NeuConnect

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NeuConnect Great Britain to Germany Interconnector

GB Offshore Scheme

Non-Technical Summary

NeuConnect Britain Limited

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Glossary and Abbreviations

Abbreviation	Description
EA	Environmental Appraisal
EEZ	Exclusive Economic Zone
HDD	Horizontal Directional Drill
HVAC	High Voltage Alternating Current
HVDC	High Voltage Direct Current
KP	Kilometre point
LNR	Local Nature Reserves
MCZ	Marine Conservation Zone
MHWS	Mean High Water Springs
MMO	Marine Management Organization
NNR	National Nature Reserves
NTS	Non-Technical Summary
PLA	Port of London Authority
PRC	Project Route Corridor
SAC	Special Area for Conservation
SPA	Special Protection Area
SSC	Suspended Sediment Concentration
SSSI	Sites of Special Scientific Interest
UXO	Unexploded Ordnance

1. Introduction

The Purpose of the Document

1.1 This document is the Non-Technical Summary (NTS) of the Environmental Appraisal (EA) report prepared for the GB Offshore Scheme of the proposed NeuConnect Project (NeuConnect). The GB Offshore Scheme includes the elements of the NeuConnect project which lie within the UK Exclusive Economic Zone (EEZ) and extends from Mean High Water Springs (MHWS) at the landfall on the Isle of Grain through the outer Thames Estuary and the southern North Sea to the UK/Netherlands median line.

1.2 The NTS provides a summary, in non-technical language, of the EA undertaken by AECOM on behalf of NeuConnect Britain Limited (the Applicant), in support of the marine licence consent application.

NeuConnect Project Overview

1.3 NeuConnect is a 1400 megawatt (MW) interconnector that will create the first direct electricity link between the Great Britain (GB) and German energy networks, allowing electricity to be passed in either direction between the two countries.

1.4 NeuConnect comprises over 700 kilometres (km) of subsea and underground High Voltage Direct Current (HDVC) cables, with onshore converter stations linking into the existing electricity grids in Great Britain and Germany. An overview of the components of NeuConnect is illustrated in **Figure 1-1**.

1.5 The connection points for NeuConnect are at the Isle of Grain in Kent, England and the Wilhelmshaven region in Germany. The subsea cables connecting these points will traverse through British, Dutch and German waters.

1.6 NeuConnect is being developed by NeuConnect Britain Limited (the Applicant). The Applicant is an international consortium comprised of Meridiam Infrastructure SAS, Allianz Capital Partners on behalf of Allianz Group and Kansai Electric Power, with the Project also supported by Greenage Power and Frontier Power.

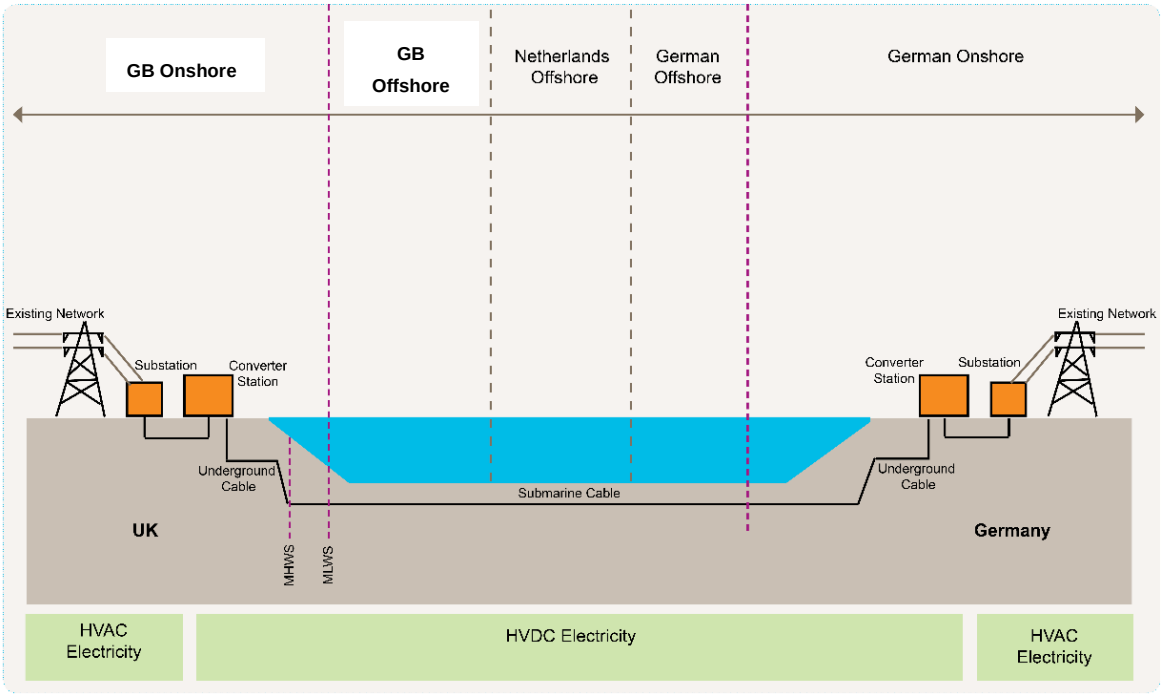

Figure 1-1: Component of NeuConnect Project

GB Offshore Scheme

1.7 The GB Offshore Scheme will extend from MHWS on the northern coast of the Isle of Grain, through the outer Thames Estuary and the southern North Sea before crossing the median line into Dutch waters. The GB Offshore Scheme comprises a Project Route Corridor (PRC) of approximately 270 km length, from KP 0 to KP 270 as shown on **Figure 1-2** within which the subsea HVDC cables will be installed.

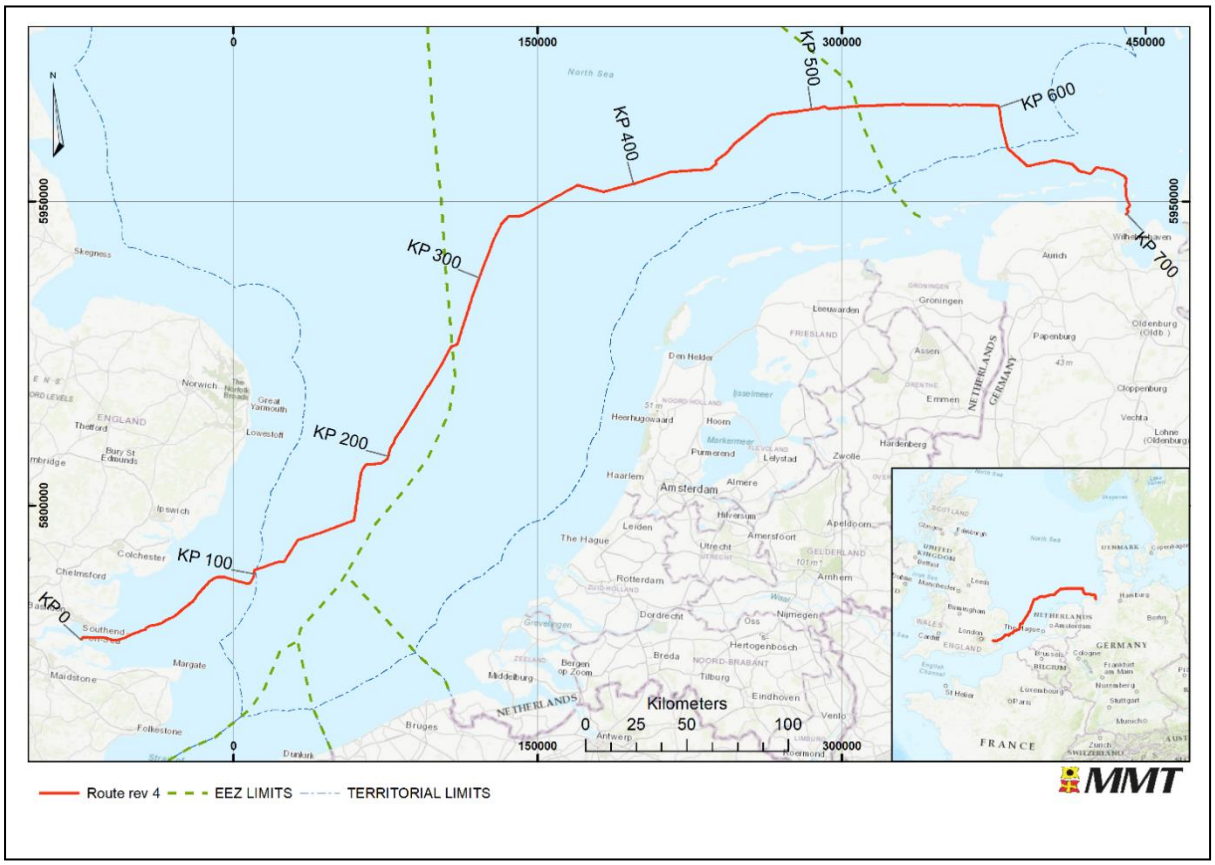

Figure 1-2: Project Route Corridor Overview (GB Offshore Scheme corresponds to KP0 to KP270)

Need for the NeuConnect Project

1.8 There is a need to invest in new infrastructure in order to have a competitive, sustainable and secure supply of energy, as well as to diversify the way in which the energy market operates. Interconnectors such as NeuConnect are a fundamental part of this, enabling electricity to flow between countries and markets and can be used to both import and export power as required.

1.9 By connecting two of Europe's largest energy markets for the first time, NeuConnect will offer a more diverse and sustainable electricity supply bringing additional resilience, security and flexibility in Great Britain and Germany.

Regulatory Context

1.10 A statutory EIA is not required in respect of the application for the GB Offshore Scheme[1].

1.11 A non-statutory EA report has however been produced to support the marine licence application. The scope of the EA was discussed and agreed with the MMO and their statutory advisors.

[1] This has been agreed with the Marine Management Organisation (MMO) and is consistent with the requirements of the Marine Works (EIA) Regulations 2007 which are themselves consistent with the requirements of Annex I and II of EU Council Directive 85/337/EEC as amended, relating to EIA.

2. Consideration of Alternatives

2.1 A range of specialist studies have been carried out to confirm the feasibility of undertaking the project. These studies have included the consideration of a range of project alternatives.

Technology Selection

2.2 NeuConnect will use Direct Current (DC) technology because it is more effective at transmitting electricity over longer distances, resulting in lower energy losses than an equivalent Alternating Current (AC) system[2].Whilst, the electricity transmission systems in Germany and the GB operate at the same frequency, they are not synchronised. An HVDC system overcomes the inherent problems associated with synchronisation. Furthermore, HVDC systems only require two transmission cables to be installed whereas equivalent HVAC systems would need multiples of three cables (i.e. one cable per phase) to accommodate the volume of electricity being transmitted. The physical footprint of an HVDC system is therefore smaller than an equivalent HVAC system which helps to minimise NeuConnect's environmental footprint.

Route Selection and Design

2.3 The PRC has been chosen taking account of a range of environmental, engineering and commercial factors. As a result, the corridor proposed is technically feasible, economically viable and reduces the potential environmental impact as far as possible.

2.4 A Desktop Study which looked at a wide range of possible constraints[3] was initially undertaken to identifying a corridor, approximately 500 m wide, which was then subject to a series of seabed surveys (geophysical, geotechnical and benthic investigations). In addition, NeuConnect met with regulatory authorities in the UK, Netherlands and Germany to discuss route options at key stages prior to and during the desktop studies and seabed surveys, as well as meetings as part of the permitting process.

2.5 The 500 m wide (variable in certain specific locations) corridor for which consent is now sought has been identified because:

- The seabed characteristics within it will allow the cable to be buried to a secure depth of between 1.5m and 2m;
- It avoids hazardous seabed terrain wherever possible meaning that the risk of the cable becoming exposed after it has been installed can be minimised;
- It minimises the incursion into environmentally protected areas, particularly the Margate and Long Sands Special Area for Conservation (SAC) in the outer Thames estuary whilst at the same time also minimising the incursion into the adjacent busy shipping lanes and transit areas;
- It minimises interaction with existing offshore infrastructure such as other cables and pipelines, offshore windfarms, Oil and Gas facilities and other defined marine uses including anchorages, aggregate dredging and military training areas.

[2] Transmission network providers within the UK use Alternating Current system to transmit electricity through the grid network
[3] Potential constraints considered included (but were not limited to): location of environmentally sensitive areas and known wreck sites, potential hazardous seabed terrain, key fishing grounds; heavily used shipping routes and anchorages, existing subsea and sea surface infrastructure (cables, pipelines, Oil and Gas infrastructure, offshore windfarms etc.)

3. Project Description

Cable Design and configuration

3.1 Electricity will be transmitted using HVDC submarine cable technology through a closed circuit of two HVDC submarine cables installed in a single cable bundle also containing a fibre optic control and communication cable as shown in **Figure 3-1**.

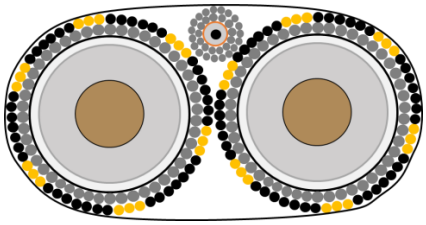

Figure 3-1: Two bundled HVDC cables with Piggybacked fibre optic cable.

3.2 The exact route for the cable bundle within the corridor will be confirmed by further detailed analysis of survey information, including additional pre-installation surveys[4] and taking account of environment mitigations as identified within the EA. In addition, although the likelihood of finding unexploded ordnance (UXO) as the result of cable installation is low, should this occur, the resultant risk to vessels, personnel and the environment would be high. Consequently, specialist survey for UXO and remediation (including, if necessary, removal and/or detonation) will be carried out following all appropriate methodologies, should they be required.

Sub-Tidal Cable Installation

3.3 Once the exact route within the corridor has been agreed, a series of route preparation activities will be carried out. These will include:

- **UXO Clearance**: Any UXO that cannot be avoided by 15-25m will be investigated and removal or demolition measures taken in accordance with the appropriate regulations.
- **Cable route clearance and pre-lay grapnel run:** A cable plough will be towed across a swathe of seabed between 5 and 10m wide within the corridor where the cable will be laid in order to clear the area of surface boulders. Permission will be sought from the owners of any out of service cables to be crossed to allow them to be retrieved at the crossing point using a de-trenching grapnel. Following that, a heavy grapnel with a series of specially designed hooks (grapnels), will also be towed along the same swathe of seabed to capture any other seabed debris which may inhibit installation and recover it to the deck of the vessel for appropriate licensed disposal ashore.
- **Sand waves and mobile bedforms** – Sandwaves have been identified on the seabed in some sections of the corridor. In these areas, pre-sweep dredging may be used to reduce their height and produce a flatter path for the installation equipment to move along. In addition, there are also several other mobile bedforms along the corridor ranging from large mobile sandbanks and associated channels through to more minor bedforms such as sand ripples. The cables will be micro-routed to avoid mobile sediments wherever possible and therefore to minimise pre-sweeping requirements.
- **Pre-lay subsea intervention (crossing infrastructure**) – where crossings of other infrastructure (e.g. existing cables and pipelines) are required cable crossings e.g. using targeted rock placement or the placing of concrete mattresses will be design and installed.

[4] Further surveys will be completed prior to the commencement of cable installation in order to confirm that no new obstructions have appeared on the seabed since the original marine surveys were undertaken and to re-confirm the viability of the corridor with regard to seabed conditions, bathymetry and other seabed features.

3.4 The cable lay operation itself will be performed on a 24-hour basis to minimise the length of time that other users of the sea area may be impacted and to maximise efficient use of suitable weather conditions, vessel and equipment time. Notifications will be issued in accordance with statutory procedures to ensure navigational and operational safety. In addition to the Cable Lay Vessel (CLV) or Barge (CLB), additional vessels (i.e. guard vessels) may be involved with the operation.

3.5 The cable will be laid either via simultaneous lay and burial, or separate lay and burial as shown in **Figure 3-2**.

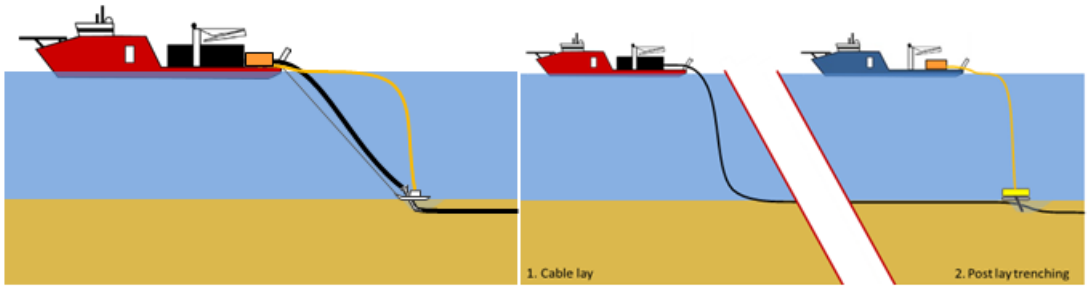

Figure 3-2: Cable Laying

3.6 Installation vessels are typically slow moving and restricted in their ability to manoeuvre whilst undertaking cable works and, as a result, other vessels will be required to remain a safe distance from the operation, typically 500m radius or potentially much greater (estimated up to 2km) if the CLV has anchors.

3.7 Where necessary, crossing agreements will be made with parties owning live or disused cables and pipelines to be crossed. These agreements detail the physical design of the crossing and outline the rights and responsibilities of both parties to ensure the ongoing integrity of the assets. Generally, the cables will cross over such infrastructure on a 'bridge' type arrangement comprised of either aggregate or concrete mattresses or possibly using a specific separator system installed around the cable.

3.8 The cable bundle will be buried in the seabed as this provides the best protection from disturbance and minimises potential for interference with fishing activity. The cable will be buried to a target depth of 1.5 to 2 m.

3.9 A range of burial methods may be used, and their suitability is determined by the characteristics of the seabed. In general, burial in soft sediments can be achieved using either jetting machines (where water jets are used to fluidise the seabed allowing the cable to sink under its own weight into the sediment) or cable ploughs. Harder seabed may require mechanical trenchers, where chainsaws or wheels are used to cut a defined trench. The choice of burial technique will vary depending upon the seabed conditions present in each section but is considered likely to primarily comprise a 'Plough with Jet assist' mechanism with simultaneous lay & burial operations.

3.10 Where the seabed composition is not suitable for burial or where unexpected obstacles in the seabed are encountered during cable trenching, external mechanical protection will be provided through either rock placement or deposition of concrete mattresses.

Intertidal Zone Installation

3.11 The subsea cables will be joined to onshore cables through a landfall at the Isle of Grain in Kent[5]. The subsea cables will be unbundled at a point immediately below low water to allow each conductor cable and the control fibre optic cable to cross the intertidal zone separately before connecting to the onshore network. Consequently, the landfall will require the installation

[5] Any works above MHWS are beyond the scope of this Environmental Appraisal and are subject to a different consent process.

of up to four ducts[6] drilled from an onshore drill compound located just above mean high water. These ducts will extend for approximately 800m[7] beneath the upper and mid intertidal zone. The lower half of the intertidal zone will be crossed by three separate trenches with the drilling breakout point and transition to surface excavated trenches facilitated by the installation of a temporary pit/coffer dam structure up to 10m wide and 20 to 30m in length.

3.12 The cables themselves will either be floated to the exit point of the duct during high tide or lowered onto the sediment and pulled along the intertidal zone using an excavator and/or rollers. Cables will then be pulled through the ducts.

3.13 It is expected that each cable pull will take up to one week. During this period small sections of the intertidal area will be inaccessible to other users for a limited period.

Maintenance and Repair

3.14 Routine maintenance work to the subsea cables is not expected to be required. the requirement for cable repairs to correctly installed and protected submarine cables is also infrequent. The most common reason for a repair of a subsea cable is damage caused by third parties, typically caused by trawlers or commercial ships' anchors dragging on a shallow or unburied cable segment. A repair would likely require the insertion of additional cable and joints. Rock placement would not be used as a method of achieving re-burial of a repaired cable section in areas of sensitive seabed habitat. A cable repair operation would have an expected duration of several weeks or months, depending on the type and extent of damage and operational constraints.

Decommissioning

3.15 Decommissioning, when required, will be undertaken according to the standard industry protocol at the agreed time.

[6] Three ducts will carry one of each of the two conductor cables and the fibre optic cable. A fourth duct will be drilled as a spare in case a problem is encountered in any of the other three.
[7] The intertidal zone spans approximately 1600m between MHWS and MLWS. Limits imposed by the HDD technology mean that the ducts cannot be drilled beyond 800m in length.

4. Consultation

4.1 A wide range of stakeholders and interested parties have been consulted throughout all stages of the preparation of this Environmental Appraisal, including relevant consent authorities, statutory and non-statutory environmental stakeholders and local community groups.

4.2 Consultees have included:

- Centre for Environment, Fisheries and Aquaculture Science (CEFAS), including Coastal Process, Benthic Ecology, Fisheries, Shellfisheries
- Crown Estate
- Environment Agency
- Fishermen Associations and organizations: National Federation of Fishermen's Organizations (NFPO), Clacton Fishermen's Association, Queenborough Fishermen's Association, Orford and District Fishermen's Association, Felixstowe Ferry Fishermen's Association, Harwich Fishermen's Association, Thames Fishermen's Association / Leigh Port Partnership, Lowestoft Fishermen's Association, Swale Fishermen, Thanet Fishermen's Association, Five independent fishermen/companies
- Historic England
- Joint Nature Conservation Committee (JNCC)
- Kent and Essex Inshore Fisheries and Conservation Authority (KEIFCA)
- Local harbour authority
- Maritime and Coastguards Agency
- Ministry of Defence
- MMO
- Natural England
- Peel Ports London Medway (Local Harbour Authority)
- Royal Yachting Association
- The SUNK User Group
- Trinity house
- Windfarm developments and cable owners

5. Environmental Appraisal

Environmental Appraisal Methodology

5.1 The EA reports the environmental appraisal process that has been carried out. The EA accompanies the Marine Licence application under the Marine and Coastal Access Act 2009 to the MMO. Its main objective is to provide sufficient environmental information and data to inform the relevant consent application for the GB Offshore Scheme as required by law, and to allow the relevant consenting authority to make an informed decision.

5.2 The information contained within the EA has been collated from existing literature; consultation with local experts; statutory and non-statutory bodies; and site-specific studies and surveys. The EA is divided into individual topic chapters that cover the physical, biological and human environment.

5.3 The EA presented follows the guidance provided by the Institute of Environmental Management and Assessment (IEMA) Guidelines for Environmental Impact Assessment (2004), and the Chartered Institute of Ecology and Environmental Management (CIEEM) Guidelines for Ecological Impact Assessment in Britain and Ireland: Marine and Coastal (2010).

5.4 In order to assess the potential impacts resulting from the GB Offshore Scheme the physical, biological and human baseline conditions within the corridor were established. After that, project activities with the potential to interact with identified environmental receptors (e.g. habitats, fish, birds) and to result in an impact were identified. For each potential impact the appraisal then considered the potential magnitude of the impact (the degree of change potentially caused) and the sensitivity of the receptor to the impact. The level of significance of the resultant effect was then determined and where necessary mitigation measures required to avoid, reduce of offshore adverse effects, or to maximise potential environmental benefits[8] were identified. Residual effects taking account of all mitigation measures were then recorded.

5.5 The Environmental Appraisal process involves the following main steps as presented in **Figure 5-1.**

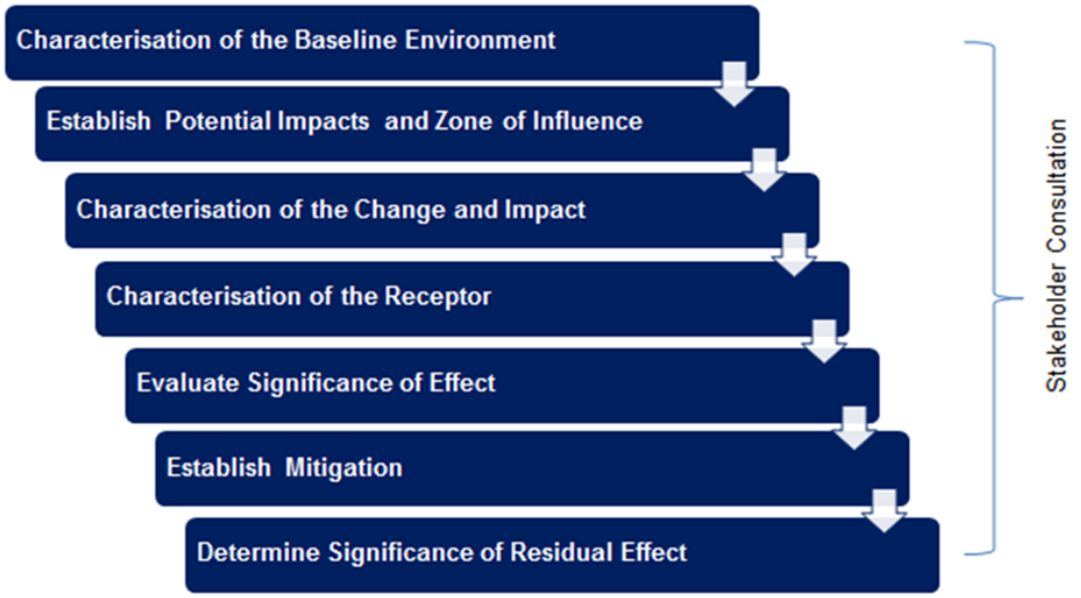

Figure 5-1: Steps of an Environmental Appraisal

[8] over and above those already incorporated within the design of the project as well as best practice installation methods already committed to by the Applicant.

5.6 The following sections summarise the findings of the EA.

Physical Processes

5.7 The bathymetry in the Thames Estuary between KP0 and approximately KP75 of the corridor, is dominated by depositions of large sandbanks and associated channels, where the seabed comprises sands and muddy sands. The area is considered active with shifting/migration of the sand banks and channels. From KP75 to KP270, where the corridor passes into Dutch waters, seabed is characterized by numerous sand waves and several large north-south trending sandbanks. These have been avoided where possible although the corridor does cross some small areas that could not be avoided. The seabed sediments generally comprise sand or gravelly sands. Tides are semi-diurnal with peak spring tidal speeds around 1.8 knots (0.9 m/s). Sediment contamination surveys did not identify elevated levels of contamination within the sediments, except for moderate levels of Arsenic, Nickel and certain hydrocarbons[9] in a small number of samples.

5.8 There is some potential for the GB Offshore Scheme to result in localised changes to seabed bathymetry and features; disturbance to geology and seabed sediments; sediment transport; sediment contamination; and change in water quality e.g. from sediment plume or discharges from installation vessels. Specific installation methods will be employed to minimise the levels of suspended sediment. In areas of sandwaves, as far as practical, the cable will be buried in the wave troughs below the mobile sediment layer to avoid exposure. Where this is not possible localised area of the sandwaves will be swept immediately prior to cable installation and are expected to return to their pre-construction state once installation is complete. Once installed, any risk of scour and changes to sediment transport associated with the presence of cables will be minimized as the cables will be buried at least 1.5 m to 2 m below the seabed. These effects are expected to be of low magnitude, temporary and localised and of minor to negligible significance.

Benthic Ecology

5.9 Eight broad-scale habitat types have been identified within the corridor.

- The two broad-scale habitats identified within the intertidal area of the corridor are representative of Annex I habitat 'mudflats and sandflats not covered by water at low tide'. In addition, intertidal sand and muddy sand is a designated feature of the Medway Estuary MCZ, which border is intercepted by the PRC along approximately 500 m. These intertidal habitats are known to represent important feeding grounds for wildfowl and waders as a result of the macrofaunal communities and flora which they support.
- The subtidal area comprises a further six broad scale habitats. Several of which are listed under Annex I of the EC Habitats Directive and are therefore of European conservation importance, including 'sandbanks slightly covered by seawater at all times' within the Margate and Long Sands SAC. Some are also of national conservation importance and are protected under national legislation and the UK Biodiversity Action Plan (BAP).

5.10 There is some potential for the GB Offshore Scheme to result in temporary and/or permanent habitat disturbance and/or loss; temporary increase in suspended sediments resulting in smothering effects and degradation of water quality. Operational disturbance as a result of localised heat from the cables affecting surrounding sediments has also be considered. The significance of any impacts was assessed as negligible to minor, except for the potential for temporary disturbance to sandwaves habitats within Margate and Long Sands SAC. The potential for significant effect on the Margate and Long Sands SAC is considered further in the 'designated sites' section below.

5.11 Deployment of anchors/anchor chains on the seabed from installation vessels will be kept to a minimum in order to reduce disturbance to seabed, particularly within the intertidal zone. The cables will be installed in the intertidal zone using boat-based methods where possible, where small potential for effects to intertidal habitats and species from beaching of the barge and vessel, anchorage is considered preferable to the potential disturbance resulting from land-

[9] Poly-aromatic hydrocarbons (PAHs)

based installation techniques. Post-installation benthic ecology monitoring will be undertaken in order to confirm habitat recovery occurs as expected.

Fish and Shellfish

5.12 The GB Offshore Scheme passes through spawning and nursery grounds for several fish species of commercial/or conservation importance, comprising demersal and pelagic species including Atlantic cod, herring, Dover sole, European plaice, sandeel and whiting. Nursery grounds of other species of economic value may also overlap or to be close to the GB Offshore Scheme such as European seabass and European sprat. The region is also important for shellfish, notably cockle, common whelk and brown crab. Other fish species of national and/or international conservation importance such as European eel, Atlantic salmon, sea lamprey, shad and smelt may also be present.

5.13 Potential impacts included temporary and/or permanent habitat disturbance and/or loss of habitat; smothering of species (directly and indirectly); disturbance or injury from underwater noise; change in marine water quality from the use of drilling fluids (intertidal only) or accidental spills; and the potential for electromagnetic fields produced by the operating cable to disrupt fish behaviour (e.g. foraging and navigation). In the majority of cases the potential impacts will be minor or negligible. Temporary disturbance to sandeel species and their spawning grounds may occur although the spatial extent of this effect is considered insignificant in the context of alternative equivalent habitat available in the wider North Sea. Furthermore, although the recoverability of sandeel is generally considered low due to the co-location of spawning and adult habitats and the high site fidelity exhibited by this species, a degree of recovery would be expected over the medium term (1 - 5 years) with individuals recolonising suitable substrates following completion of cable installation.

5.14 The GB Offshore Scheme will be installed in the intertidal zone using boat-based methods where possible, where a small potential for effects to intertidal habitats and species from beaching of the barge and vessel anchorage is considered preferable to the potential disturbance which may occur if land-based installation techniques were used. Deployment of anchors/anchor chains on the seabed from installation vessels will be kept to a minimum.

5.15 The timing of work will be planned where possible to minimise disturbance to herring and sandeel spawning and to avoid known spawning areas during peak spawning periods. Seasonal restrictions will also be placed on geophysical surveys, if necessary, to minimize any impacts of underwater noise to sensitive fish. Post-installation benthic ecology monitoring will be undertaken in order to confirm recovery occurs as expected.

Marine Mammals

5.16 Seven species of cetacean are known to occur regularly over large parts of the North Sea: harbour porpoise, bottlenose dolphin, white-beaked dolphin, minke whale, Risso's dolphin, common dolphin and white-sided dolphin. Sightings data suggests that harbour porpoise are the most abundant cetacean species within the waters surrounding the GB Offshore Scheme. All cetaceans are European Protected Species (EPS). Two species of pinniped (listed in Annex II of the EC Habitats Directive) also have the potential to be present within and adjacent to the GB Offshore Scheme; harbour seal and grey seal.

5.17 Potential impacts included disturbance from underwater noise; EMF disrupting an individual's ability to navigate; risk of collision with installation vessels; and risk of accidental leaks and spills resulting in alteration of water quality. Potential impacts were assessed as minor or negligible, while the significance of accidental collision or spills are assessed as minor, due the low likelihood.

5.18 A Marine Mammal Mitigation Plan (MMMP) will be developed and implemented as required. This will be produced to mitigate all potential impacts in accordance with the latest appropriate JNCC guidance for the activities involved.

Ornithology

5.19 The GB Offshore Scheme overlaps with two National and European sites designated for their ornithological value: The Thames Estuary and Marshes Ramsar/SPA/SSSI, and The Outer Thames Estuary SPA. These sites are designated for the protection of a number of internationally important populations of birds, including the largest aggregation of wintering Red-throated Diver in the UK. A further four sites designated for their ornithological value have been identified within 10 km of the GB Offshore Scheme. A survey of waterbirds using the intertidal area was undertaken in 2018 and recorded 24 species, of which 18 were considered as being of conservation importance. Areas further offshore in the Outer Thames Estuary and the Southern North Sea are important as feeding and loafing areas, and as migration routes for a wide range of marine birds.

5.20 Potential impacts included temporary disturbance and displacement in the subtidal and intertidal zones; and temporary disturbance to and loss of habitat and associated prey resource utilised by waterbirds in the intertidal zone. All the impacts were considered to be negligible, with the exception of bird displacement in the intertidal zone which was assessed as minor due to the high importance of the receptors in the Thames Estuary and Marshes Ramsar/SPA/SSSI.

5.21 The GB Offshore Scheme includes mitigation for the avoidance of potential effects on ornithological receptors. These include installations methods (HDD drilling) to minimise loss and disturbance to habitats supporting ornithological receptors; route preparation being carried out as locally as possible; and dredge spoil being deposited in location adjacent to the cable, minimising footprint of disturbance. In addition, if construction works are to be undertaken over high water periods during winter months, i.e. two hours either side of high water, then additional mitigation such as screening at the MHWS mark will be used, if appropriate and possible.

Designated Sites

5.22 The GB Offshore Scheme passes through the following protected sites:

- The Greater Thames Estuary SPA Complex and Ramsar sites[10] - designed for the protection of internationally important population of birds;
- Outer Thames Estuary SPA - designated for the protection of largest aggregation of wintering Red-throated Diver in the UK;
- Margate and Long Sands SAC - including the Annex I habitat 'sandbanks which are slightly covered by sea water all the time';
- Southern North Sea SAC - proposed for the protection of harbour porpoise;
- Medway Estuary of Marine Conservation Zone (MCZ) - proposed for the protection of intertidal sand and muddy sand.

5.23 A number of other sites were also identified within 10 km. These included Ramsar sites, Marine Conservation Zones (MCZs), Sites of Special Scientific Interest (SSSI), Special Protection Area (SPAs), Special Area of Conservation (SACs), National Nature Reserves (NNR) and Local Nature Reserves (LNR).

5.24 Possible impacts to the integrity of protected sites from cable installation, repair and maintenance and decommissioning may occur as a result of temporary or localised disturbance to site component features. Impacts to species / habitats of conservation importance are summarised within each individual receptors' chapter. After assessing the individual sensitivity of the designating features, consideration has been given to whether the significance of the impacts would render the integrity of the site adversely affected. Impacts, taking account of committed project mitigations, were considered of minor to negligible significance.

5.25 Mitigation and monitoring measures including minimizing any rock placement or mattresses within the sensitive habitats protected by the Margate and Long Sands SAC designation; post construction monitoring of the Margate and Long Sands SAC Sandbanks; and development of

[10] Including Thames Estuary and Marshes SPA and Ramsar; Benfleet and Southend Marshes SPA and Ramsar; Medway Estuary and Marshes SPA and Ramsar; the Swale SPA and Ramsar.

a Construction Environmental Management Plan (CEMP) and 24-hour installation operations to minimise the overall time associated with disturbance to birds in the Thames Estuary and Marshes SPA/ Ramsar/ SSSI. Once mitigation measures have been applied the significance of residual impacts will be minor.

Commercial Fisheries

5.26 351 fishing vessels were identified as registered to the home ports along the Kent, Essex and Suffolk coastline, of which 86% were under 10 m in length. Within inshore waters (6 nm from the coast) the GB Offshore Scheme overlaps with areas used by a variety of fishing gears which are used including: dredges (cockles), beam trawls (shrimps/prawns, cockles), demersal trawls/seines (highest value species sole and herring), gears using hooks (bass, sole) and pots and traps (whelks, lobsters, crabs). The value of landings was dominated by dredge fisheries, whilst the highest value species landed using this gear type was cockles.

5.27 Potential impacts include reduced access to fishing grounds during installation operations; temporary displacement of fishing activities; obstruction of navigation; indirect effects on commercial fish and shellfish species; long-term loss of fishing grounds; and long-term displacement of fishing activities. The significance of the effects will be negligible to minor, based on the temporary nature and small footprint of any restriction zone during installation, and because the cable will be buried within the seabed.

5.28 A Fisheries Liaison Officer (FLO) has been appointed to ensure effective ongoing communication between the Project and fisheries stakeholders. Temporary safety zones will be established around installation infrastructure where necessary to further reduce any risk of interactions with fishing vessels. Consultation with fishermen is ongoing and will continue to establish and maintain a good understanding of the key fishing grounds for bottom drift net fisheries. Post-construction surveys will be carried out on key primary fishing grounds where specific concerns have been raised by stakeholders. Regular surveys will also be carried out to monitor the burial depth in such key fishing grounds. Fishermen will be advised of the presence and location of the operational cable system via the KIS-ORCA Cable Awareness Charts.

Shipping and Navigation

5.29 The GB Offshore Scheme passes through the Port of London Authority's (PLA) offshore Vessel Traffic Service (VTS) limits, with a small section also passing through the inshore vessel traffic service (VTS) limit and Medway port limits. Sheerness is the closest major port, located 2 nm south-east of the cable landfall. There are multiple anchorage areas within close proximity. The GB Offshore Scheme also intersects the ‘Sunk East’ Traffic Separation Scheme which is an area of high marine traffic regulated by the International Maritime Organization. The distribution of vessel type, analysed according to the Automatic Identification System (AIS) database, indicated a predominance of cargo and tanker vessel traffic in the area.

5.30 Potential impacts include disruption to passing vessels routeing/timetables; disruption to navigation of other users of the sea such as fishing, recreational, military, aggregate and dredging disposal sites; possible compass deviation effect as a result of operating cable EMF; and accidental events including collision with a passing vessel or wind turbines, and anchoring on the cables. The significance of effects will be negligible to minor for all potential impacts. The risk of accidental events was assessed as tolerable, due to the extremely low frequency of potential occurrence.

5.31 Any disruption to commercial operations will be minimized by ensuring relevant information relating to installation, particularly location and timings are communicated to regular commercial operators (e.g. Ro-Ro vessel operators), local sailing clubs, and wind farm developers etc. Construction works within PLA port limits will be undertaking in as short as possible timescale, in order to minimise any disruption to other activities. A specific methodology will also be agreed in advance for the cable installation through the ‘Sunk East’ Traffic Separation Scheme.

Marine Archaeology

5.32 A total of 397 seabed features have been identified from the geophysical survey data as being of possible archaeological potential within the study area, of these 30 are of anthropogenic origin and of archaeological interest, 10 are of historic record and of possible archaeological interest with no corresponding geophysical anomaly, and the other 357 of uncertain origin and of possible archaeological interest. These are mostly represented as debris, dark reflectors, and items with magnetic properties. These could represent material related to shipwrecks or aircraft crash sites, it is also possible that they could represent features of non-archaeological interest.

5.33 The assessment considered both direct and indirect disturbance to known and unknown archaeological assets, as well as indirect disturbance e.g. as a consequence of changes to marine processes. Direct disturbance has the potential to have major adverse effect on marine archaeology however; following the application of appropriate mitigation the residual effect will be minor, negligible or positive.

5.34 Archaeological exclusion zones will be implemented around all 30 features identified as of anthropogenic origin of archaeological interest. A Protocol for Archaeological Discoveries (PAD) will be established and implemented. An archaeological Written Scheme of Investigation (WSI) will be prepared in consultation with the Archaeological Curator and approved as a licence condition by the MMO, should they be implemented.

Other Users of the Sea

5.35 Other users of the sea area through which the GB Offshore Scheme will pass (excluding commercial fishing, shipping and navigation which have been considered separately) include wind farms, dredging and disposal sites, military areas, Oil and Gas industry activity and several power and telecon cables. Several windfarm developments, some already operational and others under construction, consented or in early planning stage, were identified within 10 km of The GB Offshore Scheme. The GB Offshore Scheme currently crosses the Agreement to Lease area for the Galloper extension, where the PRC width is wider than the standard 500 m width to facilitate further ongoing routing discussions with the windfarm developer. In addition, two dredge disposal sites associated with constructed windfarms have also been identified. Open disposal sites for other purposes and dredging sites are not anticipated to be intersected. Two firing practice zones are located in close proximity, one of which intersects a small section of the PRC. A total of twenty pipelines and cables will be crossed by the proposed project: eleven telecommunication cables (of which three are not in use); one gas pipeline; six submarine power cables; and one cable of undefined application (not in use).

5.36 Potential impacts included potential disruption to planned vessel routes and access to working areas; damage or interference with an external asset; and potential for some limitation to future development options. Discussion with the Galloper extension windfarm developers is currently ongoing. Other anticipated impacts to other users of the sea were considered negligible after the adoption of mitigation measures.

5.37 Early consultation with relevant contacts has been undertaken to minimize disruption to planned routes. Notices to sea users to ensure a 500 m separation from cable vessels during installation, repair and decommissioning will also be issued. Crossing agreements will be undertaken with cable and pipeline owners, in order to agree rights, responsibilities and crossing design. Proximity agreement will be agreed with Wind farms in the vicinity, in line with the guidelines established by the Renewables Sub-Group of Subsea Cables UK (2012).

Potential for Cumulative effects with other projects

5.38 Several other proposed development projects are proposed within the study area considered by the EA for the GB Offshore Scheme, including: other components of NeuConnect (specifically the adjacent GB Onshore Scheme as well as the Netherlands Offshore Scheme; both the proposed GridLink interconnector and existing BritNed interconnector an aggregates production area; and eleven offshore windfarm projects.

5.39 Consideration of the identified Zones of Influence of identified potential impacts indicates that, in most cases the GB Offshore Scheme will be separated spatially from other proposed developments and will also be separate in the construction timeframes in which they are expected to be brought forward.

5.40 Potential for some localised cumulative increases in suspended sediment concentrations and water quality were identified should the GB Offshore Scheme be brought forward for construction at the same time as the GridLink interconnector proposals. Likewise construction of the section of the GB offshore scheme which lies in proximity to the Longsands Aggregate Extraction site at the same time as active extraction is taking place, or in proximity to other windfarm proposals (East Anglia Three, Norfolk Vanguard, Galloper Extension or Greater Gabbard extension) may also result in localised cumulative increases in suspended sediment concentration (SSC). Where SSC are increased, a corresponding potential for localised cumulative effect on the benthic ecology as well as fish and commercial fisheries may be expected. Likewise, temporary restrictions on access to fishing grounds may also occur where more than one development occurs in a similar location at the same time.

5.41 Good communication and coordination between the various project installation programmes, where possible, will be sought to ensure activities are programmed to occur at different times, thereby minimising any cumulative effect.