

# 1 Project Background

## 1.1 Introduction

### 1.1.1 Overview of the Project and Environmental Statement

1.1.1.1 In January 2010, Moray Offshore Renewables Limited (MORL) was awarded a Zone Development Agreement (ZDA) by The Crown Estate to develop Zone 1 of the nine UK offshore wind Round 3 zones. Zone 1 (the MORL Zone) is located in the outer Moray Firth within the UK Renewable Energy Zone (REZ) (Figure 1.1-1, Volume 3). Detailed analysis of the MORL Zone identified two separate development areas, the Eastern Development Area (EDA) and the Western Development Area (WDA) (Figure 1.1-1, Volume 3). It was decided to develop the EDA first because of existing spatial constraints to wind farm development in the WDA (see Chapter 2.2: Project Description for more detail). Within the EDA, consents under Section 36 of the Electricity Act 1989 have been granted for three offshore wind farm sites (referred to in this ES as the three consented wind farm sites):

- **Telford Offshore Wind Farm** (Telford), for which consents for construction and operation are owned by Telford Offshore Wind Limited;
- **Stevenson Offshore Wind Farm** (Stevenson), for which consents for construction and operation are owned by Stevenson Offshore Wind Limited; and
- **MacColl Offshore Wind Farm** (MacColl), for which consents for construction and operation are owned by MacColl Offshore Wind Limited.

1.1.1.2 In December 2010, MORL signed Agreements for Lease (AfL) with The Crown Estate for each of the three wind farm sites. Applications for Section 36 consents and Marine Licences for the wind farms and associated transmission infrastructure was sought in August 2012. These applications were supported by an Environmental Statement (the MORL ES (MORL, 2012)) which assessed the potential environmental effects of the Project (i.e. the wind farms and the offshore and onshore elements of the MORL transmission infrastructure as applied for). The Section 36 consents referred to above were awarded in March 2014 for construction of a maximum installed capacity of 1,116 MW, split equally between the three sites.

1.1.1.3 Due to changes explained below, modified Transmission Infrastructure (modified TI) (comprising both offshore and onshore electrical transmission infrastructure) required to transmit the power from the three wind farm sites to a connection point into the national grid, is being proposed and is the subject of this environmental statement (ES). MORL has been offered an amended connection to the existing 275 kV overhead transmission line, owned and operated by Scottish Hydro-Electric Transmission (SHE-T), located south of New Deer in Aberdeenshire (Figure 1.1-5, Volume 3). This existing 275 kV transmission line is also subject to planned upgrade works by SHE-T to 400 kV. In order to connect into the transmission line, two substations will be required in proximity to the line. An Offshore Transmission Owner (OFTO) will manage the modified TI which spans from the wind farm to the interface point with the national grid. The modified TI will include the offshore substations, onshore and offshore export cable and an onshore substation. A second onshore substation will be owned and operated by the regional onshore Transmission Owner (TO) and will be required in order to connect the OFTO assets to the national grid. Both onshore substations will be co-located and are included in the scope of this ES. MORL has decided to undertake the generator build of the modified TI and will turn the OFTO assets over to the OFTO upon commissioning. It is anticipated that the onshore substation which connects the OFTO assets to the national grid will be transferred to the regional TO prior to construction.

- 1.1.1.4 This ES details the results of the relevant studies and assessments in respect of the applications for Planning Permission in Principle under the Town and Country Planning (Scotland) Act 1997 (as amended) for the modified onshore TI (OnTI) and a Marine Licence for the modified offshore TI (OfTI) under the Marine (Scotland) Act 2010 and the Marine and Coastal Access Act 2009.
- 1.1.1.5 As discussed above the MORL ES assessed the potential environmental effects of the Telford, Stevenson and MacColl offshore wind farm (Offshore Generating Stations which together comprise the EDA) infrastructure proposal (i.e. wind turbines, substructures and interarray cables) together with associated transmission infrastructure. It was submitted in August 2012 (MORL, 2012). Section 36 consents were awarded on 19 March 2014 for construction of a power capacity of 1,116 MW. These three offshore wind farms are collectively referred to as the three consented wind farms in this ES. At the time of the Section 36 applications MORL also applied for a Marine Licence for its offshore TI to a landfall at Fraserburgh as MORL's grid connection point at the time was at Peterhead Power Station. The interconnection agreement with National Grid at Peterhead was for a direct current (DC) connection. Accordingly, the MORL ES contained the relevant assessments in support of a Marine Licence application for the OfTI and assessed the likely effects of the OfTI to Fraserburgh. In addition, the MORL ES, as far as possible, also assessed the effects of the OnTI to Peterhead. On 6 June 2014 Marine Scotland issued a Marine Licence for the offshore TI to Fraserburgh.
- 1.1.1.6 Since the submission of the MORL ES, the grid connection point has changed from Peterhead to southwest of New Deer. The change of interface point with the national grid was brought about due to MORL's participation in the Connections Infrastructure and Options Note (CION) process. CION is a joint process between National Grid, the regional TO and the generator builder which seeks to find the most economic and efficient grid connection solution against the current system background. Following this change in the grid connection point, MORL, as the generator-builder considers that a route from the EDA to a landfall at Inverboyndie and then onshore to the existing overhead line southwest of New Deer requires to be progressed (Figures 1.1-4 and 1.1-5, Volume 3). In March 2014 MORL submitted a modification application to National Grid and has now been offered a modified connection agreement at New Deer. The agreement changes the technology from DC to AC as a result of a suite of studies which MORL undertook with the regional TO and MORL's consultant engineer. MORL has recently submitted a Marine Licence application to Marine Scotland in respect of the modified OfTI.
- 1.1.1.7 A summary of the differences between the OfTI and OnTI as assessed in the MORL ES and the modified OfTI and OnTI now assessed in this ES are summarised in Tables 1.1-1 and 1.1-2 below.
- 1.1.1.8 Table 1.1-1 Comparison of offshore infrastructure assessed in MORL ES (MORL, 2012) and this ES.

**Table 1.1-1 Comparison of Offshore Infrastructure Assessed in MORL ES (MORL, 2012) and This ES**

Offshore Infrastructure	Parameter	As Assessed in MORL ES	Modified TI
<b>Substations</b>	Number	Up to 6 AC + 2 AC/DC OSPs	Up to 2 AC OSPs
	Foundation	Gravity Base Structure or jacket	Jacket or Jack-up
	Base Width Dimensions	GBS – Up to 130 m Jacket – Up to 100 m	Jacket or Jack-up – Up to 100 m
	Location	Three consented wind farm sites area plus 6 km buffer	Three consented wind farm sites area
<b>Cables</b>	Number	4 (2 bundles of 2 cables)	4 triplecore cables
	Length to shore	105 km with micrositing allowance	52 km from the boundary of the three consented wind farm sites area Up to 70 km of inter-platform and export cable within the boundary of the three consented wind farm sites area (with micrositing allowance)
	Type of cable	AC cabling between OSPs, DC from AC/DC OSPs to shore	AC cabling
	Voltage	320 kV	220 kV
	Location/design	East of Southern Trench	Cable route west of Southern Trench
	<b>Landfall</b>	Location	Fraserburgh

**Table 1.1-2 Comparison of Onshore Infrastructure Assessed in MORL ES (MORL, 2012) and This ES**

Onshore Infrastructure	Parameter	As Assessed in MORL ES	Modified TI
<b>Substations</b>	Number of AC/DC converter stations	1	0
	Number of substations	1	2
	Compound dimensions	200 x 170 m	270 x 305 m (including both substations)
<b>Cables</b>	Number	2	4 (trefoil arrangement)
	Length	30 km	33 km
	Voltage	320 kV	220 kV
	Target burial depth	1 m	1 m
	Number of trenches	Up to 2	Up to 4

1.1.1.9 This document (together with those relevant parts of the MORL ES which are cross-referenced in this ES) constitutes the ES for the modified TI given the change in grid connection, however a cumulative assessment has also been undertaken assessing the effects of the modified TI together with the three consented wind farm sites, the BOWL wind farm and transmission infrastructure and with those projects and proposals which have been identified for inclusion in the cumulative assessments through consultation, which are specified in each assessment. The Section 36 consents for the three consented wind farms limited the original design envelope as applied for and assessed in the MORL ES. The differences in the Rochdale envelope as applied for and consented are set out in Table 1.1-3 below. The cumulative assessments in the ES use updated assessments for the three wind farms as consented rather than as assessed in the MORL ES.

**Table 1.1-3 Difference in the Rochdale Envelope as Applied for (MORL, 2012) and as Consented**

Offshore Generating Stations	Parameter	As Assessed in MORL ES	As Consented
<b>Capacity</b>	EDA	1,500 MW	1,116 MW
	Per wind farm	500 MW	372 MW
<b>Turbine Types</b>	Blade tip height	204 m	204 m
	Rotor diameter	120 – 172 m	150 – 172 m
	Number of turbines in EDA	339	186
	Number of turbines per wind farm	Up to 139	Up to 62
<b>Turbine Minimum Spacing</b>	Crosswind	600 m	1,050 m
	Downwind	840 m	1,200 m

1.1.1.10 This ES details the outcomes of the Environmental Impact Assessment (EIA), which is required under EU Directive 2011/92/EU (which codifies Directive 85/337/EEC, as amended by Directive 97/11/EC and Directive 2003/35/EC). These directives are transposed into national law in the Marine Works (Environmental Impact Assessment) Regulations 2007 and the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011.

1.1.1.11 This ES is prepared to support the applications for consent for MORL's modified TI and is intended to clearly inform stakeholders of any likely significant effects, mitigation measures and residual effects expected to result from the modified TI.

1.1.1.12 The consents that are being sought are detailed in 1.1.6 of this Chapter.

## 1.1.2 Structure of the Environmental Statement

1.1.2.1 This ES has been organised into separate volumes to account for its size and to ease the readability of the document. The volumes are outlined in Table 1.1-4.

**Table 1.1-4 ES Volumes and Sections**

ES Volume	ES Section
Volume 1	Non-Technical Summary
Volume 2	Environmental Impact Assessment: Baseline Information, Impact Assessments and Cumulative Impact Assessments for all offshore and onshore disciplines. A standalone Habitats Regulations Appraisal chapter and Residual effects summary chapter is also included.
Volume 3	Figures
Volume 4	Seascape, Landscape and Visual Assessment Photomontages and Visualisations
Volume 5	Technical Appendices

### Non-Technical Summary (Volume 1)

1.1.2.2 A standalone Non-Technical Summary (NTS) of this ES has been produced. This document provides, in simple non-technical language, an overview of the modified TI and a summary of the key findings from this ES.

### Environmental Impact Assessment (Volume 2)

1.1.2.3 This Volume provides detailed information on the modified TI, the baseline environment and an assessment of the likely significant effects that may occur from the construction, operation and decommissioning phases of the modified TI. Further details on the approach taken throughout the EIA process can be found in Chapter 1.3, Environmental Impact Assessment.

1.1.2.4 An outline of the overall format of this Volume is given below.

1.1.2.5 **Chapter 1 (Volume 2)** forms the project background providing an introduction to the project and the context for the EIA. The chapter specifically covers the following:

- The policy, legislative and planning context;
- The approach to the EIA; and
- A summary of the stakeholder engagement and consultation undertaken to date.

1.1.2.6 **Chapter 2 (Volume 2)** details the site selection process and the alternatives considered, as well as the overall project description, specifically covering the following:

- The site selection process and alternatives considered;
- The modified TI design and the construction, operation and decommissioning process for the modified TI; and
- The application of Rochdale Envelope principles.

1.1.2.7 **Chapters 3 – 5 (Volume 2)** describe the baseline information, impact assessment and cumulative impact assessment of all physical, biological and human disciplines.

- 1.1.2.8 The baseline information characterises the development area, describing baseline conditions for each aspect of the environment likely to be significantly affected by the development.
- 1.1.2.9 The impact assessment results are described in relation to physical, biological and human receptors that are likely to be significantly affected by the modified TI. Each impact assessment chapter is structured accordingly:
- Introduction – Introduces the topic under discussion and sets out the consultation carried out, the baseline and relevant legislation, policy and guidance;
  - Summary – Key impact assessment outputs;
  - Rochdale Envelope parameters – Sets out the realistic worst case scenario in terms of the modified TI's parameters for the EIA discipline being assessed;
  - EIA Methodology – Description of the impact assessment methodology utilised;
  - Impact Assessment – Assessment of the likely significant effects arising from development;
  - Proposed Monitoring and Mitigation – description of proposed mitigation measures during construction, operation and decommissioning phases, based upon likely significant effects;
  - Cumulative Impact Assessment – Assessment of the likely significant cumulative effects arising as a result of interactions between the modified TI and other existing and reasonably foreseeable projects and activities; and
  - Habitats Regulations Appraisal (HRA) – where impact assessment chapters consider the potential for effects on Natura 2000 sites, then a summary of the information to support an Appropriate Assessment is present. The relevant disciplines to which HRA applies in this ES are Fish and Shellfish Ecology (Chapter 4.2), Marine Mammals (Chapter 4.3), Marine Ornithology (Chapter 4.4), and Terrestrial Ecology (Chapters 4.6). An HRA Summary chapter is also provided in Chapter 6, which gathers together the conclusions of all the chapters that have considered HRA.
- 1.1.2.10 **Chapter 6 - (Volume 2)** details relevant information provided by MORL in support of the HRA for the MORL modified TI. The information within this chapter will allow the competent authority (in relation to the offshore aspects it will be Marine Scotland and in relation to onshore aspects it will be Aberdeenshire Council) to carry out a HRA, and if necessary an Appropriate Assessment (AA).
- 1.1.2.11 **Chapter 7 - (Volume 2)** summarises the assessments of each discipline in tabular format indicating the residual effects for each effect identified.
- 1.1.2.12 **Volumes 3 and 4** contain the supporting figures to the above sections.
- 1.1.2.13 **Volume 5** contains the discipline specific technical appendices that support the ES chapters.

### 1.1.3 Definition of Terms

- 1.1.3.1 For the purposes of this ES and the assessment within, the definitions detailed in Table 1.1-5 below have been used. A full Glossary of the terms used in this ES and a list of the Abbreviations used are located in the Preface to this ES.
- 1.1.3.2 Table 1.1-5 Definition of terms used in this ES.

Table 1.1-5 Definition of Terms

Term	Definition
<b>MORL</b>	Moray Offshore Renewables Limited (MORL), the body submitting the applications to the Modified Project.
<b>This ES</b>	This environmental statement for the MORL modified Transmission Infrastructure
<b>The Modified Project</b>	The development proposal in its entirety, including the modified Transmission Infrastructure and the three consented wind farm sites.
<b>MORL Zone</b>	The Round 3 Zone 1 area awarded to MORL by the Crown Estate which is comprised of the Eastern Development Area and Western Development Area (see Figure 1-1, Volume 3)
<b>Eastern Development Area (EDA)</b>	MORL Zone for which Section 36 applications have been applied for and consent has been granted (see Figure 1.1-1 and 1.1-2, Volume 3).
<b>Western Development Area (WDA)</b>	MORL Zone area to the west of the EDA. EIA has not been progressed on this area yet (see Figure 1.1-1, Volume 3).
<b>Modified Transmission infrastructure (modified TI)</b>	Includes both offshore and onshore elements necessary for electricity transmission and interconnection both within the area of the three consented wind farms and the route between the three consented wind farms to connection with the national grid at New Deer; encompassing AC OSPs, AC export cable offshore to landfall point at Inverboyndie continuing onshore to the AC collector station and the additional regional TO substation at New Deer.
<b>Modified offshore transmission infrastructure (modified OffTI)</b>	Offshore elements of the modified Transmission Infrastructure (i.e. OSPs, inter-platform cables and offshore export cable) (see Figure 1.1-4, Volume 3) as described in section 2.2.6.
<b>Modified offshore export cable route corridor</b>	Modified offshore cable route corridor (see Figure 1.1-4, Volume 3)
<b>Modified offshore export cable route</b>	The route of the offshore export cable located within the modified offshore export cable corridor.
<b>Modified export cable landfall(s)</b>	Area at Inverboyndie where the modified OffTI meets the modified OnTI.
<b>Modified onshore transmission infrastructure (modified OnTI)</b>	Onshore elements of the modified Transmission Infrastructure (i.e. onshore export cable, two onshore substations) (see Figure 1.1-5, Volume 3) as described in section 2.2.7.
<b>Modified onshore export cable route corridor</b>	Modified Onshore cable route corridor (see Figure 1.1-5, Volume 3)
<b>Modified onshore export cable route</b>	The route of the onshore export cable located within the modified onshore export cable corridor.
<b>The MORL ES</b>	The ES submitted in support of the Project in August 2012.
<b>Three consented wind farms</b>	Telford, Stevenson and MacColl wind farms as consented on 19 March 2014 by the Scottish Ministers under Section 36 of the Electricity Act 1989
<b>The Project</b>	Up to three wind farm sites (Telford, Stevenson and MacColl) within the EDA, together with the offshore and onshore transmission infrastructure as applied for in August 2012.
<b>Rochdale Envelope</b>	The range of design parameters that the assessments have been based upon and upon which the worst case scenarios for each assessment have been based.

### 1.1.4 The Developers

- 1.1.4.1 MORL is a joint venture (JV) that was established by EDP Renewables (EDPR UK) and SeaEnergy Renewables Ltd. In June 2011, SeaEnergy Renewables Ltd was acquired by Repsol Nuevas Energias UK. MORL is now owned 67 % by EDPR UK and 33 % by Repsol Nuevas Energias UK.
- 1.1.4.2 The purpose of MORL is to develop projects within the MORL Zone. Special Purpose Vehicles (SPVs) have been established to consent, construct, operate and maintain the offshore wind farm sites within the EDA. These SPVs are Telford Offshore Wind Limited, Stevenson Offshore Wind Limited and MacColl Offshore Wind Limited. MORL will submit the necessary applications for consent for the modified TI.

### 1.1.5 Summary of Modified TI

#### Round 3 Zones

- 1.1.5.1 Zones were included within the UK Offshore Energy Strategic Environmental Assessment (SEA) for future leasing for offshore wind farms and licensing for offshore oil and gas and gas storage (DECC, 2009). The Government's plan, with respect to offshore wind was *"to enable further rounds of offshore wind farm leasing in the UK Renewable Energy Zone.....with the objective of achieving some 25 GW of additional generation capacity by 2020"*. The alternatives considered within the SEA were:
- Not to offer any areas for leasing / licensing;
  - To proceed with a leasing and licensing programme; or
  - To restrict the areas offered for leasing and licensing temporally or spatially.
- 1.1.5.2 The MORL Zone was identified by The Crown Estate (TCE), along with eight other zones, for the development of offshore wind. These zones were opened to competitive bid by The Crown Estate and developers were invited to submit applications to develop the zones. The identification of the zones was completed by The Crown Estate with assistance from their marine asset planning tool MaRS (Marine Resource System). "MaRS is a decision support tool which interrogates third party data sets using GIS technology to identify potential areas for sectoral development. The tool produces three key outputs: site suitability for potential business activity, the sustainability value of that activity and financial analysis of the potential revenue to the business which will enable long term informed decision-making for marine development" (The Crown Estate, 2010).
- 1.1.5.3 The assessment of the alternatives, considered the need / demand for the plan, whether the technologies and methods were available to reduce environmental damage compared to more traditional methods, whether the potential geographical locations were suitable and the proposed timing of plan implementation. The following provides a summary of the reasons why the Government considered the plan necessary:
- Need: it was determined that the plan was required to mitigate the increasing reliance on fuel imports from other countries as oil and gas fields declined and therefore increase domestic production of energy. The plan was required to meet the UK's contribution to European Union renewable energy consumption targets;
  - Technologies / methods: it was determined that offshore wind technologies were constantly evolving with the introduction of efficient techniques that could reduce environmental footprints;
  - Location: The locations are a function of the available wind resource, geological history and existing sensitivities; and
  - Timing: Early implementation of the plan was determined to allow potential synergies between existing and new infrastructure.

#### Location

- 1.1.5.4 The three consented wind farms are located on the Smith Bank in the outer Moray Firth approximately 22 km (12 nm) from the Caithness coastline. The water depths range from 37–57 m (20 – 31 ftm). The MORL Zone itself covers 520 km<sup>2</sup> (281 nm<sup>2</sup>).
- 1.1.5.5 The modified TI will connect the three consented wind farms to the national grid via an onshore connection point south of New Deer. The offshore export cable route has a landfall point at Inverboyndie, which is approximately 33 km in length in total



(Figure 1.1-5, Volume 3). The locations for the onshore substations have been identified to the southwest of New Deer (Figure 1.1-6, Volume 3).

- 1.1.5.6 The indicative timescales for the modified Project are detailed in Chapter 2.2 (Project Description), however, in brief, construction is programmed to commence Q2 2016 (onshore) and Q2 2017 (offshore). Working to the lengthiest construction schedule, construction of the modified TI is due to be completed in Q3 2021 and construction of the three consented wind farms is due to be completed Q3 2022.

### Modified TI Description

- 1.1.5.7 A detailed description of the modified TI is set out in Chapter 2.2 (Project Description). There are three main elements to the modified TI, these being the offshore substation platforms (OSP) structures accommodating those assets necessary for the collection and conversion of power from the individual wind turbine generators (WTGs) within the three consented wind farms, the offshore export cables for the bulk transfer of power and the onshore assets (i.e. onshore export cables and substations) necessary to facilitate the final connection to the pre-existing assets of the National Electricity Transmission System (NETS).

- 1.1.5.8 The modified TI will consist of both onshore and offshore infrastructure the constituent parts of which can be summarised as OfTI and OnTI.

- 1.1.5.9 The OfTI will comprise:

- Up to two OSPs located within the boundary of the three consented wind farms. These will house substations which will form the interface between the inter-array cables and the offshore export cables;
- Export cables (up to four triplecore cables, separated by approximately four times water depth), buried to a target depth of 1 m. Where this burial depth cannot be achieved, cable armouring will be implemented (e.g. rock placement or concrete mattressing);
- Inter-platform cables in between the OSPs
- Cable landfall: the point at which the submarine cables are physically brought ashore;
- Subsea cabling specification: AC, voltage levels 220kV.

- 1.1.5.10 The OnTI will comprise:

- Onshore transition jointing pit: the interface between the offshore and onshore cables systems;
- Underground cables (up to 12 in four bundled trefoil arrangements in total, comprising a working corridor up to 60 m wide) from landfall point to grid connection point;
- Onshore cabling specification: AC, voltage levels 220kV;
- Associated civil ground works;
- Access roads;
- Temporary construction compounds, storage facilities, laydown areas and access tracks during the construction period;
- Onshore substations comprising:
  - Grid transformers;
  - HVAC switchgear;
  - Reactive compensation;

- Auxiliary transformers;
- Control and instrumentation equipment;
- Telecoms equipment;
- Control buildings; and
- Fenced compounds.

1.1.5.11 MORL will require one onshore AC substation (which will form part of the future OFTO assets), covering an area of up to approximately 270 x 135 m at the connection point to the southwest of New Deer. In order to allow the connection of MORL to the national grid, an additional substation must be consented and constructed which will ultimately be owned by the regional TO and will feed into the existing 275 kV overhead line. This substation will be up to 270 x 170 m. Each substation will be a maximum of 13 m in height. The onshore substation site identified by MORL allows for the co-location of MORL and the additional substation which together will occupy an area no more than 10 hectares in size.

### **1.1.6 Consent Applications Submitted**

1.1.6.1 A Marine Licence for the modified OfTI (up to Mean High Water Springs) and Town and Country Planning Permission for the modified OnTI (from Mean Low Water Springs) will be required (See section 1.2 for Policy and Legislative Context).

1.1.6.2 Consents under Section 36 of the Electricity Act 1989 were granted for each of the wind farm sites, Telford, Stevenson and MacColl, in March 2014. These consents allow MORL to build and operate the offshore wind farms. In addition, MORL applied for a Marine Licence for each wind farm site in August 2012. These licences will allow MORL to deposit wind farm infrastructure on the seabed. These primary consents together will enable the construction and operation of the wind farm infrastructure.

1.1.6.3 A separate Marine Licence was received for the installation of an offshore meteorological mast within the EDA. The Marine Licence was issued in January 2014 and construction will take place August 2014. MORL also applied for a Marine Licence in August 2012 for the offshore DC TI to Fraserburgh. This Marine Licence was granted by Marine Scotland in June 2014. In the event that the current application for a Marine Licence for the modified TI is granted and implemented then the works authorised under the DC Marine Licence will not be carried out.