60 Following the appraisal of the individual elements, an on-balance preferred end-to-end solution was identified, this took account of environmental, socio-economic and technical appraisals as well as cost in accordance with National Grid's statutory duties.

1.3.5.61 Within Suffolk, the significant constraints associated with a connection into either, the existing or proposed Sizewell substations meant that these options were not preferred. Connecting into a new connection point in the area, with an associated additional substation, was also not preferred. The proposed Friston substation was therefore identified as the preferred connection point for the Proposed Project.

1.3.5.62 Whilst the southernmost of the landfall areas of search (S1) was least constrained from a marine perspective, the terrestrial green corridors from this landfall area of search would have had the greatest interaction with the AONB and require a significant crossing of the Alde and Ore Estuary, as well as interaction with the associated SAC and SPA designations. The northernmost landfall area of search (S5) was constrained both, on the marine approach from existing and proposed infrastructure, and terrestrially due to the Minsmere designated sites and potential interaction with the proposed Sizewell C Nuclear Power Station Project. The southern part of the landfall area of search (S3) between Thorpeness and Sizewell was significantly constrained on the marine approach due to the presence of an area of rocky reef. Terrestrial route corridors from this same landfall area of search could not avoid any of the pinch-points described in the sections above. The marine approach to the landfall area of search between Aldeburgh and Thorpeness (S2) had few constraints, however the Leiston Aldeburgh SSSI and North Warren RSPB reserve could not be avoided without the use of trenchless construction techniques at the landfall. Terrestrial route corridors from this landfall area of search also include the pinch-point along Leiston Road.

1.3.5.63 The northern part of the landfall area of search (S3) between Thorpeness and Sizewell could avoid the area of rocky reef however the presence of existing and proposed cables at this landfall area and in the nearshore environment constrained the marine alignments. Terrestrial route corridors connecting to this landfall could avoid the designated sites, however the terrestrial route corridors could not avoid at least one of the pinch-points described above and would result in a longer overall connection to the proposed Friston substation.

1.3.5.64 On balance, the preferred solution identified was the landfall area of search between Aldeburgh and Thorpeness (S2) connecting to a converter site option area E to the southeast of the proposed Friston substation via the red corridor. This converter site option area offered good existing screening and opportunities to develop mitigation in keeping with the existing landscape character. Whilst this option was constrained at the landfall due to presence of terrestrial nature conservation sites, it was identified that trenchless installation methods could be used to minimise or avoid potential impacts. However, as further desk based and survey work was required to confirm the feasibility of using trenchless techniques at this landfall it was considered prudent to also progress an alternative, this was to make landfall at the northern part of the landfall area of search (S3) between Thorpeness and Sizewell with the purple terrestrial route corridor connecting to the same converter site option area E.

1.3.5.65 Within Kent, the marine alignments to the landfall areas area of search along the north Kent coast (K2-K5) were highly constrained by the Margate and Long Sands SAC and an area of mobile sandbanks. Whilst the marine alignment to the landfall area of search at Broadstairs (K1a) had few constraints, the terrestrial green corridor from this landfall was highly constrained by the development between the settlements of Margate and Ramsgate and several planning applications and allocations. Whilst the marine alignments to the Pegwell Bay landfall area of search (K1) could not avoid the Pegwell Bay and Sandwich designated sites, with some potential interaction with the Goodwin Sands MCZ, the appraisal identified that any potential impacts could be mitigated through careful selection and trenchless installation techniques. The preferred solution was identified as a landfall in the northernmost part of the landfall area of search K1 connecting to the converter site option Area A adjacent to the existing Richborough Energy Park via the green corridor as it offered the shortest connection of the three corridors. It also avoided areas of Flood Zone 2 and 3 and crossings of the River Stour or other significant waterbodies. Whilst this option would require the longest crossing of the designated sites of the three corridors options from Pegwell Bay, trenchless installation techniques could be used to avoid the most sensitive saltmarsh habitat within this designated area.

1.3.5.66 Of the central marine alignments, the revised alignment to the centre of the Sunk TSS approach channels and outside of Margate and Long Sands SAC was identified as being preferred.

Stakeholder Engagement

1.3.5.67 Following the identification of the preferred end-to-end solution, a round of stakeholder engagement was undertaken and as a result several amendments were made which are described in the following sections.

Suffolk Onshore Scheme

1.3.5.68 During engagement with stakeholders Suffolk County Council and East Suffolk District Council emphasised the importance of looking at opportunities to co-ordinate with the interconnector projects being proposed by National Grid Ventures (NGV) in the area. These are the proposed Nautilus Interconnector which undertook non-statutory consultation in September 2021 and the proposed LionLink Interconnector (formally known as EuroLink Interconnector). Both projects were at the pre Environmental Impact Assessment (EIA) Scoping stage. Both interconnector projects would require their own converter station, underground HVDC cables between a landfall and the converter station and a High Voltage Alternating Current (HVAC) connection between the converter station and the network connection point.

1.3.5.69 National Grid explored the concept of co-location of converter stations, shared cable corridors and consolidation of landfalls and analysed any potential challenges and options for consenting a coordinated approach. An exercise was undertaken in consultation with NGV and National Grid will continue to engage with NGV to consider opportunities for coordination as the proposal for the Proposed Project, Nautilus and LionLink progress.

1.3.5.70 A backcheck and review of all potential converter station sites/option areas identified independently through both the NGV Nautilus[1] and the Proposed Project routeing and siting studies was undertaken to check the feasibility of whether those sites could accommodate up to three co-located converter stations. This process was also used to identify any additional sites that should be investigated/appraised further for co-location opportunities.

1.3.5.71 Seven sites were identified as potentially offering opportunities for co-location and an appraisal was undertaken of these sites in accordance with the National Grid options appraisal methodology described above. A summary of this appraisal is presented in **Volume 1, Part 2, Chapter 1, Evolution of the Suffolk Onshore Scheme**. Two sites were identified as preferred for the development of the Proposed Projects converter station, as well as offering the potential to co-locate with the NGV projects. The conclusions on the landfall option areas and terrestrial route corridors remained unchanged and as described in the sections above and as presented in **Volume 1, Part 2, Chapter 1, Evolution of the Suffolk Onshore Scheme**; however, the northern part of the landfall option area between Thorpeness and Sizewell, and the corresponding terrestrial corridors, were identified as offering limited opportunities for co-location.

[1] At the time of routeing and siting, potential converter station sites for LionLink were not know only those for the proposed Nautilus Project. The outputs of the exploration of coordination and co-location with NGV fed into the routeing and siting that was subsequently undertaken for LionLink which they consulted on in October 2022.

Kent Onshore Scheme

1.3.5.72 Following engagement with other developers who have subsequently submitted planning applications for other energy developments within Richborough Energy Park, a backcheck and review was undertaken, as the proposed developments significantly constrained the Proposed Project being able to connect into the existing network at Richborough substation. As such an alternative connection directly onto the existing Richborough to Canterbury 400 kV overhead line was identified. A backcheck and review was undertaken of the routeing and siting options in Kent based on this revised connection point and following this review the conclusions on the landfall area of search (K1), Pegwell bay green corridor and converter site option area A remained unchanged. A summary of this appraisal is presented in **Volume 1, Part 3, Chapter 1, Evolution of the Kent Onshore Scheme.**

Non-statutory Consultation

1.3.5.73 Non-statutory consultation was undertaken between October and December 2022. **Volume 1, Part 2, Chapter 1, Evolution of the Suffolk Onshore Scheme**, **Part 3, Chapter 1, Evolution of the Kent Onshore Scheme** and **Volume 1, Part 4, Chapter 1, Evolution of Offshore Scheme** provide a description of the proposals and options that were consulted on.

1.3.6 Defined Proposal and Statutory Consultation

1.3.6.1 The Proposed Project has been developed taking into account continued stakeholder engagement, further environmental and technical studies and feedback received through non-statutory consultation. Feedback received through non-statutory consultation is summarised in the Sea Link Non-Statutory Consultation Feedback Report (Ref 1.3.11).

1.3.6.2 The reasons for the selection of the preferred option are set out in the Sea Link Option Selection and Design Evolution Report (Ref 1.3.12). This report also documents the evolution of the design from proposals consulted on at non-statutory consultation to the Proposed Project presented at statutory consultation.

1.3.6.3 A summary of option selection and the relevant environmental and socio-economic factors taken into consideration in the section of the preferred option are presented in **Volume 1, Part 2, Chapter 1, Evolution of the Suffolk Onshore Scheme**, **Part 3, Chapter 1, Evolution of the Kent Onshore Scheme** and **Volume 1, Part 4**, **Chapter 1, Evolution of Offshore Scheme.**

1.3.6.4 We are seeking feedback on the Proposed Project as part of statutory consultation and that feedback will be used to refine the proposals which will form the Proposed Development for which an application for a DCO will be made.

1.3.7 References

Ref 1.3.1 Planning Inspectorates Advice Note Seven Environmental Impact Assessment: Process, Preliminary Environmental Information and Environmental Statements, June 2020 (version 7) [online] Available at: https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-seven-environmental-impact-assessment-process-preliminary-environmental-information-and-environmental-statements/

Ref 1.3.2 National Grid (2022) Our Approach to Consenting [online] Available at: https://www.nationalgrid.com/electricity-transmission/document/142336/download

Ref 1.3.3 National Grid (2003). NGC Substations and the Environment: Guidelines on Siting and Design (updated 2006). [online] Available at: https://www.nationalgrid.com/sites/default/files/documents/13796-The%20Horlock%20Rules.pdf.

Ref 1.3.4 Holford rules [online] Available at https://www.nationalgrid.com/sites/default/files/documents/13795-The%20Holford%20Rules.pdf

Ref 1.3.5 National Grid (2023) Sea Link Strategic Options Report.

Ref 1.3.6 National Grid ESO (2021). Electricity Ten Year Statement (ETYS). [online] Available at: https://www.nationalgrideso.com/researchpublications/etys.

Ref 1.3.7 National Grid (2022). Network Options Assessment 2021/22 Refresh. [online] Available at: https://www.nationalgrideso.com/document/262981/download.

Ref 1.3.8 National Grid ESO (2022). Network Options Assessment 2021/22 Refresh. [online] Available at: https://www.nationalgrideso.com/document/262981/download

Ref 1.3.9 National Grid (2022) Sea Link Corridor and Preliminary Routeing and Siting Study [online] Available at: https://www.nationalgrid.com/electricity-transmission/document/146256/download

Ref 1.3.10 National Grid (2012) National Grids Approach to Options Appraisal

Ref 1.3.11 National Grid (2023) Sea Link Non-Statutory Consultation Feedback Report

Ref 1.3.12 National Grid (2023) Sea Link Option Selection and Design Evolution Report

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