



Inch Cape Offshore Limited

Offshore Consents Variation Application Report

ICO1-EC-OFC-003-RRP-RPT 001

Date: 27/01/2020

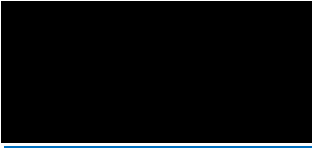
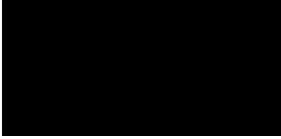

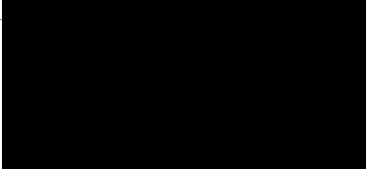
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Glossary

Development	Relates to the Inch Cape Offshore Transmission Works (OfTW) and the Inch Cape Offshore Wind Farm
Development and Onshore Transmission Works (OnTW)	Relates to the offshore and onshore elements- eg what would normally be called the project: <ul style="list-style-type: none">• Inch Cape Offshore Wind Farm;• Offshore Transmission Works (OfTW); and• Onshore Transmission Works (OnTW).
Development Area	The area for the Wind Farm, within which all WTGs, inter-array cables, interconnector cables, OSPs and the initial part of the Offshore Export Cable and any other associated works will be sited.
Inch Cape Offshore Transmission Works (OfTW)	A component of the Development, comprising OSPs and their foundations and substructures, and Offshore Export Cables.
Inch Cape Offshore Wind Farm	A component of the Development, comprising wind turbines and their foundations and substructures, and inter-array cables.
Inter-array cables	The electricity cables, which are not transmission voltage, between each WTG and between WTGs and OSPs.
Offshore Export Cable	The subsea, buried or protected electricity cables running from the offshore wind farm substation to the landfall and transmitting the electricity generated to the onshore cables for transmission onwards to the onshore substation and the electrical grid connection.
Offshore Export Cable Corridor/ Export Cable Corridor	The area within which the Offshore Export Cables will be installed within the Development Area and from there up to Mean High Water Springs.
Offshore Substation Platforms (OSPs)	The platform structures offshore that contain High Voltage or Extra High Voltage switching equipment, including transformers, switchgear and other electrical components required to control power system switching.
Onshore Transmission Works (OnTW)	All works required for the onshore element of the Project, typically including the onshore substation, cable transition pits, cable jointing pits, underground electricity transmission cables connecting to the Onshore Substation and further underground cables required to facilitate connection to the national grid. This includes all permanent and temporary works required.

Abbreviations and Acronyms

AA	Appropriate Assessment
CfD	Contracts for Difference
ICOL	Inch Cape Offshore Limited
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
HRA	Habitats Regulations Appraisal
Km	Kilometres
Kv	Kilovolts
M	Meters
MW	Megawatt
OFTW	Offshore Transmission Works
OFTi	Offshore Transmission Infrastructure
OSP	Offshore Substation Platform
WTG	Wind Turbine Generator

1 Introduction

1.1 Purpose of this document

- 1 Inch Cape Offshore Wind Farm Limited (ICOL) is seeking to vary the Inch Cape Offshore Wind Farm Section 36 Consent (048/OW/RRP-10). The purpose of the application is to vary the maximum generation capacity of the Inch Cape Offshore Wind Farm (the Wind Farm) as stated within the Section 36 Consent.
- 2 The proposed increase in generating capacity will be achieved through technological advances in turbine technology since the 2018 application was submitted and all other parameters will remain with those currently consented in the Section 36 consent. ICOL are not requesting a variation to the physical parameters of WTGs or any other component within this application.
- 3 The process for undertaking a variation to a consent under Section 36 of the Electricity Act 1989 (as amended) is outlined in Section 36C of the Electricity Act 1989 (as amended) and Part 9 of the Electricity Works (Environmental Impact Assessment) Scotland Regulations 2017. The following sections outline the requested variation and justification. Whilst there is reference to 700MW within the Decision Notice of ICOL's Marine Generation Licence (06781/19/0), the Licence itself does not include a maximum generating capacity and therefore does not require variation.

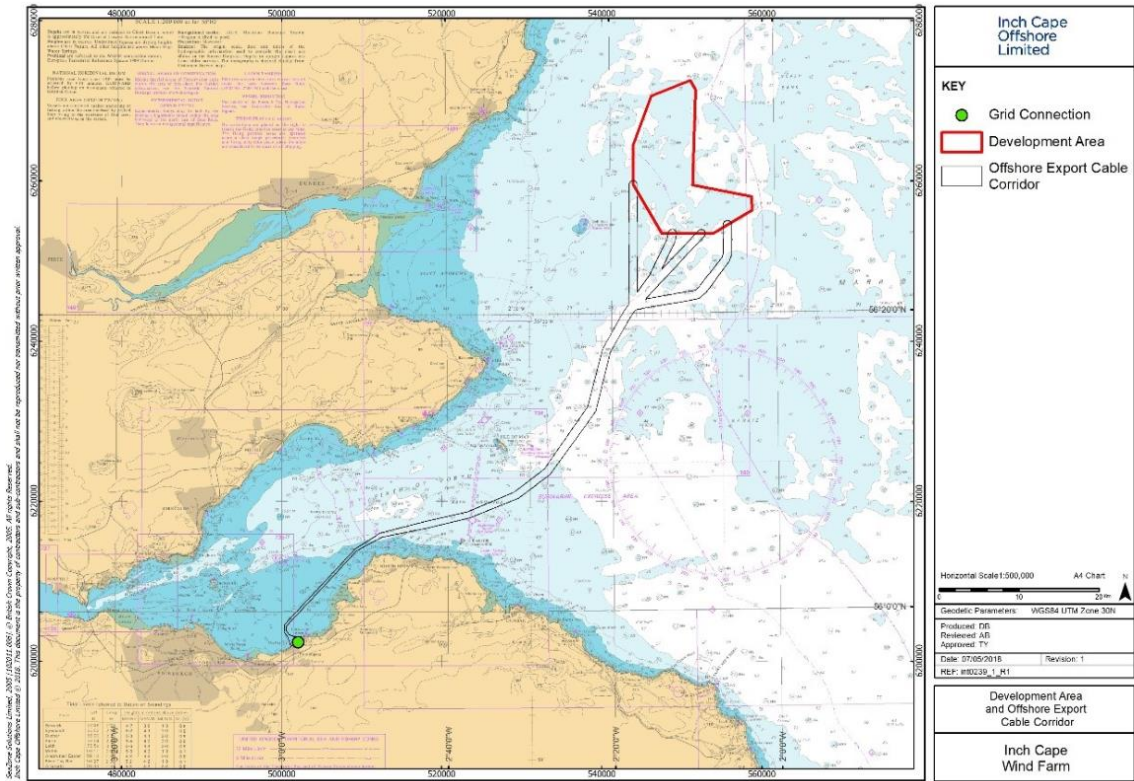
1.2 Consenting Status

- 4 The Inch Cape Offshore Wind Farm (the Wind Farm) and Offshore Transmission Works (OfTW), hereafter referred to as The Development, is being developed by Inch Cape Offshore Limited (ICOL). In 2014, ICOL was granted Section 36 Consent and Marine Licences for the construction and operation of an offshore wind farm and associated transmission works. The licences granted for ICOL in 2014 (along with those for other Forth and Tay projects, Seagreen and Nearth Na Gaoithe) were subject to a petition for judicial review in early 2015. The petition for judicial review was ultimately unsuccessful and concluded in November 2017.
- 5 In 2018, ICOL submitted a new application with a revised design that would allow the development of a project that could utilise progressions in turbine technology since the 2014 consent. The revised design was aimed at reducing the environmental impacts and increasing the cost competitiveness of the project, primarily by reducing the overall number of turbines and increasing the height of the turbines being installed. Section 36 and Marine Licence consents for the revised design were granted by Scottish Ministers in 2019.
- 6 In August 2019 ICOL entered the Contracts for Difference (CfD) auction and were unsuccessful. ICOL is committed to progressing the project and are in the process of exploring mechanisms for developing the Development within the current consent envelope that would also maximise the Development's economics.

1.3 The Development

- 7 The Development will be located approximately 15 to 22 kilometres (eight to 12 nautical miles) off the Angus coastline, to the east of the Firth of Tay. The site of the Development (Development Area) is approximately 150 km² and will contain up to 72 WTGs, up to two OSPs, inter-array cabling and interconnector cable between OSPs (if required).
- 8 The Offshore Export Cable Corridor will consist of two cables installed between the Development Area and Mean High Water Springs.
- 9 The location and extent of the Development Area and Offshore Cable Corridor is shown in Figure 1.

Figure 1: The Development Area and Offshore Export Cable Corridor



2 Need for Variation to Existing Section 36 and Generating Marine Licence

2.1 Rationale

- 10 Wind Turbine Generator (WTG) technology is constantly evolving with more efficient WTG models continually becoming available. ICOL has undertaken a review of WTG technologies, in conjunction with potential timescales for construction of the Development. This analysis has determined that it is now feasible that turbines with a greater capacity rating will become available within a suitable timeframe to deliver the Development. The physical dimensions of any such turbines would be within those parameters assessed within the application and identified in the current Section 36 consent and Generating Marine Licence.
- 11 It is therefore feasible that the overall capacity of the Wind Farm can be increased from 700MW to up to 1000MW without resulting in an increase in impact than those assessed within the Environmental Impact Assessment Report (EIAR), Habitats Regulations Appraisal (HRA) or Appropriate Assessment which underpins the 2019 Section 36 Consent and Generating Marine Licence.
- 12 Utilising best available turbine technology and increasing the overall capacity of the site will allow ICOL to produce more electricity for the same level of development, thereby producing more electricity with no increase in environmental impact. Increasing the capacity will also allow electricity in the most cost-effective way for the end user.
- 13 Based on the Scottish Government's published Renewable Electricity Output Calculator, it is estimated that, depending on the fuel type displaced, 612,325 tonnes of carbon dioxide will be saved each year through by Development, is approved to generate 1000MW. In addition, it is estimated that the Development would generate enough electricity each year to meet the needs of the equivalent of 669,565 Scottish households per year. This would represent an increase of approximately 240,938 additional homes being powered using clean energy from the currently consent 700MW project, without increasing the infrastructure allowed under the current consent.

3 Design Envelope

- 14 Table 1 outlines the design envelope that was assessed within the Inch Cape 2018 EIAR and included within the June 2019 Section 36 Consent and confirms to which parameters the variation being requested applies. ICOL are not requesting a variation to the physical parameters of WTGs or any other component within this application.

Table 1 Design Parameters

Relevant Design Parameter	Parameters	Variation Requested
Development Area	150km ²	No
Maximum generating capacity	'around 700MW' ¹	Yes, change to: 'up to 1000MW'
Wind Turbine Generators		
Max number of WTGs	72	No
Max Rotor Diameter (m)	250	No
Max Blade Tip Height (mLAT)	291	No
Min tip height (mLAT)	27.4	No
Nominal minimum turbine spacing	1,278	No
WTG Foundations		
WTG Foundation Type	Jackets (pin-piled and suction caisson), Gravity Base ² , Monopile.	No
Maximum jacket top width (m)	30 x 30	No
Maximum jacket base width and length (m)	60 x 60	No
Maximum number of piles per foundation	4	No
Maximum pile diameter (m)	Aggregate Pile Diameter of 12m, e.g. 4 piles of 3m diameter.	No
Maximum hammer energy (kJ)	5000 monopile/2400 pin-pile	No
Maximum seabed penetration (m)	70	No

¹ 'Around 700MW' was quoted as a maximum generation capacity in the Section 36 Consent and Marine Licence Decision Notice, however it is noted that the overall capacity of the Wind Farm was not defined within the EIAR design envelope and not included in the Marine Licence. Reference to 700MW was made to provide a realistic scenario to inform Chapter 8 of the EIAR (The Benefits of the Development) EIAR Chapter and was based on the grid connection agreement at the time of submission.

² Parameters for GBS have not been included as it is unlikely to be progressed as an option, however, if used, no variations to parameters would be requested.

Relevant Design Parameter	Parameters	Variation Requested
Maximum number of piling vessels active at same time	2	No
Max total seabed area (m ²) under each substructure (Shadow).	3600m	No
Max Footprint (m ²)- Total seabed area under each substructure which is not exposed	113m (area under 12m diameter monopile)	No
Footprint Including Scour Protection (m ²) for each substructure	804m	No
Offshore Substation Platforms		
Maximum number of OSPs	2	No
Topside height above LAT (m)	70	No
Maximum length and width of OSP Topside (m x m)	100 x 100	No
Maximum length and width of OSP foundation jacket	100 x 100	No
Maximum number of piles for OSP foundation	16 (8 per OSP)	No
Aggregate Pile Diameter (m) (e.g. 8 piles of 3m diameter or 2 piles of 12 m)	24	No
Maximum seabed penetration depth for OSP foundation (m)	60	No
Shadow (m ²) - Total seabed area under each substructure including those exposed	10,000	No
Footprint (m ²) - Maximum seabed area under each substructure which is not exposed.	500	No
Footprint including Scour protection at each substructure (m ²)	3,200	No
Drilled Volume at each Substructure (m ³)	6,785	No
Inter-array Cables		
Maximum total length of inter-array cables (combined) (km)	190	No
Voltage (kV)	<132	No

Relevant Design Parameter	Parameters	Variation Requested
Cable burial depth (m)	Typically, 1.2 but up to 3	No
Percentage of cable burial	90-100	No
Export Cables		
Maximum total length of export cable, including OSP connectors (combined) (km).	180	No
Maximum number of export cable	2	No
Cable burial depth (m)	Typically, 1.2 but up to 3	No
Percentage of cable burial (%)	80-100	No

3.1 EIA and HRA Implications

- 15 The Inch Cape Offshore Wind Farm EIAR (ICOL 2018) does not state the project will have a maximum generating capacity, however, a development of approximately 700MW was considered as a realistic scenario for the assessment of economic and social benefits. This scenario was based on the grid connection agreement at the time of submission, and that WTG rated to approximately 9.5MW would be available within the projected project timescales. The 700MW figure was not represented within the EIAR as a maximum possible capacity for the site based on optimisation of technology or the layout. ICOL's design envelope used to inform the EIAR was designed to enable deployment of more efficient WTG technologies if they became available and there was no commitment within the EIAR or subsequent consents to a WTG maximum rating.
- 16 As ICOL is proposing to realise the increased generating capacity within the consented physical parameters outlined in the Section 36 Consent there is no pathway for additional environmental impacts to exceed those assessed within the EIAR. Currently, several WTG models are being considered and all models have dimensions within the maximum dimensions permitted in the Section 36 Consent and Generation Marine Licence.
- 17 The proposed Section 36 Consent variation does not relate to any of the physical dimensions used to assess the EIA or Habitats Regulations Appraisal (HRA) used to inform the Appropriate Assessment (AA) (Marine Scotland, 2019), it is considered that that there is no pathway by which the results of the EIA or AA which underpin the consent award would be invalidated as a result of this variation.
- 18 Therefore, as there are no changes in the significant effects predicted on the environment from those identified in the EIAR, no further EIA information is being submitted as part of this application. ICOL consider that the Section 36 and Generation Marine Licence can be varied without any further assessment being required.

4 Section 36 Consent and Marine Licence Application Documents

- 19 Documents that ICOL submitted as part of the 2018 Section 36 and Marine Licence application, include;
- a) The application letter;
 - b) The EIAR;
 - c) HRA Information Report;
 - d) Wind Farm Marine Licence Application; and
 - e) Wind Farm Marine Licence Application Supplementary Information
- 20 Within these documents all references to a 700MW generating capacity clearly state that this is an assumed capacity based on the grid connection agreement at the time of submission and may be subject to change. ICOL does not state that 700MW would be the maximum generation capacity in any documents included within the Application.
- 21 It is therefore considered that changes to the Section 36 Consent and Marine Licence requested below are consistent with ICOL's original application and no other documents require updating.

5 Requested variations for the Section 36 Consents

- 22 The process for undertaking a variation to a consent under Section 36A of the Electricity Act 1989 (as amended) is outlined in Section 36C of the Electricity Act 1989 (as amended) and Part 9 of the Electricity Works (Environmental Impact Assessment) Scotland Regulations 2017. The following sections outline the requested changes to sections of the Section 36 consent.

5.1.1 Decision Notice - Section 1

- 23 This section outlines requested variations to the 2019 Inch Cape Section 36 Consent Decision Notice, as well as justification for those changes. Requested changes to the text are outlined in Table 2.
- 24 Variation to the text within paragraph 1.4 of the Section 36 Consent would be required (as outlined in Table 2).
- 25 Paragraph 9.4.7.3 of the consent acknowledges that at the time of submission, the application had not been based on a defined maximum capacity and that the 700MW figure had been proposed to enable a realistic assessment of the potential benefits of the project.
- 26 An increase from 'around 700 MW' to 'up to 1000 MW' would have the potential to realise significant additional benefits to those outlined in Paragraph 9.4.7.2. Using a like for like comparison of the figures provided in Paragraph 9.4.7.3 and the same

Renewable Electricity Output Calculator³, the estimated reduction in tonnes of CO₂ that could be realised would increase to between 661,311 and 2,697,936 tonnes. The equivalent number of Scottish households the Development would produce power for would increase to 723,130 Scottish households.

- 27 There are no requests to alter any of the other parameters. The change in capacity would represent approximately up to a 35.2% increase in benefit with no additional environmental impact. Proposed variations to text are provided in **bold** in Table 2 below.

Table 2 Proposed variations to Section 36 Consent Text

Section 36 Reference	Current Text	Proposed Change
<p>Paragraph 1.4</p>	<p><i>The Application is for the construction and operation of an offshore energy generating station, with a maximum generating capacity of around 700 megawatts (“MW”). The offshore generating station shall be comprised of:</i></p> <p><i>1. No more than 72 three-bladed horizontal axis Wind Turbine Generators (“WTGs”), each with:</i></p> <p style="padding-left: 40px;"><i>a) A maximum height to blade tip of 291 metres (measured from Lowest Astronomical Tide (“LAT”));</i></p> <p style="padding-left: 40px;"><i>b) A maximum rotor diameter of 250 metres;</i></p> <p style="padding-left: 40px;"><i>c) A minimum blade tip clearance of 27.4 metres (measured from LAT);</i></p> <p style="padding-left: 40px;"><i>d) A maximum blade width of 7.8 metres; and</i></p> <p style="padding-left: 40px;"><i>e) A nominal turbine spacing of 1,278 metres.</i></p> <p><i>2. No more than 72 substructures and foundations and ancillary equipment; and</i></p> <p><i>3. No more than 190km of inter-array cabling.</i></p> <p><i>All as described in the application.</i></p>	<p><i>The Application is for the construction and operation of an offshore energy generating station, with a maximum generating capacity of up to 1000 megawatts (“MW”). The offshore generating station shall be comprised of:</i></p> <p><i>1. No more than 72 three-bladed horizontal axis Wind Turbine Generators (“WTGs”), each with:</i></p> <p style="padding-left: 40px;"><i>a) A maximum height to blade tip of 291 metres (measured from Lowest Astronomical Tide (“LAT”));</i></p> <p style="padding-left: 40px;"><i>b) A maximum rotor diameter of 250 metres;</i></p> <p style="padding-left: 40px;"><i>c) A minimum blade tip clearance of 27.4 metres (measured from LAT);</i></p> <p style="padding-left: 40px;"><i>d) A maximum blade width of 7.8 metres; and</i></p> <p style="padding-left: 40px;"><i>e) A nominal turbine spacing of 1,278 metres.</i></p> <p><i>2. No more than 72 substructures and foundations and ancillary equipment; and</i></p> <p><i>3. No more than 190km of inter-array cabling.</i></p> <p><i>All as described in the application.</i></p>

³ <https://www2.gov.scot/Topics/Statistics/Browse/Business/Energy/onlinetools/ElecCalc>

<p>Paragraph 9.4.7.3</p>	<p><i>The proposed installed capacity of the Development will be around 700MW (however, the exact value is dependent on the nominal capacity and number of WTGs installed and cannot yet be confirmed). Based on the Scottish Government’s published Renewable Electricity Output Calculator, it is estimated that, depending on the fuel type displaced, 428,627 tonnes of carbon dioxide will be saved each year. In addition, it is estimated that the Development will generate enough electricity each year to meet the needs of the equivalent of 468,696 Scottish households per year.</i></p>	<p><i>The proposed installed capacity of the Development will be up to 1000MW (however, the exact value is dependent on the nominal capacity and number of WTGs installed and cannot yet be confirmed). Based on the Scottish Government’s published Renewable Electricity Output Calculator, it is estimated that, depending on the fuel type displaced, 612,325 tonnes of carbon dioxide will be saved each year. In addition, it is estimated that the Development will generate enough electricity each year to meet the needs of the equivalent of 669,565 Scottish households per year.</i></p>
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5.1.2 Section 36 Decision Notice Annex 1 - Description of the development.

28 The first paragraph of Annex 1 of the Section 36 Decision Notice is similar text as the text in paragraph 1.4, therefore the justifications for varying the text provided in Section 2.3.1 apply. The request for variation to the text within Annex 1 is outlined in Table 3 below, proposed changes in text are in **bold**.

Table 3 Proposed variations to Section 36 Text

Section 36 Annex C Reference	Current Text	Proposed Change
<p>Paragraph 1 Annex 1</p>	<p><i>An offshore energy generating station, located in the outer Firth of Forth, approximately 15-22km east of the Angus coastline, as shown in Figure 1 below, with a maximum generating capacity of around 700 megawatts (“MW”) comprising:</i> <i>1. No more than 72 three-bladed horizontal axis Wind Turbine Generators (“WTGs”), each with:</i> <i>a) A maximum height to blade tip of 291 metres (measured from Lowest Astronomical Tide (“LAT”));</i> <i>b) A maximum rotor diameter of 250 metres;</i> <i>c) A minimum blade tip clearance of 27.4 metres (measured from LAT);</i></p>	<p><i>An offshore energy generating station, located in the outer Firth of Forth, approximately 15-22km east of the Angus coastline, as shown in Figure 1 below, with a maximum generating capacity of up to 1000 megawatts (“MW”) comprising:</i> <i>1. No more than 72 three-bladed horizontal axis Wind Turbine Generators (“WTGs”), each with:</i> <i>a) A maximum height to blade tip of 291 metres (measured from Lowest Astronomical Tide (“LAT”));</i> <i>b) A maximum rotor diameter of 250 metres;</i> <i>c) A minimum blade tip clearance of 27.4 metres (measured from LAT);</i> <i>d) A maximum blade width of 7.8 metres; and</i></p>

	<p><i>d) A maximum blade width of 7.8 metres; and</i> <i>e) A nominal turbine spacing of 1,278 metres.</i> <i>2. No more than 72 substructures and foundations and ancillary equipment.</i> <i>3. No more than 190km of inter-array cabling;</i> <i>The total area within the Development site boundary is 150km².</i></p>	<p><i>e) A nominal turbine spacing of 1,278 metres.</i> <i>2. No more than 72 substructures and foundations and ancillary equipment.</i> <i>3. No more than 190km of inter-array cabling;</i> <i>The total area within the Development site boundary is 150km².</i></p>
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5.1.3 Section 36 Decision Notice Annex 2

29 There are no references to the total generating capacity outlined within Annex 2 of the Section 36 Decision Notice and therefore there are no requests to vary text within this section.

6 Summary

30 ICOL is requesting a variation of the Inch Cape Offshore Wind Farm Section 36 Consent to increase the maximum generating capacity to increase from 'around 700MW' to 'up to 1000MW'. ICOL is proposing that all other parameters within the Section 36 consent remain the same, and therefore there would be no environmental impacts beyond those identified and assessed within the EIA. ICOL also propose that this request is consistent with the wording in ICOLs 2018 application which stated that 700MW was an indicative generating capacity only.