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<b>Document Reference</b>	IC02-INT-EC-OFL-003-RRP-APP-002	<b>Revision</b>	1
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<b>Date</b>	20 January 2021
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<b>Date of Next Review</b>	Not applicable
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<b>Classification</b>	For Public Use
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# **Inch Cape Offshore Wind Farm Section 36 Consent Variation Application Supporting Report**

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## Acronyms & Abbreviations

Acronym	Term
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

## Glossary

Defined Term	Meaning
Development	The to the Inch Cape Offshore Transmission Works (OfTW) and the Inch Cape Offshore Wind Farm



<b>Development and Onshore Transmission Works (OnTW)</b>	The offshore and onshore elements- eg what would normally be called the project: Inch Cape Offshore Wind Farm; Offshore Transmission Works (OfTW); and Onshore Transmission Works (OnTW).
<b>Development Area</b>	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.
<b>Inch Cape Offshore Transmission Works (OfTW)</b>	A component of the Development, comprising OSPs and their foundations and substructures, and Offshore Export Cables.
<b>Inch Cape Offshore Wind Farm</b>	A component of the Development, comprising wind turbines and their foundations and substructures, and inter-array cables.
<b>Inter-array cables</b>	The electricity cables, which are not transmission voltage, between each WTG and between WTGs and OSPs.
<b>Offshore Export Cable</b>	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.
<b>Offshore Export Cable Corridor/ Export Cable Corridor</b>	The area within which the Offshore Export Cables will be installed within the Development Area and from there up to Mean High Water Springs.
<b>Offshore Substation Platforms (OSPs)</b>	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.
<b>Onshore Transmission Works (OnTW)</b>	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.
<b>Development</b>	The to the Inch Cape Offshore Transmission Works (OfTW) and the Inch Cape Offshore Wind Farm.
<b>Development and Onshore Transmission Works (OnTW)</b>	The offshore and onshore elements- eg what would normally be called the project: Inch Cape Offshore Wind Farm; Offshore Transmission Works (OfTW); and Onshore Transmission Works (OnTW).
<b>Development Area</b>	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  
(OTW)**

**A component of the Development, comprising OSPs and their foundations and substructures, and Offshore Export Cables.**

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## 1 Introduction

### 1.1 Purpose of this Document

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 remove the maximum generation capacity of the Inch Cape Offshore Wind Farm (the Wind Farm) as stated within the Section 36 Consent.

An increase in generating capacity beyond that currently consented will be achieved through technological advances in turbine technology, all other parameters will remain with those currently consented in the Section 36 consent. ICOL is not requesting a variation to the physical parameters of WTGs or any other component within this application.

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.

This application seeks to remove the **overall maximum generating capacity from the Section 36 Consent**. ICOL currently has consent for a maximum generating capacity of 'up to 1000MW'. Through detailed discussions with wind turbine generator (WTG) manufacturers, it is now understood that higher rated WTGs will be available on the market, within the project timeframes. This would allow for an overall generating capacity greater than 1000MW. In line with this, ICOL has also secured a grid connection of 1080MW.

WTGs being considered remain within the design envelop and consented parameters originally assessed. Therefore, this application does not seek to vary any of these.

### 1.2 Consenting Status

The Inch Cape Offshore Wind Farm and Offshore Transmission Works (OfTW), hereafter referred to as The Development, is being developed by 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 Neart 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.

In 2018, ICOL submitted a new application with a revised design that would allow the development

of a project that could utilise progressions in WTG 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 WTGs and increasing the height of the WTGs being installed. Section 36 and Marine Licence consents for the revised design were granted by Scottish Ministers in 2019.

In February 2020, ICOL applied for a Section 36 variation to increase the maximum generating capacity to from 'approximately 700MW' to 'up to 1000MW'. No other changes to parameters were included in this variation. This request was based on project timescales and understanding of WTG technology at the time of request. The variation was consented on the 16th of July 2020 (Appendix 1).

### 1.3 The Development

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 km<sup>2</sup> and will contain up to 72 WTGs, up to two OSPs, inter-array cabling and interconnector cable between OSPs (if required).

The Offshore Export Cable Corridor will be installed between the Development Area and the proposed substation at Cockenzie in East Lothian.

The location and extent of the Development Area and Offshore Cable Corridor is shown in Figure 1.

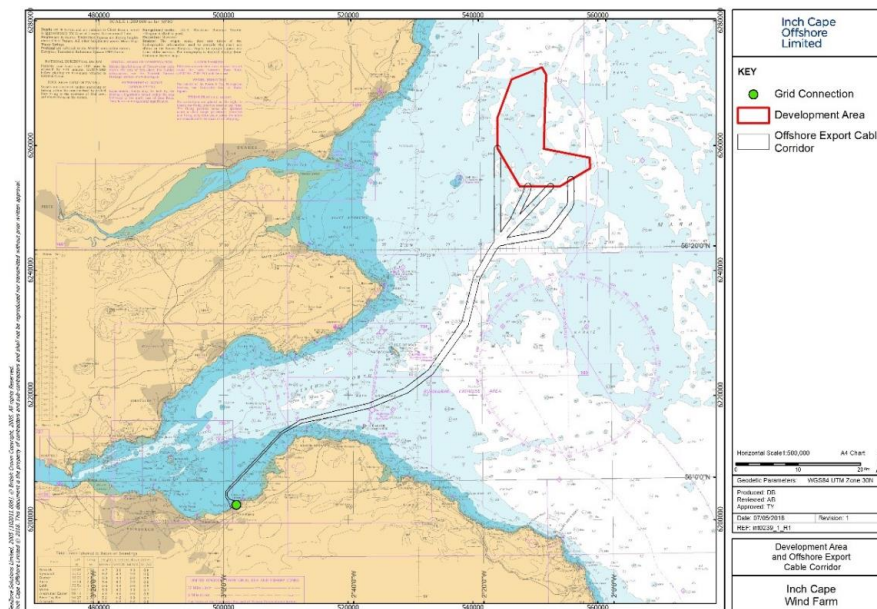


Figure 1: The Development Area and Offshore Export Cable Corridor



## 2 Need for Variation

Through discussions with leading WTG suppliers, and since applying (and receiving consent, to increase the overall generating capacity to 'up to 1000MW' ICOL has identified that further gains in maximum generating capacity may be possible utilising the consented project design envelope and within the project's timeframes. ICOL is committed to developing the project in as short a timeframe as possible, WTG technology is progressing rapidly and within the next two to four years, the market predicts higher rating models available. In line with these further advancements ICOL has recently been awarded an updated grid connection agreement of 1080MW and therefore, ICOL is seeking to remove the reference to the maximum generating capacity of 'up to 1000MW' from the current Section 36 Consent both to allow the additional grid capacity to be utilised, and avoid the potential need for further requests to increase the consented maximum generating capacity in the future.

An increase in generating capacity for the Inch Cape Wind Farm would be achieved through no change to the infrastructure than is already consented. Further to this it would contribute to the Scottish Government's targets for renewable energy generation with no increase in environmental impact.

When considering a wind farm utilising the maximum grid available to ICOL (1080MW), based on the Scottish Government's published Renewable Electricity Output Calculator, it is estimated that, depending on the fuel type displaced 661,311 tonnes of carbon dioxide will be saved each year by the project (based on 1080 MW). In addition, it is estimated that the project would generate enough electricity each year to meet the needs of the equivalent of 723,130 Scottish households per year.

The physical dimensions of any such WTGs installed would be within those parameters identified in the current Section 36 Consent and assessed within the EIA application.

## 3 Design Parameters

### 3.1 The Design Envelope

Table 1 outlines the currently consented design envelope associated with the assessed within the Inch Cape 2018 EIAR and therefore relevant to the current Section 36 and Generating Marine Licence Inch Cape Wind Farm Section 36 Consent (048/OW/RRP-10).

ICOL is not requesting a variation to the physical parameters of WTGs or any other component within this application.



**Table 1 Consented Design Parameters and Variations Requested**

Relevant Design Parameter	Parameter	Variation Request
Development Area	150km <sup>2</sup>	No
Maximum generating capacity	'up to 1000 MW'	Yes, request to remove the maximum generating capacity
<b>Wind Turbine Generators (WTG)</b>		
Max number of WTGs	72	No
Max Rotor Diameter (m)	250	No
Max Blade Tip Height (mLAT)	291	No
Max number of WTGs	72	No
Min tip height (mLAT)	22	No
Minimum turbine spacing (m)	1,278	No
<b>WTG Foundation</b>		
WTG Foundation Type	Jackets (pin-piled and suction caisson), Gravity Base <sup>1</sup> , 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

<sup>1</sup> Parameters for GBS have not been shown in the table as it is unlikely to progressed as an option however no variations to parameters would be requested.



Maximum seabed penetration (m)	<b>70</b>	<b>No</b>
Maximum number of piling vessels active at same time	<b>2</b>	<b>No</b>
Max total seabed area (m2) under each substructure (Shadow).	<b>3600m</b>	<b>No</b>
Max Footprint (m2)- Total seabed area under each substructure which is not exposed	<b>113m (area under 12m diameter monopile)</b>	<b>No</b>
Footprint Including Scour Protection (m2) for each substructure	<b>804m</b>	<b>No</b>
<b>Inter-array Cables</b>		
Maximum total length of inter-array cables (combined) (km)	<b>190</b>	<b>No</b>
Voltage (kV)	<b>&lt;132</b>	<b>No</b>
Cable burial depth (m)	<b>Typically, 1.2 but up to 3</b>	<b>No</b>

### 3.2 EIA and HRA Implications

As per ICOL's recent application (reference: ICO1-EC-OFC-003-RRP-RPT 001) to increase the overall generating capacity from 'around 700 MW' to 'up to 1GW' which received consent on the 16<sup>th</sup> of July, 2020, it was agreed that there was no pathway for additional environmental impacts to exceed those assessed within the Inch Cape Offshore Wind Farm EIAR (ICOL 2018 EIAR). As ICOL is proposing to realise the increased generating capacity within the consented physical parameters outlined in the Section 36 Consent.

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. It is now looking feasible that WTGs with ratings in excess of 15MW within the consented parameters may be available within project construction timescales, and ICOLs request would enable to ability to use of the latest WTGs models.

The 700MW figure originally proposed with in the 2018 EIAR was not represented 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.



The maximum capacity of the wind farm has not been directly assessed in terms of Environmental Impact Assessment (EIA) and Habitats Regulations Appraisal (HRA) and has not underpinned assessments, which are based on physical parameters of the WTGs (as well as other infrastructure). Therefore, its removal from the Section 36 consent would still mean that ICOL could not install infrastructure larger than considered in the 2018 EIA and subsequently consented. Removal of the generating capacity would allow ICOL the flexibility to optimise renewable energy production, without resulting in an increase in impact than those assessed within the Environmental Impact Assessment Report (EIAR), HRA or used to inform the Appropriate Assessment which underpins the consent awarded.

The ability to generate greater output without increasing the environmental impact is a key driver for this request, and will help support Scottish and UK government climate change and renewable energy objectives.

As ICOL is proposing to construct the wind farm in compliance with 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 or HRA. Currently, several WTG models are being considered and all models have dimensions within the maximum dimensions permitted in the Section 36 Consent.

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. The proposed variation will not have significant adverse effects on the environment and so is not EIA development under the Paragraph 2 of Schedule 2 to the Electricity Works (Environmental Impact Assessment) Scotland Regulations 2017. ICOL consider that the Section 36 Consent can be varied without any further assessment being required.

## **4 Requested Variations**

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.

No corresponding variations to Marine Licences are required.

### **4.1 Section 36 Consent**

This section outlines requested variations to the 2019 Inch Cape Section 36 Consent Decision Notice, Requested changes to the text are outlined in Table 2.

Variation to the text outlined in the table on Page 8 of the Section 36 Consent Variation Decision would be required (as outlined in Table 2 below).



**Table 2 Proposed Changes to Section 36 Consent**

S.36	Current Text*	Proposed Change
Reference		
<b>Annex 1</b>	<p>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:</p> <ol style="list-style-type: none"> <li>1. No more than 72 three-bladed horizontal axis Wind Turbine Generators (“WTGs”), each with               <ol style="list-style-type: none"> <li>a) A maximum height to blade tip of 291 metres (measured from Lowest Astronomical Tide (“LAT”));</li> <li>b) A maximum rotor diameter of 250 metres;</li> <li>c) A minimum blade tip clearance of 27.4 metres (measured from LAT)</li> <li>d) A maximum blade width of 7.8 metres; and</li> <li>e) A nominal turbine spacing of 1,278 metres.</li> </ol> </li> <li>2. No more than 72 substructures and foundations and ancillary equipment.</li> <li>3. No more than 190km of inter-array cabling;</li> </ol> <p>The total area within the Development site boundary is 150km<sup>2</sup>.</p>	<p>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. The offshore generating station shall be comprised of:</p> <ol style="list-style-type: none"> <li>1. No more than 72 three-bladed horizontal axis Wind Turbine Generators (“WTGs”), each with:               <ol style="list-style-type: none"> <li>a) A maximum height to blade tip of 291 metres (measured from Lowest Astronomical Tide (“LAT”));</li> <li>b) A maximum rotor diameter of 250 metres;</li> <li>c) A minimum blade tip clearance of 27.4 metres (measured from LAT);</li> <li>d) A maximum blade width of 7.8 metres; and</li> <li>e) A nominal turbine spacing of 1,278 metres.</li> </ol> </li> <li>2. No more than 72 substructures and foundations and ancillary equipment; and</li> <li>3. No more than 190km of inter-array cabling.</li> </ol> <p>The total area within the Development site boundary is 150km<sup>2</sup>.</p>

\*As per Decision Notice 048/OW/RRP-10 (16th July 2020)



## 5 Summary

ICOL is requesting a variation of the Inch Cape Offshore Wind Farm Section 36 Consent to remove reference to maximum generating capacity. 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.