# 3. Project Description

## 3.1. Introduction

As described in Section 1.1, the Project comprises a 2 GW high voltage direct current (HVDC) system linking Aberdeenshire in Scotland and Lincolnshire in England. The Project would include the construction of new infrastructure consisting of:

- **English Onshore Scheme:** An underground HVDC cable constructed in a trenchless solution beneath the existing sand dunes and salt marsh at a proposed landfall of either Anderby Creek or Theddlethorpe on the Lincolnshire coast. From landfall, the proposed underground HVDC cable will route for approximately 100 km in length (parallel with a proposed HVDC cable alignment for Eastern Green Link 4[5]) to the site of a proposed converter station in proximity to Walpole. The underground HVDC cables will be connected to a substation at Walpole by underground high voltage alternating current (HVAC) cables, allowing the Project to connect to the existing English transmission system.
- **Marine Scheme**: Approximately 575 km of subsea HVDC cable from a proposed landfall at either Anderby Creek or Theddlethorpe, Lincolnshire, to a proposed landfall at Sandford Bay, Peterhead. The submarine cable system will consist of two HVDC cables and a fibre optic cable.
- **Scottish Onshore Scheme**: There is a proposed converter station located to the west of Peterhead at Netherton. From this, there will be an underground HVDC cable to a proposed Landfall at Sandford Bay. The proposed converter station will be connected to a substation by underground HVAC cables. The substation connects the Project to the existing Scottish transmission system.

This Scoping Report focuses on the **Marine Scheme** and the Project description therefore presents information on what the marine scheme components will consist of, and how they will be constructed, operated and eventually decommissioned. The chapter provides a brief overview of the onshore components, where they are pertinent to the Marine Scheme.

Work has been undertaken to map the environmental and socio-economic baseline to gain a better understanding of the constraints and features present in the Study Area which has informed the indicative project description presented in this Scoping Report. The design of the Marine Scheme will be developed in parallel to the Marine Environmental Assessment (MEA) process and will therefore evolve as the assessments progress. The design will be influenced by engineering, environmental and commercial factors, as well as consultation with local and national stakeholders. The final design envelope assessed for the Marine Scheme may still include some flexibility regarding design parameters but will clearly identify where construction techniques/methodology has been restricted to mitigate significant environmental concerns.

At the time of writing, the installation contractor has not been identified and detailed design work has not yet been completed. This chapter therefore provides an indicative overview of the anticipated submarine installation methods and intervention works. As the Project progresses, including the appointment of an installation contractor and as detailed engineering is carried out, some variation and more detailed design development will be conducted. In the meantime, and to ensure that the realistic worst-case scenario is considered in this Scoping Report, estimated design parameters presented here seek to reflect those options that may be anticipated to result in a ‘worst case’ environmental impact.

The Marine Scheme and proposed Scoping Boundary follows a broad south to north alignment from the proposed Landfalls in England toward the proposed Landfall in Scotland. Distance along the proposed submarine cable corridor is indicated as KP (Kilometre Point) markers, with KP 0 defined at the Anderby Creek Landfall. As there are still alternative Landfalls being considered, KPs have been created along the longest route from the proposed English Landfall at Anderby Creek, around the Holderness Offshore Marine Conservation Zone (MCZ) to the proposed Scottish Landfall at Sandford Bay. The KPs for this route are referenced as KP 0 – KP 575.3. Alternative options, which branch off this longest route, are routed from the proposed English Landfall at Theddlethorpe to the point where it converges with the longest route (referenced as T_KP 0 to T_KP 18); and through Holderness Offshore MCZ, which is referenced as H_KP0 to H_KP40.

## 3.2. Location of the Marine Scheme

The Marine Scheme comprises the components of the Project proposed from the MHWS mark at the proposed English Landfalls, Lincolnshire to the MHWS mark at Sandford Bay, Scotland through English and Scottish territorial waters and the UK Exclusive Economic Zone (EEZ).

The Scoping Boundary is illustrated in Section 1.4, Figure 1-2 (Drawing C01494-LOC-016). The proposed submarine cable corridor extends for approximately 431 km in UK waters and 144 km in Scottish waters.

[5] Easten Green Link 4 is a Project which will compromise of a 2-gigawatt HVDC system linking Fife in Scotland and Lincolnshire in England. The Project is being developed by National Grid Electricity Transmission (NGET) and Scottish Power Transmission who are operating and known as Scottish Power Energy Networks (SPEN) (the Applicants).

The Scoping Boundary has been defined as the extent of the proposed submarine cable corridor, within which the cables will be laid, and all marine works will be conducted. The Scoping Boundary is nominally 1 km wide, 500 m either side of the centreline, however, it widens in areas where there is still optionality in the design e.g., to allow for micro-routeing around potential seabed features. It is anticipated that the marine licence application boundary will ultimately be 500 m following refinement and rationalisation as the MEA and design process evolves.

## 3.3. Components of the Marine Scheme

The Marine Scheme will comprise of two power cables and a fibre optic cable.

The detailed configuration of the cable system is still under development at this stage and will be informed by further electrical design studies and through selection of the cable supplier and installation contractor. However, in common with similar HVDC systems recently installed by the Applicants, it has been assumed that the HVDC link will comprise two single core metallic conductors (one positive, one negative) and a fibre optic cable. The cables will be installed either as a single bundle of two conductors and the fibre optic cable, or with the conductors laid separately in parallel, with the fibre optic cable bundled (i.e., secured) to one of the conductors. In the case that the conductors are laid separately, the separation between the conductors will be up to 30 m. Subject to detailed engineering and technical feasibility, the cable separation may be reduced to further reduce the seabed footprint of the Project in terms of electromagnetic field effects.

Burial depth is typically 1-2.5 m below chart datum. The final target burial depth will be determined by a cable burial risk assessment which will take into consideration location specific factors such as ground conditions (i.e., ability to bury), intensity of shipping and fishing activity. The results of the cable burial risk assessment will be used to inform the MEA.

The cables will likely be cross linked polyethylene (XLPE) cable, which have been used in HVDC installations since 2000, and are proven to be reliable. As illustrated in Figure 3-1, the cables have a central core (comprising of aluminium or copper), protected by insulation and a lead sheath. Heavy steel wire is wound in a helical form around the cable as armour to protect the cable from external damage during construction and operation.

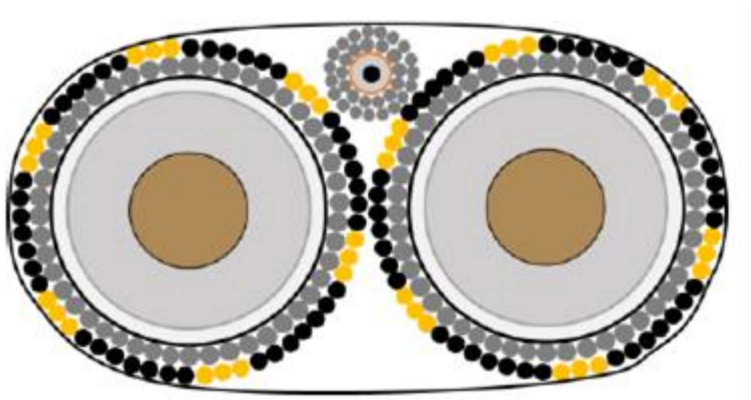

*Figure 3-1: Example Illustration of bundled HVDC cable with fibre optic cable (illustration shows double wire armoured (DWA) sheathing and is indicative only)*

## 3.4. Pre-Construction Activities

Prior to the start of offshore cable installation, it is essential to ensure that the seabed is clear of obstructions that may hinder the construction works. Seabed preparation is expected to involve clearance activities to ensure the proposed submarine cable corridor is clear of boulders, dropped object debris, and other obstacles. Table 3-1 summarises the activities that may be expected to take place.

*Table 3-1: Pre-construction activities*

| Activity | Description | Assessment Approach |
|---|---|---|
| Pre-construction survey | Seabed surveys would be carried out in the year prior to installation to reconfirm existing geotechnical and geophysical information about seabed conditions, bathymetry, and other seabed features. These may include Multi-Beam Echo Sounder (MBES); Side-Scan Sonar (SSS), Sub-Bottom Profiler (SBP), Magnetometer, cable trackers etc. In addition, visual inspections may also | It is proposed that the pre-construction survey will not be included in the MEA process. In certain circumstances the Marine and Coastal Access Act 2009 (MCAA) provides for certain activities to be exempt from requiring a Marine Licence. The activities associated with the pre-construction survey would qualify as exempt activities provided that the |

| Activity | Description | Assessment Approach |
|---|---|---|
| | be undertaken using a Remotely Operated Vehicle (ROV) or other visual inspection system. Depending on the final Marine Licence Conditions, pre-construction surveys may also include additional specialist studies, including geotechnical, benthic, and unexploded ordnance (UXO) investigations. | geotechnical and environmental sample sizes are <1 m[3] (individually) and the Applicant can demonstrate that the survey will not obstruct or present a danger to navigation and will not have a significant adverse effect on a marine protected area.<br>To demonstrate that the proposed surveys qualify as an exempt activity Screening to Inform Appropriate Assessment (Stage 1 of the Habitats Regulation Assessment (HRA) process) and a European Protected Species (EPS) Risk Assessment would be prepared. These would be submitted with a Notifications of an Exempt Activity to the Competent Authority ahead of any survey works. Notices to Mariners would be published ahead of the survey commencing. Fisheries would be notified of impending survey activity through the Project Fisheries Liaison Officer (FLO).<br>Appropriate consents would also be sought from The Crown Estate, Crown Estate Scotland, Natural England, NatureScot and the Port Authorities as relevant.<br>Should ROV inspections be required the Applicant would liaise with the MMO regarding the requirement for licencing dependant on the activities that are being undertaken. |
| Unexploded Ordnance (UXO) Identification and Clearance | A UXO survey would be undertaken as part of the pre-construction surveys. The results of the survey will be used to identify potential UXO (pUXO).<br>The Project would seek to avoid pUXO where at all possible through careful micro-routeing of the cables. If pUXO cannot be avoided, then further investigations would be undertaken to determine if the pUXO is an actual UXO or ferrous debris. Identification of UXO may involve further magnetometer and ROV investigations including small excavations. If a target is confirmed as a UXO, clearance activities may be undertaken e.g., removal to an alternate position on the seabed or removal for disposal on land. As a final option, in-situ detonation may be considered using either high or low order detonation. | As detailed above, the pre-construction survey will not be included in the MEA process. However, investigation of pUXO (Magnetometer, ROV and excavations) is a licensable activity and will be assessed as part of the MEA process. Should these investigations confirm the presence of UXO, a separate marine licence for clearance activities would be applied for, supported by the appropriate marine environmental assessments and if required underwater noise modelling.<br>An initial UXO Desk-Based Assessment (DBA) has been undertaken, to determine the potential UXO risk, which has informed the position of the proposed submarine cable corridor. A more detailed UXO assessment would be undertaken to provide detail on potential UXO (age, type, size of explosive capability) that could be found in the proposed submarine cable corridor. |
| Seabed preparation | Prior to the start of offshore cable construction, it is essential to ensure the route is clear of obstructions that may hinder the construction works. These obstructions include boulders, out of service (OOS) third party subsea assets and smaller debris such as fishnets, wires etc. The types of seabed preparation activity that may be required are:<br>**Boulder Clearance** – Should boulder clearance be required, a plough would be towed across the seabed, pushing the boulders to both sides creating a cleared swathe 5-10 m wide with berms either side of the cleared swathe, width of the berms will be determined by environmental conditions and the plough used. | The Applicant intends to acquire geophysical, geotechnical, and environmental survey data along the proposed submarine cable corridor in 2023/2024. This data would be used in route engineering and design studies. Where possible, the route would be altered to minimise seabed preparation activities e.g., avoidance of sand waves or boulder fields.<br>Where pre-sweeping is still required, studies would be undertaken to calculate the volume of sand to be removed and identify suitable disposal locations that retain the sediment within the local sediment system. Consultation with relevant authorities would |

| Activity | Description | Assessment Approach |
|---|---|---|
| | Alternatively individual boulders would be moved to an alternative seabed position using a grab deployed from a vessel.<br>**Pre-Lay Grapnel Run (PLGR)** – A PLGR is expected to be completed, involving towing a heavy grapnel with a series of specially designed hooks along the centre line of the route, snagging any debris on the seabed and within the top 0.5 m – 1.0 m of the seabed to confirm the construction site is clear of obstructions. Debris caught with the grapnel would be recovered to the vessel for appropriate licenced disposal ashore.<br>**Pre-sweeping of sand waves** – To avoid potential future cable exposure, pre-sweeping may be required if areas of sand waves are identified within the proposed submarine cable corridor during the offshore surveys. Pre-sweeping may be performed using a variety of tools including dredgers, ploughs, or mass flow excavators (MFE).<br>**Cutting Out of Service (OOS) Cables** – Removal of OOS cables may also be required; permission would be sought from asset owners to cut OOS cables crossed by the Project. The OOS cable would be snagged using a grapnel and then cut, with approximately a 100 m section of cable being removed from the seabed. The cut ends would be tied to a clump weight and placed on to the seabed.<br>If the OOS cable is buried deeper than can be retrieved with the grapnel, then an ROV fitted with a dredger will be used to uncover the OOS cable. The OOS cable would then be cut using a hydraulic cutter fitted to the ROV.<br>The removed cable will be recovered to deck and disposed of in line with a Waste Management Plan. | be undertaken to determine the most suitable methods for the pre-sweeping noting sensitivities in Scottish waters.<br>Sediment samples will be analysed by a MMO validated lab in line with MMO/MD-LOT requirements.<br>Consultation would be undertaken with Fisheries Associations with respect to the location of OOS assets and how these interact with specific fishing grounds, so that mitigation can be identified if necessary. |
| Third-party asset crossings - preparation | Where the Project crosses live infrastructure e.g., cables and pipelines, the Applicants will enter discussions with the asset owner to agree how the crossing of the asset should be engineered. These agreements detail the physical design of the crossing and outline the rights and responsibilities of both parties to ensure ongoing integrity of the assets.<br>Vertical separation between the Project cables and third-party assets would be achieved through either placing rock on the crossing locations prior to offshore cable installation, or through the placement of concrete mattresses at the crossing location to create the required separation distance.<br>To protect the third-party assets during cable installation minimum standoff distances for equipment (PLGR, burial tools etc) would be agreed with the asset owner. | The MEA would identify all crossings and provide indicative crossing dimensions. Consultation would be undertaken with Fisheries Associations with respect to the locations of crossings to identify what location specific mitigation may be technically feasible. |

## 3.5. Construction

### 3.5.1. Landfall

The English Landfall is the interface between the Marine Scheme and the English Onshore Scheme. The approximate location for the proposed Landfall area is along the Lincolnshire coast at either Theddlethorpe or Anderby Creek, as shown in Figure 1-2 (Drawing C01494-EGL3-LOC-16).

The Scottish Landfall is the interface between the Scottish Onshore Scheme and the Marine Scheme. The approximate location for the proposed Landfall area is within Sandford Bay immediately to the south of Peterhead in Aberdeenshire and adjacent (north) to the permitted Eastern Green Link (EGL) 2 cable route, as shown in Figure 1-2 (Drawing C01494-EGL3-LOC-016).

The alignment of the cables through the intertidal zone will be informed by considerations of technical, environmental, and other relevant criteria as well as the outputs from technical and engineering studies. The cable alignment across the proposed landfall will also be dependent on the chosen alignment for the onshore infrastructure. As with the marine scheme, this will be informed by a range of technical and environmental factors.

At the time of writing, a decision between a trenchless construction technique (Option 1) beneath the beach and adjacent environmental sensitivities and an 'open cut' trenching method (Option 2) across the soft sediment beach has not yet been made. Where possible the trenchless solution would be the Applicants' preference, but its selection is dependent on technical and engineering studies. Consequently, this Scoping Report considers basic design principles for both options at this stage. It is understood that the preference of the Statutory Nature Conservation Bodies is for a trenchless construction technique. Table 3-2 describes the activities that could be undertaken at each proposed Landfall and how they will be assessed.

*Table 3-2: Landfall construction activities*

| Activity | Description | Assessment Approach |
|---|---|---|
| Trenchless construction | Trenchless construction techniques include horizontal directional drilling (HDD), micro-tunnelling and using a direct pipe. These are techniques commonly used to install cable duct(s) underneath sensitive environmental features (such as sea defences, dune system, etc) or technical constraints (cliffs, shallow bedrock etc.). The information contained within this Scoping Report only relates to the typical approach for a HDD construction. Subject to the size of the duct(s) required and the ground conditions expected to be encountered, the operation typical comprise the initial drilling of a small diameter pilot hole which is then increased in stages (known as the "reaming" stage), followed by the installation of a cable duct. Drilling will use bentonite clay and water as drilling fluid. It is expected that up to three HDD cable ducts would be installed (one for each cable), although solutions to reduce this are being investigated.<br>It is currently assumed that the length of each duct will likely extend from a compound location above MHWS to a punch-out point below MLWS, indicatively 1.6 km from MHWS. The punch-out points would be defined by the geological suitability of the seabed and metocean conditions. The punch-out point may need to be excavated and would be left to either naturally back fill or would be manually infilled with excavated material.<br>A temporary compound would be required landward of the intertidal zone. It is anticipated that this compound would contain the TJB and would be situated as close as is technically feasible above MHWS, based on the geological and geotechnical suitability of the ground and also considering coastal erosion and sea level change over the asset lifespan. The size and location of a compound has not yet been confirmed; however, this is part of the onshore scheme, and therefore out of the scope of this report. | The Applicant intends to acquire geophysical, geotechnical and environmental survey data at the proposed Landfall and in the nearshore in 2023/2024. This data would be used to inform detailed engineering work to ascertain the trajectory, target depth and length of the trenchless construction solution. |
| Open cut trenching | This construction methodology comprises the excavation of trenches across the intertidal zone perpendicular to the water line using conventional land-based excavators. Typically, this is undertaken whilst the tide is low but can also be supported by barge mounted excavators below MLWS. A trench would be formed, the dimensions of which are to be determined following completion of the site specific surveys and will be subject to sediment conditions locally. Access to the construction site would be gained across the soft sediment beach via a corridor. Following the formation of the trench, the cables would either be pulled directly ashore using rollers, or ducts and messenger wires installed to facilitate cable pull-in at a later date, subject to detailed engineering.<br>It is expected that a maximum of two open-cut trenches would be excavated through the intertidal zone. Once the cable or ducts are installed these trenches will be backfilled.<br>It is possible that this option would require a cofferdam. A cofferdam is typically a sheet-piled structure which can be used within the marine environment to create a | All potential construction methodologies will be assessed to identify any that should be excluded due to the potential for significant impacts, and whether mitigation is required. |

| Activity | Description | Assessment Approach |
|---|---|---|
| | safe, dry working area. If a cofferdam is required, it is expected that vibratory piling would be adopted for installation of sheet walls with percussive piling only used where required to achieve design depth. | |

### 3.5.2. Submarine Cables

Table 3-3 describes the construction activities associated with the installation of the submarine cables and the assessment approach to be taken. The submarine cables will be buried into the seabed wherever feasible. However, there may be some areas where ground conditions (e.g., sub cropping/outcropping rock), or the presence of third-party assets (existing cables or pipelines) would mean that the submarine cables are surface laid requiring external protection. Table 3-4 presents the maximum key design parameters, representing worst case for assessment.

*Table 3-3: Submarine cables construction activities*

| Activity | Description | Assessment Approach |
|---|---|---|
| Cable lay and burial | There are three possible configurations for cable installation and protection: pre-cut trenching and cable lay; simultaneous lay and burial (SLB); and cable lay and post-lay burial. One or a combination of these would be used, depending on the ground conditions, environmental constraints and installation contractor selected. Cable lay and installation operations would be performed on a 24-hour basis, to minimise installation time and the duration of any disruption to sensitive environmental receptors as well as navigation and other sea users; this would also maximise available weather opportunities, as well as vessel and equipment availability. "Guard vessels" may be on site to warn mariners of any lengths of unprotected cable.<br>As per industry best practice, the preferred submarine cable protection method is burial. It is not yet confirmed what subsea trenching equipment would be used to install the cables; however, it is anticipated that the following may be required dependent on the seabed conditions present within the proposed submarine cable corridor:<br>• Jet-trenching – positioned on the seabed, a jet trencher uses a powerful water jetting tool to fluidise the seabed allowing pre-laid cables to sink to the required burial depth. The cable trench is typically left to back-fill naturally or would be manually infilled with excavated material.<br>• Conventional narrow share cable plough – as the plough is pulled through the seabed it cuts and lifts a wedge of soil. The cable is then fed into the plough and guided down through the share to the base of the trench and the soil wedge is placed back in over the cable. For this option, the seabed level tends to recover to its natural state within several tidal cycles.<br>• Advanced cable ploughs (vertical injectors) – deep burial ploughs using water jets fitted within the plough share to fluidise material at the leading edge of the share. Can achieve deeper burial depths (i.e., 3-6 m). The cable trench would be left to back-fill naturally.<br>• Cutting – used in hard sediments such as clay and weak bedrock or gravelly sediments to pre-cut a trench. The cables are then laid within the trench, and burial achieved either via back-fill plough or, mass flow excavator.<br>• Mass Flow Excavation (MFE) – suspended above the seabed a MFE uses high pressure water jets to fluidise the seabed which allows the cable to sink to the required burial depth. The cable trench would be left to back-fill naturally. | The Applicant intends to acquire geophysical, geotechnical, and environmental survey data, including vessel and fishing activity, along the proposed submarine cable corridor in 2023/2024. The data would inform a Cable Burial Risk Assessment (CBRA) which would define the minimum depth that the cables must be buried to protect them from external influences (e.g., dropped anchors, fishing gear interaction). The data would also be used to identify which cable burial tools may be selected. All potential construction methodologies would be assessed to identify if any should be excluded due to the potential for significant impacts, and whether mitigation is required. |

| Activity | Description | Assessment Approach |
|---|---|---|
| | The depth to which the cables would be buried will be dependent on a combination of seabed conditions and the perceived risk and probability of potential hazards to the cables and other users of the sea (e.g., vessel traffic, anchoring activity, and demersal fishing activity). A Cable Burial Risk Assessment will be conducted to inform burial depth requirements; however, it is currently anticipated that the burial depth would be 0.1-2.5 m. | |
| External cable protection | As detailed above, burial of cables is the preferred method of protection and any requirement for additional external protection would be considered a last resort and minimised by micro-routeing, refinement of target burial depths, selection of appropriate burial tools and remedial trenching. However, there may be areas within the proposed submarine cable corridor where adequate protection of the cables cannot be achieved through burial and additional external protection is required, for example where there is insufficient sediment cover, boulders, or crossings of existing seabed assets.<br>Options for providing external protection include:<br>• Rock Placement – this involves the construction of a continuous, profiled berm of graded rock over the cables. It may be used along sections of the cables where seabed conditions do not allow sufficient protection by burial (either planned or remedial), at crossings and joint locations, and where the cables transitions from surface lay to burial such as HDD punch-out points. Rock berms would be installed using targeted placement methods, e.g., fall pipe vessels would be used rather than using side or bottom discharge vessels.<br>• Concrete Mattresses/Concrete Half Shells – Concrete mattresses are frequently used to protect submarine cables and can also be used to construct crossings over existing submarine cables and pipelines. They are flexible and thus follow the contours of the seabed or crossed assets. Concrete half shells are newer innovations in the industry which form a barrier over surface laid cables to protect from dropped objects.<br>• Sand/Grout/Rock Bags – smaller bags filled with either sand, grout (which sets in water to the profiled shape), or rock bags can also be used to provide very localised protection, where most mechanical means such as trenchers cannot reach, such as HDD punch-out locations.<br>• Tubular Protection Systems – additional protection can be provided around the cable in the form of articulated half shells. They are generally made of either high density polyurethane (HDPE) or cast-iron.<br>• Imported sand placement – following cable installation in the trench, should insufficient sediment be present to re-bury the cables the trench may be backfilled with sand from a licensed marine extraction site.<br>The potential requirement for additional external cable protection would be confirmed through further design development both pre- and post-consent and would be informed by offshore survey information as it becomes available. Where external protection is or may be required, details of the type, quantity and nature of each protection measure would be provided in the MEAp and used to inform the MEA including, estimated locations, volumes/numbers, tonnages, and likely grades of rock or other materials to be used. This would include both planned and potential remedial requirements and would be provided to characterise | The deposit of substances on the seabed within the UK Marine Area is a Licensable Activity under the MCAA. In the Scottish marine area this activity is licensed under the Marine (Scotland) Act 2010.<br>Data acquired during the proposed submarine cable corridor survey would be used by engineering studies to determine locations along the proposed submarine cable corridor where ground conditions may prevent burial to the required depth of lowering. A precautionary approach will be taken in the MEA with indicative locations identified and assessed. |

| Activity | Description | Assessment Approach |
|---|---|---|
| | the nature and extent of cable protection which may be installed within English and Scottish territorial and offshore waters. | |

*Table 3-4: Subsea cable design parameters*

| Parameter | Design Envelope |
|---|---|
| **Cable construction** | |
| Number of trenches | 2 |
| Maximum separation distance between trenches | 30 m |
| Anticipated maximum burial depth (below mudline) | 2.5 m |
| Maximum installation tool seabed disturbance width | 20 m |
| Maximum width of cable trench | 1 m |
| Maximum width of external cable protection | 15 m |

### 3.5.3. Construction Vessels

A range of different vessels will be required during construction. These are likely to include:

- Cable Lay Vessel (CLV): The CLV would be a specialist ship designed to carry and handle long lengths of heavy power cables. The CLV would be equipped with a dynamic positioning (DP) system. The shallowest depth in which the cable ship can operate will depend on the vessel used but is typically around 10 m lowest astronomical tide (LAT), although some vessels can operate in much shallower depths.
- Cable Lay Barge (CLB): Alternatively a CLB may be required at the proposed Landfall(s). These types of vessel typically operate in water depths less than 10 m LAT. A CLB would require a four to six-point anchor mooring system covering an area of between 500 m and 1,000 m radius from the vessel to allow the barge to hold station whilst the installation work is undertaken.
- Jack-up/anchored barge or vessel/multi-cat: These types of vessels may be used at the trenchless technique punch-out point to support the drilling and pull-in of the cables.
- Small work boats: smaller work boats may be required to support the main construction vessels. Examples include anchor handling vessels, tugs, rigid inflatable boats (RIBs).
- Construction support vessels (CSVs): CSV include a variety of vessels that may be required to support construction activities. This may include survey vessels, diver support vessels, and general construction support vessels. CSVs come in a variety of sizes and are adapted to undertake different roles, for example archaeological or UXO inspection, PLGR, OOS cable remove, placement of concrete mattresses etc.
- Rock placement vessels: A rock placement vessel features a large hopper (tank) to transport rock and a mechanism for deploying rock on the seabed. There are many different types of rock placement vessel, however for the purposes of this Scoping Report, it has been assumed that a flexible fall pipe mechanism for rock placement would be used whereby a retractable chute is used to control the flow of rock to the seabed.
- Guard vessel: Guard vessels are used to ensure the safety of mariners operating in the vicinity of construction and maintenance activities associated with the cable.. They may be required to accompany the CLV, particularly in areas of high-frequency shipping. Guard vessels are also used to protect areas of exposed cables prior to burial or deposit of external cable protection.

For the purposes of the Scoping Report, it has been assumed that during cable installation, a 'rolling' 500 m safety zone would be applied around construction vessels and activities.

## 3.6. Operation, Maintenance and Repair

Once buried, submarine cables do not require routine maintenance. However, it is likely that regular inspection surveys would be undertaken using standard geophysical survey equipment and/or ROV to monitor the cables' burial depth and the condition of any external protection. Maintenance activities may be required, subject to the results of the inspection surveys, to ensure the integrity of the cable is maintained. These may take the form of remedial trenching or deposit of additional external protection. For example, maintenance works may be required to re-bury any sections of cable that have become exposed and or to reinstate rock berms that may have become displaced.

The most common reason for repair of a submarine cable is damage caused by third parties, typically caused by trawlers or commercial ships' anchors on a shallow or exposed cable segment. A repair requires removal of the damaged section of cable, insertion of an additional cable section and two additional cable joints. The additional cable length may be equal to or greater than approximately three times the depth of the water at the site, depending on how much damage the cable has sustained. The extra length of a repaired cable section means that the repaired cable cannot be returned to its exact previous position and alignment on the seabed. The excess cable would be laid on the seabed in a loop to one side of the original route to form an 'omega' loop or hairpin. This would then be buried into the seabed, or external cable protection would be deposited if burial is not feasible due to ground conditions or position. Depending on the size of the repair and location, a construction vessel may be stationary at a location for 1-2 weeks at a time.

The requirement for repair operations during the lifetime of the Project would depend on the number of faults, location of the faults, and the burial/protection method used for the original installation. When assessing the impacts of a repair operation within the MEA, feasible worst-case scenarios will be assessed. Information on seabed characteristics would be used to identify any locations along the proposed submarine cable corridor where burial might not be feasible following a repair, and external cable protection might therefore be required.

## 3.7. Decommissioning

The minimum design life of the submarine cables is 40 years, although with repairs, some cable systems last upwards of 60 years. The proposed Marine Scheme (within territorial waters) would be the subject of a Licence or Lease from the Crown Estate and Crown Estate Scotland. An Initial Decommissioning Plan would be written once the final route and construction methodology is chosen. This is a legal requirement necessary to secure the Crown Estate and Crown Estate Scotland Licences. The Initial Decommissioning Plan (IDP) would form the basis of the Final Decommissioning Plan which would be developed in consultation with The Crown Estate and Crown Estate Scotland. The measures and methods for any decommissioning would comply with any legal obligations which would apply to the decommissioning of the cable when it takes place.

The IDP is periodically reviewed and updated in line with the applicable guidance and regulations at the time.

The environmental impact of decommissioning the Project would be assessed at the time of decommissioning. Removal of the cable is a similar process to the installation of the cable but in reverse. The environmental impact can therefore not be fully assessed until the environmental conditions at the time of decommissioning are established. However, the MEA will considering the potential impacts of decommissioning as a high level in line with The Crown Estate and Crown Estate Scotland decommissioning principles.

## 3.8. Environmental Management

Prior to construction commencing, the Applicant would be required to prepare a Construction Environmental Management Plan (CEMP) and associated implementing procedures. The CEMP is a tool that sets out the Project's commitment and approach to environmental management and will ensure that all and any Contractors (including sub-contractors) engaged during the pre-construction and construction phase of the Project are advised of the responsibilities for environmental protection.

The objectives of the CEMP are to:

- Outline the applicable legislation, guidelines, licences, and permissions associated with the works.
- Highlight the mitigation identified prior to award of the licences and permissions.
- Provide the overarching framework for environmental management, highlighting the hierarchy of documentation that will be used to manage environmental impacts during the offshore construction works.
- Provide details of responsibilities in relation to environmental management, including induction training.
- Detail how environmental compliance will be audited and reported, and any non-conformance will be managed and corrected.
- Ensure consistency in approach and performance of environmental management across the engineering, procurement, and construction (EPC) Contractor and its sub-contractors during the offshore construction works.

### 3.8.1. Net Zero Targets

In the UK, NGET has set a target to achieve carbon neutral construction by 2026 on all projects, while SHE-T are committed to cutting carbon intensity by 60% and trebling renewable energy output by 2030. The Electricity System Operator has also committed to be able to fully operate Great Britain's electricity system with zero-carbon by 2025. These commitments are relevant to the delivery and operation of the Project.

Furthermore, the Project will itself help the UK deliver on its target of becoming net-zero in all greenhouse gases by 2050 for England and Wales and 2045 for Scotland, as it will help facilitate the transmission of electricity generated from a variety of renewable sources around the UK.

## 3.9. Indicative Programme

The timescales for the key stages of the Project are outlined in Table 3-5.

*Table 3-5: Indicative project schedule*

| Stage of development | Time period |
|---|---|
| Consultation on Scoping Report | Q4 2023/Q1 2024 |
| Proposed marine characterisation survey | Q3 2023 – Q1 2024 |
| Preparation of engineering and environmental studies and assessments | 2024 |
| Pre-application consultation with stakeholders | Q2 2023 – Q3/Q4 2024 |
| Submission of Marine Licence application | Q4 2024/Q1 2025 |
| Determination of Marine Licence application | Q4 2025/Q1 2026 |
| Construction | 2028 |
| Operation | 2030/31 |

* Calendar years