



**SCOTTISHPOWER  
RENEWABLES**

# **East Anglia ONE North and East Anglia TWO Offshore Windfarms**

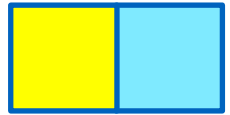
## **Applicants' Responses to Examining Authority's Written Questions**

### **Volume 8 - 1.6 Electricity Connections, infrastructure and Other Users**

Applicants: East Anglia ONE North Limited and East Anglia TWO Limited  
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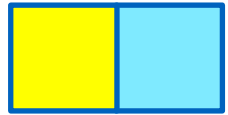
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**Applicable to East Anglia ONE North and East Anglia TWO**



Revision Summary				
Rev	Date	Prepared by	Checked by	Approved by
001	02/11/2020	Paolo Pizzolla	Lesley Jamieson / Ian Mackay	Rich Morris

Description of Revisions			
Rev	Page	Section	Description
001	n/a	n/a	Final for Deadline 1



This document is supported by the following appendices:

Appendix number	Title
1	Overview Scale of Outline Landscape Mitigation Plan
2	East Anglia ONE Substation Detailed Design Document
3	Email Correspondence with Whale and Dolphin Conservation
4	Ecological Mitigation Works
5	Email Correspondence with Suffolk Wildlife Trust
6	Illustrative Open Trench and Trenchless Onshore Cable Route
7	Onshore Crossing Schedule
8	Environment Agency Flood Zones
9.1	EA1N Annotated Viewpoint 1
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10	Landfall Indicative HDD Working Area
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12	Suffolk Seascape Sensitivity to Offshore Wind Farms Final Report
13	Tourism Impact Review
14	Junction Locations



## Glossary of Acronyms

AA	Appropriate Assessment
AADT	Annual Average Daily Traffic
ADD	Acoustic Deterrent Devices
AEOI	Adverse Effect on Integrity
AIL	Abnormal Indivisible Load
AIS	Air Insulated Switchgear
ALC	Agricultural Land Classification
ALO	Agricultural Liaison Officer
ANO	Air and Navigation Order
AONB	Area of Outstanding Natural Beauty
APP	Application Document
AST	Assured Shorthold Tenancies
ATC	Automatic Traffic Counts
BCT	Bat Conservation Trust
BEIS	Department of Business Energy and Industrial Strategy
BMV	Best and Most Versatile
BoR	Book of Reference
BT	British Telecom
CA	Compulsory Acquisition
CCS	Construction Consolidation Sites
Cd	Candela
CfD	Contract for Difference
CIA	Cumulative Impact Assessment
CIEEM	Chartered Institute of Ecology and Environmental Management
CION	Connection and Infrastructure Options Note
COCP	Code of Construction Practice
dB	Decibels
DCO	Development Consent Order
DML	Deemed Marine Licence
DMO	Destination Management Organisation
DMRB	Design Manual for Roads and Bridges
EA	Environment Agency
EIA	Environmental Impact Assessment
EM	Explanatory Memorandum
EMP	Ecological Management Plan
ES	Environmental Statement
ESC	East Suffolk Council
ESCA	European Subsea Cables Association
ESDAL	Electronic Service Delivery for Abnormal Loads
ETG	Expert Topic Group
ExA	Examining Authority
ExQs	Examining Authorities First Written Questions
FID	Final Investment Decision
FRA	Flood Risk Assessment
GEART	Guidelines for the Environmental Assessment of Road Traffic
GIS	Gas Insulated Switchgear
GLVIA	Guidelines for Landscape and Visual Impact Assessment
Ha	Hectares
HDD	Horizontal Directional Drilling
HE	Historic England
HGV	Heavy Goods Vehicle



HRA	Habitats Regulations Assessment
ICPC	International Cable Protection Committee
IPSIP	In Principle Site Integrity Plan
Km	Kilometres
kV	Kilovolt
LAT	Lowest Astronomical Tide
LCA	Landscape Character Assessment
LCT	Landscape Character Type
LiDAR	Light Detection and Ranging
LIQ	Land Interest Questionnaire
LLFA	Lead Local Flood Authority
LMP	Landscape Management Plan
LPA	Local Planning Authority
LSE	Likely Significant Effects
LVIA	Landscape and Visual Impact Assessment
M	Metres
MCA	Marine Coastguard Agency
MCTC	Manual Classified Turning Counts
MHWS	Mean High Water Springs
MMMP	Marine Mammal Mitigation Protocol
MMO	Marine Management Organisation
MoD	Ministry of Defence
MoU	Memorandum of Understanding
MW	Megawatt
MWh	Megawatt Hours
NALEP	The New Anglia Local Enterprise Partnership
NATS	National Air Traffic Service
NCTA	National Coastal Tourism Academy
NE	Natural England
NGET	National Grid Electricity Transmission
Nm	Nautical Miles
NPPF	National Planning Policy Framework
NPS	National Policy Statement
NSIP	Nationally Significant Infrastructure Project
OAMP	Outline Access Management Plan
OCTMP	Outline Construction Traffic Management Plan
OFTO	Offshore Transmission Owner
OLEMS	Outline Landscape and Ecological Management Strategy
OMLP	Outline Management and Landscape Plan
ORJIP	Offshore Renewables Joint Industry Programme
OTP	Outline Travel Plan
PD	Procedural Decision
PEIR	Preliminary Environmental Impact Report
PEMP	Project Environmental Management Plan
PIL	Persons with an interest in Land
PPG	Planning Practice Guidance
PRoW	Public Right of Way
PS	Policy Statements
PTP	Port Travel plan
PVA	Population Viability Analysis
RAG	Red Amber Green
RLoS	Radar Line of Sight
RR	Relevant Representation



RSPB	Royal Society for the Protection of Birds
RTD	Red Throated Diver
RWS	Rijkswaterstaat
SAC	Special Area of Conservation
SCC	Suffolk County Council
SCCAS	Suffolk County Council Archaeology Service
SCHAONB	Suffolk Coats and Heaths Area of Outstanding Natural Beauty
SLVIA	Seascape, Landscape and Visual Impact Assessment
SMP	Shoreline Management Plan
SNS	Southern North Sea
SoCG	Statement of Common Ground
SoS	Secretary of State
SPA	Special protected Area
SPR	ScottishPower Renewables
SSSI	Site of Special Scientific Interest
STEM	Science, Technology and Engineering and Mathematics
SuDS	Sustainable Urban Drainage System
SZC	Sizewell C
TCE	The Crown Estate
TH	Trinity House
TMZ	Transponder Mandatory Zone
TP	Temporary Purchase
TPO	Tree Purchase Order
TWT	The Wildlife Trust
UK	United Kingdom
UKCP	United Kingdom Climate Projections
UXO	Unexploded Ordinance
VP	Viewpoint
WQ	Written Question
WR	Written Representation
WSI	Written Scheme of Investigation
ZTV	Zone of Theoretical Visibility



## Glossary of Terminology

Applicants	East Anglia TWO Limited / East Anglia ONE North Limited
Cable sealing end compound	A compound which allows the safe transition of cables between the overhead lines and underground cables which connect to the National Grid substation.
Cable sealing end (with circuit breaker) compound	A compound (which includes a circuit breaker) which allows the safe transition of cables between the overhead lines and underground cables which connect to the National Grid substation.
Construction consolidation sites	Compounds associated with the onshore works which may include elements such as hard standings, lay down and storage areas for construction materials and equipment, areas for vehicular parking, welfare facilities, wheel washing facilities, workshop facilities and temporary fencing or other means of enclosure.
Construction operation and maintenance platform	A fixed offshore structure required for construction, operation, and maintenance personnel and activities.
The Councils	East Suffolk Council and Suffolk County Council
Development area	The area comprising the onshore development area and the offshore development area (described as the 'order limits' within the Development Consent Order).
East Anglia ONE North project	The proposed project consisting of up to 67 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 project	The proposed project consisting of up to 75 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.
Generation Deemed Marine Licence (DML)	The deemed marine licence in respect of the generation assets set out within Schedule 13 of the draft DCO.
Horizontal directional drilling (HDD)	A method of cable installation where the cable is drilled beneath a feature without the need for trenching.
HDD temporary working area	Temporary compounds which will contain laydown, storage and work areas for HDD drilling works.



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 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 within the onshore cable route housing electrical earthing links.
Meteorological mast	An offshore structure which contains metrological instruments used for wind data acquisition.
Mitigation areas	Areas captured within the onshore development area specifically for mitigating expected or anticipated impacts.
Marking buoys	Buoys to delineate spatial features / restrictions within the offshore development area.
Monitoring buoys	Buoys to monitor <i>in situ</i> condition within the windfarm, for example wave and metocean conditions.
National electricity grid	The high voltage electricity transmission network in England and Wales owned and maintained by National Grid Electricity Transmission
National Grid infrastructure	A National Grid substation, cable sealing end compounds, cable sealing end (with circuit breaker) compound, underground cabling and National Grid overhead line realignment works to facilitate connection to the national electricity grid, all of which will be consented as part of the proposed East Anglia TWO / 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 (including cable sealing end compounds and cable sealing end (with circuit breaker) compound) 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 / East Anglia ONE North 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 / East Anglia ONE North 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.
Offshore development area	The East Anglia TWO / East Anglia ONE North 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 (which may be laid directly within a trench, or laid in cable ducts or protective covers), up to two fibre optic cables and up to two distributed temperature sensing cables.
Onshore development area	The area in which the landfall, onshore cable corridor, onshore substation, landscaping and ecological 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 / East Anglia ONE North project from landfall to the connection to the national electricity grid.
Onshore preparation works	Activities to be undertaken prior to formal commencement of onshore construction such as pre-planting of landscaping works, archaeological investigations, environmental and engineering surveys, diversion and laying of services, and highway alterations.
Onshore substation	The East Anglia TWO / East Anglia ONE North substation and all of the electrical equipment within the onshore substation and connecting to the National Grid infrastructure.
Onshore substation location	The proposed location of the onshore substation for the proposed East Anglia TWO / East Anglia ONE North 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.
Transmission DML	The deemed marine licence in respect of the transmission assets set out within Schedule 14 of the draft DCO.



ExA. Question Ref.	Question addressed to	ExA. Question	Applicants' Response
<b>1.6 Electricity Connections, infrastructure and Other Users</b>			
1.6.1	The Applicant, National Grid	<p><b>1 2 NSIP Definition of the Authorised Development</b> Schedule 1 paragraphs 1 and 2 of the dDCO [APP-023] describes the authorised development as two NSIPs:</p> <ul style="list-style-type: none"> <li>• A nationally significant infrastructure project as defined in sections 14 and 15 of the 2008 Act (the wind turbine generator array) with associated development to make all of the offshore and onshore grid connection works; and</li> <li>• A nationally significant infrastructure project as defined in sections 14 and 16 (electric lines) (for the connection point and National Grid substation works). Work No. 41 is the National Grid substation itself.</li> </ul> <p>a) Is there an anticipated point in the period to 2030 at which the proposed development that is the subject of the East Anglia ONE North and the East Anglia TWO applications could in aggregate cease to be the predominant users of Work No. 41?</p> <p>b) If additional grid connections</p>	<p>a) The National Grid infrastructure included in the Applications is required solely for these Projects, therefore, the Applicants do not anticipate any point in the period to 2030 where they or a related Offshore Transmission Owner (OFTO) would cease to be the predominant connector to Work No. 41.</p> <p>b) (i) If additional grid connections were made at this location, the Applicants consider that additional land would be required. (ii) If additional grid connections were to be made at this location, the Applicants consider that additional physical infrastructure would be required. (iii) The Applicants are unable to make any projection on the timing, extent and impact of any possible future proposals.</p>



ExA. Question Ref.	Question addressed to		ExA. Question	Applicants' Response
			<p>were to be made at this location, what are the implications for Work No. 41 and any directly related works:</p> <ul style="list-style-type: none"> <li>i. Will additional land be required;</li> <li>ii. Will additional development (physical infrastructure be required); and</li> <li>iii. If the responses to (i) and (ii) above are affirmative, can any clear projection be made as to the timing, extent and impact of these additional proposals?</li> </ul>	
1.6.2	The Applicant, National Grid	1 2	<p><b>NSIP Definition of the Authorised Development</b> Are there circumstances in which the making of additional grid connections at Work No. 41:</p> <ul style="list-style-type: none"> <li>a) could result in Work No. 41</li> </ul>	<p>a) The Applications are in respect of the East Anglia ONE North project and the East Anglia TWO project and the works proposed are those required in relation to those projects only. The decision to locate the onshore substations and National Grid infrastructure in the vicinity of Friston was independent of any considerations relating to any potential future projects which may connect there.</p>



ExA. Question Ref.	Question addressed to	ExA. Question	Applicants' Response
		<p>desirably becoming the subject matter of a distinct application for development consent, on the basis that it is no longer solely or even substantially required to connect the generating stations (Offshore Wind Farms) that are the subject of the East Anglia ONE North and East Anglia TWO applications; and</p> <p>b) might suggest that National Grid or a relevant subsidiary might more desirably or appropriately be the applicant for an NSIP primarily comprising Work No. 41 and relevant associated development?</p>	<p>b) The Applicants have included the National Grid infrastructure required for the Projects in the <b>draft DCO</b> to ensure the deliverability of the Projects as a whole. The National Grid infrastructure included in the Applications are the extent of works required for the East Anglia ONE North project and the East Anglia TWO project only. The 2008 Act is designed to provide an integrated consent process for Nationally Significant Infrastructure Projects (NSIPs), and the approach to the Applications is consistent with that. Including the National Grid Infrastructure required for the Projects has enabled the totality of the proposed development to be properly considered through site selection and design.</p>
1.6.3	National Grid	<p>1 2</p> <p><b>Operation and Further Development of Work No. 41</b> If Work No. 41 is constructed and becomes operational, subject to responses to ExQ1.0.17 – 18 and 1.6.1 &amp; 2 above:</p> <p>a) will it be more accurate to characterise it as:</p> <p>i. a National Grid facility accommodating the generating station development proposed in these applications (the East Anglia ONE</p>	No response



ExA. Question Ref.	Question addressed to		ExA. Question	Applicants' Response
			<p>North and East Anglia TWO Offshore Wind Farms, or</p> <p>ii. as a general purpose substation facility operating as a National Grid transmission asset, providing transmission connections for multiple users and purposes; and</p> <p>b) do the powers proposed to be provided by the dDCO [APP-023] and the description of development in the ES and the Works Plans provide sufficient scope to build and operate the facility that National Grid currently envisage?</p> <p>If the answer to (b) is no, does National Grid envisage there needing to be a further application or applications for development consent (or amendments to these development consents if granted) required to form and deliver the intended use and development of this facility?</p>	
1.6.4		1 2	<p><b>Changes to the dDCO</b></p> <p>Are any changes to the dDCO as applied for [APP-023] anticipated as a consequence of a need to accommodate any development currently anticipated to be delivered as part of or to connect to Work No. 41, that is not development</p>	No.



ExA. Question Ref.	Question addressed to	ExA. Question	Applicants' Response
		proposed in these applications or by these applicants?	