

Inch Cape Offshore Wind Farm

New Energy for Scotland

Offshore Environmental Statement:
Non Technical Summary

May 2013



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Foreword

Since the award of exclusive development rights for the Inch Cape Offshore Wind Farm in 2009, Inch Cape Offshore Ltd have been progressing an extensive programme of engineering and environmental works to support consent applications to the Scottish Government. The scope of these works has considered a diverse range of environmental factors ranging from human uses of the site such as commercial fishing interests, to biological interests such as seabirds.

Over the last 3 years a comprehensive offshore survey programme has allowed the project team to gather data and understand the Inch Cape Wind Farm development area in a level of detail which previously did not exist. These works were carried out by a dedicated and experienced team of specialists who considered both the implications of working in a challenging offshore location and how the components will interact with the existing environment. The critical output of these works was to allow the potential effects of construction and operation of the wind farm to be predicted with confidence.

The culmination of this first stage of project development is the Inch Cape Offshore Environmental Statement, a significant milestone for the project, which will aid the Scottish Ministers and their advisors

in their decision making process. It also ensures that any interested organisations or individuals are informed of the project plans and predicted effects.

The wide ranging scope of the assessments means that the document is extensive; in order to make the document as accessible as possible this Non Technical Summary has been produced which distills the key points of the information included in Environmental Statement.

The Inch Cape Offshore Wind Farm is key to energy supply and security in both Scotland and the UK as well as producing a significant contribution to carbon reduction targets. The Wind Farm is expected to produce sufficient low-carbon generation to meet the electricity demands of around 650,000 UK households and power the

equivalent of 22.7 % of Scottish homes. The project will also provide economic benefits to Scotland and the UK through its construction and ongoing operation.

Engagement with the public and interested groups is a critical element of the Inch Cape development strategy. Over the last 3 years a broad range of individuals and organisations have met with the project team and provided initial representation on the proposals. Consideration and incorporation of these interests has been a key part of the works to date, and this will continue throughout the development process. As such, I would encourage organisations and individuals to respond to the submissions.



Introduction

Inch Cape Offshore Limited (ICOL) is making an application under Section 36 of the *Electricity Act 1989* to Scottish Ministers (through Marine Scotland) to construct and operate the Inch Cape Offshore Wind Farm which will be located approximately 15 to 22 kilometres [km] to the east of the Angus coastline in Scotland.

The Wind Farm has a grid connection agreement for 1,050 Megawatts [MW] and will include up to 213 wind turbines (also known as wind turbine generators) together with associated interconnecting cabling works.

The Marine (Scotland) Act 2010 requires ICOL to gain marine licences to construct and operate the Wind Farm and Offshore Transmission Works. The Offshore Transmission Works are required to transmit the generated electricity to the wider electrical network at Cockenzie, and will include offshore substation platforms, interconnecting and Export Cables.

The purpose of this Non Technical Summary [NTS] is to summarise the findings of the Environmental Impact Assessment and other key information contained in the Environmental Statement [ES]. In this NTS, reference is made to the Development Area which is the offshore area within which the wind

turbines, Offshore Substation Platforms and interconnecting cables will be located, reference is also made to the, Offshore Export Cable Corridor which is area between the Development Area and the coastline [the landfall] in which the Export Cables will be located [see Figure 1].

It is expected that the transmission assets will be constructed by ICOL and transferred to an Offshore Transmission Owner for operation and decommissioning as required by legislation. Impacts of the onshore element of the Project have been considered, where required, in the ES to ensure that cumulative effects of the whole Project are considered. A separate planning application and any necessary environmental information will be submitted to East Lothian Council once the details of the Onshore Transmission Works and grid connection have been further developed.

Assessment of the cumulative impacts which could occur from the Project and other offshore/coastal projects have also been assessed.

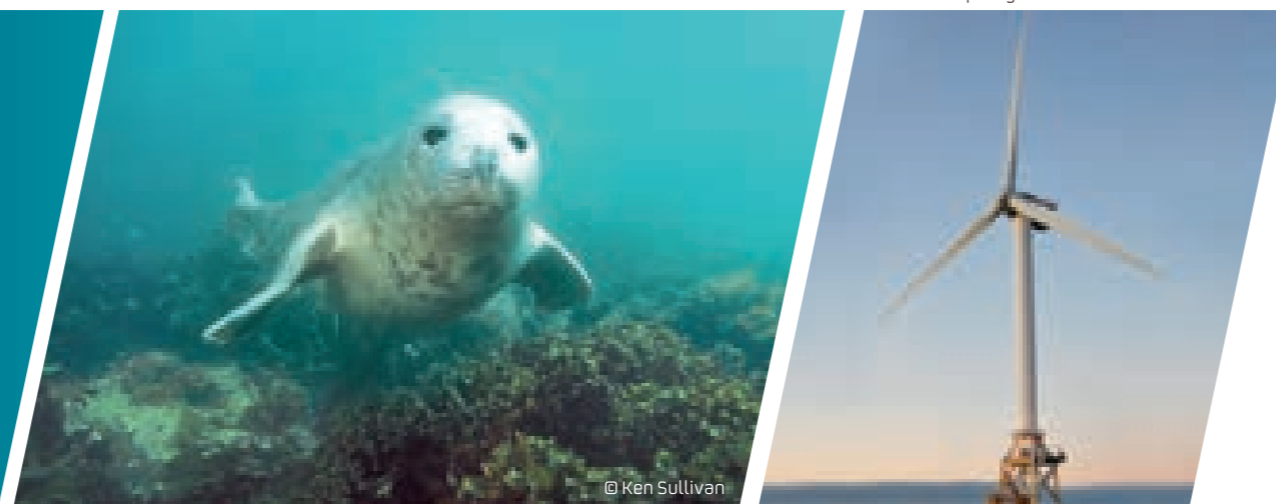
The Project consists of a number of components and all permanent and temporary works required to generate or transmit electricity to the national grid, these are grouped as follows:

- The Inch Cape Offshore Wind Farm includes wind turbines, inter-array cables and up to three meteorological masts;
- The Offshore Transmission Works includes the Offshore Substation Platforms and interconnecting cables; and
- The Onshore Transmission Works includes the underground onshore export cables and an onshore substation.

Figure 1: Location of Inch Cape Offshore Wind Farm and Offshore Export Cable Corridor



Figure 2: A Typical Offshore Wind Turbine, Maximum Tip Height 215 m Above Sea Level



Introduction *continued*

The key components of the Project are shown diagrammatically in Figure 3 and comprise:

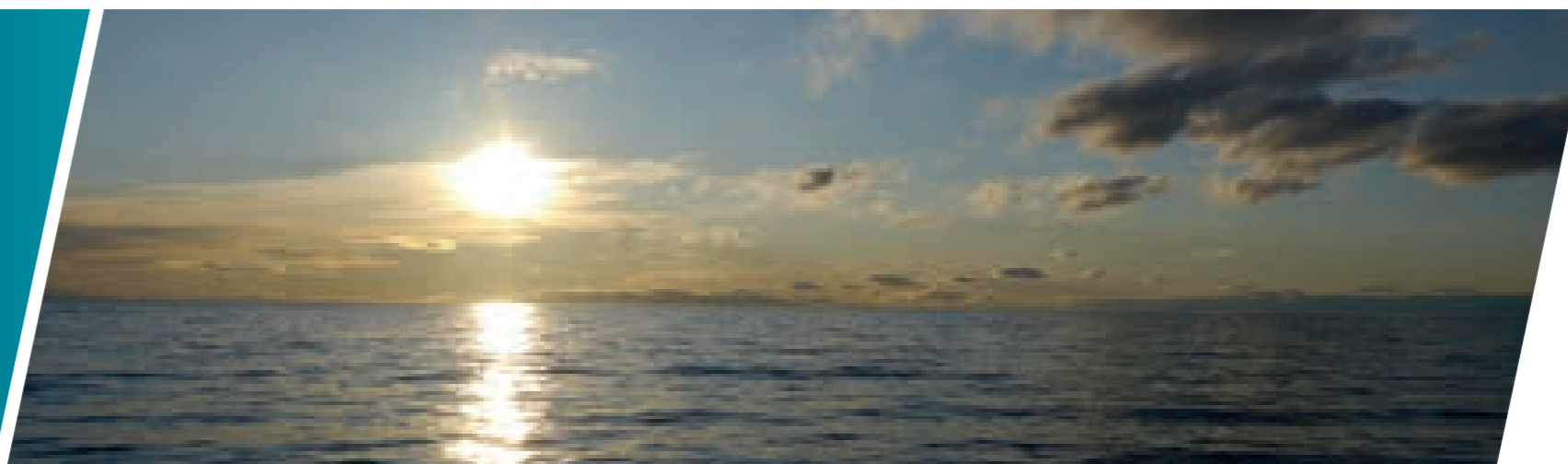
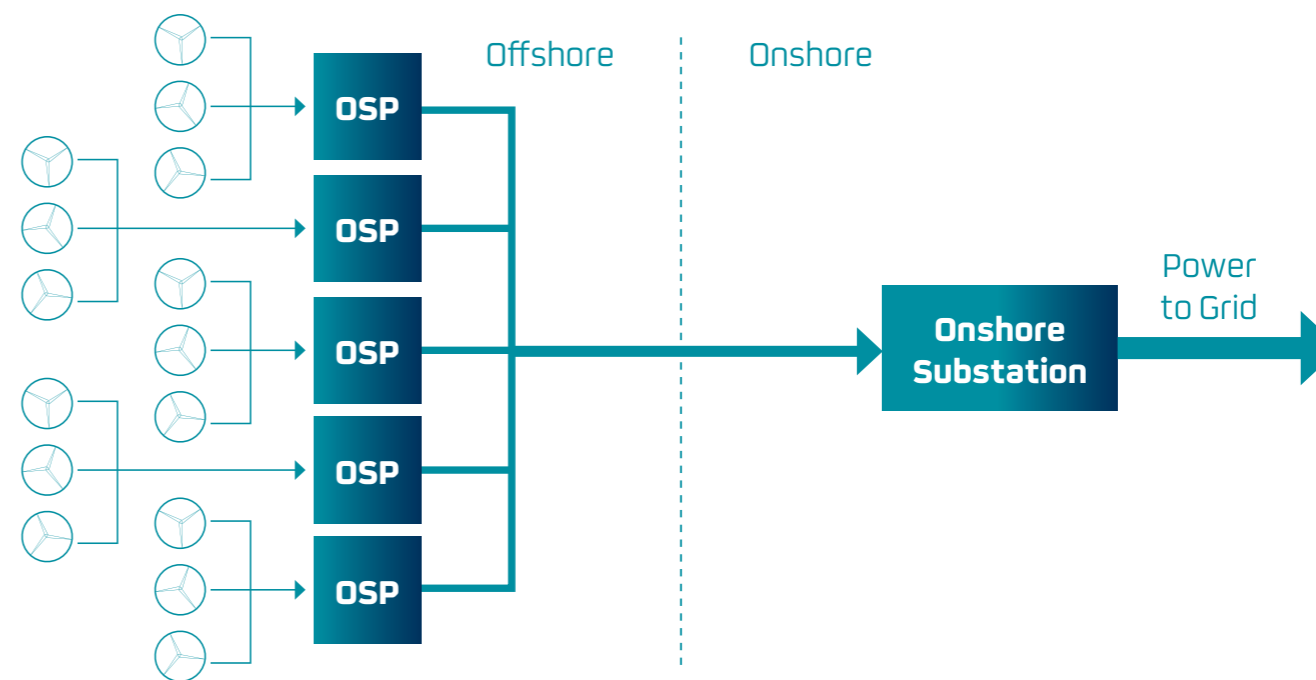
- Up to 213 wind turbines which will be secured to the seabed by steel jackets or gravity based substructures within an area covering approximately 150 km² and in water between 40 and 57 m deep;
- Up to five Offshore Substation Platforms, which will collect the electricity generated by the wind turbines for export;
- A network of electricity cables which will electrically connect the wind turbines and Offshore Substations Platforms. These interconnecting cables will be laid on the seabed and will be either buried or protected;

- Up to six Offshore Export Cables which will transmit electricity generated from the Wind Farm to the landfall on the southern side of the Firth of Forth at Cockenzie (a cable distance of approximately 83 km). These cables will be individually buried or protected within the Offshore Export Cable Corridor until landfall;
- Up to three meteorological masts will be located within the Development Area. One of these masts has been subject to a separate application process and is expected to be in situ prior to construction of the Wind Farm; and
- An onshore substation/converter station will be required which receives electrical power from the Export Cables for transmission through onshore underground cables to the existing electricity network.

The operational life of the Project is not known at this time but is expected to be at least 25 years and may be up to 50 years, in line with the lease for the seabed area. The Wind Farm will be managed and operated from an onshore facility with maintenance and repair being carried out offshore as required, using a combination of access and work vessels. Helicopter access may be required from time to time.

Operation and maintenance activities may be required at any time, 24 hours per day, 365 days a year. Offshore access will be required to undertake maintenance works and potentially to repair or refit plant and equipment at the Wind Farm and its associated infrastructure.

Figure 3: Illustration of Components



Background and Project Description

- Environmental Impact Assessment
- Consultation
- Project Need and Benefits
- Alternatives Considered
- Delivering the Project
- Project Construction and Decommissioning

Environmental Impact Assessment

An Environmental Impact Assessment (EIA) of the Project is required under Schedule 2 of The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000 (as amended) and The Marine Works (Environmental Impact Assessment) Regulations 2007 because of the scale of the proposals and the potential for significant effects.

The EIA has been undertaken in consultation with a number of different organisations, groups and individuals and developed in accordance with industry good practice. Where an EIA is undertaken, the Regulations require the information to be provided to the determining authority (in this case Marine Scotland) by the applicant in the form of an Environmental Statement.

The EIA has incorporated an assessment of the potential effects of the proposals on nature conservation sites designated under the EU Habitats and Birds Directives. These assessments, known as a Habitats Regulations Appraisal, have been included to provide the information for the Competent Authority (Marine Scotland on behalf of Scottish

Ministers) to use in undertaking their Appropriate Assessments to meet the requirements of the Directives.

This information and the findings of the assessments have been used to develop the design of the Wind Farm by ensuring that wherever possible, adverse effects on people, economic assets, and on the natural and cultural environment will be avoided or reduced whilst environmental and economic benefits are delivered.

Each technical assessment reported in the Environmental Statement has been undertaken based on a worst case scenario to ensure that the assessment has not underestimated any of the potential environmental impacts of the Project.

Mitigation measures embedded in the design of the Project are referred to as Embedded Mitigation in the ES (Section 4.5.2). The Embedded Mitigation measures taken into account in the assessments are listed in each technical chapter. Additional Mitigation measures have been identified to reduce the impacts of the development further and again these are listed in each chapter, and the residual effects then identified taking account of all mitigation measures.

Consultation

ICOL has undertaken a range of consultation activities in advance of submission of the application for Project consent. These have included:

- Public engagement based around a series of public exhibitions held in six different venues around Dundee and Angus in autumn 2010, attendance at Carnoustie Gala in summer 2011 and four further exhibitions at public events during summer 2012;
- A key stage in this process was the engagement with consultees on the Scoping Report for the EIA which was submitted to Marine Scotland for a Scoping Opinion. A range of other stakeholders and community groups were also consulted at the scoping stage via letters and meetings and by making information available on the ICOL project website (www.inchcapewind.com);
- Following scoping, ongoing consultation was held with key consultees to refine and inform the approach to the EIA and ensure that stakeholders concerns were considered in drafting the Environmental Statement; and

- Engagement with key industry groups included close collaboration with other wind farm developers in the outer Firth of Forth and Tay to ensure cross-project communication and to promote coordinated working opportunities with the other proposed offshore wind developments in the region.

Information obtained from the public and stakeholder engagement process has been taken into account, where relevant, in scoping and undertaking the EIA.

As part of the determination process ICOL and Marine Scotland will undertake formal consultation with a number of groups and organisations, including; Scottish Natural Heritage (SNH), the Scottish Environment Protection Agency (SEPA), appropriate Local Authorities, the Northern Lighthouse Board (NLB) and the Maritime Coastguard Agency (MCA). In addition, all stakeholders will be given an opportunity to make representations on the information submitted. Details of where the documentation will be available to view free of charge are provided at the end of this Non Technical Summary.



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Project Need and Benefits

The UK and Scottish Governments have set ambitious legislative targets for cutting greenhouse emissions in the UK. The Scottish Government is committed to promoting the increased use of renewable energy sources to help tackle climate change and to support economic growth in Scotland.

The long term target is to reduce Scotland's emissions of greenhouse gases from 1990 levels by at least 80% by the year 2050, with a 2020 interim target of 42%, and a framework of annual targets intended to drive the policies necessary for achieving the long term target.

The Scottish Government's "Climate Change Delivery Plan: Meeting Scotland's Statutory Climate Change Targets" sets a framework for action to achieve emissions reductions including a series of ten pledges, the first of which directly relates to the implementation of renewable energy to promote large scale, decentralised and sustainable generation. The 2020 Routemap for Renewable Energy in Scotland was published by the Scottish Government in 2011 and reflects the Scottish Government's target

to meet an equivalent of 100% demand for electricity from renewable energy by 2020.

The Wind Farm will make an important contribution to Scotland's renewable energy and climate change targets. The expected annual carbon dioxide (CO₂) emission savings from the Wind Farm could account for the equivalent of between 18% and 41% of the total carbon emissions estimated for Scotland in 2010 (the amount will depend on the general mix of fuels used for electricity generation). The time taken to payback the CO₂ costs of the Project through offsetting emissions from fossil fuel mixed generation is estimated to be slightly less than 12 months.

The Project is expected to generate in the order of 3,000 gigawatt (GW) hours of electricity per annum and could provide electricity for the equivalent of 22.7% of households in Scotland. At a UK level the Project could provide electricity for the equivalent of about 690,000 households based on average UK consumption. This represents a significant contribution, at both Scottish and UK levels, to domestic electricity generation and therefore to long term energy security.

In economic terms, the Project is expected to support investment in the renewables industry in Scotland by creating between £154 million and £507 million of Gross Value Added¹ in the construction phase and between £15.6 million and £22.4 million per annum in the operation and maintenance phase. Employment in Scotland will be created during all phases of the Project in the offshore industry sector and its supply chain which could peak at around 1,600 jobs during construction and up to 117 to 169 long term jobs during operation and maintenance.

The Project is also supported by national and sectoral development and planning policy published by the Scottish Government. These include the National Planning Framework for Scotland (NPF2) and in *Blue Seas, Green Energy – A Sectoral Marine Plan for Offshore Wind Energy in Scottish Territorial Waters*. The sectoral plan identifies Inch Cape as one of three sites in the East of Scotland area to be brought forward in the short term to the licensing stage.

¹ Gross Value Added is a measure of contribution to economic activity.

Alternatives Considered

In 2008, by request of the Scottish Government, The Crown Estate (TCE) invited potential developers to submit proposals for offshore wind farm sites within Scottish Territorial Waters (STW).

Analysis was undertaken of wind resource and water depth data which identified the east coast of Scotland as having suitable physical characteristics for offshore wind farms. Additional environmental analysis was then undertaken which considered ecological interests such as nature conservation designations, ornithology, marine mammal and natural fish characterisation and human interests such as commercial fishing, navigation, oil, gas or aggregate interests. From this assessment the ICOL Development Area was identified as being an attractive area for offshore wind development. A proposal was submitted to TCE for their evaluation and in June 2011 TCE awarded an exclusivity agreement for the Inch Cape Development Area.

The initial design phase of the Project has taken account of a wide range of health and safety, technical, environmental and economic factors and considered

alternative viable designs and technologies. For example, initial analysis indicated that up to 286 wind turbines could be located within the Development Area which was reduced to a maximum of 213 wind turbines following a refinement of the design process. The final layout and design of the Wind Farm will be dependent on procurement of major equipment in addition to environmental, technical and economic considerations and will be finalised through detailed design following consent.

Grid connection locations were considered by National Grid Electricity Transmission (NGET) in a range of locations including Arbroath, Tealing, Branxton, Torness, Cockenzie, Crystal Rig, Blyth and Hawthorn Pit. Consideration of possible grid connection points included assessment of environmental, technical and economic constraints, including grid capacity and connection dates. Following this assessment and through engagement with NGET, a grid connection point was agreed at Cockenzie. This connection was primarily chosen due to its capacity to accommodate the power output of the Wind Farm without the need for significant enhancement works

to the onshore transmission network by NGET. The grid connection location formed the basis for the selection of the Offshore Export Cable Corridor and landfall options.

The selection of landfall location for the Export Cables considered six sites along the southern shore of the Firth of Forth in East Lothian. Taking account of the location of the grid connection (described above) and analysis of other technical, environmental and economic considerations and constraints along the coast, options at Cockenzie and Seton Sands were found to be feasible landfall options (see Figure 4). These options have both been assessed in the ES. It is expected that a preferred landfall will be selected following submission of the licence applications for the offshore works.

Figure 4: Cable Approach and Landfall Options



Delivering the Project

The design of the Wind Farm and associated transmission works is not final at this stage. This is primarily due to procurement and supply chain considerations, the requirement for further site investigation, continued design and economic optimisation.

The EIA has therefore been completed using a Design Envelope which determines the range of technical parameters for the Project and associated methods of construction, operation, maintenance and decommissioning. Final design specification of the Project components cannot exceed the limits within the Design Envelope without gaining further (additional) permissions from Marine Scotland.

Once the proposals are taken forward there will be a competitive tendering process to select the main equipment suppliers and contractor(s) for the Project. The design of the Project will be finalised and selection of Project

elements such as wind turbines, substations and cables as well as preferred methods of construction will be finalised taking account of safety, commercial procurement, environmental and technical factors. The appointed contractor(s) will construct the works in accordance with the final designs and requirements of the contracts which will include all the committed environmental mitigation described in the ES and any specific licence conditions.

The development of the design will be informed by more detailed marine surveys including ground condition surveys. The findings of these surveys will be used in the micro-siting process to influence the final location of key infrastructure such as foundations for wind turbines and Offshore Substation Platforms and for local siting of cable routes within the Export Cable Corridor.

Project Construction and Decommissioning

Construction by the chosen contractors will begin following agreement of the detailed design and discharge of licence conditions with Marine Scotland and other relevant statutory authorities. Construction activities for the offshore components of the development will include:

- Pre-construction surveys and investigations;
- Installation of foundations and substructures and associated site preparation for the wind turbine and the Offshore Substation Platforms;
- Interconnecting cable installation;
- Installation and commissioning of wind turbines;
- Installation and commissioning of meteorological masts;
- Installation and commissioning of Offshore Substation Platforms; and
- Export Cable installation including intertidal areas.

A detailed construction programme will be developed as design and procurement activities progress.

The construction activities are expected to start in 2016 and work may be ongoing over approximately a four year window. Activities may not be continuous and the sequence of activities may change based on optimisation of procurement and construction logistics.

Construction of the onshore substation will take approximately 24 months. All of the infrastructure will be manufactured offsite and further studies will be undertaken to ensure that ground conditions are suitable prior to the commencement of works.

The nature of offshore work requires operations to be planned on a 24 hours, seven days a week basis, however work will not be continuous over the whole construction programme. Work durations are subject to changes which may arise, for example, from weather, site conditions, equipment lead times and supply programmes, sequential work requirements, and logistical issues.

The main contractor will support the development of a Construction Environmental Management Plan for construction, following best practice. This document, or suite of documents, will set out procedures to ensure all activities with potential to affect the environment and all contractors and personnel involved in construction activities are appropriately managed by ICOL.

Decommissioning

At the end of the economic life of the Project there will be a requirement to decommission the Project, unless a decision has been made to refurbish or replace the turbines and other offshore infrastructure including the export cables.

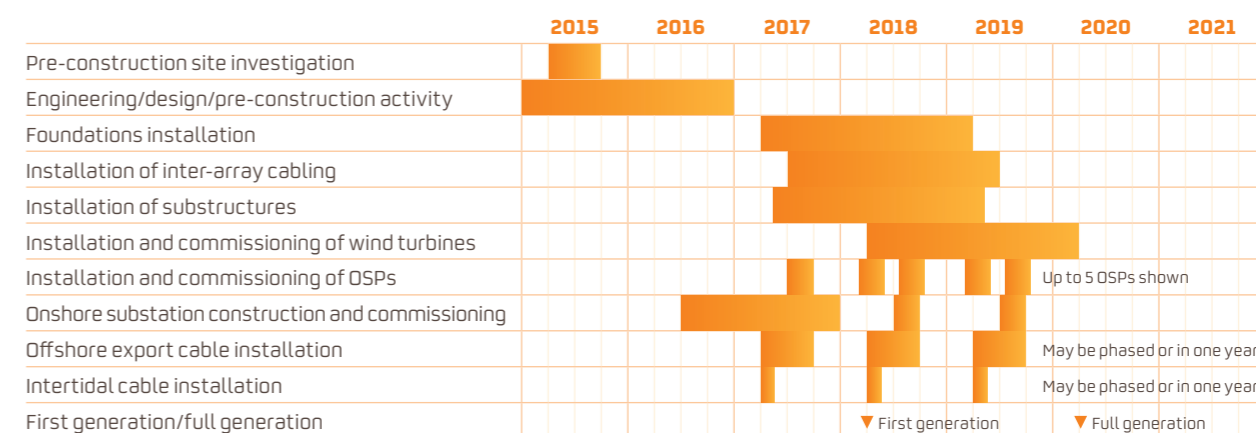
If refurbishment or replacement were proposed, additional applications and consent may be required from Marine Scotland.

Prior to completion of the operational phase, a decommissioning plan will be prepared and submitted for approval to the UK Department of Energy and Climate Change (DECC).



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Figure 5: Inch Cape Offshore Wind Farm Project Illustrative Construction Programme



- All durations are shown as windows for illustration.
- Activities will not be continuous during these windows.

- Overall durations may increase or decrease and the sequence may change.

- Start and finish dates may change.

Physical Environment

- Metocean and Coastal Processes
- Underwater Noise

Metocean and Coastal Processes

“Metocean” refers to meteorology and oceanography; the main processes of interest are water levels, currents and waves. “Coastal processes” is a generic term that refers to the physical processes affecting the seabed and coast through sediment transport and deposition, and erosion.

To understand the current systems existing information was collected from a number of sources and targeted field surveys were undertaken on behalf of the Project. In addition, a numerical modelling system which simulates water levels, current flows, waves, suspended sediment concentrations (SSC), and sediment transport and deposition was used to support the assessment.

Specific features of interest were identified near to the Development Area, such as sandbanks and designated nature conservation sites with geological interest features. A number of other receptors will potentially be impacted by changes to metocean and coastal processes resulting from the Project and these are assessed under other topics.

During construction there is expected to be short term increases in suspended sediments during activities, such as dredging or installation of cables and foundations, but these will be localised and short term. During the disposal of dredged sediment within the Development Area a small increase in suspended sediment concentration is also expected but this impact will be transient and will settle out within a few hours after the discharge stops.

The presence of Wind Farm structures in the sea during the operational phase has been considered and limited effects have been predicted on water levels and tidal currents within the vicinity of the Development Area (known as the near field) and in the modelled wave heights up to 10 km from the Wind Farm however, these will not affect coastal areas.

Overall, the metocean and coastal processes assessment identified no significant direct or indirect impacts from the Project either in isolation or cumulatively with other projects, or in the short or long term.

Underwater Noise

The Project will produce noise levels that will have a variety of potential effects on marine species.

During construction, the noise levels from a range of expected activities has been modelled, including piling, dredging, drilling, cable laying, rock placement, cable trenching and vessel movements. Piling is significantly noisier than the other activities modelled. The next highest noise levels of all these will be generated during trenching activities.

Underwater noise extent has been calculated using specific modelling software and the findings of these studies have been undertaken with reference to specific receptors and used to inform assessments on fish species and marine mammals. Four levels of impacts are predicted by the noise modelling; lethal, physical injury, auditory injury and behavioural response.

It is unlikely that marine mammals or fish will be exposed to high noise levels which will result in lethal or physical injury effects because of the specific measures ICOL have committed to which will reduce these risks.

Auditory injury is based on the agreed criteria for each receptor. It is assumed that at the onset piling the noise levels produced will cause an animal to move away from the source.

Behavioural avoidance ranges are based on the measured or assumed sensitivity of the species under consideration. Where such data is not known, an appropriate surrogate species is chosen. These ranges are calculated to assess how likely a species is to avoid a range around the noise source as a function of how loud it is perceived by the specific species. A range is predicted where a ‘strong’ and ‘mild’ reaction by the majority of species is predicted to occur. It is related only to the noise level produced by the piling and not duration.

The level of noise generated by the operational Wind Farm has been estimated. It is not expected that this noise will reach levels where any species of fish or mammal will have a strong adverse reaction to it. During decommissioning, similar noise sources are expected as during construction, but without piling. As such noise levels and potential effects should be similar to, or lower than those noted above, where any trenching is likely to have the greatest impact.





Biological Environment

- Benthic Ecology
- Natural Fish and Shellfish
- Marine Mammals
- Ornithology

Benthic Ecology

Assessments of impacts on benthic ecology consider how the plants and animals on, or in, the seabed could be impacted by the Project.

Desk study and site specific surveys, grabs and drop down video were used to collect data to inform the assessment. Data from the engineering surveys (geophysical surveys) was used in combination with the environmental baseline survey data to create detailed habitat maps.

The baseline environment of the Development Area and Offshore Export Cable Corridor was characterised by a variety of sedimentary environments, including examples of a number of

species and habitats of conservation importance (Priority Marine Features, UK Biodiversity Framework Habitats, EC *Habitats Directive* Annex I features).

The assessment of impacts considers a number of potential impacts; the primary considerations were from disruption of the seabed during construction and effects during operation. The assessment concludes that although some of the effects assessed on benthic ecology (e.g. loss of original habitat) are long term they will be spatially restricted so will not affect a large proportion of any particular habitat type. Other effects are of a large scale (such as an increase in suspended sediments) but are relatively localised and short term.

‘Inch Cape project could save up to 2.68 million tonnes of CO₂ emissions per year’

Natural Fish and Shellfish

To establish the baseline environment for the fish and shellfish assessment, commercial fisheries data, which was received from Marine Scotland, was supplemented by site specific surveys.

Desk based studies were also conducted using site specific herring spawning data, sandeel habitat suitability and existing electro-magnetic field information.

Commercial fisheries data highlights the dominance of shellfish (in particular prawn and king scallop) over white fish in commercial landings. Special Areas of Conservation (SACs) designated for migratory fish (including Atlantic salmon and lamprey species) are present in rivers on the east coast of the UK (namely the Rivers Tay, Teith, South Esk, Dee and Tweed). Existing data indicate that spawning areas of a number of species including sandeel, plaice, cod, whiting, lemon sole and prawns overlap the Development Area and Offshore Export Cable Corridor. Others, such as herring, are found to overlap with the range of noise contours resulting from piling activities. Sandeel habitat suitability assessment of the Project areas demonstrated that very little habitat is of prime suitability.

The assessment methodology split fish into six receptor groups according to their ecological characteristics and sensitivity. These groupings are: mobile fish species; hearing specialists; prey species (specifically sandeel); shellfish; electro-sensitive species; and SAC qualifying feature species.

Due to the scale and nature of the development and the characteristics of the mobile fish species, impacts are not anticipated to result in any adverse effects on any of these species at a population level.

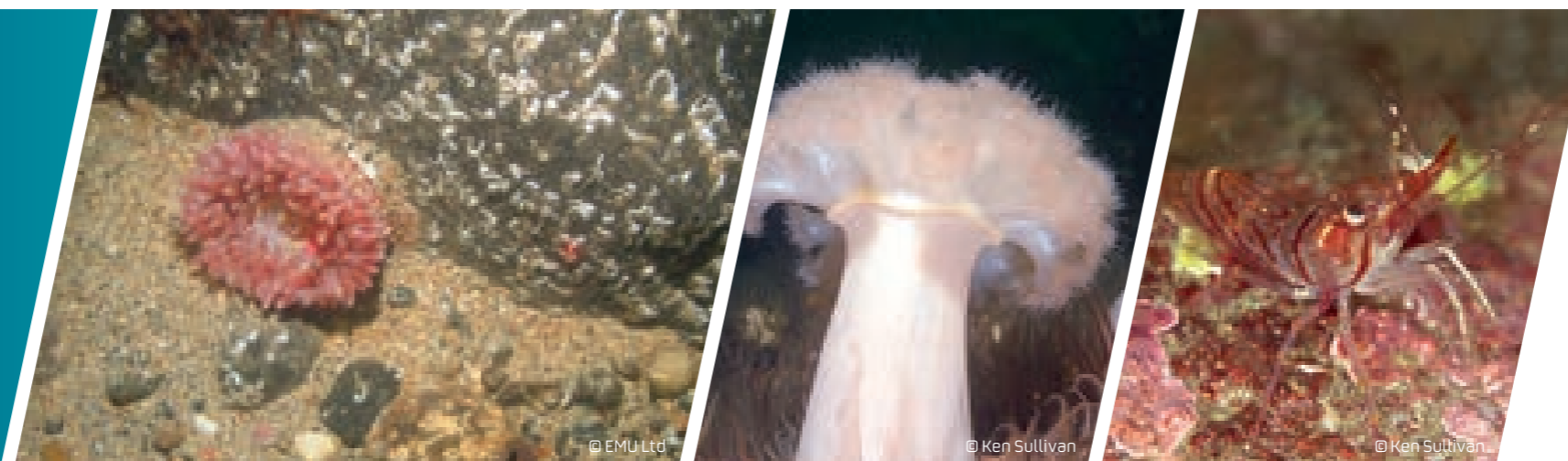
Noise during construction activities could potentially impact on hearing specialists such as herring, sprat and cod, and their spawning. Cod and sprat spawning occurs over much of the North Sea and any avoidance of the noise contour areas will not result in exclusion of individuals from the wider available spawning locations. Large areas of herring spawning grounds have been identified to both the north and the south of the Development Area and there could be moderate effects from noise during specific construction activities.

Disruption of sediment could impact those fish species, such as sandeel or shellfish, with a close association with the seabed for short periods.

There are extensive areas of sub-prime and prime sandeel habitat available in the North Sea and very few sandeel were reported during site specific surveys or in historical data for the area. It is anticipated that the Project will not adversely affect sandeel populations. In addition, habitat loss will be relatively localised and intermittent and the receptors, such as shellfish, are expected to exhibit high recoverability to these types of effects.

Baseline data indicates low intensity areas of electro-sensitive species in the vicinity of the Project and small numbers of electro-sensitive species were captured during the baseline surveys. Due to the small areas around the cables where avoidance behaviours may occur, interactions between sensitive species and electro-magnetic field will be limited.

SAC species are considered to be particularly sensitive due to their conservation protection status. Whilst uncertainty relating to movements during the marine phase of migratory SAC species is acknowledged, no barriers to habitat loss, disturbance, or migration will be created through either construction or operation of the Project alone or with other projects.



Marine Mammals

There are a number of marine mammal species in the Firths of Forth and Tay. Four species occur regularly (harbour porpoise, bottlenose dolphin, harbour seal and grey seal) and two species occur seasonally (minke whale and white-beaked dolphin).

It is predicted that the greatest impact on marine mammals will occur during the construction phase, due to underwater noise from piling. Potential impacts on marine mammals from piling include hearing damage, behavioural response and reduction in prey availability.

The effects on marine mammals from piling, such as hearing damage, changes in availability of prey species, collision risk with vessels,

displacement and accidental pollution, are considered for all cetacean species. Provided all embedded and additional mitigation measures are implemented there will not be any effect at population levels in the long term.

Potential impacts on marine mammals in the operational (and maintenance) phase of the Wind Farm include disturbance from (operational) noise, habitat loss due to the long term presence of the turbines, disturbance from EMFs, toxic contamination, changes in prey availability, accidental pollution events and collision with maintenance vessels. These impacts are not considered to affect any marine mammal population(s) in the area.

‘Inch Cape could produce enough power for up to 22.7% of Scotland’s homes’

Ornithology

A number of specific detailed studies are required to demonstrate understanding of current bird populations, predicted future changes to these populations and how these bird species could be impacted by the Project.

ICOL has spent the last two years collecting information about the birds in the area. Twenty-four boat-based surveys were conducted around the Development Area during 2010 to 2012 and land based surveys were completed for the near shore areas in 2012 to 2013. Along with existing data and desk based analysis these established a good understanding of the species present and how they use the area.

A total of 64 different bird species (receptors) have been identified. These species include a number of different seabirds, intertidal and near-shore birds, and migratory birds. Impacts of the Project individually, and with other projects,

on each species were assessed. The methodology used to carry out the assessments follows established best practice guidance and the approach was agreed with statutory agencies in advance.

Seabird species which use the site to feed (including Arctic tern, razorbill and common tern) are likely to be affected during some construction activities as fish, they prey on, will avoid the area during noisy works such as piling and the birds will have to fly further for food. This is especially prevalent during breeding seasons.

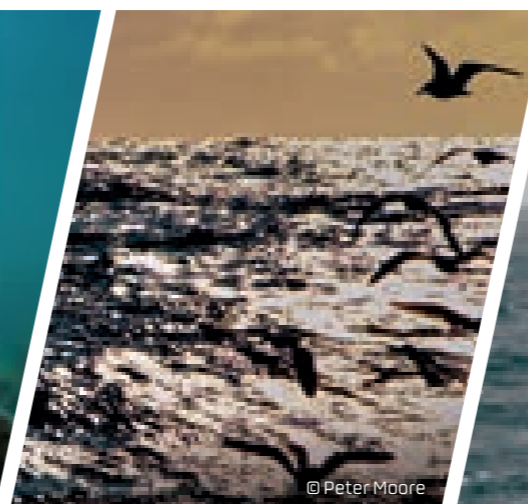
During operation of the Project birds are expected to either avoid the Wind Farm, which creates the potential for effects from this displacement into other areas, or be at risk of hitting turbine blades (collision risk). Accounting for these different potential impacts, population modelling was undertaken for four key species (kittiwake, guillemot, razorbill

and puffin) and some impacts on their populations are expected. Impacts from collision were identified, in particular for kittiwake and gannet, but the regional populations will not be materially affected in the long term.

Cumulative impacts of the Project with other projects from collision risk were also considered and the only potentially significant impacts identified were upon the regional breeding kittiwake population through collision risk. In addition, impacts from reduced prey availability were identified as cumulatively having some effect during the breeding season on Arctic tern, common tern, kittiwake and razorbill.



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Human Environment

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Seascape, Landscape and Visual

It is recognised that introducing new structures into the sea, just over 15 km from the coast at its closest point, could affect the view and/or landscape character from a number of places within 50 km.

ICOL have prepared a folder which includes large visualisations which show what the view is currently like from specific points and how it will change as a result of the Project; these inform the impact assessment but also help to give an overall feel of what the Wind Farm could look like in context. See Figure 6 and 7 for example images.

A comprehensive baseline assessment was carried out to establish the sensitivity of the seascape and landscape.

Landscape character areas are defined by SNH but seascape characterisation for this Project was defined as part of a collaborative study with other offshore wind developers in the area. Twenty five representative locations were agreed with local authorities, SNH and Marine Scotland and the visualisations were prepared from these locations to inform the assessment. In order to understand the effects on these locations/receptors a review of visibility plans and consideration of the predicted impacts at the viewpoint locations was undertaken. It has been assumed that the turbines will be visible 245 days a year from the closet point of the coast (15 km); this reduces with distance and the Wind Farm could be visible for 78 days from 43 km away.

Significant effects are predicted to occur, where structures are visible from these viewpoints, on seascape and landscape character areas. Impacts are likely to occur along the coast at a number of locations between Montrose and Fife Ness, specifically at some locations in Cambo Garden & Designed Landscape and the Isle of May.

For visual amenity receptors, significant effects are predicted for properties in coastal settlements which have open and unobstructed seaward views in Aberdeenshire, Angus and Fife. Parts of inland settlements in Fife which are close to the coastline such as Kingsbarns may experience significant effects.

Significant effects are predicted for road users on sections of the A92, the East Coast Mainline, and for recreational users of the Fife Coastal Path and National Cycle Network (NCN) Route 1 mainly between Arbroath, Montrose and Carnoustie and between Inverbervie and Montrose. Significant effects are predicted for recreational users of coastal facilities at distances of up to approximately 20 km and potentially up to 35 km distance for locations with open sea views towards the Development Area.

'Inch Cape could provide up to 9% of Scotland's electricity consumption each year'




Seascape, Landscape and Visual (continued)


Figure 6: Viewpoint 5 – Montrose



* This photomontage has been reproduced at a different scale to the original. To match the standard viewing guidance, please refer to the ES, Volume 3A, where it is reproduced to scale.




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MONTROSE

NOTES



VIEWPOINT LOCATION:	572884, 787888
VIEWPOINT ALTITUDE:	1 m AOD
BEARING TO CENTRE OF VIEW:	181.2°
DISTANCE TO NEAREST INCH CAPE TURBINE:	18.128 km

VIEWING INSTRUCTIONS


THE FOLLOWING PANORAMA IS A COMPOSITE IMAGE, PRODUCED BY JOINING 24 NO. 102.8 mm PHOTOGRAPHS USING A COMPUTER PROGRAM WHICH PRODUCES A CYLINDRICAL PROJECTION. THE IMAGE SHOULD THEREFORE BE CURVED SO THAT THE ENTIRE IMAGE IS HELD AT 300mm VIEWING DISTANCE.

VIEWING DISTANCE:	300 mm
HORIZONTAL FIELD OF VIEW:	88.2°

Horizontal Scale of Map 1:50,000

Geobatch Parameters: 0508 1028 SWD

Produced PL	
Reviewed SJP	
Approved DR	

Date: 18/06/2013	Revision: 0
REF: 1306.00010.18.015.1 (View Montrose)	

Viewpoint 5: Montrose

**Inch Cape Offshore
Wind Farm**


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NON TECHNICAL SUMMARY

Seascape, Landscape and Visual (continued)


Figure 7: Viewpoint 23 – Fife Ness



* This photomontage has been reproduced at a different scale to the original. To match the standard viewing guidance, please refer to the ES, Volume 3A, where it is reproduced to scale.

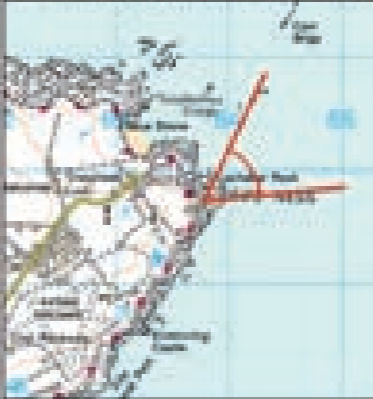


REPSOL



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NOTES


VIEWPOINT LOCATION:	36364, 18758
VIEWPOINT ALTITUDE:	0 m AOD
BEARING TO CENTRE OF VIEW:	86.1°
DISTANCE TO NEAREST INCH CAPE TURBINE:	27.268 km

VIEWING INSTRUCTIONS

THE FOLLOWING PANORAMA IS A COMPOSITE IMAGE PRODUCED BY JOINING 24 x 12.5 mm PHOTOGRAPHS USING A COMPUTER PROGRAM WHICH PRODUCES A CYLINDRICAL PROJECTION. THE IMAGE SHOULD THEREFORE BE CURVED SO THAT THE ENTIRE IMAGE IS HELD AT 300 mm VIEWING DISTANCE.

VIEWING DISTANCE:	300 mm
HORIZONTAL FIELD OF VIEW:	86.1°

Horizontal Scale of Map 1:50,000



Geoid Parameters: OSGB 1936 BNG

Prepared By:	SLR
Reviewed By:	
Approved By:	

Date: 18/06/2013 | Revision: 0
REF: 1006.00016.18.NTS.0.Vp03 Fife Ness

Viewpoint 23: Fife Ness

**Inch Cape Offshore
Wind Farm**

Cultural Heritage and Marine Archaeology

There is high potential for archaeological and cultural heritage features to be within or close to the Development Area and Offshore Export Cable Corridor.

This region has been heavily used by vessels and aircraft for hundreds of years, experiencing particular high levels of activity relatively recently during World War I and II. Careful consideration of these features has been completed and a process to manage any discoveries will be developed.

There are a number of known wrecks and features already recorded and ICOL have used analysis of the seabed data to supplement this. A number of undesignated shipwrecks have been identified but there are no cultural heritage sites that are currently subject to statutory protection within or adjacent to the Development Area. Numerous small features on the seabed have been identified. Many of these are likely to be geological but it is also possible that some of these may be cultural heritage assets such as wreckage or debris, and as such, may be important.

Impacts upon currently unknown cultural heritage features identified during construction will be mitigated through a project specific protocol for archaeological discoveries and a clear definition of how known features will be negotiated and recorded.

The potential for submerged prehistoric landscapes is not likely based upon identified features in the region and information from existing publications.

The potential for impacts upon the setting of specific Scheduled Monuments and listed buildings, identified in consultation with Historic Scotland and local authority archaeology services, has been considered. These are shown in large visualisations and the Wind Farm is not expected to substantially affect the setting of these features.

‘Inch Cape project could generate around £500 million of added value for the Scottish economy during construction’

Commercial Fisheries

The commercial fisheries chapter provides an assessment of the potential effects upon commercial fishing activities, including indirect impacts on salmon and sea trout fisheries from the Project.

These assessments consider the effects from the Project on both fish species and interactions with the vessels and different fishing methods employed in and around the Development Area and Offshore Export Cable Corridor.

Data were received from Marine Scotland which showed the main fisheries near the Development Area are scallop dredging, squid trawling and creeling for crab and lobster. Of these, the scallop fishery is the most valuable by revenue. Within the Offshore Export Cable Corridor there are important crab and lobster fisheries inshore, in addition to prawn and squid trawling and scallop dredging.

During construction and operation fishing activity is expected to be excluded from certain areas, or access restricted during discrete

periods; as a result, significant impacts on scallop fisheries could occur. There could be some increase in travel time to fishing grounds and displacement to other areas for a limited time but due to the nature of the operations the effects will be limited.

There are potential safety risks if fishing vessels interact with cables and potential navigational conflict with Inch Cape structures. This will be managed throughout construction by consultation and communications to ensure fishermen are aware of activities and application of appropriate safety/exclusion zones. Following cable installation, specific measures will ensure the remediation of any seabed obstacles created during construction.

It is predicted that there will not be an increase in impacts when considered cumulatively (with other projects) this is because there are generally different fisheries targeted in each distinct geographical area which result in limited additional impacts.



Shipping and Navigation

The assessment has considered the effects on the navigation and routing of key groups of marine vessels including commercial shipping.

To establish the existing use by vessels, specific vessel traffic surveys were carried out in 2011 and 2012. The majority of vessels were cargo vessels and fishing vessels. Tankers and 'other' vessels were also identified and account for the remaining vessel movements.

The busiest navigational route passing the Development Area is from Firth of Forth to northern Scotland and on average is used by 2.5 vessels per day. All commercial vessels travelling between ports in the Firth of Forth to European Ports intersect the Offshore Export Cable Corridor.

Inevitably there will be some disruption to specific vessel transits in accounting for the presence of new structures in the sea (and their construction and maintenance). Taking account of mitigation measures to maintain navigational safety the Project is considered to be within acceptable limits; these are also the conclusions of the Navigational Risk Assessments which is a document specifically required by legislation and included in the ES.

'Inch Cape could reduce Scottish CO₂ emissions by the equivalent of 40.9% against coal fired generation'

Military and Civil Aviation

Wind turbines within the operational range of military of civil radars may be visible in certain conditions. Visibility on a radar screen can impact the provision of air traffic control or defence services. The providers of radar services consider the theoretical visibility of any new structures, and the implication on their operational services.

Following consultation with the Ministry of Defence (MOD), it has been predicted that the wind turbines will be detectable by the Air Traffic Control Primary Surveillance Radar located at Royal Air Force Leuchars, Fife. The MOD and DECC are progressing a technology demonstration programme which seeks to identify potential technical solutions for this radar system. ICOL are contributing to the programme and working with all parties to realise an acceptable solution prior to operation.

MOD has also raised concerns about potential impacts on the Air Defence Radar located at Buchan, Aberdeenshire. They have requested provision of further design information to allow them to refine their assessment and ICOL hopes that this will provide them the additional comfort that the radar system can continue to operate effectively. In the instance where technical mitigation is required a proven solution can be implemented.

National Air Traffic Services (NATS) have confirmed that they have no concerns regarding impacts on civil aviation interests as a result of the project. As such, no further work or assessments will be required but communications will be maintained throughout development and operation of the wind farm.



Other Human Considerations

Marine Recreational Activities

The coast areas in East Lothian and Fife are heavily used for a number of different recreational activities. It is recognised that during installation of the export cables those undertaking informal sailing and other users of inshore waters will experience localised disruption during the busiest periods.

Cable laying works at the chosen landfall location will temporarily preclude recreation and access to the affected part of coast/beach. Effective communications with recreational interests will help to reduce these short term impacts.

Military Practice and Exercise Areas

A Military Practice and Exercise Areas (PEXAs) used by the Ministry of Defence (MOD) for naval exercises, is crossed by the Offshore Export Cable Corridor. The Development Area has no interactions with any PEXAs.

There could be some short term disruption to military exercises if construction or maintenance activities are being undertaken in a part of the PEXA. ICOL will ensure clear co-ordination of the work with the MOD and the regular issue of Notices to Mariners to reduce the opportunity for any interactions between these activities.

Subsea Cables and Pipelines

A high pressure gas pipeline in the Firth of Forth is crossed by the Offshore Export Cable Corridor to the north-west of North Berwick.

Offshore Export Cables will be constructed over the gas pipeline in accordance with a legal agreement, including details of crossing design, which will be agreed in advance with the pipeline operator.

Unexploded Ordnance (UXO)

As a result of military activity along the UK coast and adjacent seas, particularly during World War I and II, there is a potential for UXO to be encountered on the seabed. UXO in and around the Development Area and Offshore Export Cable Corridor may include sunken sea mines, air delivered bombs, naval ammunition, munitions dispersed from sunken ship wrecks, sea dumped munitions and land based munitions that have been fired out to sea. The exact location of these UXO are not currently known, but in order to locate and avoid positions of UXO appropriate surveys will be undertaken in advance of works on the seabed and any risks found will be avoided or dealt with in an appropriate way. These measures will be followed for all works and will ensure that all risk is reduced to as low as reasonably practicable.

‘Inch Cape could provide around 1,600 Scottish jobs during construction and around 3,000 jobs within the whole of the UK’

Socio-economics and Tourism

Within the context of strong central and Scottish government policy support, there is a wide range of business and infrastructural initiatives being implemented across Scotland designed to enhance the capacity and capability of infrastructure and supply chain for offshore wind farms.

These are intended to convert economic opportunities presented by offshore wind development off the east coast of Scotland and also further afield. These include the development of business and industry networks, infrastructural strengthening of various ports, skills and training initiatives, and attracting major international energy investors and manufacturing businesses. Assessments conclude that the development of this Project will lead to economic benefits, locally, regionally and nationally.

In order to assess the potential socio-economic impacts four representative locations were identified on the east coast of

Scotland. The facilities identified are; Leith, Rosyth, Dundee and the Cromarty Firth and the surrounding areas. These form the economic study area and data demonstrates that there is a mature well-developed economic and industrial infrastructure around these coastal areas.

The tourism Study Area (based upon areas where the Wind Farm may be visible from) is relatively healthy, with occupancy rates for accommodation providers being moderately high throughout the year. While the economic study area is relatively dependent upon visitors from within the UK and their expenditure, a wide range of overseas tourists from across the world also visit. These visitors are drawn to the numerous visitor attractions along the east coast of Scotland, including a number of key attractions within 50 km of the Development Area. It is not anticipated that any negative effects on tourism are likely to occur as a result of the Project.



Summary of Habitats Regulations Appraisal

An assessment of the predicted impacts of the Project on European designated nature conservation sites has been undertaken.

This is known as a Habitats Regulations Appraisal (HRA) and has specifically addressed effects on Natura 2000 sites which are designated under European Directives and implemented through Regulation 48 of the *Conservation (Habitats &C.) Regulations 1994 and 2010*. These sites are known as Special Protection Areas (SPAs) which are designated under the *Birds Directive* and SACs which are designated under the *Habitats Directive*.

The HRA process initially considered the potential for a 'Likely Significant Effect' of the Project on designated sites. The HRA was completed for predicted impacts of the Project on sites where there was a potential for a Likely Significant Effect. The HRAs then considered the potential for impacts on European sites from the Project's different components and in-combination with other plans and projects.

A range of SACs and their qualifying habitats and species were considered in the HRA:

- Berwickshire and North Northumberland Coast SAC;
- Firth of Tay and Eden Estuary SAC;
- Isle of May SAC;
- Moray Firth SAC;
- River Dee SAC;
- River Tweed SAC;
- River Tay SAC;
- River Teith SAC; and
- River South Esk SAC.

The impact assessment included consideration of effects such as: the direct and indirect effects of underwater noise; changes to metocean and coastal processes; collision risk; loss of seabed and coastal habitat and effects from disturbance. It is concluded that, for marine mammals and fish species, the Project alone or in-combination with other plans and projects will have no adverse effect on site integrity to any of the SACs and that they will maintain their contribution to favourable conservation status of the qualifying species.

Seven SPAs were identified as having the potential for a Likely Significant Effect. Three of those were designated due to the populations of their qualifying interests in the non-breeding season:

- Slamannan Plateau SPA;
- Upper Solway Flats and Marshes SPA; and
- The Firth of Forth SPA.

The remaining four sites were designated due to the populations of their qualifying interests in the breeding season:

- Forth Islands SPA;
- Fowlsheugh SPA;
- St. Abb's Head to Fast Castle SPA; and
- Buchan Ness to Collieston Coast SPA.

Assessment of predicted impacts on qualifying species for coastal and offshore SPAs was a core part of the HRA due to the potential to affect birds in a number of ways including displacement from important feeding areas, risk

of colliding with turbines, barrier effects on flight paths and migratory routes and indirect effects on food sources.

Detailed information on a range of impact sources (particularly disturbance, indirect impacts on prey species, displacement and collision) has been collated to inform the assessment of the conservation objectives for each of these SPAs together with an assessment of the viability of the existing populations of kittiwake, guillemot, razorbill and puffin.

For the SPAs designated due to the populations of their qualifying interests in the non-breeding season it was concluded beyond reasonable scientific doubt that the Project alone or in-combination with any other plans or projects would have no adverse effect on site integrity for any of these SPAs.

For the SPAs designated due to the populations of their qualifying interests in the breeding season it was concluded beyond reasonable scientific doubt that the Project alone would have no adverse effect on site integrity for any of these SPAs. At the time of writing information was not available to allow apportionment of kittiwake collision mortality from other projects to individual SPAs and allow conclusions to be presented on the in-combination effects on the population of kittiwake as viable component of these four SPAs. It was therefore not possible to conclude no adverse effect on site integrity, at this time, due to in-combination effects from other projects.



Further Information

- Review and Comments on the Environmental Statement



Review and Comments on the Environmental Statement

The ES will be submitted with an application to Marine Scotland for consent to construct and operate the Wind Farm and associated infrastructure. Once the application has been formally registered, Marine Scotland will undertake consultation and invite public representations on the proposals before reaching a decision.

The ES can be viewed during the consultation period for the licence application during normal working hours at the following locations:

- Angus Council – Planning and Transport Division, County Buildings, Market Street, Forfar, DD8 3LG;

- Dundee Council – Planning and Building Control, Floor 6, Dundee House, 50 North Lindsay Street, Dundee, DD1 1LS;
- Fife Council – Enterprise, Planning and Protective Services, Kingdom House, Kingdom Avenue, Glenrothes, KY7 5LY;
- East Lothian Council, John Muir House, Brewery Park, Haddington, East Lothian, EH41 3HA;
- Dunbar Library, Bleachingfield Centre, Dunbar, EH42 1DX;
- Dundee Central Library, Wellgate, Dundee, Angus, DD1 1DB;
- Montrose Library, High Street, Montrose, DD10 8PH;
- Port Seton Library, Community Centre, South Seton Park, Port Seton, EH32 0BG; and
- St Andrews Library, Church Square, St Andrews, KY16 9NN.

The ES comprises four volumes:

- **A Non Technical Summary (this document)**
- **Volume 1: Main Text;**
- **Volume 2: Appendices; and**
- **Volume 3: Visualisations and Figures.**

Copies of the ES are available from ICOL in hard copy for £350 and £10 for an electronic copy of the Environmental Statement on DVD/Memory Stick. A copy of the NTS can also be requested from the address above free of charge or downloaded from the project website.

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If you wish to comment on this ES or make representations to Marine Scotland, please write to Marine Scotland at the following address:

Scottish Government
Marine Laboratory
PO Box 101, 375 Victoria Road
Aberdeen, AB11 9DB



Inch Cape Offshore Wind Farm
New Energy for Scotland

Offshore Environmental Statement:
Non Technical Summary

www.inchcapewind.com