



**SCOTTISHPOWER  
RENEWABLES**

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

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

### **Volume 16 – 1.16 Seascape, landscape and Visual Amenity**

Applicants: East Anglia ONE North Limited and East Anglia TWO Limited  
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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:

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2	East Anglia ONE Substation Detailed Design Document
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## 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>1.16 Seascape, Landscape and Visual Amenity</b>			
1.16.1	The Applicant	<p><b>1 2 Cumulative Effects</b></p> <p>ES Chapter 28 [APP-076] notes that as a result of an assessment of cumulative effects the physical area of EA2 was reduced, while maintaining generation capacity. This was to increase the gap between EA1N and EA2 to increase legibility of each windfarm in its own right and reduce cumulative effects from the AONB from areas further north such as Southwold.</p> <p>a) In views from further south along the coast, such as Aldeburgh or Orford Ness where angles of view are different, would the change in the physical area of EA2 have a noticeable effect? Would each windfarm still be legible from such viewpoints or would they visually merge into one?</p> <p>b) Would any such visual effects be accentuated at night-time due to the lighting of the proposed turbines?</p> <p>c) Similarly, in views from further north, would there be a marked legibility between the proposed EA2 windfarm and the Greater Gabbard/Galloper windfarms (both in the day-time and at night)?</p>	<p>a) The change in the physical area in views from Aldeburgh (VP13) ensures that there is a notable gap between East Anglia ONE North (EA1N) and East Anglia TWO (EA2) where prior to this reduction there was an apparent overlap between the two windfarms. In the view from Orford Ness (VP18), the reduction ensures that EA1N and EA2 do not appear to overlap. However, notably from these locations, EA1N is located at distances of 54.2km and 59.2km respectively and is therefore likely to be comparatively less visible than EA2 so that there is a further impression of separation due to the difference in their relative distance from the viewpoints or where EA1N visibility is limited due to distance/visibility conditions. It is therefore considered that EA2 would be legible in its own right from such viewpoints.</p> <p>b) It is considered that the visual effects relating to legibility / separation between each offshore windfarm would not be accentuated at night-time from turbine lighting, due to the separation/gap between the arrays described above in answer to (a) and the greater distances of the EA1N aviation lights offshore.</p> <p>The Applicants propose to include a new paragraph (2) within Requirement 31 of the updated draft DCO to be submitted at Deadline 3 stating <i>“Such lights will be operated at the lowest permissible lighting intensity level”</i>. This amendment which corresponds to 200 candela (10%) of the maximum 2000 candela, subject to visibility levels, within the Air Navigation Order (2016)(a) has been included to address stakeholder concerns surrounding night-time visual effects of aviation lighting.</p>



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ExA. Question Ref.	Question addressed to	ExA. Question	Applicants' Response
			<p>NE has concluded, (with particular reference to VP13) that the effect of the 200cd lighting on EA2 will not be significant for all receptors and the special qualities of the SCHAONB.</p> <p>c) In views from further north, such as Covehithe (VP3), Southwold (VP4) and Dunwich (VP7) there would be a marked legibility between the proposed EA2 windfarm and the Greater Gabbard/Galopper windfarms to the south, as they are separated by a clear section of undeveloped sea skyline (both in the day-time and at night). The longer distances to Galloper/Greater Gabbard from the northern part of the AONB also mean that Galloper/Greater Gabbard are comparatively less visible, which further adds to the impression of separation.</p>
1.16.2	The Applicant	1 2	<p><b>Suffolk Coastal Path</b> The effect of the construction and operation of the proposed windfarms on users of the Suffolk Coastal Path is assessed by the ES (Chapter 28) as not significant [APP-076, para 280], due to various factors including periods of no visibility of EA2 or EA1N and the route being characterised by a wide variety of landscapes.</p> <p>a) From looking at a map, it could appear that were a walker to be traversing the Suffolk Coastal Path that existing wind farms and the proposed wind farms may be visible for much of the route from around Felixstowe to Lowestoft and consequently a near ever-present view of turbines may have a substantial effect on such walkers. Do you agree with this statement?</p> <p>a) Whilst it is acknowledged that there would be an increase in the sequential visibility of offshore windfarms from the Suffolk Coastal Path, as a result of the addition of the proposed EA1N and EA2 windfarms to the operational windfarms, the Applicant does not agree that windfarms would become a near ever-present feature in views from the Suffolk Coastal Path between Felixstowe and Lowestoft.</p> <p>Within the study area, the Applicant has surveyed actual visibility of EA1N and EA2 from the Suffolk Coastal Path as presented in Figure 28.23a (EA1N) and Figures 28.23a and 28.23b (EA2) respectively. This shows that the visibility of the proposed EA1N and EA2 windfarms (and indeed visibility out to sea) from the route of the Suffolk Coastal path is highly intermittent, due to a combination of the factors described in Chapter 28 Para 280 (APP-076) and in more detail in Appendix 28.6 (APP-561). Although significant effects on views from the Suffolk Coastal Path are identified on specific sections and viewpoints, the Applicant's</p>



ExA. Question Ref.	Question addressed to	ExA. Question	Applicants' Response
		<p>b) From the USI the ExA's noted that elements of the Coastal Path such as north of Thorpeness have limited views on the 'land' side of the path, due to topography. In such circumstances where your view is more constricted focussed to seaward, would the proposed windfarms have more of an impact visually on path users?</p>	<p>assessment is that this does not equate to a significant overall effect on the Suffolk Coastal Path on long distance walkers walking the route as a whole.</p> <p>The Applicant has not surveyed the full stretch of the Suffolk Coastal Path between Bawdsey Manor and Felixtowe, which is outside the study area, however, it is noted from illustrative Viewpoint E (Figure 28.51a-e (APP-381) and Viewpoint F (Figure 28.52a-e (APP382)) that views of the operational Greater Gabbard/Galloper, London Array and Gunfleet Sands offshore windfarms will be most notable from this stretch. EA1N will not be visible due to its distance offshore (over 74km from Bawdsey Manor). EA2 will theoretically be visible, albeit with limited visibility at long distances of 52-59km (between Languard Fort and Bawdsey Manor).</p> <p>b) Immediately north of Thorpeness the defined route of the Suffolk Coastal Path diverts inland, away from the crumbling cliffs, where it passes along a hedge-lined track and through open fields and adjacent areas of commercial forestry which restrict visibility of EA1N and EA2 as shown on Figures 28.23 (APP-351) (EA1N) and Figures 28.23a and 28.23b (APP-351 and APP-352) (EA2). There is however, a footpath route along the coastal edge of the Sizewell cliffs at this location (Viewpoint 11), which affords more limited views on the 'land' side of the path, due to the topography and direct views out to sea from the cliff edge. The Applicant's understanding is that this section is no longer part of the defined route of the Suffolk Coastal Path due to the erosion of the cliff edge, hence its routing inland.</p> <p>The Applicant does note the potential for the windfarms becoming a more prominent visual focus in offshore views when the views</p>



ExA. Question Ref.	Question addressed to	ExA. Question	Applicants' Response
			<p>are more constricted inland, where the views focused seaward, however based on the surveys it has undertaken, these circumstances are considered to occur relatively rarely along the route and limited to short sections, such as at Sizewell Cliffs and Dunwich Heath/Cliffs.</p> <p>On other sections of the route, such as further north from Thorpeness, along the section defined as (7) Minsmere &amp; Sizewell, the experience from the route of the path is varied with sections where the intervening shingle ridge obscures views out to sea but also where topography, vegetation and built form limit views inland as noted by the ExA, so that views are more concentrated on the sea panorama. This may increase viewers susceptibility to the proposed windfarms (and therefore their effect), however, this also has to be balanced with the aspects of susceptibility that are influenced by existing visual amenity which, along this stretch of the route, often include the Sizewell A and B Nuclear Power Stations.</p>
1.16.3	Natural England	1 2	<p><b>Visual effects of turbines</b></p> <p>Detailed analysis of the visible height of offshore wind turbines is provided by yourselves to the ExAs ([RR-059], Appendices E, Section 2).</p> <p>The ExA also note the detailed responses of the Applicants to this analysis in their response to the RRs [AS-036] and their view that there are limitations to the analysis presented and that the apparent height of the Project 300m turbines will only be greater than that of the</p>



ExA. Question Ref.	Question addressed to	ExA. Question	Applicants' Response
		<p>existing offshore windfarms in views from northern parts of the seascape setting of the AONB.</p> <ul style="list-style-type: none"> <li>• Respond to this analysis of your comments, should you wish to do so</li> </ul>	
1.16.4	Natural England, The Applicant	<p><b>2</b></p> <p><b>Good design: seascape</b> Natural England (NE) consider that after reviewing Chapters 3 and 6 of the ES [RR-059] they are unable to find a direct reference to how the proposal will achieve 'good design'. NE note that the revised layout design would add some embedded mitigation in the form of reduced lateral spread and note the role of the site selection process and the operation of navigational lighting in minimising landscape and visual effects. However, despite this, it considers that significant detrimental landscape and visual effects are still predicted for the scheme, principally as a result of technology choice selected for use in the worst-case scenario: i.e. 300m high turbines.</p> <p>NE request further information on the decisions which have led to the selection of 300m turbines, in particular in the portion closest to the coast of the AONB.</p> <p>Due to the technology choice selected for use in the worst case scenario, and reflecting that smaller turbines are available, NE considers that the NPS requirements for 'good design' have not yet been fully applied in the design of the EA2 scheme, and that as a consequence the statutory purpose of the AONB will be</p>	<p>b) The 300m turbines were selected as part of the worst case scenario in accordance with the Rochdale Envelope approach of the assessment. This was considered a realistic upper size limit.</p> <p>The Applicant notes that following submission of the ES, the maximum turbine height parameter has been reduced from 300m to 282m blade tip. This provides a reduction in the apparent height/vertical scale of turbines visible in views from the SCHAONB. This change has resulted from continued liaison with the supply chain since the Applications were made.</p> <p>The Applicant considers that the measures incorporated into the revised design of the East Anglia TWO project windfarm site afford sufficient mitigation of the seascape, landscape and visual effects on the SCHAONB and constitute good design.</p> <p>In addition to the proposed reduction in the maximum turbine height the Applicant has proposed, by way of mitigation, a reduced windfarm site area. The north-south extent of the East Anglia TWO windfarm site was reduced (by 9.68km on the western boundary and 8.03km on the east) in order to mitigate potential seascape effects, without a reduction in wind turbine numbers or generation capacity. This refinement is shown in Figure 4.3: Refinement of the East Anglia TWO Windfarm Site Boundary of the ES (APP-082). The embedded mitigation afforded is described in Section 28.3.3 of Chapter 28 of the ES.</p>



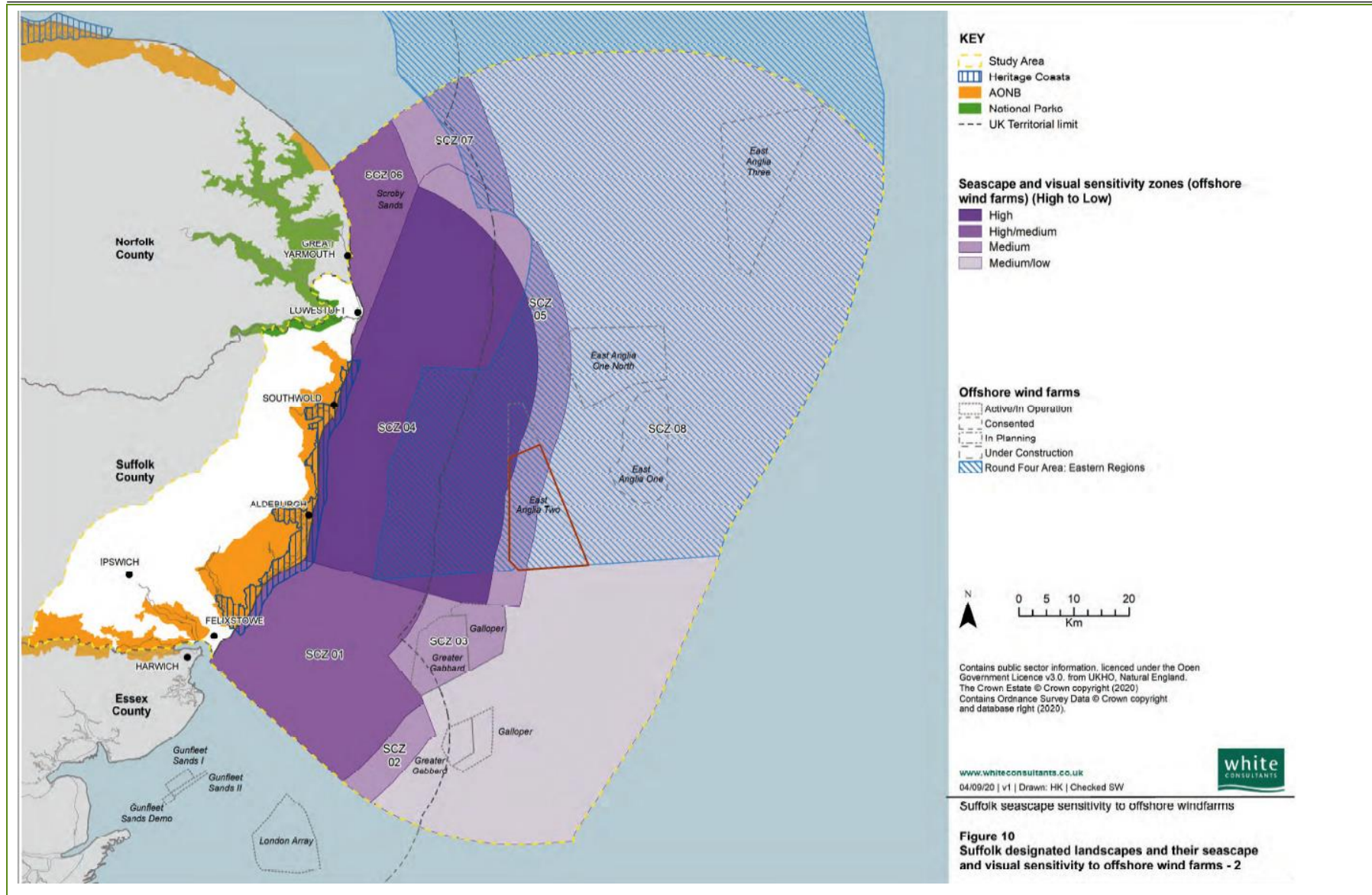


ExA. Question Ref.	Question addressed to	ExA. Question	Applicants' Response
		<p>adversely effected by the EA2 proposal as it is currently configured.</p> <p>The ExA notes the detailed responses of the Applicant to this point of view in their responses to the RRs [AS-036]. The Applicant considers that the mitigation of a reduced windfarm site area has regard to the statutory purposes of the AONB and demonstrates good design in respect of landscape and visual amenity, given the various siting, operational, and other relevant constraints. The ExA also notes the commitment to provide further information in justification of the decisions which have led to the selection of 300m turbines.</p> <p>To Natural England:</p> <p>a) Please provide any further responses considered necessary in response to the Applicant's comments. Do you remain of the view that the NPS requirements for good design have not been met in the design of the EA2 scheme, and if so, why is that and what additional mitigation is required?</p> <p>To the Applicant:</p> <p>b) Provide further justification for the selection of 300m turbines, in particular in the portion of the array closest to the coast of the AONB, with reference made as to how the requirement of good design in the NPS has been met</p>	<p>All the relevant interested parties that expressed an opinion have been supportive of this mitigation.</p> <p>We note that the White Associates (October 2020) Suffolk Seascape Sensitivity to Offshore Wind Farms Final Report for Suffolk County Council Suffolk Coast and Heaths AONB Partnership (<b>Appendix 12</b> of this document) illustrates in Figure 10 the seascape and visual sensitivity zones identified by the authors in levels between high and medium/low.</p> <p><b>Figure 10</b> below (prepared by the Applicant) shows the extent of EA2 assessed in the PEIR as well as the reduced array area proposed over-laid on these zones. This shows that the reduction in the extent of EA2 has removed the majority of the area identified in the study as being within an area of 'High' seascape and visual sensitivity.</p> <p>The Applicant does not consider that the methods and conclusions of work undertaken for broadscale strategic purposes such as this can be directly applied to individual projects (which need detailed EIA). However, this does provide independent support for the case that the Applicant has used 'good design' principles with the strategic seascape and visual mitigation of removing the majority of the East Anglia TWO windfarm site from the area of 'High' seascape and visual sensitivity identified in the study.</p> <p>The Applicant notes the general advice at EN-1 paragraph 5.9.8 that 'virtually all nationally significant energy infrastructure projects will have effects on the landscape'.</p> <p>The Applicant considers that the mitigation embedded in the design of the windfarm site and its proposed turbines will provide an important contribution to reducing the seascape, landscape</p>



ExA. Question Ref.	Question addressed to	ExA. Question	Applicants' Response
			and visual effect of the East Anglia TWO windfarm (and cumulative effects with EA1N) on the AONB and therefore meet the requirement of good design.







## Applicants' Response to ExA WQ1 Volume 16

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ExA. Question Ref.	Question addressed to	ExA. Question	Applicants' Response
1.16.8	The Applicant, Natural England	<p><b>1 2 Night-time effects</b></p> <p>Natural England note that at ES Chapter 28, section 28.3.3 para. 42 [APP- 076] embedded mitigation measures include the fitting of 'aviation warning lights to significant peripheral wind turbines and will allow for reduction in lighting intensity at and below the horizon when visibility from every wind turbine is more than 5km', and presume therefore that the worst case scenario would be that illustrated in figure 28.28g where 2000 candela lights are shown.</p> <p>NE are unsure as to why the assessment of night-time effects has been restricted to Landscape Character Type 25, which only affects the urban areas of Southwold and Aldeburgh. They note that dark skies are an important component of the special qualities of the AONB and consider that it is clear from ES figures 28.28g and 28.37f that the aviation navigational lighting proposed has the potential to adversely affect dark skies. NE state that their experience of other offshore wind farms suggests that aviation navigational lighting is a conspicuous feature when viewed from the shore and that atmospheric conditions, such as sea fog, can amplify the adverse effect as aviation navigational lights flash in sequence.</p> <p>NE wish to see an assessment of the effects of navigational lighting on night-time skies, based upon the worst case scenario for the use of navigational lighting, for LCT 05</p>	<p>a) The Applicant does not intend to submit the assessments requested by Natural England having discussed this with them. The Applicants expect NE to submit a response at Deadline 1 confirming these are no longer required.</p> <p>b) The Applicants propose to include a new paragraph (2) within Requirement 31 of the updated draft DCO to be submitted at Deadline 3 stating "<i>Such lights will be operated at the lowest permissible lighting intensity level</i>". This amendment has been included to address stakeholder concerns surrounding night-time visual effects of aviation lighting.</p> <p>The Applicants can commit to reduction of nacelle lighting intensity from 2000cd to 200cd where the horizontal meteorological visibility in all directions from every turbine in the group is more than 5km. This embedded mitigation simply requires the installation of visibility meters at the site. The Applicant does this as a matter of course for its offshore windfarms (which benefit from this provision in ANO Article 223).</p> <p>The Applicants intends to secure this commitment through amendment to the draft DCO Schedule 1, Part 3, Requirement 31, which will be updated and submitted in the Examination at Deadline 3</p> <p>NE has concluded, (with particular reference to VP13) that the effect of the 200cd lighting on EA2 will not be significant for all receptors and the special qualities of the SCHAONB.</p>



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		<p>Coastal Dunes and Shingle Ridges (Area C), LCT 06 Coastal Levels (Area B and D), LCT 07 Estate Sandlands (Areas A and C), and LCT 29 Covehithe Broad and Easton Broad.</p> <p>NE also request that a visual assessment is undertaken for the receptor group 'beach users' from the viewpoints located within the relevant LCTs namely, viewpoints 03, 04, 06, 07, 08, 09, 11, 12 and 18.</p> <p>The ExA note the detailed responses of the Applicants to this point in their responses to the RRs [AS-036] and their view that the proposed aviation lighting will not have significant effects on the perception of landscape character, which is not readily perceived at night in darkness, particularly in rural areas.</p> <p>To the Applicant:</p> <p>a) Confirm whether you propose to submit the assessments requested by Natural England</p> <p>b) Explain how are aviation lights controlled and dimmed to 200cd (when visibility conditions permit)? How could this be secured through the DCO?</p> <p>To Natural England:</p> <p>c) Respond to the comments of the applicants, should you wish to do so, including on their view that landscape character is not readily perceived at night</p>	



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		due to the level of darkness, particularly in rural areas and their view that dark skies are not described as a particularly important component of the special qualities of the AONB.	
1.16.12	Natural England, The Applicant	<p><b>2 Landscape Receptors</b></p> <p>Natural England [RR-059] disagree with the conclusions of no likely significant effects for the construction and operational phases of the proposed development for LCT 06 Areas B and D and advise that there will be a likely significant adverse effect on LCT 29 which has not been assessed in the ES.</p> <p>The ExA note the responses of the applicant to this point in their responses to the RRs [AS-036], where after further field work they maintain their assessment of the relevant LCT areas and consider that the effect on LCT 29 is not significant.</p> <p>To the Applicant:</p> <p>a) How 'large' is the part of LCT 06 Area B which extends to the coast at Sole Bay, in area terms (e.g. m2) or as a percentage of the overall size of Area B?</p> <p>b) With regard to LCT 06 Area D Natural England refer to the long distance and panoramic views out to the seaward horizon, as opposed to direct views. Do you wish to add</p>	<p>a) LCT 06 Area B extends in a triangular form with a point towards the coast and sandwiched between LCT 7 and LCT 25, which together form the coastal edge. There is a narrow area of LCT 7 Area B Coastal Dunes and Shingle Ridges between LCT 06 Area B and the coast. Therefore, LCT 06 Area B does not actually include any stretch of the coast at Sole Bay. Slightly inland the LCT includes a small extent of Easton Marshes and drained grassland areas inland. These areas are separated from the coast by an area of hard standing and there is some screening vegetation within the Easton Marshes that also limit views.</p> <p>The small area of LCT 06 Area B that lies to the north of Buss Creek and east of the water channel running north to south across the grassland extends to approximately 0.12 km<sup>2</sup> which equates to less than 3% of the full extent of LCT 06 Area B (4.06km<sup>2</sup>).</p> <p>b) It is the ES (Appendix 28.4 p.22 (APP-559)) that states 'there are long distance and panoramic views to the seaward horizon which form a key component of the character of this area'. We confirm therefore that consideration of this has been included in the assessment.</p> <p>For this LCT Area D such incidences are limited with the locations where these panoramic views are possible set back from the coast so that there is intervening foreground. This includes a minor road with vegetation running alongside and a wide stretch of shingle beach. From these inland locations there are also other</p>



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		<p>to your comments on this aspect with regard to any effect on this LCT; could you confirm if this has been considered in the assessment?</p> <p>To Natural England:</p> <p>c) Respond to the rebuttal of the applicant [AS-036], should you wish to do so, including on any effect on LCT 29.</p>	<p>contextual influences on character such as built development and pylon mounted transmission lines.</p> <p>The coastal side of Area D of the Coastal Levels does not have a direct 'coastal portion' or edge to the seascape, as such, being entirely separated from the sea by an approximately 200m wide strip of intervening Coastal Dunes and Shingle Ridges LCT 05. The eastern, coastward side of the LCT is often the area that is most screened behind the raised shingle ridge contained in LCT 05 (as is evident in the ZTV and from field survey assessment), which limits directs views of the sea and is predicted to provide screening of the turbines within the East Anglia TWO windfarm site from the low coastal levels behind the Shingle Ridges LCT 05.</p> <p>It is the Applicant's assessment that the aesthetic and perceptual aspects that define its baseline character as a former mere will not be lost and will remain fundamental to defining its character, and that on balance, the perceived character of this area of the Coastal Levels LCT will not be significantly affected.</p> <p>The Applicant maintains its assessment of LCT 06 Coastal Levels (Area D) that the magnitude of change should be medium-low, as set out in the ES and expanded in its response to Natural England's relevant representation at NE-3.7.3.</p>
1.16.13	Natural England, The Applicant	<p>2 <b>AONB Special Qualities</b></p> <p>NE disagree [RR-059] with the conclusions of the ES Chapter 28 in relation to the following special qualities of the AONB: Influence of Incongruous features (Landscape Quality); Appeal to the senses – Sensory stimuli and 'big Suffolk skies' (Scenic Quality); Sense of Remoteness – pockets of relative wildness and</p>	<p>a) The addition of the proposed turbines to the largely open seascape setting of the northern part of the AONB has been assessed by the Applicant within the SLVIA. The 'largely open seascape' is one which is large in scale and is simple rather than complex as well as having few scale comparators. In addition, the views of the seascape are generally very wide and open with no discordant relationships with coastal landform or landscape</p>





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		<p>largely undeveloped countryside, and Sense of passing time and return to nature (all Relative Wildness); and Distractors from tranquillity (Relative Tranquillity) [Table 28.10, APP-076].</p> <p>For all such categories NE disagree with the magnitude of change judgment of medium-low, considering the change to be at least medium and that the significance of effect should be concluded as significant.</p> <p>In terms of Landscape Quality NE note that the northern section of the seascape setting of the AONB is currently free of fixed man-made features, and consider that the introduction of wind turbines into this seascape “can only spread the influence of such incongruous features into an otherwise naturalistic vista.” They also note that while the claim that turbines may also be seen to represent the visual aesthetic of green / sustainable energy which may be perceived as having positive visual associations with the natural environment may reflect the opinion of some people it should have no bearing on the determination of the scheme.</p> <p>In terms of Scenic Quality NE note that Big Suffolk skies do not stop at the coastline, but extend out over the sea and contribute to the</p>	<p>features that may otherwise have contained or focussed the views, which would have increased the effects of EA2. These factors are part of the balancing of the magnitude of change contained in the assessment, which also takes account of the baseline landscape of the AONB from where EA2 would be perceived.</p> <p>b) The Applicant proposes to include a new paragraph (2) within Requirement 31 of the updated draft DCO to be submitted at Deadline 3 stating “Such lights will be operated at the lowest permissible lighting intensity level”. This amendment has been included to address stakeholder concerns surrounding night-time visual effects of aviation lighting.</p> <p>The Applicant intends to secure this commitment through amendment to the draft DCO Schedule 1, Part 3, Requirement 31, which will be updated and submitted in the Examination at Deadline 3</p> <p>NE has concluded, (with particular reference to VP13, Aldeburgh) that the effect of the 200cd lighting on EA2 will not be significant for all receptors and the special qualities of the SCHAONB.</p> <p>c) The Applicant confirms that the lights of Leiston have a minor influence on the views from the coast.</p> <p>d) The ExA is correct in noting that Kessingland Beach, Thorpeness and Sizewell are not towns but are smaller settlements or clusters of development with Kessingland Beach also forming part of the built-up area of Kessingland. Whilst some of these development areas do have a lighting influence along the coast, they are generally of lesser influence on dark skies than the towns found within and on the edges of the AONB.</p>

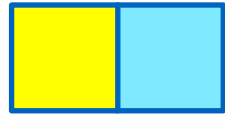


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		<p>natural beauty of the designation and that at night, in the northern section of the AONB, such skies are free of fixed marine lighting and this, combined with the generally unlit coastline, allows for extensive areas of the dark night sky to be experienced. NE consider that the safety and navigation lighting associated with each turbine will detract from these dark skies by providing points of fixed lighting which, in the case of the aviation lighting will also flash. This lighting will extend out over a considerable distance.</p> <p>While NE appreciate that in the southern portion of the AONB the 'big Suffolk skies' which extend out to sea are already influenced by the navigation lighting from existing windfarms and coastal shipping they state that the influence of marine traffic on the seascape setting of the AONB is less pronounced in the northern portion and consider that extending the influence of fixed marine lighting into the northern portion will therefore result in the loss of this important characteristic in this part of the seascape setting of the AONB and further note that big Suffolk skies contribute to the 'sense of openness and exposure'(under the Relative Wildness special quality) which has been judged to be adversely effected by EA2.</p>	<p>e) The Applicant acknowledges that dark skies and relatively dark skies are contributory components of the Natural Beauty Indicators of Scenic Quality and Relative Tranquillity respectively as set out in Part 2.0 of LDA Design (2016) Suffolk Coast and Heaths Area of Outstanding Natural Beauty (AONB) Natural Beauty and Special Qualities Indicators.</p>



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		<p>For relative wildness, NE note that this special quality is particularly associated with the undeveloped sections of the coastline in the northern portions of the AONB, where built development along the coastline is well confined and with the exception of Sizewell Nuclear Power station of a small scale; both in terms of height and lateral spread along the coast, with very few buildings extending above two storeys in height. They consider that the wind turbines of EA2 will detract from this special quality in this area due to their apparent size and, to a lesser extent, lateral spread. They are also of the view that they are also likely to lessen the experience of relative wildness through the introduction of incongruous made-man features into an otherwise undeveloped seascape and advise that the significant adverse landscape and visual effects resulting from the construction and operation of EA2 will not contribute to the sense that nature is returning to the AONB.</p> <p>In terms of relative tranquillity, NE are of the view that the opportunity to experience tranquillity in a naturalistic environment is influenced by many Factors, including seeing offshore wind turbines. They consider the turbines of EA2, as defined in the ES, will act as a significant detractors for the northern</p>	





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		<p>portion of the AONB, and that in certain locations, such as beaches of Covehithe and Minsmere, the presence of these structures in the seascape will significantly reduce the opportunity to experience relative tranquillity in this part of the AONB.</p> <p>The ExA note the detailed responses of the applicants to this point in their responses to the RRs [AS-036]. In essence they maintain the conclusions of effects as outlined in the SLVIA.</p> <p>To the Applicant:</p> <p>a) The existing 'incongruous features' in the northern AONB are largely land based. Has the Applicant considered whether the proposal would have more of an effect by positioning incongruous features into a largely open seascape?</p> <p>In your response concerning Scenic Quality you state that "visible aviation lighting of existing wind turbines has been recorded as being clearly visible from night-time viewpoints as far north as Aldeburgh during the SLVIA." (AS-036 page 441, 1st para).</p> <p>b) How does this tally with your responses above (referenced within question</p>	



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		<p>1.17.8) to night-time effects of the proposal?</p> <p>On page 441 of AS-036 you state that “there are several coastal areas of the AONB that have brighter night lights, particularly around the main towns at Kessingland Beach, Southwold, Sizewell, Leiston, Thorpeness and Aldeburgh”.</p> <p>c) Would/do lights from Leiston have an effect on views from the coastline?</p> <p>d) Kessingland Beach, Thorpeness and Sizewell do not appear to the ExA to be towns. Would lighting at smaller settlements have the same effect on the dark skies on the AONB at night as a town?</p> <p>It is stated that “While dark skies may therefore be valued by people viewing the night-sky, they do not in themselves ‘contribute to natural beauty’, as an assessment of the special qualities of a designated landscape cannot be made at night-time during the dark.</p> <p>e) Does a dark sky contribute to the special qualities of a designated landscape? One argument could be that the light of the moon in a sky largely unaffected by artificial light could increase the natural beauty of a designated landscape at night-time, and add to other qualities such as solitude and tranquillity.</p>	



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		<p>To Natural England:</p> <p>f) Should you wish to do so, respond to the detailed comments of the Applicant, including (but not limited to) their view expressed of page 446 of their response [AS-036] that you have incorrectly identified the AONB special quality of Relative Wildness</p>	
1.16.14	Natural England, The Applicant	<p><b>2 Viewpoints and Visual Receptors</b></p> <p>NE disagree with the conclusions of the ES and consider that the significance of effects for beach users and walkers on the Suffolk Coastal Path at Viewpoint 10 (Sizewell Beach) and visitors/tourists at Viewpoint 18 (Orford Ness) should be concluded as adverse [RR-059].</p> <p>In relation to Sizewell Beach, NE consider that there is no justification in lowering the sensitivity of beach users and walkers on the premise that the presence of Sizewell nuclear power station would reduce their expectations, and hence the sensitivity, of these groups. They note that it could be argued that the opportunity to experience an open undeveloped seascape, as an alternative to the nuclear power station, means that such views are valued more by these receptor groups at this location.</p> <p>For Orford Ness, NE's concerns remain in relation to the cumulative effect of Greater Gabbard plus Galloper offshore wind farm</p>	<p>a) The existence of Sizewell Nuclear Power Station on the coast (and extending out into the sea close to the coast in the form of the offshore intake and outfall structures) is a notable component of the landscape context of Viewpoint 10 included in the assessment, as is the potential influence and visibility of the Galloper and Greater Gabbard offshore (in very good/excellent visibility conditions as part of the seascape).</p> <p>To have a 'more significant effect' the magnitude of change or the sensitivity would have to increase.</p> <p>Whilst the word 'contrast' may not have been included in the assessment it did take into account that the development would be added to an open part of the seascape as part of the consideration of the magnitude of change.</p> <p><i>'The turbines within the East Anglia TWO windfarm site will add further large-scale offshore wind farm element to the composition of the view, which is currently a relatively simply composed view of scrub vegetation/woodland, sea and sky layers.'</i></p> <p>Sensitivity is derived from a combination of both attributed value and susceptibility to the proposed development. In respect of</p>



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		<p>arrays plus EA2, considering that this would be contrary to the statutory purposes of the AONB as these structures would be seen to dominate views out to sea (from the northeast through to south east) thereby detracting from the natural beauty afforded by this location. NE disagree that the vertical height of the turbines will be relatively moderate in scale and that they will appear similar in height to the Galloper turbines considering that the EA2 turbines are likely to appear taller than the Galloper turbines by a factor of 1.239 or around 24% taller.</p> <p>NE also disagree that the existence of the Galloper and Greater Gabbard offshore wind farm arrays provides justification for the EA2 application, agreeing that EA2 would not form an entirely new type of visible development but would be seen in the context of existing wind turbines on the horizon and result in a northerly extension to this influence; however, noting that this northerly extension will be a significant increase in the space occupied (from 22% to 37%) and use turbines which are and will appear substantially taller.</p> <p>The ExA note the responses of the Applicant to this point of view in their responses to the RRs [AS-036], where they maintain their conclusion that the effect of the project upon visitors to be not significant.</p>	<p>assessing susceptibility of visual receptors to change, GLVIA3 notes (para 6.32):</p> <p><i>'The susceptibility of different visual receptors to changes in views and visual amenity is mainly a function of:</i></p> <ul style="list-style-type: none"> <li>• <i>the occupation or activity of people experiencing the view at particular locations; and</i></li> <li>• <i>the extent to which their attention or interest may therefore be focused on the views and the visual amenity they experience at particular locations'.</i></li> </ul> <p>In Viewpoint 10 Sizewell Beach, the visual amenity that receptors experience at this particular location has been changed by the presence of the Sizewell A and B Nuclear Power Station at close range and it remains the Applicant's assessment that their susceptibility (and therefore sensitivity) to the East Anglia TWO windfarm site is slightly lower than visual receptors in other parts of the SCHAONB. For example, this would include viewpoints where visual receptors may have a heightened sensitivity in respect of the visual amenity they experience at that alternative location, such as from the pockets of wildness identified in the SCHAONB (e.g. Viewpoint 3, Covehithe) where development influences are not present to the same degree.</p> <p>The fact that the 'open seascape' could be seen to offer a greater contrast to the developed coastline could increase viewers susceptibility to the proposed windfarms being added to the open seascape (and therefore their effect) , however, this also has to be balanced with the aspects of susceptibility that are influenced by existing visual amenity which, along this stretch of the beach and</p>



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		<p>To the Applicant:</p> <p>a) Could an argument be made that an open undeveloped seascape 'opposite' to Sizewell power station would have a more significant effect on beach users and walkers, as a direct contrast to the power station?</p> <p>b) Would the addition of the proposed EA2 offshore wind farm array to the existing views of wind turbines at Orford Ness lead to a higher cumulative effect on receptors, reducing the amount of overall undeveloped seascape?</p> <p>To Natural England:</p> <p>c) Respond to the comments of the applicant [AS-036] on this matter if you wish to do so.</p>	<p>Suffolk Coastal Path, often include the Sizewell Nuclear Power Station.</p> <p>The Applicant is certainly not dismissing these views out to sea or the magnitude of change on them that would result from EA2, but notes again that the 'attention or interest' of viewers is likely to be focused on the views of the Sizewell A and B Nuclear Power Station, given its scale, form and interest as a dominant feature in the landscape, and people's curiosity with viewing the power station at close range. Clearly people will also look out to sea, and it may be the case that this becomes their focus to avoid the detracting element in the view.</p> <p>With respect to these offshore views from this viewpoint, the Applicant would, however, note, with reference to Figure 28.34b-d (APP-364), that the East Anglia TWO windfarm site will occupy a relatively limited portion of the wider 180° sea view available. Opportunities will remain to experience expansive views out to sea from Sizewell Beach, including undeveloped seascape to the north and south of the East Anglia TWO windfarm site. This relatively contained horizontal/lateral spread is evident from the viewpoint with reference to the foreground lifebuoy and boats.</p> <p>The SLVIA includes consideration of these factors affecting magnitude of change and sensitivity in determining the significance of the effect.</p> <p>b) The addition of EA2 to views from Orford Ness (Viewpoint 18) that contain existing windfarms is a consideration within the baseline description of the view and visitors to Orfordness are prescribed with a medium-high susceptibility and a high sensitivity to the changes.</p>



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				<p>The Applicant notes that approximately 40 degrees of the panoramic sea skyline is affected by operational windfarm development in very good/excellent visibility conditions.</p> <p>The presence of the existing windfarms in the view is considered in two different respects within the magnitude of change assessment. Firstly, that their presence ensures they are not a completely new feature but secondly '<i>The turbines within the East Anglia TWO windfarm site will add <b>further large-scale offshore windfarm element to the composition of the view...</b></i>'</p> <p>The assessment of the magnitude of change is a balance of these factors.</p> <p>The Applicant notes that in its latest response, Natural England stated the following in relation to Viewpoint 18 Orfordness 'NE accepts the Applicant's point that the reduced lateral spread of the EA2 array has contributed to a reduction in the magnitude of change to medium-low '<i>resulting on balance, to a judgement of not significant within the ES</i>'.</p>
1.16.16	Natural England, The Applicant	1	2 Cumulative Effects NE recognise that the contribution that EA1N makes to identified cumulative effects in Chapter 28, section 28.9 of the ES (Tables 28.14, 28.15 and 28.17) [APP-076] is small, but advises that opportunities should be sought to reduce this contribution as far is possible within the design envelope of the proposed development. In particular, NE note that the use of lower turbines (250m) for the EA1N project would assist in reducing the cumulative effects predicted in both the EA2 and EA1N ES SLVIA. They	<p>Since the 11<sup>th</sup> of June submission, the Applicants have committed to reducing the maximum blade tip height of wind turbines from 300m to 282m and consider that further mitigation of turbine height for East Anglia ONE North to reduce the cumulative impact is not required.</p> <p>Also see 1.16.17, regarding the need to balance environmental impacts.</p>



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		<p>state that the possibility of taking this approach should be explored, so that further embedded mitigation is introduced into the design of EA1N to help reduce the adverse cumulative effects predicted, and suggest that the use of shorter turbines (250m) at the western edge of the EA1N development area is likely (based upon the apparent height measurements provided above) to assist in reducing the significant cumulative effects predicted in the EA2 and EA1N ES SLVIAs.</p> <p>The ExA note the responses of the Applicant to this point in their responses to the RRs [AS-036], where they consider that since there is agreement that the effects of the EA1N project alone are not significant, further mitigation of the turbine height for EA1N as a contribution towards cumulative impact mitigation is not required. To the Applicant:</p> <p>a) The response by NE refers to cumulative effects, rather than just the effects of EA1N. Would the use of 250m turbines reduce such cumulative effects?</p> <p>To NE:</p> <p>b) Respond to the comments of the Applicant [AS-036], should you wish to do so.</p>	





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1.16.17	The Applicant, SCC, ESC	<p><b>1 2 Cumulative Effects</b></p> <p>SCC and ESC consider that cumulative effects and the visual effects of EA2 alone will result in significant adverse landscape and long term adverse visual effects on the Suffolk Coast, including on the character and special qualities of the Suffolk Coast and Heaths AONB. Given the sensitivity and designation of seascape and landscape, in the view of the Councils the applicants have not demonstrably exhausted all reasonable mitigation measures in terms of design of scheme, including the proposed height of turbines.</p> <p>In response, the Applicant notes that the geographic extent of EA2 has been reduced and that they have demonstrated an ongoing commitment to reducing visual effects on the Suffolk coast [AS-036].</p> <p>To the Applicant:</p> <p>a) Could you elaborate on the statement “[t]he height of the wind turbines is dependent on multiple factors and requires balance between engineering constraints, environmental impacts and commercial viability”?</p> <p>To SCC, ESC:</p>	<p>The trend in offshore wind has been an increase in the capacity (and physical size) of wind turbines as the industry has developed. This trend has meant that fewer larger devices are required to meet the capacity of a site – for example East Anglia ONE was originally planned (per the DCO application in 2012) with turbines between 3.6MW and 8MW and has been built (and is now operational) with 7MW devices. The key advantage of this is that there is a requirement for less infrastructure overall, which is reflected in a smaller overall seabed footprint for foundations, fewer cables, fewer piling events etc all of which reduce direct impacts and indirect impacts (through, for example, reduced transport of materials and personnel and reduced energy requirement for construction) of a project. Fewer larger turbines have also provided benefits for ornithological impacts by reducing the swept area of space through which birds fly, indeed, Natural England is requesting that the Applicants raise the draught height of the Projects' turbines above the standard 22m above MHWS in order to reduce potential collisions with key species. This is in direct conflict with their request to reduce turbine height as it requires squeezing the Rochdale Envelope at both ends.</p> <p>Having less infrastructure also clearly has benefits for the developer in terms of reducing risk (e.g. fewer components to install, fewer turbines to maintain, fewer man days at sea for construction etc.) and also allows better optimisation of the site layout (to maximise efficiency) and reduces risks from constraints within the site (e.g. from cables and pipelines, archaeology or ecology). In addition, less infrastructure reduces the potential for adverse impacts upon other industries. These benefits translate into both direct and indirect financial savings for the developer and ultimately for the consumer. These trends drive the technologies</p>





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		<p>b) Respond to the above comments of the Applicant in their responses [AS-036], should you wish to do so.</p>	<p>available on the market as suppliers respond to demand. Thus, smaller devices are simply no longer manufactured with the trend toward larger devices continuing which is reflected in the Rochdale Envelope of the Projects (with devices up to 300m, although the Applicants have since confirmed that the maximum tip height will now be 282m).</p> <p>Finally, whilst the trend is generally towards the largest possible devices available at the time, there are constraints on what can be deployed due to site-specific considerations such as ground conditions. The feasible foundation options are determined by the site-specific geology and the physical requirements to support the turbine towers and generators themselves. Given that ground conditions are not confirmed until post-consent and that turbine technology is evolving quickly there is a need to retain flexibility in the Rochdale Envelope in order to maintain a viable project, which can be delivered with minimum impacts, whilst accepting that mitigation for one impact could worsen another (e.g. collision risk mitigation versus visual impact) and finding an acceptable balance between them.</p>