

# Preliminary Information Memorandum

September 2016



**Race Bank**

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### Glossary of terms

Terms used in this Preliminary Information Memorandum, unless otherwise defined in this Preliminary Information Memorandum, have the following meaning:

Term	Definition
AIS	Air insulated switchgear
Asset Transfer Date	The date on which the ROW01 Transmission Assets are transferred from the Developer to the OFTO
BAFO	Best and Final Offer
Cable length	Cable length cited in applicable contract
CIGRE	Conseil International des Grands Réseaux Electriques
CPA	Coastal Protection Act 1949
CRA	Cable Risk Assessment
CUSA	Connection and Use of System Agreement
DECC	Department of Energy and Climate Change
Developer	Race Bank Wind Farm Limited
DONG Energy	DONG Energy A/S and its affiliates
DTS	Distributed Temperature Sensing
EPQ	Enhanced Pre-Qualification
FAT	Factory Acceptance Test
FEED	Front End Engineering and Design
FTV	Final Transfer Value
GB	Great Britain
GIS	Gas Insulated Switchgear
GW	Gigawatt
HDD	Horizontal Directional Drilling
HV	High Voltage
HVAC	Heating, ventilation and air conditioning
IEC	International Electrotechnical Commission
ITT	Invitation to Tender
ITV	Indicative Transfer Value
km	Kilometre
kN	Kilo Newton
kV	Kilovolts
LAT	Lowest Astronomical Tide
Ltd	Limited company
MVA	Megavolt Ampere
MVA <sub>r</sub>	Megavolt Ampere Reactive
MW	Megawatt
NETS	National Electricity Transmission System

NETS SQSS	National Electricity Transmission System Security and Quality of Supply Standards
NETSO	The National Electricity Transmission System Operator is the entity responsible for coordinating and directing the flow of electricity over the National Electricity Transmission System
NETSO Licence	The electricity transmission licence granted, or treated as granted, pursuant to section 6(1)(b) of the Electricity Act 1989 and in which section C of the standard transmission licence conditions applies
NGET	National Grid Electricity Transmission plc. NGET owns and maintains the transmission system in England and Wales. It is also the NETSO for GB.
O&M	Operation and Maintenance
Offshore Boundary Point	The point at which, with effect from the Asset Transfer Date, the Developer's assets will connect to the ROW01 Transmission Assets
Ofgem	The Office of Gas and Electricity Markets
OFTO or Offshore Transmission Owner	The holder of the Offshore Transmission Licence for Race Bank
Onshore Boundary Point	The point at which, with effect from the Asset Transfer Date, the Developer's assets will connect to the ROW01 Transmission Assets
ONSS	Onshore Substation
OSS	Offshore Substation including topside module and jacket substructure including piles together with HV, MV and LV components and systems, mechanical and electrical services
PB	Preferred Bidder
PIM	Preliminary Information Memorandum
PQ	Pre-Qualification
Renewable Energy Zone	Area with high concentration of high-quality, easily developed renewable energy potential
ROW01	Race Bank
ROW01 Offshore Transmission Licence	The Transmission Licence relating to the ROW01 Transmission Assets
ROW01 Offshore Wind Farm	The ROW01 Generation Assets and the ROW01 Transmission Assets
ROW01 Transmission Assets	The assets of the transmission system of the ROW01 Offshore Wind Farm as outlined in Table 1 of this Preliminary Information Memorandum
RPI	The UK Retail Price Index
S&I	Supply and Install
SB	Successful Bidder
SCADA	Supervisory Control and Data Acquisition
SPA	Sale and Purchase Agreement
SPV	Special Purpose Vehicle
TCPA	Town and Country Planning Act 1996
TEC	Transmission Entry Capacity
TO	Transmission Owner
TOC	Taking-Over Certificate

Transmission Asset SCADA System	The SCADA system for the ROW01 Transmission Assets
Transmission Licence	The licence awarded under section 6(1)(b) of the Electricity Act 1989 authorising the NETSO or a TO to participate in the transmission of electricity including an Offshore Transmission Licence. The licence sets out a TO's rights and obligations as a transmission asset owner and operator.
Transmission Licensee	The holder of a Transmission Licence
TR5	Tender Round Five
UK	United Kingdom of Great Britain and Northern Ireland
UPS	Uninterrupted Power Supply
WTG	Wind Turbine Generator
XLPE	Cross-Linked Polyethylene
€/MWh	Euro per Megawatt hour

## 1. Investment Highlights

### 1.1 Overview

The Race Bank ("**ROW01**") Offshore Wind Farm will be situated 27km north of Blakeney Point off the coast of Norfolk, and 28km east of Chapel St. Leonards off the Lincolnshire coast in the North Sea, and will be located partially within UK territorial waters. The wind farm itself is outside the 12 nautical mile limit but within the Renewable Energy Zone. NGET is the onshore transmission licensee, and the ROW01 Transmission Assets will connect to the Walpole 400kV substation, near King's Lynn.

The ROW01 Offshore Wind Farm is expected to comprise 91 Wind Turbine Generators ("**WTGs**") each with a power output of 6.3MW totalling 573.3MW installed capacity and with a Transmission Entry Capacity ("**TEC**")<sup>1</sup> of 565 MW at the Offshore Transmission Owner ("**OFTO**") offshore interface point. These will be connected to two Offshore Substations ("**OSS**") located within the boundaries of the ROW01 Offshore Wind Farm

The difference between installed and connected capacity is attributed to WTG transformer and array cable losses. A figure of 548MW has been provided to NGET which is the value which can be exported at the onshore boundary point (transmission interface point – ("**TIP**")).

The ROW01 Transmission Assets are currently under construction and due to be fully operational and commissioned by the end of Q3 2017. They will include an onshore substation, two offshore substation platforms, two export cables (subsea and land), interlink cable (subsea between platforms) and a Transmission Asset Supervisory Control and Data Acquisition System ("**SCADA**") system.

The ROW01 Transmission Assets are expected to deliver an availability of 98%, taking into account both planned and unplanned maintenance.

### 1.2 Highly Experienced Project Developer

The participating company in the ROW01 Offshore Wind Farm is Race Bank Wind Farm Limited (the "**Developer**"), which is an indirect subsidiary of DONG Energy A/S (together with its affiliates, "**DONG Energy**").

DONG Energy is highly experienced in the offshore wind sector, bringing a track record which demonstrates a capacity and ability to design, construct and operate the ROW01 Offshore Wind Farm alongside other similar scale projects in its pipeline.

DONG Energy has established itself as a market leader in the UK and European offshore wind power sector, where the company has been engaged in developing, planning and constructing some of the largest offshore wind farms in operation worldwide. In the UK its major offshore wind farms include; Barrow, Gunfleet Sands, Walney I, Walney II, London Array, West of Duddon Sands, Westernmost Rough, and most recently Burbo Bank Extension.

Eight OFTO transactions have previously been executed in respect of DONG Energy projects. These OFTO assets total approximately 2.1GW<sup>2</sup> of installed transmission capacity with the total transfer value of these assets being approximately £1.5bn<sup>3</sup>.

<sup>1</sup> TEC is a CUSC term that defines a generator's maximum allowed export capacity onto the transmission system

<sup>2</sup> Ofgem Website, June 2016

<sup>3</sup> Ofgem Website, June 2016

### 1.3 Mature and Attractive Regulatory Environment

The independent ownership and operation of offshore transmission in the UK enjoys strong political, regulatory and stakeholder support in the UK. The regime was developed by the Department of Energy and Climate Change ("DECC") and Ofgem over several years. Both have consulted widely and regularly on each stage of the development of the regime and have taken account of respondents' views at all stages of the process. The tender round for the ROW01 Transmission Assets will be Ofgem's fifth, and its third round of enduring tenders following the implementation and finalisation of the OFTO tender regime. In total, 14<sup>4</sup> projects have been divested to date under both the transitional and enduring OFTO regimes in tender rounds 1-3. This represents a total installed capacity of approximately 4.1GW<sup>5</sup> and a total transfer value in the order of £2.7bn<sup>6</sup> which has been successfully divested to independent transmission owners.

### 1.4 Financial Highlights

The ROW01 Transmission Licence that will be granted to the successful bidder for the ROW01 Transmission Assets will include the right to a 20-year revenue stream in return for purchasing the ROW01 Transmission Assets and operating them in accordance with the obligations of the ROW01 Transmission Licence.

The 20-year revenue stream bid of the successful bidder for the ROW01 Transmission Assets that will be incorporated into the ROW01 Transmission Licence will be fixed, subject to agreed adjustment mechanisms including indexing for inflation.

The revenue stream will be availability-based, with the opportunity to earn additional revenues for better than expected operational performance. The revenue stream will not be subject to periodic review, provided operational performance remains above the relevant minimum standard.

The revenue stream will also not be exposed to any revenue or performance shortfalls from the ROW01 Offshore Wind Farm itself. If the ROW01 Offshore Wind Farm ceases to operate, the National Electricity Transmission System Operator's ("NETSO") obligation to pay the revenue stream will continue.

## 2. Initial Transfer Value

This document is a summary of information provided by the Developer and outlines specifically the opportunity for investors to acquire the ROW01 transmission assets and to become the licensed OFTO of the ROW01 Offshore Wind Farm.

It is currently estimated that a "Preferred Bidder" for ROW01 will be appointed in Q4 2017. This is following first generation from the ROW01 Offshore Wind Farm, scheduled for June 2017. Construction of the ROW01 Transmission Assets is due to be completed by Q3 2017. Once completed, the ROW01 Transmission Assets will be commissioned and transferred to the OFTO identified as the successful bidder through the tender process via a transfer agreement. Asset transfer is currently anticipated to occur in Q2/Q3 2018.

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<sup>4</sup> Ofgem website, June 2016

<sup>5</sup> Ofgem website, June 2016

<sup>6</sup> Ofgem website, June 2016



The costs of developing and constructing the ROW01 Transmission Assets, estimated on the basis of information provided to Ofgem to date by the project developers, are £530.4<sup>7</sup> million (the “**Initial Transfer Value**”). For the purpose of the Enhanced Pre-Qualification (“**EPQ**”) stage of the tender process, bidders should assume this value.

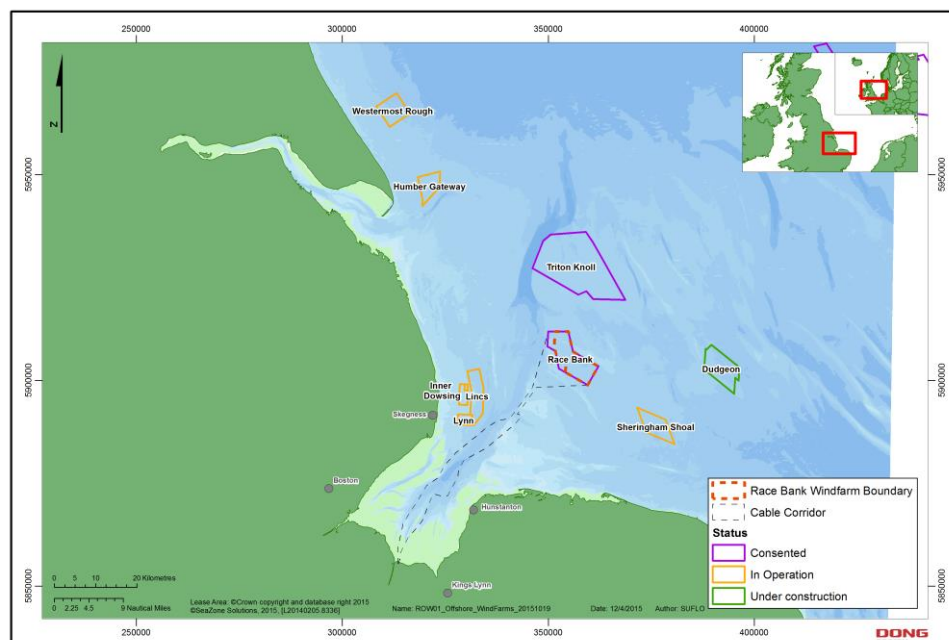
Ofgem is in the process of reviewing this information and expects to provide an estimate of the economic and efficient costs incurred in connection with developing and constructing the transmission assets at the Invitation to Tender (“**ITT**”) stage (the “**Indicative Transfer Value**”).

Ofgem will calculate the economic and efficient costs which have been, or ought to have been, incurred in connection with developing and constructing the transmission assets once the assets have been completed. This assessment will be used to determine the **Final Transfer Value** (“**FTV**”).

### 3. The Investment Opportunity

#### 3.1 Location of the Wind Farm Assets

The ROW01 Offshore Wind Farm will be situated 27km north of Blakeney Point off the coast of Norfolk, and 28km east of Chapel St. Leonards off the Lincolnshire coast in the North Sea, and will be located partially within UK territorial waters. The wind farm itself is outside the 12 nautical mile limit but within the Renewable Energy Zone within which the UK has sovereign rights for the purpose of the economic exploitation of the zone for the production of wind energy. The ROW01 Offshore Wind Farm is about 18km east of Lincs, 23km east of Inner Dowsing, 25km east of Lynn and 14km west of Sheringham Shoal offshore windfarms.



Source: DONG Energy 19<sup>th</sup> October 2015

**Figure 1. Location of ROW01 Offshore Wind Farm and ROW01 Transmission Assets**

<sup>7</sup> Developer estimate



Source: DONG Energy, 4<sup>th</sup> December 2015

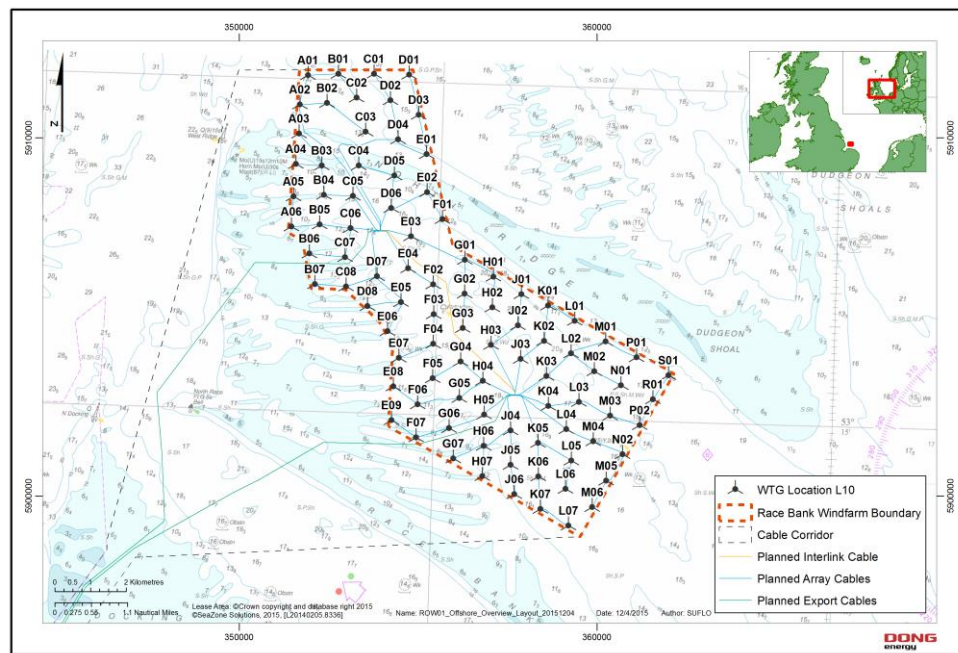


Figure 1. ROW01 Offshore Wind Farm Layout

The ROW01 Onshore Substation will be located 8km from shore at Race Bank Onshore Substation, Walpole Bank, Walpole St. Andrew, Norfolk PE14 7JE, adjacent to the existing NGET Walpole 400kV Substation, which feeds directly into the existing 400kV GB national electricity transmission system.

The offshore export cables will be routed from the Offshore Substations (“OSS”) to landfall 1km east of the mouth of the river Nene near Sutton Bridge. The offshore export cables will be installed using a variety of techniques suitable to the conditions in each section of the cable route (this includes mechanical, jetted and ploughed trenching techniques.). The cable will be brought onshore within a ploughed trench approximately 2km from the sea defence wall, beneath the salt marsh at the landfall. The sea defence wall will be temporarily breached and open cut for laying and backfilling the cables beyond the wall to the transition joint bays installed in open trench and backfilled. The two onshore export cables will be installed between the transition joint bays and the ROW01 Onshore Substation in trefoil ducts installed generally by conventional excavation/trenching means along the 11.6km route. Horizontal Directional Drilling (“HDD”) will be utilised in required locations to install the cable ducts beneath physical obstacles including roads, utilities, drainage ditches and other infrastructure assets.

Two 400kV cable grid connections will also be installed between the ROW01 Onshore Substation and the existing NGET Walpole Substation. These cables will be installed underground beneath the Lincs Substation Road in ducts and overall within HDD ducts to run beneath third party power, communication and piped services.

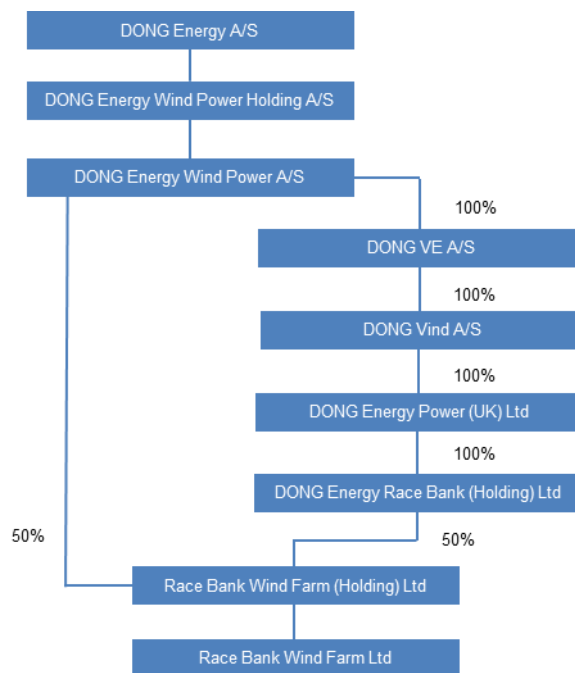
Location, onshore substation and onshore cable route maps can be found in **Appendix 2, 3 and 4.**

### 3.2 Ownership and Sponsors

The ROW01 Offshore Wind Farm is owned by Race Bank Wind Farm Limited. Race Bank Wind Farm Limited is an indirect subsidiary of DONG Energy A/S and holds the marine licence for the ROW01 Offshore Wind Farm under the Marine and Coastal Access Act 2009, and consent under section 36 of the Electricity Act 1989.

An overview of the current ownership structure is illustrated in **Figure 3** below.

**Figure 2. Company Legal Structure**



Source: DONG Energy Legal Group Structure, 31<sup>st</sup> August 2016

### 3.3 Operation and Maintenance (“O&M”)

OFTOs will have the opportunity to benefit from DONG Energy’s extensive experience of operating wind farms and associated transmission assets. DONG Energy will offer to provide emergency response services which cover repair activities of export cables (off- and onshore) including fault finding, repair work and project management of all involved stakeholders. DONG Energy has invested substantial resources in developing, testing and establishing an emergency response service for rectification of OFTO asset failures in the UK. The service offering includes full access to DONG Energy’s broad base of in-house experts with unique knowledge of the OFTO assets and immediate allocation of resources for repair activities.

In respect of routine O&M services, the maturity of the market has increased with a number of prudent service providers capable of providing such services. DONG Energy is willing to engage in a dialogue on certain routine O&M services, however it will focus on providing emergency response services for rectification of OFTO asset failures.

### 3.4 Transmission Assets Transferring to the OFTO

The ROW01 Transmission Assets will include two Offshore Substations (“OSS”), two offshore export cables each with a route length of approximately 71km to onshore transition joints, two onshore export cables each with a route length of approximately

11.6km from the onshore transition joints to an onshore substation and connected via two 400kV cables of approximately 100m to a double busbar via 400kV Air Insulated Switchgear ("**AIS**") bay within the existing NGET Walpole substation. A 220kV subsea cable interlink will be provided between the two Offshore Substations with an approximate route length of 6.5km.

An overview of the assets that the Developer currently proposes to transfer to the OFTO under the project specific Sale and Purchase Agreement ("**SPA**") and which were used to derive the initial transfer value of the ROW01 Transmission Assets, is set out in Table 1 below.

A simplified single line diagram for the ROW01 Transmission Assets including the boundary points is given in **Appendix 1**.

**Table 1. Asset Summary**

Asset	Description
OSS	<ul style="list-style-type: none"> <li>▪ Structural steel topsides with five main decks mounted on a jacket foundation. The overall dimensions of the substation topside will be approximately (H x W x L) 20 x 30x 38m with an overall height of 35m above the lowest Astronomical Tide level (“LAT”) excluding crane, antenna and diesel containers on roof deck.</li> <li>▪ The cable deck (17.5m above LAT) will be provided for array and export cable management and muster areas.</li> <li>▪ The main deck (23m above LAT) will accommodate the two 220/34kV transformers, together with the associated 220kV GIS and the 34kV switchgear. Also, LV Utility and UPS Room 2, Battery Room 2 together with the Fire Systems Room will be situated on the main deck.</li> <li>▪ The mezzanine deck (27m above LAT) will house the High Voltage (“HV”) shunt reactor, auxiliary transformers and earthing resistors together with the main transformer radiators as well as OFTO SCADA Room and Generator SCADA Room.</li> <li>▪ The OFTO Control Room, Public Rooms and Workspace will be situated on the utility deck (31m above LAT) together with the LV Utility and UPS Room 1 and Battery Room 1.</li> <li>▪ Diesel generators, with diesel tank and HVAC equipment will be mounted on the roof deck (35m above LAT) as well as a heli-winch area, an antenna mast and a telescopic boom crane.</li> </ul>
Offshore export cables	<ul style="list-style-type: none"> <li>▪ Two 220kV offshore export cable systems each comprising a subsea section, which will be a three-core 950m<sup>2</sup> aluminium conductor cross-linked polyethylene (“XLPE”) single-wire armoured submarine cable. For the final 8km approximately a similar cable but with 1600mm<sup>2</sup> aluminium conductors will be adopted across the landfall section to the transition pits.</li> <li>▪ The total route length of each offshore export cable is approximately 71km.</li> <li>▪ 220kV rated, XLPE-insulated, complete with integral optical fibres.</li> </ul>
Onshore export cables	<ul style="list-style-type: none"> <li>▪ Two 220kV onshore export cable systems, each comprising 3 x single-core 1400mm<sup>2</sup> aluminium conductor XLPE-insulated cables installed in trefoil formation in ducts. The cable systems will be installed as a balanced cross bonded system with manhole access to the link boxes for measuring purposes.</li> <li>▪ Each onshore export cable will connect to the offshore export cable at the onshore transition joint at landfall and the cables will be installed underground in local arable land and beneath roads, utilising 9 sections and 9 onshore joints (including transition joint).</li> <li>▪ The total route length to the ROW01 Onshore Substation is approximately 11.6km.</li> <li>▪ Two separate 48 fibre optic cables (single mode) will be routed adjacent to each 220kV onshore export cable system. Dedicated fibres will be used for DTS purposes (temperature sensing of the conductors).</li> </ul>

<p>Onshore 400kV cables to NGET substation</p>	<ul style="list-style-type: none"> <li>▪ 400kV Onshore export cable to NGET Walpole substation comprising three single core 1200mm<sup>2</sup> aluminium conductor XLPE insulated cables installed in trefoil formation with single point screen bonding and 500mm<sup>2</sup> earth continuity cables installed alongside.</li> <li>▪ External earthing connections 2x300mm<sup>2</sup> Cu isolated to connect the earth mats at ROW01 and NGET Walpole Substations.</li> <li>▪ The 400kV export cable length is approximately 100m from ROW01 Substation to NGET Walpole Substation – installed in one length.</li> <li>▪ Control cables will be run in ducts adjacent the 400kV export cables for connection between the two Substations. No DTS installed.</li> </ul>
<p>Onshore substation</p>	<ul style="list-style-type: none"> <li>▪ The ROW01 Onshore Substation will house the HV equipment with associated reactive compensation equipment. The HV equipment is necessary for transforming the voltage level and connecting the onshore export cable to the GB national electricity transmission system (NGET Walpole Substation) The GIS will be housed in a purpose built GIS Building (GIS hall with ancillary rooms).</li> <li>▪ The main equipment for each circuit proposed for transfer includes 400/220kV transformer complete with 400kV and 220kV GIS, 220kV variable shunt reactor, dynamic reactive compensation system, 400kV harmonic filtration equipment and UPS DC battery system.</li> </ul>
<p>NGET Walpole substation GIS</p>	<ul style="list-style-type: none"> <li>▪ The NGET Walpole Substation, which is the property of NGET, is the location of the Onshore Boundary Point.</li> <li>▪ Two 400kV AIS circuit breakers (one per circuit) positioned within the NGET Walpole Substation will be included in the equipment transfer.</li> <li>▪ This AIS equipment included in the transfer will consist of two bays of circuit breaker, disconnectors, earth switches and maintenance earth switches, portable relay room (“<b>PRR</b>”) complete with associated protection and control apparatus and associated civil works.</li> </ul>
<p>SCADA</p>	<ul style="list-style-type: none"> <li>▪ The ROW01 Transmission Assets will be operated from a standalone segregated Transmission Asset SCADA System that will be operated and maintained independent of the Generator SCADA System.</li> <li>▪ The Transmission Asset and Generator Asset SCADA Systems will exchange signals as required by the Grid Code.</li> <li>▪ The Transmission Asset SCADA System will be connected to the National Grid Control Centres via the telecoms and data interface at the NGET Walpole Substation and will deliver the signals required from the HV systems of the ROW01 Transmission Assets and the ROW01 Offshore Wind Farm</li> <li>▪ The OSS and the Onshore Substation (“<b>ONSS</b>”) will both have separate Transmission Asset and Generator Asset SCADA System equipment rooms</li> </ul>
<p>Spares</p>	<ul style="list-style-type: none"> <li>▪ Later in the process, the Developer will discuss the possibilities for cooperation regarding spare parts with the preferred bidder for the ROW01 Transmission Assets in order to ensure the highest possible availability of the ROW01 Transmission Assets.</li> </ul>

### 3.5 Ownership Boundaries

Detail of the current offshore and onshore boundary points proposed by the Developer which have been used for the purposes of calculating the initial transfer value as described in Table 2 below.

*Table 2. Proposed boundary points offshore and onshore*

Location	Boundary Point
Offshore	Located at the sealing ends of the 34kV cables terminating at the 34kV medium voltage ("MV") switchgear connecting from the grid transformers on the Offshore Substations.
Onshore	The complete fixed contact assembly bolted to the busbar above the isolator (pantograph type disconnecter) for both main and reserve 400kV busbars within the existing NGET Walpole substation. NGET own the fixed contact assemblies of the pantograph disconnecters and the OFTO will own all other HV equipment in the generator bays.

### 3.6 Consents

The Developer has all of the necessary major consents in place to construct the ROW01 Offshore Wind Farm and ROW01 Transmission Assets. The Developer has also entered into all of the required crossing and proximity agreements for the export cable route.

The Developer and the preferred bidder for the ROW01 Transmission Assets will have to agree on provisions relating to the assumption by the OFTO of responsibility for the performance of, and compliance with, certain consent conditions, and these will be detailed in the SPA relating to the ROW01 Transmission Assets.

### 3.7 Project Timeline

DONG Energy acquired the ROW1 Offshore Wind Farm from Centrica in 2013. Design of the ROW01 Offshore Wind Farm commenced in 2014, and construction work on the ROW01 Transmission Assets started in 2015.

The construction of the ROW01 Transmission Assets is expected to be complete by Q3 2017, and the current expected date of delivery of the onshore connection by NGET is Q3 2016. Export of power from the ROW01 Offshore Wind Farm by NGET is planned for June 2017. Commissioning of the ROW01 Transmission Assets is expected to be completed by Q3 2017 and the commissioning of the ROW01 Offshore Wind Farm is expected to be completed during Q1 2018. An overview of the timeline is given in **Figure 4**.





### 3.8 Risk Mitigation

The ROW01 Transmission Assets have been designed according to the planning criteria as defined in the NETS SQSS.

The ROW01 Transmission Assets have been designed to ensure that the capacity of the ROW01 Offshore Wind Farm that can be transferred during a planned or unplanned outage is compliant with Chapter 7 of the NGET SQSS, with the exception of the onshore substation, which has a design variation accepted by NGET (20th October 2014) where a single 220kV busbar design has been applied. The onshore and offshore transformers have been designed and rated to approximately 63% and 70% of the wind farm entry capacity (565MW). Should a fault occur in one of the export circuits, the ROW01 Offshore Wind Farm will not have to be shut down by default. However, the export capacity of the ROW01 Offshore Wind Farm may, under certain outage conditions, be constrained. The extent of this constraint will depend on the prevailing wind speeds and generator availability.

A 220kV interlink between the two Offshore Substations has been designed to provide export capacity during an export cable or onshore transformer outage. Normally the interlink is de-energised. Following an export cable or onshore transformer outage then this transmission asset can be switched into service by the OFTO operator in communication and agreement with NGET, the system operator, in order to allow export from both Offshore Substations. In this scenario both Offshore Substations must be curtailed to 50% to limit the power production to the rating of the remaining export cable.

### 3.9 Network Design Features

**Table 3** summarises the key transmission network design features of the ROW01 Transmission Assets:

*Table 3. Summary of ROW01 Transmission Asset system design features*

Parameter	Specification
Expected designated service life	25 years
Composite export circuit capacity -Circuit 1	302MVA
Composite export circuit capacity -Circuit 2	302MVA
Composite export circuit capacity -Interlink	302MVA
Expected minimum annual design availability	98% (taking into account both planned and unplanned maintenance)
Technical compliance with industry codes and standards	System compliant with requirements - "Codes and standards" section refers.

A Connection and Use of System Agreement (“**CUSA**”) has been entered into between the developer and NGET with Transmission Entry Capacity (“**TEC**”)<sup>8</sup> export rights of 565MW at the OSS.

#### 4. Commercial and Contractual Arrangements

Contracting and procurement for the ROW01 Offshore Wind Farm has been carried out on a multi-contract basis, including installation vessels and O&M facilities. The Developer has managed a comprehensive and robust pre-qualification, tender and contracting process. The contracts associated with the ROW01 Transmission Assets are set out in **Table 4**.

**Table 4. Contractors for the transfer of the ROW01 Transmission Assets**

Services and main equipment list	Contract and contractor
<p><b>OSS - construction:</b> Two 5-story steel topside modules each mounted on a jacket foundation.</p>	<p>Supply: Joint Venture Fabricom \ Iemans, JVFI Belgium Installation: Seaway Heavy Lifting Contracting Limited</p>
<p><b>OSS – mechanical and electrical equipment (for each of two OSSs):</b></p> <ol style="list-style-type: none"> <li>1. 1 x 220kV GIS switchgear</li> <li>2. 2 x 220/34kV 200MVA power transformers</li> <li>3. 2 x 34/0.4kV earthing/auxiliary transformers</li> <li>4. 2 x neutral earthing resistors</li> <li>5. 1 x 220kV shunt reactors 90 MVar</li> <li>6. 2 x 274kVA diesel generator sets</li> <li>7. 2 x low voltage switchgear</li> <li>8. 2 x UPS AC and DC battery systems</li> </ol>	<ol style="list-style-type: none"> <li>1. Supply and installation: Siemens A/S (DK)</li> <li>2. Supply and installation: ABB A/S (DK)</li> <li>3. Supply and installation: Kolektor Etra- JVFI</li> <li>4. Supply and Installation: Hilkar Elektrik Elektrotechnik -JVFI</li> <li>5. Royal SMIT Transformers (Netherlands)</li> <li>6. Supply and Installation: JVFI</li> <li>7. Supply and Installation: JVFI</li> <li>8. Supply and Installation: JVFI</li> </ol>
<p><b>Offshore export cables (for each of two systems):</b> 71km total length from OSS to transition pit comprising:</p> <ol style="list-style-type: none"> <li>1. 8km 220kV 3c 1600mm<sup>2</sup> aluminium XLPE galvanised SWA c/w 48 single fibres (for Landfall)</li> <li>2. 63km 220kV 3c 950mm<sup>2</sup> aluminium XLPE galvanised SWA c/w 48 single fibres</li> </ol> <p>Interlink between OSSs</p>	<p>Supply &amp; termination: NKT Cables A/S Installation: Jan De Nul Luxembourg S.A.</p>

<sup>8</sup> Transmission Entry Capacity (TEC) is a CUSC term that defines a generator’s maximum allowed export capacity onto the transmission system.

<p>comprising:</p> <p>3. 6.5km 220kV 3c 950mm<sup>2</sup> aluminium XLPE galvanised SWA c/w 48 single fibres</p>	
<p><b>Onshore export cables(for each of two systems):</b></p> <p>1. 11.6km 220kV 3 x 1c 1400mm<sup>2</sup> aluminium XLPE SWA underground cable in trefoil ducts</p> <p>2. Fibre optic cable – 48 single fibres (run with onshore export cable)</p> <p>3. 100m 400kV 3c 1200mm<sup>2</sup> aluminium XLPE SWA</p>	<p>1. Supply &amp; termination: NKT Cables A/S. Installation: J Murphy &amp; Sons</p> <p>2. Supply: NKT Cables A/S. Installation and termination: J Murphy &amp; Sons</p> <p>3. Supply &amp; termination: NKT Cables A/S. Installation J Murphy &amp; Sons</p>
<p><b>Onshore substation:</b></p> <p>1. Civils construction</p> <p>2. 400kV GIS</p> <p>3. 220kV GIS</p> <p>4. 2 x 400/220kV 360MVA auto transformers</p> <p>5. 2 x 220kV shunt reactors 120 – 200MVar</p> <p>6. 2 x 400kV harmonic filter (35MVar)</p> <p>7. 2 x 120MVar (at 28kV) DCR, 220/28kV 130MVA transformer and 28/0.4kV 500kVA auxiliary transformer</p>	<p>1. Supply and installation: J Murphy &amp; Sons</p> <p>2. Supply and installation: Siemens A/S</p> <p>3. Supply and installation: Siemens A/S</p> <p>4. Supply and installation: ABB A/S</p> <p>5. Supply and installation: Siemens</p> <p>6. Supply and installation: Alstom Grid UK Ltd</p> <p>7. Supply and installation: Rongxin Power Electronic Co. Limited</p>
<p><b>Walpole NGET substation:</b></p> <p>400kV GIS switchgear</p>	<p>Supply and installation: Mitsubishi Electric Europe</p>
<p><b>SCADA:</b></p> <p>OFTO station control and protection system</p>	<p>Supply, install, commission: Alstom Grid UK Ltd.</p>

## 5. Disclaimer and Notices

### 5.1 Non-reliance, Accuracy of Information and Exclusion of Liability

5.1.1 It is the responsibility of each bidder to ensure that it has all of the information it needs to prepare its submissions.

5.1.2 While information provided by Ofgem and/or its advisers in this PIM or otherwise in relation to the Tender Round has been prepared in good faith, neither Ofgem nor any of its advisers make any representation or warranty (express or implied) in relation to the Tender Round or any information provided by developers through data rooms or otherwise. Ofgem and its advisers expressly disclaim any and all liability (other than in respect of fraudulent misrepresentation) based on or relating to any such information or representations or warranties (express or implied) contained in, or errors or omissions

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#### Use of Information

5.1.3 This PIM is not intended to provide the basis of any investment decision, nor is it intended to be considered as an investment recommendation by Ofgem or by any of its advisers. Each bidder, developer and any other interested party must make its own independent assessment of the qualifying project(s) after making such investigation and taking such professional advice as it deems necessary.

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#### Contact Details

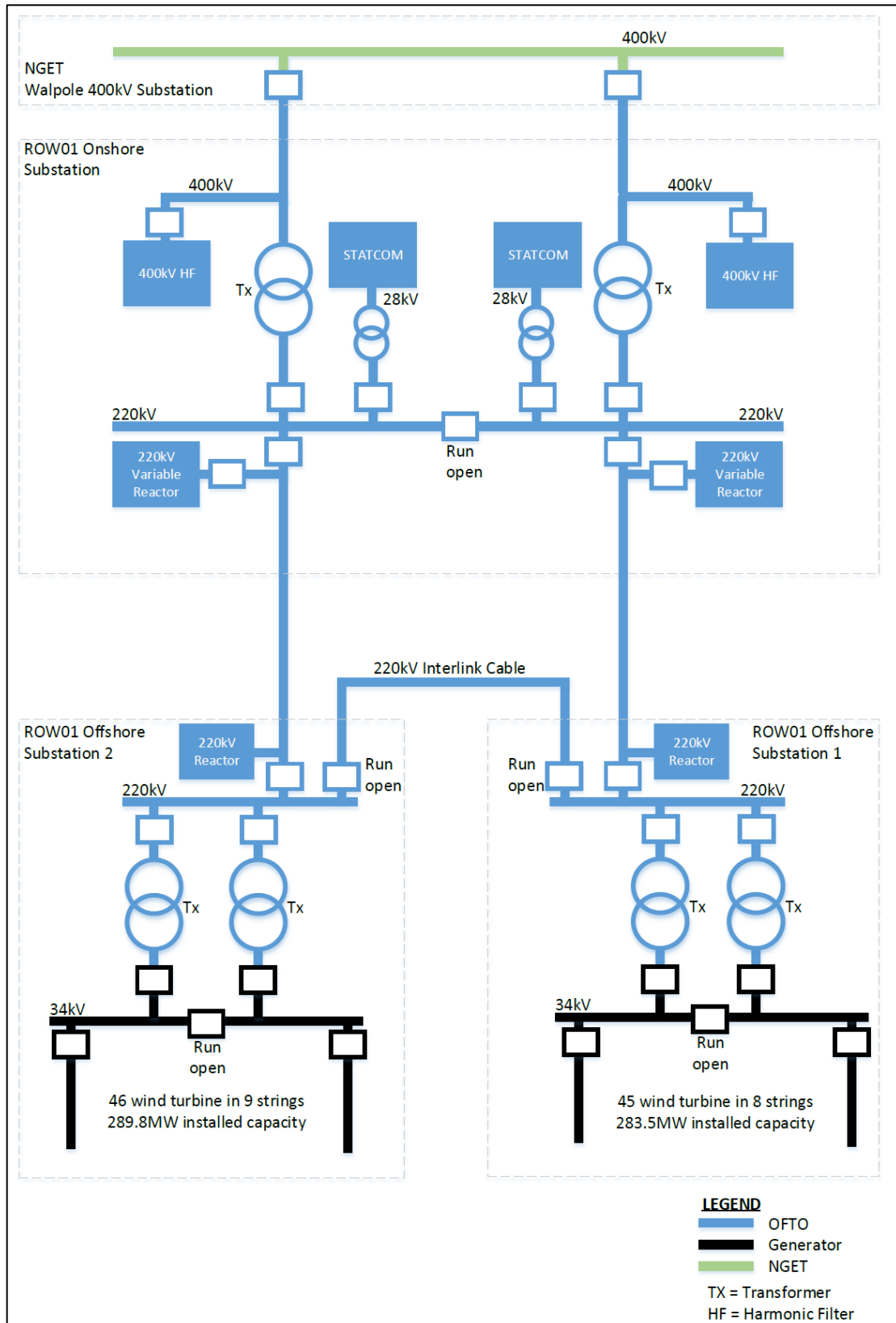
The information in this document is provided for information purposes only. It is designed to provide prospective OFTOs, lenders and advisers with certain high-level information related to the ROW01 Transmission Assets, to support the launch of the initial, pre-qualification phase of the tender process.

For more information on the tender process please refer to the Generic Preliminary Information Memorandum (Generic PIM) published alongside this document.

All enquiries or communications, including requests for additional information, should be sent to [tendercoordinator@ofgem.gov.uk](mailto:tendercoordinator@ofgem.gov.uk).

**Appendices**

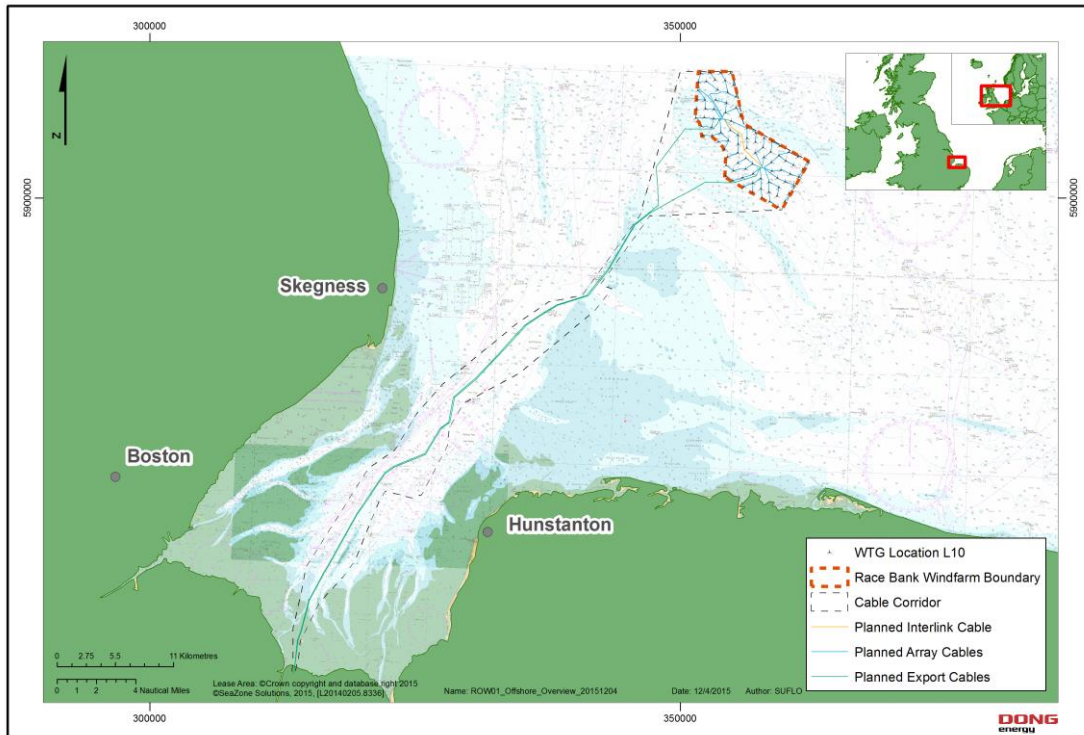
*Appendix 1 - Simplified Single Line Diagram*



Source: DONG Energy, 4<sup>th</sup> December 2015



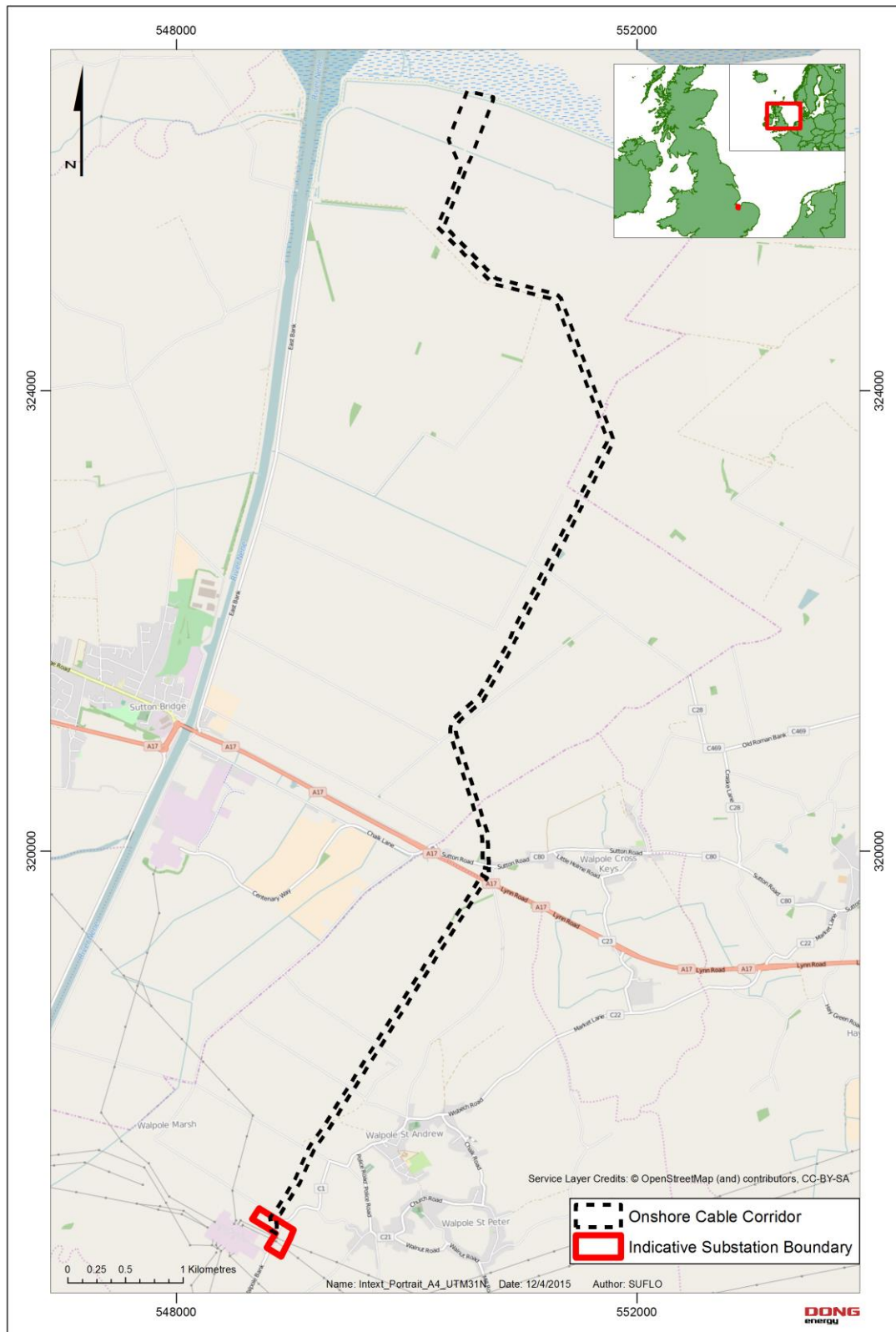
Appendix 2 - Location Map



Appendix 3 - Onshore Substation



Appendix 4 - Onshore Cable Route



Source: DONG Energy, 4<sup>th</sup> December 2015