codling wind park

Environmental Impact Assessment Report

Volume 4

Appendix 23.2 Landscape and Visual Impact Assessment Methodology


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Abbreviations

Abbreviation	Term in Full
CEA	Cumulative Effects Assessment
CWP	Codling Wind Park
DSM	Digital Surface Model
DTM	Digital Terrain Model
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
ELC	European Landscape Convention
EU	European Union
GIS	Geographic Information System
GLVIA3	Guidelines for Landscape & Visual Impact Assessment, Third Edition
IEMA	Institute of Environmental Management and Assessment
LVIA	Landscape and Visual Impact Assessment
OTI	Onshore Transmission Infrastructure
ZTV	Zone of theoretical visibility

Definitions

Glossary	Meaning
the Applicant	The developer, Codling Wind Park Limited (CWPL).
Codling Wind Park (CWP) Project	The proposed development as a whole is referred to as the Codling Wind Park (CWP) Project, comprising of the offshore infrastructure, the onshore infrastructure and any associated temporary works.
Codling Wind Park Limited (CWPL)	A joint venture between Fred. Olsen Seawind (FOS) and Électricité de France (EDF) Renewables, established to develop the CWP Project.
Environmental Impact Assessment (EIA)	A systematic means of assessing the likely significant effects of a proposed project, undertaken in accordance with the EIA Directive and the relevant Irish legislation.
Environmental Impact Assessment Report (EIAR)	The report prepared by the Applicant to describe the findings of the EIA for the CWP Project.
onshore development area	The entire footprint of the OTI and associated temporary works that will form the onshore boundary for the planning application.
onshore transmission infrastructure (OTI)	The onshore transmission assets comprising the TJBs, onshore export cables and the onshore substation. The EIAR considers both permanent and temporary works associated with the OTI.
onshore substation	Site containing electrical equipment to enable connection to the national grid.
onshore substation site	The area within which permanent and temporary works will be undertaken to construction the onshore substation.
onshore substation site boundary	The physical boundary of the onshore substation site.
onshore substation operational site	The area within the operational site boundary within which operational activities will occur.
operations and maintenance (O&M) activities	Activities (e.g., monitoring, inspections, reactive repairs, planned maintenance) undertaken during the O&M phase of the CWP Project.
O&M phase	This is the period of time during which the CWP project will be operated and maintained.
parameters	Set of parameters by which the CWP Project is defined and which are used to form the basis of assessments.
planning application boundary	The area subject to the application for development consent, including all permanent and temporary works for the CWP Project.

APPENDIX 23.3 LVIA METHODOLOGY

1 Introduction

1. Codling Wind Park Limited (hereafter 'the Applicant') is proposing to develop the Codling Wind Park (CWP) Project, which is located in the Irish sea approximately 11 - 22 km off the east coast of Ireland, at County Wicklow.

2. This appendix forms part of Chapter 23 LVIA of the Environmental Impact Assessment Report (EIAR) for the CWP Project.

3. The LVIA has been undertaken in accordance with the Landscape Institute and Institute of Environmental Management and Assessment (IEMA) (2013) Guidelines for Landscape and Visual Impact Assessment, 3rd Edition (GLVIA3) and other best practice guidance, listed in **Chapter 23 Landscape Visual Impact Assessment**. An overview of the LVIA process is provided here.

4. The LVIA is undertaken using the following steps:

   - The features of the Onshore Transmission Infrastructure (OTI) that may result in landscape / townscape and visual effects are described;
   - The overall scope of the assessment is defined, including the study area and range of possible landscape / townscape and visual effects;
   - The landscape / townscape baseline is established using landscape / townscape character assessment and the ZTV maps, to identify landscape / townscape receptors that may be affected and their key characteristics and value;
   - The visual baseline is established by identifying the extent of possible visibility, identifying the people who may be affected, identifying visual receptors and selecting viewpoints;
   - A preliminary assessment is undertaken of landscape / townscape and visual receptors to identify which landscape / townscape and visual receptors are unlikely to be significantly affected; and those that are more likely to be significantly affected and which require more detail assessment;
   - Interactions are identified between the OTI and landscape / townscape and visual receptors to predict potentially significant effects arising and measures are proposed to mitigate effects;
   - An assessment of the susceptibility of landscape / townscape and visual receptors to specific change and the value attached to landscape / townscape receptors and views is undertaken, combining these judgements to assess the sensitivity of the landscape / townscape and visual receptor to the OTI;
   - An assessment of the size/scale of landscape / townscape effect, the degree to which landscape / townscape elements are altered and the extent to which the effects change the key characteristics of the landscape / townscape is undertaken, combining these judgements to assess the magnitude of change on the landscape / townscape 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 OTI 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 landscape / townscape and visual effects.

5. 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. Notably GLVIA3 is not a prescriptive methodology but guidance. The guidance suggests that this approach is to be applied in respect of both landscape / townscape and visual receptors. It is considered that the process of combining all three considerations in one rating can distort the aim of identifying likely significant effects of

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 would be overlooked if effects are diluted down due to their limited geographical extents and/or duration or reversibility.

6. As advocated by GLVIA3 the assessment has used professional judgement in defining the methodology for the LVIA. GLVIA3 (paragraphs 2.23-2.24) states that:

> *"Professional judgement is a very important part of LVIA……Professional judgements must be based on both training and experience and in general suitably qualified and experienced landscape professionals should carry out Landscape and Visual Impact Assessments. Even with qualified and Experienced professionals there can be differences in the judgements made. This may result from using different approaches or different criteria, or from variation in judgements based on the same criteria."*

7. In this LVIA, the consideration of the size or scale of the effect, its geographical extent and its duration and reversibility has been undertaken separately, 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. Duration and reversibility are stated separately in relation to the assessed effects (i.e., as short/medium/long-term and temporary/permanent) and are considered as part of drawing conclusions about likely significance, combining with other judgements on sensitivity and magnitude, to allow a final judgement to be made on whether each effect is significant or not significant.

8. The assessment methodology utilises six scales of magnitude of change - high, medium-high, medium, medium-low, low and negligible/none; which are preferred to the 'maximum of five categories' suggested in GLVIA3 as a means of clearly defining and summarising magnitude of change judgements.

9. The LVIA Chapter has followed the methodology set out in this section of the Onshore EIA Report. Specific to the assessment of LVIA, the following guidance documents have also been considered:

- Landscape Institute and IEMA (2013). Guidelines for Landscape and Visual Impact Assessment: Third Edition (GLVIA3);
- NatureScot (2021). Assessing the Cumulative Impact of Onshore Wind Energy Developments;
- NatureScot (2019). Digital Map-Based Landscape Character Assessment; and
- Landscape Institute (2019). Visual Representation of Development Proposals.

2 Approach to assessment and assessment criteria

2.1 Categories of effects

10. In this assessment, potential effects on the landscape / townscape and visual resource are grouped into four categories:

- **Effects on Physical Landscape Elements:** are restricted to the area within the Planning Application Boundary and are the direct effects on the existing fabric of the onshore development area and intertidal area. This category of effects is made up of landscape elements, which are the components of the landscape, such as trees and hedges, that may be directly and physically affected by the OTI.
- **Effects on Landscape / Townscape Character:** landscape / townscape character is the distinct and recognisable pattern of elements that occurs consistently in a particular type of landscape / townscape, and the way that this pattern is perceived. Effects on landscape / townscape character arise either through the removal of elements and/or introduction of new elements that physically

alter the pattern of elements, or through visibility of the OTI, which may alter the way in which the pattern of elements is perceived. This category of effects is made up of landscape / townscape character receptors, which fall into two groups; landscape / townscape character types and landscape- / townscape-related designated areas.

- **Effects on Views**: the assessment of effects on views is an assessment of how the introduction of the OTI would affect views throughout the Study Area. The assessment of effects on views is carried out in two parts:
    - an assessment of the effects that the OTI would have on a series of viewpoints, which may also represent views from principal visual receptors; and
    - an assessment of the effects that the OTI would have on views from principal visual receptors, which include relevant settlements and routes throughout the Study Area.

2.2 Physical landscape elements

11. The sensitivity of a physical landscape element is an expression of its ability to accommodate the OTI. This is dependent on the value of the landscape element and its susceptibility to the change that would arise from the addition of the OTI.

2.2.1 Value of the landscape element

12. The value of a landscape element is a reflection of its importance in the pattern of elements which constitute the landscape character of the area. For example, the value of woodland is likely to be increased if it provides an important component of the local landscape character. If a landscape element is particularly rare - as a remnant of a historic landscape layout for example - its value is likely to be increased.

2.2.2 Landscape element susceptibility to change

13. The susceptibility of a landscape element is a reflection of the degree to which the element can be restored, replaced or substituted. For example, it may be possible to restore ground cover following the excavation required for the building of turbine foundations, and this would reduce the susceptibility of this element.

2.2.3 Landscape element sensitivity rating

14. The sensitivity of each landscape element is a product of the specific combination of value and susceptibility to the OTI as evaluated by professional judgement. The evaluation of sensitivity is described for each receptor in the assessment, and levels of sensitivity - high, medium or low - are applied. Interim levels of sensitivity – medium-high and medium-low - may also be applied where appropriate for the combination of value and susceptibility.

2.2.4 Landscape elements magnitude of change

15. The magnitude of change on landscape elements is quantifiable and is expressed in terms of the degree to which a landscape element would be removed or altered by the OTI. Definitions of magnitude of change are applied in order that the process of assessment is made clear.

- High - where the OTI would result in the complete or substantial removal of a key landscape element;
- Medium - where the OTI would result in the removal of or major alteration to a notable part of a key landscape element;
- Low - where the OTI would result in the removal of or alteration to a minor part of a key landscape element; and
- Negligible - where the alteration to the landscape element is barely discernible (or may equate to no change).

16. There may also be intermediate levels of magnitude of change – medium-high, medium-low and low-negligible - where the change falls between two of the definitions.

2.2.5 Evaluating effects on landscape elements and their significance

17. The significance of the effect on landscape elements is dependent on all of the factors considered in the sensitivity of the receptor and the magnitude of change upon it. A significant effect would occur where the degree of removal or alteration of a key landscape element is such that the form of this element would be redefined. If the landscape element is of a high sensitivity, a significant effect can occur with a relatively limited degree of removal or alteration. A not significant effect would occur where the landscape element is not a key landscape element, and/or is not redefined as a result of the OTI. If the landscape element is of lower sensitivity, it may undergo a higher level of removal or alteration yet remain as a not significant effect.

2.3 Landscape / townscape character

2.3.1 Sensitivity of landscape / townscape receptor

18. The sensitivity of a landscape / townscape character receptor is a combination of the judgements made about the value associated with that receptor and the susceptibility of the receptor to the OTI.

Value of the landscape / townscape receptor

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

20. **Landscape / townscape designations** - A receptor that lies within the boundary of a recognised landscape / townscape related planning designation is of increased value, depending on the proportion of the receptor within it and the level of importance of the designation which may be international, national, regional or local. The absence of designations does not however preclude value, as an undesignated landscape / townscape character receptor may be valued as a resource in the local or immediate environment.

21. **Landscape / townscape quality** - The quality of a landscape / townscape character receptor is a reflection of its attributes, such as scenic quality, sense of place, rarity and representativeness and the extent to which its valued attributes have remained intact. A landscape / townscape with consistent, intact, well-defined and distinctive attributes is considered to be of higher quality and, in turn, higher value, than a landscape / townscape where the introduction of elements has detracted from its character.

22. **Landscape / townscape experience** - The experiential qualities that can be evoked by a landscape / townscape 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 landscape / townscape in its own right;
- the recreational value of the landscape / townscape; and
- the contribution of other values relating to the nature conservation or archaeology of the area.

Landscape / townscape susceptibility to change

23. The susceptibility of a landscape / townscape character receptor to change is a reflection of its ability to accommodate the changes that would occur as a result of the addition of the OTI. Some landscape / townscape receptors are better able to accommodate change as a result of the development than others due to certain characteristics that are indicative of capacity to accommodate change. These characteristics may or not also be special landscape / townscape qualities that underpin designated landscapes / townscapes.

24. The assessment of the susceptibility of the landscape / townscape receptor to change is classified as high, medium-high, medium, medium-low or low and the basis for this assessment has been made clear using evidence and professional judgement. The following indicators of landscape / townscape susceptibility are considered in the context of the OTI:

- **Overall strength and robustness**: Collectively the overall characteristics and qualities of a particular landscape / townscape result in a strong and robust landscape / townscape that is capable of reasonably accommodating the influence of the OTI without undue adverse effects on the special landscape / townscape qualities (in the case of a designated landscape / townscape) or the key characteristics.
- **Landscape / townscape scale and topography**: The scale and topography are large enough to physically accommodate the influence of the OTI. Topographical features such as more complex, distinctive or small-scale coastal landforms are likely to be more susceptible than simple, broad and homogenous coastal landforms.
- **Openness and enclosure**: Openness in the landscape / townscape may increase susceptibility to change because it can result in wider visibility, however an open landscape / townscape may also be larger scale and simple, which would decrease susceptibility. Conversely, enclosed landscapes / townscapes can offer more screening potential, limiting visibility to a smaller area, however they may also be smaller scale and more complex which would increase susceptibility.
- **Skyline**: Prominent and distinctive skylines and horizons with important landmark features that are identified in the landscape / townscape character assessment, are generally considered to be more susceptible to development in comparison to broad, simple skylines which lack landmark features or contain other infrastructure features.
- **Relationship with other development and landmarks**: Contemporary landscapes / townscapes where there are existing similar developments or other forms of development (industry, mineral extraction, masts, urban fringe/large settlement, major transport routes) that already have a characterising influence result in a lower susceptibility to development in comparison to areas characterised by limited development or smaller scale, historic development and landmarks.
- **Perceptual qualities**: Notable landscapes / townscapes that are acknowledged to be particularly scenic, wild or tranquil are generally considered to be more susceptible to development in comparison to ordinary, cultivated or farmed/developed landscapes / townscapes where perceptions of 'wildness' and tranquillity are less tangible. Landscapes / townscapes which are either remote or appear natural may vary in their susceptibility to development.
- **Landscape / townscape context and association**: the extent to which the OTI would influence the character of landscape / townscape receptors across the study area relates to the associations that exist between the landscape / townscape receptor within which the OTI is located and the

landscape / townscape receptor from which the OTI is experienced. In some situations, this association is strong, where the landscapes / townscapes are directly related, and in other situations weak, where the landscape / townscape association is weak. The context and visual connection to areas of adjacent landscape / townscape character or designations has a bearing on the susceptibility to development.

Landscape / townscape sensitivity rating

25. An overall sensitivity assessment of the landscape / townscape receptor is made by combining the assessment of the value of the landscape / townscape character receptor and its susceptibility to change. The evaluation of landscape / townscape sensitivity has been applied for each landscape / townscape receptor - high, medium-high, medium, medium-low and low - by combining individual assessments of the value of the receptor and its susceptibility to change.

2.3.2 Landscape / townscape character magnitude of change

26. The magnitude of change affecting landscape / townscape receptors is an expression of the scale of the change that would result from the OTI and is dependent on a number of variables regarding the size or scale of the change and the geographical extent over which the change would be experienced.

Size or scale of change

27. This criterion relates to the size or scale of change to the landscape / townscape that would arise as a result of the OTI, based on the following factors.

- **Landscape / townscape elements**: The degree to which the pattern of elements that makes up the landscape / townscape character is altered by the OTI, by removal or addition of elements in the landscape / townscape. The magnitude of change will generally be higher if the features that make up the landscape / townscape character are extensively removed or altered, and/or if many new elements are added to the landscape / townscape.
- **Landscape / townscape characteristics**: The extent to which the effect of the OTI changes, physically or perceptually, the key characteristics of the landscape / townscape that may be important to its distinctive character. This may include, for example, the scale of the landform, its relative simplicity or irregularity, the nature of the landscape / townscape context, the grain or orientation of the landscape / townscape, the degree to which the receptor is influenced by external features and the juxtaposition of the OTI in relation to these key characteristics. If the OTI is located in a landscape / townscape receptor that is already affected by other similar development, this may reduce the magnitude of change, particularly if there is a high level of integration and the developments form a unified and cohesive feature in the landscape / townscape.
- **Landscape / townscape designation**: In the case of designated landscapes / townscapes, the degree of change is considered in light of the effects on the special landscape / townscape qualities which underpin the designation and the effect on the integrity of the designation. All landscapes / townscapes change over time and much of that change is managed or planned. Often landscapes / townscapes will have management objectives for 'protection' or 'accommodation' of development. The scale of change may be localised, or occurring over parts of an area, or more widespread affecting whole landscape / townscape receptors and their overall integrity.
- **Distance**: The size and scale of change is also strongly influenced by the proximity of the OTI to the receptor. Distance may be an influential factor to the extent that over a long range the scale of the influence on landscape / townscape receptors may be small or very limited. Conversely, landscapes / townscapes closest to the development are likely to be most affected. Where the

development is located within a 'host' landscape / townscape character area this would be directly affected whilst adjacent areas of landscape / townscape character would be indirectly affected.

- **Amount and nature of change**: The amount of the OTI that is seen. Generally, the greater the amount of the OTI that can be seen, the higher the scale of change. Generally, the magnitude of change is likely to be lower where the OTI is largely perceived to be at a distance, rather than 'within' the landscape / townscape being considered.

Geographical extent

28. The geographic extent over which the landscape / townscape effects are 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.

29. The extent of the effects will vary depending on the specific nature of the OTI and is principally assessed through analysis of the extent of perceived changes to the landscape / townscape character through visibility of the OTI.

Duration and reversibility

30. The duration and reversibility of landscape / townscape effects are based on the period over which the OTI is likely to exist (during construction, operation and decommissioning). Duration and reversibility are not incorporated into the assessment of magnitude of change, but are stated separately in relation to the assessed effects (i.e. as short/medium/long-term and temporary/permanent) and are considered as part of drawing conclusions about significance, combining with other judgements on sensitivity and magnitude, to allow a final judgement to be made on whether each effect is significant or not significant.

31. As it is anticipated that the substation would remain as a permanent addition to the transmission network, a decommissioning phase to remove components is not expected. Consequently, effects related to the substation operational and maintenance (O&M) phase are considered permanent.

32. Long-term, medium-term and short-term landscape / townscape effects are defined as follows:

- long-term - more than 10 years (or defined as permanent/irreversible);
- medium-term - 5 to 10 years; and
- short-term - 0 to 5 years.

Landscape / townscape magnitude of change rating

33. The 'magnitude' or 'degree of change' resulting from the OTI is described as 'high', 'high-medium', 'medium', 'medium-low' 'low' or 'negligible' which may equate to ‘no change’. In assessing magnitude of change, the assessment focuses on the size or scale of change, its geographical extent and its duration and reversibility, which are stated separately in relation to the assessed effects.

34. The levels of magnitude of change that can occur are defined below. As noted above there may be intermediate levels, where the change falls between definitions.

- High - The OTI will result in a major alteration to the baseline characteristics of the landscape / townscape, providing the prevailing influence and/or introducing elements that are uncharacteristic in the receiving landscape. The addition of the OTI will result in a major incremental change, loss or addition to the baseline context.

- Medium - The OTI will result in a moderate alteration to the baseline characteristics of the landscape / townscape, providing a readily apparent influence and/or introducing elements potentially uncharacteristic in the receiving landscape. The addition of the OTI will result in a moderate incremental change, loss or addition to the baseline context.
- Low - The OTI will result in a minor alteration to the baseline characteristics of the landscape / townscape, providing a slightly apparent influence and/or introducing elements that are characteristic in the receiving landscape townscape. The addition of the OTI will result in a minor incremental change, loss or addition to the baseline context.
- Negligible (no change) - The OTI will result in a negligible alteration (or no change) to the baseline characteristics of the landscape / townscape, providing a barely discernible influence and/or introducing elements that are substantially characteristic in the receiving landscape. The addition of the OTI will result in a negligible or no incremental change, loss or addition to the baseline context.

2.3.3 Evaluating landscape / townscape effects and significance

35. The level of landscape / townscape effect is evaluated primarily through the combination of landscape / townscape sensitivity and magnitude of change. Once the level of effect has been assessed, a judgement is then made as to whether the level of effect is 'significant' or 'not significant'. This process is assisted by the matrix in **Table 1** which is used to guide the assessment. Geographical extent and duration and reversibility are considered relevant in drawing conclusions about significance, combining with other judgements on sensitivity and magnitude, to allow a final judgement to be made on whether each effect is significant or not significant.

36. Further information is also provided about the nature of the effects (whether these would be direct/indirect; temporary/permanent/reversible; beneficial/neutral/adverse or cumulative).

37. A significant effect occurs where the combination of the variables results in the OTI having a defining effect on the landscape / townscape receptor, or where changes of a lower magnitude affect a landscape / townscape receptor that is of particularly high sensitivity. A major loss or irreversible effect over an extensive area of landscape / townscape character, affecting landscape / townscape elements, characteristics and/or perceptual aspects that are key to a nationally valued landscape / townscape are likely to be significant, particularly if they are of long duration and irreversible.

38. A non-significant effect would occur where the effect of the OTI is not defining, and the landscape / townscape character of the receptor continues to be characterised principally by its baseline characteristics. Equally a small-scale change experienced by a receptor of high sensitivity may not significantly affect the special landscape / townscape qualities or integrity of a designation. Reversible effects, on elements, characteristics and character that are of small-scale or geographical extent or affecting lower value receptors, are unlikely to be significant.

2.4 Views

39. Effects on views are concerned wholly with the effect of the OTI on views, and the general visual amenity. Visual Effects are defined by the Landscape Institute in GLVIA 3 (paragraph 6.1) as follows:

> *"An assessment of visual effects deals with the effects of change and development on views available to people and their visual amenity. The concern ... is with assessing how the surroundings of individuals or groups of people may be specifically affected by changes in the context and character of views."*

40. Visual effects are identified for different receptors (people) who would experience the view at their place of residence, within their community, during recreational activities, at work, or when travelling through the area. The visual effects may include the following:

- Visual effect: a change to an existing static view, sequential views, or wider visual amenity as a result of development or the loss of particular landscape elements or features already present in the view; or
- Cumulative visual effects: the cumulative or incremental visibility of similar types of development may combine to have a cumulative visual effect.

41. The level of visual effect (and whether this is significant) is determined through consideration of the sensitivity of the visual receptor and their view and the magnitude of change that would be brought about by the [OTI].

Zone of Theoretical Visibility (ZTV)

42. Plans mapping the ZTV are used to analyse the extent of theoretical visibility of the substation. The ZTVs provide a starting point in the assessment process and tend towards giving the greatest calculation of the theoretical visibility.

Viewpoint Analysis

43. Viewpoint analysis is used to assist the assessment and is conducted from selected viewpoints within the study area. The purpose of this is to assess both the level of visual effect for particular receptors and to help guide the design process and focus of the assessment. A range of viewpoints are examined in detail and analysed to determine whether a significant visual effect would occur.

44. The assessment involves visiting the viewpoint location and viewing visualisations prepared for each viewpoint location. Field survey is generally conducted in periods of fine weather with good visibility and considers seasonal changes such as reduced leaf cover or hedgerow maintenance. The viewpoint analysis is used to assist in the assessment of effects on visual receptor locations as well as landscape / townscape character effects reported in the LVIA.

2.4.1 Evaluating visual sensitivity to change

45. In accordance with GLVIA3 (paragraphs 6.31-6.37), the sensitivity of visual receptors is determined by a combination of the value of the view and the susceptibility of the visual receptors to the change likely to result from the OTI on the view and visual amenity.

Value of view

46. The value of a view or series of views reflects 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 has been classified as high, medium-high, medium, medium-low or low and the basis for this assessment has been 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 / townscape or heritage planning designations, for example the value of a view has been increased if it presents an important vista from a designed landscape / townscape or lies within or overlooks a designated area, which implies a greater value to the visible landscape / townscape.

- **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 appreciated by a large number of people will generally have greater importance than one gained by very few people.

Susceptibility to change

47. Susceptibility relates to the nature of the viewer experiencing the view and how susceptible they are to the potential effects of the OTI. 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, classified as high, medium-high, medium, medium-low or low and based on the following criteria:

- **Nature of the viewer** - The nature of the viewer is defined by the occupation or activity of the viewer 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 / townscape, or with static long-term views, are likely to have a higher susceptibility. Viewers travelling in cars or on trains will tend to have a lower susceptibility as their view is transient and moving. The least sensitive viewers are usually people at their place of work as they are generally less susceptible 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 OTI 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 OTI, the experience of the visual receptor is 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 / townscape in the view may accommodate the influence of the OTI.

Visual sensitivity rating

48. An overall level of sensitivity is applied for each visual receptor or view - high, medium-high, medium, medium-low or 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.

2.4.2 Visual magnitude of change

49. The visual magnitude of change is an expression of the scale of the change that will result from the OTI and is dependent on a number of variables regarding the size or scale of the change. A separate assessment is also made of the geographical extent, duration and reversibility of visual effects.

Size or scale of change

50. An assessment is made regarding the size or scale of change in the view that is likely to be experienced as a result of the OTI, based on the following criteria:

- Distance: the distance between the visual receptor/viewpoint and the OTI. Generally, the greater the distance, the lower the magnitude of change, as the OTI will constitute a smaller scale component of the view.
- **Size**: the amount and size of the [OTI] that is seen. Visibility may range from small or partial visibility of the [OTI] to wider visibility of the onshore elements. Generally, the larger and greater number of elements of the [OTI] that appear in the view, the higher the magnitude of change. This is also related to the degree to which the OTI may be wholly or partly screened by landform, vegetation (seasonal) and/or built form. Conversely open views are likely to reveal more of the OTI, particularly where this is a key characteristic of the landscape / townscape context.
- **Scale**: 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 scale of the OTI may appear larger or smaller relative to the scale of the receiving landscape / townscape.
- **Field of view**: the vertical/horizontal field of view (FoV) and the proportion of the view that is affected by the OTI. Generally, the more of the proportion of a view that is affected, the higher the magnitude of change. If the OTI extends across the whole of the open part of the outlook, the magnitude of change is higher as the full view has been affected. Conversely, if the OTI covers just a narrow part of an open, expansive and wide view, the magnitude of change is likely to be reduced as it will not affect the whole open part of the outlook. This can in part be described objectively by reference to the horizontal/vertical FoV affected, relative to the extent and proportion of the available view.
- **Contrast**: the character and context within which the OTI are seen and the degree of contrast or integration of any new features with existing landscape / townscape elements, in terms of scale, form, mass, line, height, colour, luminance and motion. Developments which contrast or appear incongruous in terms of colour, scale and form are likely to be more visible and have a higher magnitude of change.
- **Consistency of image**: the consistency of image of the OTI in relation to other developments. The magnitude of change due to the OTI is likely to be lower if its layout design is broadly similar to other developments in the landscape / townscape, in terms of its scale, form and general appearance. New development is more likely to appear as logical components of the landscape / townscape with a strong rationale for their location.
- **Skyline/background**: whether the OTI would be viewed against the skyline or a background landscape / townscape may affect the level of contrast and magnitude. If the OTI adds to an already developed skyline the magnitude of change would tend to be lower.
- **Number**: generally, the greater the number of the OTI's separate elements seen simultaneously or sequentially, the higher the magnitude of change. Further effects could also occur in the case of separate developments and their spatial relationship to each other would affect the magnitude of change. For example, development that appears as an extension to an existing development would tend to result in a lower magnitude of change than a separate, new development.
- **Nature of visibility**: the nature of visibility is a further factor for consideration. The OTI may be subject to various phases of development change and the manner in which the OTI may be viewed could be intermittent or continuous and/or vary seasonally, due to periodic management or leaf fall.

Geographical extent

51. The geographic extent over which the visual effects has been experienced is also assessed, which is distinct from the size or scale of effect and is described in terms of the physical area or location over which it is experienced (described as a linear or area measurement). The extent of the effects varies

according to the specific nature of the OTI and is principally assessed through ZTV, field survey and viewpoint analysis of the extent of visibility likely to be experienced by visual receptors.

Duration and reversibility

52. The duration and reversibility of visual effects are based on the period over which the [OTI] is likely to exist (during construction and operation). Duration and reversibility are not incorporated into the assessment of magnitude of change, but are stated separately in relation to the assessed effects (i.e. as short/medium/long-term and temporary/permanent) and are considered as part of drawing conclusions about significance, combining with other judgements on sensitivity and magnitude, to allow a final judgement to be made on whether each effect is significant or not significant.

53. As it is anticipated that the Substation would remain as a permanent addition to the transmission network, a decommissioning phase to remove components is not expected. Consequently, effects related to the substation O&M phase are considered permanent.

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

- long-term - more than 10 years (or defined as permanent/irreversible);
- medium-term - 5 to 10 years; and
- short-term - 0 to 5 years.

Visual magnitude of change rating

55. The 'magnitude' or 'degree of change' resulting from the OTI is described as 'high', 'high-medium', 'medium', 'medium-low' 'low' and 'negligible'. In assessing the magnitude of change the assessment focuses on the size or scale of change and its geographical extent. The duration and reversibility are stated separately in relation to the assessed effects (i.e., as short/medium/long-term and temporary/permanent). The basis for the assessment of magnitude for each receptor is made clear using evidence and professional judgement.

56. The levels of magnitude of change that can occur are defined below. As noted above there may be intermediate levels, where the change falls between definitions.

- High - The OTI 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 OTI will result in a major incremental change, loss or addition to the baseline view.
- Medium - The OTI 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 proposed East Anglia TWO project will result in a moderate incremental change, loss or addition to the baseline view.
- Low - The OTI 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 OTI will result in a low incremental change, loss or addition to the baseline view.
- Negligible or no change - The OTI will result in a negligible alteration or no change 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 OTI will result in a negligible incremental change, loss or addition to the baseline view.

2.4.3 Evaluating visual effects and significance

57. The level of visual effect is evaluated through the combination of visual sensitivity and magnitude of change. Once the level of effect has been assessed, a judgement is then made (using professional judgement) as to whether the level of effect is 'significant' or 'not significant'. This process is assisted by the matrix in **Table 1** which is used to guide the assessment. Geographical extent and duration and reversibility are considered as part of drawing conclusions about significance, combining with other judgements on sensitivity and magnitude, to allow a final judgement to be made on whether each effect is significant or not significant. Further information is also provided about the nature of the effects (whether these would be direct/indirect; temporary/permanent/reversible; beneficial/neutral/adverse or cumulative).

58. A significant effect is more likely to occur where the OTI would have a defining effect on the view or visual amenity or where changes affect a visual receptor that is of high sensitivity.

59. A non-significant effect is more likely to occur where the OTI would have a non-defining effect on the view or visual amenity or where changes affect a visual receptor that is of low sensitivity.

2.5 Evaluation of significance

60. The matrix in **Table 1** is used as a guide to help inform the threshold of significance when combining sensitivity and magnitude to assess significance. On this basis likely significant effects are assessed as negligible, minor, moderate-minor, moderate, moderate-major and major. In those instances where the magnitude has been assessed as 'no change', the level of effect is recorded as 'no effect'.

61. For the purposes of this assessment, any effects with a significance level of major and moderate-major have been assessed as significant as indicated by the dark shaded boxes in **Table 1**). Moderate levels of effect (as indicated by the mid-blue coloured boxes) have the potential, subject to the assessor's professional judgement, to be considered as significant or not significant, depending on the sensitivity and magnitude of change factors evaluated. These assessments are explained as part of the assessment, where they occur. The duration and reversibility of a moderate level of effect can also influence whether it is considered significant or not, with short-term and reversible moderate effects considered less likely to be significant.

62. Significance can therefore occur at a range of levels depending on the magnitude and sensitivity, however in all cases, a significant effect is considered more likely to occur where the OTI would have a defining effect on the landscape / townscape character or view. Definitions are not provided for the individual categories of significance shown in the matrix and the reader should refer to the detailed definitions provided for the factors that combine to inform sensitivity and magnitude.

63. Effects assessed as being either moderate-minor, minor or negligible level are assessed as not-significant (white boxes in **Table 1**).

64. In line with the emphasis placed in GLVIA3 upon the application of professional judgement, an overly mechanistic reliance upon a matrix is avoided through the provision of clear and accessible narrative explanations of the rationale underlying the assessment made for each landscape / townscape and visual receptor.

Table 1 Impact assessment matrix for determination of level and significance of effect

Sensitivity of Receptor	Magnitude of Impact					
	High	Medium-high	Medium	Medium-low	Low	Negligible
High	Major	Major	Moderate-major	Moderate	Moderate-minor	Minor
Medium-high	Major	Moderate-major	Moderate	Moderate	Moderate-minor	Minor
Medium	Moderate-major	Moderate	Moderate	Moderate-minor	Minor	Minor
Medium-low	Moderate	Moderate	Moderate-minor	Minor	Minor	Negligible
Low	Moderate	Moderate-minor	Minor	Minor	Negligible	Negligible

2.5.1 Nature of effects

65. The European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 state that the environmental impact assessment 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 proposed development…".

66. In accordance with the EIA Regulations 2018, in this assessment the nature of effects refers to whether the landscape / townscape and/or visual effect of the OTI is positive or negative (herein referred to as 'beneficial', 'neutral' or 'adverse').

67. Guidance provided in GLVIA3 on the nature of effect 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.

68. A precautionary approach has been adopted in the LVIA, which assumes that significant landscape / townscape and visual effects are weighed on the adverse side of the planning balance, unless otherwise stated. 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 landscape / townscape and visual resource through the enhancement of desirable characteristics or the introduction of new, beneficial attributes. The OTI contributes to the landscape / townscape 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 OTI fits with the existing landscape / townscape character or visual amenity. The OTI neither contributes to nor detracts from the landscape / townscape 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 landscape / townscape and visual resource is not considered to be adverse simply because it constitutes an alteration to the existing situation.

- **Adverse effects** - are those that detract from the landscape / townscape character or quality of visual attributes experienced, through the introduction of elements that contrast, in a detrimental way, with the existing characteristics of the landscape / townscape and visual resource, or through the removal of elements that are key in its characterisation.

3 Cumulative landscape / townscape and visual effects

69. NatureScot's guidance, 'Assessing the Cumulative Impact of Onshore Wind Energy Developments' (2021) is widely used across the UK and in Ireland to inform the specific assessment of the cumulative landscape / townscape and visual effects of different types of development. Whilst the focus of the NatureScot guidance relates to wind farm development, both GLVIA3 and NatureScot's guidance provides the basis for the methodology for the cumulative LVIA and is relevant to the LVIA.

70. NatureScot's guidance states that:

> *"The purpose of a Cumulative Landscape and Visual Impact Assessment (CLVIA) is to describe, visually represent and assess the ways in which a proposed wind farm would have additional impacts when considered with other consented or proposed wind farms. It should identify the significant cumulative impacts arising from the proposed wind farm."*

71. In terms of the assessment, NatureScot's guidance says that:

> *"The assessment should be proportionate to the likely impacts and all CLVIA should accord with the guidelines within GLVIA3. The emphasis should be on the production of relevant and useful information, highlighting why the proposals assessed have been included and why others have been excluded, rather than the provision of a large volume of information."*

72. NatureScot's guidance notes that *"Cumulative landscape impacts can change either the physical fabric or character of the landscape, or any special values attached to it "* and that *"Cumulative impacts on visual amenity can be caused by 'combined visibility' and/or 'sequential impacts.".*

73. GLVIA3 (p120) highlights that *"the focus of the cumulative assessment will be on the additional effect of the project in conjunction with other developments of the same type (as for example, in the case of wind farms)".*

3.1 Approach to cumulative effects

74. The Cumulative Effects Assessment (CEA) considers the impact associated with the OTI together with other relevant plans, projects and activities. Cumulative effects are therefore the combined effect of the OTI and the effects of a number of different projects, on the same receptor or resource.

75. GLVIA3 (paragraph 7.2) defines cumulative landscape and visual effects as those that *"result from additional changes to the landscape and visual amenity caused by the proposed development 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."*

76. The projects and plans selected as relevant to the CEA presented within this chapter are based upon the results of a screening exercise (see **Appendix 5.1** of **Chapter 5 EIA Methodology** and Appendix A23.3). Each project or plan has been considered on a case-by-case basis for screening in or out of this chapter's assessment based upon data confidence, effect-receptor pathways and the spatial/temporal scales involved.

77. Other proposed developments that have the potential for cumulative effects in combination with the OTI are typically considered to be those developments that are found within the LVIA study area.

Beyond the LVIA study area cumulative effects are limited by distance and a lack of intervisibility with other proposed developments.

78. Adjacent developments may complement one another, or may be discordant with one another, and it is the increased or reduced level of significance of effects which arises as a result of this change that is assessed. Where this occurs, the magnitude of change varies according to cumulative effect factors such as its consistency of image and degree of contrast or integration with the onshore elements of the OTI, as well as other 'non-cumulative' factors, such as its distance, lateral spread and amount of visibility.

79. In line with NatureScot (2021) guidance and GLVIA3, cumulative effects are assessed as the additional changes caused by the OTI in conjunction with other similar developments (not the totality of the cumulative effect). The CEA assesses the cumulative effect of the OTI with other projects against the baseline, with the assessment apportioning the amount of the effect that is attributable to the OTI. Adjacent developments may complement one another, or may be discordant with one another, and it is the increased or reduced level of significance of effects which arises because of this change that is assessed in the CEA, such as through design discordance or proliferation of multiple developments affecting characteristics or new geographic areas, and ultimately if character changes occur because of multiple developments becoming a prevailing characteristic of the landscape / townscape or view.

3.1.1 Tiered approach to CEA

80. In accordance with NatureScot guidance and GLVIA3 (paragraph 7.13), existing projects are included in the LVIA baseline and described as part of the baseline conditions, including the extent to which these have altered character and views, and affected sensitivity to windfarm development. These developments have an existing influence on the baseline landscape / townscape and visual environment.

81. A further assessment of the OTI's additional cumulative landscape / townscape and visual effects with other potential future projects is undertaken in the CEA. In undertaking the CEA for the OTI, it is important to bear in mind that other projects and plans under consideration will have differing potential for proceeding to an operational stage and hence a differing potential to ultimately contribute to a cumulative impact alongside the OTI. Therefore, a tiered approach has been adopted. This provides a framework for placing relative weight upon the potential for each project/plan to be included in the CEA to ultimately be realised, based upon the project/plan's current stage of maturity and certainty in the projects' parameters. The tiered approach which will be utilised within the CEA employs the following tiers.

Table 2 CEA Tiered Approach

Tier	Description
Tier 1	• Under construction: • Permitted applications, but not yet implemented: • Offshore applications submitted six months or more in advance of the CWP Project planning application, but not yet determined: and • Onshore applications submitted six months or more in advance of the CWP Project planning application, but not yet determined.
Tier 2a	• Offshore projects in receipt of a Maritime Area Consent (MAC) and an ORESS contract;
Tier 2b	• Offshore projects in receipt of a Maritime Area Consent (MAC);

	• Offshore Projects in the public domain where an EIA scoping report has been issued; and • Onshore Projects in the public domain where an EIA scoping report has been issued
Tier 3	• Projects in the public domain where an EIA scoping report has not been issued; and • Projects that have been identified in the relevant development plans and programmes, which set the framework for future development consents / approvals, where such development is reasonably likely to come forward.

82. A comprehensive list of projects that have the potential to contribute to the cumulative effects of the OTI has been compiled and this 'long list' and the approach to compiling this list is described in **Appendix 5.1** of **Chapter 5 EIA Methodology**.

83. In order to focus the cumulative assessment on the potential for significant cumulative effects, Appendix A23.3 has undertaken a process of screening out projects and activities from this list where it is assessed there would be no potential for a significant cumulative effect as a result of the addition of the OTI.

84. In addition to this, the LVIA has undertaken a further preliminary assessment of the shortlisted Tier 1 and Tier 3 cumulative projects based on professional judgement, assessment rationale and guidance relevant to landscape / townscape and visual impacts. The results of this are presented in **Appendix 23.3**.

3.2 Cumulative sensitivity of landscape / townscape and visual receptors

85. In evaluating cumulative sensitivity, the value component of the assessments of sensitivity would not change, however, in an evolving development context, the susceptibility of a landscape / townscape and visual receptor to the introduction of the OTI may increase or decrease. This is based on the criteria contained in the landscape / townscape and visual susceptibility criteria sections of this methodology.

3.3 Cumulative magnitude of change

86. The cumulative magnitude of change is an expression of the degree to which landscape / townscape character receptors and visual receptors/views would be changed by the addition of the OTI to other relevant developments that are already operational, consented or at application stage. Where required, scoping stage developments may exceptionally be included. The cumulative magnitude of change is assessed according to a number of criteria, described as follows:

87. The location of the OTI in relation to other relevant developments. If the OTI is seen in a part of the view or setting to a landscape / townscape receptor that is not affected by other development, this would generally increase the cumulative magnitude of change as it would extend influence into an area that is currently unaffected by development. Conversely, if the OTI 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 OTI 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 OTI would add notably to the developed skyline in a view, the cumulative magnitude of change would tend to be higher as skyline development can have a particular influence on both views and landscape / townscape 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 would be. The addition of the OTI to a view or landscape / townscape where a number of smaller developments are apparent would 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 OTI is of a similar scale to other visible developments, particularly those seen in closest proximity to it, the cumulative magnitude of change would generally be lower as it would have more integration with the other sites and would be less apparent as an addition to the cumulative situation.
- **The consistency of image of the OTI in relation to other developments**. The cumulative magnitude of change of the OTI is likely to be lower if its turbine height, arrangement and layout design are broadly similar to other developments in the landscape / townscape, as they are more likely to appear as relatively simple and logical components of the landscape / townscape.
- **The context in which the developments are seen**. If developments are seen in a similar landscape / townscape context, the cumulative magnitude of change is likely to be lower due to visual integration and cohesion between the sites. If developments are seen in a variety of different landscape / townscape settings, this can lead to a perception that development is unplanned and uncoordinated, affecting a wide range of landscape / townscape characters and blurring the distinction between them; and
- **The magnitude of change of the OTI as assessed in the main assessment**. The lower this is assessed to be, the lower the cumulative magnitude of change is likely to be. Where the OTI itself is assessed to have a negligible magnitude of change on a view or receptor there would not be a cumulative effect as the contribution of the OTI would equate to the 'no change' situation.

3.4 Evaluating cumulative effects and significance

88. The level of visual effect is evaluated through the combination of receptor sensitivity and cumulative magnitude of change. Once the level of effect has been assessed, a judgement is then made (using professional judgement) as to whether the level of effect is 'significant' or 'not significant'. This process is assisted by the matrix in **Table 1** which is used to guide the assessment. Further information is also provided about the nature of the effects (whether these would be direct/indirect; temporary/permanent/reversible; beneficial/neutral/adverse).

89. Significant cumulative effects are considered likely to occur where the addition of the OTI to the baseline under consideration (which may include other developments), leads to these developments becoming a prevailing landscape / townscape and visual characteristic or where the OTI adversely contrasts with the scale or design of an existing or proposed cumulative development. A non-significant cumulative effect is more likely to occur where the OTI would have a non-defining effect on the receptor or where changes affect a receptor that is of low sensitivity.

4 Graphic production

4.1 ZTV analysis

90. The ZTVs (**Figures 23.3-23.5**) have been generated using Geographic Information Systems (GIS) software to demonstrate the extent to which the substation may theoretically be seen from any point in the LVIA study area.

91. The ZTVs have been calculated to illustrate the maximum levels of theoretical visibility for the substation, based 3D models of the buildings proposed within the onshore substation site. The buildings represent the tallest structures during the operation and maintenance phase of the OTI.

92. ZTVs have been prepared in line with GLVIA3. ZTVs are primarily calculated based on the visibility at 2 m above the height of the landform (i.e., viewer height of 2 m), relative to the height of the onshore substation. The ZTV shown in **Figure 23.3** reflects bare ground theoretical visibility. There are limitations in the production of the ZTV that should be borne in mind in its consideration and use, and these are:

- The ZTVs are based on 2 m resolution grid data (OPW DTM) with a viewer height of 2 m above ground level;
- The bare ground ZTV does not consider the screening effects of woodlands, vegetation, buildings, or other local features that may prevent or reduce visibility;
- The ZTV does not indicate the decrease in visibility that occurs with increased distance from the onshore substation. The nature of what is visible from one kilometre (km) away would differ markedly from what is visible from 3 km away, although both are indicated on the 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 as having visibility of the onshore substation may only gain views of the slightest extremity rather than all of it as may be the case elsewhere.

93. These limitations mean that while the ZTV is used as a starting point in the assessment, providing an indication of where the onshore substation would theoretically be visible, the information drawn from the ZTV is not the sole factor relied upon to accurately represent visibility of the substation.

94. The Screened ZTVs shown in **Figures 23.4** and **23.5** present the modified theoretical visibility of the OTI, taking consideration of the screening effects of surface features which have been derived from Bluesky DSM at 2m resolution.

4.2 Visualisations

95. The viewpoint assessment of the onshore substation is illustrated by visualisations, including photographs and photomontages, which are in line with current best practice and guidance provided in 'Visual Representation of Development Proposals' (Landscape Institute, 2019). Visualisations have a number of limitations when used to form a judgement on a development, that are presented below.

- The images provided give a reasonable impression of the scale and distance to the onshore substation, but can never be 100% accurate;
- The viewpoints illustrated are representative of views in the area but cannot represent visibility at all locations;
- To form the best impression of the visual impacts of the onshore substation these images are best viewed at the viewpoint location shown using printed version of the visualisations;
- The visualisations must be viewed at the correct size to be viewed properly (A3 tall and A1 width) and viewed at a comfortable arm's length viewing distance;
- The first visualisation sheets for each of the viewpoints illustrate the existing views using baseline photography presented to show a 53.5 degree field of view in planar projection; and
- Subsequent visualisation sheets show the 3D model of the onshore substation as it would sit within the existing view.

96. The photographs used to produce the photomontages have been taken using Canon EOS 5D and 6D Digital Single Lens Reflex (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 panoramic head at a height of approximately 1.5 m above ground. To create the baseline panorama, the frames are individually cylindrically projected, digitally joined and then modified to

create a planar projected panorama with a 53.5-degree field of view. Tonal alterations are made using Adobe software to create an even range of tones across the photographs once joined.

97. The photographs 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 will be apparent to the human eye and are not intended to be photorealistic. Reference should be made to the visualisations prepared by the project architects contained in **Appendix 23.3** for photorealistic impressions of what the buildings would look like. The assessments are carried out from observations in the field and therefore may include elements that are not visible in the photographs.

5 References

98. Landscape Institute and Institute of Environmental Management and Assessment (2013). Guidelines for Landscape and Visual Impact Assessment: Third Edition (GLVIA3). Routledge.

99. Landscape Institute (2019). Visual Representation of Development Proposals, Technical Guidance Note 06 / 19. https://landscapewpstorage01.blob.core.windows.net/www-landscapeinstitute-org/2019/09/LI_TGN-06-19_Visual_Representation.pdf

100. Landscape Institute (2021). Assessing landscape value outside national designations, Technical Guidance Note 02/21. https://www.landscapeinstitute.org/publication/tgn-02-21-assessing-landscape-value-outside-national-designations/

101. NatureScot (2017). Visual Representation of Wind farms, Guidance (Version 2.2). https://www.nature.scot/sites/default/files/2019-09/Guidance%20-%20Visual%20representation%20of%20wind%20farms%20-%20Feb%202017.pdf

102. NatureScot (2021). Assessing the Cumulative Impact of Onshore Wind Energy Developments. https://www.nature.scot/doc/guidance-assessing-cumulative-landscape-and-visual-impact-onshore-wind-energy-developments The Planning Inspectorate (2019). Advice Note 17 Cumulative Effects Assessment. https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-17/