

Walney Offshore Windfarm

Environmental Statement | **Non Technical Summary**



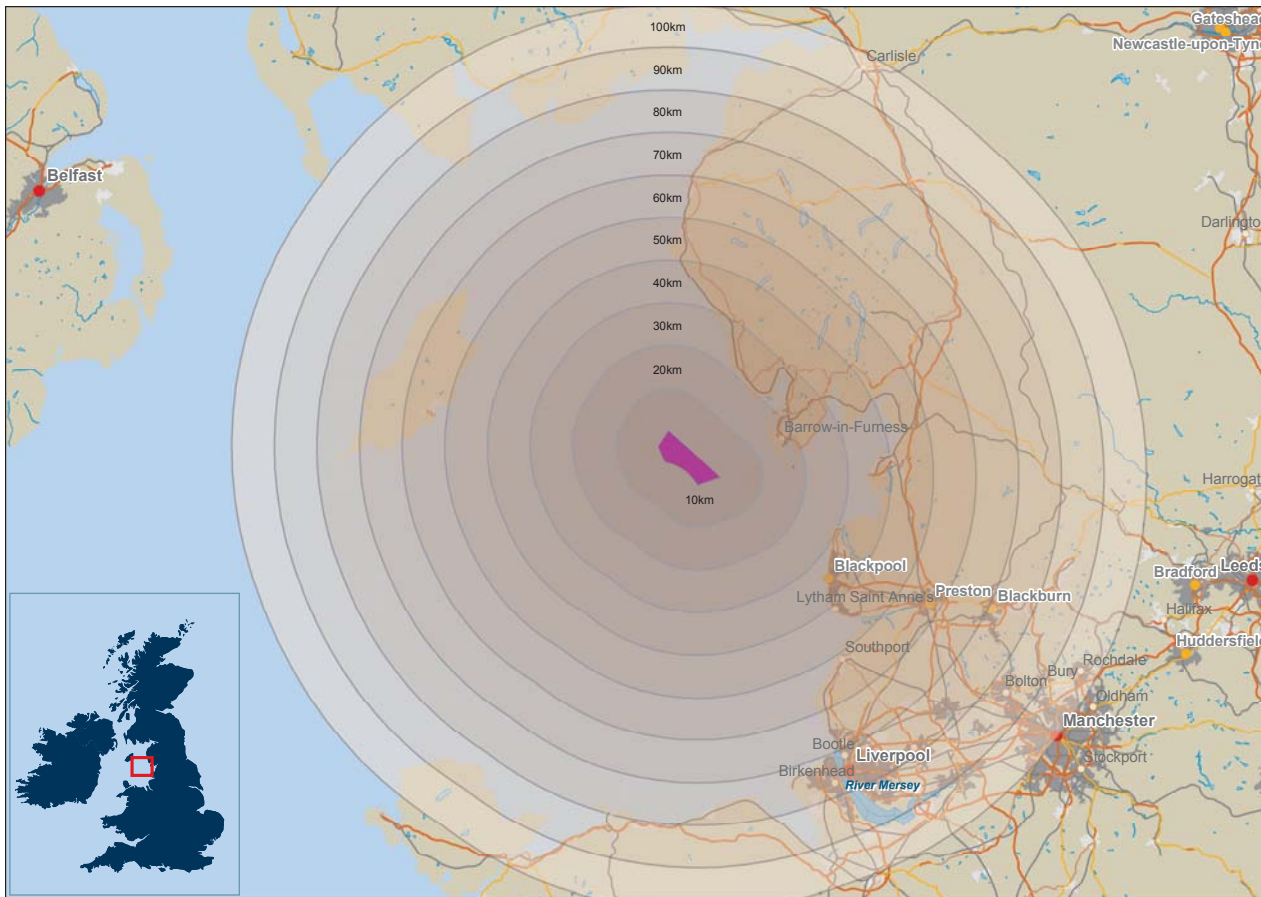
March 2006



Barrow Offshore Wind Farm (Barrow, 2006)

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NON TECHNICAL SUMMARY



Location of Walney Offshore Windfarm

This document is a non-technical summary of the Environmental Statement (ES) for the Walney Offshore Windfarm project. The ES is based on information from a number of surveys, studies and impact assessments.

DONG Walney Ltd. (UK) is planning to build a windfarm of 450 - 600MW capacity 14km offshore Walney Island (Barrow in Furness) between the Cumbrian coast and the Isle of Man.

The site chosen for the windfarm lies in an area of relatively shallow water, at some distance from the coast, but within British territorial waters (12 nautical miles from the coast). The location of the site represents a compromise between optimal wind resource, limited impact on fishing and shipping activities, optimal construction depths, and the visual impacts.

The completed windfarm will make a substantial contribution to the United Kingdom's energy requirements in the form of clean, emission-free electricity. It will thus assist in achieving the UK's commitments to reduce greenhouse gas emissions.

Construction, operation and decommissioning will have a number of impacts on the chosen site and its surroundings, and the purpose of the Environmental Statement is to describe and evaluate those impacts. It is our firm belief that the positive impacts of the windfarm far outweigh the negative impacts.



Introduction

DONG Walney (UK) Ltd. is a wholly owned daughter company of DONG A/S, an energy company based in Denmark. DONG produces, distributes and trades in energy and related products in Scandinavia and northern Europe. DONG is wholly owned by the Danish state, but privatisation is planned to take place in 2007. DONG has a small but rapidly growing interest in renewable energy sources, primarily windpower, but also geothermal energy, fuel cells and district heating. DONG owns and operates land-based wind turbines in Denmark and is partner in a number of offshore windfarm projects in Denmark and the United Kingdom, including the Barrow Offshore Wind Farm not far from the proposed Walney Offshore Windfarm site. Further information can be found at www.dongenergy.com.

Walney Offshore Windfarm represents a major step forward for DONG's renewable energy activities. The project is significantly larger than any other offshore windfarm constructed so far.

The Project

The windfarm will most likely be constructed in two phases. Phase 1, i.e. approximately 160MW to be constructed in 2008, and phase 2, awaiting transmission grid reinforcement in the landfall area, to be constructed in 2012.

The Wind Turbines and the Foundations

The windfarm turbine array consists of a number of rows of wind turbines connected by cables to two substations from which export cables on the seabed carries the power to shore. The number of turbines will depend on what MW size is well proven at the time of construction. Turbines within the range 2.3-9MW have been assessed.

The turbines and offshore substations stand on individual foundations of concrete or steel. A number of foundation types exist, and the type to be used has not been finally decided. The impact assessment has taken this into account by taking the "base case" and the "worst case" foundation for each type of effect. For example, the gravity foundation takes up more space on the seabed and gives rise to more turbidity and sedimentation during construction, whereas the steel monopile gives rise to noise impacts when it is driven into the seabed.

The construction of the foundations and installation of the wind turbines involves a number of workboats, crane barges and support vessels. Shipping of materials and supplies to the site will also create additional traffic during the construction period.

The windfarm will be connected to shore by two export cables buried in the seabed. Conventional techniques will be used to install the cables and will cause only temporary disturbance to the seabed. The first export cable will have its landfall at Heysham and the second at Cleveleys, and both cables will continue as conventional

buried power cables to the substations at Heysham and Stanah/Hillhouse respectively.

The Windfarm Site Selection

The site proposed for Walney Offshore Windfarm is leased from the Crown Estate as a so-called Round 2 Offshore Windfarm site. These sites have been offered in three selected strategic areas around the British coastline.

The choice of site for an offshore windfarm is strongly influenced by the need to find a site with good wind characteristics, shallow water (to reduce construction costs) and a near-shore position (to reduce energy losses and cable construction costs). The location of Walney Offshore Windfarm is based on these considerations, but in addition, a number of compromises have been made to take account of other activities and interests offshore the Cumbrian coast. Biological impacts, sand and gravel extraction sites, offshore oil and gas production facilities, fishing grounds, helicopter and shipping routes and submarine cable links have all been taken into consideration.

A number of other sites in the Liverpool Bay Area are also being studied with a view to construction of windfarms. The cumulative effects of these developments - if realised - must also be taken into consideration when assessing the impacts that may arise.

Wind Energy Production

With a power capacity of 450MW, possibly increasing to 600MW, Walney Offshore Windfarm will make a substantial contribution to British renewable energy production. The UK government has set a target of 10% renewable energy by 2010, ideally rising to 20% by 2020. Walney Offshore Windfarm will also contribute to a reduction in greenhouse gas emissions by displacing fossil-fuel based electricity. The United Kingdom has a national target of a 20% reduction in CO₂ emissions in 2010 relative to 1990.

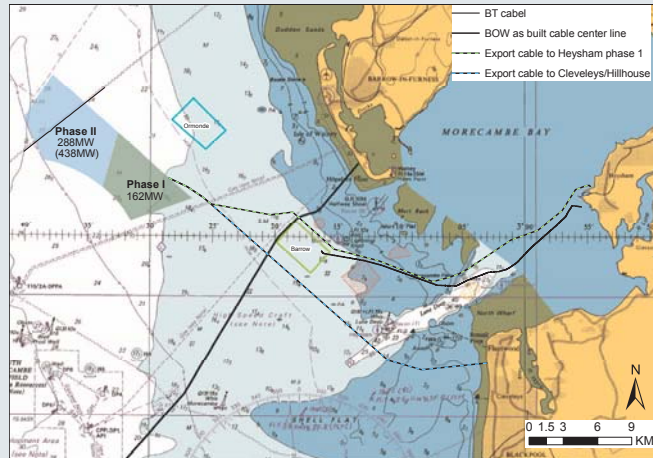
SUMMARY OF WALNEY OFFSHORE WINDFARM SCENARIOS

1) Most likely the windfarm will be constructed in two phases:

- Phase I, approximately 160MW installed in 2008 or later

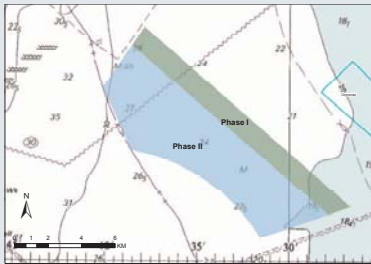
- Phase II, 290 to 440MW installed, when the transmission grid of the Heysham Ring has been reinforced, currently expected in 2012/2013

The current Agreement for Lease for Walney Offshore Windfarm specifies an upper limit of 450MW. The windfarm area has a potential for an installed capacity of 600MW. Therefore up to 600MW is applied for.

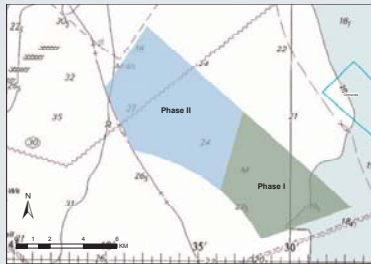


2) Three different park layouts have been described.

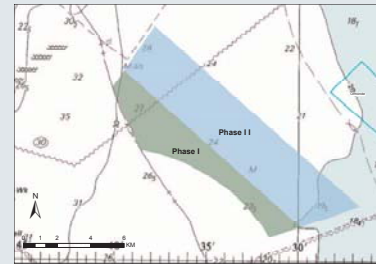
Park Layout 1



Park Layout 2



Park Layout 3



3) Four alternative wind turbine configurations have been described in the range from 2.3 to 9MW.

4) Three types of foundations have been described.

5) Two substations have been anticipated.

6) Two meteorological masts have been anticipated.

7) Two cable routes have been expected:

- Phase I, from the windfarm to Heysham substation.
One route will be applied for and three alternative assessed options are presented.

- Phase II, from the windfarm to Hillhouse substation.
One route will be applied for and three alternative assessed options are presented.

All coordinates used in the technical description of the Environmental Statement are to be considered as indicative.

Because of its size, Walney Offshore Windfarm will make a noticeable positive contribution to a problem of global importance.

The scale of the offshore windfarms currently envisaged in the UK is far larger than in any other country in the world. A development of this size will contribute significantly to a low carbon future, job creation, and an update of the energy infrastructure.

There are many important users of the sea in the United Kingdom. A major challenge for windfarm developers is to ensure the problem-free co-existence of offshore windfarms with existing activities including navigation, sand and gravel extraction, oil and gas activities and commercial fisheries.

The Environmental Statement (ES)

The impacts of the proposed windfarm will fall into three distinct phases: construction, operation and decommissioning. Full information about the impact assessment is given in the ES report and its accompanying Annex sections. The report deals with the environmental impact of the proposed project during the construction, operation and decommissioning phases, as well as describing the quality, safety, health and environmental management and monitoring systems that will apply during the lifetime of the project.

The ES presents the justification for the proposed Walney Offshore Windfarm project and the different



Barrow Offshore Wind Farm (Barrow, 2006)

options for project implementation. It considers the impact of the proposed project on the physical, biological and human environment in the geographical area surrounding the project where potential effects could occur. Cumulative effects of Walney and other windfarm projects in the area are also considered.



Wind is monitored at the nacelle (Barrow, 2006)

The Environmental Impact Assessment Process

Scoping

In September 2004 Walney Offshore Windfarm submitted its Scoping Report to the Department of Trade and Industry (DTI). The report identified the physical limits of the proposed project study area and the time frame for the study. It identified key potential risks and the types and levels of impacts that were to be assessed and used to select alternatives for consideration.

The Scoping Report also formed the basis for initial consultations of some 150 stakeholders in addition to those consulted by the Secretary of State. 41 of the parties who were asked to comment on the Scoping Report forwarded a reply.

The DTI considered the Scoping Report in accordance with regulations and formulated a Scoping Opinion

following consultations with English Nature, the Countryside Agency, Cumbria County Council, the Maritime and Coastguard Agency, Barrow Borough Council and Trinity House Lighthouse Services. The Scoping Opinion resulted in adjustments and additions to the proposed surveys and studies for the Environmental Impact Assessment.

An integral part of the Environmental Impact Assessment process is consultation with statutory and non-statutory consultees and key stakeholders, particularly those people and companies living and working in areas near to the proposed project. During the whole Environmental Impact Assessment process, authorities and stakeholders were consulted regarding specific issues.

Following dialogue between the developer and key stakeholders on the navigational issue together with a formal consultation procedure defined by The Crown Estate, a boundary

amendment of the proposed site for the windfarm has been made in order to mitigate possible navigational problems.

Public Exhibitions

In November 2004 Walney Offshore Windfarm carried out a MPs Briefing and Public Information Programme. The briefing was held at the House of Commons in London for local Cumbria and Lancashire MPs and followed by a series of four Public Exhibitions in Millom, Barrow, Morecambe and Blackpool. These exhibitions provided general information about wind energy together with more detailed information about the proposed windfarm projects off the coast of Cumbria.

A second public consultation is to take place at the end of March 2006 in order to present the project and the results of the Environmental Impact Assessment undertaken for Walney Offshore Windfarm.

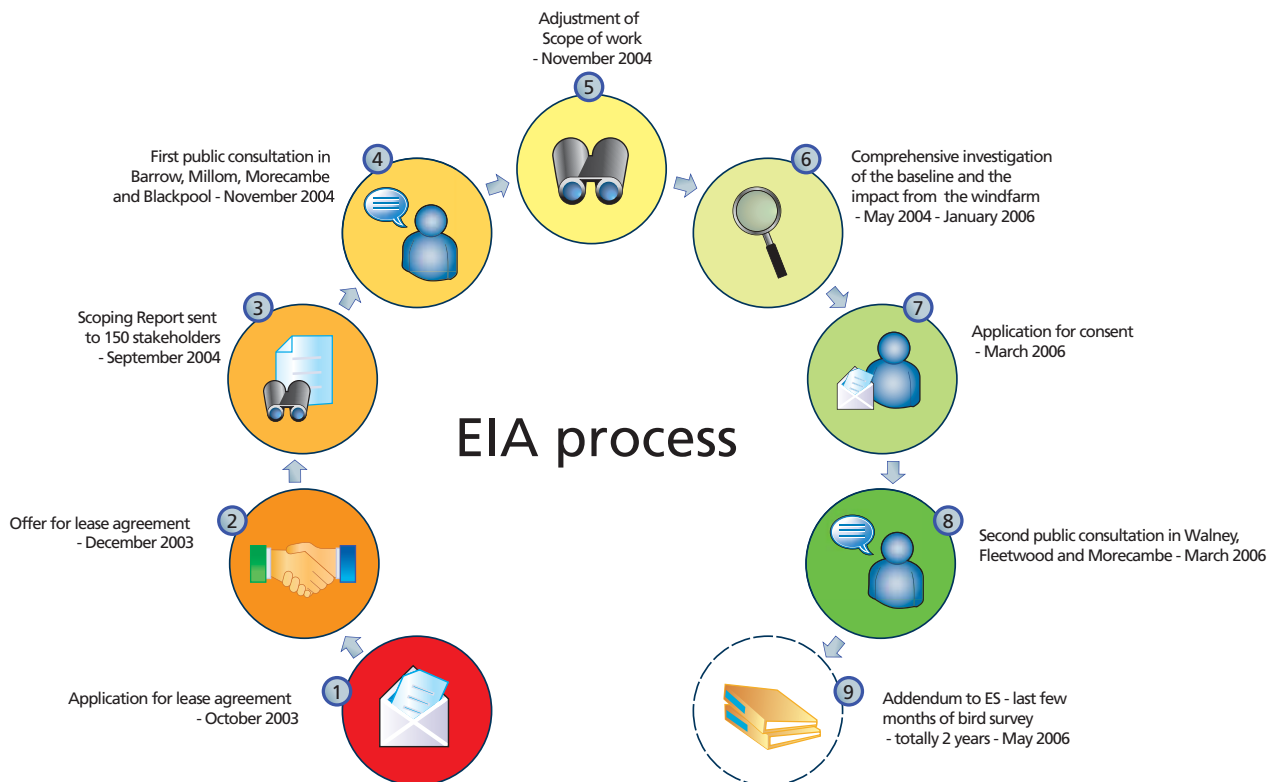


Illustration of the process of the Environmental Impact Assessment (EIA)

East Irish Sea Developers Group

The Round 2 windfarm developers in the East Irish Sea and some of the Round 1 developers have joined forces in the so-called East Irish Sea Developers Group (EISDG). Whenever possible and convenient, this group has coordinated contact with the local and national authorities in order to assist the process of applications for consent, and also to coordinate the locations of the different sites. Various combinations of the developers within the group have jointly undertaken major parts of the environmental surveys and other investigations required for the Environmental Impact Assessments.

Investigations

Following the guidelines and specifications established by DTI and EU on Environmental Impact Assessments concerning offshore windfarms, a whole range of details with regard to the physical, biological and human environments have been assessed.

This non-technical summary presents the overall results of the assessment, and highlights a number of issues that have been identified by the developer as being of key interest.

Stakeholders are encouraged to read the main report and the annexes to the report to find more detailed information on any specific issues.

Regulatory Consents

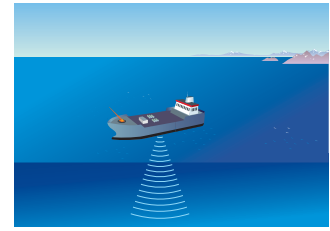
A number of regulatory consents are required for the construction and the operation of Walney Offshore Windfarm. The Offshore Renewable Consents Unit established by Department of Trade and Industry and Department for Environment, Food and Rural Affairs leads the consents process.

The key consents applied for are the following:

Consent under **section 36 of the Electricity Act 1989** to construct and operate a windfarm. This will also



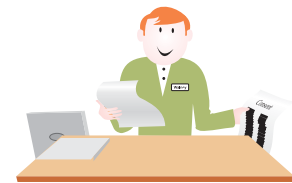
March 2006
ES Submitted



May 2006
Geotechnical Investigations 1



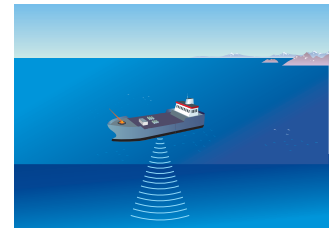
March 2006 -
March 2007 Tender Procedure
and Contract Negotiations



March 2007
Consent



March 2007
Financial Close



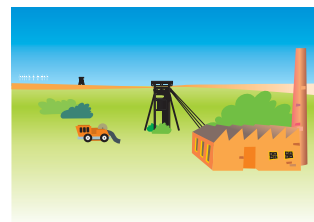
March - May 2007
Geotechnical Investigations 2



March 2007 - March 2008
Fabrication



March - December 2008
Construction Phase I
approx. 162MW



Reinforcement of
the Onshore Grid



Approx. 2012
Construction of Phase II
approx. 288MW, totally
450MW (600MW)

Illustration of the windfarm construction process

cover the offshore cables and other infrastructure.

FEPA License under **section 5 of the Food and Environment Protection Act 1985**, concerning the protection of marine ecosystems.

Consent under **section 34 of the Coast Protection Act 1949** in order to make provision for the safety of navigation in relation to the export cables.

Planning permission under **section 90 of the Town and County Planning Act 1990**, sought as part of the section 36 application, for the onshore elements of the works (“Deemed planning permission”).

Extinguishment of public rights of navigation will be requested under the **Energy Act 2004** for the areas of seabed directly covered by the offshore structures. Safety zones around all structures will also be requested in order to prevent those navigational activities in the windfarm area that are considered to be a safety risk.

The Environmental Impact Assessment

Visual Impacts

The Walney Offshore Windfarm will be located approximately 14km from the coastline of Walney Island in a north-west to south-easterly direction covering an area of approximately 73sq.km. As the basis to undertake the landscape and visual assessment, the base case was selected comprising 45 3.6MW turbines in Phase 1 with a proposed blade tip height of 157m, and 48 6.0MW turbines in Phase 2 with a proposed blade tip height of 202.5m. This gives a total of 93 turbines with a maximum power capacity of 450MW. Scenarios with a high number of small turbines and fewer large scale turbines together with the 600MW scenario were also assessed.

A total of 17 viewpoints were agreed with the Local Planning Authorities and statutory consultees. The viewpoints ranged from St. Bees Head in the north and down the coastline to Blackpool Tower in the south, using

both elevated and low level locations at points on the coastline itself and further inland. Computer-generated visibility plans, photomontages, images, and wireframe outlines were prepared from all of the viewpoints. Five viewpoints were deemed to be particularly sensitive due to their elevated location or their proximity to the windfarm.

The assessment included potential for significant visual effects during the construction phase and during the operational phase of the windfarm. During construction of the turbines, offshore substations and cable laying, the assessment concluded that there would be temporary, short term visual effects essentially from the closer range viewpoints on Walney Island, however, the significance of the visual effects was assessed to be minor to negligible. The effects were due primarily to the movement of offshore vessels. Following the recent construction of the Barrow Offshore Windfarm, these activities are considered to be familiar activities within the seascape already.



Visualisation, viewpoint Biggar Bank Road

Based on information supplied by the Met Office, a detailed visibility assessment concluded that in more distant views from the north, the windfarm could potentially be visible for up to 10 days per year (2%) from a distance of 42km, whilst at the more close range viewpoints on Walney Island at a distance of 14km the potential visibility rose to 205 days per year (56%). To the south from Blackpool Tower at a distance of 35km, the windfarm could be potentially visible up to 37 days per year (10%).

A detailed assessment of the potential effects for residents, tourists and road users was undertaken for both the landscape character areas and regional seascape units from West Cumbria via Morecambe Bay to the Fylde Coast. The assessment concluded that during the operational phase of the windfarm, the effects on the landscape and seascape character would be of moderate significance for areas in the vicinity of the Duddon Estuary and Walney Island, and of slight significance for Morecambe Bay and the Fylde Coast.

A detailed visibility assessment to assess the potential for significant visual effects concluded that in views from the north along the western coastline of Cumbria from St. Bees to Bootle Fell, the visual effects were of minor to negligible significance. In closer distance views from the northern shoreline of the Duddon Estuary at Haverigg and along the western shoreline of Walney Island, the effects were assessed to be of moderate significance. For inland viewpoints, from Kirkby in Furness, Ulverston and within the Furness Peninsula, the effect was assessed to be of minor to negligible significance.

In views from the east and the south, the significance of effects was assessed to be minor, whilst at Morecambe, Heysham and Blackpool the significance of effects was assessed to be negligible.



Visualisation, viewpoint High Haume Farm

For the most sensitive viewpoints including Black Combe, Haverigg coastal path, above Askam in Furness, Biggar Bank Road, Walney Island and South Walney Nature Reserve, the effects were assessed to be of moderate significance.

For the assessment of Walney Offshore Windfarm in conjunction with Barrow Offshore Wind Farm, the assessment of effects on the seascape and visual environment did not reveal any 'significant' effects as classified under the Environmental Impact Assessment Regulations (England and Wales) 1999.

Cumulative Visual Impacts

The assessment of cumulative effects included all the other four Round 1 and Round 2 offshore windfarms and the four operating on-shore windfarms within the 45km study area.

Due to the close proximity of the Walney Offshore Windfarm to the West of Duddon Sands Offshore Windfarm, the cumulative effect assessment was undertaken as a joint exercise. The assessment also took into account the numerous other offshore structures within the Eastern Irish Sea, including several gas platforms.

All 17 viewpoints were assessed to determine the potential for residual cumulative effects. The results of the detailed assessment indicated that some residual landscape and visual effects already exist in West Cumbria, due to the existing Barrow Offshore Wind Farm and the existing onshore developments at Haverigg, Askam, Harlock Hill and Kirkby Moor.

When the proposed wind farm developments of West of Duddon Sands and Walney are considered together

with all the other proposed offshore windfarms and the operating onshore and offshore developments, some major changes to the character of the landscape and seascape will be caused in certain areas.

It is concluded that from the sensitive viewpoints on the Coast Path close to Haverigg and along the western shoreline of Walney Island at Biggar Bank Road and at the South Walney Nature Reserve, there will be residual visual effects of major significance. Moderate residual effects will occur at the elevated viewpoint on Black Combe. Moderate residual effects would also occur along the western shoreline of the Fylde Coast, but from these locations the effects are due primarily to the development of the Shell Flat wind farm. They are not attributable to the West of Duddon or Walney Offshore Windfarms.

Navigation

A series of studies has been undertaken of the possible impact of the windfarm on shipping, leisure sailing and navigational radar operations. Two 14-day maritime traffic surveys were carried out in the windfarm area using shore-based radar etc. The study showed a total of 20-60 vessels per day around the site.

If no other windfarms than Walney Offshore Windfarm were constructed, it is anticipated that commercial shipping would alter its passage so as to clear the eastern edge of the Walney Offshore Windfarm site. In itself this is a minor change of voyage distance and time. However, the cumulative impacts of the planned and constructed windfarm developments in the Morecambe Bay area have further implications.

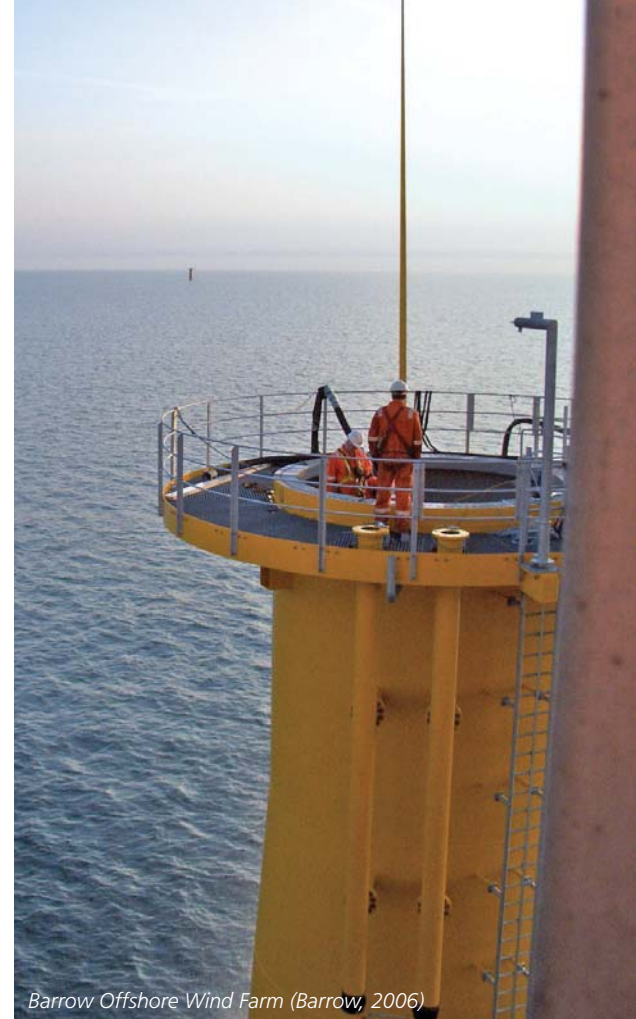
The main issue, seen from the perspective of Walney Offshore Windfarm, is the distance between Walney Offshore Windfarm and the planned Ormonde Combined Gas and Windfarm project. Construction of both

developments would force the NW/SE traffic to funnel between the two sites. The distance between Walney Offshore Windfarm and Ormonde was raised as an issue of concern during consultations with shipping operators. As a result, the siting of Walney Offshore Windfarm site was amended to increase the separation between the project boundaries from 1.3nm to 2.2nm.

Safety Aspects

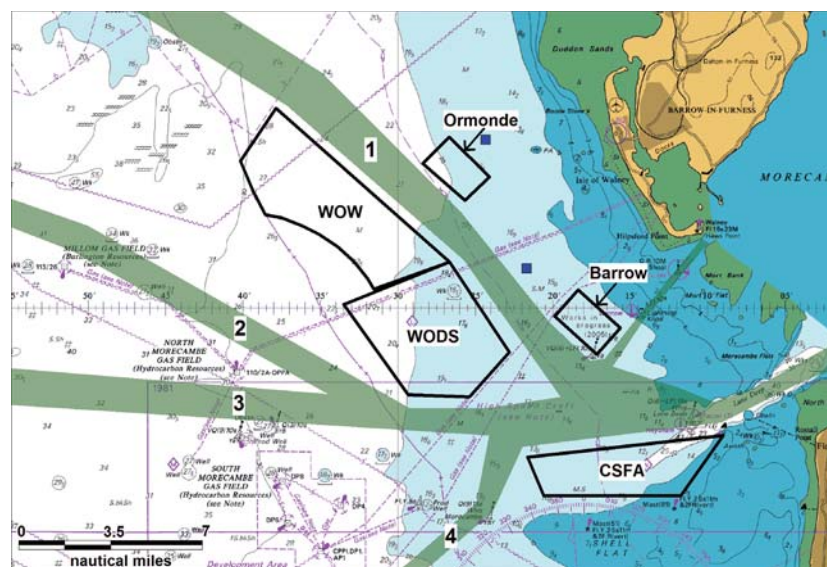
Walney Offshore Windfarm has undertaken a Formal Safety Assessment in accordance with international and national standards. Hazards associated with the windfarm were identified, and the associated scenarios prioritised by risk level. Within each scenario, vessel types were considered separately to ensure that the risk levels were assessed for each type of vessel, and the control options were identified on a type-specific basis. For example, risk control measures for fishing vessels may differ from those for tankers.

Ranking of the consequences of a collision showed that the majority of incidents are expected to result in only minor damage. In a scenario involving a larger ship, it is expected



Barrow Offshore Wind Farm (Barrow, 2006)

that a head-on collision at steaming speed would lead to the collapse of a turbine. The likely consequence will be limited pollution from the oil contained within the wind turbine. Breach of a vessel's fuel tank is considered unlikely, and in the case of a tanker or nuclear vessel, the additional safety features associated with these vessels



Anticipated Impact of all NW Windfarms on Main Shipping Lanes

would further mitigate the risk of pollution. In terms of smaller vessels such as fishing and recreational craft, the worst-case scenario would be risk of damage leading to sinking of the vessel.

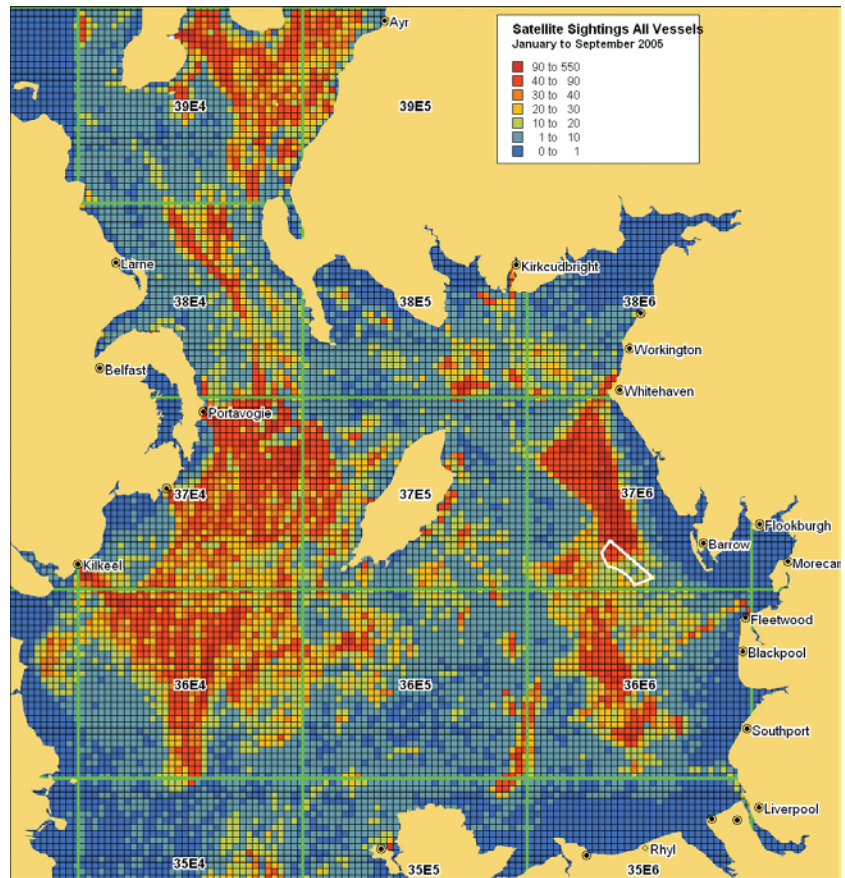
In addition to the boundary amendment of the windfarm that has already been undertaken to reduce navigational impacts and risk, a considerable number of mitigation measures are considered, including deployment of navigational buoys, emergency response and oil spill response plan, a continuously manned control room, and a dedicated rescue boat. With regard to recreational navigation, a proposal for a marked channel through the area will be further evaluated. Based on the sum of the actions planned, the negative impacts on navigation are assessed to be minor, although of permanent nature.

Commercial Fishery

Walney Offshore Windfarm will be situated within fishing area 37E6, for which fisheries statistics are available from the International Council for the Exploration of the Sea (ICES). The area covers 2490 km², of which the windfarm site covers a little less than 3%. The major landings are *Nephrops* (Norwegian lobster, “Dublin Bay prawn”) and sole.

Most of the sole landings come from foreign fishing vessels that only fish outside the 12 nautical mile boundary, i.e. outside Walney Offshore Windfarm. There is a minor fishery for *Nephrops* within the windfarm site. This fishery is dominated by local vessels, although some Northern Irish vessels may occasionally have participated.

During the construction phase, only construction vessels will have access



Relative Distribution of Fishing Vessels Positions – All Nationalities, Jan. – Sept. 2005 (Defra)

to the windfarm site. This is in line with normal offshore practice. A 500 metre safety zone will apply around the laying and trenching vessels during export cable installation. In the periods between cable laying and burial, a temporary safety zone will be established along any unburied cable sections.

Permission will be sought to establish safety zones around all structures within the windfarm site from the beginning of construction to the end of decommissioning. The impact arising from loss of fishing area will be the subject of further consultations with the fishing industry. The assessment suggests that only a limited number

of vessels regularly fish the area of the Walney Offshore Windfarm site to any significant extent. The findings of the Baseline Assessment indicate that the impact arising from loss of area will be vessel-specific, and mainly confined to vessels based at Fleetwood, Barrow and Kilkeel/Whitehaven.

The satellite tracking data suggests that the Kilkeel-Whitehaven *Nephrops* trawlers are the most numerous vessels within the area, with up to 27 individual vessels being tracked in the area. The proportion of sea time spent by these vessels within the site appears low, however, with only 5 vessels recording more than 1% of their position plots within the site.



The possible impact on fisheries in co-existence in general with offshore windfarms can be mitigated through a number of initiatives such as introduction of other fishing methods, and help to local fishermen to identify new fishing sites. At least identifying new fishing sites may be possible for Walney Offshore Windfarm because the *Nephrops* is abundant at present, and quotas have recently been increased in the Irish Sea, West of Scotland and North Sea areas.

Taking into account the relatively small numbers of vessels involved, possible reductions in vessel numbers due to decommissioning of vessels, possible relocation of larger vessels to the North Sea, and the proportion of effort that would be displaced, the residual overall loss of access is expected to have only a minor impact.

Cultural Heritage

Records of wrecks and seabed obstructions within the Marine Study Area were collated using information provided by the United Kingdom Hydrographic Office and the National Monuments Record.

Of the 21 live wrecks within the Marine Study Area, 8 constitute the



remains of identified vessels while 13 of the wrecks are unidentified.

The significance of the effect of windfarm development upon archaeological remains has been determined on the basis of the importance of the feature in question and the scale of any likely impact.

Based on the detailed mitigation measures, no significant residual impact is expected from the development of Walney Offshore Windfarm

on important archaeological findings. The residual impact of changes in scour and sedimentation patterns associated with the construction, operation and decommissioning of Walney Offshore Windfarm may be negative where wrecks and/or prehistoric deposits are exposed to erosion.

In some circumstances, the residual impact may be positive if increased sedimentation leads to burial of an archaeological site or feature, resulting in increased protection.

Wreck Status	No. of Wrecks
Live wreck – a wreck considered to exist by the UKHO	21
Live obstruction – an obstruction considered to exist by the UKHO	4
Live foul – a foul considered to exist by the UKHO	5
Dead wreck – a wreck not detected by repeated surveys and therefore considered to not exist by the UKHO	8
Dead obstruction – an obstruction not detected by repeated surveys and therefore considered to not exist by the UKHO.	0
Dead foul – a foul not detected by repeated surveys and therefore considered to not exist by the UKHO	2
Obstruction listed in Kingfisher Charts Obstruction Book General and recorded in the NMR	54
Possible wreck identified on aerial photographs by WA	2
Total	96

Classification of maritime records within the Marine Study Area

Social and Economic Impacts

The construction and operation of Walney Offshore Windfarm will have social and economic impacts in the region. The most important impact will be on employment. Tourism and leisure may also be affected.

Employment

The construction phase of Walney Offshore Windfarm will create a number of jobs. Some of these could potentially be sourced locally. Further, the existing service sectors will benefit from the service requirements of the additional temporary labour brought in from outside the area.

During the operational phase of the windfarm, a number of employees will be required on a long-term basis for the operation, maintenance, monitoring, management and administration of the offshore facilities. There are obvious advantages in sourcing such jobs locally.

A conservative estimate from European Wind Energy Association suggests a value of 0.1 direct employees per MW in the operations and maintenance phase of wind energy projects. This suggests that some 45 - 60 maintenance jobs will be created by Walney Offshore Windfarm, and hundred of jobs will be created for a 20 - 30 year period or longer if all proposed windfarms in North West are realized.

Furness Enterprise is very active in terms of preparing the area for new possibilities in the wind energy business. This covers all project phases and could lead to substantial involvement for local industry.

Tourism and Leisure

Walney Offshore Windfarm will be visible primarily from the Fylde and Walney coasts. Some tourists may feel attracted by the sustainable technology. Others may feel that the windfarm spoils the seascape. There is currently no evidence that tourists would stay



Installation of offshore substation (Barrow, 2006)

away from coastal areas nearby offshore windfarms.

The same considerations apply to other leisure users, such as walkers on coastal paths and visitors to coastal nature reserves, where the seascape effects could intrude upon the visual amenity.

The leisure activities most likely to be affected by the presence of the windfarm will be sea-based recreation such as sailing and yachting, windsurfing, scuba diving, leisure fishing and power boating. Again, there is no evidence that the offshore windfarm would influence such activities in any negative way.

Other Human Activities

Ministry of Defence has been consulted in order to ascertain whether the windfarm project could affect military activities in the area, for example by affecting radar or impacting on the firing range north of the site.

National Air Traffic Services (en route) has been consulted before and after technical investigations concerning radar implications in the area.

There are important **gas exploitation activities** in the Morecambe bay area. Because of the use of helicopters for supply and rescue activities in the industry, the distance from the nearest wind turbines in Walney Offshore Windfarm to the gas platforms will respect the minimum 6nm distance proposed by the Civil Aviation Authority. The windfarm will have no effect on the supply boats to the platforms, nor will microwave links be influenced. The export cables will cross the existing gas pipelines in the area. Consultation on crossing agreements will be initiated after consent has been achieved.

There are two **marine aggregate dredging and extraction** licenses active in the eastern Irish Sea. One of the license areas is located 7nm north-west of Walney Offshore Windfarm. The windfarm will impact the aggregate dredging activities from a purely navigational point of view, since the dredgers currently pass through the site on their way to and from the license area. The altered route would be some 2-3% longer. The operator of the license, United Marine Dredging, has been consulted during the

assessment process. The operator has indicated that the boundary amendment already undertaken by Walney Offshore Windfarm has significantly improved the situation compared to the originally proposed boundaries for the windfarm.

Ofcom and telecommunication operators have been consulted concerning potential impact on radio and TV links in the area. No such impacts are expected according to operators and experts.

Noise

Some construction activities such as driving of monopiles are quite noisy. It is not certain that monopile foundations will be used, but it is possible. Since the wind turbine nearest to the coast is 14km away from Walney Island, the sound will be greatly reduced when it reaches the shore.

The airborne noise from the windfarm construction will be low and only discernible at the nearest shores under very special weather conditions. Noise during cable trenching onshore will be comparable to general road maintenance work, and it will not be possible to hear the wind turbines when the windfarm is operating.

The waterborne noise will occasionally be significant during construction, but will not affect humans. The other activities will produce noise at negligible levels.

The Coast and Seabed

The Environmental Impact Assessment for Walney Offshore Windfarm has included investigations into potential effects on the physical processes of the Morecambe Bay region. The assessment has included effects on suspended solids, scour effects, effects on sediment transport, and effects on waves and tides. The different scenarios in regard to number of turbines and foundation options have been taken into account.

The general conclusion is that only negligible impacts on the physical environment are expected to occur from the construction, operation and decommissioning activities.

The windfarm project would have some localised impact in the immediate vicinity of the site, but the impacts further away from the site are expected to be negligible.

Scour protection is anticipated to be needed around the offshore struc-

tures, depending on the foundation design that is finally selected. Some disturbance of sediment would also occur as a result of the cable installation process. However, potential impacts are comparable to disturbance from natural processes in the Morecambe Bay region.

Birds

The protection of bird life has been an issue of great concern for the project, and a two-year assessment has been undertaken. Boat surveys have been performed since May 2004 and aerial surveys have been conducted, first in 2002 and regularly since February 2004. The surveys cover the windfarm site and surrounding waters, to obtain a good picture of the bird species living and foraging at Walney Offshore Windfarm site.

Migrating birds, such as Whooper Swan and Pink-footed Goose, were also assessed. In October 2005 a research vessel was placed for a month at the Walney Offshore Windfarm site and recorded migrating birds using horizontal and vertical radar. Simultaneously, a team of ornithologists recorded the occurrence and movements of the species at the onshore bird sanctuaries.



Photo: Jupterimages

Whooper Swans



Photo: Jupiterimages

A variety of marine mammals present in the area

The Walney Offshore Windfarm is located in an area of relatively low bird density. The populations of most species are small, although species of conservation importance are present, like the Common Scoter, Herring Gull, Lesser Black-backed Gull, Manx Shearwater, Pink-footed Goose, Red-throated Diver, Sandwich Tern and Whooper Swan.

The observations of Manx Shearwater and records of their behaviour indicate that they may feed in the western part of the boat survey area. Although some of these records are within the western part of the proposed Walney Offshore Windfarm, the majority are located several kilometres to the west of the windfarm boundary and may be associated with deeper water. During July and August, Manx Shearwater is present in considerable numbers at the western part of the site. The construction of the windfarm may result in displacement of this species, but the impacts are assessed as only minor in nature.

The impacts of the windfarm on habitat loss and displacement on all other species have been assessed. It is concluded that the impacts may be regarded as negligible.

With regard to migratory species, the investigations revealed that only a few Whooper Swan and Pink-footed Goose pass the site when migrating, and the impacts from collision and barrier effects are assessed to be negligible. Common Scoter flies over the site, but always at heights below the rotor blades, so it is concluded that the risk of these ducks colliding with turbines is negligible. There is a low collision risk for other species.

In total the impacts of the windfarm on bird species are assessed to be negligible.

Whales, Dolphins and Seals

The East Irish Sea is generally a region with a low abundance of whales, dolphins and seals, although harbour porpoises and bottlenose dolphins are present in the region. Three species are considered important for the region: harbour porpoise, bottlenose dolphin and grey seal.

The major impact on marine mammals from windfarms arises during the construction period due to the underwater noise that is caused. The loudest noises generated during construction would be those associated with pile driving.

Marine mammals that are less than 1000m from peak pile driving operations may suffer physical damage. Therefore it will be a requirement that whales, dolphins and seals less than 1000m from the pile-driving site are scared away before driving begins. A combination of slow start-up of hammering and scaring devices will be performed.

At distances between 0.5 and >20km the specimens may experience discomfort and will move away until the noise is over. The whales, dolphins and seals may move around in the East Irish Sea as a result of the cumulative waterborne noise whilst different offshore windfarms are being constructed. Although in the short term this might exclude marine mammals from parts of the East Irish Sea area, this is expected to have only a minor effect on the overall population of the three key species.

Other Wildlife

Potential impacts on other forms of marine life apart from birds and mammals have also been thoroughly studied. The studies assessed possible impacts on the bottom fauna, shellfish and fish in the affected area. The largest part of the seabed that will be covered by structures and stone inside Walney Offshore Windfarm comprises less than 0.4% of the windfarm area. No special protected species will be affected.

The remaining impacts, e.g. of suspended sediment and the electromagnetic fields around the cables, are expected to result in negligible impacts on the marine environment.

Summary of Cumulative Impacts

The selection of so-called Strategic Areas with regard to offshore wind energy development is an important part of the Government strategy for renewable energy development in the UK. The North West Strategic Area, where Walney Offshore Windfarm is



Photo: Vestas

Barrow Offshore Wind Farm

situated, is an area, where a number of other windfarms are either consented or planned. In addition, oil and gas activities are ongoing together with aggregate dredging.

Barrow Offshore Wind Farm is now constructed. The Ormonde project and Cirrus Shell Flats Array project have submitted application for consent. The West of Duddon Sands project will submit in the same period as Walney Offshore Windfarm. Further south and north in the area other projects are ongoing and planned for.

An important part of the Environmental Impact Assessment undertaken for Walney Offshore Windfarm concerns the cumulative impacts of the project. The analyses have been undertaken in close cooperation with the other windfarm developers in the area.

Even if all potential cumulative impacts have been analysed, special attention have been given to 4 major issues, i.e. navigation, birds, commercial fisheries and visual impact.

Navigation

The distance between the Ormonde project and Walney Offshore Windfarm has been highlighted as a concern from MCA and a boundary amendment initiated for the Walney project in order to increase this

distance has been undertaken. Sailing simulation studies and a number of other analyses indicate that from a navigational safety point of view, the planned distance increased from 1.3nm to 2.2nm between the two sites leave sufficient distance to comply with worst case collision risk. Rerouting of the ferries sailing in the area will be needed after the development of the Ormonde and Walney projects. Such rerouting will increase sailing distance with a few minutes in time and cause a minor increase in fuel costs.

Birds

The coexistence of birds and windfarms has generated discussions since the utilisation of modern wind technology took off. A co-operation between windfarm developers in the area on cumulative bird assessments have focused the species Common Scoter, Red-throated Divers, Pink-footed Goose, Whooper Swan and Lesser Black-backed Gull after intensive consultation with English Nature, hereafter suggested to be the key bird species or groups present within the general area. It has been concluded that the Walney Offshore Windfarm would not make a significant contribution to any potentially significant cumulative ornithological effects of the future development of the North West Strategic Offshore Windfarm Area.

Commercial Fisheries

The scale of any cumulative impacts on the commercial fishery will largely be a function of the effective range of the vessels that could potentially be impacted, relative to the locations of the windfarm developments within the Irish Sea. Density of satellite-tracked position plots for fishing vessels relative to the planned and consented windfarms have been established. It appears that 10 vessels, which had plots recorded in the Walney site also had plots recorded in other proposed windfarms. Four larger vessels, i.e. over 15 meters and two in particular could potentially suffer cumulative impacts due to the development of Walney Offshore Windfarm.

Visuals

The cumulative assessment determined that as a result of the number of existing and anticipated windfarms proposed within these seascape units, that the overall character of all four seascape units will inevitably change to a seascape character affected to varying degrees of significance by windfarm developments. In particular, the Barrow and Walney Island Seascape Unit and views from within that Unit area, will become dominated by windfarm developments, in effect would become 'windfarm seascapes.' For the assessment of residual cumula-

tive effects the conclusions of the assessment determined that 'significant' effects as classified under the Environmental Impact Assessment Regulations (England and Wales) 1999 would result in closer range views from Haverigg and the western shoreline of Walney Island.

Summary of Onshore Environmental Impact Assessment

Walney Offshore Windfarm will have two grid connection points. Phase I is planned to be connected at Heysham substation in 2008, and Phase II at Hillhouse substation (an extension of the existing Stanah substation) in 2012. The Environmental Impact Assessment covers both connection points.

Heysham Onshore Cable Route

A total of five onshore cable routes have been assessed. Based on the

Environmental Impact Assessment, the cable route with the least environmental impact has been chosen and will be applied for. In addition, three alternative route options have been selected. One route option has been excluded due to significant environmental impact.

From the landfalls around Heysham, the cable routes head in a generally easterly direction towards an existing substation. The greater part of all routes lies along existing highways and tracks, with only a small amount of undisturbed land being affected.

In order to establish the environmental baseline, consultations were held with Lancaster City Council, Lancashire County Council, Environmental Agency, English Heritage, English Nature, Royal Society for Protection of Birds, Lancashire Wildlife Trust and

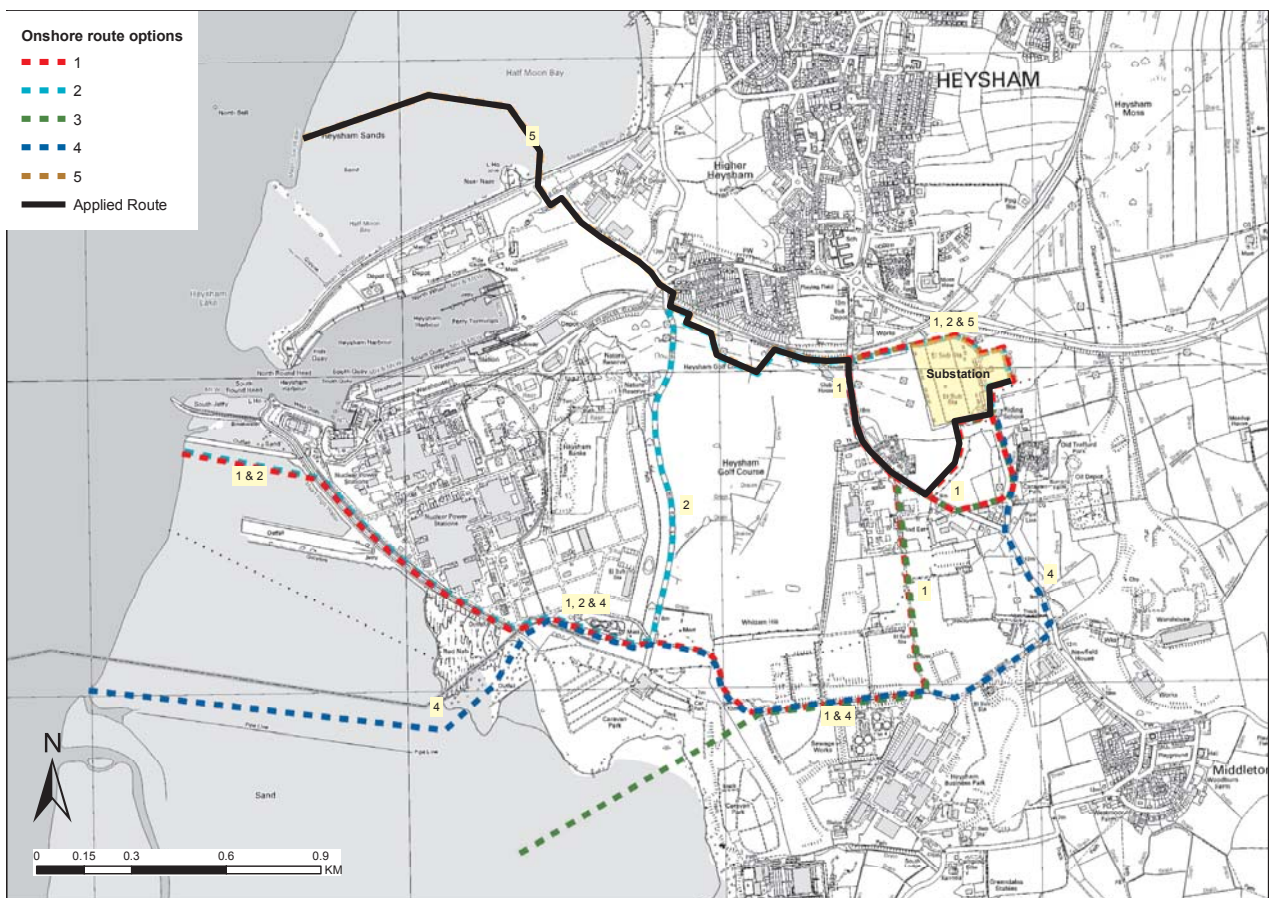
other statutory and non-statutory organisations.

Regionally Important Geological Sites (RIGS)

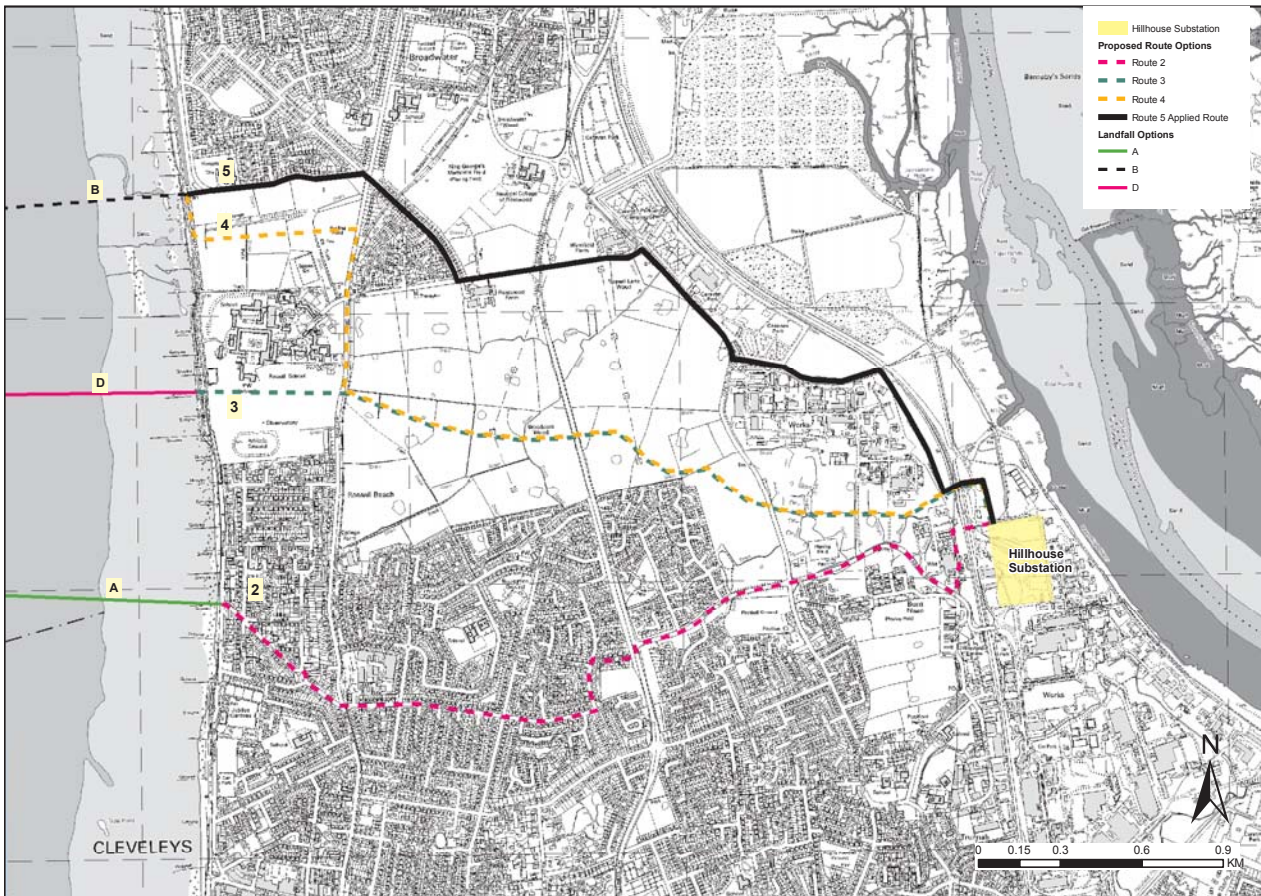
South of Heysham harbour there is a sandstone outcrop known as Red Nab RIGS. The landfall of cable route option 4 is close to the designated site, though none of the cable routes will enter the Red Nab RIGS and therefore no impact on the site is anticipated.

Landfill Sites and Contaminated Land

Seven licensed landfill sites are registered with the Environmental Agency in proximity to the onshore cable routes. Made ground or contaminated land may therefore be encountered during construction. Potential impact is considered to be moderate. Working procedures for cable laying will be



Landfall at Heysham, phase I 2008



Landfall at Cleveleys, phase II 2012

agreed in advance with the Environmental Agency.

Nature Conservation and Protected Species

The proposed cable route does not pass through any statutory or non-statutory conservation sites. The impact from this cable route on Biological Heritage Sites (BHS) is considered negligible.

Based on a Phase I Habitat Survey the impact on the terrestrial flora is considered to be temporary and minor. The impact on terrestrial fauna will be negligible for the cable route to be applied for.

The cable laying works could potentially have minor short term impacts on nesting birds if they coincide with the nesting season and cross scrub and hedgerows. If construction coincides with the nesting season, mitiga-

tion measures may include early scrub and hedgerow removal. Therefore, it is anticipated that the level of impact on nesting birds will be negligible.

Infrastructure

Dependent upon the final route selection, the majority of the cable will be laid along existing highways. This may cause some minor disruption to traffic in the area during the construction period. Complete closure of the smaller roads is unlikely. Before work starts on site, a scheme-specific Traffic Management Plan will be developed in cooperation with local authorities to minimise local traffic disruption.

Archaeology

No impacts are anticipated upon any of the known sites of archaeological interests. An archaeological watching brief will be in place during construction to deal with any unanticipated archaeological remains encountered.

Cleveleys Onshore Cable Route

A total of five onshore cable routes at Cleveleys has been assessed. Based on the Environmental Impact Assessment, the cable route with the least environmental impact has been chosen and will be applied for. In addition, three alternative route options have been selected and presented.

From the landfall at Cleveleys’ west coast, the proposed cable routes head east. After crossing Fleetwood promenade, the cable route to be applied for and route option 2 run along existing roads for the majority of the route to Hillhouse substation.

The construction of Walney Offshore Windfarm may necessitate the construction of the proposed Hillhouse substation, since the existing Stanah substation cannot be upgraded to the necessary capacity. Whether it will be Walney Offshore Windfarm or another

development, e.g. Cirrus Shell Flat Array that will initiate the construction of Hillhouse will depend on the timing of the developments.

Landfill Sites and Contaminated Land

The cable route to be applied for will not cross any landfill sites, but it will pass nearby two sites, and made ground or contaminated land may therefore be encountered during construction. Potential impact is considered to be moderate. Working procedures for cable laying will be agreed in advance with the Environmental Agency.

Flooding

Due to the location of the proposed onshore cable route between the sea and the River Wyre, and the low-lying nature of the area, there is a potential for flooding events. The construction of the proposed cable route will have no impact on the existing marine flood defences, because Horizontal Directional Drilling is chosen as the preferred construction technique.

Nature Conservation and Protected Species

The Wyre Estuary is the only statutory nature conservation site within 1km of the proposed cable route. There will be no impact on the designated Wyre Estuary.

Several non-statutory nature conservation sites are located within 500m of the cable routes.

The cable route to be applied for crosses two Biological Heritage Sites, respectively Fleetwood Promenade and Fleetwood Railway Branch Line. The impact is expected to be only minor since Horizontal Directional Drilling is chosen as the preferred construction technique at both crossings.

Based on a Phase I Habitat Survey the impact on the terrestrial flora is considered to be temporary and minor or negligible.



Construction workers (Barrow, 2006)

Infrastructure

Dependent upon the final route selection, the majority of the cable will be laid along existing highways. This may cause some minor disruption to traffic in the area during the construction period. Before work starts on site, a scheme-specific Traffic Management Plan will be developed in cooperation with local authorities to minimise local traffic disruption.

Archaeology

As for Heysham no impacts are anticipated upon any of the known sites of archaeological interests.

Conclusion

Walney Offshore Windfarm has carried out an assessment of the environmental impacts of the proposed project in accordance with EU and UK regulations, and has extensively consulted statutory and non-statutory bodies, interested parties and the public. The findings have been presented in a technical report, the Environment Statement, which includes a number of detailed annexes.

The preparatory work has included proposals for measures to mitigate any important negative impacts of the development. DONG has further made

commitment to establish overall plans for quality, health, safety and environmental management. This will ensure that the windfarm, during construction, operation and decommissioning, will be conducted in a responsible manner.

Walney Offshore Windfarm offers strong positive benefits to British society and will assist Great Britain in fulfilling international commitment to reduce greenhouse gas emissions. There could be some limited negative environmental impacts, however a balanced evaluation based on the Environmental Statement favours construction of the **Walney Offshore Windfarm**.

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Walney Offshore Windfarm

Construction of phase I and phase II

