



# **East Anglia TWO Offshore Windfarm**

## **Appendix 28.1**

### **SLVIA Methodology**

Preliminary Environmental Information

Volume 3

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# Table of Contents

<b>28.1</b>	<b>SLVIA Methodology</b>	<b>1</b>
28.1	Introduction	1
28.2	Defining Impact Study Area	7
28.3	Defining Impact Significance – Seascape/Landscape	9
28.4	Defining Impact Significance – Visual Effects	18
28.5	Potential Impacts	38
28.6	Visual Representations	42
28.7	References	48

**Appendix 28.1** is supported by the tables listed below.

Table Number	Title
Table A28.1	Projects Considered as part of the Baseline
Table A28.2	Sensitivity to Change
Table A28.3	Magnitude of Change Definitions
Table A28.4	Magnitude to Change Criteria
Table A28.5	Impact Significance Matrix
Table A28.6	Sensitivity to Change Visual Receptors
Table A28.7	Magnitude of Change Visual Effects
Table A28.8	Magnitude of Change Views/Visual Receptors
Table A28.9	Impact Significance Matrix Visual Effects
Table A28.10	Other Energy Developments Considered in the SLVIA

## Glossary of Acronyms

AOD	Above Ordnance Datum
AONB	Area of Outstanding Natural Beauty
CMOS	Complementary Metal Oxide Semiconductor
DTM	Digital Terrain Model
EIA	Environmental Impact Assessment
ES	Environmental Statement
ETG	Expert Topic Group
GIS	Geographic Information Systems
GLVIA	Guidelines for Visual Impact Assessment
km	Kilometres
LCA	Landscape Character Assessment
LCT	Landscape Character Type
LVIA	Landscape Visual Impact Assessment
MHWS	Mean High Water Springs
MLWS	Mean Low Water Springs
MW	Megawatt
NCA	National Character Area
NSIP	Nationally Significant Infrastructure Project
O&M	Operation and Maintenance
OS	Ordnance Survey
PEIR	Preliminary Environmental Information Report
RPG	Registered Park and Garden
SCT	Seascape Character Type
SL&V	Seascape, Landscape and Visual
SLVIA	Seascape, Landscape and Visual Impact Assessment
SNH	Scottish Natural Heritage
ZTV	Zone of Theoretical Visibility

## Glossary of Terminology

Applicant	East Anglia TWO Limited.
Development area	The area comprising the Indicative Onshore Development Area and the Offshore Development Area
East Anglia TWO project	The proposed project consisting of up to 75 wind turbines, up to four offshore electrical platforms, up to one offshore 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.
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.
Landfall	The area (from Mean Low Water Springs) where the offshore export cables would make contact with land, and connect to the onshore cables.
Monitoring buoys	Buoys to monitor in situ condition within the windfarm, for example wave and metocean conditions.
Offshore cable corridor	This is the area which will contain the offshore export cable 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.
Offshore infrastructure	All of the offshore infrastructure including wind turbines, platforms, and cables.
Construction, operation and maintenance platform	A fixed structure required for construction, operation and maintenance personnel and activities.
Offshore platform	A collective term for the offshore construction, operation and maintenance platform and the offshore electrical platforms.
Platform link cable	An electrical cable which links one or more offshore platforms.
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.

## 28.1 SLVIA Methodology

### 28.1 Introduction

1. This appendix describes the scope and methodology taken to the preliminary environmental information report (PEIR) of the seascape, landscape and visual impact assessment (SLVIA) of the proposed East Anglia TWO project. The SLVIA predicts, describes and assesses the likely significant effects that the proposed East Anglia TWO project will have on the seascape, landscape and visual resource, covering effects on landscape elements, seascape/ landscape character, visual effects and cumulative effects. It builds upon the information provided within the East Anglia TWO Environmental Impact Assessment (EIA) Scoping Report and discussion at consultation meetings with the SLVIA Expert Topic Group (ETG) (Suffolk County Council, Suffolk Coastal District Council, Waveney District Council, Great Yarmouth Borough Council, the Broads National Park, Suffolk Coast and Heaths AONB unit, Natural England and Historic England).
2. Detailed technical assessment of the seascape, landscape and visual (SL&V) effects of the construction and operation of the offshore infrastructure is set out in technical appendices, as follows:
  - **Appendix 28.2 Seascape Assessment;**
  - **Appendix 28.3 Landscape Assessment;**
  - **Appendix 28.4 Visual Assessment;**
  - **Appendix 28.5 Suffolk Coastal Path Assessment;** and
  - **Appendix 28.6 Cumulative Assessment.**
3. These appendices assess, in full technical detail, the likely significant effects of the construction and operation of the offshore infrastructure on each seascape, landscape and visual receptor.
4. **Chapter 28 Seascape, Landscape and Visual Impact Assessment** provides a summary of the significant effects identified in the technical assessments.

#### 28.1.1 Whole Project Effects

5. Together, **Chapter 28 Seascape, Landscape and Visual Impact Assessment** and **Chapter 29 Landscape and Visual Impact Assessment** provide a whole project assessment of the SL&V effects of the proposed East Anglia TWO project i.e. of both the offshore development area (including windfarm site, offshore platforms, offshore export cable corridor) and the onshore transmission works (i.e. onshore substation, onshore export cable corridor, landfall location).

6. The effect of the construction and operation of the offshore infrastructure on specific offshore receptors (coastal viewpoints, seascape character areas etc) is assessed in **Chapter 28 SLVIA**. The effect of the onshore infrastructure on specific onshore receptors (inland viewpoints, landscape character areas etc) is assessed in **Chapter 29 Landscape and Visual Impact Assessment**. A further assessment of inter-related effects in **section 28.11 of Chapter 28 Seascape, Landscape and Visual Impact Assessment** assesses any areas where the construction and operation of the offshore infrastructure and onshore infrastructure combine, or inter-relate, to have an effect e.g. on views from the coastal area near the landfall (between Sizewell and Thorpeness) and the combined effects of the construction and operation of the offshore infrastructure and onshore infrastructure on the character of the Suffolk Coast and Heaths AONB.

### 28.1.2 Seascape Effects and Landscape Effects

7. In England, seascape character 'principally applies to coastal and marine areas seaward of the low-water mark' and landscape character 'principally applies to terrestrial areas lying to the landward side of the high-water mark' (Natural England 2012, p7, Box 1). Although these definitions are clear in the guidance, the importance of the interaction of sea, coastline and land as perceived by people is also highlighted in subsequent definitions of seascape in the guidance (Natural England 2012), indicating a subtler transition between seascape and landscape than defined in Box 1, p7 of the guidance.
8. In order to address this and avoid under-valuing the intertidal area between the mean low water spring and mean high-water spring marks (MLWS and MHWS respectively), this SLVIA assesses seascape effects on Seascape Character Types (SCTs) that are seaward of the MLWS, which consist of areas of inshore waters and offshore shipping channels. Landscape effects are assessed on Landscape Character Types (LCTs) lying to the landward side of the MLWS, which includes beaches, intertidal areas and coastlines within LCTs covering the coast and those LCTs covering inland terrestrial areas with views of the proposed East Anglia TWO project.
9. The SLVIA predicts, describes and assesses the likely significant effects that the proposed East Anglia TWO project will have on the SL&V resource, and covers the following types of effect:
  - **Effects on seascape/ landscape character** – arising from the introduction of new elements that alter the existing pattern of elements that define character; or through visibility of the proposed East Anglia TWO project, which may alter the way in which the pattern of elements is perceived. Seascape and landscape effects of the proposed East Anglia TWO project are assessed on SCTs, LCTs and landscape designations.



- **Visual effects** - assessment of how the introduction of the proposed East Anglia TWO project will affect the views available to people and their visual amenity. Visual effects of the proposed East Anglia TWO project will be assessed on principal visual receptors (i.e. groups of people, such as within settlements, using transport routes or recreational trails) and representative viewpoints in the study area.
- **Cumulative effects** - arise where the study areas for two or more projects overlap so that all are experienced at a proximity where they may have a greater incremental effect, or where projects may combine to have a sequential effect. In accordance with guidance (SNH 2012), the SLVIA assesses the overall effect arising from the combination of projects, in this case, the proposed East Anglia TWO and ONE North projects.

### 28.1.3 Guidance

10. This methodology has been specifically devised by OPEN for the assessment of wind energy developments and accords with Guidelines for Landscape and Visual Impact Assessment: Third Edition (GLVIA3). The following publications have been used for guidance and reference in preparation of the SLVIA:
  - Planning Inspectorate (2018) Advice Note Nine: Rochdale Envelope <https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/2013/05/Advice-note-9.-Rochdale-envelope-web.pdf>;
  - Landscape Institute and IEMA, 2013 - Guidelines for Landscape and Visual Impact Assessment: Third Edition (GLVIA3);
  - Landscape Institute (2017). Visual Representation of Development Proposals;
  - Natural England (2012). An Approach to Seascape Character Assessment;
  - Natural England (2014). An Approach to Landscape Character Assessment;
  - Scottish Natural Heritage (SNH) (2012). Assessing the Cumulative Impact of Onshore Wind Energy Developments; and
  - SNH, 2017 - Siting and Designing Windfarms in the Landscape, Guidance (Version 3) (herein referred to as 'SNH Siting and Designing'); and
  - SNH, 2017 - Visual Representation of Windfarms, Guidance (Version 2.2) (herein referred to as 'SNH Visual Representation').
11. Whilst many of these guidance documents have been prepared by SNH for projects in Scotland, in the absence of alternative guidelines they have become best practice across the UK. The preparation of visual representations that accord with this SNH guidance has been agreed with stakeholders as part of the SLVIA ETG consultations.

12. OPEN's SLVIA methodology generally accords with the guidance set out in the GLVIA3. Where it diverges from specific aspects of the guidance, in a small number of areas, reasoned professional justification for this is provided as follows. These are not new diversions and follow practice established on other Nationally Significant Infrastructure Projects (NSIP) such as East Anglia THREE, Norfolk Vanguard and Thanet Extension.
13. GLVIA3 sets out an approach to the assessment of magnitude of change in which three separate considerations are combined within the magnitude of change rating. These are the size or scale of the effect, its geographical extent and its duration and reversibility. This approach is to be applied in respect of both landscape and visual receptors. OPEN considers that the process of combining all three considerations in one rating can distort the aim of identifying significant effects of windfarm development. For example, a high magnitude of change, based on size or scale, may be reduced to a lower rating if it occurred in a localised geographical area and for a short duration. This might mean that a potentially significant effect will be overlooked if effects are diluted down due to their limited geographical extents and/ or duration or reversibility.
14. OPEN has chosen to keep the consideration of the size or scale of the effect, its geographical extent and its duration and reversibility separate, by basing the magnitude of change on size or scale to determine where significant and not significant effects occur, and then describing the geographical extents of these effects and their duration and reversibility separately.
15. OPEN's assessment methodology utilises six scales of magnitude of change – high, medium-high, medium, medium-low, low and negligible; which are preferred to the 'maximum of five categories' suggested in GLVIA3 (3.27), as a means of clearly defining and summarising magnitude of change judgements.

#### 28.1.4 Data Sources

16. Data has been gathered from official, reliable and the most up-to-date sources. This includes Ordnance Survey map-based data, as well as data on landscape characterisation, landscape designations and other Governmental and local authority data of relevance, including:
  - Broadland District Council (2013) Broadland District Landscape Character Assessment.
  - Great Yarmouth Borough Council (2008) Great Yarmouth Landscape Character Assessment.
  - LDA Design (April 2018) Suffolk, South Norfolk and North Essex Preliminary Seascape Character Assessment.

- Marine Management Organisation (2012) A Seascape Character Area Assessment for the East Inshore and East Offshore Marine Plan Areas.
- Met Office (2017) Visibility Data for Weybourne and Shoeburyness.
- Ordnance Survey (2017) Terrain 50 DTM; Terrain 5 DTM; 1:50,000 scale colour raster.
- South Norfolk Council (2001) South Norfolk Landscape Character Assessment.
- Stour and Orwell Society (2013) Shotley Peninsula and Hinterland Landscape Character Assessment.
- Suffolk Coast and Heaths AONB (2012) Touching the Tide Landscape Character Assessment.
- The Broads Authority (2006) The Broads Landscape Character Assessment.
- The Broads Authority (2012) The Broads Landscape Sensitivity Study for Renewables and Infrastructure.
- Waveney District Council (2008) Waveney District Landscape Character Assessment.

#### 28.1.5 Overview of Approach to SLVIA

17. The SLVIA deals with the effects of changes resulting from the proposed East Anglia TWO project on landscape/ seascape as a resource, the views available to people and their visual amenity. The SLVIA is undertaken using the following steps:

- The features of the proposed East Anglia TWO project that may result in seascape, landscape and visual effects are described;
- The overall scope of the assessment is defined, including the study area and range of possible seascape, landscape and visual effects;
- The seascape and landscape baseline is established using seascape and landscape character assessment and the zone of theoretical visibility (ZTV) of the proposed East Anglia TWO project, to identify seascape and landscape receptors that may be affected and their key characteristics and value;
- The visual baseline is established by identifying the extent of possible visibility (ZTV), identifying the people who may be affected and identifying visual receptors and selecting viewpoints;
- A preliminary assessment is undertaken of landscape and visual receptors using ZTV analysis, to identify which landscape and visual receptors are unlikely to be significantly affected and those that are more likely to be significantly affected by the proposed East Anglia TWO project, which require to be assessed in full;

- Interactions are identified between the proposed East Anglia TWO project and seascape, landscape and visual receptors, to predict potentially significant effects arising and measures are proposed to mitigate effects;
  - An assessment of the susceptibility of seascape, landscape and visual receptors to specific change and the value attached to seascape/ landscape receptors and views is undertaken, combining these judgements to assess the sensitivity of the seascape, landscape and visual receptor to the proposed East Anglia TWO project;
  - An assessment of the size/ scale of landscape effect, the degree to which landscape elements are altered and the extent to which the effects change the key characteristics of the seascape/ landscape is undertaken, combining these judgements to assess the magnitude of change on the seascape/ landscape receptor;
  - An assessment of the size/ scale of visual effect, the extent to which the change would affect views, whether this is unique or representative of a wider area, and the position of the proposed East Anglia TWO project in relation to the principal orientation of the view and activity of the receptor. These judgements are combined to assess the magnitude of change on the visual receptor; and
  - The assessments of sensitivity to change and magnitude of change are combined to assess the significance of seascape, landscape and visual effects.
18. The SLVIA is conducted for the proposed East Anglia TWO project as a standalone project, with the proposed East Anglia ONE North project being considered within this assessment as a cumulative source of impact.

#### 28.1.6 Field Survey

19. Field survey work has been undertaken during periods of clear visibility between January 2017 and August 2018. Viewpoints have been agreed for the SLVIA as part of the SLVIA ETG consultations. This has allowed the seascape/ landscape character and visual amenity of the study area to be experienced in a range of different conditions and seasonal variation. Field surveys are carried out throughout the study area, although the focus is on the areas shown on the ZTV, viewpoints and specific visual receptors, particularly the Suffolk Coastal Path, to gain theoretical visibility of the proposed East Anglia TWO project. The field survey allows the assessors to judge the likely scale, distance, extent and prominence of the array directly.
20. The seascape/ landscape of the study area was assessed for any features that contribute to the landscape character of the site or are important to the wider

landscape setting. In particular, the form and pattern of the landscape was assessed from the site and surrounding area to better understand its character and to take these qualities into account in the siting and design of the proposed East Anglia TWO project. The seascape/ landscape character areas for the study area were reviewed and the key characteristics of the seascape/ landscape were identified. The field surveys provided an experience of the character areas of the study area and verification of how these areas might be affected by the proposed East Anglia TWO project.

21. The visual amenity of the study area was surveyed including both static and sequential views, from receptors representative of the range of views and viewer types likely to experience the proposed East Anglia TWO project. Views from a variety of distances, aspects, elevations and extents were included. Receptor types include properties and settlement; main transport routes; main visitor locations; areas of cultural significance; a range of landscape character areas within the study area. The position of other offshore windfarms in the study area was reviewed cumulatively with the proposed East Anglia TWO project.
22. The field survey is essential to informing the sequential assessment, through the experience of each of the routes under consideration, to provide an understanding of the essential characteristics, and how these are likely to be affected by the proposed East Anglia TWO project.

## 28.2 Defining Impact Study Area

23. The SLVIA study area for the proposed East Anglia TWO project covers a radius of 50 kilometres (km) from the East Anglia TWO windfarm site, as illustrated in **Figure 28.2** and the blade tip Zone of Theoretical Visibility (ZTV) in **Figures 28.5** and **28.6**. The blade tip ZTV has been generated using Geographic Information Systems (GIS) software to demonstrate the number of wind turbines that may theoretically be seen from any point in the SLVIA study area (based on the maximum blade tip height of 300m). The ZTV illustrates the 'bare ground' situation and does not take into account the screening effects of vegetation, buildings, or other local features that may prevent or reduce visibility.
24. A 50km radius study area has been selected for the SLVIA for a number of reasons. Although wind turbines of the height proposed could theoretically be visible at distances beyond 50km, the EIA regulations require assessment of the 'likely significant effects' of the proposed East Anglia TWO project, therefore the SLVIA study area should extend far enough to include all areas within which significant effects are likely to occur (not all effects). It is considered that the proposed East Anglia TWO project is unlikely to result in significant effects at distances greater than 50km. Relevant guidance, professional experience, ZTV analysis (**Figure 28.5** and **28.6**), published visibility studies and Met Office

visibility frequency data all indicate that the threshold at which significant visual effects would diminish is likely to be within this proposed 50km radius area.

25. Consideration of the blade tip ZTV (**Figures 28.5** and **28.6**) and field survey verification of visibility from the ground, indicates that the visibility of the proposed East Anglia TWO project will become very restricted and dispersed at distances beyond 50km, with visibility from inland areas of Suffolk and Norfolk becoming fragmented by either landform, vegetation or built features/settlements that screen visibility of the sea. At distances over 50km, the lateral spread of the East Anglia TWO windfarm site will occupy a very small portion of available views and the vertical height of the wind turbines would appear relatively small, therefore significant visual effects are unlikely to arise (even if the wind turbines are visible - in only the most excellent visibility conditions).
26. Significant SL&V effects as a result of the proposed East Anglia TWO project are scoped out beyond 50km as agreed in the Scoping Opinion. This SLVIA study area is considered to be the maximum area within which a significant effect would be likely to occur and is suitable for the purposes of assessing the likely significant effects of the proposed East Anglia TWO project. In reality, significant SL&V effects are more likely to occur from locations in closer proximity; and less likely to occur towards the outer edges of the SLVIA study area at long distance. Consultations with relevant stakeholders have indicated that significant SL&V effects of the East Anglia TWO windfarm site would be most likely to occur on visual receptors along the Suffolk coastline and a suite of representative viewpoints have been agreed with stakeholders along the coastline to assess these effects.
27. Within the SLVIA study area, the assessment will focus primarily on the assessment of SL&V effects of the proposed East Anglia TWO project within Suffolk Coastal and Waveney District in Suffolk; and Great Yarmouth, Broadland and South Norfolk Districts in Norfolk; and their adjacent seascapes.
28. Potential cumulative effect interactions with other offshore windfarms have also influenced the study area for the SLVIA. Other Offshore windfarms within the SLVIA study area are shown in **Figure 28.9**.

### 28.2.1 Operational Energy Development Baseline

29. The SLVIA considers the effects of the proposed East Anglia TWO project in combination with a baseline of operational projects/energy developments, as listed in **Table A28.1** and shown in **Figure 28.9**. The SLVIA focuses on the effects resulting from the proposed East Anglia TWO project in conjunction with operational offshore windfarms and energy projects (as identified in **Table A28.1** and shown in **Figure 28.9**), which form part of the baseline for the seascape, landscape and visual effects assessments in **Appendices 28.2 – 28.5**.



Cumulative effects with other proposed projects (including the proposed East Anglia ONE North project) are assessed in **Appendix 28.6**.

**Table A28.1 Projects Considered as Part of the Baseline**

Project	Status	Distance (km) from coastline	Number of wind turbines	Wind turbine blade tip height (m)	Wind turbine rotor diameter (m)
Scroby Sands	Operational	2.0km	30	100	80
Greater Gabbard	Operational	24.8km (from Orford Ness)	140	170	130
Galloper	Under construction	28.9km (from Orford Ness)	56	180.5	164
Gunfleet Sands 1, 2 and 3	Operational	6.2km (from Clacton-on-Sea)	49	129 144	107 120
London Array	Operational	22.5km (from Frinton-on-Sea)	175	147	124
Lowestoft Ness Point	Operational	Onshore	1	126	92
Sizewell A and B Nuclear Power Station	Operational	Onshore	N/A	N/A	N/A

## 28.3 Defining Impact Significance – Seascape/Landscape

### 28.3.1 Sensitivity of Seascape/ Landscape Receptor

30. The sensitivity of a seascape/ landscape character receptor is an expression of its ability to accommodate the proposed East Anglia TWO project as part of its own character or as part of its visual setting or context. This is dependent on the value of the seascape/ landscape receptor and its susceptibility to change.

#### 28.3.1.1 Value of the Seascape/ Landscape Receptor

31. The value of a seascape/ landscape character receptor is a reflection of the value that society attaches to that seascape/ landscape. The assessment of the seascape/ landscape value will be classified as high, medium-high, medium, medium-low or low and the basis for this assessment will be made clear using evidence and professional judgement, based on the following range of factors:

- **Seascape/landscape designations** - A receptor that lies within the boundary of a recognised landscape related planning designation will be of increased value, depending on the proportion of the receptor that is covered and the level of importance of the designation; international, national, regional or local. The absence of designations does not preclude value, as an undesignated

landscape character receptor may be valued as a resource in the local or immediate environment.

- **Seascape/landscape quality** - The quality of a seascape/ landscape character receptor is a reflection of its attributes, such as scenic quality, sense of place, rarity and representativeness and the extent to which attributes have remained intact. A seascape/ landscape with consistent, intact, well-defined and distinctive attributes is considered to be of higher quality and, in turn, higher value, than a landscape where the introduction of elements has detracted from its character.
- **Seascape/landscape experience** - The experience of the seascape/ landscape character receptor can add to its value and relates to a number of factors including the perceptual responses it evokes, the cultural associations that may exist in literature or history, or the iconic status of the seascape/ landscape in its own right, the recreational value of the seascape/ landscape, and the contribution of other values relating to the nature conservation or archaeology of the area.

#### 28.3.1.2 Susceptibility to Change - Seascape/ Landscape

32. The susceptibility of a seascape/ landscape character receptor to change is a reflection of its ability to accommodate the changes that will occur as a result of the addition of the proposed East Anglia TWO project. The assessment of the susceptibility of the seascape/ landscape receptor to change will be classified as high, medium-high, medium, medium-low or low and the basis for this assessment will be made clear using evidence and professional judgement, based on the following criteria:

- **The specific nature of the proposed East Anglia TWO project** - The susceptibility of seascape/ landscape receptors will be assessed in relation to change arising from the specific development proposed, including the specific components and features of the proposed East Anglia TWO project, its size, scale, location, context and characteristics.
- **Seascape/landscape character** - The key characteristics of the existing seascape/ landscape character will be considered in the evaluation of susceptibility, as they determine the degree to which the receptor may accommodate the influence of the proposed East Anglia TWO project. A landscape that is of a particularly wild and remote character may have a high susceptibility to the influence of development, due to the contrast that it would have with the landscape, whereas a developed, industrial landscape, where built elements and structures are already part of the character may have a lower susceptibility.



- **Seascape/landscape association** - The extent to which the proposed East Anglia TWO project will influence the character of the seascape/ landscape receptors across the study area, relates to the associations that exist between the seascape/ landscape receptor within which the proposed East Anglia TWO project is located and the seascape/ landscape receptor from which the proposed East Anglia TWO project is being experienced. In some situations, this association will be strong, where the seascapes/landscapes are directly related, and in other situations weak where the landscape association is weak.

### 28.3.1.3 Sensitivity Rating - Seascape / Landscape

33. An overall sensitivity assessment of the seascape/ landscape receptor will be made by combining the assessment of the value of the seascape/ landscape character receptor and its susceptibility to change. An overall level of sensitivity will be applied for each seascape/ landscape receptor - high, medium-high, medium, medium-low and low - by combining individual assessments of the value of the receptor and its susceptibility to change. The basis for the assessments will be made clear using evidence and professional judgement in the evaluation of sensitivity for each receptor. Criteria that tend towards higher or lower sensitivity are set out in the table below.

**Table A28.2 Sensitivity to Change – seascape/landscape receptors**

Criteria tending towards higher or lower sensitivity		
Value	Higher	Lower
	Designated seascapes/landscapes with national policy level protection or defined for their natural beauty.	Seascapes/landscapes without formal designation.
	Higher quality seascape/ landscapes with consistent, intact and well-defined, distinctive attributes.	Despoiled or degraded seascape/ landscape with little or no evidence of being valued by the community.
	Rare or unique seascape/ landscape character types or features.	Lower quality seascapes/landscapes with indistinct elements or features that detract from its inherent attributes.
	Aesthetic or perceptual aspects of designated wildlife, ecological or cultural heritage features that contribute to seascape/ landscape character.	Widespread or 'common' seascape/ landscape character types or features.
	Evidence that the seascape/ landscape is valued or used substantially for recreational activity.	Limited or no wildlife, ecological or cultural heritage features, or limited contribution to seascape/ landscape character.
	Seascape/landscape with perceptual qualities of wildness, remoteness or tranquillity.	No evidence that the seascape/ landscape is used for recreational activity.
	Seascape/landscape with strong cultural associations that contribute to perceptions of scenic quality.	Seascape/landscape with inherent character has been changed by human activity.

Criteria tending towards higher or lower sensitivity		
		Seascape/landscape with few cultural associations.
<b>Susceptibility to change</b>	Higher	Lower
	<p>Seascape/landscape which is likely or liable to be influenced by the proposed East Anglia TWO project.</p> <p>Seascape/landscape vulnerable or fragile to change through the loss or addition of features that would alter key landscape characteristics.</p> <p>Seascape/landscape which lacks the ability to resist/accommodate the change that is likely to occur as a result of the proposed East Anglia TWO project.</p> <p>Aesthetic or perceptual aspects of landscape are susceptible to changes associated with features of proposed development.</p> <p>Strong or direct association between proposed development and the landscape receptor.</p> <p>Seascape/landscape which is directly exposed to the proposed East Anglia TWO project and has highest degree of exposure.</p>	<p>Seascape/landscape which is unlikely or not liable to be influenced by the proposed East Anglia TWO project.</p> <p>Robust landscape, able to accommodate change or loss of features without altering key characteristics.</p> <p>Seascape/landscape which has the ability to resist/accommodate the change that is likely to occur as a result of the proposed East Anglia TWO project.</p> <p>Aesthetic or perceptual aspects of landscape may accommodate changes associated with features of proposed development.</p> <p>Weak and indirect association between proposed development and the landscape receptor.</p> <p>Seascape/landscape which is not directly exposed to the proposed East Anglia TWO project and has degree of concealment/screening.</p>

### 28.3.2 Magnitude of Change - Seascape/ Landscape

34. The magnitude of change on seascape/ landscape receptors is an expression of the scale of the change that will result from the proposed East Anglia TWO project and is dependent on a number of variables regarding the size or scale of the change. The basis for this assessment is made clear using evidence and professional judgement, based on the following criteria. An assessment will also be made of the geographical extent of the area over which this will occur and the duration and reversibility of such changes, however this is not taken into account in the assessment of magnitude as there is the potential that the reversibility aspect could alter or reduce potentially significant effects even though they are long-term.

#### 28.3.2.1 Size or Scale of Change

35. This criterion relates to the size or scale of change to the seascape/ landscape that will arise as a result of the proposed East Anglia TWO project, based on the following factors:

- The degree to which the pattern of elements that makes up the seascape/ landscape character will be altered by the proposed East Anglia TWO project, by removal or addition of elements in the seascape/ landscape. The magnitude of change will generally be higher if the features that make up the seascape/ landscape character are extensively removed or altered, and/or if many new components are added to the seascape/ landscape;
- The extent to which the effect of the proposed East Anglia TWO project changes, physically or perceptually, the key characteristics of the seascape/ landscape as identified in the baseline study and which may be important to the distinctive character of the landscape. This may include, for example, the scale of the landform, its relative simplicity or irregularity, the nature of the seascape/ landscape context, the grain or orientation of the seascape/ landscape, the degree to which the receptor is influenced by external features and the juxtaposition of the proposed East Anglia TWO project in relation to these key characteristics;
- The degree to which seascape/ landscape character receptors will be changed by the addition of the proposed East Anglia TWO project to baseline wind energy developments that are already present in the seascape/ landscape. If the proposed East Anglia TWO project is located in a seascape/ landscape receptor that is already affected by other wind energy development, this may reduce the magnitude of change if there is a high level of integration and the developments form a unified and cohesive feature in the seascape/ landscape.
- The seascape/ landscape context in which the proposed East Anglia TWO project and other wind energy development are located. If the development is located in a similar seascape/ landscape context, the magnitude of change is likely to be lower as they relate consistently to key seascape/ landscape characteristics. If developments are located in different seascape/ landscape settings, this can lead to a perception that wind energy development is unplanned and uncoordinated, affecting a wide range of seascape/ landscape characters and blurring the distinction between them;
- The scale of the seascape/ landscape, landform and patterns of the landscape. A large-scale seascape/ landscape can provide a more appropriate receiving environment than a more intimate, small-scale setting where development may result in uncomfortable scale comparisons and increase the magnitude of change;
- The distance between the seascape/ landscape character receptor and the proposed East Anglia TWO project. Generally, the greater the distance, the lower the scale of change as the proposed East Anglia TWO project will constitute a less apparent influence on the seascape/ landscape character; and

- The amount of the proposed East Anglia TWO project that will be seen. Visibility of the proposed East Anglia TWO project may range from one wind turbine blade tip to all of the wind turbines; generally, the greater the extent of the proposed East Anglia TWO project that can be seen, the higher the scale of change.

#### 28.3.2.2 Geographical Extent

36. The geographic extent over which the seascape/ landscape effects will be experienced is also assessed, which is distinct from the size or scale of effect. This evaluation is not combined in the assessment of the level of magnitude, but instead expresses the extent of the receptor that will experience a particular magnitude of change and therefore the geographical extents of the significant and non-significant effects.
37. The extent of the effects will vary depending on the specific nature of the proposed East Anglia TWO project and is principally assessed through analysis of the extent of perceived changes to the seascape/ landscape character through visibility of the proposed East Anglia TWO project.

#### 28.3.2.3 Duration and Reversibility

38. The duration and reversibility of seascape/ landscape effects will be based on the period over which the proposed East Anglia TWO project is likely to exist and the extent to which the proposed East Anglia TWO project will be removed and its effects reversed at the end of that period. Duration and reversibility will not be incorporated into the overall magnitude of change and are stated separately in relation to the assessed effects. Long-term, medium-term and short-term seascape/ landscape effects are defined as follows:
- **Long-term** – more than 10 years;
  - **Medium-term** – 5 to 10 years.
  - **Short-term** – 1 to 4 years.
39. OPEN's methodology does not include duration and reversibility as part of magnitude of change, as there is the potential that the reversibility aspect could alter or reduce potentially significant effects even though they are long-term. The duration and reversibility of the effects is instead determined separately and recorded alongside significance rather than being a factor of it.

#### 28.3.2.4 Magnitude of Change Rating – Seascape/ Landscape

40. An assessment of the magnitude of change resulting from the proposed East Anglia TWO project on the seascape/ landscape receptor will be made by assessing the size or scale of change. The geographical extent over which this

change takes place will also be assessed. The basis for the assessment of magnitude for each receptor will be made clear using evidence and professional judgement. The levels of magnitude of change that can occur are defined in **Table A28.3**.

**Table A28.3 Magnitude of Change Definitions – seascape/landscape character**

Magnitude of change	Description/reason
<b>High</b>	The proposed East Anglia TWO project will result in a major alteration to the baseline characteristics of the seascape/ landscape, providing the prevailing influence and/or introducing elements that are uncharacteristic in the receiving seascape/ landscape. The addition of the proposed East Anglia TWO project will result in a major incremental change, loss or addition to the baseline windfarm context.
<b>Medium</b>	The proposed East Anglia TWO project will result in a moderate alteration to the baseline characteristics of the seascape/ landscape, providing a readily apparent influence and/or introducing elements potentially uncharacteristic in the receiving seascape/ landscape. The addition of the proposed East Anglia TWO project will result in a moderate incremental change, loss or addition to the baseline context.
<b>Low</b>	The proposed East Anglia TWO project will result in a minor alteration to the baseline characteristics of the seascape/ landscape, providing a slightly apparent influence and/or introducing elements that are characteristic in the receiving seascape/ landscape. The addition of the proposed East Anglia TWO project will result in a minor incremental change, loss or addition to the baseline context.
<b>Negligible</b>	The proposed East Anglia TWO project will result in a negligible alteration to the baseline characteristics of the seascape/ landscape, providing a barely discernible influence and/or introducing elements that are substantially characteristic in the receiving seascape/ landscape. The addition of the proposed East Anglia TWO project will result in a negligible incremental change, loss or addition to the baseline context.
<b>None</b>	The proposed East Anglia TWO project will result in no change to the baseline characteristics of the seascape/ landscape.

41. There may also be intermediate levels of magnitude of change, such as medium-high and medium-low, where the change falls between definitions. Criteria that tend towards higher or lower magnitude of change are set out in **Table A28.4** below.

**Table A28.4 Magnitude to Change Criteria – seascape/landscape receptors**

Criteria tending towards higher or lower magnitude		
Size or scale of change	Higher	Lower
	Major loss of existing seascape/ landscape elements which contribute to the seascape/ landscape character. Major alteration to pattern of elements, or perception of seascape/ landscape pattern, through removal or addition of new elements.	Minor or negligible loss of existing seascape/ landscape elements. Minor alteration to pattern of elements, or perception of seascape/ landscape pattern. Minor change to key characteristics, or changes to characteristics which are not part of inherent distinctiveness.

Criteria tending towards higher or lower magnitude	
	<p>Major change to key characteristics which define the distinctive character of the seascape/ landscape.</p> <p>The proposed East Anglia TWO project is located within or close to seascape/ landscape receptor and results in large scale change to its character.</p> <p>Large amount of the proposed East Anglia TWO project visible resulting in higher scale of change.</p>
	<p>The proposed East Anglia TWO project is located at long distance outside seascape/ landscape receptor and results in small scale change to its seascape/ landscape character.</p> <p>Small amount of the proposed East Anglia TWO project visible resulting in lower scale of change.</p>

### 28.3.2.5 Impact Significance – Seascape/ Landscape Effects

42. The objective of the assessment is to predict the likely significant effects of the proposed East Anglia TWO project on the SL&V resource. In accordance with the EIA Regulations, the SL&V effects will be assessed to be either significant or not significant. The SLVIA will not define intermediate levels of significance as the EIA Regulations do not provide for these.
43. The significance of the effect on each seascape/ landscape character receptor is dependent on all of the factors considered in the sensitivity of the receptor and the magnitude of change resulting from the proposed East Anglia TWO project. These judgements on sensitivity and magnitude will be combined to arrive at an overall assessment as to whether the proposed East Anglia TWO project will have an effect that is significant or not significant on the seascape/ landscape character receptor. An assessment of the factors considered in the evaluation of the sensitivity of each seascape/ landscape character receptor and the magnitude of the change resulting from the proposed East Anglia TWO project will be presented, in order that the relevant considerations which have informed the significance can be considered transparently. The matrix shown in
44. **Table A28.4** helps to inform the threshold of significance when combining sensitivity and magnitude to assess significance.
45. A significant effect will occur where the combination of the variables results in the proposed East Anglia TWO project having a defining effect on the seascape/ landscape character receptor, or where changes of a lower magnitude occur on a seascape/ landscape character receptor that is of particularly high sensitivity.
46. A not significant effect will occur where the effect of the proposed East Anglia TWO project is not definitive, and the seascape/ landscape character of the receptor continues to be characterised principally by its baseline characteristics, or where the small scale of change experienced by a high sensitivity receptor is such as to be considered not significant. A major loss or irreversible effect over an extensive area, on elements and/or perceptual aspects that are key to the character of nationally valued seascapes/landscapes are likely to be of greatest significance. Reversible effects, over a restricted area, on elements and/or



perceptual aspects that contribute to but are not key characteristics of the character of seascapes/landscapes that are of lower value, are likely to be of least significance.

47. OPEN’s methodology requires the application of professional judgement in accordance with the GLVIA3. Although it is not reliant on the use of a matrix, the following matrix in
48. **Table A28.5** is included to illustrate how combinations of the ratings for sensitivity and magnitude of change can give rise to significant effects, as well as to give an understanding of the threshold at which significant effects may arise.
49. Effects that are assessed within the red boxes in the matrix will be assessed to be significant in terms of the requirements of the EIA Regulations. Those effects that are assessed within the orange boxes may be significant, or not significant, depending on the specific factors and effect that is assessed in respect of a particular SL&V receptor. In accordance with the GLVIA3, experienced professional judgement will be applied to the assessment of all effects and reasoned justification presented in respect of the findings in each case.

**Table A28.5 Impact Significance Matrix – Seascape/Landscape Effects**

		Magnitude of change					Negligible
		High	Medium-high	Medium	Medium-low	Low	
Sensitivity	High	Significant	Significant	Significant	Significant or not significant	Not significant	Not significant
	Medium-high	Significant	Significant	Significant or not significant	Significant or not significant	Not significant	Not significant
	Medium	Significant	Significant or not significant	Significant or not significant	Not significant	Not significant	Not significant
	Medium-low	Significant or not significant	Significant or not significant	Not significant	Not significant	Not significant	Not significant
	Low	Significant or not significant	Not significant	Not significant	Not significant	Not significant	Not significant

## 28.4 Defining Impact Significance – Visual Effects

50. The assessment of visual effects is an assessment of how the introduction of the East Anglia TWO project will affect the views available to people and their visual amenity. The assessment of visual effects will be carried out in two parts:
- An assessment of the effects that the East Anglia TWO project will have on a series of viewpoints that have been selected to represent the views available to people from representative or specific locations within the study area; and
  - An assessment of the effects that the East Anglia TWO project will have from principal visual receptors, including residents of settlements, motorists using roads and people using recreational routes, features and attractions throughout the study area.
51. The objective of the assessment of effects on visual receptors is to determine what the likely effects of the East Anglia TWO project will be on the people experiencing views across the study area, and whether these effects will be significant or not significant. The methodology for the assessment of visual effects involves the evaluation of sensitivity, magnitude of change and an assessment of impact significance.

### 28.4.1 Sensitivity of Visual Receptor

52. The sensitivity of visual receptors will be determined by a combination of the value of the view and the susceptibility of the visual receptors to the change that the East Anglia TWO project will have on the view.

#### 28.4.1.1 Value of the View

53. The value of a view or series of views is a reflection of the recognition and the importance attached either formally through identification on mapping or being subject to planning designations, or informally through the value which society attaches to the view(s). The value of a view will be classified as high, medium-high, medium, medium-low or low and the basis for this assessment will be made clear using evidence and professional judgement, based on the following criteria:
- **Formal recognition** - The value of views can be formally recognised through their identification on Ordnance Survey (OS) or tourist maps as formal viewpoints, sign-posted and with facilities provided to add to the enjoyment of the viewpoint such as parking, seating and interpretation boards. Specific views may be afforded protection in local planning policy and recognised as valued views. Specific views can also be cited as being of importance in relation to landscape or heritage planning designations, for example the value of a view will be increased if it presents an important vista from a designed landscape or lies within or overlooks a designated area, which implies a greater value to the visible landscape.



- **Informal recognition** - Views that are well-known at a local level and/or have particular scenic qualities can have an increased value, even if there is no formal recognition or designation. Views or viewpoints are sometimes informally recognised through references in art or literature and this can also add to their value. A viewpoint that is visited or used by a large number of people will generally have greater importance than one gained by very few people.
- **Scenic quality** - The value of the view is a reflection of the scenic qualities gained in the view. This relates to the content and composition of the seascape/ landscape, whereby certain patterns and features will increase the scenic quality and others will reduce the scenic quality. The value of the view will also be increased if the condition of the landscape is near to the optimum for its type.

#### 28.4.1.2 Susceptibility to Change

54. Susceptibility relates to the nature of the viewer experiencing the view and how susceptible they are to the potential effects of the East Anglia TWO project. A judgement to determine the level of susceptibility therefore relates to the nature of the viewer and their experience from that particular viewpoint or series of viewpoints, as follows:

- **Nature of the viewer** - The nature of the viewer is described by the occupation or activity which they are engaged in at the viewpoint or series of viewpoints. The most common groups of viewers considered in the visual assessment include residents, motorists, and people taking part in recreational activity or working. Viewers, whose attention is focused on the landscape, or with static long-term views, are likely to have a higher sensitivity. Viewers travelling in cars or on trains will tend to have a lower sensitivity as their view is transient and moving. The least sensitive viewers are usually people at their place of work as they are generally less sensitive to changes in views.
- **Experience of the viewer** - The experience of the visual receptor relates to the extent to which the viewer's attention or interest may be focused on the view and the visual amenity they experience at a particular location. The susceptibility of the viewer to change arising from the East Anglia TWO project may be influenced by the viewer's attention or interest in the view, which may be focused in a particular direction, from a static or transitory position, over a long or short duration, and with high or low clarity. For example, if the principal outlook from a settlement is aligned directly towards the East Anglia TWO project, the experience of the visual receptor will be altered more notably than if the experience relates to a glimpsed view seen at an oblique angle from a car travelling at high speed. The visual amenity experienced by the viewer

varies depending on the presence and relationship of visible elements, features or patterns experienced in the view and the degree to which the landscape in the view may accommodate the influence of the East Anglia TWO project.

### 28.4.1.3 Sensitivity rating – Views/ Visual Receptors

55. An overall level of sensitivity will be applied for each visual receptor or view – high, medium-high, medium, medium-low, low – by combining individual assessments of the value of the view and the susceptibility of the visual receptor to change. Each visual receptor, meaning the particular person or group of people likely to be affected at a specific viewpoint, is assessed in terms of their sensitivity. The basis for the assessments will be made clear using evidence and professional judgement in the evaluation of each receptor. Criteria that tend towards higher or lower sensitivity are set out in **Table A28**. below.

**Table A28.6 Sensitivity to Change – visual receptors**

Criteria tending towards higher or lower sensitivity		
<b>Value</b>	Higher	Lower
	Specific viewpoint identified in OS maps and/or tourist information and signage. Facilities provided at viewpoint to aid the enjoyment of the view. View afforded protection in planning policy. View is within or overlooks a designated landscape, which implies a higher value to the visible landscape. View has informal recognition and well-known at a local level, as having particular scenic qualities. View or viewpoint is recognised through references in art or literature. View has high scenic qualities relating to the content and composition of the visible landscape.	Viewpoint not identified in OS maps or tourist information and signage. No facilities provided at viewpoint to aid enjoyment of the view. View is not afforded protection in planning policy. View is not within, nor does it overlook, a designated landscape. View has no informal recognition and is not known as having particular scenic qualities. View or viewpoint is not recognised in references in art or literature. View has low scenic qualities relating to the content and composition of the visible landscape.
<b>Susceptibility to change</b>	Higher	Lower
	Viewer who is likely or liable to be influenced by the East Anglia TWO project. Viewers such as walkers, or tourists, whose main attention and interest are on their surroundings.	Viewer who is unlikely or not liable to be influenced by the proposed East Anglia TWO project. Viewers whose main attention is not focused on their surroundings, such as people at work, or specific forms of recreation. Viewers whom are transient and dynamic, such as those travelling in

Criteria tending towards higher or lower sensitivity		
	<p>Residents that gain static, long-term views of the proposed East Anglia TWO project in their principal outlook.</p> <p>Viewpoint is visited or used by a large number of people.</p> <p>A view that is focused in a specific directional vista, with notable features of interest in a particular part of the view.</p> <p>A view of an undeveloped landscape with little or no built development and/or human influence.</p> <p>Existing elements, features or patterns in view that will contrast with the proposed East Anglia TWO project.</p>	<p>cars or on trains, where the view is of short duration.</p> <p>View is visited or gained by very few people.</p> <p>Open views with no specific point of interest.</p> <p>A view of a developed, industrial landscape where built elements and structures are present.</p> <p>Existing elements, features or patterns in view that may assist with integration of the proposed East Anglia TWO project.</p>
<b>Sensitivity to change</b>	High Low	Medium

### 28.4.2 Magnitude of Change – Views/ Visual Receptors

56. The magnitude of change on views is an expression of the scale of the change that will result from the proposed East Anglia TWO project and is dependent on a number of variables regarding the size or scale of the change.
57. A separate assessment will also made of the geographical extent of the area over which this will occur and the duration and reversibility of such changes which will not feed into the magnitude of change assessment

#### 28.4.2.1 Size or Scale of Change

58. An assessment will be made about the size or scale of change in the view that is likely to be experienced as a result of the proposed East Anglia TWO project, based on the following criteria:
  - The distance between the visual receptor/viewpoint and the proposed East Anglia TWO project. Generally, the greater the distance, the lower the magnitude of change, as the proposed East Anglia TWO project will constitute a smaller scale component of the view;
  - The amount and size of the proposed East Anglia TWO project that will be seen. Visibility may range from one blade tip to all of the wind turbines. Generally, the larger the proposed East Anglia TWO project appears in the view, and the more of the proposed East Anglia TWO project that can be seen, the higher the magnitude of change;
  - The scale of the change in the view, with respect to the loss or addition of features in the view and changes in its composition;

- The field of view available and the proportion of the view that is affected by the proposed East Anglia TWO project. Generally, the more of a view that is affected, the higher the magnitude of change will be. If the proposed East Anglia TWO project extends across the whole of the open part of the outlook, the magnitude of change will generally be higher as the full view will be affected. Conversely, if the proposed East Anglia TWO project covers just a part of an open, expansive and wide view, the magnitude of change is likely to be reduced as the proposed East Anglia TWO project will not affect the whole open part of the outlook;
- The scale and character of the context within which the proposed East Anglia TWO project will be seen and the degree of contrast or integration of any new features with existing landscape elements, in terms of scale, form, mass, line, height, colour, luminance and motion. Contrasts and changes may arise particularly as a result of the rotation movement of the wind turbine blades, as a characteristic that gives rise to effects;
- The consistency of image of the proposed East Anglia TWO project in relation to other developments. The cumulative magnitude of change of the proposed East Anglia TWO project is likely to be lower if its wind turbine height, arrangement and layout design are broadly similar to other developments in the landscape, as they are more likely to appear as relatively simple and logical components of the landscape;
- The uniformity of appearance of the proposed East Anglia TWO project in different views. If the proposed East Anglia TWO project appears relatively uniform and consistent in appearance from different viewpoints and viewing angles, in a similar setting and familiar form, this tends to reduce the magnitude of change. If, on the other hand, it appears inconsistent in image, scale and appearance, or from a variety of different angles, and is seen in a different form and setting, the magnitude of change is likely to be higher as it will be a variable and less familiar component of views;
- The extent of the wind energy developed skyline. If the proposed East Anglia TWO project will add notably to the wind energy developed skyline in a view, extending the lateral spread of development or increasing the perceived connection between other windfarms, the cumulative magnitude of change will tend to be higher;
- The number and scale of developments seen simultaneously or sequentially. Generally, the greater the number of clearly separate developments that are visible, the higher the cumulative magnitude of change will be, whereas an extension to an existing windfarm would tend to result in a lower magnitude of change than a separate, new development; and
- The scale and form comparison between developments. If the proposed East Anglia TWO project is of a similar scale and form to other visible

developments, particularly those seen in closest proximity to it, the cumulative magnitude of change will generally be lower as it will have more integration with the other sites and will be less apparent as an addition to the cumulative situation.

#### 28.4.2.2 Geographical Extent

59. The geographic extent over which the visual effects will be experienced will also be assessed, which is distinct from the size or scale of effect. The extent of the effects will vary depending on the specific nature of the proposed East Anglia TWO project and is principally assessed through analysis of the extent of visibility of the proposed East Anglia TWO project from visual receptors, to assess the geographical extent of the receptor that will be affected, based on the following criteria:

- The extent of the visual receptor (a road, footpath or settlement for example) that will experience changes through visibility of the proposed East Anglia TWO project; and
- The extent to which the change affects views, whether this is unique to the viewpoint or if similar changes occur over wide areas represented by the viewpoint.

#### 28.4.2.3 Duration and Reversibility

60. The duration and reversibility of visual effects are based on the period over which the proposed East Anglia TWO project is likely to exist and the extent to which the proposed East Anglia TWO project will be removed and its effects reversed at the end of that period. Duration and reversibility will not be incorporated into the overall magnitude of change and are stated separately in relation to the assessed effects.

61. Long-term, medium-term and short-term visual effects are defined as follows:

- **Long-term** – more than 10 years;
- **Medium-term** – 5 to 10 years.
- **Short-term** – 1 to 4 years.

62. OPEN's methodology does not include duration and reversibility as part of magnitude of change, as there is the potential that the reversibility aspect could alter or reduce potentially significant effects even though they are long-term. The duration and reversibility of the effects will instead be determined separately and recorded alongside significance rather than being a factor of it.

#### 28.4.2.4 Magnitude of Change Rating – Views/ Visual Receptors

63. An assessment of the magnitude of change resulting from the proposed East Anglia TWO project on each visual receptor and viewpoint will be made by assessing the size or scale of change. The geographical extent over which this change takes place will also be assessed. The basis of the assessment is made clear using evidence and professional judgement. There may also be intermediate levels of magnitude of change, such as medium-high or medium-low, where the change falls between the definitions. The levels of magnitude of change that can occur on views are defined in **Table A28.7**.

**Table A28.7 Magnitude of Change – visual effects**

Magnitude of change	Visibility level	Magnitude of Change Definition
High	The proposed East Anglia TWO project will be the prevailing feature in the view and will form the major focus of visual attention due to its large vertical scale and lateral spread, filling a large proportion of the field of view. Contrasts in form, line, colour, texture, luminance or motion may contribute to the prevailing influence. Moving objects associated with the proposed East Anglia TWO project may contribute substantially to drawing viewer attention. The visual prominence of the proposed East Anglia TWO project will detract noticeably from views of other seascape/ landscape elements.	The proposed East Anglia TWO project will result in a high level of alteration to the existing view, forming the prevailing influence and/or introducing elements that are substantially uncharacteristic in the baseline view. The addition of the proposed East Anglia TWO project will result in a major incremental change, loss or addition to the baseline view.
Medium-high	The proposed East Anglia TWO project will strongly attract the visual attention of viewers, either due to its large vertical scale or lateral spread in the view, or due to contrasts in form, line, colour, or texture, luminance, or motion. Moving objects associated with the proposed East Anglia TWO project may contribute substantially to drawing viewer attention. Will form a major-moderate focus of visual attention, drawing viewer attention immediately and tending to hold that attention. The visual prominence of the proposed East Anglia TWO project interferes noticeably with views of nearby seascape/ landscape elements.	The proposed East Anglia TWO project will result in a medium-high level of alteration to the existing view, forming a prominent influence and/or introducing elements that are uncharacteristic in the baseline view. The addition of the proposed East Anglia TWO project will result in a moderate to major incremental change, loss or addition to the baseline view.
Medium	Plainly visible, so will not be missed by casual observers, but does not strongly attract visual attention or dominate the view because of its apparent size. The proposed East Anglia TWO project is obvious and will have sufficient size to contrast with other seascape/ landscape	The proposed East Anglia TWO project will result in a medium level of alteration to the baseline view, forming a readily apparent influence and/or introducing elements that are potentially uncharacteristic in the receiving view. The addition of the



Magnitude of change	Visibility level	Magnitude of Change Definition
	elements, but with insufficient visual contrast to strongly attract visual attention and insufficient size to occupy most of an observer's field of view.	proposed East Anglia TWO project will result in a moderate incremental change, loss or addition to the baseline view.
Medium-low	The proposed East Anglia TWO project will be visible after a brief glance in its general direction and is unlikely to be missed by casual observers. Will be easily detected after a brief look and will be visible to most casual observers, but without sufficient size or contrast to compete with the main seascape/landscape elements in the view.	The proposed East Anglia TWO project will result in a medium-low level of alteration to the existing view, forming an apparent influence and/or introducing elements that may be characteristic in the baseline view. The addition of the proposed East Anglia TWO project will result in a medium-low incremental change, loss or addition to the baseline view.
Low	The proposed East Anglia TWO project will be visible when scanning in its general direction; otherwise it may be missed by casual observers. Very small and/or faint, but when the observer is scanning the horizon or looking more closely at an area, can be detected and sometimes noticed by casual observers; however, most people would not notice it without some active looking.	The proposed East Anglia TWO project will result in a low level of alteration to the baseline view, providing a slightly apparent influence and/or introducing elements that are characteristic in the receiving view. The addition of the proposed East Anglia TWO project will result in a low incremental change, loss or addition to the baseline view.
Negligible	Visible only after extended viewing. The proposed East Anglia TWO project is near the limit of visibility. It would not be seen by a person who was unaware of it in advance and looking for it. Even under those circumstances, it can be seen only after looking at it closely for an extended period.	The proposed East Anglia TWO project will result in a negligible alteration to the existing view, forming a barely discernible influence and/or introducing elements that are substantially characteristic in the baseline view. The addition of the proposed East Anglia TWO project will result in a negligible incremental change, loss or addition to the baseline view.
None	The proposed East Anglia TWO project is not visible.	The proposed East Anglia TWO project will result in no change to the existing view or its baseline characteristics.

64. Criteria that tend towards higher or lower magnitude of change are set out in **Table A28.8**.

**Table A28.8 Magnitude of Change – views/visual receptors**

Criteria tending towards higher or lower magnitude		
Size or scale of change	Higher	Lower
	Large scale change in the view resulting from loss and/or addition of features and changes in its composition.	Small-scale change in the view resulting from loss and/or addition of features and changes in its composition.

Criteria tending towards higher or lower magnitude		
	<p>Proposed development located in close proximity to the viewpoint and will form large scale component of the view.</p> <p>All or majority of the proposed East Anglia TWO project will be visible in the view e.g. full towers and rotor sweep.</p> <p>The proposed East Anglia TWO project affects a large proportion of available field of view.</p> <p>The proposed East Anglia TWO project has a high degree of contrast/ low degree of integration with existing seascape/ landscape elements, in terms of scale, form, mass, line, height, colour and texture.</p> <p>The proposed East Anglia TWO project appears inconsistent; in a different setting and/or form each time it is visible.</p>	<p>The proposed East Anglia TWO project is located at long distance from the viewpoint and will form a small scale component of the view.</p> <p>Limited amount of the proposed East Anglia TWO project will be visible in the view e.g. extremity of blade tips.</p> <p>The proposed East Anglia TWO project will affect a small proportion of available field of view.</p> <p>The proposed East Anglia TWO project has a low degree of contrast/ high degree of integration with existing seascape/ landscape elements, in terms of scale, form, mass, line, height, colour and texture.</p> <p>The proposed East Anglia TWO project appears consistent, in a similar setting and/or form each time it is visible.</p>

#### 28.4.2.5 Impact Significance - Visual Effects

65. The significance of the effect on each view is dependent on all of the factors considered in the sensitivity of the view and the magnitude of change resulting from the proposed East Anglia TWO project. These judgements on sensitivity and magnitude will be combined to arrive at an overall assessment as to whether the proposed East Anglia TWO project will have an effect that is significant or not significant on the visual receptor. The matrix shown in **Table A28.9** helps to inform the threshold of significance when combining sensitivity and magnitude to assess the significance of effect.
66. A significant effect will occur where the combination of the variables results in the proposed East Anglia TWO project having a defining effect on the view or where changes of a lower magnitude occur on a view or visual receptor that is of particularly high sensitivity.
67. A not significant effect will occur where the appearance of the proposed East Anglia TWO project is not definitive, and the view continues to be defined principally by its baseline characteristics or where the small-scale of change experienced by a high sensitivity receptor is such as to be considered not significant.
68. Irreversible, long-term effects on people who are particularly sensitive to changes in views and visual amenity are more likely to be significant, as are effects on people at recognised viewpoints with high scenic quality. Large-scale changes which introduce new, non-characteristic or discordant elements into the view are



also more likely to be significant than small changes or changes involving features already present within the view.

69. The assessment of visual effects assumes clear weather and optimum viewing conditions. This means that effects that are assessed to be significant may be not significant under different, less clear conditions. Viewing conditions and visibility tend to vary considerably and therefore the likelihood of effects resulting from the proposed East Anglia TWO project will vary greatly according to the prevailing viewing conditions

**Table A28.9 Impact Significance Matrix – Visual Effects**

		Magnitude of change					
		High	Medium-high	Medium	Medium-low	Low	Negligible
Sensitivity	High	Significant	Significant	Significant	Significant or not significant	Not significant	Not significant
	Medium-high	Significant	Significant	Significant or not significant	Significant or not significant	Not significant	Not significant
	Medium	Significant	Significant or not significant	Significant or not significant	Not significant	Not significant	Not significant
	Medium-low	Significant or not significant	Significant or not significant	Not significant	Not significant	Not significant	Not significant
	Low	Significant or not significant	Not significant	Not significant	Not significant	Not significant	Not significant

### 28.4.3 Impact Significance – Suffolk Coastal Path

#### 28.4.3.1 Suffolk Coastal Path Background

70. The visual effects on users of the existing Suffolk Coastal Path have been assessed separately. This is in accordance with consultation responses which indicated the need for a systematic approach which takes into consideration the potential varying impacts on walkers depending on the direction of travel and the relationship between the sea and the Suffolk Coastal Path at any given point along the route.

71. The assessment of the visual effects of the proposed East Anglia TWO project on users of the Suffolk Coastal Path is provided in **Appendix 28.5** and takes into consideration both those who are walking the full length of the route, as well as those who are walking smaller sections as part of a circular walk. For practical purposes the assessed route is that which is set out in OS mapping as of July 2018, but it is acknowledged that due to the dynamic nature of the coastline the route will shift, and walkers may take beach alternatives in favourable conditions or be diverted inland away from any offshore developments during winter months or after major storm events.
72. The Suffolk Coast is undergoing Stage 2 and 3: Develop and Propose for inclusion into the England Coastal Path – a new national trail around England’s Coast, which when completed will be one of the longest coastal walking routes in the world. The proposals are expected to be published in 2018 and the England Coastal Path established by 2020. The study area includes a section of the England Coastal Path north of Lowestoft between Hopton on Sea to Sea Palling which is currently open to the public, however, this assessment focuses on the existing Suffolk Coastal Path which is in line with the sections of the England coastal path between Bawdesy to Aldeburgh and Aldeburgh to Hopton on Sea. The open and sections of the England Coastal Path which are relevant to the study area are illustrated in **Figure 28.22** along with the existing Suffolk Coastal Path route.

#### 28.4.3.2 Suffolk Coastal Path Assessment Methodology

73. The assessment method of the visual effects of the construction and operation of the offshore infrastructure on users of the Suffolk Coastal Path follows that outlined here for the assessment of visual effects. However, the path has been divided into 11 sections, each of which has been assessed independently. This is followed by a combined assessment of the entire route.
74. The varying impact due to the direction of walking is considered in the susceptibility section of the assessment and subsequently incorporated within the sensitivity of users of the Suffolk Coastal Path. Users walking north and those walking south are given specific susceptibility ratings and where these differ the impact is reported separately as part of the significance of effect.
75. The division of the Suffolk Coastal Path into sections follows a systematic method devised by Chartered Landscape Architects at OPEN. The path was divided into 11 sections initially using desk based research which was subsequently refined and verified on site by walking sections of the Suffolk Coastal Path and comparing views with computer visualisations.

76. The Suffolk Coastal Path is divided into 11 sections based on consideration of following factors. Baseline descriptions and character photographs of each section are provided in the assessment tables:
- Theoretical visibility and sequential route analysis - based on 300m Blade Tip ZTV with OS Terrain 5m data at an observer height of 2m (**Figures 28.23a and 28.23b**)
  - Ground visibility – The ZTV analysis does not consider the impact of surface features such as buildings, woodland and other vegetation. A site visit was made during August 2018 to verify the actual visibility of the EA TWO windfarm site along the route. This is mapped and superimposed on the sequential route analysis (**Figures 28.23a and 28.23b**)
  - Landscape and Seascape Character – This includes consideration of the level of offshore activity between the Suffolk Coastal Path and the construction and operation of the offshore infrastructure as well as changes in the onshore character of the landscape through which the Suffolk Coastal Path passes. (**Figures 28.24a and 28.24b**)
  - Path/shoreline relationship – The distance of the Suffolk Coastal Path from the shoreline does not always correspond with the level of visibility of the East Anglia TWO windfarm site. The Suffolk Coastal Path may be set behind a feature which obscures views or equally located at some distance from the shoreline yet with wide open views towards the sea. This aspect was assessed by walking sections of the Suffolk Coastal Path and the results are mapped and superimposed alongside the route in **Figures 28.23a, 28.23b and Figures 28.24a and 28.24b**.

#### 28.4.4 Defining Impact Significance – Cumulative Effects

##### 28.4.4.1 Introduction

77. In GLVIA3 (Landscape Institute and IEMA, 2013, p120) the guidelines define cumulative landscape and visual effects as those that *‘result from additional changes to the landscape and visual amenity caused by the proposal in conjunction with other developments (associated with or separate to it), or actions that occurred in the past, present or are likely to occur in the foreseeable future.’*
78. SNH’s guidance, Assessing the Cumulative Impact of Onshore Wind Energy Developments (SNH, 2012) is widely used across the UK to inform the specific assessment of the cumulative effects of windfarms. Both GLVIA3 and SNH’s guidance provide the basis for the methodology for the cumulative SLVIA undertaken in this PEIR. The SNH (2012) guidance defines:

- Cumulative effects as ‘the additional changes caused by a proposed development in conjunction with other similar developments or as the combined effect of a set of developments taken together’ (SNH, 2012: p4).
- Cumulative landscape effects are those effects that ‘can impact on either the physical fabric or character of the landscape, or any special values attached to it’ (SNH, 2012, p10); and
- Cumulative visual effects are those effects that can be caused by combined visibility, which ‘occurs where the observer is able to see two or more developments from one viewpoint’ and/or sequential effects which ‘occur when the observer has to move to another viewpoint to see different developments’ (SNH, 2012, p11).

79. In line with guidance (SNH, 2012), the SLVIA focuses on the key cumulative impacts which are likely to influence decision making, rather than assessing every potential cumulative effect.

#### 28.4.4.2 Scope of the Cumulative Assessment

80. In accordance with guidance (SNH, 2012), the cumulative SLVIA undertaken in this PEIR assesses the combined effect of a set of developments taken together. The focus of the cumulative SLVIA is on the combined effect of the construction and operation of the East Anglia TWO offshore infrastructure with the East Anglia ONE North offshore infrastructure.
81. The main SLVIA in **Appendices 28.2 – 28.5** considers effects of the construction and operation of the offshore infrastructure with a baseline of existing energy development, as listed in **Table A28.10** and illustrated in **Figure 28.9**.
82. The cumulative SLVIA in **Appendix 28.6** considers effects of the construction and operation of the East Anglia TWO offshore infrastructure cumulatively with the East Anglia ONE North offshore infrastructure, as this is the only relevant project which requires assessment, as listed in **Table A28.10** and shown in the cumulative search plan (**Figure 28.9**). The cumulative effects assessment focuses on the combined (or total) effect of the East Anglia TWO and ONE North projects since the applications for both projects are being submitted at the same time and it is the combined effect of both projects that is likely to be of interest to stakeholders (rather than the additional/incremental effect of the project being assessed, on top of a baseline with the other project).
83. **Table A28.10** identifies those projects that have been scoped in and out of the cumulative assessment. Existing offshore windfarms which form part of the baseline are also listed in **Table A28.10**.

**Table A28.10 Other Energy Developments Considered in the SLVIA**

Project	Status	Distance (km) from coastline	Scoped in (✓) or scoped out (x)	Rationale
<b>Projects considered as part of the baseline</b>				
Scroby Sands	Operational	2.0 km	✓	Considered as part of the baseline.
Greater Gabbard	Operational	24.8 km (from Orford Ness)	✓	Considered as part of the baseline.
Galloper	Under construction	28.9 km (from Orford Ness)	✓	Considered as part of the baseline.
Gunfleet Sands 1, 2 and 3	Operational	6.2 km (from Clacton-on-Sea)	✓	Considered as part of the baseline.
London Array	Operational	22.5 km (from Frinton-on-Sea)	✓	Considered as part of the baseline.
Lowestoft Ness Point	Operational	Onshore	✓	Considered as part of the baseline.
Sizewell A and B Nuclear Power Station	Operational	Onshore	✓	Considered as part of the baseline.
<b>Projects scoped out of the SLVIA (as agreed at scoping)</b>				
East Anglia ONE	Consented	48.6 (between Kessingland and Covehithe)	x	Limited theoretical visibility of East Anglia ONE offshore windfarm in coastal views and location behind East Anglia TWO windfarm site and at greater distance offshore.
East Anglia THREE	Consented	67.9 (Lowestoft)	x	Likelihood that there will be no visibility of East Anglia THREE offshore windfarm at distances over 67.9km from the coast.
Norfolk Vanguard	Scoping	47.8 (Winterton-on-sea)	x	Limited theoretical visibility of Norfolk Vanguard in coastal views at distances of 47.8km from coast. Geographic separation from East Anglia TWO windfarm site.
Norfolk Boreas	Scoping	73.2 (Scratby)	x	Likelihood that there will be no visibility of Norfolk Boreas at distances over 73.2km from coast. Geographic separation from East Anglia TWO windfarm site.
National Grid Ventures (NGV) inter-continental	Pre-application	NA - site location yet to be determined	x	NGV inter-continental connector projects are at pre-application stage. Lack of detail dictates that the NGV projects cannot be

Project	Status	Distance (km) from coastline	Scoped in (✓) or scoped out (x)	Rationale
connectors (Nautilus and Eurolink)				properly considered as part of the SLVIA for the East Anglia TWO windfarm site.
<b>Projects considered as part of the cumulative impact assessment (assessed in Appendix 28.6)</b>				
East Anglia ONE North	Application (to be made at the same time as the proposed East Anglia TWO project)	37.3km (from Lowestoft)	✓	East Anglia ONE North will be included in the cumulative assessment for the East Anglia TWO offshore windfarm due to its proximity and potential for cumulative effects on receptors/coastal views from the Suffolk/Norfolk coast.
Sizewell C	Scoping	Onshore	x	EDF Energy's proposals for a new nuclear power station to north of Sizewell B are within the onshore study area and may have cumulative effect interactions with the onshore infrastructure associated with the proposed East Anglia TWO project. Cumulative effects assessed in the Onshore LVIA <b>Chapter 29 Landscape and Visual Impact Assessment</b>

## 28.4.5 Types of Cumulative Effect

### 28.4.5.1 Cumulative Seascape/ Landscape Effects

84. Cumulative development within a particular area may build up to create different types of seascape/ landscape effect. The significance of the cumulative seascape/ landscape effects of the addition of the proposed East Anglia TWO project will be assessed as follows:

- If the combined East Anglia TWO and ONE North projects form a separate isolated feature from other developments within the seascape/ landscape, too infrequent and of insufficient significance to be perceived as a characteristic of the area, then the cumulative seascape/ landscape effect of the East Anglia TWO and ONE North project is unlikely to be significant.
- If the addition of the East Anglia TWO and ONE North projects results in offshore windfarms and/or energy generation/ transmission developments forming a key characteristic of the seascape/ landscape, exerting sufficient presence as to establish or increase the extent of a 'seascape/ landscape with windfarms'; then the cumulative seascape/ landscape effect of the proposal may be significant or not significant, depending on the sensitivity of the receptor and magnitude of the change.



- If the addition of the East Anglia TWO and ONE North projects results in offshore windfarms forming the prevailing characteristic of the seascape/ landscape, seeming to define the seascape/ landscape as a 'windfarm seascape/ landscape character type' then the cumulative seascape/ landscape effect of the East Anglia TWO and ONE North project is likely to be significant.

#### 28.4.5.2 Cumulative Visual Effects

85. Cumulative visual effects consist of combined and sequential effects:

- **Combined visibility** - occurs where the observer is able to see two or more developments from one viewpoint. Combined visibility may either be where several developments are within the observer's main angle of view at the same time, or , where the observer has to turn to see the various developments. The cumulative visual effect of the East Anglia TWO and ONE North project may be significant, or not significant, depending on factors influencing the cumulative magnitude of change, such as the degree of integration and consistency of image with other developments in combined views; and its position relative to other developments and the landscape context in successive views.
- **Sequential visibility** - occurs when the observer has to move to another viewpoint to see different developments. Sequential effects are assessed along regularly used routes such as major roads, railway lines and footpaths. The occurrence of sequential effects range from 'frequently sequential' (the features appear regularly and with short time lapses between, depending on speed of travel and distance between the viewpoints) to 'occasionally sequential' (long time lapses between appearances, because the observer is moving slowly and/or there are large distances between the viewpoints). The cumulative visual effect is more likely to be significant when frequently sequential.

#### 28.4.5.3 Cumulative Sensitivity of Landscape and Visual Receptors

86. In evaluating cumulative sensitivity in the cumulative SLVIA (**Appendix 28.6**), the sensitivity to change of seascape, landscape and visual receptors are retained from the main assessment in **Appendices 28.2-28.5**.

#### 28.4.5.4 Cumulative Magnitude of Change

87. The cumulative magnitude of change is an expression of the degree to which SL&V receptors will be changed by the addition of the East Anglia TWO and ONE North projects cumulatively. The cumulative magnitude of change is assessed according to a number of criteria, described below:

- The location, position and visual relationship of the East Anglia TWO offshore windfarm site with the East Anglia ONE North offshore windfarm site: Depending on the viewpoint/viewing angle from the coast, the East Anglia TWO and ONE North offshore windfarm sites may be viewed adjacent to one another on the skyline, covering a wider lateral spread; they may form one grouping or could be viewed separately as two windfarms on the skyline (separated by space on the skyline); or could be viewed with one project being 'behind' the other project. The overall magnitude of change will vary depending on this visual relationship at different viewpoints, and is likely to be higher when the two projects are viewed adjacent to each other over a wider lateral spread; and lower when one project (usually East Anglia ONE North) is viewed behind the other project.
- The location of the East Anglia TWO and ONE North offshore windfarm sites in relation to other developments: If the East Anglia TWO and ONE North offshore windfarm sites are seen in a part of the view or setting to a landscape receptor that is not affected by other development, this will generally increase the cumulative magnitude of change as it will extend influence into an area that is currently unaffected by development. Conversely, if the proposal is seen in the context of other sites, the cumulative magnitude of change may be lower as development is not being extended to otherwise undeveloped parts of the outlook or setting. This is particularly true where the scale and layout of the proposal is similar to that of the other sites as where there is a high level of integration and cohesion with an existing site the various developments may appear as a single site;
- The extent of the developed skyline: If the East Anglia TWO and ONE North offshore windfarm sites will add notably to the developed skyline in a view, the cumulative magnitude of change will tend to be higher as skyline development can have a particular influence on both views and seascape/ landscape receptors;
- The number and scale of developments seen simultaneously or sequentially: Generally, the greater the number of clearly separate developments that are visible, the higher the cumulative magnitude of change will be. The addition of the East Anglia TWO and ONE North offshore windfarm sites to a view or seascape/ landscape where a number of smaller developments are apparent will usually have a higher cumulative magnitude of change than one or two large developments as this can lead to the impression of a less co-ordinated or strategic approach;
- The scale comparison between developments: If the East Anglia TWO and ONE North offshore windfarm sites are of a similar scale to other visible developments, particularly those seen in closest proximity to it, the cumulative magnitude of change will generally be lower as it will have more integration



with the other sites and will be less apparent as an addition to the cumulative situation;

- The consistency of image of the proposal in relation to other developments: The cumulative magnitude of change of the East Anglia TWO and ONE North offshore windfarm sites is likely to be lower if its turbine height, arrangement and layout design are broadly similar to other developments in the seascape, as they are more likely to appear as relatively simple and logical components of the seascape;
- The context in which the developments are seen: If projects are seen in a similar seascape/ landscape context, the cumulative magnitude of change is likely to be lower due to visual integration and cohesion between the sites. If projects are seen in a variety of different settings, this can lead to a perception that windfarm development is unplanned and uncoordinated, affecting a wide range of landscape character and blurring the distinction between them; and
- The magnitude of change of the proposed East Anglia TWO project as assessed in the project alone assessment: Where the East Anglia TWO offshore windfarm site is assessed to have a negligible or low magnitude of change on a view or seascape/landscape receptor, there is more likely to be a low cumulative effect.

88. Definitions of cumulative magnitude of change are applied in order that the process of assessment is made clear. These are:

- **High** - where the magnitude of change arising from the combination of the East Anglia TWO and ONE North windfarm sites will result in a high cumulative change, loss or addition to the seascape/landscape receptor or view;
- **Medium** - where the magnitude of change arising from the combination of the East Anglia TWO and ONE North windfarm sites will result in a medium change, loss or addition to the seascape/landscape receptor or view;
- **Low** - where the magnitude of change arising from the combination of the East Anglia TWO and ONE North windfarm sites will result in a low change, loss or addition to the seascape/landscape receptor or view.
- **Negligible** - where the magnitude of change arising from the combination of the East Anglia TWO and ONE North windfarm sites will result in a negligible incremental change, loss or addition to the seascape/landscape receptor or view; and
- **None** - where the magnitude of change arising from the combination of the East Anglia TWO and ONE North windfarm sites will result in no change, loss or addition to the seascape/landscape receptor or view.

89. There may also be intermediate levels of cumulative magnitude of change - medium-high and medium-low - where the change falls between two of the definitions.

#### 28.4.5.5 Significance of Cumulative Effects

90. The objective of the cumulative assessment is to determine whether any effects that the construction and operation of the offshore infrastructure will have on SL&V receptors, when seen or perceived cumulatively with the construction and operation of the East Anglia ONE North offshore infrastructure, will be significant or not significant. Significant cumulative SL&V effects arise where the addition of the East Anglia TWO and ONE North windfarm sites, leads to offshore windfarms becoming a prevailing seascape/ landscape and visual characteristic of a receptor that is sensitive to such change. Cumulative seascape/ landscape effects may evolve as follows:

- A small scale, single development will often be perceived as a new or 'one-off' landscape feature or landmark within the seascape. Except at a local site level, it usually cannot change the overall existing seascape character, or become a new characteristic element of a landscape/ seascape;
- With the addition of further development, it can become a characteristic element of the landscape/ seascape, as they appear as elements or components that are repeated. Providing there was sufficient 'space' or undeveloped landscape/ seascape between each development, or the overlapping of several developments is not too dense; they would appear as a series of developments within the landscape/ seascape and would not necessarily become the dominant or defining characteristic of the seascape nor have significant cumulative effects; and
- The next stage would be to consider larger scale developments and/or an increase in the number of developments within an area that either overlap or coalesce and/or 'join-up' along the skyline. The effect is to create a landscape/ seascape where the offshore windfarm and/ or energy generation/ transmission element is a prevailing characteristic of the landscape/ seascape. The result would be to materially change the existing seascape/ landscape character and resulting in a significant cumulative effect. A landscape/ seascape characterised by offshore windfarm or energy generation/ transmission development may already exist as part of the baseline seascape context.

91. Less extensive, but nevertheless significant cumulative SL&V effects may also arise as a result of the addition of the East Anglia TWO and ONE North windfarm sites where it results in a seascape/ landscape or view becoming defined by the

presence of more than one offshore windfarm or similar/large scale development, so that other patterns and components are no longer definitive, or where the proposal contrasts with the scale or design of an existing or development. Higher levels of significance may arise from cumulative SL&V effects related to the East Anglia TWO and ONE North windfarm sites when they are clearly visible together in views, however provided that the projects are designed to achieve a high level of visual integration, with few notable visual differences between developments, these effects may not necessarily be significant. In particular, the effects of an extension to an existing development are often less likely to be significant, where the effect is concentrated, providing that the design of the developments are compatible and that the overall capacity of the seascape is not exceeded.

92. The capacity of the seascape/ landscape or view may be assessed as being exceeded where the SL&V receptor becomes defined by a particular type of development, or if the East Anglia TWO and ONE North offshore windfarm site extends across seascape/ landscape character types or clear visual/topographic thresholds in a view. More substantial cumulative effects may result from developments that have some geographical separation, but remain highly inter-visible, potentially resulting in extending effects into new areas, such as an increased presence of development on a skyline, or the creation of multiple, separate offshore windfarm defined seascape/ landscapes.

#### 28.4.6 Nature of Effects

93. The nature of effects refers to whether the landscape and/or visual effect of the proposed East Anglia TWO project is positive or negative (herein referred to as 'beneficial' and 'adverse').
94. The EIA Regulations 2017 state that the Environmental Statement (ES) should cover *'the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development'*.
95. Guidance provided by the Landscape Institute In GLVIA3 on the nature of effect (i.e. beneficial or adverse) states that *'in the LVIA, thought must be given to whether the likely significant landscape and visual effects are judged to be positive (beneficial) or negative (adverse) in their consequences for landscape or for views and visual amenity'*, but it does not provide guidance as to how that may be established in practice. The nature of effect is therefore one that requires interpretation and, where applied, this involves reasoned professional opinion.
96. In relation to many forms of development, the LVIA will identify 'beneficial' and 'adverse' effects by assessing these under the term 'Nature of Effect'. The landscape and visual effects of windfarms are difficult to categorise in either of

these brackets as, unlike other disciplines, there are no definitive criteria by which the effects of windfarms can be measured as being categorically 'beneficial' or 'adverse'. In some disciplines, such as noise or ecology, it is possible to quantify the effect of a windfarm in numeric terms, by objectively identifying or quantifying the proportion of a receptor that is affected, and assessing the nature of that effect in justifiable terms. However, this is not the case in relation to landscape and visual effects where the approach combines quantitative and qualitative assessment.

97. Generally, in the development of 'new' windfarms, a precautionary approach is adopted by OPEN, which assumes that significant landscape and visual effects will be weighed on the adverse side of the planning balance. Unless it is stated otherwise, the effects considered in the assessment will be considered to be adverse. Beneficial or neutral effects may, however, arise in certain situations and are stated in the assessment where relevant, based on the following definitions:

- Beneficial effects contribute to the SL&V resource through the enhancement of desirable characteristics or the introduction of new, beneficial attributes. The development contributes to the landscape by virtue of good design or the introduction of new landscape planting. The removal of undesirable existing elements or characteristics can also be beneficial, as can their replacement with more appropriate components;
- Neutral effects occur where the development fits with the existing seascape/ landscape character or visual amenity. The development neither contributes to nor detracts from the landscape and visual resource and can be accommodated with neither beneficial or adverse effects, nor where the effects are so limited that the change is hardly noticeable. A change to the SL&V resource is not considered to be adverse simply because it constitutes an alteration to the existing situation; and
- Adverse effects are those that detract from the seascape/ landscape character or quality of visual attributes experienced, through the introduction of elements that contrast, in a detrimental way, with the existing characteristics of the SL&V resource, or through the removal of elements that are key in its characterisation.

## 28.5 Potential Impacts

98. A range of potential impacts on the landscape and visual resource are assessed during the construction, operation and decommissioning of the proposed East Anglia TWO project, as described in the following sections.

### 28.5.1 Potential Impacts during Construction

99. The potential impacts during construction will occur in relation to the construction of the proposed East Anglia TWO project. These include potential impacts on the seascape, landscape character and visual amenity of the development area and its surroundings. The impacts relate principally to the construction process, and presence of associated plant, materials, infrastructure and temporary structures, as well as the presence of emerging structures, where they would be visible above ground.
100. The detail and scope of the decommissioning works will be determined by the relevant legislation and guidance at the time of decommissioning and agreed with the regulator. It is anticipated that the decommissioning impacts will be similar in nature to those of construction.
101. The SL&V effects that could arise as a result of the proposed East Anglia TWO project during construction and decommissioning are identified as follows:
- **Temporary effects on seascape character** - within identified seascape character areas primarily as a result of the installation of the proposed East Anglia TWO project during construction and changes in the visual/perceptual characteristics of seascape character areas;
  - **Temporary effects on landscape character** - including direct effects on physical landscape elements and changes to the physical pattern and perception of landscape character areas and landscape designations. Changes to the perceived landscape character are likely to occur primarily as a result of visibility of the onshore infrastructure and changes associated with the proposed East Anglia TWO project installation during construction within terrestrial landscape character areas and landscape designations, primarily as a result of visibility of the proposed East Anglia TWO project installation during construction; and
  - **Temporary visual effects on views** - primarily as a result of visibility of the proposed East Anglia TWO project installation during construction, including installation of the substation site, onshore and offshore export cable corridors and wind turbines, experienced by visual receptors (groups of people) with visibility of the proposed East Anglia TWO project, on specific views and on their visual amenity/experience of the seascape/ landscape.

### 28.5.2 Potential Impacts during Operation

102. The potential impacts during operation and maintenance (O&M) would relate principally to the presence of the proposed East Anglia TWO project. Potential impacts on landscape/ seascape character and visual amenity are assessed, with particular consideration of sensitive receptors such as valued landscapes, residents, recreational users of the countryside and road-users.

103. The SL&V effects that could arise as a result of the proposed East Anglia TWO project during O&M are identified as follows:
- **Long-term effects on seascape character** - within identified seascape character areas, primarily as a result of the offshore wind turbines, either affecting the pattern of elements that define the character or affecting the visual/perceptual characteristics of seascape character areas;
  - **Long-term effects on landscape character** - within terrestrial landscape character areas and landscape designations, as a result of changes arising from physical pattern of elements and perceived character of the landscape. Changes to the perceived landscape character occur primarily as a result of visibility of the proposed East Anglia TWO project during O&M, particularly the operation of the substation site and East Anglia TWO windfarm site; and
  - **Long-term visual effects on views** - primarily as a result of visibility of the East Anglia TWO windfarm site and substation site during O&M, experienced by visual receptors (groups of people) with visibility of the proposed East Anglia TWO project, on specific views and on their visual amenity/experience of the landscape.

### 28.5.3 Frequency and Likelihood of Visual Effects – Weather Conditions

104. The judgements made in the SLVIA are based on optimum ‘very good’ to ‘excellent’ visibility of the East Anglia TWO windfarm site. This assumption is assessed as the worst-case scenario, but in reality, the degree and extent of visual effects arising from the construction and operation of the offshore infrastructure is a combination of several different factors, including the prevailing weather conditions. The prevailing visibility weather can determine changes in character and visibility, with varied wind, light and tidal movements and the clarity or otherwise of the atmosphere. Collectively, these will combine to reduce the number of days upon which views of the East Anglia TWO windfarm site will be available from the coastline and hinterland, or to inhibit views, rendering them more visually recessive within the wider seascape. Viewing conditions and visibility have been found to vary in the study area, and the effects of the wind farm will vary greatly according to the weather. This means that effects that are assessed to be significant may be not-significant under different, less clear conditions.
105. Although the SLVIA is based on ‘very good’ to ‘excellent’ visibility conditions, a description of visibility frequency is provided using METAR visibility data from the nearest Met Office stations that record visibility (Weybourne and Shoeburyness), to highlight potential trends in the visibility conditions of the study area. Both GLVIA3 (8.15) and SNH guidance (SNH, 2017, para 39) refer to use of Met Office visibility data to assess typical visibility conditions within an area. Most synoptic



observing stations have sensors which provide a measurement of visibility. Visibility sensors measure the meteorological optical range which is defined as the length of atmosphere over which a beam of light travels before its luminous flux is reduced to 5% of its original value. The use of light within the visible spectrum allows the sensor to most accurately simulate human perception of visibility. Reasonably accurate measurements are possible over a range of visibility extending from a few tens of metres to a few tens of kilometres.

106. Although there are limitations to how this data can be applied to judgements about windfarm visibility, the visibility data provides some understanding and evidence basis for evaluating the visibility of the wind turbines against their background.
107. Met Office visibility data is assessed from the nearest weather stations that record visibility, in Weybourne and Shoeburyness (located to the north and south of the SLVIA study area). Visibility is categorised into distance ranges, such as <1km, 1 to 2km, 2 to 3km etc and a frequency table has been compiled revealing the total number of observations within each distance category at hourly intervals for each month. The data, summarised in Appendix 28.7 and illustrated in **Figure 28.20**, highlights trends in the visibility conditions of the study area, such as the distance category which has the most visibility observations recorded, and approximate number of viewing days lost to low visibility weather conditions. Visibility data is then assessed to set out the frequency of visibility (over a 10 year period) at different distance ranges, based on Met Office visibility definitions: < 1km Very Poor; 1 - 4km Poor; 4 - 10km Moderate; 10 - 20km Good; 20 - 40km Very Good; 40km > Excellent.
108. The Met Office visibility data is then interpreted to allow more specific quantification of the likely frequency of visibility of the East Anglia TWO windfarm site from the coastal viewpoints (as a % and average number of days per year), based on the distance of each viewpoint location from the East Anglia TWO windfarm site. The Met Office visibility frequency data is used to inform an assessment of the 'likelihood of effect' from each viewpoint, in order to qualify any significant effects assessed in optimum visibility conditions with how likely they are to actually occur given the prevailing weather/ visibility conditions.

#### 28.5.4 Effects Scoped Out of Assessment

109. Temporary effects on physical landscape elements/features as a result of wind turbine installation during construction have been scoped out of the SLVIA.
110. Operational effects of the offshore cable route have been scoped out of the SLVIA, since the operational phase of an offshore export cable will have no SL&V effects.

111. The SLVIA will include a 'Preliminary Assessment' which identifies those aspects of the SL&V resource that do not have potential to experience a significant effect as a result of the proposed East Anglia TWO project. These aspects of the SL&V resource are then scoped out of further detailed assessment.
112. Transboundary effects have been scoped out of the SLVIA since there is no potential for transboundary seascape/ landscape and visual effects to arise as a result of the construction and operation of the offshore infrastructure.

## 28.6 Visual Representations

### 28.6.1 Production Methods

113. Photomontages have been produced in accordance with SNH Visual Representation of Windfarms Guidance (SNH, February 2017) and the Guidelines for Landscape and Visual Impact Assessment, Third Edition (GLVIA 3) (Landscape Institute and IEMA, 2013).
114. A photomontage is a visualisation which superimposes an image of a proposed development upon a photograph or series of photographs. Photomontage is a widespread and popular visualisation technique, which allows changes in views and visual amenity to be illustrated and assessed, within known views of the 'real' landscape.
115. The photographs used to produce the photomontages have been taken using Canon EOS 5D and 6D Digital SLR cameras, with a fixed lens and a full-frame (35 mm negative size) complementary metal oxide semiconductor (CMOS) sensor. The photographs are taken on a tripod with a pano-head at a height of approximately 1.5 m above ground.
116. To create the baseline panorama, the frames are individually cylindrically projected and then digitally joined to create a fully cylindrically projected panorama using Adobe Photoshop or PTGui software. This process avoids the wide-angle effect that would result should these frames be arranged in a perspective projection, whereby the image is not faceted to allow for the cylindrical nature of the full 360-degree view but appears essentially as a flat plane.
117. Tonal alterations are made using Adobe software to create an even range of tones across the photographs once joined.
118. The photographs are also joined to create planar projection panoramas using PTGui software. These are used in the creation of the 53.5 degree field of view photomontages.
119. Visualisations show a wind turbine model with a 250 m rotor diameter, 175 m hub height and a maximum blade tip height of 300 m, which represent the maximum

blade tip height of the intended wind turbines the East Anglia ONE North and East Anglia TWO windfarm site and allow the potential proportions of the wind turbines to be appreciated from the visualisations.

120. Wireline representations that illustrate the East Anglia TWO and East Anglia ONE North windfarm site set within a computer-generated image of the landform are used in the assessment to predict theoretical appearance of the wind turbines. These are produced with Resoft WindFarm software and are based on a terrain model with a 50m data grid (OS Panorama) with a more detailed area of terrain modelling (OS terrain 5) used for the coastal parts of the study area, which includes the majority of viewpoints (see **section 4.6.3**) used in the SLVIA. There are limitations in the accuracy of digital terrain model (DTM) data so that landform may not be picked up precisely and may result in wind turbines being more or less visible than is shown, however, the use of OS terrain 5 minimises these limitations. Where descriptions within the assessment identify the numbers of wind turbines visible this refers to the illustrations generated and therefore the reality may differ to a degree from these impressions.
121. Fully rendered photomontages have been produced for viewpoints identified in **Chapter 28 SLVIA**, again using Resoft WindFarm software, to provide a photorealistic image of the appearance of the East Anglia TWO windfarm site. Wireline representations are combined with the baseline view photographs to create a photorealistic rendered photomontage image of the development.
122. The baseline photographs and cumulative wireline visualisations shown for each viewpoint cover a 90-degree field of view (or in some cases, up to 360-degree), which accords with SNH guidance. These are cylindrically projected images and should be viewed flat at a comfortable arm's length.
123. The 53.5 degree field of view wirelines and photomontages are prepared using a planar projected image and should also be viewed flat at a comfortable arm's length. These images are each printed on paper 841 x 297mm (half A1) which provides for a relatively large scale image.
124. In the wirelines, the wind turbines are shown with the central wind turbines facing the viewer directly, with the full rotor diameter visible at its tallest extent. In the photomontages, the wind turbine rotors are shown with a random appearance with the central wind turbines facing the viewer directly.
125. The photographs and other graphic material such as wirelines and photomontages used in this assessment are for illustrative purposes only and, whilst useful tools in the assessment, are not considered to be completely representative of what has been apparent to the human eye. The assessments are carried out from observations in the field and therefore may include elements

that are not visible in the photographs. Limitations of photomontages are set out in **section 6.3**.

126. Cumulative ZTVs and wirelines have been produced for all offshore windfarms scoped in to the SLVIA, in order to illustrate and assess the proposed East Anglia TWO project in the context of other projects.

### 28.6.2 Weather Conditions

127. Guidelines for LVIA (GLVIA3) para 8.22 state – ‘In preparing photomontages, weather conditions shown in the photographs should (with justification provided for the choice) be either:

- *representative of those generally prevailing in the area; or*
- *taken in good visibility, seeking to represent a maximum visibility scenario when the development may be highly visible’.*

128. In preparing photomontages for the SLVIA, photographs have been taken in favourable weather conditions. Weather conditions shown in the photographs for all viewpoints have, where possible, been taken during periods of ‘very good’ or ‘excellent’ visibility conditions, during summer and in the afternoon or evening - seeking to represent a maximum visibility scenario when the developments may be highly visible. The East Anglia TWO and East Anglia ONE North windfarm site will only be visible in very good and/or excellent visibility, due to its distances from the coast.

129. Although periods of very good and excellent visibility that afford visibility of the East Anglia TWO and East Anglia ONE North windfarm sites are not ‘prevailing’ in terms of their frequency across the year; it is these shorter periods of very good or excellent visibility during the summer which are particularly relevant to their potential visual effect. These periods have been found to occur most frequently during the summer seasons, which provides for a higher concentration of visitors to the Suffolk coast, who may experience views of the construction and operation of the offshore infrastructure in favourable weather conditions.

130. All of the photomontages have been produced using photographs taken during the summer (in August or September 2017) and in the afternoon or early evening. Photographs from key viewpoints (Viewpoints 3, 4, 5, 6, 7 and 8) have been taken during summer evenings (6pm-8pm). This is the period of the day when the East Anglia TWO windfarm site may be most visible, in views generally looking to the east from the coastline, when the sun has moved around from behind the East Anglia TWO windfarm site and is lighting the wind turbines from the south-west / west, such that the wind turbines have a higher contrast in views.

131. Further photomontages have also been produced from five key viewpoints (Lowestoft, Kessingland, Southwold, Aldeburgh and Felixstowe) at night-time, showing a photomontage representation of the appearance of visible aviation and marine navigation lighting.
132. Rendering of the wind turbines in the photomontages is as photorealistic as possible to the conditions shown in each viewpoint photograph. There is some variation in the appearance and visibility of the wind turbines between the viewpoints, as they are rendered to suit the conditions shown in each of the different viewpoint photographs, which have some unavoidable degree of variation in terms of lighting and weather conditions. The key requirement is that the wind turbines have been rendered with sufficient contrast against the skyline backdrop to illustrate their maximum visibility scenario in each image. Photomontages have been prepared to depict how the East Anglia TWO offshore windfarm site would appear in excellent visibility conditions to illustrate the worst-case. The full suite of viewpoint photomontages should be viewed to gain an impression of the likely visual effects of the East Anglia TWO windfarm site.

### 28.6.3 Information on Limitations of Visualisations

133. The photomontage visualisations of the East Anglia TWO windfarm site (and any windfarm proposal) have a number of limitations when using them to form a judgement on visual impact. These include:
  - A visualisation can never show exactly what the East Anglia TWO windfarm site will look like in reality due to factors such as: different lighting, weather and seasonal conditions which vary through time and the resolution of the image;
  - The images provided give a reasonable impression of the scale of the wind turbines and the distance to the wind turbines, but can never be 100% accurate;
  - A static image cannot convey turbine movement, or flicker or reflection from the sun on the turbine blades as they move;
  - The viewpoints illustrated are representative of views in the area, but cannot represent visibility at all locations;
  - To form the best impression of the impacts of the East Anglia TWO windfarm site proposal these images are best viewed at the viewpoint location shown;
  - The images must be printed and viewed at the correct size (260mm by 820mm);
  - Images should be held flat at a comfortable arm's length. If viewing these images on a wall or board at an exhibition, stand at arm's length from the image presented to gain the best impression;

- It is preferable to view printed images rather than view images on screen. Images on screen should be viewed using a normal PC screen with the image enlarged to the full screen height to give a realistic impression; and
- There are practical limitations to shooting viewpoint photographs only in very good or excellent visibility and at particular times of day. The photographs shown in the visualisations show the most favourable weather conditions available during photographic survey work.

#### 28.6.4 Zone of Theoretical Visibility

134. The ZTV has been generated using GIS software (ESRI ArcGIS Version 10.5) to demonstrate the number of wind turbines that may theoretically be seen from any point in the study area. The ZTVs, shown in **Figures 28.4 to 28.6** and **28.16 to 28.19**, show the number of wind turbines (blade tips) that are theoretically visible around the study area (based on the maximum blade tip height of 300 m). A hub height ZTV will be produced to show the number of wind turbine hubs theoretically visible in the study area. When used in conjunction with the blade tip ZTV, the hub height ZTV provides an indication of the degree to which the wind turbines may be visible.
135. There are limitations in this theoretical production, and these should be considered in the interpretation and use of the ZTV:
- The ZTV illustrates the ‘bare ground’ situation, and does not take into account the screening effects of vegetation, buildings, or other local features that may prevent or reduce visibility;
  - The ZTVs are based on theoretical visibility from 2 m above ground level;
  - The 50 km radius ZTVs are based on a 50 m data grid OS Digital Terrain Model (DTM). Several ZTVs have been produced at an enlarged A1 scale utilising 5m data grid (OS Terrain 5) (**Figures 28.6, 28.15 - 28.19**);
  - The Blade Tip ZTV does not indicate the decrease in visibility that occurs with increased distance from the East Anglia TWO windfarm site. The nature of what is visible from 3 km away will differ markedly from what is visible from 10 km away, although both are indicated on the Blade Tip ZTV as having the same level of visibility; and
  - There is a wide range of variation within the visibility shown on the ZTV, for example, an area shown on the blade tip ZTV as having visibility of 75 wind turbines may gain views of the smallest extremity of blade tips, or of 75 full wind turbines. This can make a considerable difference in the effects of the proposed East Anglia TWO project on that area. The hub height ZTV will be used in conjunction with the blade tip ZTV to provide an indication of the degree to which the wind turbines are visible.



136. These limitations mean that while the ZTV is used as a starting point in the assessment, providing an indication of where the East Anglia TWO windfarm site will theoretically be visible, the information drawn from the ZTV is checked in the field, to ensure that the assessment conclusions represent the visibility of the East Anglia TWO windfarm site reasonably accurately.
137. The SLVIA will include a Horizontal Angle ZTV. This will be generated using open Wind software and the same data as the other ZTVs. The Horizontal Angle ZTV will show the horizontal field of view (in degrees) that may be affected by views of the wind turbines.

## 28.7 References

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