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Annual  
Review

June 2011

# Our progress so far

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## Introduction

On 22 December 2009 the Forewind consortium, an equal joint venture between RWE, SSE, Statkraft and Statoil, was formally awarded exclusive rights by The Crown Estate to develop the Dogger Bank Zone – the largest of the Round 3 wind farm zones.

As development partner for Dogger Bank, Forewind has the objective to achieve consent for an agreed target installed capacity of 9GW of offshore wind farm projects by 2020, however the zone has a potential for up to 13GW – which is more than a third of the total Round 3 potential. Dogger Bank is the biggest wind energy development in the world.

This publication is a summary of Forewind's progress towards achieving its objectives and covers the 18-month period since the Zone Development Agreement (ZDA) was signed to the end of June 2011. It marks the halfway point in Forewind's progress towards the first development consent application.





### Chairman's Report

Forewind is at the forefront of the development of wind power in the North Sea. The Dogger Bank is no anonymous area of sands but a widely recognised name. We aim to add to that traditional reputation a whole new chapter in which the Dogger Bank will symbolise economically viable, technically sound, and environmentally excellent power generation.

In this, the largest Round 3 project, four of Europe's biggest energy companies have come together to deliver a scheme that is capable of providing up to 10% of the UK's electricity. To achieve that we seek, by continuous innovation, technically excellent, sustainable solutions that will attract significant further investment.

We all recognise that this is a pioneering business which has to obtain the necessary consents and deliver the programme to the agreed schedule and budget. That's why we set ourselves the highest standards and aim to be the most admired offshore wind development team in Europe. I am fortunate to have been asked to chair this exciting company which has already achieved a great deal but which is determined to set the standards by which North Sea projects are judged.

**The Rt Hon. John Gummer, Lord Deben**  
Chairman

*'I am fortunate to have been asked to chair this exciting company which has already achieved a great deal...'*



### General Manager's Report

Over the past year we have been establishing Forewind, building a world-class team to deliver development consents for wind farm projects on the Dogger Bank. We have brought together competences from four of Europe's leading energy companies; only a handful of organisations can match the depth and breadth of experience we have been able to draw on.

The Dogger Bank project is unparalleled in scale and the key to its successful delivery is to bring together all the necessary elements and resources. Our teams in onshore and offshore development, engineering, electrical systems, operations and commercial development are organised to deliver consents for safe, technically achievable, financially viable wind farm schemes with the minimum of environmental impact. These teams have already begun to deliver the necessary packages of work to achieve planning consent for the first group of wind farms.

We have worked hard to engage with, and retain the trust of, Forewind's stakeholders: our joint venture shareholders, The Crown Estate, the general public, Government, regulators and statutory bodies, NGOs and our current and potential future suppliers. In continuing to do so we aim to ensure we have the licence to operate, deliver consents for the projects, and create value for our owners.

Forewind is committed to leading the offshore wind industry in health and safety. The marine environment is challenging, but we understand that excellent health and safety performance is necessary for our success. We believe there is always time to work safely.

Forewind is an exciting place to work. I'm constantly impressed by the dedication, expertise and enthusiasm of our people. Everyone is conscious that they are contributing to the first stages of a project that is likely to play an enormous role in delivering a low-carbon and secure energy future for Britain.

The progress we have made so far would not have been possible without the hard work and dedication of the Forewind team and I'm confident we will continue to build on our early efforts and achieve the milestones required to advance this pioneering offshore wind project.

**Lee Clarke**  
General Manager

*'I'm constantly impressed by the dedication, expertise and enthusiasm of our people.'*

### Mission

Forewind aims to achieve development consent for a minimum of 9GW of safe, technically deliverable and economically viable offshore wind capacity on the Dogger Bank that will provide an attractive opportunity for investors.

### Vision

We aim to be the most admired offshore wind development team in Europe.

- Reputation for quality, expertise, and integrity – best in class in our industry.
- Continuously innovating to deliver the programme on time and on budget.
- Proud to be Forewind; recognised as the project colleagues and competitors would like to be part of.
- Our benchmark is offshore wind in general and Round 3 in particular.
- The biggest Round 3 project, capable of generating up to 10% of the UK's electricity.
- Dogger Bank has a vital part to play in helping combat climate change by reducing carbon emissions.
- Committed to developing Dogger Bank, with the minimum environmental impact.
- Working together to achieve safe, technically and economically viable projects ready for construction.
- Building on the strengths of four of Europe's biggest energy companies.
- Leadership in the development of renewables in the North Sea.

### In the beginning

**By the time of the Zone Development Agreement signing in December 2009, the majority of the Forewind team was in place, or in the process of transferring to Forewind from the owner companies.**

This meant that Forewind had a running start as soon as the zone awards were announced by then Prime Minister, Gordon Brown, in January 2010. There are now more than 30 full-time secondees plus other staff, consultants and advisers.

Selected advance development and procurement activities were undertaken prior to the ZDA signing including a thorough tendering process for an

offshore survey vessel which concluded with a binding Letter of Intent delivered well before the award of the ZDA.

Another key pre-ZDA activity was submission of a grid connection application to the National Grid that resulted in an early agreement for a 1GW connection at an existing substation at Creyke Beck, East Riding of Yorkshire.



### Milestones

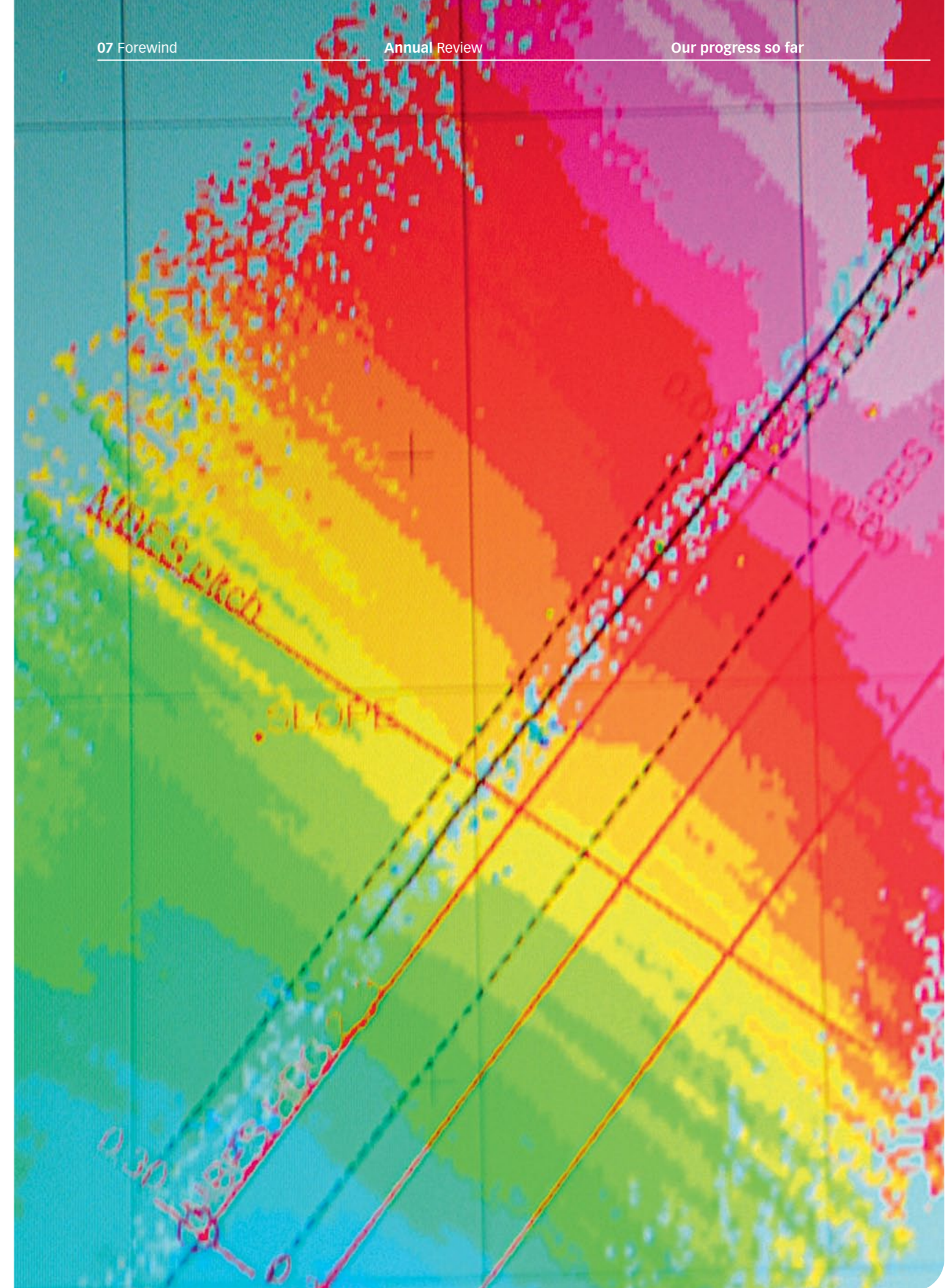
**The Zone Development Agreement has a number of contractual milestones spread over a five-year period. To the end of June 2011, more than a third of those milestones had been completed.**

**'Signing the first vessel contract was the start of a long-term process** to study the Dogger Bank site and assess the possible impacts the project could have on marine wildlife, habitat and users of the sea.'

**Simon Franey**  
Operations Manager

**'Making such demonstrable progress feels great,** but securing consents and then seeing investment decisions is the big motivator.'

**Ryan Trow**  
Commercial Manager



## Activities and achievements

**Since Forewind was named as development partner for the Dogger Bank Zone, the main focus has been on securing the first tranche of projects, therefore building momentum and confidence in Forewind.**

### Calendar of highlights

#### January 2010

Announcement of Forewind as development partner for Dogger Bank  
Start of stakeholder engagement  
Start of comprehensive ornithological and marine mammal surveys

#### February 2010

Participation in all The Crown Estate supply chain events and start of bilateral supply chain meetings

#### March 2010

First grid connection agreement signed (1GW at Creyke Beck, East Riding of Yorkshire)

#### April 2010

Stakeholder workshop events in Hull, Newcastle and London

#### May 2010

Start of geophysical surveys that continued up to December 2010

#### July 2010

Ongoing Zone Appraisal and Planning (ZAP) process

#### September 2010

First wave buoy deployed

#### October 2010

Published Zonal Characterisation (ZoC)  
Project One Scoping Report submitted to the Infrastructure Planning Commission (IPC)  
Announcement of location of Tranche A and Project One onshore scoping envelope

Geotechnical surveys underway, continued for three months

#### November 2010

Scoping Response received from IPC  
Second wave buoy deployed

Work starts on the selection of preferred onshore cable route and landfall for Project One

#### January 2011

Second year of ornithological and marine mammal surveys underway

#### March 2011

Revised met mast design and procurement process. The previous process was postponed due to higher than anticipated costs

#### May 2011

Selection of landfall location for Project One

Geophysical survey work begins on the Project One cable corridor

#### June 2011

Benthic and other offshore surveys continue on the Dogger Bank site

**'Forewind aims to install one or two met masts on Dogger Bank in 2012. We will utilise a multi-contract approach to maximise the business opportunities and most effectively manage expenditure.'**

**Pete Geddes**  
Construction Manager



## Health and safety

From the start, health and safety has been a primary focus for Forewind. In January 2010 Forewind set itself the target of becoming industry leaders in Health Safety and Environment management. Regrettably, despite its best efforts, Forewind has experienced a total of 14 incidents, two of which were potentially very serious. Fortunately neither caused permanent harm to people or the environment. Both incidents have been investigated, mitigation strategies identified and implemented, and lessons shared across the industry. Forewind is committed to the zero-harm mindset, but in the unfortunate event of an incident, will ensure experiences are transferred and lessons learned.

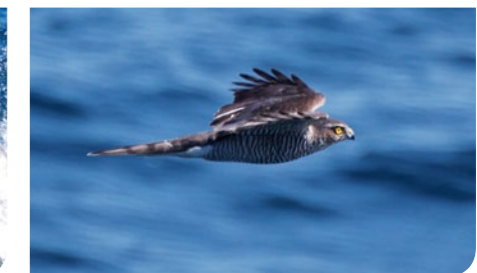
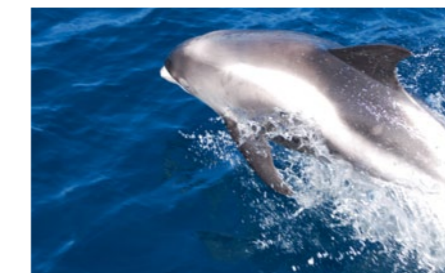
**'Forewind has the ambition to become industry leaders in managing health, safety and the environment.'**

**Stein Møller-Nilsen**  
HSEQ Manager

## Operations

Since the start of 2010, Forewind has undertaken a thorough Zone Characterisation Process to characterise the Dogger Bank Zone. This work has included:

- geophysical surveys covering 7000 kilometres of the full zone and 24,000 kilometres of the Tranche A area
- ornithological surveys from both aerial and boat-based platforms to identify birds and marine mammals amounting to the largest ever study of this kind
- geotechnical surveys comprising 94 Cone Penetration Tests (CPTs) and 41 sample boreholes
- deployment of two wave buoys (Datawell in September 2010 and Triaxys two months later)
- onshore consenting studies
- contact with all fisheries associations providing updates on operational activities.



**'We believe this is the largest and possibly most ambitious bird survey ever, and while it has been challenging due to weather and other conditions, the results are groundbreaking in an area that previously had been very poorly surveyed.'**

It has enhanced our understanding of seabird populations and distributions and reinforces the pelagic nature of many species, some of which don't even breed in the northern hemisphere.'

**Alastair Mackay**  
Protected Species Specialist



**Supply chain**

The success of the Dogger Bank development is highly dependent on the market capabilities and flexibilities to meet the Dogger Bank supply chain demands. The main success criteria is the need for an overall cost reduction (capex and opex) to ensure the sustainability of the offshore wind industry, including robust wind turbine generator technology that meets the defined target generation requirements. Ensuring sufficient capacities in all parts of the supply chain to meet the schedule and performance targets is a crucial success factor for the development of the Dogger Bank.

Forewind's strategic approach during the early development phase has been to try to improve the current industry structure to help develop the supply market, in order to better the supply position for the Dogger Bank development. This has been delivered through market reviews including supplier visits, meetings, participation in relevant supply chain conferences and forums.

**Grid**

Forewind has worked closely with National Grid over the past 18 months to secure suitable connection points to the UK transmission network for the Dogger Bank projects. In March 2010 Forewind signed a connection agreement for the first project, to connect at Creyke Beck, north of the Humber Estuary. Forewind has continued to engage with National Grid to identify further suitable connection points for the subsequent projects to provide timely, cost-effective and environmentally acceptable solutions.

From a technical perspective, work has been initiated to design the electrical system to connect from the offshore zone back to the National Grid substations. These connections will make use of innovative High Voltage Direct Current (HVDC) technology. These assets will eventually be owned and operated by an Offshore Transmission Owner (OFTO).



**'It has been remarkable to observe how quickly the supply market has responded to predicted future demands and requirements.'**

**Anne Karin Knausgård**  
Supply Chain Manager

**'We have worked hard over the past year developing an excellent relationship with National Grid and we are optimistic we will be able to deliver timely grid connections and achieve an outcome we are all happy with.'**

**Leon Notkevich**  
Electrical Engineer

## Future

**The 18 months since Forewind's award of the ZDA have seen significant progress, however, despite the numerous achievements of 2010, Forewind's work needs to push on to submit our first development consent application by the end of 2012.**

Goals for 2011 include safe operation; completing arrangements for the ownership, construction and operation of Projects One to Three including entry into Agreements for Lease; keeping consenting

activities for these first three projects to schedule and delivering competitive engineering concepts for them, and securing timely grid connections that are technically and commercially viable.

**'We are well underway with our environmental assessment work, including fieldwork to characterise the ecology along the potential cable corridor and converter station sites for our first project.'**

Good working relationships with the local authority and other statutory agencies are also a major focus so we will continue to liaise closely with them.'

**Tamsyn Reynolds**  
Onshore EIA Manager

## Dogger Bank – facts



**Size**  
8660km<sup>2</sup>  
(3,343 square miles)

Largest of the Round  
3 zones



**Distance from UK coast**  
125 to 290 kilometres  
(77 to 180 miles)



**Water depth**  
18 to 63 metres  
(59 to 206 feet)



**CO<sub>2</sub> reduction**  
The 9GW Dogger Bank development would reduce CO<sub>2</sub> emissions by approximately 13.7 million tonnes per annum, based on the current UK energy mix and an assumed capacity factor of 40%



**Depth distribution**  
Approximately 4GW in less than 30m water depth and 8GW in less than 35m water depth



**Estimated capacity**  
Agreed target 9GW by 2020, with the potential for approximately 13GW



**Wind speeds**  
High wind speeds > 10m/s  
Average wind speed consistent across the zone

## Photo captions

### Front cover

Greater Gabbard Offshore Wind Farm, off the Suffolk coast – view from a nacelle

### Inside front cover

Vessel on the way to Hywind, floating turbine, installed off the west coast of Norway

### Page 4/5

St Mary's Lighthouse, Whitley Bay, County Durham

### Page 6

**Top:** Transition pieces awaiting installation at North Hoyle Offshore Wind Farm

**Bottom:** Seismic survey underway at Dogger Bank

### Page 7

Seismic survey results from Dogger Bank

### Page 8

**Top:** Met mast at North Hoyle Offshore Wind Farm, in Liverpool Bay off the coast of Wales.

**Bottom:** Rhyl Flats Offshore Wind Farm, off the north Wales coast

### Page 9

Images from Dogger Bank supplied by Gardline Environmental

**From left:** Fulmar, Ringed Plover, Dolphin, Sparrow Hawk

### Page 10

Sheringham Shoal Offshore Wind Farm, off the coast of North Norfolk (image by www.chpv.co.uk)

### Page 11

**Top:** Beatrice Wind Farm Demonstrator Project, off the east coast of Scotland

**Bottom:** Fishing boats in Bridlington Harbour, East Riding of Yorkshire

### This page

Hywind floating wind turbine, installed off the west coast of Norway

