



ORMONDE PROJECT

ENVIRONMENTAL IMPACT ASSESSMENT

NON TECHNICAL SUMMARY

July 2005



Introduction

An Environmental Impact Assessment (EIA) has been undertaken for the proposed Ormonde Project. This process analyses the proposed Project in relation with the existing (baseline) environmental conditions, using a combination of field surveys, desktop studies and modelling techniques, to ensure that all potential impacts are identified and appropriately assessed.

It examines in detail the need for the project and its design, construction, operation and decommissioning. For those impacts that have been assessed as being unacceptable, appropriate mitigation measures have been identified. An integral part of the EIA process has been extensive consultations undertaken with statutory and non-statutory consultees, interest parties and the general public. This document is the Non Technical Summary of the Environmental Statement (ES), which reports the findings and conclusions of the EIA process.

The Project

The Developer

Eclipse Energy Company Limited (EECL) is a private upstream energy company founded in 1999. The Company's management team has extensive experience in the upstream oil and gas sector including conducting operations in near-shore environmentally sensitive locations. EECL is focused primarily on developing an innovative approach to generating electricity from both undeveloped gas and wind resources; the latter developed by utilization of offshore wind turbines. The electricity generated from both sources is exported via cable to shore and distributed via the existing national deregulated UK power transportation system. In this way the concept liberates hitherto sub-commercial or 'fallow' hydrocarbon discoveries and may provide extension to existing field life elsewhere on the United Kingdom Continental Shelf through the efficient use of end of field-life reserves. The co-development of the gas and wind resources in this way enhances the commercial development of offshore wind energy. The combination of the two energy production systems significantly increases the amount of energy developed through the new infrastructure, increasing the overall efficiency of the development.

Project Overview

EECL has identified such a co-development project in the East Irish Sea. It intends to develop two small gas fields (Ormonde GT) alongside the installation of a 30 turbine offshore wind farm (Ormonde OWF).

The Ormonde development will be operated overall by Eclipse Energy with the Ormonde GT element in the ownership of EECL, and the Ormonde OWF in the ownership of subsidiary company, Ormonde Energy Limited (OEL). The Ormonde Development would be the first global application of the co-development concept.

Exploitation of the gas reservoirs will be undertaken via two drilling centres; Ormonde South and Ormonde North. Both locations, and that of the proposed Ormonde OWF area, lie in about 20 metres of water and roughly 10km west of the nearest coastline at Walney Island, Barrow-in-Furness, and 10km northwest of the Barrow Offshore Wind Farm which is being constructed during 2005. (Figure 1)

The two gas fields will be developed consecutively, the second being brought on-stream once the first is depleted. Thus drilling operations at the North location will take place about four years after those at Ormonde South. Two wells will be drilled at both locations and drilling operations are expected to last about a month. All drilling operations will use water based muds which are generally non-toxic to marine life. Cuttings generated from the drilling operation will be discharged to sea, a total of about 280 tonnes of cuttings and associated mud are expected from each well. Once drilled, a relocatable production facility, the Gas Turbine Platform (GTP), will be used to draw off the gas and generate electricity onboard the platform via gas turbines.

The proposed Ormonde OWF will be located in an area approximately 4.0 x 2.5 km, located about 10 kilometres offshore off Walney Island. The proposal is to install 30 x 3.6MW wind turbines within the area (Total installed generating capacity of 108 MW) although a smaller number of larger turbines, ca. 5.0 or 6.0 MW, could be installed if they became available from the manufacturer. The largest turbines envisaged will have a hub height of about 100m and a rotor diameter of 140m, therefore giving a total structure height of about 170m.

The turbines will be aligned approximately parallel with the coastline, orientated in a northeast to southwest direction, and comprise three regularly spaced rows each of ten. The distance between the turbines will be about 560 metres in the NW/SE direction and 760 metres in the NE/SW direction.

Subsea cables will be used to transfer the electricity from the wind and gas turbine generators to shore. There will be about 105km of sub-sea cables



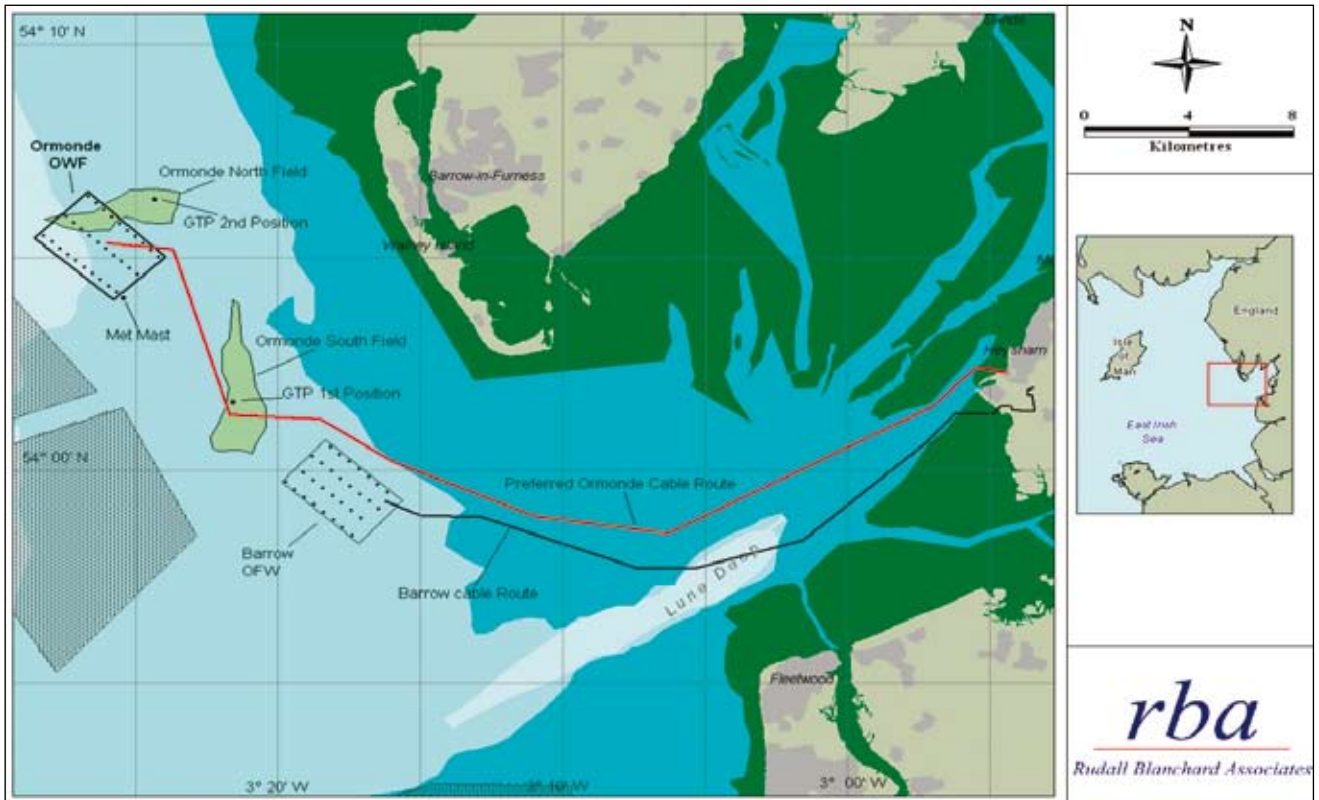


Figure 1: Project Elements and Location

associated with the project. 33kV array cables will run from the individual wind turbines to a substation platform (SSP) that will be located within the wind farm area. A GTP link cable also runs to the SSP from the GTP. Within the SSP, the electricity will be transformed up to 132kV and exported to shore via two export cables, a dedicated cable each for the GTP and the wind farm; these will each be about 40km long. Cable diameters will be about 105mm for the 33kV cables and 190 the 132kV cables.

At any one time, the Ormonde Project will comprise a maximum of 33 offshore structures - the GTP, 30 wind turbines, the SSP and a met mast which will be located just outside of the wind farm area.

The currently preferred export cable route travels from Ormonde, SW and just inshore of the Barrow OWF. It then crosses Morecambe Bay and has a proposed landfall just to the north of Heysham Port in Half Moon Bay. The onshore cable route then travels through mainly industrial and amenity areas (golf course) to the Heysham substation on the outskirts of the town.

Project Construction

Turbine Construction and Installation

The majority of the offshore construction work will be carried out during the summer months when the weather is normally at its best. In general it is desirable to complete construction in the period March – October.

A 24-hour working period will be used to carry out all activities offshore, a strategy that will reduce the overall duration of the construction programme and hence minimise any disruption to other sea users.

Wind turbines are typically constructed in stages, with the foundation section installed first, followed by the tower, the nacelle and finally the rotor. The Ormonde OWF turbine foundations will most probably be monopiles although it is possible that a tripod design may be used. Both foundations types will be piled into the sediment (Figure 2). EECL will finalise the foundation design during the engineering and tendering process and following detailed geotechnical investigations.

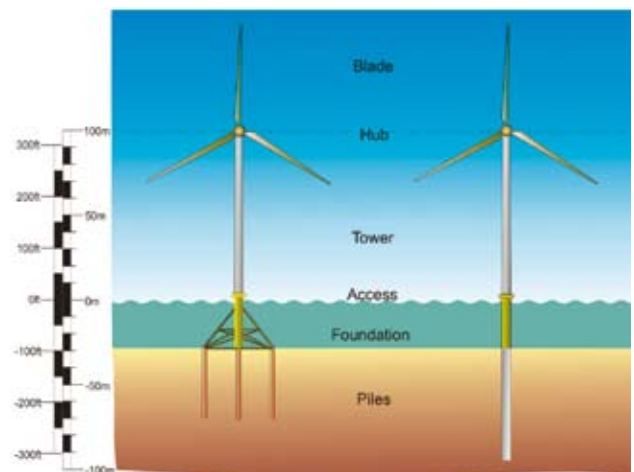


Figure 2: Schematic of a Generalised Offshore Wind Turbine showing Tripod and Monopile Foundation Designs



The precise construction vessels to be used will be selected during the procurement process, however, it is likely to be either a jack up with attendant barges and tugs (See example in Figure 3) or a purpose built installation vessel.

The turbines will most likely be erected in small groups, possibly five at a time. During construction the installation vessel will remain in place while supply vessels ferry equipment and consumables to and from the shore base. The erection of each individual turbine follows a set sequence of established procedures.

The foundation piles will firstly be raised into the vertical position using cranes and driven into position by a piling hammer until the required depth has been reached. For monopile foundations the pile dimensions will be about 60m in length and 5-6m diameter; whilst the tripod piles will be smaller; about, 30 to 40m in length and 1m in diameter. Once the foundations are in place, the tower sections will be erected. A short transition piece is installed first, being fitted to the top of the pile; this will be fully fitted out with the boat fending arrangements, access platform and the necessary cable ducting. The turbine towers will then be installed using a high reach crane operated from the installation vessel (Figure 3). The nacelle will be transported as a single piece and lifted into position. The rotor may be transported to site either as a single piece (with blades connected to the hub), or the hub may be fitted to the nacelle and the blades attached in situ. Each turbine will have subsea anti-corrosion measures in the form of zinc anodes.

Once the structure is complete, the control and power cables will be lowered down within the tower and connected via the subsea array cables to the SSP. Once complete the installation vessel and attendant boats will move on to the next turbine location.

Gas Infrastructure

The planned consecutive development of the two gas fields will mean that drilling at Ormonde North will be undertaken probably about four years after that at Ormonde South. Two development wells are planned at each location. The drilling rig has yet to be chosen but will be a jack-up drilling rig of the type used routinely in the Irish Sea. It is anticipated that it will take approximately 12 to 14 days to drill each well with a further 7 days allowed for clean-up and possible well testing. All of the wells will be deviated with a total depth of approximately 830 metres. All wells will be drilled entirely using Water Based Mud (WBM) with cuttings and associated mud discharged to sea. A total of about 280 tonnes of cuttings are anticipated for each well.



Figure 3: A Jack-Up Installation Rig with Attendant Barge (Source: Seacore)

Once drilled, the Gas Turbine Platform (GTP) will be installed on location. This will be a minimum facilities platform and will not be permanently manned. It will most probably be a converted offshore accommodation facility (flotel) or jack-up drilling rig that will have its existing superstructure replaced with a minimum facility topsides similar in general structure to many small gas production platforms operating in the North and Irish Seas (Figure 4).

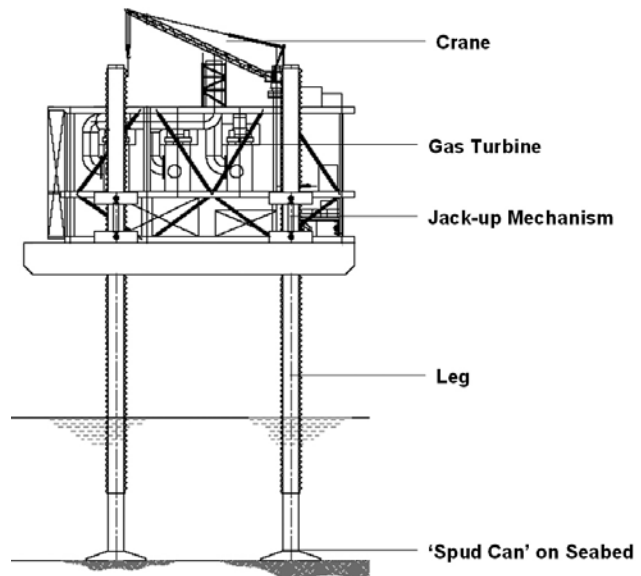


Figure 4: Schematic Representation of the Ormonde Gas Turbine Platform (GTP)

The GTP will be converted in a fabrication yard (i.e. a shipyard) and all equipment will be put aboard prior to float-out. When complete, it will be towed to the Ormonde South gas field location by tugs. The precise location of the platform will be determined by the results of a detailed site investigation prior to installation. Once in position, if a jack-up design is assumed, the legs will be lowered onto seabed until a stable arrangement is obtained. Hook-up and commissioning operations will then commence and will include connecting the wells and subsea cable the GTP, and final testing of all equipment.



The GTP has been designed to be relocatable and for this reason a 'jack-up' design is ideal. Once the decision has been made to suspend Ormonde South gas production operations the wells will be 'shut in' (closed) and suspended prior to being abandoned. Well abandonment will most probably be undertaken from a drilling rig or specialist vessel once the GTP has been moved. Once the wells have been suspended they, together with the GTP link cable, will be disconnected. The GTP legs will then be raised and the platform towed to the Ormonde North location by tugs. Installation and commissioning of the GTP on Ormonde North will be as described above.

Scour Protection

The effect of wave and tides can induce a scouring effect around a fixed structure placed on the seabed resulting in the formation of scour pits which could, if severe reduce the structure's lateral support. At Ormonde it is estimated that scouring will occur up to 5m in depth and 10 m away from each structure. To counteract this, EECL will install some form of scour protection around each structure. The exact form of this protection will be decided upon during the detailed engineering and the tendering process.

As stated above there will be a total of about 105 kilometres of electrical cable associated with the Project. It is proposed to bury all electrical cables, where possible, to a depth of at least 1m and preferably 2 – 3m. All cables will be delivered either to site direct from the manufacturing facility, or to an onshore lay-down area. The cable laying methodology will be determined during the detailed design stage of the project but the most likely scenario is that the cable lay will commence from the shore end. The cable will initially be pulled ashore from a barge and anchored. The laybarge will then move off along the planned cable route, playing out the cable as it goes. On arrival

at the SSP, the barge will be positioned close by and the cable pulled onto the platform, cut to length, sealed and capped. Throughout the cable lay the barge will be monitored to ensure it maintains the agreed cable route. The cable laying process with the anchoring is expected to take about two months to complete. A typical cable lay barge is shown in Figure 5.

Cable burial can be achieved by either ploughing or jetting, and both methods have constraints within which they can be effectively used i.e. shallow water, depth of burial required, sediment disturbance, sediment type and corners required to be turned. Based on existing knowledge of the Ormonde Project area it is anticipated that the majority of cables can be laid and buried using a plough, with jetting being used in those areas, e.g. close to pipeline crossings and turbine foundations, where facilities may be at risk.

Construction methods for the intertidal area will either be by open cut or non intrusive means such as horizontally directional drilling (HDD). The coastal sea defences at Heysham will probably be crossed by HDD. Ducts will be installed and the cable would be pulled through the ducts to a underground chamber probably located behind the seawall. Here the marine and land cables will be joined. Scour protection is not envisaged for the cable routes.

Onshore cabling will be necessary to link the offshore cables to the proposed substation at Heysham. The length of the onshore cable route is approximately two kilometres all onshore cables will be buried along their entire length, to a depth of at least 1m; at no time will overhead power cabling be used.

A temporary construction area to accommodate site offices, storage facilities, canteen, toilets and car parking will be required. The area will be fenced off



Figure 5: Typical Cable Lay Vessel (Source: Middelgrunden OWF)

and gated for security. During construction all activities other than access and cable storage will be confined to a defined working width. This will be about 5m wide, although additional land may be required at certain locations such as road, and railway crossings and in the vicinity of the landfall to facilitate safe construction practices.

In open land, following the fencing of the working width, the topsoil will be stripped in advance of the trench construction. This will be stored separately from the subsoil excavated as the trench is formed, in order that it can be replaced in good condition to help with the restoration process.

In the roadway (street works), prior to trench excavation, a full services search will be completed, and all existing services marked. Trench excavation will involve the cutting out of the existing tarmac surface and removal of the sub-base. Following this, the cable trench will be cut and prepared to receive the cable. The cable will then be installed, and the trench backfilled. The road surface will be reinstated in accordance with the Highways Authority's requirements. Work will continue until the cables have reached the substation location, ready for connecting to the transformer equipment.

Following completion of the cable laying, the land within the working width, including the permanent easement of 5m, will be reinstated as near as practically possible to its former condition, any walls and hedgerows will be reinstated.

Project Operation

The facilities will operate all year round. The GTP will operate on a constant basis, except for planned maintenance shutdown periods, although the Ormonde OWF will be subject to the ambient wind conditions.

A local operations base will be required for the life of the project, estimated at ca.7-14 years for the GTP and 25 years for the wind farm. This will comprise storage, workshop and office areas. The exact location for this has yet to be decided although a facility within Barrow port is a possibility. The facilities will be serviced and maintained by a team of 20-25 trained, locally based personnel. It is anticipated that the GTP will be visited monthly and each wind turbine roughly twice a year.

The Ormonde OWF area will be open to access by all vessels, apart from a 500m navigation safety zone around and SSP; a similar zone will also be set up around the GTP. All offshore facilities will be fitted with lighting etc. in accordance with Civil Aviation Authority and Trinity House requirements.

At the end of their operational life the facilities will be decommissioned. The exact method will depend on best practice at the time, but this is likely to require the removal of all equipment above the seabed.

Project Benefits

Offshore wind farms, such as the Ormonde OWF, play a key role in assisting the UK government to meet its domestic goals for reducing emissions of carbon dioxide and other greenhouse gases. The UK government has agreed that at least 15% of all electricity generated in the UK should come from renewable sources by 2015. In addition to this supply of clean energy, Ormonde GT will supply electricity from fuel gas that might otherwise have been left undeveloped, therefore representing a net gain to the UK's energy supply balance.

On a local level, the development will strengthen the region's energy production, providing electricity equivalent to 155,000 homes (assuming peaking rate for gas production), 71,000 of which will be produced from a renewable and sustainable source (Note, there are an estimated. 32,000 homes in the Barrow-in-Furness borough area)

Project Options

Site Selection

The location of Ormonde was initially driven by the presence of available undeveloped gas discoveries. Once the Ormonde North and Ormonde South gas reserves were identified the general location area for the Ormonde Project had been set. Initial selection of a location for the Ormonde OWF used the following criteria:

- Proximity (less than 10km) to the two gas discoveries
- Preferably in less than 20m water depth
- Suitable seabed sediments for piling operations down to 40m

From this exercise, several areas were identified. The OWF site selection was made after conducting a series of consultations with local stakeholders to determine which area would have the least impact. Consultations included:

- ABP Barrow-in-Furness – Local shipping and navigation



- English Nature – Environmental issues
- Barrow Fishermen – Fishing issues
- BA Systems (Walney Airfield) – Local air traffic considerations
- Barrow-in-Furness Borough Council – Economic and visual issues
- Furness Enterprise – Economic issues

Alternative Offshore Engineering Solutions

During detailed design alternative engineering solutions will be considered a number of Project elements including:

Offshore:

- GTP design
- foundation design for the turbines and SSP
- micrositing of all the offshore facilities
- finalising offshore cable routes and installation techniques
- Use and type of scour protection around offshore facilities

Onshore:

- finalising landfall location and onshore cable route
- finalising onshore cable installation techniques

Planning Context

There are two principle routes for obtaining the statutory right necessary for the construction of an offshore power generation project in UK territorial waters. The option which EECL has chosen for the Ormonde Project requires the following principal consents/licences to be obtained:

- Electricity Act 1989 - Sections 36, S36a and 37
- Food and Environment Protection Act 1985 - Section 5
- Coast Protection Act 1949 - Section 34

Other consents that may be required, depending on the nature of the site and onshore development proposals:

- Town and Country Planning Act 1990 Section 57 or 90 (e.g. for onshore substations)

- Electricity Act 1989 - Section 37 (for onshore overhead lines, if required)
- Water Resources Act 1991 - Section 109 (if erecting structures in a water course)

Summary of the Results of the Ormonde Project EIA Process

The EIA process has identified and assessed a wide range of potential impacts that the proposed Project could have on the local and surrounding physical, biological and socio-economic (human) environment. A summary of the key finding from this process is given below.

Socio-Economic (Human) Environment

Employment

The proposed Ormonde Project has the potential to provide a benefit to sections of the local community during both the construction and operational phases. The main economic impact will be the creation and support of employment both directly and indirectly due to increased expenditure within the local economy. It is anticipated that 50-100 locally sourced temporary personnel would be required during the construction period (ca. 8 months) and up to 20 full time jobs will be generated to staff the operation and maintenance facility.

Commercial Fisheries

The eastern Irish Sea ports have supported a commercial fishing industry since the early 1800s and although the industry has been in decline for a number of years there is still an active local fishery. The Ormonde OWF lies within a fishing ground called the 'Connie which supports a mixed commercial fishery of mainly local trawlers but is an area where fishing activity is relatively low compared to other nearby grounds such as the Prawn ground to the north and Shell Flat off Blackpool. The EIA concluded that the presence of the wind farm will probably not greatly impact the value of fishery in the area although it may result in a change of fishing methods within the wind farm area, from mobile trawls to static gear such as pots and gill nets. Mitigation will take the form of ongoing liaison with local fisherman.

Navigation and Shipping

The location of the Ormonde OWF was finalised only after a lengthy period of consultation with local interested parties including commercial shipping



interests. A 28 day radar based marine traffic survey, conducted during Autumn 2004, determined vessel traffic volumes in the waters surrounding Morecambe Bay. The study looked in detail at the presence of the proposed Ormonde, Walney and West of Duddon Sands OWFs as well as the consented Barrow OWF site.

The results identified that commercial shipping, fishing and recreational vessels pass through all four proposed OWF site boundaries, although this varied significantly in extent, with Ormonde being least busy. The number of recorded vessels in the vicinity of Ormonde was low, in total, 23 radar tracks were recorded passing through the Ormonde OWF boundary during the entire 28 day survey period, an average of less than one vessel per day. It was therefore concluded that the current siting of the proposed Ormonde Project would not represent a navigation problem to commercial vessels leaving and entering the ports of Barrow, Fleetwood and Heysham as it is located inshore of the main shipping lane in the area. (Figure 6)

Using modelling, a collision risk assessment has also been undertaken for the project. This estimated, assuming all of the proposed wind farms were developed, that there would be one major collision in 660 years (increased from 1:850 years if only Ormonde was developed). In addition, the risk of a passing

ship collision with one of the wind farm structures (powered and drifting scenarios) was estimated to be about 1 in 3,000 years, which was below the historical average for UK offshore installations and reflects the fact that location of the Ormonde OWF is relatively remote from busy shipping routes. Finally, the risks associated with incident between a recreational craft and the Ormonde facilities (blade/mast and vessel/structure collisions) were concluded to be as low as reasonably practicable.

The assessment focused on the operational phase of the Project, but it is recognised that there will be additional risks associated with construction, maintenance and decommissioning operations due to increased vessel activity. Risk to shipping and navigation will be managed effectively by undertaking detailed task risk assessments at the operations planning stage, providing appropriate training to marine personnel and maintaining good communication with other sea users. In compliance with Trinity House requirements, all offshore structures towers will be appropriately lit, marked and identified.

Tourism

It is considered that the presence of the Ormonde Project, offshore of Barrow-in-Furness will generate interest from both the local population and visitors to the area. From a tourist perspective, the newly erected Ormonde wind turbines, together with the existing

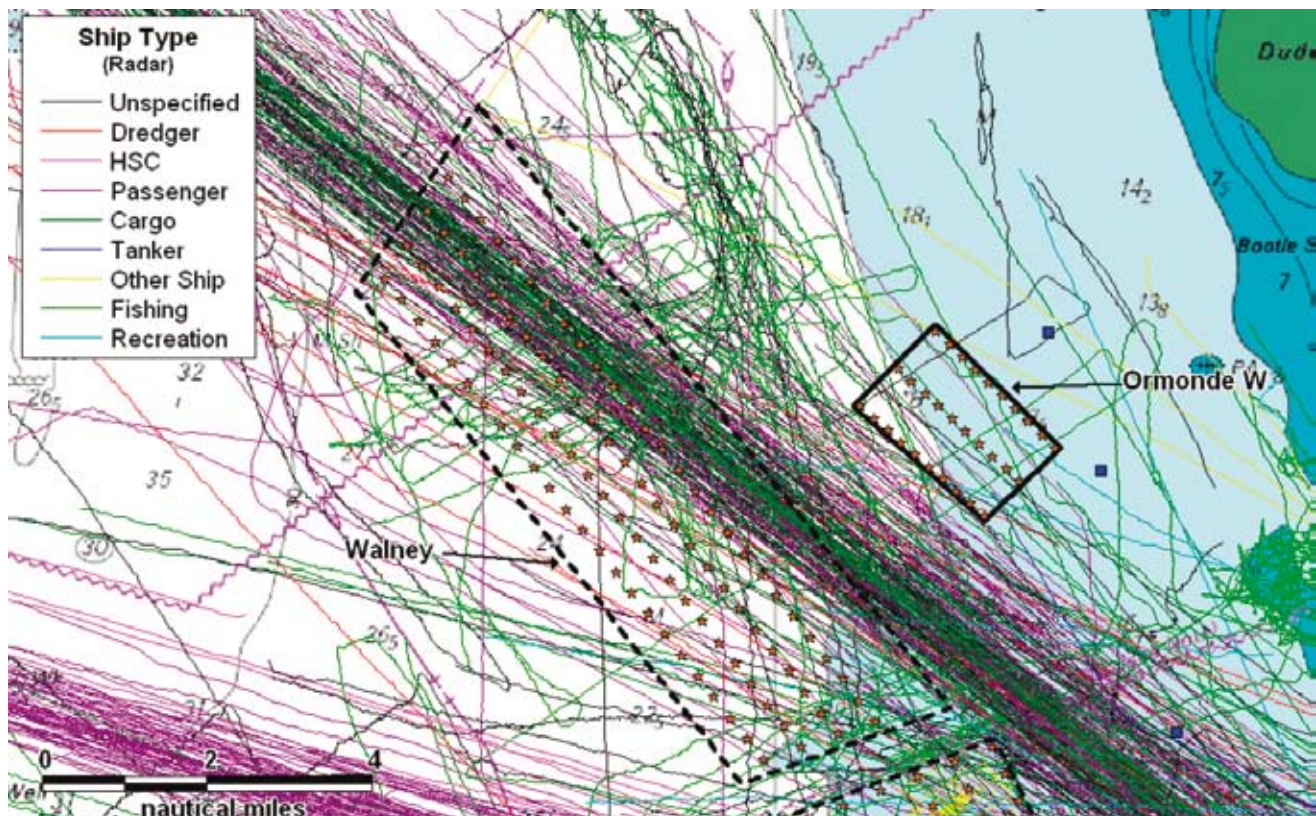


Figure 6: All Radar Tracks Passing the Proposed Ormonde OWF during the 28 day survey



Barrow OWF turbines may act as a new attraction which could contribute to the local economy. The existence of the wind farms in particular may generate a new business of offering small boat trips for tourists or sports fishermen to visit the wind turbines close at hand thus increasing local revenue. This, however, would have to be balanced against any possible modification in commercial fishing patterns and would also need to take into account potential navigation risks to small vessels.

Conversely, there will always be some tourists who may feel that the offshore presence of the Ormonde Project impacts negatively on the seascape, deterring them from visiting the area, even though there is currently no direct evidence to support or contradict this (See general BWEA information <http://www.bwea.com/media/index.html>).

Noise

A baseline noise study undertaken for the Ormonde Project highlighted that the location of the facilities, about 10km offshore is the primary mitigation measure and that the majority of construction and operational noise will not be detectable above background noise levels at any onshore location. Offshore piling operations may be just audible under certain conditions, but this temporary activity was assessed to be minor. It is unlikely that the fully operational gas turbines on the Ormonde GTP will be audible onshore, in order to further minimise any potential for this noise source the design team will look to orientating the gas turbine inlets away from land.

It is considered that there will be no cumulative acoustic impacts to human receptors from the combined presence of a number of offshore wind farms in the area.

Civil and Military Aviation

There are no identified impacts from the presence of the Ormonde Project with regard to low level operational aviation activities, as none of the proposed offshore sites lie within the takeoff or landing zones of any aerodromes within the area. It is considered that that the Project will pose no risk to either civil or military radar or high level flight paths. An initial objection to the Project lodged by the National Air Traffic Service (NATS) was removed after detailed consultation by the project team.

Land Transport

It is likely that there will be a relatively small increase in vehicle traffic, including some increase in the quantity of heavy goods vehicles, travelling into the towns of

Barrow, Heysham and possibly Fleetwood, depending on where the lay down and assembly areas are located during the project construction phase. These vehicles are unlikely to significantly affect current daily traffic flows for any roads that are affected, but it is nevertheless recognised that there could be a temporary localised inconvenience for local traffic within the urban areas of the chosen construction base.

To manage this, a traffic management plan will be produced and agreed with the Local Authority's planning department; this will detail the number and type of additional vehicle movements that are anticipated during construction operations and the routes that will be taken.

Any additional traffic due to the presence of the operations and maintenance base is considered to be negligible.

Offshore Oil and Gas Operations

The only significant potential impact from the Ormonde Project on the existing oil and gas infrastructure will be during construction and installation operations. There will be a requirement for both the GTP Link cable from Ormonde south to the SSP and the export cables from the SSP to shore to cross existing gas pipelines. The exact positioning and methods of the cable crossings will be determined once the final cable routes have been established, and this will be undertaken in consultation with pipeline owners and operators.

Seascape and Visual Assessment

A landscape and seascape visual impact assessment was undertaken along the coastline from St Bees to Blackpool. Within this area the visual impact was assessed at a total of 18 viewpoints, of which seven were assessed in detail. In summary the results from these areas were:

Selker Bay - Located on the Cumbrian Coastal Path this viewpoint was chosen to represent the views for coastal walkers and beach visitors. The closest Ormonde wind turbine would be about 20km away and all turbines would be clearly visible and well defined on the southern horizon. The magnitude of change to the view has been assessed to be medium and the significance of visual effect will be moderate as the development would constitute a noticeable change in the quality and character of the existing view.

Black Coombe – The highest selected viewpoint at about 570m and located in the southern Lakeland fells. The Ormonde OWF would form a conspicuous element within the overall seascape and will be clearly



visible. The closest wind turbine would be about 18km away and the development would appear well defined. From this high level expansive view, the magnitude of change to the view is assessed at medium and the significance of visual effect will be moderate as the development would result in a noticeable change in the quality and character of the view.

Haverigg Beach - This is a popular visitor location. The closest turbine will be 14.2km away and the turbines will catch the eye or attention of the observer and be noticeable elements to the SW and be clearly visible extending southwards. The presence of the turbines will result in a noticeable change in the existing view and cause a noticeable change in the existing quality and character of the view. The significance of visual effect will be moderate to significant.

Askam Pier - The frontage at Askam is a combination of shingle beach, a small sandy bay and a more extensive rocky foreshore. For residents and beach users the proposed wind farm would be clearly visible and well defined in oblique views to the SW. The nearest turbine would be 16.6km away and would extend to the NW beyond the tip of Walney Island. The full extent of the wind farm would be apparent. From this viewpoint the Ormonde OWF would result in a noticeable change in the existing view and cause a noticeable change in the quality and character of the view. The magnitude of change of the proposed development is assessed to be medium and the significance of visual effect will be moderate.

Biggar Bank Road, Walney Island – This area represents the view to a variety of both high and medium sensitive receptor groups, including residents

living on Biggar Bank Road and people using the wide grassed area and beach between the road and the sea. The proposed wind farm would be easily seen, would stand out and be unmistakable protruding above the western horizon. The closest wind turbine would be 9.8km away and would appear large scale with obvious blade movement. The Ormonde OWF would result in a prominent change in the existing view and the turbines would form prominent elements in the overall view. The magnitude of change of the proposed development is assessed to be large and the significance of visual effect will be significant for residents and visitors and moderate for road users (See Figure 7 below).

Walney Island Nature Reserve - The viewpoint is located on low ground just behind the shingle beach and is in an area of County Importance for Landscape. The proposed wind farm would be clearly visible on the horizon as a very oblique view in a west to NW direction. The nearest turbine would be 13.9km away and the arrangement would appear informal. From this viewpoint the Barrow OWF would be at a closer distance (7.5 km) in a SW direction and be a more prominent element in direct views. From this viewpoint the turbines of the Ormonde OWF would be well defined and would cause a noticeable change to the existing view. If consented, however, the Ormonde turbines would not constitute a noticeable change in the character of the view as the Barrow turbines will already have been constructed. The magnitude of change of the proposed development is assessed to be medium and the significance of visual effect will be moderate.

The Mount, Fleetwood - This viewpoint is the only elevated location along the Fleetwood sea frontage.



The proposed wind farm would be visible on the horizon to the NW at a distance of about 30km. The turbine arrangement would appear formal as 3 distinct rows. From this viewpoint the Barrow OWF would be at a closer distance and be a more distinct element. The Ormonde development would result in a perceptible change in the existing view, without affecting the overall character of the view. The magnitude of change of the proposed development is assessed to be small and the significance of visual effect will be moderate-slight.

Biological Environment

Birds

The coastal area of the eastern Irish Sea is important for over-wintering, summer breeding and migrating bird populations. Because of the long held concern that the presence of wind farms are potentially detrimental to birds, detailed birds surveys have been undertaken to gain a fuller understanding of the fauna in the Ormonde and surrounding area. Studies included vessel based (monthly) and aerial surveys (seasonal) between May 2004 and April 2005 (See Figure 8 for example of results), a survey of autumn migrating wildfowl and collation of shoreline bird count data from the proposed cable landfall at Heysham.

The results indicated that compared to the adjacent areas of Morecambe Bay and Shell Flat, the project area is of no particular significance to breeding, feeding or roosting birds although a number of migrant species, such as Pink Footed Geese, do use the airspace as part of the much larger East Irish Sea flyway.

It was concluded that no bird group would be likely to be significantly affected by the presence of the

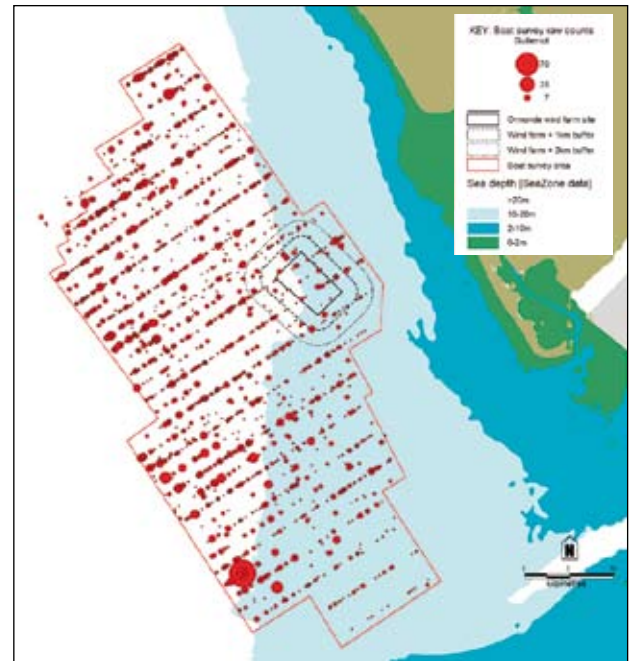


Figure 8: Guillemot – Boat Survey Summary Distribution Map

Ormonde Project, even when using a precautionary worst-case assessment. A range of low/negligible impacts will be likely to occur on a variety of species, including resident gulls and other seabirds, and migratory waterfowl, however, none of these would be likely to be significant in the context of the EIA Regulations.

The proposed export cable landfall in Half Moon Bay Heysham lies in proximity to the Morecambe Bay SPA and is likely to pass through it. The heliport at Heysham port lies adjacent to the proposed landfall and is an important roosting area for several species. In particular it regularly holds internationally important numbers of knot (peak 30,000; 2002-05) and nationally important numbers of oyster-



Figure 7: Predicted view from Bigger Bank Road showing Barrow (consented) and Ormonde (proposed) offshore wind farms

catchers (peak 4,100; 2002-05). Any effect on these populations could be potentially significant, as they form an important part of the Morecambe Bay bird populations. To avoid such an effect, intertidal, landfall and onshore cable installation works will be scheduled for the period between mid-May and mid-July when the population numbers in the area are lowest.

Benthic Communities

No benthic species of particular conservation importance are anticipated within the offshore Project area or along the proposed cable routes. The most significant Project related impacts to benthic communities will be from:

- Discharge of drilling cuttings from the two drilling centres (Ormonde South and North). Modelling indicates that the benthic communities up to 250m from the GTP will be impacted, mainly by burial from discharged cuttings. As the drilling mud associated with these cuttings will be water based and contain minimal contaminants, recolonisation of the area is likely to be rapid.
- Loss of some soft sediment habitat, due to installation of the turbine foundations and location of the GTP and SSP, estimated at about 1.2 hectare
- Temporary impact from the installation of the cables. Although this will take place over a comparatively large area, ca. 525 hectares if there are 105 km of cable and a 5m impact corridor, any disturbance to the soft sediment faunal communities will be short lived and recolonisation is again expected to be rapid
- Introduction of hard substrate (turbine foundations and platform legs) plus any 'hard' material that used for scour control will attract a new faunal community thus increasing the overall diversity of the area.

The overall impact on the local benthic communities within the project area is considered to be minor.

Fish and Shellfish

Whiting, Sprat and Dover sole are the species most likely to spawn in the vicinity of Ormonde, and it is also likely to be a nursery ground for herring, and plaice.

Overall, Project construction and operation is likely to result in only minor impacts to fish and shellfish populations. The most significant impact during the construction phase will be from the underwater noise

generated during the foundation piling operations. Fish in general are sensitive to noise and those close to the site of piling operations when they commence could potentially be permanently damaged, although any impact is likely to be localised as high noise levels will be limited to the immediate vicinity of operations. In order to minimise this impact, however, all piling operations will use a 'soft-start' procedure. This will slowly increase the level of underwater noise prior to piling starting and thus help to ensure that fish have the opportunity to move away from the noise source.

In addition:

- fish associated with inshore environments are generally tolerant of variations in turbidity so are unlikely to be impacted by sediment plumes from installation operations
- underwater noise generated by the turbines during operation is anticipated to be of low frequency and will be continuous thus promoting habituation to the noise
- electro-sensitive fish (sharks and rays) are unlikely to be impacted significantly by the subsea cable as the electrical field generated by cables will be minimised by insulation and burial.
- Migrating Salmon and Sea-trout could be affected by sediment plumes from inshore cable laying and burial operations. These operations should be timed to avoid the period when adult salmonids are migrating to their natal rivers, generally between November and January.

The turbine bases and potential scour protection may result in some form of artificial reef effect, as fish tend to aggregate around objects placed in the sea. In the longer term, this may have a minor beneficial effect leading to an improved habitat biodiversity in the area.

Marine Mammals

Numbers of marine mammals are generally low within the Project area and therefore any impacts as a result of the construction and operations are not considered to be significant.

Noise and vibration produced by vessel movements, drilling and construction activities, and turbine operation will be similar to those produced by existing offshore traffic. Mitigation in the form of 'soft start' procedures will be carried out prior to operations such as piling.



Terrestrial Ecology

A habitat assessment was undertaken within the proposed onshore cable route corridor (Figure 9) and concluded that the majority of the study area contained habitats that were of negligible ecological value due to development or intensive management practices, although there were some small areas of local value, including ponds, small patches of scrub and planted woodland.

There were no statutory designated ecological sites within the area although it does border the Morecambe Bay European Marine Site. Five non-statutory Biological Heritage Sites (BHSs) lie within 1km of the central point of the survey corridor but only Higher Heysham Knoll BHS, lies wholly within the area. This is a mixture of planted woodland, scrub, herb-rich grassland and seasonally flooded areas. A small part of the Heysham Nature Reserve BHS also lies within the survey boundary.

None of the habitats present within the study area were considered to be either of a sufficient size or quality to be considered under the UK Biodiversity Action Plan (UKBAP or BAP) although the linnet, a UK BAP species, is present as a breeding species in the scrub throughout much of the survey corridor.

Physical Environment

Sediment and Coastal Process

The proposed Project is likely to have a very localised

impact on the waves, currents and the corresponding sediment transport regime within in the immediate vicinity of offshore structures but there is not anticipated to be any significant or measurable far-field impacts. As discussed above, some scour around structures is anticipated and protection against this will be installed. All cables will be buried to avoid possible damage from sediment movements, particularly within Morecambe Bay.

Water Quality

Offshore discharges to sea will include drilling and completion chemicals and various drainage and personnel wastewater from vessels and offshore facilities. No adverse impact from any project related discharge is anticipated and there will be no lowering of water quality along the local coastline.

Air Quality

The exhaust emissions from the drilling rig, project associated vessels and the GTP will cause a minor, temporary degradation of the air quality in the immediate vicinity of operations. Modelling of the largest output, from the GTP, has indicated that elevated levels of exhaust gases would decrease rapidly with distance. At the nearest shore locations calculated levels of all exhaust gases were consistent with good air quality standards.

Marine Archaeology

Detailed geophysical and geotechnical surveys have been conducted in and around the Ormonde Project

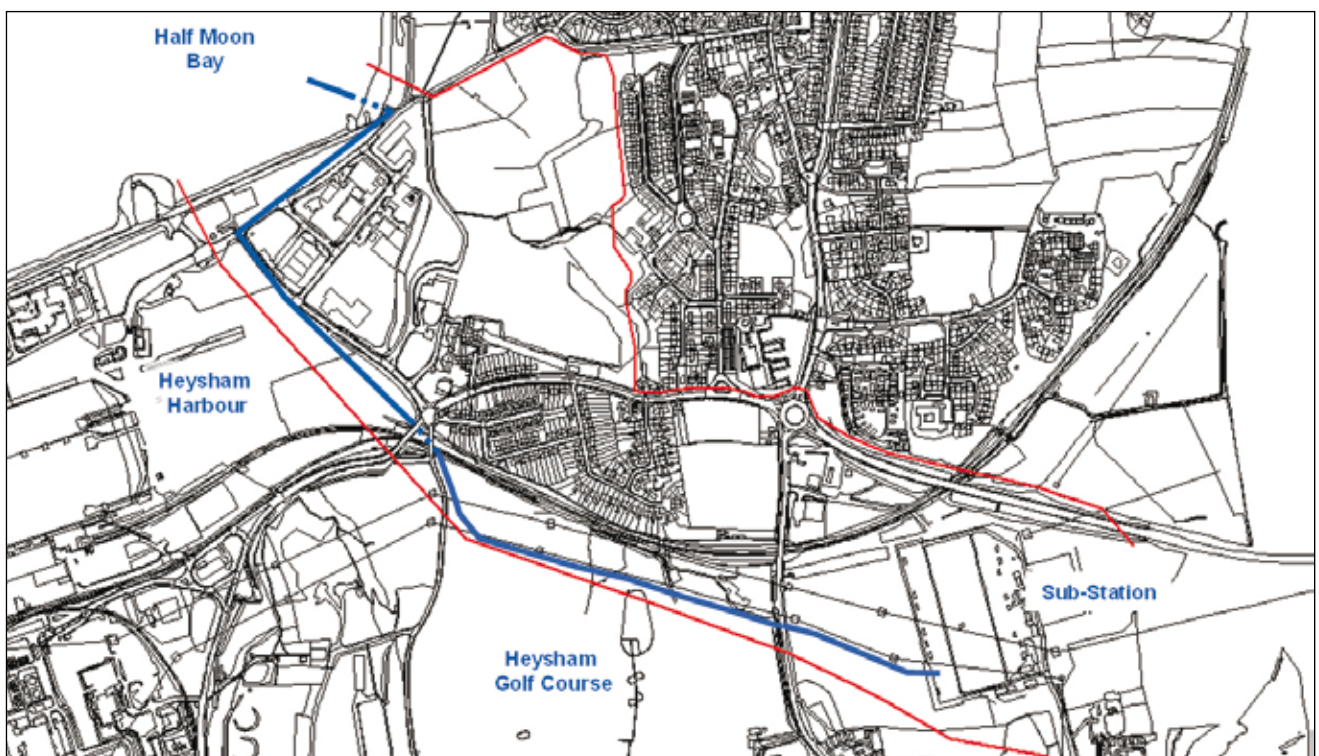


Figure 9: Preferred Onshore Cable Routing (blue) and Survey Area (red), Heysham



area and have not indicated the presence of any wrecks, prehistoric deposits, land-surfaces or artifacts. It is possible that construction activities could disturb currently unknown sites, deposits or artifacts, exposing them to physical, biological and chemical decay.

Mitigation may take the form of some further archaeological assessment and analysis of existing survey data prior to starting construction operations. A procedure will be agreed with Cumbria County Council, Lancaster City Council and English Heritage for notifying them of the discovery of any previously unidentified wreck or artefact during the course of the construction works, and for the appropriate treatment of any such discovery.

Accidental Oil Spills

The drilling rig and some of the vessels involved with offshore construction operations will have on board large quantities of marine fuel, usually diesel. Although very remote, the possibility exists that an oil spill could take place that could potentially impact the local area.

In mitigation, EECL will prepare a full Oil Spill Contingency Plan (OSCP) and an Emergency Procedures Plan will be in place prior to any drilling operations taking place to provide guidance on actions to be taken in the event of a release or spill. The OSCP is a statutory obligation and has to be formally approved by the DTI and Maritime and Coastguard Agency (MCA) prior to drilling operations commencing. The OSCP will be supported by a range of personnel training in oil spill response and emergency management. It should also be noted that drilling operations have been scheduled to avoid the periods of highest seabird vulnerability during the winter months.

Cumulative Impacts

The Ormonde project lies within an area where a number of other offshore wind farms have either been consented, e.g. Barrow OWF; or are proposed, e.g. Shell Flat, Walney and West of Duddon Sands. The Ormonde EIA process has therefore taken account of the potential cumulative environmental impacts assuming all of the proposed wind farms were developed. Key areas where cumulative environmental impacts might arise include:

Coastal Process

A review of the local coastal process has indicated that the Ormonde wind turbine foundation spacing will have no significant or measurable cumulative impact on waves, currents or sediment transport, either within the OWF site or over a wider area. As individual

foundations do not have an influence on adjacent structures, then there is no potential for one wind farm to have a cumulative impact with a neighbouring wind farm at several kilometres distance.

It is likely that there will be localised interactions between export cables from the various developments e.g. cable crossings. The extent and significance of potential cumulative impacts will depend on the methods of crossing, cable separation distances and the cable laying schedules. These issues will form part of the detailed project design process to ensure that they are appropriately addressed.

Commercial Fishing

Fishermen in the local area have expressed concerns about the potential cumulative impacts on their commercial activities from the development of up to five offshore wind farms. It is likely that any cumulative impact on local fishing operations will vary depending on where individual fishermen operate. The summer prawn fishery and the inshore Rough ground will not be affected by any of the proposed developments. The location and size of the proposed Shell Flat, Walney and West of Duddon Sands OWFs is currently under review and as such, it is difficult to make any assessment of likely cumulative impacts on local fishing operations.

Although EECL cannot confirm the intentions of other developers it is assumed that there will generally be an 'open access' policy within all of the OWF sites, and fishing can therefore continue within these areas.

Navigation

If all of the proposed wind farm developments go ahead there are likely to be some potential issues regarding navigation, the most significant of which would be the routing of larger commercial vessels leaving and entering the ports of Heysham, Barrow and Fleetwood. A detailed consultation process is currently ongoing between developers and commercial shipping interests. From this consultation it has been established that the Ormonde site was not considered a major issue especially as the Barrow OWF is already consented. A possible cumulative impact between Ormonde and the Walney OWF does exist that would result in a funneling of traffic between the two sites. The results of the collision risk modelling have shown that the presence of both sites would increase the potential vessel-to-vessel collision risk to one major collision in 660 years. This was an increase from one collision in 850 years if only Ormonde was developed. Only a small minority of this increased risk (estimated at less than 20 percent) is associated with the Ormonde Project.



Birds

The detailed bird impact assessment undertaken for the Ormonde Project included an assessment of potential cumulative impacts due to the presence of the other wind farm developments. It concluded that as there was a relatively low ornithological interest within the proposed Project area and it was not considered that there was potential for any significant cumulative effects with any of the other consented or proposed offshore wind farms. In order for the Ormonde OWF to contribute to a significant cumulative effect, it would need to support important numbers of a bird population that also had important numbers at one of the other proposal sites. This was not the case for any of the key bird species or groups present within the general area, and so it can be concluded that the Ormonde OWF would not make a significant contribution to any potentially significant cumulative ornithological effects. This conclusion is reinforced when the relatively small scale of the Ormonde site is considered.

Visual

Some cumulative landscape and visual effects already exist in South Cumbria, due to the existing onshore wind developments of Haverigg, Askam, Harlock Hill and Kirkby Moor. When the consented Barrow OWF and the proposed Ormonde OWF are considered together with all the other proposed offshore wind farms and the operating onshore developments, some significant and very significant changes to the character of the landscape and seascape would result in certain areas. In most cases the Ormonde OWF would be seen in the same direction or angle of view and the potential cumulative effect is therefore increased.

It is concluded that the most significant cumulative effects will be primarily on Walney Island and at Haverigg Point, with moderate effects further to the north at Black Coombe and along the coast, with moderate to slight effects to the south at Fleetwood. There are numerous locations and routes where the proposed Ormonde turbines would be seen in combination and in succession with all the other proposed offshore wind farms, as well as the existing onshore wind farms or the consented development at Barrow.

Environmental Management

EECL operates under an integrated Business Management System that includes a comprehensive Environmental Health and Safety (EH&S) management system. This system will help to ensure that the project is undertaken on a sound environmental basis.

Environmental mitigation and monitoring programmes that have been proposed as part of this EIA process, or that are included within any conditions attached to the Project Consents, will be compiled into an Environmental Management Plan and incorporated into the Project planning process. A system of internal and third party audits will provide the necessary feedback to ensure that the process operates correctly.

Overall Conclusions of the Ormonde Project EIA

In conclusion, it is considered that, providing the proposed mitigation and monitoring requirements are put in place, the Ormonde Project will not have a significant adverse impact on the local and far-field physical, biological or social-economic environment, and from a cumulative perspective, is unlikely to comprise a significant component. Overall, any adverse impacts should be balanced against the beneficial effects of the project to the East Irish Sea area including the potential effects of the local economy.

In addition, the development will strengthen the region's energy production, providing electricity equivalent to 155,000 homes (assuming peaking rate for gas production), 71,000 of which will be produced from a renewable and sustainable source.

EECL will continue the consult with all interested parties throughout the development and operational phases of the Project, keeping local residents and business informed of progress and addressing any comments and concerns that may be forthcoming.



Printed copies of the Environmental Statement
may be obtained from Eclipse Energy at the
address below for a charge of £250.

Copies of the Environmental Statement in
CD format and additional copies of the Non
Technical Summary are also available free of
charge from the address below.

This Non Technical Summary is available in
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