



# Scotland England Green Link 1 / Eastern Link 1 - Marine Scheme

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Environmental Appraisal Report  
Volume 2

Chapter 1 - Introduction

**nationalgrid**



**SP TRANSMISSION**

National Grid Electricity Transmission and Scottish Power Transmission

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# 1. Introduction

## 1.1 General Introduction

National Grid Electricity Transmission (NGET) and Scottish Power Transmission (SPT) (hereafter referred to as 'the Applicant') are jointly developing a subsea High Voltage Direct Current (HVDC) link between Torness in East Lothian and Hawthorn Pit in County Durham, referred to as the Scotland England Green Link 1 (SEGL1) or Eastern Link 1 (EL1) (hereafter referred to as 'the Project') (Figure 1-1). NGET will be the Transmission Operator (TO) within English jurisdiction and SPT will be the TO within Scottish jurisdiction.

NGET and SPT are submitting Marine Licence Applications (MLAs) to the Marine Scotland Licensing Operations Team (MS-LOT) and to the Marine Management Organisation (MMO) for the marine elements of the Project, referred to as the 'Marine Scheme', which extend up to Mean High Water Springs (MHWS) at both the Scottish and English landfalls.

The onshore components of the Project, referred to as the Scottish Onshore Scheme and the English Onshore Scheme, will be subject to two separate consenting processes under the Town and Country Planning (Scotland) Regulations 1997, and Town and Country Planning Act 1990. Applications will be submitted to East Lothian Council and Durham County Council respectively, supported by the relevant environmental studies.

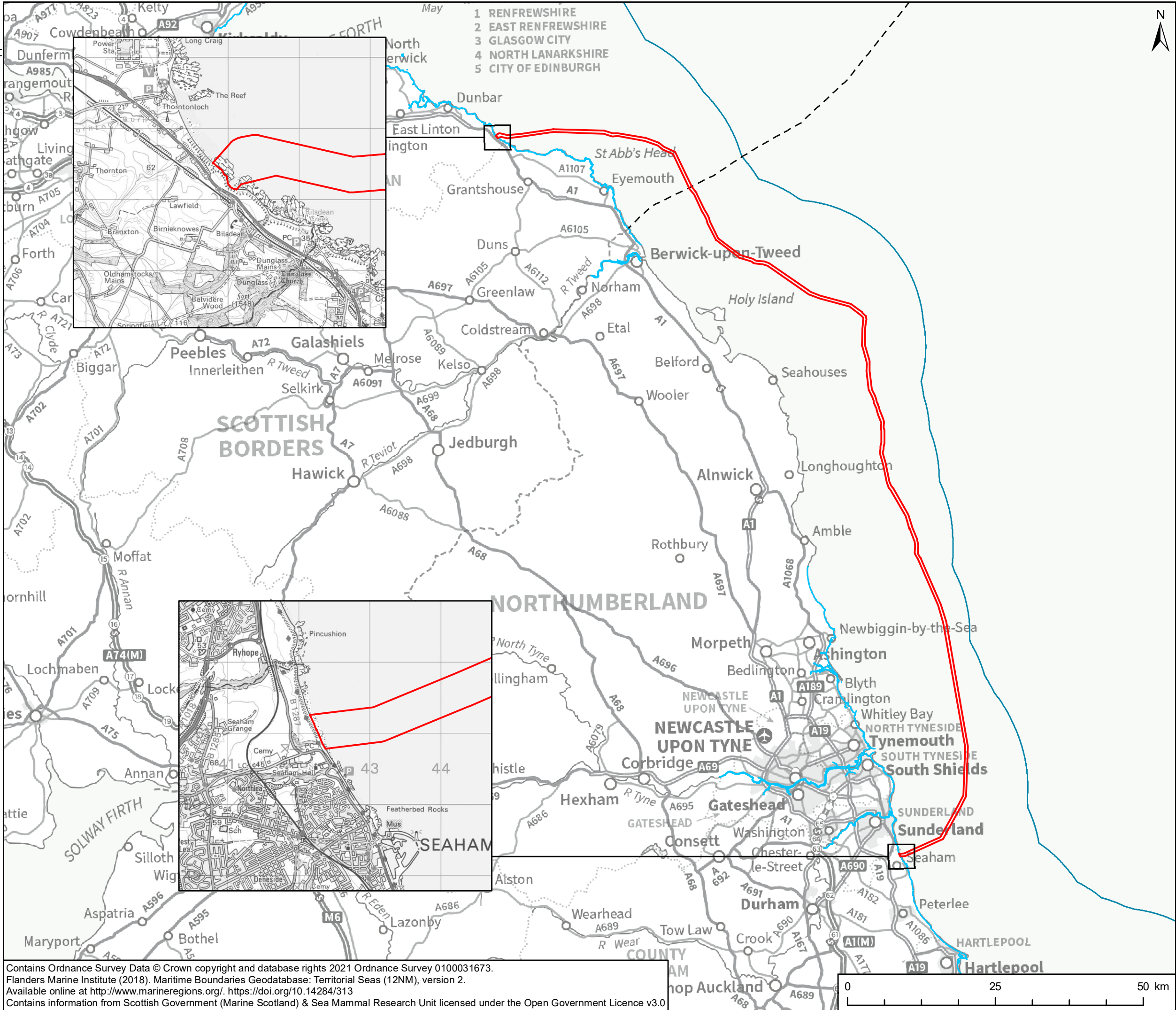
The spatial extent of the Marine Acts (Marine and Coastal Access Act 2009 (MCAA), Marine (Scotland) Act (MSA), 2010) and TCPAs (TCPA (Scotland), 1997 and TCPA, 1990) overlap between MHWS and Mean Low Water Springs (MLWS). On this basis, the intertidal zone is covered within the scope of both the Marine Scheme as well as the respective Onshore Scheme's consents, within each of the jurisdictions. A schematic showing the extent of the Marine Scheme is provided in Figure 1-2.

Advice from MS-LOT (03 February 2021) and the MMO reference ENQ/2021/00066 (16 March 2021) confirmed that the Marine Scheme is not considered to be 'EIA Development' under the terms of the Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (the Scottish Marine EIA Regs) and The Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended) (the English Marine EIA Regs (together the EIA Regulations)). However, NGET and SPT, in line with their statutory obligations, consider it important to provide comprehensive information about the Project's potential environmental impacts, which are presented in this non-statutory Environmental Appraisal Report (EAR), prepared to accompany the MLAs to MS-LOT and the MMO. Further information is provided in Section 1.5.3 regarding the Applicant's obligations.

This EAR has been prepared by appropriately qualified and experienced environmental specialists from AECOM Ltd, supported by Wessex Archaeology, Xodus Group, and Brown and May Marine Ltd.



GIS: LC Checked: HT Approved: FF



PROJECT  
**Scotland England Green Link 1 / Eastern Link 1**

KEY

- Marine Installation Corridor
- UK Territorial Sea Limit
- Scottish/English Water Border
- Mean High Water Springs

TITLE  
**Figure 1-1  
The Marine Scheme**

REFERENCE  
SEGL1\_M\_EAR\_1-1\_v2\_20220512

SHEET NUMBER  
1 of 1

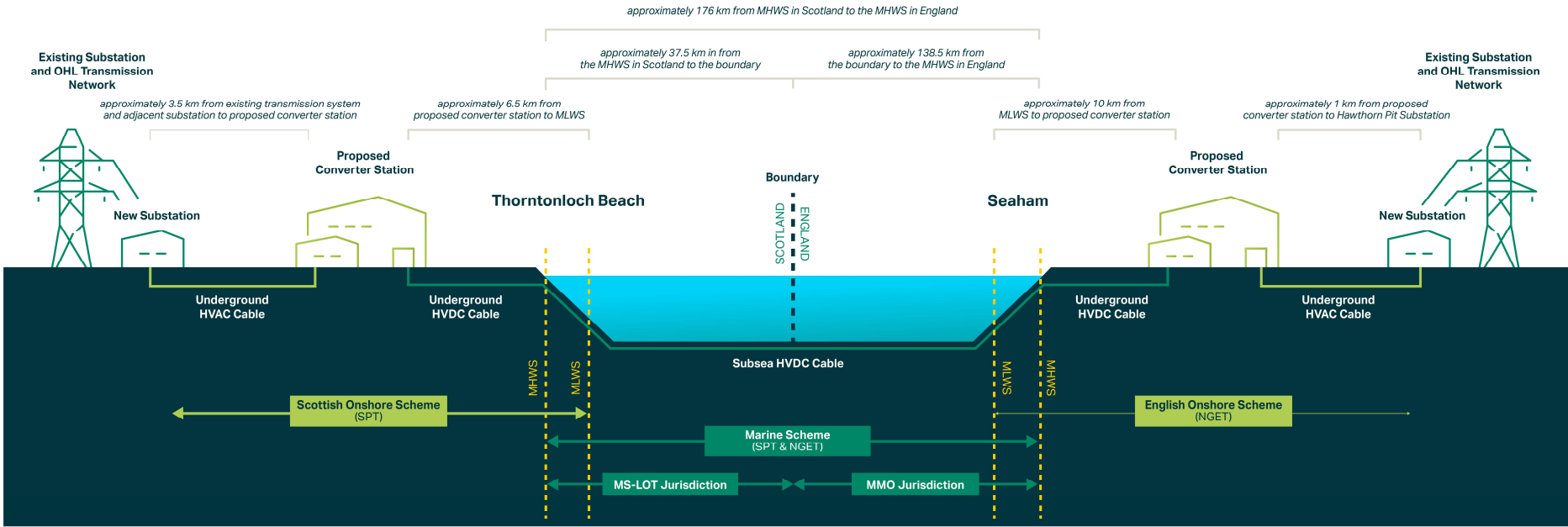
DATE  
12/05/2022

Contains Ordnance Survey Data © Crown copyright and database rights 2021 Ordnance Survey 0100031673.  
Flanders Marine Institute (2018). Maritime Boundaries Geodatabase: Territorial Seas (12NM), version 2.  
Available online at <http://www.marineregions.org/>. <https://doi.org/10.14284/313>  
Contains information from Scottish Government (Marine Scotland) & Sea Mammal Research Unit licensed under the Open Government Licence v3.0

Coordinate System: ETRS 1989 UTM Zone 30N / British National Grid (Inset)

Scale @ A3 1:600,000 / 1:50,000

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**Key:**  
HVDC - High Voltage Direct Current  
HVAC - High Voltage Alternating Current  
OHL - Overhead Line

MHWS - Mean High Water Springs  
MLWS - Mean Low Water Springs  
MMO - Marine Management Organisation

MS-LOT - Marine Scotland Licensing Operations Team  
NGET - National Grid Electricity Transmission  
SPT - Scottish Power Transmission

Figure is not to scale.

Figure 1-2: Scope of the Marine Scheme

## 1.2 Need for the Project

The UK is a world leader in offshore wind energy (UK Research and Innovation, 2021) and its target of becoming net-zero in all greenhouse emissions by 2050 for England and Wales (under the Climate Change Act 2008 (2050 Target Amendment) Order 2019) and by 2045 for Scotland (under the Climate Change (Scotland) Act 2009 (as amended)) is now enshrined in law. In addition, the Government has shown clear commitment to developing offshore wind at scale through the recent Ten Point Plan and Energy White Paper (UK Government, 2020), identifying a target of delivering 40 gigawatts (GW) of offshore wind energy by 2030, enough to power every home in the UK.

New North Sea developments, including offshore wind farms, interconnectors, and transmission system reinforcements will be essential to meeting these climate change targets and driving economic growth across the country.

As the UK transitions away from traditional forms of fuel to power vehicles and heat homes there will be a greater need for renewable and low carbon electricity. By the end of this decade, every home in the country has the potential to be powered by renewable energy (UK Government, 2020). To move this renewable and low carbon energy from its source and into people's homes and businesses, the UK needs to increase the capability of its electricity transmission network.

This Project is a major reinforcement of the UK electricity transmission system which will provide additional transmission capacity from north and south across transmission network boundaries, ensuring that green energy is transported from where it is produced to where it is needed, economically and efficiently. The primary objective of the Project is to reinforce the electricity network and increase transmission capacity across the B6 boundary<sup>1</sup> between southern Scotland and northern England before 2030.

In the short to medium-term, increased power flows through Scotland and between Scotland and England are caused by generation already connected to the transmission network, and by generation contracted to connect to the network in the Scotland and North of England region.

In the medium to the long-term there are significant increases in north to south power flows across a diverse and credible range of scenarios including a tripling of wind generation connected across the Scottish networks by 2030, driving higher north-to-south power transfers, and at least a doubling of transfer requirements from northern Scotland to the Midlands over the next 10 years. New reinforcements will be required to facilitate these power flows through the North of England. The Project is one of those reinforcements.

A second HVDC link, Scotland England Green Link 2 (SEGL2) / Eastern Link 2 (EL2) from Peterhead in Aberdeenshire to Drax near Selby, via the East Riding of Yorkshire, is being developed jointly by NGET and Scottish Hydro Electric (SHE) Transmission Plc, however that project is subject to a separate consenting process and is not included within the scope of this EAR.

Balancing the cost of investing in the network against the costs of constraints is undertaken by National Grid Electricity System Operator (National Grid ESO, which is entirely separate entity to NGET) and overseen by the Office of Gas and Electricity Projects (Ofgem). Reviews include:

- Future Energy Scenarios (FES) – these are developed annually by National Grid ESO with input from industry and other stakeholders. The FES represent a range of different, credible ways in which the energy system could evolve taking account of policy and legislation, including net zero targets.
- Electricity Ten Year Statement (ETYS) – using data from the FES, National Grid ESO undertakes an annual assessment to identify points on the transmission system where more network capability is needed to ensure that energy is delivered efficiently and reliably to where it is needed.
- Network Options Assessment (NOA) – the Transmission Owners and other stakeholders respond to ETYS with solutions to address network capability requirements. These are assessed by

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<sup>1</sup> Boundary B6 separates the transmission network at the SP Transmission and National Grid Transmission interface running roughly along the border between Scotland and England.



National Grid ESO so that the most economic and efficient solutions are recommended to proceed, and others told to hold or stop.

The need for the Project has been identified and assessed as part of this continuous annual cycle. A subsea HVDC link between Torness and Hawthorn Pit, known as the Eastern Link, was given a 'proceed' signal in the first NOA published in 2015/16. It has continued to appear in each yearly NOA Report and is included in the most recent NOA 2021/22, published in January 2022, along with the SEGL2/EL2 project.

## 1.3 Project Overview

The Project forms part of the UK transmission system (rather than an interconnector), and will comprise the following components:

- **Scottish Onshore Scheme:** A converter station located in the Torness area, to the east of the Dunbar Energy Recovery Centre and a new 400kV substation at Branxton in East Lothian, Scotland, with approximately 7.5 km of buried HVDC cable to a landfall south-east of Thorntonloch Beach. The substation at Branxton was part of a separate planning application (reference 21/01569/PM). The converter station and substation will be connected by approximately 5 km of High Voltage Alternating Current (HVAC) cable. The substation connects the Project to the existing transmission system. The scope of the Scottish Onshore Scheme ends at MLWS and a separate consent application has been made to East Lothian District Council.
- **Marine Scheme:** Commencing at MHWS at Thorntonloch Beach, East Lothian, approximately 176 km of subsea HVDC cable, comprising 37.5 km in Scottish waters and 138.5 km in English waters, will extend to MHWS at Seaham, County Durham. This is subject to MLAs to MS-LOT and the MMO, which this EAR supports; and
- **English Onshore Scheme:** Commencing at MLWS approximately 10 km of underground HVDC cable will be laid from the landfall north of Seaham, west along the Sunderland City/County Durham administrative boundary and then south-west through County Durham, to a converter station at Hawthorn Pit. The converter station will be connected to a new 400 kV substation by approximately 1 km of HVAC cable. The new 400 kV substation will connect the Project to the existing 275 kV Hawthorn Pit substation and the existing electricity transmission system. This is subject to a separate consent application which will be made to Durham County Council.

As stated in Section 1.1 there is overlap between the Marine Schemes and the Onshore Schemes in the intertidal zones between MLWS and MHWS (illustrated in Figure 1-2:). This EAR has been prepared for the scope of the Marine Scheme only although the impacts of the Onshore Schemes are assessed as part of the cumulative assessment.

## 1.4 The Marine Scheme

The HVDC cable system, comprising two HVDC single core metallic conductors and one fibre optic (FO) cables, will be installed within a 500 m installation corridor (hereinafter referred to as the 'marine installation corridor'). The cables will either be laid separately or as a single bundle. If the cables are laid separately the separation between them will be up to 30 m, with the FO cable bundled with one of the cables. The decision regarding separate cable laying or bundling will be taken post consent based upon detailed engineering design and procurement factors.

At both the Scottish and English landfalls the cable system will be installed beneath the intertidal zone using Horizontal Directional Drilling (HDD) to install cable ducts from the temporary Transition Joint Bay (TJB) located landward of MHWS (and therefore not part of the Marine Scheme and not considered further in this EAR).

The Project Design Envelope is described in detail within Chapter 2: Marine Scheme Description.

## 1.5 Regulatory Context

The regulatory regime is such that each of the components of the Marine Scheme requires separate permissions and licences from different authorities. The separate permissions and licences are being sought for the marine installation corridor, which will encompass the eventual route of the installed



cables. It is recognised that within this corridor, there will be flexibility to allow for micro routing and refinement of the exact cable route following detailed design by the installation contractor.

Further information on legislation and policy is presented in Chapter 3: Legislation and Policy Framework of this EAR.

### 1.5.1 Marine Licences

The MSA (2010) and MCAA (2009), together known as 'the Marine Acts', set out the framework for marine licensing. Under the MSA 2010, MS-LOT is responsible for the marine licensing activities carried out in the Scottish inshore region, from MHWS to 12 nautical miles (NM). The MMO is responsible under Part 4 of the MCAA 2009 for licensing of activities relating to the construction and removal of any substance or object in English territorial waters (up to 12 NM).

A Marine Licence is therefore required for the installation of the Marine Scheme within Scottish and English territorial waters from MS-LOT and the MMO respectively. Two Marine Licences are required for the Marine Scheme, as follows:

- One Marine Licence is required for the Marine Scheme in Scottish waters under the MSA (2010), for all activities associated with the installation and maintenance of the Marine Scheme in Scottish territorial waters (within 12 NM); and
- One Marine Licence is required for the Marine Scheme in English waters under the MCAA (2009), for all activities associated with the installation and maintenance of the Marine Scheme within English territorial waters (the Marine Scheme is located entirely within 12 NM).

This EAR has been prepared in support of the MLAs to the MMO and MS-LOT under the Marine Acts.

### 1.5.2 Other Statutory Duties and Use of Licences

Several other permissions and licences are also required to support the Project. These will be sought through separate processes at the appropriate time and include, but may not be limited to:

- Planning Permission: The works required for the Scottish and English Onshore Schemes extend from the connection point at the proposed substation to MLWS. The Applicant has made separate applications for planning permission as detailed in Section 1.31.1. The applications for planning permission are supported by separate Onshore Scheme environmental assessments / appraisals; and
- Other environmental permissions / licences e.g. European Protected Species licence(s).

### 1.5.3 Requirements for Environmental Appraisal

On receipt of a MLA, it is the responsibility of the MMO and MS-LOT to assess and understand the potential impacts of the proposed activities associated with the Marine Scheme. The Applicant must supply in support of the MLA sufficient information to allow the MMO and MS-LOT to undertake that assessment.

The Environmental Impact Assessment (EIA) Directive (Council Directive 85/337/EC) (as amended 2011/92/EU) requires that certain types of project with the potential to significantly affect the environment have an EIA before a licence decision is made. The EIA Regulations (i.e. the Scottish Marine EIA Regs and the English Marine EIA Regs) transpose the requirements of the EIA Directive (2014/52/EU) into UK law. The EIA Regulations set out the requirement for the EIA process to consider all licensable activities proposed within UK waters.

There is no reference to cable projects or the constituent inshore or offshore component parts of this type of development in the EIA Regulations. The installation of cables or cable protection is not listed on either Schedule A1 or A2 of the EIA Regulations. A formal screening request was submitted to MS-LOT and the MMO, and the following advice was received:

- Advice received from MS-LOT on 03 February 2021 confirmed that the Marine Scheme in Scottish waters is not considered EIA development (MS-LOT Pers. Comm); and

- The MMO advised that screening for EIA in English waters is not possible since the installation of a cable within the UK Marine Area is not listed under the Schedules of the EIA Regulations (16 March 2021. Case Reference EIA/2021/00006).

A statutory EIA under the terms of the EIA Regulations (with reference to Annex I and II of Council Directive 85/337/EEC) is therefore **not** required in respect of the applications for the Marine Scheme<sup>2</sup>.

Notwithstanding this, in order to provide the MMO and MS-LOT the relevant information to assess and understand the likely impacts of the proposed activities, this document has been prepared as a non-statutory EAR to allow the MMO and MS-LOT to determine the MLAs.

A non-statutory scoping request was submitted on 31 March 2021 to the MS-LOT and 1 April 2021 to the MMO, with responses received on 09 July 2021 from MS-LOT and 6 August 2021 from the MMO. MMO / MS-LOT responses are presented in Chapter 6: Consultation and Stakeholder Engagement along with how these comments have been subsequently addressed within this EAR.

## 1.6 The Applicant

The Marine Scheme is being jointly developed by NGET and SPT. NGET and SPT own the high voltage electricity transmission network in England and Wales, and in southern and central Scotland respectively. They are responsible for ensuring electricity is transmitted safely and efficiently from generation to end user.

NGET and SPT are transmission licence holders under the Electricity Act (1989) and have a number of statutory duties, which this EAR will support, including the requirement “*to develop and maintain an efficient, coordinated and economical system of electricity transmission*” as well as specific responsibilities under Schedule 9 with regard to the preservation of amenity, including:

- Having regard to the desirability of preserving natural beauty, of conserving flora, fauna and geological or physiographical features of special interest and of protecting sites, buildings and objects of architectural, historic or archaeological interest; and
- Doing what they reasonably can to mitigate any effect which the proposals would have on the natural beauty of the countryside or on any such flora, fauna, features, sites, buildings or objects.

The MLAs for activities associated with cable installation and operation within Scottish and English waters will be jointly submitted to MS-LOT and the MMO respectively, by NGET and SPT.

## 1.7 The Environmental Appraisal

During non-statutory scoping consultation with the MMO and MS-LOT (and their statutory and non-statutory advisors) the scope of this EAR was discussed and agreed. As part of the scope, specialist assessments were confirmed and have been undertaken where there is potential for the Marine Scheme to significantly impact associated receptors.

The structure of this EAR is presented in Table 1-1 and comprises three volumes:

- **Volume 1 – Non-Technical Summary.** This is readily accessible to the general public. It is concise and written in non-technical language providing a description of the Project, in particular the Marine Scheme, and a summary of the assessment of likely significant environmental effects and proposed mitigation measures;
- **Volume 2 – Main Report.** This comprises the main text including a description of the Marine Scheme (including the alternatives considered), the baseline conditions, and appraisal of the likely

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<sup>2</sup> Note: The onshore component of the Project in Scotland, the Scottish Onshore Scheme, which comprises the Scottish terrestrial component and extends to MLWS, is subject to a statutory Environmental Statement (ES), which will be submitted separately to East Lothian Council as part of the onshore application under the Town and Country Planning Act 1990. A request for an EIA Screening and Scoping Opinion (EIA/SCREEN/21/02) was submitted to East Lothian Council the 9 February 2021, which response was obtained on the 2 March 2021.

In England, screening opinion received from the Durham County Council on 25 March concluded that the onshore component of the Project in England, the English Onshore Scheme, is not EIA development, and that any future planning application would not need to be supported by an Environmental Statement in line with the Town and Country Planning (Environmental Impact Assessment) (England) Regulations 2017.

significant environmental effects resulting from the Marine Scheme, and proposed measures to mitigate those effects; and

- **Volume 3 – Technical Appendices.** This comprises the supporting technical information which is cross referenced throughout Volume 2.

The overall structure of the EAR is presented within Table 1-1.

**Table 1-1: Structure of the Environmental Appraisal**

Chapter	Title/ Description
<b>Volume 1 Non-Technical Summary</b>	
<b>Volume 2 Main Report</b>	
01	Introduction
02	Project Description
03	Legislative and Policy Framework
04	Approach to Environmental Appraisal
05	Alternatives and Design Development
06	Consultation and Stakeholder Engagement
07	Physical Environment
08	Benthic Ecology
09	Fish and Shellfish Ecology
10	Marine Mammals
11	Ornithology
12	Marine Archaeology
13	Shipping and Navigation (including Navigational Risk Assessment)
14	Commercial Fisheries
15	Other Sea Users
16	Cumulative and In-Combination Effects
17	Schedule of Mitigation Commitments
18	Summary and Conclusions
<b>Volume 3 Technical Appendices</b>	
2.1	Eastern Link EMF and Compass Deviation Assessment
3.1	Marine Plans Compliance Checklist
3.2	Topic Specific Legislation
7.1	Water Framework Directive Report
8.1	Marine Protected Area and Marine Conservation Zone Assessment
8.2	Habitat Regulations Assessment Report
12.1	Marine Archaeology Technical Report
14.1	Report on Baseline Consultation with Fisheries Stakeholders

## 1.8 Availability of the Environmental Appraisal Report

This EAR forms part of the MLA to the MMO and MS-LOT and will be advertised in accordance with MMO and MS-LOT required procedures.

Full digital copies of this EAR are available through:

- MMO Marine Case Management System:  
[https://marinelicensing.marinemangement.org.uk/mmofox5/fox/live/MMO\\_LOGIN/login](https://marinelicensing.marinemangement.org.uk/mmofox5/fox/live/MMO_LOGIN/login);
- MS-LOT Marine Licence Details: [All applications | Marine Scotland Information](#);
- Project websites:  
SPT: [https://www.spenergynetworks.co.uk/pages/eastern\\_link\\_introduction.aspx](https://www.spenergynetworks.co.uk/pages/eastern_link_introduction.aspx)  
NGET: <https://www.nationalgrid.com/seg1>; and
- Projects communication team at:  
SPT: [easternlink@spenergynetworks.co.uk](mailto:easternlink@spenergynetworks.co.uk)  
NGET: [info@SEGL1.nationalgrid.com](mailto:info@SEGL1.nationalgrid.com)  
Tel: 0808 196 8405

## 1.9 References

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Climate Change (Scotland) Act (2009). Available at:

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