

# Preliminary Information Memorandum

## West of Duddon Sands Offshore Transmission Assets

December 2012



*ofgem* E-Serve



RBC Capital Markets®

## EXECUTIVE SUMMARY

The UK already has more offshore wind power than any country in the world – and the UK government plans to increase this significantly by 2020. Fit for purpose offshore electricity transmission infrastructure is required to transfer the electricity generated offshore to the onshore network and ultimately to consumers. It is important that this infrastructure is developed in a timely, secure and cost-effective manner. It should also provide best value to present and future electricity consumers, while reflecting the requirements of generators and ensuring that, as far as possible, offshore infrastructure develops in a co-ordinated manner.

To support these plans, the UK's Department of Energy and Climate Change and the Office of Gas and Electricity Markets<sup>1</sup> (“**Ofgem**”) have developed a regulatory regime for offshore electricity transmission. A key part of this regime is that Offshore Transmission Licences can be granted following a competitive Tender Exercise run by Ofgem, with a successful Bidder being appointed as an Offshore Transmission Owner (“**OFTO**”).

The first transitional tender round commenced in July 2009 and strong competition has attracted over £4 billion of investment appetite for nine transmission links worth around £1.1 billion. To date we have successfully reached financial close for six out of the nine transactions, with Preferred Bidders appointed for the remaining three projects in the first transitional tender round. All Preferred Bidders so far were new entrants to the UK transmission sector prior to the first tender round.

Ofgem E-Serve, which is the delivery arm of Ofgem, is now launching the final tender for the second round of transitional projects. The tenders in Tender Round 2 have been conducted across two tranches of tender exercises. The first tranche of tender exercises (Tranche A) commenced in November 2010 with two of the 3 projects having a Preferred Bidder appointed, and the Invitation to Tender (“**ITT**”) for the final project is now underway. The West of Duddon Sands project is the final project in the second transitional round (Tranche B). Projects included in both Tranches are those projects which have been confirmed as qualifying projects by Ofgem E-Serve and have satisfied the necessary tender entry conditions in accordance with the Electricity (Competitive Tenders for Offshore Transmission Licences) Regulations 2010 (the “**Tender Regulations**”).

There are current proposals to replace the Tender Regulations with revised regulations which are expected to come into force in early 2013, subject to consultation. The revised regulations, if and when enacted, will be the Electricity (Competitive Tenders for Offshore Transmission Licences) Regulations 2013 (the “**New Tender Regulations**”). If enacted as currently drafted for consultation, the New Tender Regulations will apply to a qualifying project where the Gas and Electricity Markets Authority (the “**Authority**”) has given notice in respect of the invitation to tender stage on or after the date upon which the New Tender Regulations come into force. If the Authority has already given such notice prior to the date the New Tender Regulations come into force, the Tender Regulations will continue to apply. It is therefore currently anticipated that for the qualifying project in Tranche B of Tender Round 2, the PQ and QTT stages will be run under the existing Tender Regulations and the ITT stage will be run under the New Tender Regulations. However, Ofgem will confirm which regulations apply to a particular tender stage at the start of that stage.

This document is a summary of information provided by the Developer and outlines specifically the opportunity for investors to acquire the transmission assets and to become the licensed OFTO of the West of Duddon Sands wind farm (“**WoDS Wind Farm**”). West of Duddon Sands is a qualifying project in accordance with the Tender Regulations and is being tendered in Tranche B of Tender Round 2.

The transmission assets for the WoDS Wind Farm (referred to in this document as the “**WoDS Transmission Assets**”) are currently owned by Scottish Power Renewables (WoDS) Ltd (50%) and DONG Energy West of Duddon Sands (UK) Ltd (50%) (the “**Developers**”), via an unincorporated Joint Venture. It is currently expected that a Preferred Bidder will be appointed before first generation from the WoDS wind farm, scheduled for October 2013. Construction of the WoDS Transmission Assets is due to be completed by the end of Q4 2013. Once completed,

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<sup>1</sup> The Gas and Electricity Markets Authority is the regulator of gas and electricity markets in Great Britain. Ofgem is the Office of Gas and Electricity Markets, which supports the Authority in performing its statutory duties and functions. It is the Authority which is responsible for exercising the relevant statutory powers.

the WoDS 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 anticipated to be during April 2014, approximately 6 months after first generation.

The costs of developing and constructing the WoDS Transmission Assets, estimated on the basis of information provided to date, are £311 million (the “Initial Transfer Value”). The Initial Transfer Value will be updated as part of Ofgem’s cost assessment process, as described in the Generic Preliminary Information Memorandum entitled “GB Offshore Transmission: Investment Opportunity – Tender Round 2” and as further described below. That document also provides further information on the tender process generally.

## THE INVESTMENT OPPORTUNITY

### 1. Transmission Assets Overview

#### Location

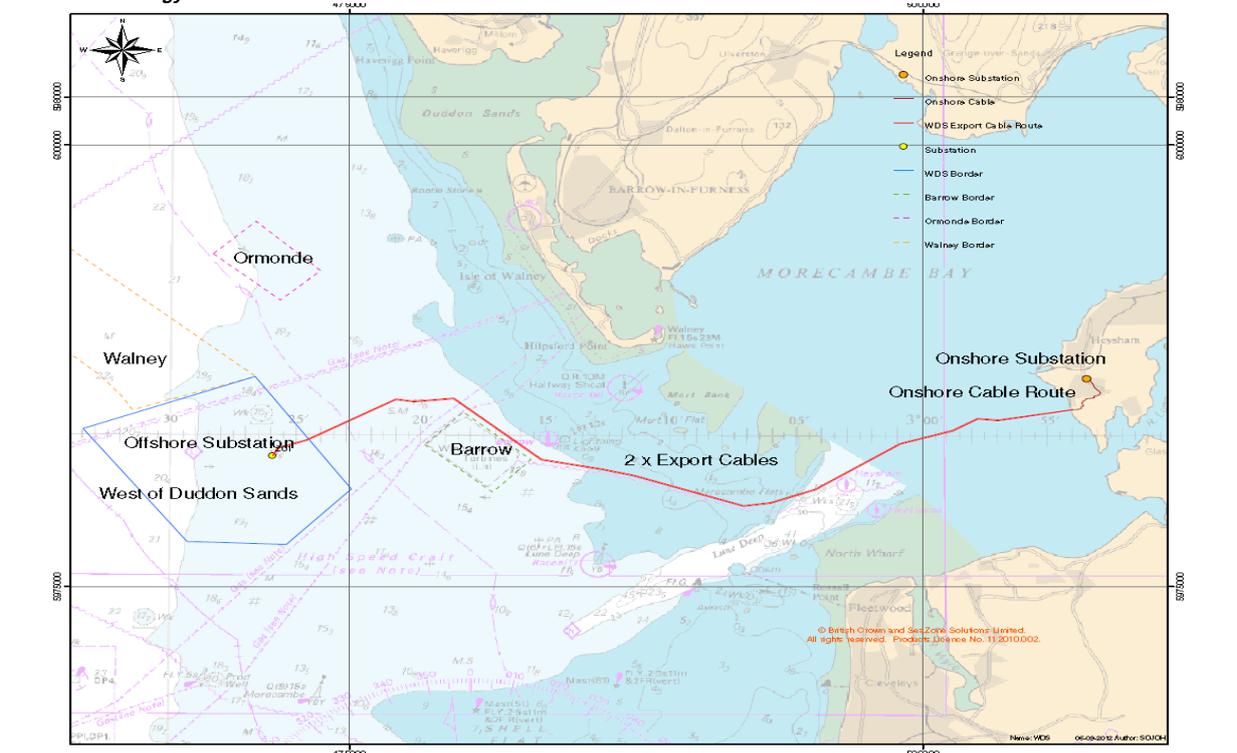
The WoDS Wind Farm is to be located in the East Irish Sea approximately 14 km from Barrow-in-Furness, off the Cumbrian Coast in northwest England. The offshore connection point will be on the Offshore Substation Platform (“OSP”) at the 34KV transformer LV terminals, within the boundaries of the WoDS Wind Farm as illustrated in Figure 1 below.

The WoDS Transmission Assets will connect to the 400/132kV National Grid substation at Heysham, Cumbria. The onshore transmission licensee is National Grid Electricity Transmission PLC (“NGET”). The connection point between the WoDS Wind Farm and the WoDS Transmission Assets will be at the point at which the 34kV inter-array cables connect to the offshore 155/34kV transformer, as further described below.

The WoDS Transmission Assets will be located entirely within UK territorial waters. Figure 1 below shows the location of the WoDS Wind Farm and WoDS Transmission Assets.

**Figure 1: Location of WoDS Wind Farm and WoDS Transmission Assets**

Source: DONG Energy



## Timeline

Construction work on the WoDS Transmission Assets commenced Q1 2012. The current expected date of delivery of the onshore connection by NGET is 31 October 2013. Construction of the WoDS Transmission Assets is scheduled to be completed by the end of Q4 2013 with the WoDS Wind Farm planned to be fully operational by the end of Q4 2014.

## Transmission Network Design

Table 1 summarises the key transmission network design features of the WoDS Transmission Assets:

**Table 1 –West of Duddon Sands Network Design Features**

Key Features	
Expected minimum designated service life	20 years
Capacity rating at maximum output at the OFTO connection point	382MW

A Connection and Use of System Agreement (“**CUSA**”) has been entered into between the Developers and NGET with Transmission Entry Capacity (“**TEC**”) export rights of 388.8 MW at the OSP. This will allow a maximum wind turbine output of 382MW to be exported to the OFTO point of connection. The difference is attributed to wind turbine array cable losses.

## Description of Transmission Assets

Figure 2 below shows the proposed route of the onshore transmission cable.

**Figure 2: Proposed Route of the WoDS Onshore Transmission Cable**



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

A summary of the transmission assets is set out in table 2 below.

**Table 2 – Asset summary**

Asset	Description
<b>OSP</b>	The OSP is provided to house the equipment necessary for the connection and switching of the wind turbine arrays. Main equipment proposed to be transferred includes two 155/34kV transformers together with associated 170kV Gas Insulated Switchgear (“GIS”), two 34/0.4kV auxiliary transformers and two 0.4kV standby generators (220kVA & 275kVA) located on the offshore substation, itself.
<b>Subsea cable</b>	The subsea cables connect the OSP to the shore where it is joined to the onshore cable. The subsea cables consist of two 170kV cables of approximately 41km in length to be buried at depths between 1m and 2m (in some places it may be surface laid with rock dumping). Each cable is designed for continuous load, rated to carry 50% of the wind farm output.
<b>Onshore cable</b>	The subsea cable connects to the onshore cable via an excavated transition joint bay. The onshore cable links the subsea connection to the onshore substation GIS and from the GIS to the 400/155kV transformers. The cable consists of two 3 x single core 170kV underground cables, each approximately 3km in length. Connection between the 400kV NGET GIS in the Heysham substation and the 400/155kV transformers in the West of Duddon Sands onshore substation consists of two 3 x single core 420kV cables.
<b>Onshore substation</b>	The onshore substation houses the high voltage switchgear necessary for connecting the onshore cable to the transmission network with associated reactive compensation equipment. Main equipment proposed to be transferred includes two 400/155kV transformers complete with 170kV GIS, two auxiliary transformers, associated shunt reactor, reactive compensation and harmonic filtration equipment.
<b>Heysham substation</b>	The Heysham substation, which is NGET’s property, is where the onshore connection point will be located. Two 400kV GIS positioned within the NGET Heysham substation will be included in the equipment transfer.
<b>SCADA</b>	The West of Duddon Sands Transmission Assets are operated from a standalone SCADA system that is independent of the Generator SCADA system. The OFTO and Generator SCADA systems exchange signals as required by the Grid Code. The OFTO SCADA interfaces to National Grid Control Centre delivering required signals from the OFTO and Generator HV systems. The offshore and the onshore substation have separate OFTO and Generator SCADA equipment rooms.
<b>Spares</b>	Later in the process the Developer will discuss the possibilities for cooperation regarding spare parts with the OFTO in order to ensure the highest possible availability of the West of Duddon Sands Transmission Assets.

Table 3 below describes the current offshore and onshore boundary points proposed by the Developers. These have been used for the purpose of calculating the Initial Transfer Value.

**Table 3 – Proposed boundary points offshore and onshore**

Boundary Point	Location
Offshore	Located at the 155/34kV transformer 34kV LV terminals.
Onshore	Located at the 400kV main and reserve busbar clamps contained within NGET's Heysham Substation.

## Risk Mitigation

The WoDS transmission system has been designed with two circuits to ensure that 50% of the WoDS Wind Farm installed capacity (TEC), excluding cable losses, can be transmitted during an outage of one of the circuits' system equipment, including transformers in the OSP, subsea and onshore export cables, supergrid transformers, and reactive compensation equipment.

## Contractual Arrangements

The Developers have adopted a multi-contract strategy for the delivery of the WoDS Transmission Assets. This is consistent with the Developers' preferred contracting strategy for power generation assets, including offshore wind farms. This strategy is based on the strength of the Developers' in-house engineering and management expertise and many years' experience in the design and construction of multi-contract power projects. The WoDS project has been designed to provide separate transmission & generation assets and thereby ensure a clear delineation of liability and asset ownership.

Table 4 sets out the main contracts, current contract status and assets currently proposed for transfer.

**Table 4 – Main Contracts, Current Contract Status and Assets**

Services and main equipment list	Contract	Contractor
<b>OSP - construction:</b>		
Four storey steel topside module mounted on a jacket foundation.	Supply Installation	JV Fabricom& Iemants NV Scaldis
<b>OSP - mechanical and electrical equipment:</b>		
2 x 240MVA 155/34kV transformers	Supply & Installation	CG Power
2 x 170kV GIS switchgear	Supply & Installation	Alstom
Auxiliary transformers	Supply & Installation	Siemens A/S
<b>Offshore cables:</b>		
2 x 41km 170kV 3 core cables	Supply Installation	NKT Cables A/S Visser & Smit
<b>Onshore cables:</b>		
2 x 3 x 3km 170kV single core cables and 2 x 3 x 0.25km 420kV single core cables	Supply	NKT Cables A/S
2 x 3 x 3km 170kV single core cables and 2 x 3 x 0.25km 420kV single core cables	Installation	Morrisons Utility Services

Services and main equipment list	Contract	Contractor
<b>Onshore Substation:</b>		
Civils	Supply & Installation	Morrison's Utility Services
400/155kV transformers	Supply & Installation	SMIT Transformatoren BV
SVCs	Supply & Installation	Siemens STDL
13.9kV reactors	Supply & Installation	Siemens STDL
170kV reactors	Supply & Installation	SMIT Transformatoren BV
170kV GIS switchgear	Supply & Installation	Alstom
Harmonic filters	Supply & Installation	Alstom
Auxiliary transformers	Supply & Installation	SMIT Transformatoren BV
<b>Heysham substation:</b>		
400 kV GIS switchgear	Supply & Installation	NGET

**Consents and Property Rights**

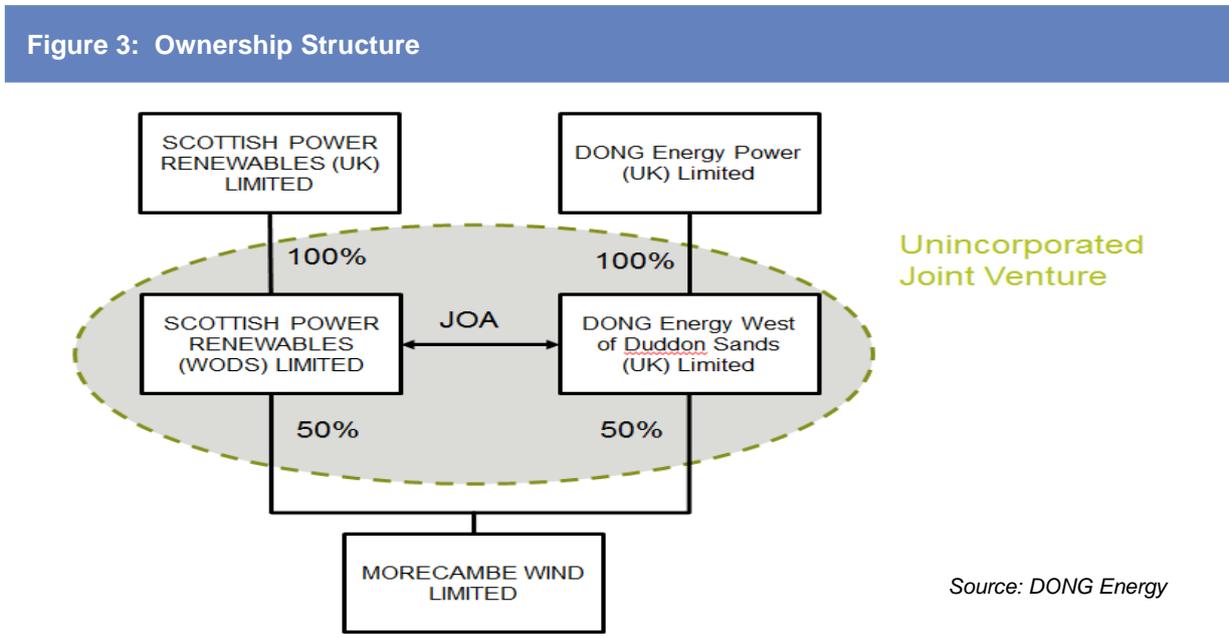
All necessary offshore consents and licences are in place for the construction of the WoDS Transmission Assets. These include an exercised option on the Crown Estate Lease, consent under Section 36 of the Electricity Act 1989, Coast Protection Act 1949 consents, a Marine Construction Works Licence and Flood Defence Consents pursuant to the Water Resources Act 1991.

The onshore substation Town and Country Planning Act consent is in place for the onshore substation and onshore export cables and the onshore substation land has been purchased and agreements for onshore cable easements are also in place.

WoDS has entered into some of the required crossing and proximity agreements for the export cable route and is in the process of finalising all other required crossing and proximity agreements for the export cable route.

**Ownership Structure**

An overview of the ownership structure of the WoDS Wind Farm and WoDS Transmission Assets is set out in Figure 3 below:



The WoDS Wind Farm is owned by Scottish Power Renewables (WoDS) Ltd and DONG Energy West of Duddon Sands (UK) Ltd, via Unincorporated Joint Venture. Morecambe Wind Ltd. is jointly owned by the Developers and holds the Section 36 (Electricity Act) consent for the WoDS Wind Farm and as such is included in the ownership structure chart for completeness.

## 2. Initial Transfer Value

Ofgem E-Serve will calculate the economic and efficient costs which ought to be, or ought to have been, incurred in connection with developing and constructing the Transmission Assets. The assessment of these costs will be used to determine the final transfer value. For the purpose of commencing the tender process, applicants should assume an Initial Transfer Value of £311 million for the Transmission Assets summarised in Tables 2 and 4 above.

This value has been provided from cost forecasts provided by the Developer, assuming the boundary points summarised in Table 3. Ofgem E-Serve has not yet reviewed this cost forecast information. Ofgem E-Serve will be undertaking a detailed review of the information as part of its calculation of the estimate of the economic and efficient costs and will provide this estimate as the indicative transfer value at the Invitation to Tender stage.

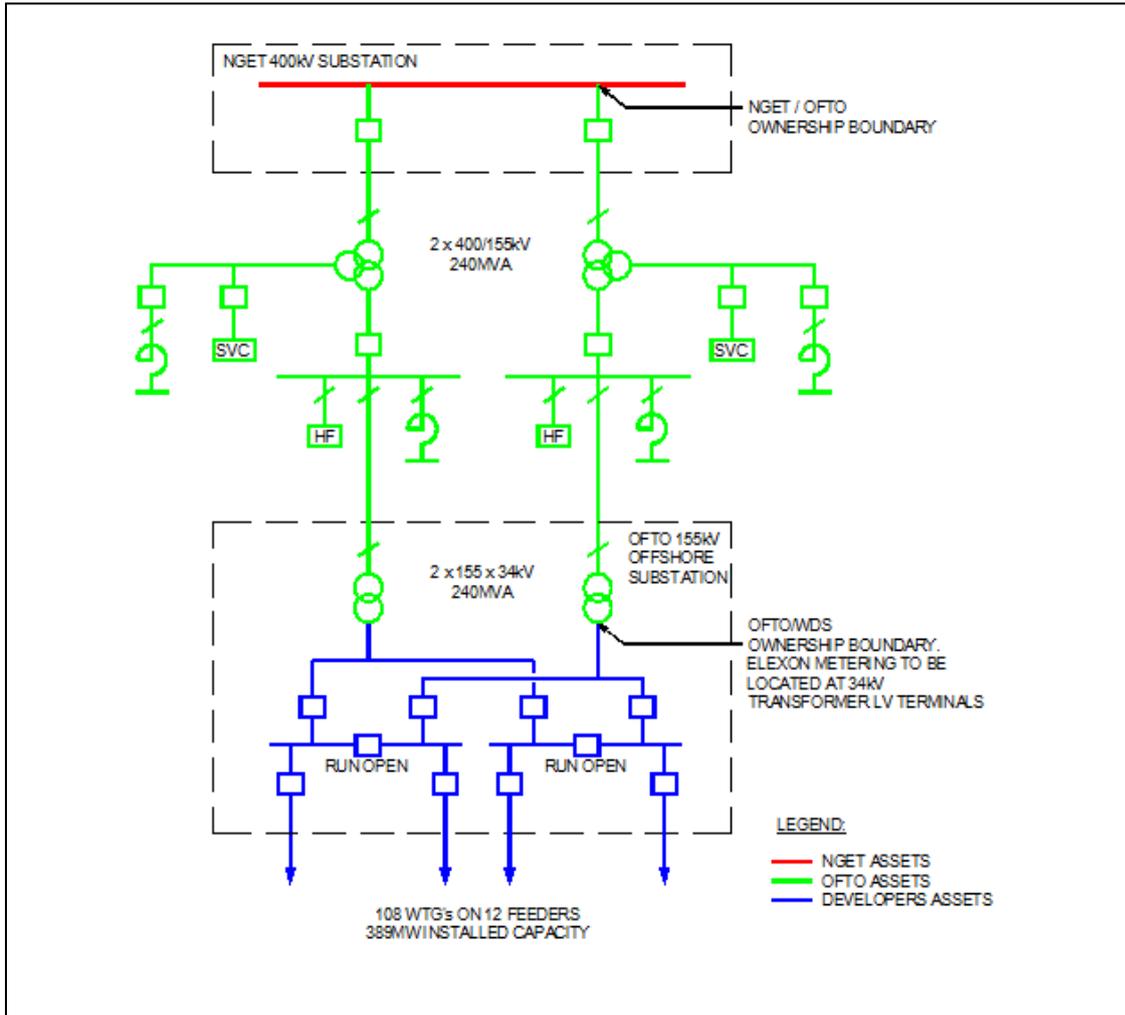
## CONTACT DETAILS

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 WoDS Transmission Assets, to support the launch of the initial, pre-qualification phase of the tender process.

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

APPENDIX 1

Simplified Single Line Diagram



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