FOREWIND

Welcome

Final statutory consultation

As part of the development of Dogger Bank Teesside A & B, Forewind has thoroughly consulted stakeholders both formally and informally. A first phase of statutory consultation was held in May 2012.

DOGGER BANK TEESSIDE A & B

This event is part of Forewind's second and final phase of statutory consultation. The aim is to ensure you have an opportunity to review, comment on and influence the Dogger Bank Teesside A & B proposals, before the application for a development consent order is submitted to the Planning Inspectorate in early 2014.

The consultation to date has contributed to the design proposals and information in the documents prepared for this phase – Preliminary Environmental Information.

We now invite you to comment on the Preliminary Environmental Information, including a draft Environmental Statement (ES) and a draft Non-Technical Summary, as well as the draft plans and maps detailing the nature and location of Dogger Bank Teesside A & B.

While Forewind welcomes feedback on all aspects of the proposed development, there remain some key decisions to make prior to the final application. These are highlighted in boxes throughout this display.

This statutory consultation period ends on Friday, 20 December so Forewind must receive your response by then to ensure its consideration.

Thank you for coming to take part in this consultation. We hope it provides you with a good opportunity to submit your opinions about the proposals.

How to respond

The consultation documents are available at this exhibition but can also be downloaded from **www.forewind.co.uk**. Hard copies and DVDs are available at the following libraries during the consultation period: Grangetown, Guisborough, Laburnum Road, Marske, Redcar Central, Roseberry and Saltburn. DVDs are also available from us here today or at Kirkleatham Museum, the local mobile library and the Wilton Centre.

Responses to the consultation can be submitted:
- in person at the public exhibitions
- by email to **info@forewind.co.uk**
- by calling us on the Freephone number **0800 975 5636**
- by the electronic questionnaire available at **www.forewind.co.uk**
- to our Freepost address: **Freepost RSLY-HKGK-HEBR, Forewind, Davidson House, Forbury Square, Reading, RG1 3EU**

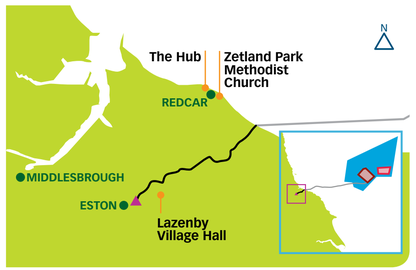
Responses will be made public as part of the Dogger Bank Teesside A & B application.

There will be three consultation events as follows:

Venue	Date (2013):	Time:
The Hub **28–29 Esplanade, Redcar TS10 3AE**	Friday 22 November	2.00pm to 7.30pm
Lazenby Village Hall **High Street, Lazenby TS6 8DU**	Saturday 23 November	10.30am to 4.30pm
Zetland Park Methodist Church **The Crescent, Redcar TS10 3AU**	Monday 25 November	11.00am to 6.00pm

Legend
- Onshore export cable route
- Offshore export cable route
- Dogger Bank Zone
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Lackenby Substation

Map Source: Round 3 zone boundary © The Crown Estate, 2010. National Grid Substations © National Grid, 2010. Ordnance Survey data © Crown copyright and database right, 2013.



Clockwise from top
Public event locations; Sheringham Shoal Offshore Wind Farm and suction-installed Bucket Foundation

Dogger Bank Teesside A & B

Overview of the development

Dogger Bank Teesside A & B will comprise two offshore wind farms (Dogger Bank Teesside A and Dogger Bank Teesside B) each with a generating capacity of up to 1.2 gigawatts (GW) and connecting into the existing Lackenby substation near Eston, in the Borough of Redcar and Cleveland. The development is located 165 kilometres from the UK coast at its closest point.

In total it will have an installed generating capacity of up to 2.4 GW and will generate around 8 terawatt hours (TWh) of green electricity per annum, which is enough to power around 1.8 million British homes or supply all industrial and commercial users in the North East every year.

Dogger Bank Teesside A & B is a Nationally Significant Infrastructure Project (under Section 14 of the Planning Act 2008) and needs a development consent order before it can be built. Following this consultation, Forewind will submit a single application for a development consent order to the Planning Inspectorate. The Planning Inspectorate will examine the proposals and make a recommendation to the Secretary of State for Energy and Climate Change, who will decide the application.

This may take up to 15 months and the indicative programme for Dogger Bank Teesside A & B is:

Date	Activity
Q2 2012	First stage of statutory consultation (complete)
2012 – 2013	Environmental surveys and reporting (complete)
Q4 2013	Second and final stage of statutory consultation
Q1 2014	Submit application for development consent order
Q3 2015	Application determined
2015 – 2017	Pre-construction phase

Project flexibility

As large scale offshore wind farm developments are relatively new, and technology is advancing rapidly, it is expected there will be improvements in the efficiency and availability of components and working methods before the design of Dogger Bank Teesside A & B is finalised.

The project description therefore is flexible to allow the best available technology and methodologies to be used when the detailed design is carried out post-consent. Relevant authorities will be included in this process.

This flexibility will ensure health, safety, and environmental risks can be reduced as far as possible, the most up-to-date technology is used and the viability of the projects maximised. These factors will also increase the likelihood that government cost reduction targets will be met.

Development flexibility

Do you have any comments on the extent of flexibility included in the proposals?

Above top: Sheringham Shoal Offshore Wind Farm under construction
Above: Saltburn beach

Legend
- Landfall between Redcar and Marske-by-the-Sea
- Existing National Grid substation at Lackenby
- Onshore export cable route
- Offshore export cable route
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Round 3 Zone

Data Source: Round 3 zone boundary © The Crown Estate, 2010 Ordnance Survey data © Crown copyright and database right, 2013.

Offshore description

Site information

Forewind has gathered a lot of information about the Dogger Bank Zone over the past three years through surveys that have assessed the depth and shape of the seabed and its geological make-up, as well as wind, wave and tidal conditions.

The data gathered have been analysed with help from a number of expert consultants and groups and gives enough detail for the environmental impact assessment. Further high-resolution survey data will be collected post-consent for the detailed design work needed prior to construction.

Wind climate

Compared with the typical wind conditions across the UK, the Dogger Bank Zone has high average annual wind speeds making it an attractive location for a wind energy development. It is also one of the shallowest of the Round 3 development zones.

Boundaries and infrastructure

The boundaries for both Dogger Bank Teesside A and Dogger Bank Teesside B were identified in 2012. They define the limits of where the offshore wind farm infrastructure, such as wind turbines and platforms, can go, as well as the space between wind farms.

During construction additional temporary work areas may be needed, such as cable laying vessel space for anchors to spread alongside the cable corridors.

Project boundaries

Do you have any comments on the extent and location of the project boundaries?

In total the offshore infrastructure will include:
- up to 400 wind turbines and supporting tower structures
- wind turbine foundations and associated support and access structures
- two offshore converter platforms and up to eight offshore collector platforms, and associated foundations
- up to four offshore accommodation or helicopter platforms for operations and maintenance activities, and associated foundations
- subsea inter-array cables
- subsea inter-platform cables
- offshore export cable systems, carrying power from the offshore platforms to the landfall
- crossing structures at the points where project cables cross existing subsea cables and pipelines or other Dogger Bank project cables
- up to 10 offshore meteorological monitoring stations. This is in addition to the two meteorological stations which were installed in 2013
- protection against scour and subsea foundation damage (where necessary)
- seabed preparation measures for foundation installation (where necessary)
- cable protection measures (where necessary)
- up to 20 vessel mooring buoys.

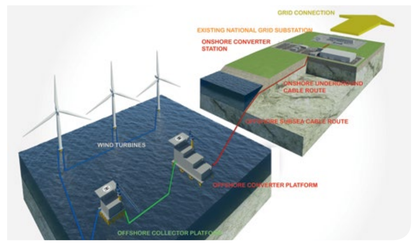
Decommissioning

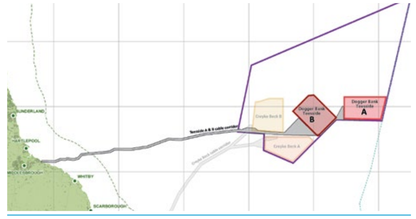
At the end of the wind farm's life, a decommissioning process will be undertaken which broadly will be the reverse of the construction process. Decommissioning is a condition of The Crown Estate lease and is also incorporated in the statutory consenting process.

The decommissioning plan will take into account the latest technological advances as well as legislative and environmental requirements at the time the work is undertaken. The majority of the components will be removed and recycled or disposed of in line with best practice. However, a number, such as buried cables, may remain in-situ if it is assessed that their removal would result in negative environmental impacts.

Parameters	Maximum per project	Maximum total for Dogger Bank Teesside A & B
Wind turbines	200	400
Offshore collector substation platforms	4	8
Offshore converter substation platforms	1	2
Offshore accommodation or helicopter platforms	2	4
Offshore meteorological stations	5	10
Indicative length of inter-array cabling (km)	950	1900
Indicative length of inter-platform cabling (km)	320	640
Number of HVDC export cable pairs	1	2

Above top right: Drawing of a wind farm
Right: Offshore export cable corridor
Table above: Summary of key offshore project components





Legend
- Dogger Bank Round 3 Zone
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Creyke Beck A
- Dogger Bank Creyke Beck B
- Dogger Bank Teesside A & B export cable corridor
- Creyke Beck export cable corridor
- UK International boundary
- 12nm Territorial boundary

Data Source: Round 3 zone boundary © The Crown Estate, 2010. International Boundary supplied by UKHO, 2013. Contains UKHO Law of the Sea data © Crown copyright and database right. Ordnance Survey data © Crown copyright and database right, 2013.

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Offshore components

Make up of a wind farm

The offshore components are those items that make-up the wind farm and include turbines, foundations, cables and offshore structures such as converter stations. A full description of the offshore components proposed can be found in Chapter 5 of the draft Environmental Statement.

DOGGER BANK TEESSIDE A & B

Wind turbines

The wind turbines proposed will have three blades and a horizontal axis. As technology is evolving rapidly it is anticipated that wind turbines between approximately 6 megawatts (MW) and 10 MW will be available at the time the Dogger Bank Teesside A & B projects are designed.

The maximum dimensions would include a blade tip height of up to 315 metres (above highest astronomical tide) and rotor diameter of up to 215 metres. The maximum total area swept by the rotor and the generating capacity of the projects has been fixed to allow some flexibility in the final design whilst ensuring that the environmental impacts have been properly assessed.

The final layout of the wind turbines, and other wind farm components, will depend on factors such as: stakeholder feedback, seabed obstructions, ground conditions, water depth, economics, and the wind turbine itself. A number of wind farm layout rules have been developed in consultation with stakeholders that will apply to the final layout, and which address key issues and environmental sensitivities.

Wind turbines

Do you have any comments on the total installed capacity and number of wind turbines, or other aspects of the wind turbine array?

Foundations

Foundations secure the wind turbines, platforms and other offshore structures to the seabed. They also enable maintenance crews to safely access the structures. The range of foundation types continues to grow as technology advances, however currently there are three types: monopole, multi-leg and gravity base. The innovative suction bucket foundation technology employed by Forewind for its two meteorological masts is an example of a monopole.

Foundations

Of the three types of foundations available, do you have a preference?

Offshore cables

Offshore cables transmit the electricity generated by the offshore wind turbines to shore, via offshore converter platforms. Fibre-optic cables serving the wind farm control systems may be integrated within them.

Offshore cables are typically installed from a cable-laying vessel or barge using either a multi-point anchoring or dynamic positioning system. The Dogger Bank Teesside A & B offshore cables will be buried where feasible or protected appropriately along their full length.

The offshore export cables for both Dogger Bank Teesside A and Dogger Bank Teesside B will be installed within the corridor shown in the map on this panel. The export cables will run from the offshore converter platforms to the cable landfall.

Export cable

Do you have any comments on the proposed route of the export cable corridor, the installation methods or proposed cable protection?

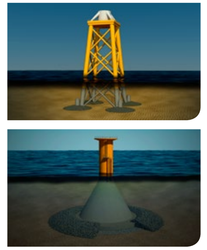
Cumulative impact assessment

There is no industry-wide method for cumulative impact assessment although representative body Renewable UK has released guidelines, which are in line with the approach Forewind has adopted. The approach is set out in the appendix to Chapter 4 of the draft Environmental Statement, which includes other projects within the Dogger Bank Zone. This strategy has been applied throughout the offshore chapters of the Environmental Statement.

Cumulative impact assessment

Do you have any views on Forewind's selected approach to cumulative impact assessment?

Above: Transition pieces



Clockwise from top: Monopole foundation; Multi-leg foundation; Gravity based foundation; Installation vessel laying cables; Installation of a monopole foundation; Wind turbine installation; Installation of meteorological mast

Onshore description

Site information

All of the onshore works for Dogger Bank Teesside A & B will take place within the Borough of Redcar and Cleveland. Through the site selection process, Forewind has aimed to minimise disruption to those living or working in the area.

The land likely to be affected by the onshore works during the cable installation and construction of the converter stations is a mix of semi-urban, rural and industrial. There are a number of buried services along the cable route including water mains, sewers, gas and telecommunications.

The converter stations will be located within the southern margin of the Wilton Complex, an area set aside for light industrial use with a mixture of brownfield and greenfield sites.

Onshore infrastructure

The onshore infrastructure will include:

- cable landfall and transition bays
- onshore high voltage direct current (HVDC) export cable system carrying power from the landfall to the onshore HVDC converter stations
- directional drilling as part of the landfall works and under the foreshore, as well as where required under obstructions such as roads, watercourses, other cables, railways and pipelines
- onshore converter stations with associated road, fencing, landscaping and drainage
- onshore high voltage alternating current (HVAC) cable systems carrying power from the onshore HVDC converter stations to the existing National Grid substation at Lackenby
- connection bays within the existing National Grid substation at Lackenby
- temporary works and laydown areas
- permanent and temporary access roads; and
- service corridors, including telecommunications, water and connection to the local electricity network.

Some works will be required at the existing National Grid substation at Lackenby to enable the connection of Dogger Bank Teesside A & B however no additional overhead lines will be required.

Onshore design and components

Are there any additional factors we should consider when finalising the onshore aspects of the proposals?

Construction timeframe

Dogger Bank Teesside A and Dogger Bank Teesside B may be constructed at the same time, one after the other or with some overlap, with certain onshore elements for the second project being installed during the construction of the first. If they are built in parallel, the entire development, from landfall to the Lackenby substation, may take up to three years to complete. If built sequentially, it is anticipated three years will be required for each project, with a maximum gap of up to five years between projects.

Landfall

The landfall, where offshore export cables come to shore, is between Redcar and Marske-by-the-Sea. The offshore cables will be connected to the onshore cables in one or more specifically designed underground joint bays or pits, known as transition bays.

The transition bays will be on dry land, buried below ground, and the final location will take into account local coastal erosion, a feature of the area.

To minimise disruption at the shoreline and to the coastal road, the cables are most likely to be installed using the horizontal directional drilling (HDD) technique. The work is likely to start from the transition bay with the drill going under the coastal road, cliffs and beach.

After installation, the transition bays will be backfilled and the top surface reinstated so the area can be returned to previous use.

Landfall location

Do you have any comments on the proposed landfall location and whether there is anything else we should consider when finalising the location the cables come ashore?

Above top: Example of landfall works
Above: Indicative construction timeframe

Construction in parallel	2017–2020	2020–2024	2024
Dogger Bank Teesside A	Up to three years		
Dogger Bank Teesside B	Up to three years		
Construction in sequence	**2017–2020**	**2020–2024**	**2024**
Dogger Bank Teesside A	Up to three years	maximum five-year gap	
Dogger Bank Teesside B			Up to three years

Indicative cable route and converter station locations

Legend

- Dogger Bank Teesside A&B cable landfall envelope (from mean high water mark)
- Dogger Bank Teesside A&B landfall horizontal directional drill compound and joint transition bay

Onshore cable route

- Dogger Bank Teesside A&B HVDC, open trench
- Dogger Bank Teesside A&B HVDC, HDD
- Dogger Bank Teesside A&B HVAC, open trench
- Dogger Bank Teesside A&B HVAC, HDD
- Dogger Bank Teesside A&B major horizontal directional drill entry or exit locations
- Dogger Bank Teesside A&B minor horizontal directional drill entry or exit locations
- HDD or open trench to be confirmed
- Dogger Bank Teesside A&B indicative access points for construction
- Dogger Bank Teesside A&B cable route primary construction compound
- Dogger Bank Teesside A&B cable route primary construction compound project divider
- Dogger Bank Teesside A&B intermediate construction compound
- Dogger Bank Teesside A&B intermediate construction compound options

Converter station site

- Dogger Bank Teesside A&B converter station area of work
- Dogger Bank Teesside A&B converter stations
- Converter stations landscape mitigation works
- Dogger Bank Teesside A&B converter station construction compounds
- National Grid Lackenby Substation
- HVAC access options
- Indicative environmental assessment area

Data Source: Ordnance Survey © Crown Copyright 2013. All rights reserved. License number 100020449.

Onshore components

Onshore cable corridor

The onshore cable systems will be buried approximately 1.2 m underground for their entire length, though slightly less underneath roads crossed. Forewind ruled out the use of overhead lines early in its development process.

Cables will be installed using conventional open cut trenching, either buried directly or in ducts. After installation, the trenches will be backfilled and the land reinstated so it can be returned to its former use. No permanent over-ground structures will remain other than cable marker posts.

Where the cables need to cross obstacles such roads, railways, pipelines and waterways and it is not feasible to use open cut trenching, alternative installation techniques will be considered – most likely horizontal directional drilling (HDD), where the cable passes under the obstacle, would be used. Where HDD is used for road crossings, the need for road closures during construction will be reduced.

The cable installation techniques will be finalised after consent, as part of the detailed design process, as well as the locations of temporary construction compounds for offices, storage areas and lay-down areas.

Onshore cable corridor

Is there anything else we should consider when finalising details for the onshore cable route not already within the draft Environmental Statement?

Converter stations

The proposals include two converter stations, one for each of the wind farms, to be built on industrial land contained within the Wilton Complex located to the south-west of Redcar.

Each converter station will include a valve hall, which is a large building up to 20 m tall that houses electronic devices to convert the power from direct current to alternating current. The valve halls are expected to be steel-framed buildings with cladding. The colour and external materials will be agreed with Redcar and Cleveland Borough Council post-consent.

The site for the converter stations will also include: additional buildings such as a control room, a storeroom and operator facilities; outdoor electrical equipment areas with current connectors and transformers; lightning protection systems, permanent lighting designed to minimise glare and light spillage off-site, and space for car parking and internal roads.

Location and appearance of converter stations

After considering the proposed location, design and layout of the converter stations, how do you feel about them?

The draft ES details the proposed location and possible form of landscaping to mitigate the visual impact of the two converter stations and you can see computer-generated visualisations on this panel.

Converter station screening

What is your opinion on the landscaping proposed to reduce the visual impact of the converter stations?

Electric and magnetic fields (EMF)

Forewind's proposals all comply with the established industry guidelines (1998 International Commission on Non-Ionizing Radiation Protection (ICNIRP).

The underground cables will produce magnetic fields, however these will be below the limits set in the guidelines. Cable screening will eliminate any electric fields. The converter stations will generate electric fields from the above-ground conductors, however these fields will either be completely contained within the site, or at most will fall to zero within the first few metres of the perimeter fence.

Further information about EMF can be found in Forewind's EMF factsheet.

Onshore cable route reinstatement at Gwynt y Môr Offshore Wind Farm

Visualisations of the converter station site viewed from Lazenby northern edge

Photograph of the site today

Computer-generated visualisation of the converter stations

Visualisation 10 years after construction

Indicative converter station landscape mitigation plan

1. Proposed bunding to screen views from Lazenby. Landform graded into existing bunds.
2. Proposed native woodland
3. Existing woodland

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Environmental Impact Assessment (EIA)

Unparalleled data gathered

An Environmental Impact Assessment has been undertaken for Dogger Bank Teesside A & B with almost three years of desk-based research, as well as field studies and comprehensive surveys. These have included:

DOGGER BANK TEESSIDE A & B

Offshore

- geophysical surveys covering the whole 8,660 km² zone and the length of the cable corridor for Dogger Bank Teesside A & B – more than 7,000 line kilometres
- geotechnical surveys including around 20 boreholes and 90 cone penetration tests
- wind, wave and tidal data collection with the use of buoys as well as a laser measuring device (LIDAR) installed on a nearby oil platform and Forewind meteorological masts
- recording and surveying vessel movements
- marine and intertidal ecology surveys
- fish and shellfish surveys carried out in two phases
- boat based (2,400 line km per month), coastal and aerial bird surveys
- marine mammal surveys.

Onshore

- viewpoint photography
- archaeological surveys including walkovers and geophysical surveys
- contaminated land walkovers
- topographical surveys and watercourses walkover to gather data for the Flood Risk Assessment
- background noise monitoring
- onshore ecology surveys to identify the main habitats and the presence of any protected species such as great crested newt or water voles
- traffic assessments and vehicle counts
- boreholes at the landfall site.

Draft Environmental Statement

The findings of the environmental impact assessment are presented in the draft Environmental Statement (ES) – a comprehensive report of the development's potential effects during its construction, operation and decommissioning phases. Proposed mitigation measures – ways to reduce or avoid adverse effects – are also covered.

The full list of chapters in the draft ES are as shown in the table on the right, with those from eight to 32 covering the assessment outcomes.

After this consultation, the final version of the ES and an accompanying Non-Technical Summary will be produced. They will be submitted to the Planning Inspectorate with the application for a development consent order, and will be made publicly available.

Habitats Regulations Assessment

A Habitats Regulations Assessment (HRA) to determine whether Dogger Bank Teesside A & B could have an adverse effect on the integrity of a Natura 2000 site, one of those belonging to a network of protected areas, has also been undertaken and is available for comment alongside the draft ES.

Chapter	Title
1	Introduction
2	Project need
3	Legislation and policy
4	EIA process
5	Project description
6	Site selection and alternatives
7	Consultation
8	Designated sites
9	Marine physical processes
10	Marine water and sediment quality
11	Marine and coastal ornithology
12	Marine and intertidal ecology
13	Fish and shellfish ecology
14	Marine mammals
15	Commercial fisheries
16	Shipping and navigation
17	Other marine users
18	Marine and coastal archaeology
19	Military activities and civil aviation
20	Seascape and visual character
21	Landscape and visual impact assessment
22	Socio-economics
23	Tourism and recreation
24	Geology, water resources and land quality
25	Terrestrial ecology
26	Land use and agriculture
27	Terrestrial archaeology
28	Traffic and access
29	Noise and vibration
30	Air quality
31	Inter-relationships
32	Transboundary effects
33	Cumulative impact assessment
34	Conclusions
35	Summary of monitoring and mitigation

Clockwise from top: Herring gull; The Wilton Complex, location of the proposed converter stations; Deploying an offshore camera

Assessment summary

Topics of interest

On this panel, and the three that follow, is a very broad summary of the topics most likely to interest the local community. Full details can be found in the draft Environmental Statement and the relevant chapter numbers are included for ease of reference.

Offshore impacts

Designated sites
The construction, operation, and decommissioning phases of Dogger Bank Teesside A & B are predicted to result in no significant impacts on any UK designated sites and protected species. However, if they and all other projects now in the planning process were to start at the same time, there could be more significant impacts on harbour porpoise and harbour seal. This is an issue that extends beyond this development and so discussions about wider mitigation strategies are underway at industry level. *(ES reference – Chapter 8)*

Marine physical processes
There will be some potential effects on marine physical processes such as waves, tidal currents and sediment transport during installation and operation, for example, temporary increases in suspended sediment concentrations. The impacts of these have been considered within the assessments for other marine topics within the ES and no significant impacts have been concluded. *(ES reference – Chapter 9)*

Marine water and sediment quality
Throughout Dogger Bank Teesside A & B's development and operation only a minor deterioration of water quality is expected, and that would be due to re-suspension of sediments and contaminants. There is a low risk of accidental pollution but to ensure this remains low, and as part of an overall Environmental Management Plan, industry standard control measures will be put in place. *(ES reference – Chapter 10)*

Marine and coastal ornithology
Baseline surveys and data collection were carried out to understand the numbers of marine and coastal bird species using the area in and around Dogger Bank Teesside A & B, their abundance and behaviour. The same data were also used to compare the birds located within the zone with the national and international populations. Eleven seabird species were found to use the offshore areas in significant numbers, whilst 45 migratory bird (terrestrial and waterfowl) species were recorded flying through.

The impacts on the species during construction (and decommissioning) are predominantly short-term, reversible disturbance and displacement impacts and not significant with respect to the national and biogeographic populations.

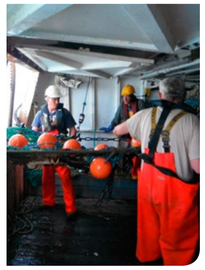
During operation there may be: disturbance and displacement effects due to habitat loss or alteration; a barrier effect on breeding seabird and migratory wintering or passage bird populations; and collision effects. However, even when using the lowest population figures, none of these effects are predicted to be significant.

This is still the case if Dogger Bank Teesside A & B, Dogger Bank Teesside C & D, Dogger Bank Creyke Beck and other planned developments are built and operated at the same time, although the cumulative effect of multiple developments could raise the level of the impacts on some identified species, but not to a point where populations would decline or their viability would be affected. *(ES reference – Chapter 11)*

Ornithological methodology

Do you have any comments on the way that Forewind has assessed the impact of our proposal on birds?

Marine and intertidal ecology
The seabed habitats recorded in the wind farm site, cable corridor and landfall areas are among the most common habitats found around the coast of the UK, with sandy sediments supporting relatively low diversity plant and animal communities. Whilst some disturbance and habitat loss may occur during the construction phase, the impacts are not predicted to be significant. *(ES reference – Chapter 12)*



Clockwise from top: Black backed gulls; Minke whale; Marine ecology survey; *Jubilee Spirit* survey vessel

Offshore impacts

Extensive study undertaken

Forewind has conducted the most extensive study of an offshore area ever undertaken by a wind energy developer to thoroughly map and characterise the Dogger Bank Zone.

Fish and shellfish
Impacts on fish and shellfish in the Dogger Bank Zone and in the export cable corridor are mostly localised, temporary or can be mitigated by adopting low impact construction techniques. *(ES reference – Chapter 13)*

Marine mammals
Aerial and boat-based studies were conducted to assess the possible impacts of wind farm construction and operation on marine mammals such as harbour porpoise, white-beaked dolphin and minke whale. While there would be some impacts, primarily during construction, the key disturbance relates to hearing injury. An industry standard protocol will be implemented to minimise this and reduce exposure to risks. Other potential impacts which were assessed included possible collisions with vessels and changes to prey resource.

The cumulative impact assessment concluded that harbour porpoise could be impacted by noise from driving piles into the seabed if several projects were built at the same time. There is currently limited data linking disturbance with effects in individuals or populations, so the assessment conclusions are not certain. However, Forewind will continue to monitor research and follow new industry guidelines or mitigation measures should they be introduced, to reduce impact levels. *(ES reference – Chapter 14)*

Commercial fisheries
The commercial fisheries impact assessment confirmed that fishing vessels from the UK, Netherlands, Denmark, Germany, Belgium, Norway, France and Sweden target several commercial species of fish and shellfish, with a variety of fishing gears, in the development area.

Potential impacts on fishing activities include: the effects of temporary, or complete loss of, or restricted access to, traditional fishing grounds; displacement or interference of fishing activity; increased steaming times to fishing grounds; and impacts on commercially exploited species.

The main significant impact on commercial fishing is the potential loss of fishing grounds for the seine net fishermen. Forewind is committed to working with the seine netters who may be affected to explore options to reduce these impacts.

Safety issues during construction and operation will be mitigated with regular Notices to Mariners; the establishment of safety zones of up to 500 metres during construction or significant maintenance work; installation of adequate safety lighting; and ensuring construction vessels follow international regulations in respect of fishing routes. *(ES reference – Chapter 15)*

Shipping and navigation
Marine activity in the Dogger Bank area is primarily commercial, not recreational, and due to shallow seas very few vessels transit through the site. Given its location, relatively small changes in a vessel's course will be necessary to avoid the wind farms. This means that although the number of potential hazards does increase as a result of the project, significant impacts are not expected. *(ES reference – Chapter 16)*

Other marine users
Other activities in this part of the North Sea include renewable energy projects and carbon capture and storage, oil and gas exploration and production, aggregate extraction, subsea cables and pipelines. These have been taken into account in the site selection process and it is anticipated that, through further engagement with the potentially affected parties, significant impacts will be avoided. *(ES reference – Chapter 17)*

Marine and coastal archaeology
The offshore area of Dogger Bank is a well-researched and archaeologically important prehistoric submerged landscape that joined the UK coastline to north-west Europe during glacial periods when sea-levels were at their lowest. The North Sea, between Dogger Bank and the Teesside coastline, also has wreck sites and numerous aviation casualties from the Second World War.

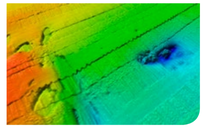
A series of exclusion zones around identified archaeological remains and features will ensure there are no significant impacts on marine and coastal archaeology. *(ES reference – Chapter 18)*

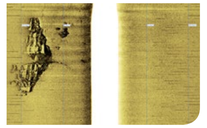
Military activities and civil aviation
The impact assessment considered the potential impacts of Dogger Bank Teesside A & B on all relevant Ministry of Defence (MoD) activities as well as impacts upon the interests of the Civil Aviation Authority, National Air Traffic Services, Meteorological Office weather radar, offshore helicopter operators, coastguard search and rescue operations and airports.

The development will not significantly change conditions in ways that would adversely impact MoD practice and exercise areas and while search and rescue helicopters may be affected, proposed mitigation measures such as lighting, marking, maximising turbine visibility on radar and on-going consultation will ensure search and rescue operations can take place safely. *(ES reference – Chapter 19)*

Offshore impacts

Do you have any comments on the offshore impacts and the proposed mitigation measures?





Clockwise from top: Harbour porpoise; data from surveys (2 images shown); fishing pots; offshore wind technician at work

Onshore impacts

Seascape
As the nearest wind turbines will be 165 kilometres offshore, the development will have no impact on the seascape. However cable installation vessels working off the coast will be visible for a short period during construction. *(ES reference – Chapter 20)*

Landscape and visual impact
During construction there will be a limited temporary landscape and visual impact due to works at the landfall and along the cable route. These will be short-term and after construction each affected area will be reinstated to its pre-construction condition.

During operation, impacts are limited to the permanent above-ground features, namely the converter stations and possible works required to extend the existing Lackenby substation.

A new section of landscaped bund, with associated tree planting, has been proposed as a possible solution to help screen views of the converter stations from the surrounding areas. The agricultural farmland to the south and south west, and the edge of the settlement of Lazenby will experience the main landscape and visual impacts though the introduction of a bund and planting will reduce these visual impacts over time as seen in the visualisation photographs on the Onshore components panel.
(ES reference – Chapter 21)

Socio-economics
Potential socio-economic benefits within the North East region relate to the potentially very significant project expenditure and both direct and indirect job creation during the construction and operation phases of the wind farms.

Forewind has engaged with the UK supply chain and regional suppliers, to ensure that a high quality, sustainable supply base for the industry can be developed. The organisation has also initiated the Champions for Wind schools programme, providing teachers with bursaries, and access to industry experts, to enable them to develop curriculum-based lessons and materials. The aim is to highlight all the potential career opportunities likely to come from the offshore wind energy industry.
(ES reference – Chapter 22)

Tourism and recreation
Some minor, short-term impacts have been identified on onshore tourism and recreation features during the construction phase. There will be some disruption related to construction activities nearby Kirkleatham Museum, Kirkleatham Owl Centre, local towns and villages, the National Cycle Trail, Public Rights of Ways and other footpaths however they will be managed through good engagement and communications with the community and tourist attraction representatives by minimising the duration of any closures and via the agreement of a strategy with the Public Rights of Way Officer at Redcar and Cleveland Borough Council. *(ES reference – Chapter 23)*

Community engagement

Could we improve our communication with you, and how? Do you have any suggestions on how best to engage and inform local communities during construction?

Onshore geology, water resources and land quality
All geology, rivers, streams, and ditches, areas of contamination, flood sensitivity and any important water resources along the proposed cable route have been identified. Potential construction impacts such as discharge of contaminants, surface water run-off, and removal of groundwater to surface water will be managed via the use of appropriate construction practices and through the adoption of a Site Waste Management Plan.
(ES reference – Chapter 24)

Terrestrial ecology
The cable route and converter stations are mainly located within agricultural land however the cable route does cross the Redcar to Saltburn Coast Local Wildlife Site, which has a valued coastal grassland habitat with a number of hedgerows. A diverse mix of bird species breed along the cable corridor, bats were recorded foraging in the hedgerows and wintering bird species were also found in the coastal fields close to the landfall during the winter months.

Construction impacts on hedgerows and the local ecology will be minimised by reducing the working area, reinstating habitat, through consultation with those likely to be impacted, sensitive vegetation clearance and good working practices. *(ES reference – Chapter 25)*

Clockwise from top: Newt in hand, Surfers at Saltburn beach, HDD will be used to install the cable under railways tracks

Onshore impacts (continued)

Land use and agriculture
Onshore construction activities will disrupt existing land use and agricultural activities along the length of the cable route and at the site of the converter stations. However, this disruption will be temporary and consultation with landowners and occupiers will continue throughout.
(ES reference – Chapter 26)

Onshore cultural heritage
Known sites of cultural heritage importance have been avoided and impacts upon archaeological features are not considered to be significant. The operational converter stations will be visible from the scheduled monument hill fort at Eston Nab, however the buildings will not be a prominent feature in the landscape.
(ES reference – Chapter 27)

Traffic and access
The construction of Dogger Bank Teesside A & B means large numbers of vehicles, such as HGVs, will use the main roads and add to the existing ordinary traffic through the area. To minimise the effects, construction traffic will be directed to two primary compounds, six intermediate compounds and two converter stations compounds, positioned to avoid sensitive locations such as schools and residential areas. Access routes have been selected to avoid smaller local roads and built-up areas.

Two alternative routes have been proposed for construction traffic to access the section of the cable route near the Lackenby Substation. Route 1 is to the west of the substation and Route 2 is to the east using the existing A1053 underpass. Route 2 would remove traffic from the more sensitive B1380 and direct it along the less sensitive A174. Forewind invites feedback on these alternative access routes, which will be considered in the selection of the final route.

Construction access near the substation

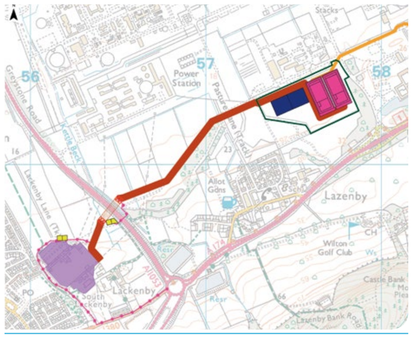
Of the two proposed alternative construction access routes to the National Grid Lackenby substation, which do you prefer?

A construction traffic management plan and construction travel plan will be developed in consultation with the Highways Authorities (Redcar and Cleveland Borough Council and the Highways Agency) to ensure that construction traffic is managed throughout the construction period. During operation there will be minimal additional traffic along the access route. *(ES reference – Chapter 28)*

Noise
Forewind's noise assessments identified that a small number of properties in the Old Lackenby and Marske-by-the-Sea areas are located close enough to the proposed construction works to potentially experience elevated noise levels. Construction noise in any one location will be relatively short-lived and the installation of fencing to screen these properties from the construction works will keep it low.

The baseline noise survey at the converter stations found that existing noise levels are typical of a heavy industrial area variable in the day though steady and relatively high at night. An assessment of operational noise for the converter stations predicted that some form of noise reduction may be needed. For example, the selection of quieter equipment and installation of acoustic enclosures will ensure levels are acceptable at The Grange Estate, Lazenby Grange Farmhouse, Wilton Complex office accommodation and Wilton Golf Club. With the correct mitigation in place residual impacts would be negligible.
(ES reference – Chapter 29)

Air quality
There may be some air quality impacts where the construction is close to housing and public areas, however, a range of measures to be specified in a Dust Management Plan, will ensure that dust generated during construction does not cause a nuisance to people.
(ES reference – Chapter 30)



Legend

Onshore cable route
- Dogger Bank Teesside A&B HVDC, open trench
- Dogger Bank Teesside A&B HVAC, open trench
- Dogger Bank Teesside A&B HVAC, HDD
- Dogger Bank Teesside A&B minor horizontal directional drill entry or exit locations
- Dogger Bank Teesside A&B intermediate construction compound options

Converter station site
- Dogger Bank Teesside A&B converter stations area of work
- Dogger Bank Teesside A&B converter stations
- Dogger Bank Teesside A&B converter stations construction compounds
- National Grid Lackenby Substation
- HVAC access options

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Above: Map of indicative construction access route
Left: Marske-by-the-Sea

Next steps

Responses due

The final statutory consultation period for Dogger Bank Teesside A & B ends on Friday, 20 December so you have until then to submit your comments. However we encourage you to please take the time today to read the materials provided, ask questions of Forewind staff and fill in the questionnaire provided.

Consultation responses
A summary of the consultation and information about how we are taking responses into account will be included in the winter edition of our newsletter: Dogger Bank News. This will be available on our website and will be sent electronically or in hard copy to all those that have registered with Forewind.

You can register to receive the newsletter on our website, on the exhibition questionnaire, or by contacting us in any of the ways listed on the first display panel.

A full account of the consultation will be included in the Consultation Report, which will be submitted to the Planning Inspectorate as part of the application.

What happens next?
Forewind will collate, review and take into account comments from this consultation when finalising the development consent order application for Dogger Bank Teesside A & B.

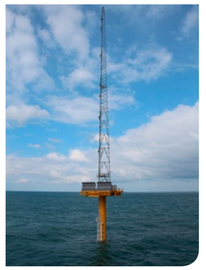
The application is due to be submitted to the Planning Inspectorate in the first quarter of 2014 and it has 28 days to decide whether to accept the application for examination.

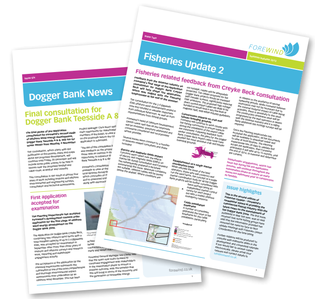
If the Planning Inspectorate accepts the application, members of the public will have the opportunity to take part in the examination by registering as an interested party. Information about how to do this will be published in local newspapers and on both the Forewind and Planning Inspectorate websites at the appropriate time.

Continuing stakeholder engagement
As Forewind is a developer, it will not be responsible for the construction and operation of each wind farm. This will be the role of a lead operator, most likely to be one of Forewind's four parent companies. The lead operator for each wind farm has not yet been finalised however it will be within their remit to engage and consult with stakeholders, including the local community, during those stages.

Forewind will include principles for continuing stakeholder engagement in the Outline Code of Construction Practice. This document will be submitted with the application for a development consent order and will be finalised after consent with input from Redcar and Cleveland Borough Council.

Thank you for your attendance





Above left: Previous consultation event in Teesside
Above right: Dogger Bank Met Mast East