



# Beatrice Offshore Windfarm

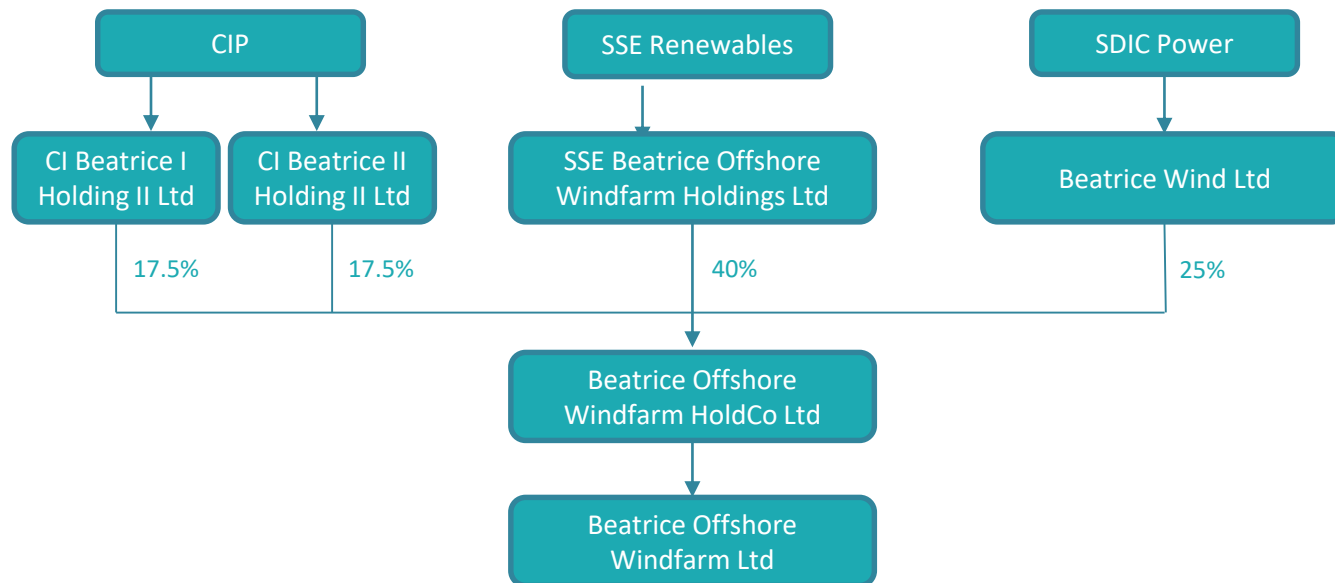
Tender Round 6 Launch  
9<sup>th</sup> October 2018

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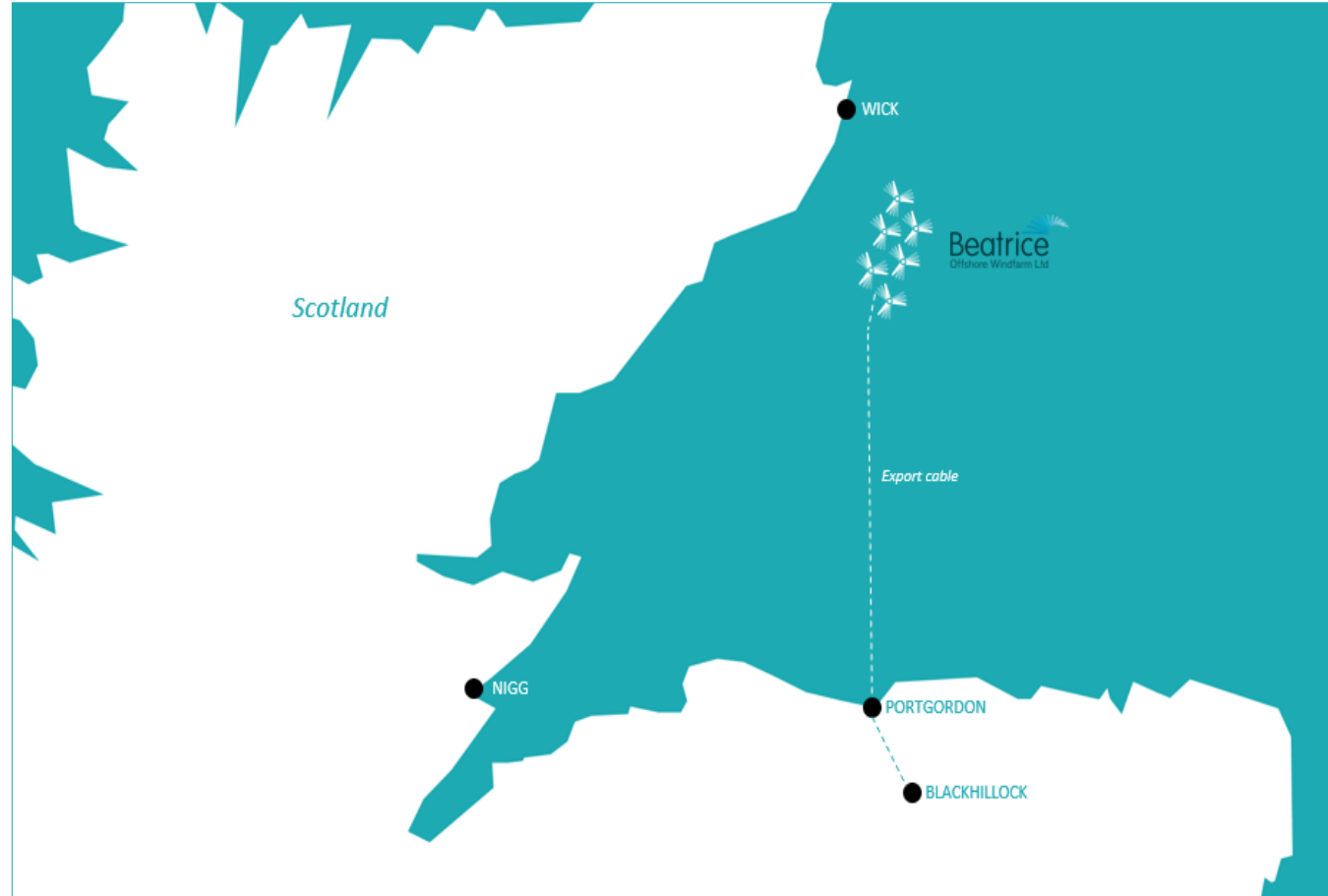
# Introduction to Beatrice Offshore Windfarm

- Beatrice Offshore Windfarm Ltd, 'BOWL' is owned by SSE Renewables (40%), Copenhagen Infrastructure Partners (35%) and SDIC Power (25%) via a HoldCo (100% shareholder of BOWL).
- Sponsors have deep experience in offshore wind worldwide with involvement in more than 20 offshore wind projects combined, covering all aspects from development, construction, operations, financing and partnership structuring.
- BOWL secured project financing from commercial banks, the European Investment Bank and EKF (Denmark's ECA), achieving Financial Close in May 2016 after a comprehensive technical and legal due diligence process.
- Once fully operational, Beatrice will be Scotland's largest offshore wind farm. The project will be operated and maintained by SSE Generation Limited.



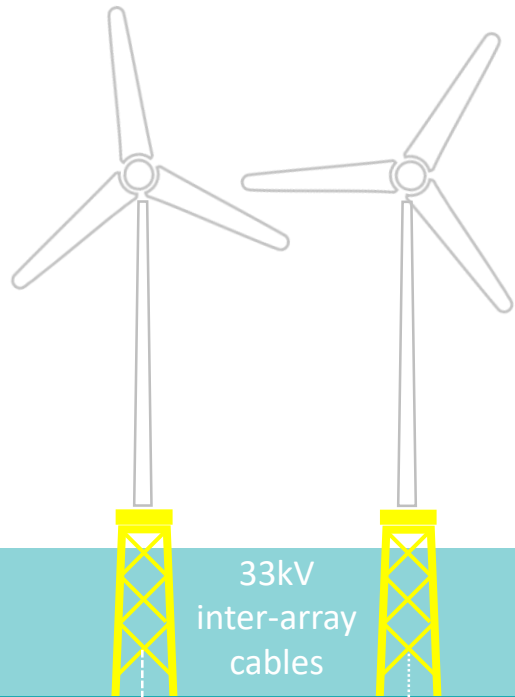
# Project Overview

Location	Outer Moray Firth 13.5km off the coast of Caithness, Scotland
Site Area	131km <sup>2</sup>
Water Depth	35m-55m
Capacity	588MW
Turbines	84 SGRE 7.0-154 Turbines
Foundations	4-leg jacket foundations with pin piles
Grid Connection	<ul style="list-style-type: none"> <li>- Onshore substation at Blackhillock</li> <li>- c.20km onshore export cable</li> <li>- c.70km subsea export cable connected to OTMs</li> </ul>
OFTO assets construction update	<p>Construction and energisation works completed July-18</p> <p>Final hook up and completions works in progress</p>
Balance of Plant O&M	Long term Operations Management Agreement with SSE Generation Ltd
Scheduled Commercial Operations Date	April 2019



# Overview of the Infrastructure

## GENERATION ASSETS



- 84 Siemens SWT-7MW-154 on jacket foundations
- 91 x 33kV inter array cables
- 14 strings in total, with 7 strings connecting into each OTM

## OFFSHORE TRANSMISSION ASSETS



- Two OTMs transform the power from 33kV to 220kV
- Two export cables (one per OTM) connect the OTMs to the Onshore Substation
- Onshore Substation at Blackhillock connects to the SSE Networks substation

# OFTO Assets

## Offshore

- **2 Offshore Transformer Modules (OTMs)** – including two 220/33 kV grid transformers and 220 kV Gas Insulated Switchgear
- **2 Offshore export cables** (with associated fibre optics) – two 220kV submarine cable circuits of circa 70 km, including a 1km section at landfall
- **1 Interlink cable** (with associated fibre optics) – a 220 kV cable of 1.5 km in length which connects the two OTMs



## Onshore

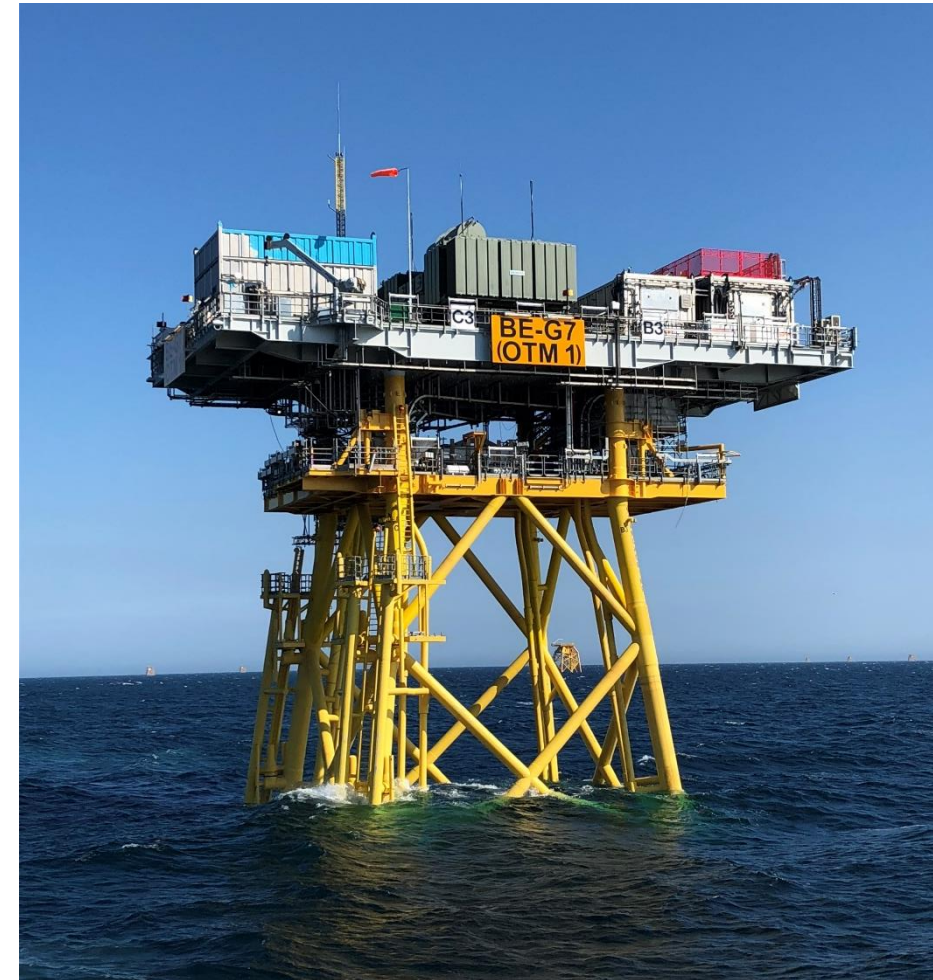
- **2 Land cables (with associated fibre optics)** – onshore 220 kV underground cables of 19.4 km length
- **1 Onshore substation** – including 400 kV Air Insulated Switchgear and two 400/220/33 kV Super Grid Transformers
- **400 kV cables** – two 400 kV circuits, c.0.7 km in length, linking the onshore substation to SSEN's Blackhillock substation
- **SCADA** - including OFTO SCADA servers & OFTO SCADA network



# Transmission Assets - OTMs

## OTM Summary

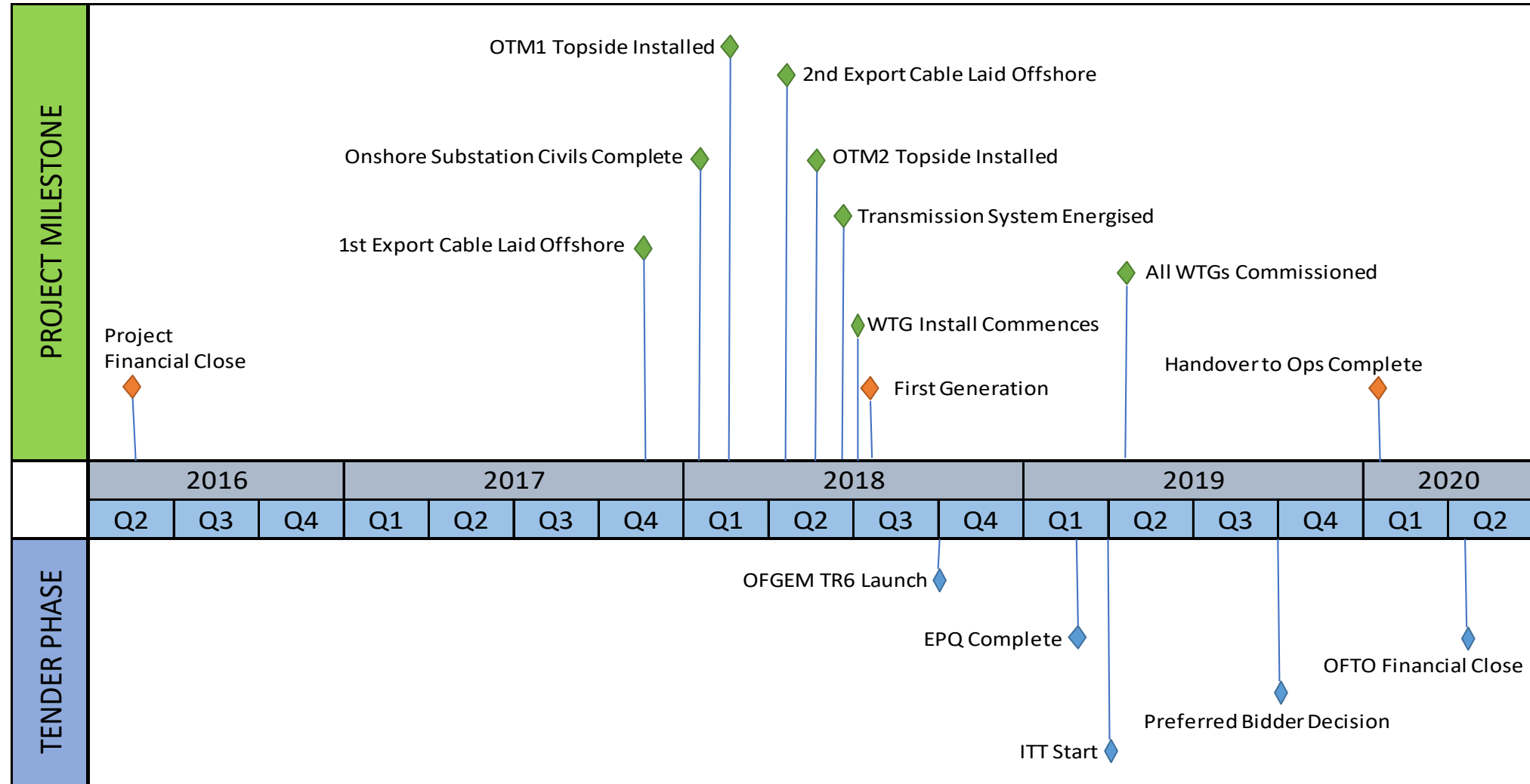
- Siemens supplied two Offshore Transformer Modules (OTM), an offshore substation concept saving space, weight and cost.
- OTMs are one-third smaller in size and weight compared to a conventional alternating-current (AC) platform.
- Structure consists of a single skid deck with a containerised package substation including a heli-winch platform
- Size and weight reductions achieved by focusing on the core electrical equipment and removing a number of optional ancillary systems.
- This also results in a reduced maintenance regime.
- Structure contains a built-in earthing transformer.



# Investment Opportunity

Project Highlights	<ul style="list-style-type: none"><li>• The project will operate under the UK CfD Framework</li><li>• 588MW generation capacity with transmission asset Initial Transfer Value approx. £498m</li><li>• All consents in place and transmission asset construction is near completion.</li></ul>
OFTO Assets	<ul style="list-style-type: none"><li>• OFTO assets are currently operational and exporting power from the wind farm, demonstrating asset integrity.</li><li>• Security provided through twin circuit approach with no single point of failure.</li><li>• Transmission system delivered by market leading suppliers: cables designed, supplied and installed by Nexans; onshore substation and OTM designed and supplied by Siemens Transmission &amp; Distribution Ltd.</li><li>• OTM results in reduced maintenance regime.</li><li>• Spare offshore export cable sections and transformer included.</li></ul>
Experienced Sponsors	<ul style="list-style-type: none"><li>• The Sponsors combined have had involvement with more than 20 offshore wind projects globally, allowing for the project to be built on a range of lessons learned.</li><li>• BOWL team is well resourced and motivated to conclude OFTO sale swiftly.</li></ul>
Contract Structure	<ul style="list-style-type: none"><li>• OFTO assets have been designed and built under one EPCI contract, jointly delivered by STDL and Nexans.</li><li>• Single EPCI contract results in fewer contracts to transfer and minimal interface risk during the OFTO handover process.</li><li>• Robust warranty provisions facilitated by single EPCI approach.</li><li>• EPCI Contractors have liability for all defects under the EPCI Contract.</li><li>• Transfer Agreement to be based on market precedent. BOWL has appointed experienced legal counsel to facilitate smooth transfer process.</li></ul>
O&M Agreement	<ul style="list-style-type: none"><li>• BOWL open to offering an O&amp;M Agreement with SSE Generation (rated A- / A1 / BBB+) as the service provider.</li></ul>

# Transaction Timeline



*Note: OFTO Tender timeline indicative and subject to amendment by Ofgem.*

# Construction Update

## Offshore

### OFTO Assets

- 2x70km Circuits of 220kV Subsea Export Cable installed and energised
- 2 Offshore Transmission Modules (OTM) jacket Substructures Installed
- 2 Siemens Offshore Transmission Modules installed and energised

### Windfarm Assets

- 84 Wind turbine jacket substructures installed
- 91 x 33kV Inter-Array Cable Installed (c.185km in total)
- 24 of 84 Siemens 7MW Wind Turbines installed



## Onshore

- Beatrice 400/200 kV Substation at Blackhillock fully energised and operational including two 400kV circuits linking the onshore substation to SSEN's Blackhillock Transmission Substation
- Final completion Q4 2018
- 2 x 20km Circuits of 220kV onshore export cable to landfall at Portgordon installed and energised
- 500m Direct Pipe tunnelling at landfall completed in August 2017





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