



**DOGGER BANK
TEESSIDE A & B**

**March
2014**




Environmental Statement


Chapter 1 Introduction

Application Reference: 6.1

Cover photograph: Installation of turbine foundations in the North Sea

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Introduction
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1 Project Background

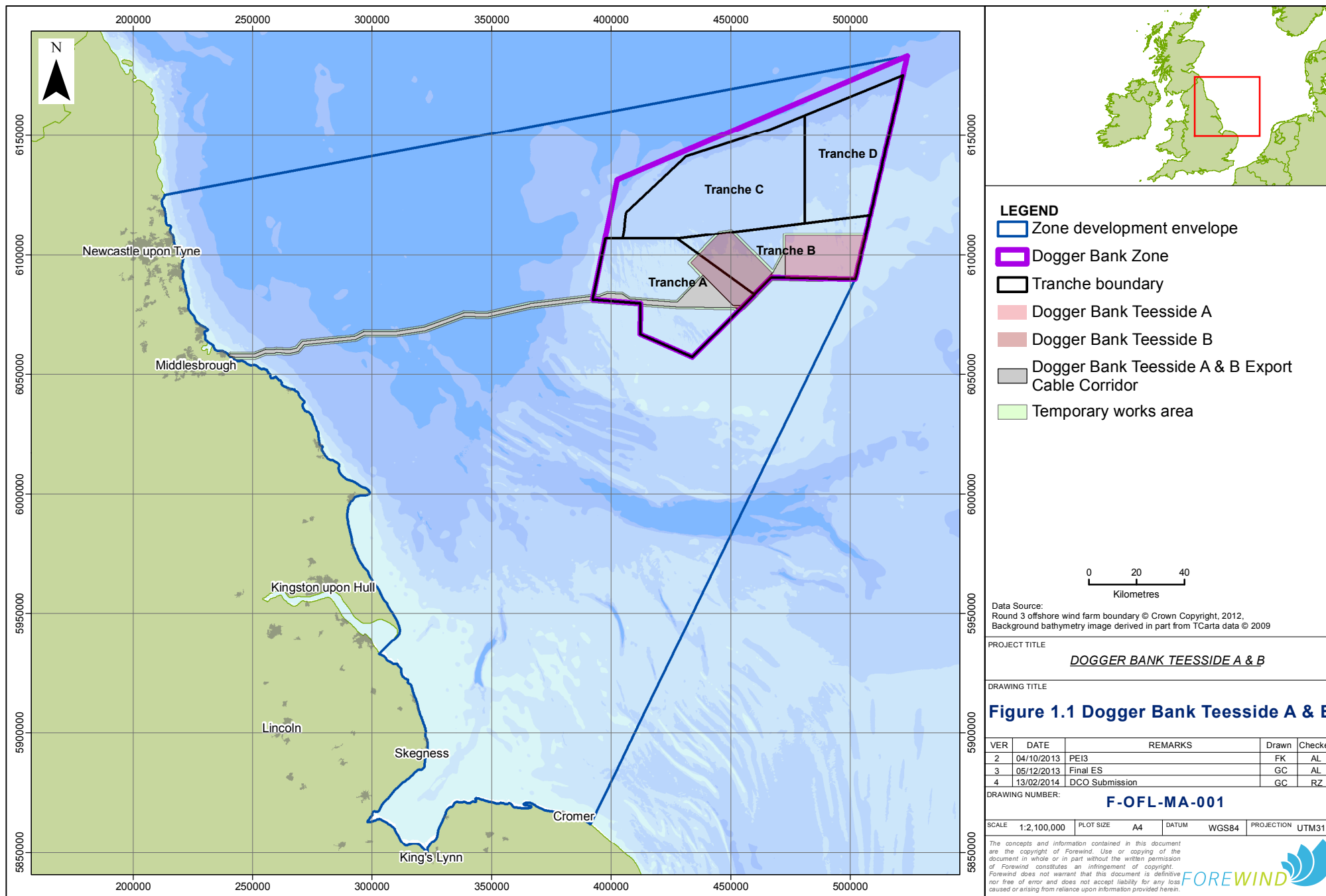
1.1 Project context

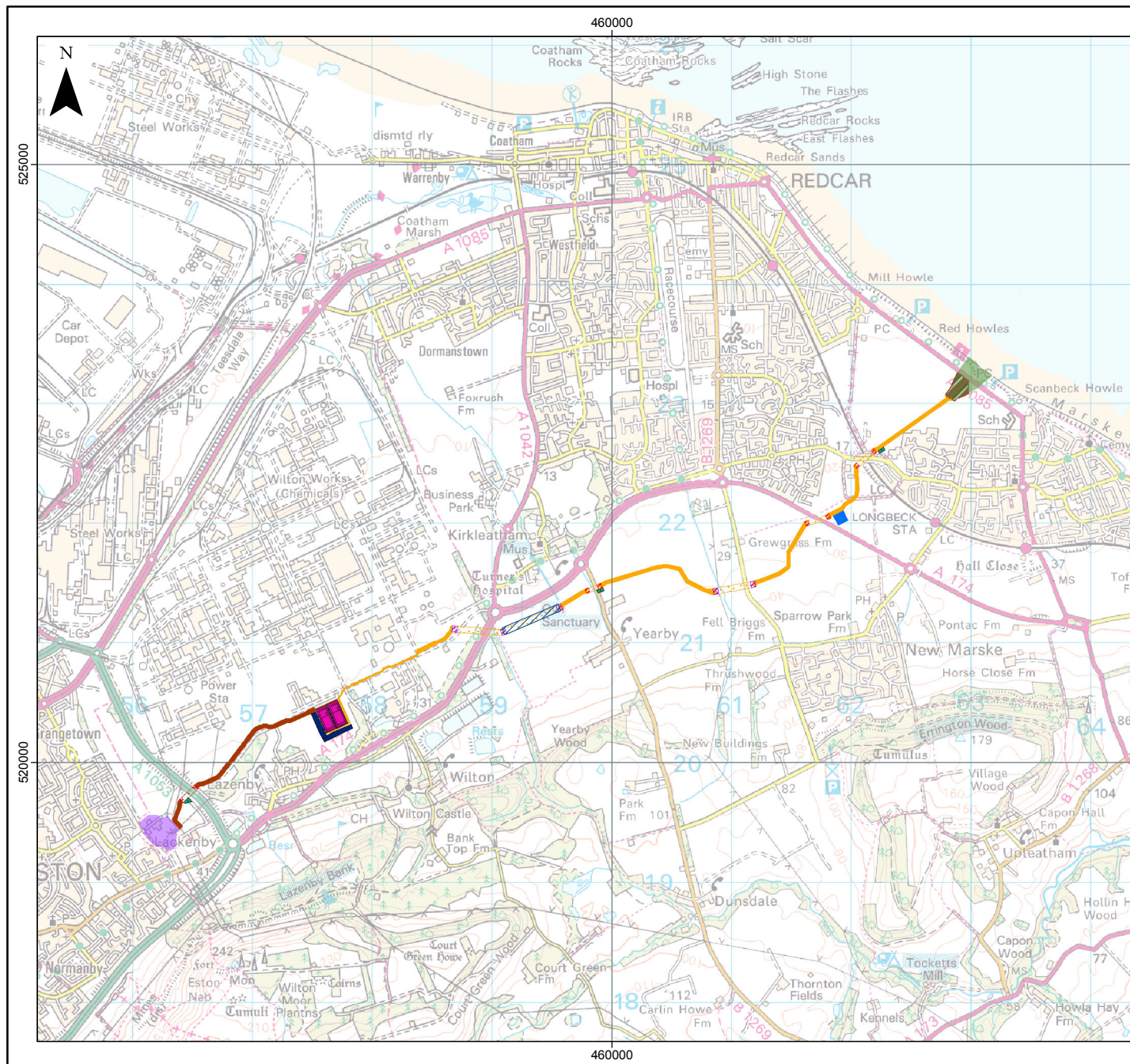
- 1.1.1 In June 2008 The Crown Estate announced proposals for the third round (Round 3) of offshore wind farm leasing, following on from the 8 gigawatts (GW) planned from earlier United Kingdom (UK) offshore wind leasing programmes (Rounds 1 and 2). Subsequent to this announcement, the Offshore Energy Strategic Environmental Assessment (Department of Energy and Climate Change (DECC) 2009) was carried out, to examine the potential for 25GW of additional UK offshore wind.
- 1.1.2 In this process nine Round 3 Zones were identified by The Crown Estate with a combined target energy generation capacity of 25GW. In January 2010, following a competitive tender process, The Crown Estate awarded Forewind Limited (Forewind) the exclusive development rights for 'Zone 3, Dogger Bank'; the largest of the Round 3 offshore wind farm zones. The Dogger Bank Zone comprises an area of 8,660km², and is located in the North Sea between 125km and 290km off the coast of Yorkshire (**Figure 1.1**).
- 1.1.3 Forewind's commitment is to secure all of the necessary consents for the construction and development of the Dogger Bank Zone, up to the point of an investment decision. The delivery strategy has been structured around the delivery of 9GW of offshore wind farm projects in the Zone by 2020. At the time of award of the site by The Crown Estate in 2010, it was believed that a capacity of 13GW might be achievable if the Zone was found to be completely developable with only limited constraints. In light of information (such as site survey data) that has been gathered over the course of the last three years, the organisation's current plan is to secure development consent for six projects, which have a total target installed capacity of 7.2 GW. Its focus is on the first four, which together are Dogger Bank Creyke Beck and Dogger Bank Teesside A&B.
- 1.1.4 The 7.2GW capacity will be achieved by a series of individual wind farm projects being developed in phases, based on the identification of development areas referred to as 'tranches'. Projects will subsequently be constructed by different parties over a phased period that is anticipated to commence in 2016. Forewind's current focus is on the first four, which together are Dogger Bank Creyke Beck and Dogger Bank Teesside A&B.
- 1.1.5 The boundaries of tranches A to D have now been identified within the Dogger Bank Zone. Selection of tranches A and B was informed by data which was collated during Zone Appraisal and Planning (ZAP)¹ and presented in the Zone Characterisation Document (ZoC) (Forewind, 2010). This process uses information collected in a series of stakeholder workshops and discussions, as

¹ A framework intended to rationalise and balance the commercial aim of maximising development capacity aspirations with the practicalities of deliverability

well as considering relevant technical, environmental and commercial aspects associated with offshore wind farm project delivery and operation.

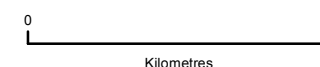
- 1.1.6 The ZoC, now in its second edition (Forewind 2011), primarily provides a baseline understanding of the environment across the zone. The Offshore Tranche, Wind Farm Array Boundary and In-Zone Export Cable Corridor Selection Report (Forewind 2013) details the selection processes and information for tranches C and D, as well as providing an update to the ZoC by outlining further the spatial planning undertaken by Forewind across the zone.
- 1.1.7 Tranche A was identified in 2010 (Tranche A Selection Report, Forewind, October 2010b) and spans 2000km² while Tranche B was identified in 2011 (Tranche B selection report, Forewind, May 2011b) and covers 1500km² sharing its western boundary with Tranche A (see **Figure 1.1**).
- 1.1.8 Dogger Bank Teesside A & B, the subject of this ES, are the first and second projects of the second stage of the Dogger Bank development. Forewind's development of the Dogger Bank Zone began with Dogger Bank Creyke Beck for which planning application was lodged during 2013. Dogger Bank Teesside A & B will comprise two wind farms, each generating up to 1.2GW, and will connect to the existing National Grid substation at Lackenby, in Teesside. Dogger Bank Teesside A & B projects will have a total combined generating capacity of up to 2.4GW. Following on from Dogger Bank Teesside A & B the next stage of development will be Dogger Bank Teesside C & D. This development will comprise of two wind farms in Tranche C of the Dogger Bank development area (Forewind 2013).
- 1.1.9 Dogger Bank Teesside A is located within the eastern portion of the developable area in Tranche B. Dogger Bank Teesside B crosses the border between Tranche A and Tranche B, with the majority of the project being located in Tranche B. The final project boundaries are shown on **Figure 1.1**.
- 1.1.10 The offshore infrastructure for Dogger Bank Teesside A & B will comprise of two wind farm arrays, within each array there will be four offshore collector stations, one converter platform and two accommodation platforms along with sub-sea inter-array and export cabling.
- 1.1.11 The onshore elements of the project will include two buried cable systems from the landfall north of Marske-by-the-Sea to the onshore converter station and then onto the National Grid connection at Lackenby substation (**Figure 1.2**).
- 1.1.12 Dogger Bank Teesside A & B was incorporated within the Dogger Bank Teesside Environmental Impact Assessment Scoping Report (Forewind 2012) which was submitted under Regulation 8 of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2009 to support Forewind's request for a scoping opinion. The Scoping Report covers the development of up to four such projects within the Dogger Bank Zone.





LEGEND

- Teesside A&B cable landfall
- ▨ Teesside A&B landfall construction
- Teesside A&B HVDC, Open
- Teesside A&B HVDC, Open
- Teesside A&B HVAC, Open
- ▨ Teesside A&B HVAC, Open
- ▭ Teesside A&B major horizontal directional drill entry or exit locations (2,000m²)
- ▭ Teesside A&B minor horizontal directional drill entry or exit locations (1,200m²)
- HDD or open trench to be confirmed
- ▭ Teesside A&B cable route primary construction compound
- ▭ Teesside A&B intermediate construction compound
- ▭ Teesside A&B converter stations
- ▭ Teesside A&B converter stations construction compounds (10,000m² per project)
- ▭ Lackenby 400kV substation



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PROJECT TITLE

DOGGER BANK TEESIDE A & B

DRAWING TITLE

**Figure 1.2 Dogger Bank
Teesside A & B onshore**

VER	DATE	REMARKS	Drawn	Checked
1	05/09/2013	Draft	SW	GC
2	04/10/2013	PE13	LW	GC
4	14/02/2014	DCO Submission	SW	RZ

DRAWING NUMBER:

F-ONC-MA-029

SCALE	1:50,000	PLOT SIZE	A4	DATUM	OSGB36	PROJECTION	BNG
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2 The Environmental Statement

2.1 Environmental Impact Assessment

- 2.1.1 This document constitutes the Environmental Statement (ES) for Dogger Bank Teesside A & B, presenting the findings of the Environmental Impact Assessment (EIA). The ES is submitted in support of the Development Consent Order (DCO) application and is required under the Infrastructure Planning (Environmental Impact Assessment) Regulations 2009 (which transpose the EIA requirements of the EU Directive (EIA Directive) 85/337/EEC (as amended by Directive 97/11/EC and Directive 2003/35/EC) (see **Chapter 3 Legislation and Policy**)).
- 2.1.2 The objectives of the EIA process are to ensure that environmental factors are considered throughout the project and the decision-making process, and that any potential environmental impacts are identified and assessed (see **Chapter 4 EIA Process**). As a result of this assessment process potential measures to avoid or minimise any adverse impacts can be identified.
- 2.1.3 The EIA encompasses temporary and permanent activity, both onshore and offshore, during the construction, operational and decommissioning phases of the development. This ES presents the findings of the EIA for the development of Dogger Bank Teesside A & B, as identified in Sections 6.3.1 to 6.3.6 below.
- 2.1.4 The information and design decisions presented within this document have been informed through an extensive programme of consultation, including provision of Preliminary Environmental Information (PEI) (see **Chapter 7 Consultation**).

3 The Applicant

3.1 Forewind

- 3.1.1 Forewind is a consortium comprising of four leading international energy companies; RWE Innogy UK (an RWE Innogy company), SSE plc (SSE), Statoil and Statkraft. Together, these companies combine extensive experience of international offshore project delivery and renewable energy development, construction, asset management and operations. Through the combined strength of its owner companies, Forewind has the ability to make a significant contribution to the future of wind energy in the UK, and to demonstrate commitment to the continuing development of offshore wind.

Partner companies

- 3.1.2 A summary of each of the Forewind partner companies is provided below:



RWE Innogy UK is the UK subsidiary of RWE Innogy and one of the UK's leading renewable energy developers and operators. The organisation is committed to developing and operating renewable energy projects to produce sustainable electricity.



SSE plc is one of the UK's leading energy companies. Its core purpose is to provide the energy people need in a reliable and sustainable way. It is involved in the generation, transmission, distribution and supply of electricity; energy trading; the development of major renewable energy projects; the extraction, storage, distribution and supply of gas; electrical and utility contracting; data centres and telecoms.



Statoil is an international energy company with operations in 36 countries. Building on 40 years of experience from oil and gas production on the Norwegian continental shelf, the company is committed to accommodating the world's energy needs in a responsible manner, applying technology and creating innovative business solutions. Statoil is headquartered in Norway with approximately 21,000 employees worldwide, and is listed on the New York and Oslo stock exchanges.



Statkraft is Europe's leader in renewable energy. The group develops and generates hydropower, wind power, gas power and district heating, and is a major player on the European energy exchanges. Statkraft is active in more than 20 countries.

4 Zone Appraisal and Planning

4.1 The Zone Appraisal and Planning process

- 4.1.1 ZAP is a non-statutory strategic planning process, which is advocated by The Crown Estate and the Marine Management Organisation (MMO) as part of the development process for the larger Round 3 Zones. One of the objectives of this zonal approach is to assist developers in making informed decisions on the location of their projects offshore by providing a mechanism for the early consideration of environmental, planning and engineering constraints.
- 4.1.2 It should be noted that the ZAP process is primarily focussed on the development of the offshore infrastructure. ZAP is being undertaken across the full Zone Development Envelope (ZDE) (see **Figure 1.1**), comprising the Dogger Bank Zone and associated Dogger Bank Teesside A & B Export Cable Corridor. The Crown Estate ZAP Framework document explains the process in further detail (The Crown Estate 2010).
- 4.1.3 The activities that make up Forewind's ZAP process are used to inform the identification of tranches for ongoing development. The ZAP process has been used to identify all four tranches of the development (referred to as Tranches A - D, **Figure 1.1**) (see also Forewind 2010b, 2011b and 2013).
- 4.1.4 The information collected so far in the ZAP process is included in the Zonal Characterisation Document (ZoC) (see below).
- 4.1.5 The ZoC studies undertaken to date have involved the collection and interpretation of a wide range of data including, as a starting point, the information available from the Offshore Energy Strategic Environmental Assessment (DECC 2009) and the accompanying 'planning level' Habitats Regulations Assessment (HRA) (The Crown Estate 2009), which were conducted for the purpose of informing the Round 3 development process. Available data has been stored and mapped within a Geographic Information System (GIS) database, which assists interrogation and enables the visual assessment of constraints.
- 4.1.6 The first ZoC document (Version 1, Forewind 2010) was completed in 2010 and provided a high level environmental and planning characterisation of the ZDE and the onshore study area around the National Grid Creyke Beck substation.
- 4.1.7 The second ZoC document (Version 2, Forewind 2011) provided an updated environmental characterisation, informed through site investigations that took place between 2010 and 2011.
- 4.1.8 The information is continuously evolving as additional surveys and studies are completed. Further updates to the ZoC will be made as surveys are undertaken in the newly identified tranches C and D. These additions to the ZoC will outline further steps in wind farm spatial planning across the Zone undertaken by Forewind (further details are presented in **Chapter 6 Site Selection and Assessment of Alternatives**).

- 4.1.9 The ZAP process has identified four tranches for development in accordance with the programme outlined below:
- Tranche A – identified in 2010 (Forewind 2010b);
 - Tranche B – identified in 2011(Forewind 2011b); and
 - Tranches C and D – identified in 2013 (Forewind 2013).
- 4.1.10 The first stage of ZAP was to undertake a gap analysis of the information collected and interpreted by Forewind during the Round 3 bidding phase. The output of the gap analysis was a set of targeted recommendations for the acquisition of further information and/or data in order to inform the identification of Tranche A and the ongoing ZAP process. A similar exercise will continue throughout the ZAP process in order to ensure that the zonal development strategy is informed by the best and most appropriate information and data.
- 4.1.11 It should be noted that the current version of the ZoC (Version 2) provides an assessment of the information collected to date and that this assessment will be informed and supplemented by the ongoing zonal and project level data collection and consultation activities that will be undertaken by Forewind throughout the ongoing development of the Dogger Bank Zone.

4.2 Ongoing Zone Appraisal and Planning phase

- 4.2.1 The ZAP process will continue throughout the development phase. The outcome of the initial ZAP and project development processes will inform subsequent ZAP and project development phases. In this way, the development of each project will be set within the context of the relevant stage of development of the Dogger Bank Zone and subsequently facilitate the Cumulative Impact Assessment (CIA) process (see **Chapter 4**). Importantly, this approach is also intended to provide stakeholders with the assurance that, while being asked to comment on individual projects, Forewind is fully cognisant of the need to maintain a strategic overview of the development strategy for the whole Dogger Bank Zone.
- 4.2.2 The information collected so far in the ZAP process is included in the latest ZoC document (Forewind 2011).

5 Dogger Bank Teesside A & B

5.1 Project overview

- 5.1.1 As detailed in **Chapter 5 Project Description**, a range of development options are being considered for Dogger Bank Teesside A & B and, as a result, a parameter specific 'realistic worst case' approach to impact assessment has been followed. This approach to assessment is known as the 'Rochdale Envelope' (see **Chapter 4**). This ensures that all realistic and likely worst case development scenarios are adequately assessed, and where flexibility is necessary, the project is described in such a way that a robust EIA can be undertaken.
- 5.1.2 Each proposed offshore wind farm project will have an installed generating capacity of up to 1,200MW (megawatts). Dogger Bank Teesside A and Dogger Bank Teesside B would each primarily comprise the following elements.

Offshore

- 5.1.3 The main offshore components include:
- Up to 200 wind turbines and supporting tower structures;
 - Wind turbine foundations and associated support and access structures;
 - One offshore converter platform, and associated foundation;
 - Up to four offshore collector platforms, and associated foundations;
 - Up to two offshore accommodation or helicopter platform(s) for operations and maintenance activities, and associated foundations;
 - Subsea inter-array cables:
 - between the wind turbines;
 - between wind turbines and offshore collector platforms;
 - between wind turbines and offshore converter platform;
 - linking to meteorological stations and accommodation platforms;
 - Subsea inter-platform cables:
 - between offshore collector platforms;
 - between offshore collector platforms and High Voltage Direct Current (HVDC) offshore converter platforms;
 - Offshore export cable systems, carrying power from the offshore HVDC converter platforms to the landfall(s);
 - Crossing structures at the points where project cables cross existing subsea cables and pipelines or other Dogger Bank project cables;

- Up to five offshore meteorological monitoring stations. This is in addition to the two meteorological stations which were subject to an earlier and separate consent application and 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); and
- Up to 10 vessel mooring buoys.

Onshore

5.1.4 The main onshore components include:

- Cable landfall and transition joint bays;
- Onshore High Voltage Direct Current (HVDC) export cable system;
- Onshore High Voltage Alternating Current (HVAC) export cable system;
- Onshore converter station; and
- Connection bay within the existing National Grid Electricity Transmission (NGET) substation at Lackenby.

5.1.5 Offshore wind farms comprise of wind turbines and the associated electricity infrastructure required to ensure that the electricity generated can be connected into the national grid. **Figure 5.1** illustrates the key components of an offshore wind farm project.

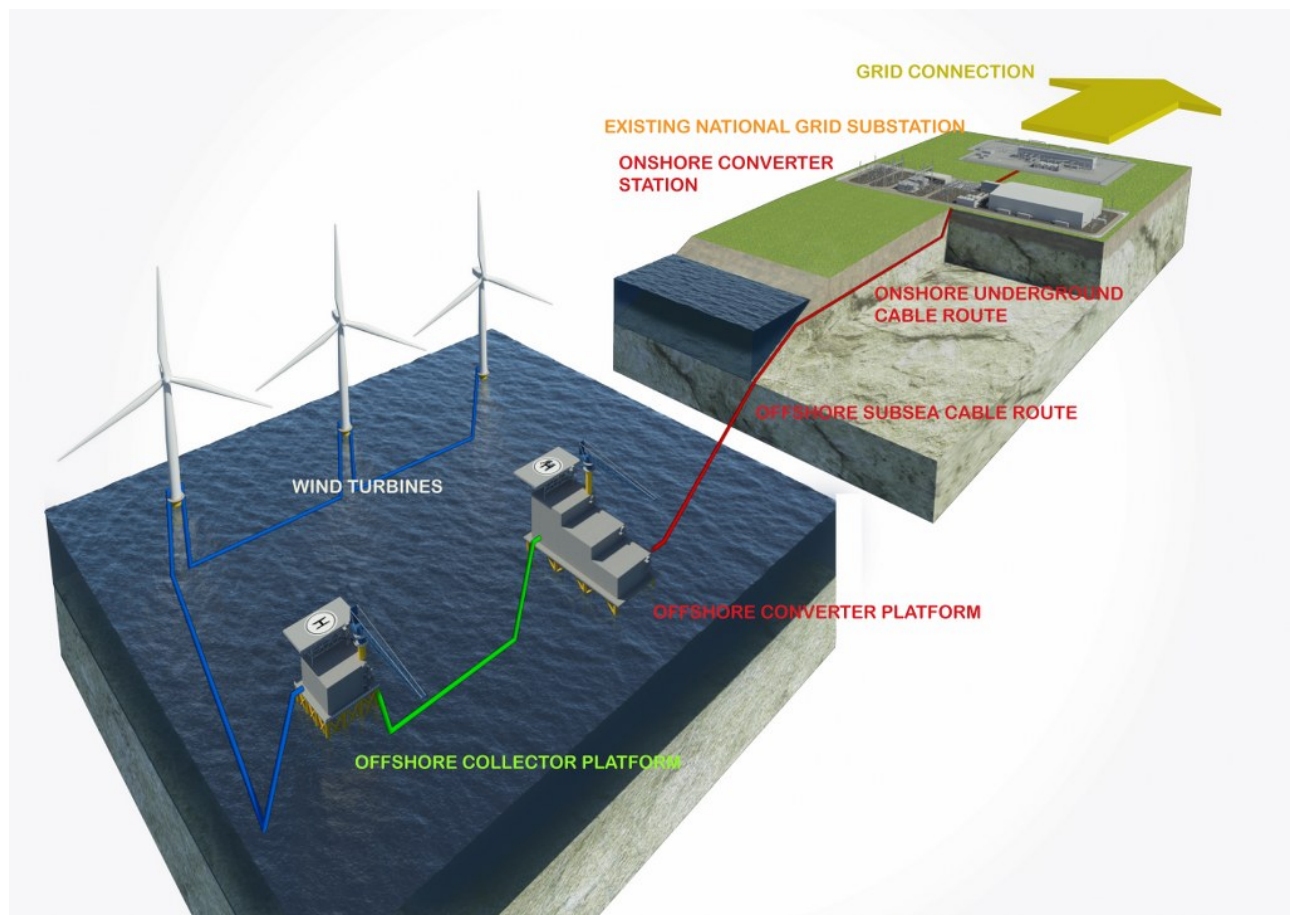


Figure 5.1 Schematic diagram of an offshore wind farm project

5.1.6 **Table 5.1** identifies the summary key project components that are likely to form part of Dogger Bank Teesside A & B. Further information on these components and their installation methodologies are included in **Chapter 5**.

Table 5.1 Summary of key project components

Parameters	Maximum per project	Maximum total for Projects 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
Length of inter-array cabling (km)	950	1,900
Length of inter-platform cabling	320	640
Number of HVDC export cable pairs	1	2
Onshore converter stations	1	2
Number of export HVAC cables	3	6
Met Masts	5	10

5.2 Programme overview

- 5.2.1 The indicative outline programme for the delivery of Dogger Bank Teesside A & B is as follows (full details in **Chapter 5**):
- **Q2 2012** – Request for Scoping Opinion;
 - **2010 to 2013** – Site characterisation, data analysis and reporting to inform the EIA;
 - **2012 - 2013** – EIA reporting and preparation of the draft ES;
 - **Q4 2013** – Submission of the draft ES for consultation under section 42 of the Planning Act;
 - **Spring 2014** – Submission of Application to the Planning Inspectorate (including submission of the draft Development Consent Order and final Environment Statement);
 - **Q2 2014** – Start of examination of application by Planning Inspectorate;
 - **Q2 2015** – Determination of application by the Secretary of State;
 - **2015/16** – Pre-construction phase;
 - **2017** – Earliest start of construction; and
 - **2020** – Earliest start of operation.
- 5.2.2 The construction programme for Dogger Bank Teesside A & B will be dependent on a number of factors that include, but are not limited to:
- The grid connection date in the connection agreement with National Grid (which may be subject to change);
 - The date that development consent is awarded.
- 5.2.3 The availability and lead times associated with the key project components, such as wind turbines and foundations.

6 Structure of the Environmental Statement

6.1 The Environmental Statement

- 6.1.1 The ES is comprised of the main assessment itself and supporting technical appendices (details below). Figures are included within the body of the ES and technical appendices. Note that the ES is submitted as part of a wider DCO application. The 'Explanatory Memorandum' provides a guide to all of the material that is submitted with the DCO application.

6.2 Non-technical summary

- 6.2.1 A standalone Non-Technical Summary (NTS) document provides, in non-technical language, an overview of the project and a summary of the key findings of the EIA.

6.3 Environmental Statement

- 6.3.1 The ES provides detailed information on Dogger Bank Teesside A & B, the baseline environment and an assessment of the subsequent impacts that may occur from the construction, operation and decommissioning phases of the project. Further details on the approach taken throughout the EIA process can be found in **Chapter 4**.
- 6.3.2 **Chapters 1 to 7** are the introductory chapters, providing the context to the EIA and the project. These chapters specifically cover the following:
- Introduction to the development;
 - The need for the projects;
 - The legislative and planning context, including the relevant policy guidance;
 - The approach to the EIA and definition of impact significance levels;
 - The project design and the construction, operation and decommissioning process for the wind farm and associated infrastructure;
 - The site selection process and alternatives considered; and
 - The consultation undertaken to date.
- 6.3.3 **Chapters 8 to 30** are the assessment chapters in relation to the physical, biological and human receptors that have the potential to be impacted by, or impact upon, the projects. Each individual chapter is structured accordingly:
- Introduction – sets the context for the parameter under discussion;
 - Guidance and consultation – details the relevant guidelines that have been followed and provides brief details of the key consultation undertaken to inform the assessment;
 - Methodology:

- Study area – provides a definition of the study area(s) used within the chapter;
 - Characterisation of the existing environment – describes the sources of data and the methodology used to undertake data collection and any issues associated with collecting that data; and
 - Assessment of impacts – explains the impact assessment process (highlighting any differences to the general methodology set out in **Chapter 4**).
- Existing environment – describes, using the data identified in the methodology section, the existing conditions for the relevant parameter within the study area;
 - Assessment of impacts:
 - Realistic worst case definition – outlines the details of the development which are considered to be the realistic worst case scenario for the receptor or impact being assessed (see **Chapter 4**);
 - Assessment of impacts during the construction phase (applying the realistic worst case defined for the receptor) – assesses the predicted impact from each aspect of the construction activity, where relevant, and assigns a predicted significance level for each impact. Where relevant, details of the mitigation measures that Forewind will commit to are presented;
 - Assessment of impacts during the operational phase – as above, but for the operational phase of the project; and
 - Assessment of impacts during the decommissioning phase – as above, but for the decommissioning phase of the project.
 - Inter-relationships – identifies where the receptor under discussion could be influenced by other parameters considered within the ES and if this could result in a combined impact upon that receptor;
 - Transboundary effects – considers any likely significant effects on the environment of another Member State of the European Economic Area (EEA), including impacts that might occur on the environment within other EEA member states (i.e. not within the UK Regional Economic Zone) and impacts that might occur on interests of another EEA member state within the UK Regional Economic Zone;
 - Cumulative impacts – identifies, describes and evaluates the impacts resulting from the combined effects of Dogger Bank Teesside A & B, Dogger Bank Creyke Beck and Dogger Bank Teesside C & D with other relevant infrastructure, development proposals and activities;
 - Proposed monitoring – if appropriate, where verification of predicted impacts is required, monitoring programmes are outlined; and
 - Summary – a tabulated summary of the main findings of the assessment.

- 6.3.4 **Chapter 31 Inter-relationships, Chapter 32 Transboundary Effects and Chapter 33 Cumulative Impact Assessment** capture and summarise the relevant discrete assessments provided in each technical chapter (as described above).
- 6.3.5 **Chapter 34 Conclusions** provides a summary of the findings of the EIA.
- 6.3.6 **Chapter 35 Summary of Mitigation and Monitoring** outlines any mitigation measures and monitoring as detailed in each of the assessment chapters.

6.4 Appendices

- 6.4.1 For certain parameters, specialist technical studies or site surveys have been undertaken to help inform the EIA. The data associated with these studies/surveys is described within the ES and is provided in full within the appendices.

7 References

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