East Anglia TWO Offshore Windfarm

Chapter 1

Introduction

Preliminary Environmental Information
Volume 1
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Glossary of Acronyms

AFL	Agreement for lease
AONB	Area of Oustanding Natural Beauty
DCO	Develpoment Consent Order
EAOW	East Anglia Offshore Wind
EIA	Environmental Impact Assessment
ES	Environmental Statement
EU	European Union
IEMA	Institute of Environmental Management and Assessment
MW	Megawatt
NSIP	Nationally Significant Infrastructure Project
NTS	Non-Technical Summary
PEIR	Preliminnary Environmental Information Report
SPR	ScotttishPower Renewables
UK	United Kingdom
VWPL	Vattenfall Wind Power Limited
ZDA	Zone Development Agreement

Glossary of Terminology

Applicant	East Anglia TWO Limited.
Construction consolidation sites	Compounds which will contain laydown, storage and work areas for onshore construction works. The HDD construction compound will also be referred to as a construction consolidation site.
Construction operation and maintenance platform	A fixed offshore structure required for construction, operation, and maintenance personnel and activities.
Development area	The area comprising the Proposed Onshore Development Area and the Offshore Development Area
East Anglia TWO project	The proposed project consisting of up to 675 wind turbines, up to four offshore electrical platforms, up to one construction operation and maintenance platform, inter-array cables, platform link cables, up to one operational meteorological mast, up to two offshore export cables, fibre optic cables, landfall infrastructure, onshore cables and ducts, onshore substation, and National Grid infrastructure.
East Anglia TWO windfarm site	The offshore area within which wind turbines and offshore platforms will be located.
European site	Sites designated for nature conservation under the Habitats Directive and Birds Directive, as defined in regulation 8 of the Conservation of Habitats and Species Regulations 2017 and regulation 18 of the Conservation of Offshore Marine Habitats and Species Regulations 2017. These include candidate Special Areas of Conservation, Sites of Community Importance, Special Areas of Conservation and Special Protection Areas.
Evidence Plan Process	A voluntary consultation process with specialist stakeholders to agree the approach to the EIA and the information required to support HRA.
Horizontal directional drilling (HDD)	A method of cable installation where the cable is drilled beneath a feature without the need for trenching.
Inter-array cables	Offshore cables which link the wind turbines to each other and the offshore electrical platforms, these cables will include fibre optic cables.
Jointing bay	Underground structures constructed at regular intervals along the onshore cable route to join sections of cable and facilitate installation of the cables into the buried ducts.
Landfall	The area (from Mean Low Water Springs) where the offshore export cables would make contact with land, and connect to the onshore cables.
Link boxes	Underground chambers or above ground cabinets next to the cable trench housing electrical earthing links.
Met mast	An offshore structure which contains metrological instruments used for wind data acquisition.
Mitigation areas	Areas captured within the Development Area specifically for mitigating expected or anticipated impacts.
Monitoring buoys	Buoys to monitor in situ condition within the windfarm, for example wave and metocean conditions.

National Grid infrastructure	A National Grid substation, connection to the existing electricity pylons and National Grid overhead line realignment works which will be consented as part of the proposed East Anglia ONE North project Development Consent Order but will be National Grid owned assets.
National Grid overhead line realignment works	Works required to upgrade the existing electricity pylons and overhead lines to transport electricity from the National Grid substation to the national electricity grid
National Grid overhead line realignment works area	The proposed area for National Grid overhead line realignment works.
National Grid substation	The substation (including all of the electrical equipment within it) necessary to connect the electricity generated by the proposed East Anglia TWO project to the national electricity grid which will be owned by National Grid but is being consented as part of the proposed East Anglia TWO project Development Consent Order.
National Grid substation location	The proposed location of the National Grid substation.
Natura 2000 site	A site forming part of the network of sites made up of Special Areas of Conservation and Special Protection Areas designated respectively under the Habitats Directive and Birds Directive.
Offshore cable corridor	This is the area which will contain the offshore export cables between offshore electrical platforms and landfall jointing bay.
Offshore development area	The East Anglia TWO windfarm site and offshore cable corridor (up to Mean High Water Springs).
Offshore electrical infrastructure	The transmission assets required to export generated electricity to shore. This includes inter-array cables from the wind turbines to the offshore electrical platforms, offshore electrical platforms, platform link cables and export cables from the offshore electrical platforms to the landfall.
Offshore electrical platform	A fixed structure located within the windfarm area, containing electrical equipment to aggregate the power from the wind turbines and convert it into a more suitable form for export to shore.
Offshore export cables	The cables which would bring electricity from the offshore electrical platforms to the landfall, these cables will include fibre optic cables.
Offshore infrastructure	All of the offshore infrastructure including wind turbines, platforms, and cables.
Offshore platform	A collective term for the construction operation and maintenance platform and the offshore electrical platforms.
Onshore cable corridor	The corridor within which the onshore cable route will be located.
Onshore cable route	This is the construction swathe within the onshore cable corridor which would contain onshore cables as well as temporary ground required for construction which includes cable trenches, haul road and spoil storage areas.
Onshore cables	The cables which would bring electricity from landfall to the onshore substation. The onshore cable is comprised of up to six power cables and two fibre optic cables.

Proposed onshore development area	The area in which the landfall, onshore cable corridor, onshore substation, mitigation areas, temporary construction facilities (such as access roads and construction consolidation sites), and the National Grid Infrastructure will be located.
Onshore infrastructure	The combined name for all of the onshore infrastructure associated with the proposed East Anglia TWO project from landfall to the connection to the national electricity grid.
Onshore substation	The East Anglia TWO substation and all of the electrical equipment, both within and connecting to the National Grid infrastructure.
Onshore substation location	The proposed location of the onshore substation for the proposed East Anglia TWO project.
Platform link cable	Electrical cable which links one or more offshore platforms, these cables will include fibre optic cables.
Safety zones	A marine area declared for the purposes of safety around a renewable energy installation or works / construction area under the Energy Act 2004.
Scour protection	Protective materials to avoid sediment being eroded away from the base of the foundations as a result of the flow of water.
Transition bay	Underground structures at the landfall that house the joints between the offshore export cables and the onshore cables.

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1 Introduction

1.1 Purpose of this Document

1. This document is the Preliminary Environmental Information Report (PEIR) for the proposed East Anglia TWO project, which will have a generating capacity of up to 900MW[1]. The project is being developed by East Anglia TWO Limited (the Applicant), which is a wholly owned subsidiary of ScottishPower Renewables (SPR) Limited.

2. The PEIR describes the preliminary findings of the assessment of the potential environmental impacts associated with the construction, operation, maintenance and decommissioning of the proposed East Anglia TWO project including the onshore infrastructure and offshore infrastructure. The purpose of the PEIR is to provide preliminary environmental information to allow stakeholders to develop an informed view of the likely significant environmental effects of the development (including associated development) as required by The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations 2017).

3. The PEIR has been informed by a Scoping Opinion from the Planning Inspectorate that was received in December 2017 (The Planning Inspectorate 2017). This followed the submission of a scoping request and accompanying Scoping Report to the Planning Inspectorate in November 2017 (SPR 2017) as well as subsequent pre-application consultation (as detailed in each relevant technical chapter, chapters 7-30).

4. The PEIR has been produced to support consultation under Section 42 of the Planning Act 2008. Feedback from this consultation will be taken into consideration and where relevant, will be used to inform the final design of the project and the scope of the final impact assessment presented in the Environmental Statement (ES). The ES will be submitted as part of an application for a Development Consent Order (DCO) as required under Section 37 of the Planning Act 2008. Further information on the legislative context for the proposed East Anglia TWO project is provided in ***Chapter 3 Policy and Legislative Context***.

1.2 Background to Proposed East Anglia TWO Project

5. In 2010, The Crown Estate announced the successful bidders to the Round 3 offshore windfarm zones. A 50:50 joint venture between SPR and Vattenfall Wind Power Limited (VWPL) was successful in securing rights to develop offshore wind capacity within what was originally referred to as the 'East Anglia Zone'. After successfully obtaining consent and a CfD (Contract for Difference) for East Anglia

[1] As measured at point of connection of the onshore cables to the onshore substation.

ONE, and successfully submitting the application for consent for East Anglia THREE (now consented), SPR and VWPL split the zone. SPR agreed to develop the southern half of the former East Anglia Zone and VWPL agreed to develop the northern half of the East Anglia Zone. SPR are now solely responsible for East Anglia ONE, East Anglia THREE, the proposed East Anglia TWO project, and the proposed East Anglia ONE North project, and the Zone is now referred to as the former East Anglia Zone.

6. East Anglia TWO Limited, which is a wholly owned subsidiary of SPR, is now undertaking the EIA for the proposed East Anglia TWO project. A full project description is provided in ***Chapter 6 Project Description***. When operational the project would have the potential to provide the equivalent of up to 742,000[2] homes with power.

7. From the wind turbines electricity will flow via subsea inter-array cables to a number of offshore electrical platforms within the East Anglia TWO windfarm site. Offshore export cables will connect the offshore electrical platforms to shore, making landfall to the north of Thorpeness in Suffolk.

8. Once the offshore export cables reach the shore they will be joined to underground onshore cables via an underground transition joint bay near the point of landfall. The underground onshore cables will then connect to a new SPR onshore substation. From this onshore substation, the proposed East Anglia TWO project will then be connected into the national electricity grid via a new National Grid substation to be owned and operated by National Grid. In addition, works will be required on the existing electricity pylons and overhead lines in the immediate vicinity of the new National Grid substation to allow for connection to the national electricity grid.

9. The applicant is committed to undergrounding onshore cables between the landfall and the SPR substation with the benefit of avoiding landscape and visual impacts associated with overhead lines. This is particularly important given that a section of the onshore cables is routed through the Suffolk Coast & Heaths Area of Outstanding Natural Beauty (AONB).

10. SPR, via its project companies, is currently developing the proposed East Anglia TWO project in parallel with another project in the former East Anglia Zone, the proposed East Anglia ONE North project. Separate DCO applications for the proposed East Anglia TWO and East Anglia ONE North projects will be submitted. The proposed onshore development area, which includes the landfall, cable corridor

[2] Calculated taking the number of megawatts (900) multiplied by the number of hours in one year (8,766), multiplied by the average load factor for offshore wind (36.7 %, published by the Digest of United Kingdom Energy Statistics), divided by the average annual household energy consumption (3,900 kWh), giving an equivalent of powering 742,413 homes.

and substation site, has been developed to allow for the construction of both the East Anglia TWO and East Anglia ONE North projects. At this stage it is not known whether both projects would be constructed simultaneously or sequentially. The assessment presented in this PEIR will:

- Assess the impacts of the proposed East Anglia TWO project alone; and
- Assess the impacts of the proposed East Anglia TWO and East Anglia ONE North projects being constructed in parallel.

11. Further details on the EIA methodology and construction scenarios are provided in ***Chapter 5 EIA Methodology.***

1.3 The Applicant and the Project Team

12. The Applicant is a wholly owned subsidiary of SPR and has been incorporated to develop the proposed East Anglia TWO project.

13. SPR is part of the Iberdrola Group, a world leader in clean energy with an installed capacity of over 28,000MW, and the leading wind energy producer worldwide. SPR is at the forefront of the development of the renewables industry through pioneering ideas, forward thinking and outstanding innovation which, in turn, drives economic success.

14. SPR is helping to drive the Iberdrola Group's ambition of being the "Utility of the Future" and, as of 2018, has 40 operational windfarms in the UK producing over 2,500MW of clean energy. SPR manage all of their operational sites, including their international offshore portfolio, through the innovative and world leading Control Centre at Whitelee Windfarm, Scotland.

15. SPR is currently building the 714MW East Anglia ONE offshore windfarm approximately 43km off the coast of Suffolk. This £2.5 billion project is planned to deliver renewable energy to meet the equivalent annual demand of almost 600,000 homes[3] and should be fully operational during 2020. This project will be followed by the 1,200MW East Anglia THREE offshore windfarm which received development consent in August 2017. Building on these first two projects within the East Anglia portfolio, SPR has set up special project companies; East Anglia TWO Limited and East Anglia ONE North Limited and these project companies are now formally progressing development of the proposed East Anglia TWO and proposed East Anglia ONE North projects.

[3] Calculated taking the number of megawatts (714) multiplied by the number of hours in one year (8,766), multiplied by the average load factor for offshore wind (36.7 %, published by the Digest of United Kingdom Energy Statistics), divided by the average annual household energy consumption (3,900 kWh), giving an equivalent of powering 588,981 homes.

16. Royal HaskoningDHV has been commissioned as the consultant to lead the EIA for the proposed East Anglia TWO project. Royal HaskoningDHV is supported through the EIA process by a number of additional consultants who are responsible for particular specialist topics. Royal HaskoningDHV is an environmental and engineering consultancy with significant expertise in offshore renewable energy.

17. Royal HaskoningDHV has provided environmental, development and consenting support on over 14GW of renewable energy projects across 26 UK offshore windfarms. Their EIA activities and ESs are accredited by the Institute of Environmental Management and Assessment (IEMA) under the EIA Quality Mark Scheme. This demonstrates Royal HaskoningDHV's commitment to ensuring EIA is undertaken to a high quality and in accordance with best practice.

1.4 Purpose of the Project

18. Climate change is a global issue as a result of carbon emissions released into the atmosphere due to human activity. Generating and harnessing energy from low carbon, renewable sources, such as offshore wind, is one of the solutions available to substantially reduce carbon emissions, whilst answering the challenges of meeting energy demand as part of a balanced energy portfolio. The UK has an ambitious target of reducing greenhouse gas emissions by 57% relative to 1990 levels by 2030, and by 80% by 2050. Offshore wind currently generates 5% of the UK's electricity and this is expected to double by 2020 (The Crown Estate 2018). In 2017, more than 50% of the UK's electricity was generated by low carbon sources (Imperial College London 2018).

19. The proposed East Anglia TWO project would make a significant contribution both to the achievement of UK decarbonisation targets and to global commitments to mitigating climate change. By generating low carbon, renewable electricity in the UK, the proposed East Anglia TWO project will also help to reduce the UK's reliance on imported energy and improve the UK's energy security. Further detail is provided on this in ***Chapter 2 Need for the Project*** and ***Chapter 3 Policy and Legislative Context***.

1.5 EIA Process

20. The overall objective of the EIA is to identify potentially significant adverse impacts resulting from a project in order for them to be avoided or minimised where possible, as well as identifying opportunities for beneficial impacts.

21. EIA is required under the terms of European Union (EU) Directive 2011/92/EU (as amended by Directive 2014/52/EU)) on the assessment of the effects of certain public and private projects on the environment (EIA Directive). The EIA Directive is transposed into English law for Nationally Significant Infrastructure Projects (NSIPs)

by the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (EIA Regulations 2017).

22. The proposed East Anglia TWO project has a capacity of up to 900MW and is above the 100MW threshold for offshore development projects to be considered as NSIPs under the Planning Act 2008. As such, a DCO application will be submitted to the Planning Inspectorate for development consent for the project. The proposed East Anglia TWO project is also "EIA Development" for the purposes of the EIA Regulations 2017 and an EIA will be completed for the project and submitted along with the DCO application. This PEIR precedes the ES by identifying the potential significant environmental impacts of the project. The assessment methodology that has informed the PEIR is explained in further detail in ***Chapter 5 EIA Methodology***.

1.6 The PEIR Structure

23. This document covers the proposed East Anglia TWO project including the offshore development area and the proposed onshore development area. It comprises three volumes;

- Volume 1: PEIR Chapters (chapter list shown in ***Table 1.1***);
- Volume 2: Figures; and
- Volume 3: Appendices.

Table 1.1 PEIR Volume 1 Chapter List

Section	Chapters	Title
Introductory	Chapter 1	Introduction
	Chapter 2	Need for the Project
	Chapter 3	Policy and Legislative Context
	Chapter 4	Site Selection and Assessment of Alternatives
	Chapter 5	EIA Methodology
	Chapter 6	Project Description
Offshore	Chapter 7	Marine Geology, Oceanography and Physical Processes
	Chapter 8	Water and Sediment Quality
	Chapter 9	Benthic Ecology
	Chapter 10	Fish and Shellfish Ecology
	Chapter 11	Marine Mammals
	Chapter 12	Offshore Ornithology

Section	Chapters	Title
	Chapter 13	Commercial Fisheries
	Chapter 14	Shipping and Navigation
	Chapter 15	Civil and Military Aviation and Radar
	Chapter 16	Marine Archaeology and Cultural Heritage
	Chapter 17	Infrastructure and Other Users
Onshore	Chapter 18	Ground Conditions and Contamination
	Chapter 19	Air Quality
	Chapter 20	Water Resources and Flood Risk
	Chapter 21	Land Use
	Chapter 22	Onshore Ecology
	Chapter 23	Onshore Ornithology
	Chapter 24	Archaeology and Cultural Heritage
	Chapter 25	Noise and Vibration
	Chapter 26	Traffic and Transport
Wider-Scheme Aspects	Chapter 27	Human Health
	Chapter 28	Offshore Seascape, Landscape and Visual Amenity
	Chapter 29	Landscape and Visual Impact
	Chapter 30	Tourism, Recreation and Socio-Economics

24. In addition, a separate stand-alone Non-Technical Summary (NTS) is available which summarises the key characteristics of the proposed East Anglia TWO project and the preliminary findings of the PEIR.

25. During this phase of consultation, the Draft report to Inform the Habitat Regulations Assessment will also be available for review and comment.

1.7 References

Imperial College London (2018) Electric Insights Quarterly Reports: 2017 in Review. Available online at: http://electricinsights.co.uk/#/reports/report-2017-q4/detail/2017-in-review?_k=kys8a8 [Accessed 10/07/18].

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