

# **Technical Appendix 5.1 – Landscape and Visual Impact Assessment Methodology and Glossary**

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## 1.1 Introduction

- 1.1.1 This appendix describes the methodology used within the landscape and visual impact assessment (LVIA) for the proposed Creag Riabhach Wind Farm Extension (the 'proposed development') which comprises up to three turbines with a maximum blade tip height of up to 149.9m and associated infrastructure.
- 1.1.2 This appendix has been structured as follows:
- Overview of LVIA Methodology;
  - Data Sources and Site Survey;
  - Integrated Design and Assessment;
  - Assessing Landscape Effects;
  - Assessing Visual Effects;
  - Assessing Cumulative Landscape and Visual Effects;
  - Evaluation of Significance;
  - Nature of Effect;
  - Wild Land Assessment; and
  - Production of Zone of Theoretical Visibility (ZTV)s and Visualisations.

## 1.2 Overview of LVIA Methodology

- 1.2.1 The LVIA assesses the likely effects of the proposed development on the landscape and visual resource, encompassing effects on landscape elements, characteristics and landscape character, designated landscapes, visual effects and cumulative effects.
- 1.2.2 Essentially, the landscape and visual effects (and whether they are significant) are determined by an assessment of the nature or 'sensitivity' of each receptor or group of receptors and the nature of the effect or 'magnitude of change' that would result from the proposed development. The evaluation of sensitivity takes account of the value and susceptibility of the receptor to the proposed development. This is combined with an assessment of the magnitude of change which takes account of factors such as the size and scale of the proposed change and the geographical extent. Other factors regarding the nature of the effect such as the duration of change and whether the effect is cumulative are also noted. By combining assessments of sensitivity and magnitude of change, a level of landscape or visual effect as well as the nature of that effect can be evaluated and the significance of the effect determined.
- 1.2.3 The resulting level of effect is described in terms of whether it is significant or not significant and the type or nature of effect is described as either direct or indirect; temporary or permanent (reversible); cumulative; and positive, neutral or negative. The assessment has also considered the cumulative effects resulting from the proposed development in combination with other existing and consented wind farms, and wind farms at the planning application stage.
- 1.2.4 The time period for the assessment covers phases of development related to the construction of the proposed development and associated infrastructure, its operation for a period of 40 years, and decommissioning.

- 1.2.5 LVIA unavoidably involves a combination of both quantitative and subjective assessment and wherever possible a consensus of professional opinion has been sought through consultation, internal peer review, and the adoption of a systematic, impartial, and professional approach.

## Technical guidance and best practice

- 1.2.6 The methodology for the LVIA accords with the Landscape Institute and IEMA *Guidelines for Landscape and Visual Impact Assessment*, 3rd Edition (GLVIA 3). In addition to planning policy documents and other supporting technical guidance, the LVIA methodology includes, but is not limited to the following:
- *Siting and Designing Windfarms in the Landscape*, Version 3a, Scottish Natural Heritage (SNH), August 2017;
  - *Guidance: Spatial Planning for Onshore Wind Turbines – natural heritage considerations*, Version 3a, SNH, June 2015;
  - *Visual Representation of Windfarms*, Version 2.2, SNH, February 2017;
  - *Guidance: Assessing the Cumulative Landscape and Visual Impact of Onshore Wind Energy Developments*, NatureScot (NS), 2021; and
  - *Visualisation Standards for Wind Energy Developments*, Highland Council, July 2016.

## Defining the LVIA Study Area

- 1.2.7 The SNH guidance<sup>1</sup> advises that the LVIA Study Area for wind turbines of this height should be based on an area 40km distance from each of the proposed turbine locations. However, it has been agreed through consultation that the LVIA Study Area is limited to 35km as illustrated in **Figure 5.1**. The LVIA Study Area covers a circular area of 35,624m radius from the site centre (based on a minimum 35km distance from each of the proposed turbines).
- 1.2.8 It is important to note that the boundary of the LVIA Study Area is not the limit of potential visibility. Rather, it is an area defined by SNH, on the basis of research, to determine a suitable LVIA Study Area for the assessment of wind farms which will contain all likely significant landscape and visual effects.

## Desk-based and site survey work

- 1.2.9 The LVIA is informed by desk-based studies and site and field survey work undertaken within the LVIA study area.
- 1.2.10 A preliminary desk-based assessment was undertaken of landscape and visual receptors using a range of map-based data and related computer and digital analysis including ZTV, digital and / or surface terrain modelling and wireframe and street view software. This information used to inform initial assessments and focus the site and field survey work and likely locations for viewpoint photography and sequential route assessment.
- 1.2.11 The field studies have included documented visits to all relevant landscape and visual receptors to assess the likely effects of the proposed development in the field, checking

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<sup>1</sup> Visual Representation of Wind Farms, Version 2.2, SNH (2017).

data, 'ground truthing' and examining landscape elements, characteristics / character and views / visual amenity.

1.2.12 Site and field survey activities include:

- Site survey verification of landscape elements within the site boundary where potentially significant effects are likely;
- Field survey verification of the ZTV from landscape and visual receptor locations and transport and recreational routes through the LVIA study area;
- Micro-siting of viewpoint locations and recording of panoramic baseline photography and subsequent visual assessment from the assessment viewpoints; and
- Field survey assessment and verification of likely landscape, visual and cumulative effects.

1.2.13 The viewpoint photography and visual assessment surveys were undertaken between August and November 2022.

1.2.14 All site survey work was undertaken in fair weather conditions with good to excellent visibility.

## 1.3 Integrated Design and Assessment

1.3.1 Design is an integrated and iterative part of the LVIA process. In particular the advice from the relevant local planning authority and the following documents in particular, is relevant to the design in terms of the turbine scale, location / layout and where required aviation warning lights:

- SNH, February 2017. *Siting and Designing Wind Farms in the Landscape*, Guidance (Version 3);
- SNH, 2019. *Landscape Character Types and Descriptions*;
- Highland Council, November 2016. *Onshore Wind Energy Supplementary Guidance*; and
- NatureScot, August 2022, *General pre-application and scoping advice for onshore wind farms Guidance*.

## Potential effects during Construction

1.3.2 A range of potential effects on the landscape and visual resource are likely during the construction of the proposed development. An appraisal of the potential effects helps to define the scope of the LVIA and develop an integrated design and mitigation response which can be embedded into the proposed development. The potential effects likely to result from construction are described below.

- **Landscape Effects:**
  - ▶ Effects on landscape elements, features and patterns (including, but not limited to soils, landform, ground vegetation, hedgerows / field boundaries, trees / forestry and buildings) as a result of land preparation including site clearance and earthworks.
  - ▶ Effects on landscape character and key characteristics, including perceptual characteristics and qualities as a result of construction activities. The construction activities are likely to include the presence of construction staff and machinery,

cranes, vehicle movements, contractors' facilities and site access associated with the proposed development.

- ▶ Effects on the special landscape qualities and integrity of designated landscapes as a result of the above construction activities.

- **Visual Effects:**

- ▶ Effects on the views and visual amenity experienced by people undertaking various activities at various locations, distances and directions from the proposed land preparation and construction activities. These visual effects could be experienced from one location or sequentially as part of a route through the landscape such as a cycle route or long-distance footpath.

- **Cumulative effects:**

- ▶ Cumulative effects could occur as a result of multiple wind farm construction activities affecting a landscape or visual receptor.

1.3.3 Mitigation and design responses may include a range of design decisions about the location, form, process and timing of construction related infrastructure / operations to mitigate potential landscape and visual effects (avoid, reduce or compensate) as well as reference to a range of best practice behaviours and processes undertaken as part of construction site operation.

## Potential Effects during Operation

1.3.4 The potential effects during operation relate principally to the presence of the proposed development and its on-going maintenance during the 40-year operational period. This is likely to lead to long-term (reversible) effects on landscape and visual receptors.

1.3.5 Mitigation and design responses may include landscape / architectural design strategies which aim to control the physical appearance of the proposed development in terms of its scale, form, colour and number of components. Examples include Landscape Mitigation Plans, choice of project colour scheme, or focus on particular aspects such as a Lighting Strategy to reduce effects on the night-time environment.

1.3.6 Landscape Mitigation Plans illustrate and explain a range of landscape design and management techniques that may be employed to mitigate the effects of proposed development by enhancing and controlling its landscape setting and visual appearance. Examples include landscape planting and management plans, habitat management plans and integrated forestry design and management plans, all of which can relate to 'on-site' and off-site' interventions.

## Potential Effects during Decommissioning

1.3.7 The proposed development would be decommissioned and the land reinstated, leading to a whole or partial reversal of the landscape and visual effects.

## 1.4 Assessing Landscape Effects

1.3.1 Landscape Effects are defined by the Landscape Institute in GLVIA 3, paragraphs 5.1 and 5.2 as follows:

1.4.1 *"An assessment of landscape effects deals with the effects of change and development on landscape as a resource. The concern ... is with how the proposal will affect the elements that make up the landscape, the aesthetic and perceptual aspects of the*

*landscape and its distinctive character. ... The area of landscape that should be covered in assessing landscape effects should include the site itself and the full extent of the wider landscape around it which the development may influence in a significant manner.”*

- 1.4.2 In accordance with GLVIA 3 the term ‘landscape’ encompasses areas of ‘townscape’ and coastal areas of ‘seascape’. Areas of landscape are relevant to this assessment and they are described as follows.

## Landscape character

- 1.4.3 GLVIA 3, paragraph 5.4, advises that Landscape Character Assessment should be regarded as the main source for baseline studies and identifies the following factors which combine to create areas of distinct landscape character:
- *“the elements that make up the landscape in the study area including:*
    - ▶ *physical influences – geology, soils, landform, drainage and water bodies;*
    - ▶ *landcover, including different types of vegetation and patterns and types of tree cover; and*
    - ▶ *the influence of human activity, including landuse and management, the character of settlements and buildings, and pattern and type of fields and enclosure.*
    - ▶ *The aesthetic and perceptual aspects of the landscape – such as, for example, its scale, complexity, openness, tranquillity or wildness;*
    - ▶ *The overall character of the landscape in the study area, including any distinctive Landscape Character Types or Areas that can be identified, and the particular combinations of elements and aesthetic and perceptual aspects that make each distinctive, usually by identification as key characteristics of the landscape.”*

## Landscape effects

- 1.4.4 The potential landscape effects, occurring during the construction, operation and decommissioning periods of the proposed development may therefore include, but are not restricted to the following:
- **Changes to landscape elements:** The addition of new elements (wind turbines for example) or the removal of existing elements such as trees, vegetation and buildings and other characteristic elements or valued features of the landscape character;
  - **Changes to landscape qualities:** Degradation or erosion of landscape elements and patterns and perceptual characteristics, particularly those that form key characteristic elements of the landscape character or contribute to the landscape value;
  - **Changes to landscape character:** Landscape character may be affected through the incremental effect on characteristic elements, landscape patterns and qualities (including perceptual characteristics) and the addition of new features, the magnitude of which is sufficient to alter the overall landscape character within a particular area;
  - **Changes to designated landscapes:** Including nationally and locally designated landscapes and Wild Land Areas (WLA) that would affect the special landscape qualities underpinning these areas and their integrity; and
  - **Cumulative landscape effects:** Where more than one development of a similar type may lead to a cumulative effect.

- 1.4.5 Development may have a direct effect on the landscape as well as an indirect effect which would be perceived from the wider landscape, outside the immediate site area and its associated landscape character/ designation. Landscape effects also have to be recognised in terms of natural and man-made processes which can change or alter the landscape over time.

## Evaluating landscape sensitivity to change

- 1.4.6 The assessment of sensitivity takes account of the landscape value and the susceptibility of the receptor to the proposed development.
- 1.4.7 Landscape sensitivity often varies in response to both the type and phase of the development proposed and its location, such that sensitivity needs to be considered on a case-by-case basis. It should not be confused with 'inherent sensitivity' where areas of the landscape may be referred to as inherently of 'high' or 'low' sensitivity. For example, a National Park may be described as inherently of high sensitivity on account of its designation and value, although it may prove to be less sensitive or susceptible to particular development, and of variable sensitivity across its geographical area. Alternatively, an undesignated landscape may be of high sensitivity to a particular development regardless of the lack of local or national designation.

## Value of the Landscape Receptor

- 1.4.8 The value of a landscape receptor is a reflection of the value that society attaches to that landscape. The assessment of the landscape value is classified as high, medium or low and the basis for this assessment is made clear using evidence and professional judgement, based on the following range of factors:
- **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 affected and the level of importance of the designation which may be international, national, regional or local. The absence of designation does not however preclude value, as an undesignated landscape receptor may be valued as a resource at a local level;
  - **Landscape quality:** The quality of a landscape 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 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; and
  - **Landscape experience:** The experiential qualities that can be evoked by a landscape receptor can add to its value. These responses relate to a number of factors including cultural associations that may exist in art, literature or history; the recreational value of the landscape, or the iconic status of the landscape in its own right; and its contribution of other values such as nature conservation or archaeology.

## Landscape Susceptibility to Change

- 1.4.9 The susceptibility of a landscape receptor to change is a reflection of its ability to accommodate the changes that will occur as a result of the proposed development without undue consequences for the maintenance of the baseline situation and / or the achievement of landscape planning policies and strategies. Some landscape receptors are better able to accommodate development than others due to certain characteristics



that are indicative of capacity to accommodate change. These characteristics may or may not also be special landscape qualities that underpin designated landscapes.

1.4.10 The assessment of the susceptibility of the landscape receptor to change is classified as high, medium or low and the basis for this assessment is made clear using evidence and professional judgement. Indicators of landscape susceptibility to the type of development proposed (wind farm construction, operation and decommissioning) are based on the following criteria:

- **Overall Strength and Robustness:** Collectively the overall characteristics and qualities of a particular landscape result in a strong and robust landscape that is capable of reasonably accommodating the proposed development without undue adverse effects on the special landscape qualities (in the case of a designated landscape) or the key characteristics for which an area of landscape character or a particular element it is valued.
- **Landscape Scale and Topography:** The scale and topography are large enough to physically accommodate the development footprint without the requirement of invasive earthworks or drainage. Topographical features such as narrow valleys or more complex and small-scale landforms such as drumlins, incised river valleys / gorges, cliffs or rock outcrops are likely to be more susceptible to this type of development than broad, homogenous topography.
- **Openness** in the landscape may increase susceptibility to change because it can result in wider visibility of the proposed development, however open landscape may also be larger in scale and simple, which would decrease susceptibility. Conversely enclosed landscapes 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.
- **Land Cover Pattern:** Ancient and mature or long-established vegetation such as mature trees, woodland and protected hedgerows are likely to be more susceptible to the proposed development, particularly where these elements form part of a valued characteristic landscape pattern or feature. Conversely grassland / or forestry are likely to be less susceptible to wind farm development.
- **Skyline:** Prominent and distinctive skylines and horizons with important landmark features that are identified in the landscape character assessment, are generally considered to be more susceptible to wind farm development in comparison to broad, simple skylines which lack landmark features or contain other infrastructure features.
- **Relationship with other Development and Landmarks:** Contemporary landscapes where there are existing wind energy developments or other forms of development (industry, mineral extraction or electrical grid connections) that already have a characterising influence result in a lower susceptibility to development in comparison to areas characterised by smaller scale, historic development and landmarks (historic villages with dense settlement patterns and associated buildings such as church towers). It should be noted that existing wind energy development is time limited and subject to decommissioning.
- **Rationale:** Some site locations have an obvious visual rationale for the proposed development in terms of the available space, access, simplicity and relationship to other similar forms of development. Conversely a site may appear overly constrained and require greater engineering or additional construction activity to accommodate the proposed development with lower design quality and few embedded environmental measures.

- Remoteness, Naturalness, Wildness / Tranquillity:** Notably landscapes 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 forested / developed landscapes where perceptions of ‘wildness’ are less tangible. Landscapes which are either remote or appear natural may vary in their susceptibility to development.
- Landscape Context and Adjacent Landscapes:** The extent to which the proposed development will influence landscape receptors across the study area relates to the associations that exist between the landscape receptor within which the proposed development is located and the landscape receptor from which the proposed development is being experienced. In some situations, this association will be strong, where the landscapes are directly related. For example, adjacent areas of landscape character may share or ‘borrow’ a high number of common characteristics. Landscape elements may be linked to or associated with wider landscape patterns such as individual trees forming part of an avenue or pattern of woodland copses, for example. In other situations, the association between adjacent landscapes will be weak. The context and visual connection to areas of adjacent landscape character or designations has a bearing on the susceptibility to development.

### Landscape Sensitivity Rating

- 1.4.11 An overall sensitivity assessment of the landscape receptor is made by combining the assessment of the value of the landscape character receptor and its susceptibility to change. The evaluation of landscape sensitivity is described as ‘High’, ‘Medium’ or ‘Low’ and is drawn from the consideration of a range of criteria that indicate landscape value and susceptibility. The basis for the assessment is made clear using evidence and professional judgement in the evaluation of sensitivity for each receptor.
- 1.4.12 Criteria that tend towards higher or lower sensitivity are set out in **Table 5.1**.

**Table 5.1 Landscape Sensitivity to Change**

Value / Susceptibility criteria	Level of value/susceptibility ranging from ‘High’ to ‘Medium’ to ‘Low’	
	High	Low
<b>Value</b> – Landscape Value is determined by a range of indicators/criteria with examples as follows:		
<b>Designation</b>	Designated landscapes/elements with national policy level protection or defined for their natural beauty. Evidence that the landscape/element is valued or used substantially for recreational activity.	Landscapes without formal designation. Despoiled or degraded landscape with little or no evidence of being valued by the community. Elements that are uncharacteristic such as non-natives or self-seeded vegetation that may need to be cleared.
<b>Quality</b>	Higher quality landscapes/elements with consistent, intact and well-defined, distinctive attributes.	Lower quality and indistinct landscapes/elements or features that detract from its inherent attributes.
<b>Rarity</b>	Rare or unique landscape character types, features or elements.	Widespread or ‘common’ landscape character types, features or elements.
<b>Aesthetic/ scenic</b>	Aesthetic/scenic or perceptual aspects of designated wildlife, ecological or	Limited wildlife, ecological or cultural heritage features, or limited contribution to landscape character.

Value / Susceptibility criteria	Level of value/susceptibility ranging from 'High' to 'Medium' to 'Low'	
	High	Low
	cultural heritage features that contribute to landscape character.	
<b>Perceptual qualities</b>	Landscape with perceptual qualities of wildness, remoteness or tranquillity.	Limited or no evidence that the landscape is used for recreational activity.
<b>Cultural associations</b>	Landscape with strong cultural associations that contributes to scenic quality.	Landscape with few cultural associations.
<b>Susceptibility</b> – determined by a range of indicators / criteria with examples as follows:		
<b>Strength and robustness</b>	Fragile landscape vulnerable and lacking the ability to accommodate change.	Robust landscape, able to accommodate change or loss of features without undue adverse effects.
<b>Landscape Scale</b>	A landscape of a suitably large enough scale to accommodate the proposed development.	A smaller scale landscape that may require further engineering to accommodate the proposed development.
<b>Openness/ Enclosure</b>	An open landscape with limited screening and higher susceptibility to the proposed development.	An enclosed landscape with screening and lower susceptibility to the proposed development.
<b>Reinstatement</b>	Lower value, non-characteristic landcover and elements capable of rapid reinstatement or replacement.	Higher value, characteristic landcover and elements that cannot be easily reinstated or replaced.
<b>Skyline</b>	Distinctive undeveloped skylines with landmark features.	Developed, nondistinctive skylines.
<b>Association</b>	Weak and indirect association. Other development may be of a smaller scale or historic.	Strong or direct association other similar contemporary developments/landscape character.
<b>Rationale</b>	Strong landscape rationale and opportunity with high degree of design quality and/or environmental measures.	Landscape with numerous environmental and technical constraints and fewer environmental measures.
<b>Perceptual Qualities</b>	Perceptual qualities associated with particular scenic qualities, wildness or tranquillity.	Contemporary, cultivated/settled or developed landscapes are likely to have a lower susceptibility.
<b>Landscape Context</b>	Adjacent landscape character context connected by borrowed character and views.	Host landscape character is separate from surrounding/adjacent landscape character
<b>Sensitivity</b>	<b>Sensitivity drawn from consideration of the Value and Susceptibility criteria with the final conclusion on the level of Sensitivity ranging from 'High' to 'Medium' to 'Low'.</b>	

## Landscape Magnitude of Change

1.4.13 The magnitude of change affecting landscape receptors is an expression of the scale of change that would result from the proposed development. In assessing the magnitude of

change the assessment has focused 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 or permanent).

## Size or Scale of Change

1.4.14 This criterion relates to the size or scale of change to the landscape that would arise as a result of the proposed development, based on the following factors:

- **Landscape Elements:** The degree to which the pattern of elements that makes up the landscape character would be altered by the proposed development, through the loss, alteration or addition of elements in the landscape. The magnitude of change would generally be higher if the features that make up the landscape character are extensively removed or altered, and / or if many new components are added to the landscape.
- **Landscape Characteristics:** The extent to which the effect of the proposed development change, (physically or perceptually) the key characteristics of the landscape which may be important to its distinctive character. This may include, for example, the scale of the landform, its relative simplicity, complexity or irregularity, the nature of the landscape context, the grain or orientation of the landscape, the degree to which the receptor is influenced by external features and the juxtaposition of the proposed development in relation to these key characteristics.
- **Landscape Character / Designation:** The degree to which landscape character receptors would be changed by the addition of the proposed development. If the proposed development is located in a landscape receptor that is already affected by other similar 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 landscape. In the case of designated landscapes, the degree of change is considered in light of the effects on the special landscape qualities which underpin the designation and the effect on the integrity of the designation.

All landscapes change over time and much of that change is managed or planned. Often landscapes 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 character areas and their overall integrity. Developmental change may be time limited or permanent.

- **Distance:** The size and scale of change is also strongly influenced by the proximity of the proposed development to the receptor and the extent to which the development can be seen as a characterising influence on the landscape. Consequently, the scale or magnitude of change is likely to be lower in respect of landscape receptors that are distant from the proposed development and / or screened by intervening landform, vegetation and built form to the extent that the scale of their influence on landscape receptors is small or limited. Conversely, landscapes closest to the proposed development are likely to be most affected. Host landscapes (where the proposed development is located within a 'host' landscape character unit) would be directly affected whilst adjacent areas of landscape character would be indirectly affected.

## Geographical Extent

1.4.15 Landscape effects are described in terms of the geographical extent or physical area that would be affected (described as a linear or area measurement). This should not be confused with the scale of the development or its physical footprint. The manner in which

the geographical extent of the landscape effect is described for different landscape receptors is explained as follows:

- **Landscape Elements:** The geographical extent of landscape elements may be objectively measured in terms of numbers, area or linear measurement. For example, the number of trees, area of woodland / or length of hedgerow affected may be recorded.
- **Landscape Character / Characteristics:** The extent of the effects on landscape character will vary depending on the specific nature of the proposed development. This is not simply an expression of visibility or the extent of the ZTV. It is a specific assessment of the extent of landscape character that would be changed by the proposed development in terms of its character, key characteristics and elements.
- **Landscape Designations and Wild land:** In the case of a designated landscape, this refers to the extent the special landscape qualities of the designation, or wild land qualities, are affected and whether this can be defined in terms of area or linear measurements, or subjectively (with the support of panel and / or peer review) and whether the integrity of the designation is affected.

## Duration and Reversibility

1.4.16 The duration and reversibility of landscape effects is based on the period over which the proposed development is likely to exist (during construction and operation) and the extent to which it would be removed (during decommissioning) and the effects reversed at the end of that period. Long-term, medium-term and short-term landscape effects are defined as follows:

- **Permanent Development:** No decommissioning, removal or reinstatement is planned.
- **Temporary Development:** This includes time limited development, such as a longer period of operation where decommissioning for example forms part of the proposed development or temporary phases of the development such as construction or decommissioning works:
  - ▶ Long-term – more than 10 years – essentially assessed as though ‘permanent’;
  - ▶ Medium-term – 6 to 10 years; and
  - ▶ Short-term – 1 to 5 years.

1.4.17 Reversibility is a separate, but linked consideration concerning the prospects and practicality of a particular effect being reversed. Some forms of development, such as housing can be considered as permanent, whereas other forms of development such as wind farms can be considered as reversible because they have a limited operational life and after their removal the land would be restored. Mineral workings for example may be partially reversible with the landscape restored, although not completed to the same state as the original. In the case of the proposed development, the application is for a 40 year operation period, beyond which the project would be decommissioned or a new application submitted, and many of the effects would be reversed.

## Landscape Magnitude of Change Rating

1.4.18 The ‘magnitude’ or ‘degree of change’ resulting from the proposed development is described as ‘High’, ‘High – Medium’, ‘Medium’, ‘Medium – Low’, ‘Low’, ‘Low – Very Low’, ‘Very Low’ or ‘Zero’. In assessing the magnitude of change the assessment has focused 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 or permanent). The basis for the assessment of magnitude for each receptor is made clear using evidence and professional judgement.

1.4.19 The levels of magnitude of change that can occur are defined in **Table 5.2**.

**Table 5.2 Landscape Magnitude of change Ratings**

Magnitude of landscape change	Examples of Landscape Magnitude
<b>High</b>	<p><u>Size / Scale:</u> A large-scale change and major loss of key landscape elements / characteristics or the addition of large scale or numerous new and uncharacteristic features or elements that would affect the landscape character and the special landscape qualities of a landscape designation. Directly affecting a host landscape receptor or indirectly affecting a nearby receptor.</p> <p><u>Geographical extent:</u> The size or scale of change would typically, but not always affect a large geographical extent or area and may be close to the proposed development.</p>
<b>High - Medium</b>	Intermediate rating with combination of criteria from high or medium magnitude.
<b>Medium</b>	<p><u>Size / Scale:</u> A medium scale change and moderate loss of some key landscape elements / characteristics or the addition of some new medium scale uncharacteristic features or elements that could partially affect the landscape character and the special landscape qualities of a landscape designation. Directly affecting a host landscape receptor or indirectly affecting a nearby receptor.</p> <p><u>Geographical extent:</u> The size or scale of landscape change would typically, but not always affect a more localised geographical extent at an intermediate distance from the proposed development.</p>
<b>Medium - Low</b>	Intermediate rating with combination of criteria from medium or low magnitude.
<b>Low</b>	<p><u>Size / Scale:</u> A small-scale change and minor loss of a few landscape elements / non key characteristics, or the addition of some new small-scale features or elements of limited characterising influence on landscape character / designations.</p> <p><u>Geographical extent:</u> There may be a small partial change in landscape character, typically, but not always affecting a localised geographical extent at some distance from the proposed development.</p>
<b>Low - Very Low</b>	Intermediate rating with combination of criteria from low or very low magnitude.
<b>Very Low to Zero</b>	<p><u>Size / Scale:</u> A very small-scale change that may include the loss or addition of some landscape elements of limited characterising influence. The landscape characteristics and character would be unaffected.</p> <p><u>Geographical extent:</u> Typically affecting a very small geographical extent at greater distance from the proposed development.</p>

## Evaluating landscape effects and significance

- 1.4.20 The level of landscape effect is evaluated through the combination of landscape sensitivity and magnitude of change. Once the level of effect has been assessed, and the nature of the effect determined (whether this is direct / indirect; its duration, whether this is temporary / permanent; and whether it is beneficial / neutral / adverse or cumulative) a judgement is then made as to whether the level of effect is 'significant' or 'not significant' as required by the relevant EIA Regulations. This process is assisted by the matrix illustrated in **Table 5.5** which is used to guide the assessment. The factors considered in the evaluation of the sensitivity and the magnitude of the change resulting from the proposed development and their conclusion, will be presented in a comprehensive, clear and transparent manner.

### Significant Landscape Effects

- 1.4.21 A significant effect would occur where the combination of the variables results in the proposed development having a defining effect on the landscape receptor, or where changes of a lower magnitude affect a landscape receptor that is of particularly high sensitivity. A major loss or irreversible effect over an extensive area of landscape character, affecting landscape elements, characteristics and / or perceptual aspects that are key to a nationally valued landscape are likely to be significant as described in GLVIA 3 paragraph 5.56.

### Non-Significant Landscape Effects

- 1.4.22 A non-significant effect would occur where the effect of the proposed development is not defining, and the landscape 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 quality or integrity of a designation. Reversible effects, on elements, characteristics and character that are of small-scale or affecting lower value receptors are unlikely to be significant as described in GLVIA 3 paragraph 5.56.

## 1.5 Assessing Visual Effects

- 1.5.1 Visual Effects are concerned wholly with the effect of the development on views, and the general visual amenity and are defined by the Landscape Institute in GLVIA 3, paragraphs 6.1 as follows:

- 1.5.2 *“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.”*

- 1.5.3 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; and
- Cumulative visual effects: the cumulative or incremental visibility of similar types of development may combine to have a cumulative visual effect.

- 1.5.4 The level of visual effect (and whether this is significant) is determined through consideration of the sensitivity of each visual receptor (or range of sensitivities for receptor groups) and the magnitude of change that would be brought about by the construction, operation and decommissioning of the proposed development.

## Zone of Theoretical Visibility (ZTV)

- 1.5.5 Plans mapping the Zone of Theoretical Visibility (ZTV) are used to analyse the extent of theoretical visibility of development or part of a development, across the LVIA Study Area and to assist with viewpoint selection. The ZTV does not however, take account of the screening effects of buildings, localised landform and vegetation, unless specifically noted (see individual figures). As a result, there may be roads, tracks and footpaths within the study area which, although shown as falling within the ZTV, are screened or filtered by built form and vegetation, which would otherwise preclude visibility.
- 1.5.6 The ZTVs provide a starting point in the assessment process and accordingly tend towards giving a 'worst case' or greatest calculation of the theoretical visibility.

## Viewpoint Analysis

- 1.5.7 Viewpoint analysis is used to assist the assessment and is conducted from selected viewpoints within the LVIA 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 the assessment. A range of viewpoints are examined in detail and analysed to determine whether a significant visual effect would occur. By considering the viewpoints in order of distance it is possible to define a threshold or outer geographical limit, beyond which it would be reasonable to assume that significant effects would be unlikely.
- 1.5.8 The assessment involves visiting the viewpoint location and viewing wirelines and photomontages prepared for each viewpoint location. The fieldwork is conducted in periods of fine weather with good visibility and considers seasonal changes such as reduced leaf cover or hedgerow maintenance.
- 1.5.9 Viewpoint analysis prepared for each viewpoint is presented as supporting evidence in an appendix to the LVIA (**Technical Appendix 5.2**). A summary table of the findings is also provided in order of distance from the development site. This summary table assists in defining the direction, elevation, geographical spread and nature of the potential visual effects and identifies areas where significant effects are likely to occur. This approach seeks to provide clarity and confidence to consultees and decision makers by allowing the detailed judgements on the magnitude of visual change to be more readily scrutinised and understood.

## Evaluating Visual Sensitivity to Change

- 1.5.10 In accordance with paragraphs 6.31-6.37 of GLVIA 3, 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 proposed development on the view and visual amenity.

### Value of the view

- 1.5.11 The value of a view or series of views reflects the recognition and 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 is classified as high, medium or low and the basis for this assessment is 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 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 would 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 and appreciated by a large number of people would generally have greater importance than one gained by very few people.

## Susceptibility to Change

1.5.12 Susceptibility relates to the nature of the viewer experiencing the view and how susceptible they are to the potential effects of the proposed development. 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 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, or with static long-term views, are likely to have a higher sensitivity. Viewers travelling in cars or on trains would 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 proposed development 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 and over a long or short duration. For example, if the principal outlook from a settlement is aligned directly towards the proposed development, the experience of the visual receptor would 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 proposed development.

## Visual Sensitivity Rating

1.5.13 An overall level of sensitivity is applied for each visual receptor or view, classified as 'High', 'Medium' 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. The basis for the assessments is 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 5.3**.

**Table 5.3 Visual sensitivity to change**

Value / Susceptibility criteria	Level of value / susceptibility ranging from 'High' to 'Medium' to 'Low'	
	High	Low
<b>Value</b> – Landscape Value is determined by a range of indicators/criteria with examples as follows:		
<b>Map/tourist information</b>	Specific viewpoint identified in OS maps and/or tourist information and signage.	Viewpoint not identified in OS maps or tourist information and signage.
<b>Facilities</b>	Facilities provided at viewpoint to aid the enjoyment of the view.	No facilities provided at viewpoint to aid enjoyment of the view.
<b>Planning recognition</b>	View afforded protection in planning policy.	View is not afforded protection in planning policy.
<b>Landscape value</b>	View is within or overlooks a designated landscape, which implies a higher value to the visible landscape.	View is not within, nor does it overlook, a designated landscape.
<b>Recognition</b>	View has informal recognition and well-known at a local level, as having particular scenic qualities.	View has no informal recognition and is not known as having particular scenic qualities.
<b>Art/Literature</b>	View or viewpoint is recognised through references in art or literature.	View or viewpoint is not recognised in references in art or literature.
<b>Scenic Quality</b>	View has high scenic qualities relating to the content and composition of the visible landscape.	View has low scenic qualities relating to the content and composition of the visible landscape.
<b>Susceptibility</b> – determined by a range of indicators / criteria with examples as follows:		
<b>Activity of the viewer</b>	Viewer who is likely or liable to be influenced by the proposed development such as residents, walkers, or tourists, whose main attention and interest may be on their surroundings.	Viewer who is un or less likely to be influenced by the proposed development such as viewers whose attention is not focused on their surroundings (e.g. people at work, or team sports).
<b>Nature of the View</b>	Residents that gain static, long-term views of the development in their principal outlook.	Mobile viewers whose views are transient and dynamic (e.g. travelling in cars or on trains with glimpsed views).
<b>Direction/ Field of View</b>	A view that is focused in a specific directional vista, with notable features of interest in a particular part of the view.	Open views with no specific point of interest.
<b>Visual amenity</b>	Viewers are focused on the experience of a high level of visual amenity at the location due to its overall pleasantness as an attractive visual setting or backdrop to activities.	The visual amenity experienced at the location by viewers is less pleasant or attractive than might otherwise be the case.

<b>Value / Susceptibility criteria</b>	<b>Level of value / susceptibility ranging from 'High' to 'Medium' to 'Low'</b> High ←————→ Medium ←————→ Low
<b><u>Sensitivity</u></b>	<b>Sensitivity drawn from consideration of the Value and Susceptibility criteria to level of Sensitivity ranging from 'High' to 'Medium' to 'Low'.</b>

## Visual Magnitude of Change

- 1.5.14 The visual magnitude of change is an expression of the scale of change that would result from the visibility of the proposed development. In assessing the magnitude of change the assessment has focused 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).

### Size or Scale of Change

- 1.5.15 An assessment is made of the size or scale of change in the view that is likely to be experienced as a result of the proposed development, based on the following criteria:
- **Distance:** The distance between the visual receptor / viewpoint and the proposed development. Generally, the greater the distance, the lower the magnitude of change, as the proposed development would constitute a smaller-scale component of the view due to the effects of perspective.
  - **Size:** The amount and size of the proposed development that would be seen. Visibility may range from small or partial to whole visibility of the proposed development. Generally, the larger and greater number of elements (wind turbines and access tracks) of the proposed development that appear in the view, the higher the magnitude of change.  
  
This is also related to the degree to which development may be wholly or partly screened by landform, vegetation (seasonal) and / or built form. Conversely open views are likely to reveal more of a development, particularly where this is a key characteristic of the landscape.
  - **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 proposed development may appear larger or smaller relative to the scale of the receiving landscape.
  - **Field of View** The vertical / horizontal field of view (FoV) and the proportion of view that is affected by the proposed development. Generally, the more of the proportion of a view that is affected, the higher the magnitude of change would be. If the proposed development extends across the whole of the view, the magnitude of change would generally be higher as the full view would be affected. Conversely, if the proposed development extends over a narrow part of an open view, the magnitude of change is likely to be reduced as the proposed development would not affect the whole view or 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 proposed development would 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. 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 proposed development in relation to other developments. The magnitude of change for the proposed development is likely to be lower if it appears broadly similar to other developments in the landscape in terms of its scale, form and general appearance. New development is more likely to appear as logical components of the landscape with a strong rationale for their location.
- **Skyline / Background:** Whether the proposed development would be viewed against the skyline or a background landscape may affect the level of contrast and magnitude. For example, skyline developments may appear more noticeable, particularly where they affect open and undeveloped horizons. Conversely, development may also appear more noticeable when viewed against a darker background landscape, such as forestry. In these cases, the magnitude of change would tend to be higher.

If the proposed development adds to an already developed skyline the magnitude of change would tend to be lower.

- **Number:** Generally, the greater the number of separate development components seen simultaneously or sequentially, the higher the magnitude of change and this may lead to whole project effects (for example the visual effect of the turbines and the substation). Further cumulative effects would occur in the case of separate, existing 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 proposed development may be subject to various phases of development change and the manner in which the development may be viewed could be intermittent or continuous and / or seasonally, due to periodic management or leaf fall.

## Geographical Extent

1.5.16 The geographic extent over which the visual effects would be experienced is also assessed. This is distinct from the size or scale of effect and is described in terms of the physical area or location over which it would be experienced (described as a linear or area measurement). The extent of the effects would vary according to the specific nature of the proposed development and is principally assessed through ZTV, field survey and viewpoint analysis of the extent of visibility likely to be experienced by visual receptors. The geographical extent of visual effects is described as per the following examples:

- The geographical extent can be described as an area measurement or proportion of the total receptor affected. For example, effects on people within a particular area such as a golf course or area of common land can be illustrated via a 'representative viewpoint' that represents a similar visual effect, likely to be experienced by larger numbers of people within that area. The geographical extent of that visual effect can be expressed as approximately '5 hectares' or '10%' of the common land or a golf course area.
- The geographical extent can be described as a linear measurement (metres or kilometres) according to the length of route affected. For example, effects on people travelling on a route through the landscape such as a road or footpath can be illustrated via a 'representative viewpoint' that represents a similar visual effect, likely to be experienced by larger numbers of people along that route. The geographical extent of that visual effect can be expressed as approximately '2km' or '10%' of the total length of the route.

- The geographical extent of a visual effect experienced from a specific viewpoint may be limited to that location alone. (An example of a ‘specific viewpoint’ is a public viewpoint recommended in tourist literature such as a well visited hill summit. An example of an ‘illustrative viewpoint’ is a particular location within a built up or well vegetated area where an uncharacteristically open view exists).

### Duration and Reversibility

- 1.5.17 The duration or time period over which a visual effect is likely to occur is judged on a scale of ‘short’, ‘medium’ or ‘long’ term and is assessed for the proposed development as per the method described in section 1.4.
- 1.5.18 Reversibility is a separate, but linked consideration, also assessed for the proposed development as per the method described in section 1.4.

### Visual Magnitude of Change Rating

- 1.5.19 The ‘magnitude’ or ‘degree of change’ resulting from the proposed development is described as ‘High’, ‘High – Medium’, ‘Medium’, ‘Medium – Low’, ‘Low’, ‘Low – Very Low’, ‘Very Low’ or ‘Zero’. In assessing the magnitude of change the assessment has focused 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 and some examples of the levels of magnitude of change that can occur on views are defined in **Table 5.4**.

**Table 5.4 Visual Magnitude of change**

Magnitude of landscape change	Examples of Visual Magnitude
<b>High</b>	<p>Size and Scale: A very large - large and dominant change to the view.</p> <p>Number: Involving the loss/addition of a large number of features / elements.</p> <p>Distance: Typically appearing closer to the viewer in the fore to mid-ground.</p> <p>FoV: Affecting a large vertical and wide horizontal FoV.</p> <p>Nature of Visibility: Multiple phase development, continuously and sequentially visible.</p> <p>Contrast: Strong degree of contrast with surroundings, little / no screening.</p> <p>Skyline: Visible on the skyline as a new feature.</p> <p>Consistency of Image: Contrasting with other developments, lacking in visual rationale.</p> <p>Typically experienced from representative viewpoints illustrating a visual effect likely to be experienced by larger numbers of people, relative to the activity, affecting a large area or length / proportion of route. May also be experienced from a specific viewpoint.</p>
<b>High - Medium</b>	Intermediate rating with combination of criteria from high or medium magnitude of change category.
<b>Medium</b>	<p>Size and Scale: A medium and prominent change to the view.</p> <p>Number: Involving the loss/addition of a number of features / elements.</p> <p>Distance: Typically appearing in the middle ground.</p> <p>FoV: Affecting a medium vertical and a medium horizontal FoV.</p> <p>Nature of Visibility: Multiple phase development, intermittently and sequentially visible.</p> <p>Contrast: Contrast with surroundings and may benefit from some screening.</p>

Magnitude of landscape change	Examples of Visual Magnitude	
	Skyline: Consistency of Image:	Visible on the skyline along with other features. Different from other existing developments, some visual rationale.
Typically experienced from representative viewpoints illustrating a visual effect likely to be experienced by a medium number of people, relative to the activity, affecting a medium area or length / proportion of route. May also be experienced from a specific viewpoint.		
<b>Medium - Low</b>	Intermediate rating with combination of criteria from medium or low magnitude of change category.	
<b>Low</b>	Size and Scale: Number: Distance: FoV: Nature of Visibility: Contrast: Skyline: Consistency of Image:	A small / noticeable change, could be missed by the casual observer. Involving the loss/addition of a small number of features / elements. Typically appearing in the background. Affecting a small vertical and a narrow horizontal FoV. Simple, single development, intermittently and infrequently visible. Some parity / 'fits' with surroundings and some screening. Partly visible on a developed skyline or not visible on the skyline. Similar from other developments with visual rationale, appearing reasonably well accommodated within its surroundings.
Typically experienced from illustrative viewpoints likely to be experienced by low numbers of people, relative to the activity, affecting a smaller area or length / proportion of route. May also be experienced from a specific viewpoint.		
<b>Low – Very Low</b>	Intermediate rating with combination of criteria from low or very low magnitude of change category.	
<b>Very Low to Zero</b>	Size and Scale: Number: Distance: FoV: Nature of Visibility: Contrast: Skyline: Consistency of Image:	A small or negligible change, need to 'look for it'. Involving the loss/addition of a small number of features / elements. Typically appearing in the far distance. Affecting a small vertical and a very narrow horizontal FoV. Simple, single development, intermittently and infrequently visible. Blends with surroundings and / or is well screened. Partly visible on a developed skyline or not visible on the skyline. Similar from other developments with strong visual rationale, appearing well accommodated within its surroundings.
Typically experienced from illustrative viewpoints likely to be experienced by low numbers of people, relative to the activity, affecting a smaller area or length / proportion of route. May also be experienced from a specific viewpoint.		

## Evaluating visual effects and significance

1.5.20 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, and the nature of the effect determined (whether this is direct / indirect; its duration, whether this is temporary / permanent; and whether it is beneficial / neutral / adverse or cumulative) a judgement is then made as to whether the level of effect is 'significant' or 'not significant' as required by the relevant EIA Regulations. This process is assisted by the matrix illustrated in **Table 5.5** which is used to guide the assessment. The factors considered in the evaluation of the sensitivity and the magnitude of the change resulting from the proposed development and their conclusion, is presented in a comprehensive, clear and transparent manner.

## Significant Visual Effects

- 1.5.21 A significant effect is more likely to occur where a combination of the variables results in the proposed development having a defining effect on the view or visual amenity or where changes affect a visual receptor that is of high sensitivity as described in GLVIA 3 paragraph 6.44.

## Non-Significant Visual Effects

- 1.5.22 A non-significant effect is more likely to occur where a combination of the variables results in the proposed development having a non-defining effect on the view or visual amenity or where changes affect a visual receptor that is of low sensitivity as described in GLVIA 3 paragraph 6.44.

## Weather conditions

- 1.5.23 The assessment of visual effects is undertaken in clear weather with good to excellent visibility. This means that the viewpoint assessment represents a fair assessment of the likely visual effects.

## 1.6 Assessing Cumulative Landscape and Visual Effects

- 1.6.1 The assessment of cumulative effects is essentially the same as for the main assessment of the primary landscape and visual effects, in that the level of landscape and visual effect is determined by assessing the sensitivity of the landscape or visual receptor and the magnitude of change. Cumulative assessment, however, considers the magnitude of change posed by multiple developments.
- 1.6.2 A cumulative landscape or visual effect simply means that more than one type of development is present or visible within the landscape. Other forms of existing development and land-use such as woodland and forestry, patterns of agriculture, built form, and settlements already have a cumulative effect on the existing landscape that is already accepted or taken for granted. These features often contribute strongly to the existing character, forming a positive or adverse component of the local landscape. Landscapes, however will have a finite capacity for cumulative development, beyond which further new development would result in landscape character change and could result in the creation of a 'wind farm landscape' where wind farms have become the dominant characteristic.
- 1.6.3 Detailed guidance on the cumulative assessment of wind farm development is provided in the NS document '*Guidance: Assessing the Cumulative Landscape and Visual Impact of Onshore Wind Energy Developments*' (2021). This assessment distinguishes between 'additional' cumulative effects that would result from adding the proposed development to other cumulative wind farm development and 'combined' cumulative effects that assess the total cumulative effect of the proposed development and other cumulative wind farm development. In the latter case a significant cumulative effect may result from the proposed development or one of more other existing, under-construction or consented wind farms, or other wind farm applications. In those cases, the main contributing wind farm(s) is identified in the assessment.
- 1.6.4 Types of cumulative effect are defined as follows:
- Cumulative Landscape Effects: Where more than one wind development may have an effect on a landscape designation or particular area of landscape character;

- Cumulative Visual Effects: the cumulative or incremental visibility of similar types of development that may combine to have a cumulative visual effect. These can be further defined as follows:
  - ▶ Simultaneous or combined: where two or more developments may be viewed from a single fixed viewpoint simultaneously, within the viewer's field of view and without requiring them to turn their head<sup>2</sup>;
  - ▶ Successive or repetitive: where two or more developments may be viewed from a single viewpoint successively as the viewer turns their head or swivels through 360°; and
  - ▶ Sequential: where a number of developments may be viewed sequentially or repeatedly at increased frequency, from a range of locations when travelling along a route within the LVIA Study Area.

1.6.5 The SNH document '*Siting and Designing Wind farms in the Landscape*' (Version 3a) explains that the development of multiple wind farms within a particular area may create different types of cumulative effect, that can be described as follows:

1.6.6 *"The wind farms are seen as separate isolated features within the landscape character type, too infrequent and of insufficient significance to be perceived as a characteristic of the area;*

1.6.7 *The wind farms are seen as a key characteristic of the landscape, but not of sufficient dominance to be a defining characteristic of the area; [a landscape with wind farms] and*

1.6.8 *The wind farms appear as a dominant characteristic of the area, seeming to define the character type as a 'wind farm landscape character type.'*"

1.6.9 Wind farm development that results in the creation of a '*wind farm landscape*' as opposed to a '*landscape with wind farms*' or '*landscape with occasional wind farms*' is likely to be assessed as significant. Equally the 'additional effect' of wind farm development, adding to a scenario where there are already a number of other existing or consented wind farms, may be less than the effect of the proposed development either on a primary basis or in an area where there are few or no wind farms existing. This is because wind farm development has already been established as a characterising influence and the additional effect of further development may or may not alter this.

1.6.10 Whilst the CLVIA considers other wind farm development, it should not be considered as a substitute for individual LVIA assessment in respect of each of the other cumulative developments included in the CLVIA.

## Defining the Cumulative Study Area

1.6.11 The cumulative study area is the same as the LVIA Study Area as illustrated in **Figure 5.1**. The cumulative assessment considers the effects of other existing, under-construction, consented and application wind energy sites on the landscape and visual receptors within the LVIA Study Area. In determining which wind energy developments should be included in the CLVIA the assessors may draw on the advice from consultees and other wind energy development within a wider search area (up to 60km radius from the proposed turbines).

1.6.12 Those developments at pre-planning or scoping stage are excluded in accordance with SNH guidance unless there is a justified / exceptional circumstance for their inclusion in

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<sup>2</sup> Note: A person's field of view is variable but is approximately 90° when facing in one direction.



the assessment. However, scoping stage wind farms within 10km of the proposed development have been included in the wirelines.

## Predicting Cumulative Landscape Effects

- 1.6.13 The assessment considers the extent to which the proposed development, in combination with others, may change landscape character through either an ‘additional’ or ‘in combination’ effect on characteristic elements, landscape characteristics and quality of the baseline landscape character. Identified cumulative landscape effects are described in relation to each individual Landscape Character Type/Area and for any designated landscape areas assessed within the LVIA Study Area.

## Predicting Cumulative Visual Effects

- 1.6.14 The assessment of cumulative visual effects involves reference to the cumulative visibility ZTV maps and the cumulative viewpoint analysis. The cumulative visibility of other existing and consented wind energy developments and applications is established in the first instance using the computer programme (Resoft Wind Farm© software) to identify areas where wind energy developments are theoretically visible. Cumulative visibility maps are analysed to identify the visual receptor locations and routes where cumulative visual effects on the landscape and people may occur as a result of the proposed development.
- 1.6.15 With potential receptor locations identified, cumulative effects on individual receptor groups are then explored through viewpoint analysis, which involves site visits informed by wireline illustrations that include other wind energy developments. The computer programme itself can also be used to ‘drive’ particular routes to assess the visibility of different wind energy developments and inform the assessment of sequential cumulative effects that may occur along a route or journey and compared to actual visibility experienced along a route on site.

## Evaluation of Cumulative Landscape and Visual Effects

- 1.6.16 The evaluation of cumulative effects is assisted by the matrix illustrated in **Table 5.5**, which is used to guide the assessment.
- 1.6.17 The cumulative assessment has been prepared to ensure that the ‘additional’ cumulative effects and the ‘combined’ cumulative effect (CLVIA) is reported to account for two cumulative Scenarios as follows:
- **Proposed development:** This part of the assessment takes account of other existing forms of wind farm development that may be present in the landscape, whilst recognising that their influence on landscape character is likely to be time limited. It only considers the additional effects with the adjacent existing Creag Riabhach Wind Farm (CRWF) and no other wind farms. This is because the operational periods for the proposed development and the existing CRWF would remain at the same at 40 years, and the existing CRWF would not be decommissioned prior to the proposed development.
  - **Scenario 1: Existing + Consented + the proposed development:** The additional and combined cumulative effects of the existing and consented wind energy developments with the proposed development are assessed; and
  - **Scenario 2: Existing + Consented + Applications + the proposed development:** The additional and combined cumulative effects of the existing and consented wind energy developments and applications, with the proposed development are assessed.

- 1.6.18 In addition, the cumulative assessment takes account of the timescales, as far as practicable, for the operation of the existing and consented developments.
- 1.6.19 Due to the numbers of other developments involved, the overall cumulative effects may be greater than for the primary effect or additional effect for the proposed development assessed in the main LVIA. The resulting level of cumulative effect may remain at the same level of effect or increase to a higher level of effect. The point at which these effects become significant or not significant in landscape and visual terms is still a matter for professional judgement, although four scenarios or combinations of cumulative effect, taking account of other wind energy development can occur as follows:
- A significant effect from the proposed development is predicted in addition or combination with another significant effect attributed to other development(s). The effect is still termed significant and cumulative but is a greater level of effect than for either development individually.
  - A significant effect from the proposed development is predicted in addition or combination with another non-significant effect attributed to other development(s). The effect is still termed significant and cumulative but is attributed to the proposed development and is a greater level of effect than for either development individually.
  - A non-significant effect from the proposed development is predicted in addition or combination with another significant effect attributed to other development(s). The effect is still termed significant and cumulative but is attributed to the other wind energy development(s) and is a greater level of effect than for either development individually.
  - A non-significant effect from the proposed development is predicted in addition or combination with another non-significant effect attributed to other development(s). The effect is still termed cumulative and is a greater level of effect than for either development individually; the combined effect, however, may or may not be significant.
- 1.6.20 The nature of a cumulative effect may also be described as direct / indirect, temporary / permanent, or beneficial / adverse. The probability of a cumulative effect occurring may also be described (certain, likely or uncertain / unknown) according to whether the developments in question are existing / under construction, consented or at the application stage.

## 1.7 Evaluation of Significance and Nature of Effect

- 1.7.1 The matrix presented in **Table 5.5** is used as a guide to illustrate the LVIA process. In line with the emphasis placed in GLVIA 3 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 and visual receptor. Such narrative assessments provide a level of detail over and above the outline assessment provided by use of the matrix alone.
- 1.7.2 The landscape and visual assessment unavoidably, involves a combination of quantitative and qualitative assessment and wherever possible cross references will be made to objective evidence, baseline figures and / or to photomontage visualisations to support the assessment conclusions. Often a consensus of professional opinion has been sought through consultation, internal peer review, and the adoption of a systematic, impartial, and professional approach. Importantly each effect results from its own unique set of circumstances and have been assessed on a case-by-case basis. The matrix should therefore be considered as a guide and any deviation from this guide will be clearly explained in the assessment.

- 1.7.3 In accordance with the relevant EIA Regulations, it is important to determine whether the effects, assessed as a result of the proposed development, are likely to be significant. Significant landscape and visual effects will be highlighted in bold in the text and in most cases, relate to all those effects that result in a '**Substantial**', '**Major**' or a '**Major to Moderate**' effect as indicated in **Table 5.5** (and shaded dark grey). '**Moderate**' levels of effect (shaded grey) can also be assessed as significant, subject to the assessor's opinion that should be clearly explained as part of the assessment.
- 1.7.4 White or un-shaded boxes in **Table 5.5** indicate a non-significant effect. In those instances where there would be no effect, the magnitude has been recorded as 'Zero' and the level of effect as 'None' or 'No View'. Intermediate levels of magnitude or effect are also used in the LVIA and are shown in **Table 5.5** in italics, for example *High – Medium* magnitude or *Substantial to Major* level of effect.

**Table 5.5 Evaluation of Landscape and Visual Effects**

Magnitude of Change	Landscape and Visual Sensitivity			
	High	Medium	Low	Very Low
<b>High</b>	<b>Substantial</b>	<b>Major</b>	Moderate	Not used
<i>High - Medium</i>	<b><i>Substantial to Major</i></b>	<b><i>Major to Moderate</i></b>	<i>Moderate to Minor</i>	
<b>Medium</b>	<b>Major</b>	Moderate	Minor	
<i>Medium - Low</i>	<b><i>Major to Moderate</i></b>	<i>Moderate to Minor</i>	<i>Minor</i>	
<b>Low</b>	Moderate	Minor	Negligible	
<i>Low – Very Low</i>	<i>Moderate to Minor</i>	<i>Negligible</i>	<i>Negligible</i>	
<b>Very Low</b>	Minor	Negligible	Negligible	
<b>Zero</b>	None / No View			

### Type or Nature of Effect

- 1.7.5 In accordance with the EIA Regulations the type or nature of effect is also described in terms of whether it is direct or indirect; its duration (temporary / permanent or reversible) cumulative; and whether the effect is positive, neutral or negative.
- 1.7.6 Transboundary effects are not relevant to this assessment as the LVIA Study Area for the proposed development would not overlap with the territory of another country.

### Direct and indirect effects

- 1.7.7 GLVIA, paragraph 5.2 notes that landscape may be directly and indirectly affected by development and defines indirect effects as "*Effects that result indirectly from the proposed project as a consequence of the direct effects, often occurring away from the site, or as a result of a sequence of interrelationships or a complex pathway. They may be separated by distance or in time from the source of the effects*".
- 1.7.8 Direct landscape effects relate to the host landscape and concern both physical and perceptual effects on the receptor. Indirect landscape effects may also affect the host

landscape as well as other landscapes, often separated by distance from the proposed development, as a consequence of views that affect the perceptual aspects of their character and key characteristics.

- 1.7.9 Visual effects are generally all considered as direct effects. An indirect visual effect may however be used to define a visual effect on a view that is not in the direction of the main view of the viewer as described by the following examples:
- Road users generally face the road directly ahead in the direction of travel and visual effects affecting those views may be described as direct effects. Where the visual effect is experienced in views oblique to the direction of travel they may be described as indirect; and
  - Designed landscapes and vistas / viewpoints may be orientated in a particular direction and visual effects affecting those views may be described as direct effects. Where the visual effect is experienced in views oblique to the direction of the designed or main / primary view they may be described as indirect.
- 1.7.10 Secondary effects (or effects subsequent to an initial effect) are covered in this assessment by indirect effects.

### Positive (beneficial) and negative (adverse) effects

- 1.7.11 Wind farms give rise to a wide range of opinions, from strongly adverse to strongly beneficial. However, LVIA is not an assessment of public opinion, although a precautionary approach has been taken, which assumes that the nature of the effects would be adverse or neutral unless otherwise stated.
- 1.7.12 Guidance provided by the in GLVIA 3 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.
- 1.7.13 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 large-scale infrastructure are difficult to categorise in either of these brackets as, unlike other disciplines, there are no definitive criteria by which the effects can be measured as being categorically 'beneficial' or 'adverse'. In some disciplines, such as noise or ecology, it is possible to quantify the effect 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.
- 1.7.14 As a starting point, unless 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 landscape and visual resource through the enhancement of desirable characteristics or the introduction of new, beneficial attributes. The proposed 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 proposed development fits with the existing landscape character or visual amenity. The proposed development neither contributes to or detracts from the landscape and visual resource and can be accommodated with neither beneficial or adverse effects, or where the effects are so limited that the change is hardly noticeable (very low magnitude). A change to the landscape 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 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 and visual resource, or through the removal of elements that are key in its characterisation.

## Probability of Effect

- 1.7.15 The probability of cumulative effects is variable. Those effects related to existing wind energy development and those under construction are considered as certain; effects related to development with planning consent are considered as likely. Wind energy development sites for which there is a submitted planning application are considered as uncertain with an even greater level of uncertainty attached to pre-planning application sites.

## 1.8 Wild Land Assessment

- 1.8.1 A high-level Wild Land Assessment has been reported in the LVIA at the request of THC. NatureScot has agreed to scope out a detailed Wild Land Assessment during consultation (see Table 5.1 in **Chapter 5: Landscape and Visual Impact Assessment**).

- 1.8.2 The assessment methodology is based on NatureScot's Technical Guidance: *Assessing Impacts on Wild Land Areas* (September 2020). The method and general approach to the wild land assessment is described in paragraphs 4 and 12 and is based on GLVIA 3 methodology as follows:

*"This guidance sets out a methodology and general principles for assessing the impact of development and other proposals on WLAs, as they are experienced from within the WLA, not from outwith."*

*"The method described employs the general approach and principles set out within the Guidelines for Landscape and Visual Impact Assessment (GLVIA)3. The assessment of effects of a proposal on a WLA is an exercise distinct from landscape and visual impact assessment (LVIA) that can draw on but should not duplicate its information. The assessment should consider effects on the physical attributes and perceptual responses that contribute to the WLA qualities identified in the WLA descriptions."*

*"Each of the WLA descriptions set out their particular wild land qualities, with the physical attributes and perceptual responses contributing to it identified. These descriptions should form the starting point for an assessment of impacts on a WLA."*

## 1.9 Production of ZTVs and Visualisations

- 1.9.1 Zones of Theoretical Visibility (ZTVs) and visualisations (wirelines / wirelines and photomontages) are graphical images produced to assist and illustrate the LVIA and the

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<sup>3</sup> Guidelines for Landscape and Visual Impact Assessment, 3rd Edition, Landscape Institute and IEMA (May 2013), hereafter referred to as 'GLVIA 3'

cumulative assessment. The methodology used for viewpoint photography and photomontages accords with the SNH guidance *Visual Representation of Wind Farms*, Version 2.2, February 2017 and THC guidance *Visualisation Standards for Wind Energy Developments* July 2016, whilst the methodology for the ZTV's follow the SNH guidance *Visual Representation of Wind Farms*, Version 2.2, February 2017. Further, additional guidance is provided by the Landscape Institute Technical Guidance Note: *Visual Representation of Development Proposals*, 17 September 2019.

## Methodology for Production of ZTVs

- 1.9.2 The ZTVs are calculated using Resoft Wind Farm© software to generate the zone of theoretical visibility of the proposed development. This software creates a 3D computer model of the existing landscape and the proposed development using digital terrain data as follows:
- Ordnance Survey Terrain 50: Used to produce the main or standard ZTV plot and wirelines, these tiles provide a digital record of the existing landform of Great Britain, or Digital Terrain Model (DTM) at 10m elevation intervals based on 50m grid squares and models representing the specified geometry and position of the proposed turbines. The computer model includes the entire LVIA Study Area and takes account of the effects caused by atmospheric refraction and the Earth's curvature; and
  - Ordnance Survey Terrain 5: Used to produce a more detailed ZTV plot or wireline for limited areas, often used where there are small undulations or crags within the landscape. These tiles provide a digital record of the existing landform of Great Britain based on 5m grid squares and models representing the specified geometry and position of the proposed turbines. The computer model includes the central LVIA Study Area and takes account of atmospheric refraction and the Earth's curvature.
- 1.9.3 The resulting ZTV plots are overlaid on Ordnance Survey mapping at an appropriate scale and presented as figures using desktop publishing/graphic design software.
- 1.9.4 The same computer software is also used to calculate cumulative ZTV plots based on the intervisibility of the proposed development with other existing, consented and application wind farms included in the CLVIA. In addition to the methods as described above, the layouts and geometries of the surrounding existing, consented and application wind farms are loaded into the same computer programme.

## Methodology for Baseline Photography

- 1.9.5 Once a view has been selected, the location is visited, confirmed, and assessed with the aid of a wireline or similar visualisation in the field. The viewpoint location is micro-sited to avoid as far as reasonable foreground clutter and photographed during fair weather and light conditions. A photographic record is taken to record the view and the details of the viewpoint location and associated data are recorded to assist in the production of visualisations and to validate their accuracy.
- 1.9.6 The following photographic information is recorded:
- Date, time, weather conditions and visual range;
  - GPS recorded 12 figure grid reference accurate to ~5-10 m;
  - GPS recorded Above Ordnance Datum (AOD) height data;
  - The focal length of lens is confirmed;
  - Horizontal field of view (in degrees); and

- Bearing to Target Site (proposed development).

- 1.8.1 All photographs included in this assessment were recorded with a digital SLR camera set to produce photographs equivalent to that of a manual 35 mm SLR camera with a fixed 50mm or 75mm focal length lens as required.
- 1.8.2 All the resulting visualisations have been prepared to show other cumulative wind energy development in order that they may assist the cumulative assessment as well as the LVIA.
- 1.8.3 Whilst no two-dimensional image can fully represent the real viewing experience, the visualisation aims to provide a realistic representation of the proposed development, based on current information and photomontage methodology.
- 1.8.4 Photography was undertaken whilst the existing CRWF was under construction. As a result, not all of the existing turbines are visible in the baseline photographs. However, all of the existing CRWF turbines have been re-rendered in the baseline photographs.

## Weather Conditions

- 1.9.7 GLVIA 3 para 8.22 states:
- “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”.*
- 1.9.8 In preparing photomontages for the LVIA, photographs will be taken in favourable weather conditions that are representative of the weather conditions generally and where possible, will be taken during periods of ‘good’ or ‘excellent’ visibility conditions.

## Methodology for Production of Visualisations

- 1.9.9 Each view has been illustrated with a photograph, a wireline and / or a photomontage indicating the proposed development. Definitions of each of these are described as follows:
- **Baseline photograph:** A photograph of the existing view recorded in fair weather conditions and usually presented as a panorama as required by the relevant SNH or THC guidance.
  - **Wireline or Wireframe:** A computer generated model of the landscape and the proposed development.
  - **Photomontage** is a visualisation which superimposes an image of a proposed development (in this case the wireline or wireframe) upon the baseline photograph, which is then rendered by computer software to produce an image of how the proposed development would appear from that viewpoint. Photomontage is a widespread and popular visualisation technique, which allows changes in views and visual amenity to be illustrated and assessed.

## Baseline Photograph Production

- 1.9.10 Photographs are then taken using a digital SLR camera in combination with a panoramic head equipped tripod. Detailed information is then recorded on site to enable the accurate alignment of the photographs with the wireline model (data such as: GPS grid co-

ordinates; ground level information; compass bearings; and any other known references and viewpoint information).

- 1.9.11 To create the baseline panorama, the photographs from the viewpoint are then digitally joined using Adobe Photoshop or PTGui software to form a planar or cylindrical projection image or panorama using computer software to remove 'barrel distortion' caused by the camera lens. There are practical limitations to shooting viewpoint photographs only in very good or excellent visibility and at particular times of day or from location that avoid foreground clutter or other vertical features such as telegraph poles, particularly where this is a true representation of the view from that viewpoint area.

### Wireline or Wireframe Production

- 1.9.12 The wirelines and photomontages are produced using Resoft Wind Farm© software to generate a perspective view of the wind farm. This software creates a 3D computer model of the existing landscape and the proposed development using digital terrain data and models representing the specified geometry and position of the proposed turbines. The computer model includes the entire LVIA Study Area, and all visualisations take account of the effects caused by atmospheric refraction and the Earth's curvature. The computer model does not take account of the screening effects of any intervening objects and forestry, unless specified (see individual figures).
- 1.9.13 A wireline of the proposed development and the existing landform is generated for each viewpoint within the LVIA Study Area. These wirelines are used to assist the assessment on location at each viewpoint, the position of which, if required, is adjusted on site to achieve the most visible vantage-point of the proposed development (e.g. to avoid buildings, forestry, other features, potentially interfering with the view).

### Photomontage Production

- 1.9.14 Visualisations will be produced for the agreed viewpoints identified in the LVIA and photomontages will aim to provide a photorealistic image of the appearance of the proposed development. 3D model representations are combined with the baseline view photographs to create a photorealistic rendered photomontage image of the development.
- 1.9.15 Visualisations that illustrate the proposed development are produced using a range of computer software, most commonly in this case Resoft WindFarm©. Others such as True View and 3D AutoCAD or Studio Max are also used for example.
- 1.9.16 The photomontage is produced by digitally combining or superimposing the wireline / wireframe or computer generation 3D model of the landscape and the proposed development onto the baseline photograph and rendering this in order to add colour, texture and lighting effects.
- 1.9.17 To produce the photomontage, the wireline turbines are rendered to appear 'life-like' taking into account the time of the photography and weather conditions occurring on the day.
- 1.9.18 The completed panoramas, wirelines, photomontages and accompanying data are then presented as figures using desktop publishing/graphic design software.

### Limitations of Visualisations

- 1.9.19 The photomontage visualisations used in the LVIA 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. The assessments are carried out from observations in the field and therefore may include elements that are not visible in the



photographs. SNH guidance advises that beyond 20km the visibility of turbines in the printed photomontages is difficult to see or reproduce realistically.

- 1.9.20 The photomontage visualisations of the proposed development have a number of limitations when using them to form a judgement on visual effect. These include:
- A visualisation can never show exactly what a proposed development 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 and the distance to the proposed development but can never be 100% accurate to the as constructed effect;
  - A static image cannot convey movement such as turbine blade rotation or other features such as the movement of water or the reflection from the sun. The assessment however will take account of turbine movement by examining animated versions of the photomontages on screen and / or other examples of existing wind farm development on site;
  - The viewpoints illustrated are representative of views in the area but cannot represent visibility at all locations;
  - To form the best impression of the effects, these images are best viewed at the viewpoint location shown;
  - The visualisations must be printed and viewed at the correct size as indicated on the figures;
  - 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; and
  - 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.

## Printing of Maps and Visualisations

- 1.9.21 All electronic visualisations and maps should be printed out and viewed at the correct scale as noted on the document.

## 1.10 Glossary of Terms and Abbreviations

Note: Descriptions marked with an asterisk are repeated from the GLVIA 3 glossary.

Term/abbreviation	Definition
AOD	Above Ordnance Datum
AoV / FoV	Angle of View / Field of View
Artificial light	Light produced by electrical means.
BT	Blade Tip
Candela	A unit of measure of luminous intensity, in a given direction.
CLVIA	Cumulative Landscape and Visual Impact Assessment
Constant light	Uninterrupted light source over a given time period.
Cumulative effects	Additional changes caused by a proposed development in conjunction with other similar developments or as a combined effect of a set of developments, taken together' (Scottish Natural Heritage, 2012)
Cumulative landscape effects	Effects that 'can impact on either the physical fabric or character of the landscape, or any special values attached to it' (Scottish Natural Heritage, 2012)
Cumulative visual effects: In combination In succession Sequentially	<p>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' (Scottish Natural Heritage 2012)</p> <ul style="list-style-type: none"> <li>• In combination: Where two or more developments are or would be within the observer's arc of vision at the same time without moving his/her head (GLVIA 3, 2013 Table 7.1).</li> <li>• In succession: Where the observer has to turn his/her head to see the various developments – actual and visualised (GLVIA 3, 2013 Table 7.1).</li> <li>• Sequential cumulative effect. Occurs where the observer has to move to another viewpoint to see the same or different developments. Sequential effects may be assessed for travel along regularly used routes such as major roads or popular paths (GLVIA 3, 2013 Table 7.1).</li> </ul>
Darkness survey	Visual survey the night-time environment and the identification of artificial light sources.
Development*	Any proposal that results in change to the landscape and/or visual environment.
Degree of change	A combination of the scale, extent and duration of an effect also defined as 'magnitude'.

Term/abbreviation	Definition
Designated Landscape*	Areas of landscape identified as being of importance at international, national or local levels, either defined by statute or identified in development plans or other documents.
Direct light	The artificial light source is visible. Note that light emanating from the window of a building is considered to be a 'direct' light source.
EIA	Environmental Impact Assessment
Elements*	Individual parts which make up the landscape, such as, for example, trees, hedges and buildings.
Enhancement*	Proposals that seek to improve the landscape resource of the site and its wider setting beyond its baseline condition.
Environmental fit	The relationship of a development to identified environmental opportunities and constraints in its setting.
Feature*	Particularly prominent or eye-catching elements in the landscape such as tree clumps, church towers or wooded skylines OR a particular aspect of the project proposal.
FoV	Field of View – the horizontal angle of the view illustrated in a visualisation.
GDL	Garden and Designed Landscape
Geographical Information System (GIS)	A system that captures, stores, analyses, manages and presents data linked to location. It links spatial information to a digital database.
GLVIA 3	Guidelines for Landscape and Visual Impact Assessment, Third Edition, published jointly by the Landscape Institute and Institute of Environmental Management and Assessment, 2013.
Heritage	The historic environment and especially valued assets and qualities such as historic buildings and cultural traditions.
HH	Hub Height
Historic Landscape Characterisation (HLC) and Historic Land-use Assessment (HLA)	Historic characterisation is the identification and interpretation of the historic dimension of the present-day landscape or townscape within a given area. HLC is the term used in England and Wales, HLA is the term used in Scotland.
Indirect effects*	Direct effects relate to the host landscape and concern both physical and perceptual effects on the receptor. Indirect effects relate to those landscapes and receptors which separated by distance or remote from the development and therefore are only affected in terms of visual or perceptual effects. The Landscape Institute also defines indirect effects as those which are not a direct result of the development but are often produced away from it or as a result of a complex pathway.

Term/abbreviation	Definition
Indirect light	The light source is not visible but the light emanating from the source is apparent.
Infrared light	A type of light not visible to the human eye.
Iterative design process	The process by which project design is amended and improved by successive stages of refinement which respond to growing understanding of environmental issues.
Key characteristics	Those combinations of elements which are particularly important to the current character of the landscape and help to give an area its particularly distinctive sense of place.
Land cover	The surface cover of the land, usually expressed in terms of vegetation cover or lack of it. Related to but not the same as land use.
Landscape and Visual Impact Assessment (LVIA)	A tool used to identify and assess the likely significance of the effects of change resulting from development both on the landscape as an environmental resource in its own right and on people's views and visual amenity.
Landscape Character Area (LCA)*	These are single unique areas which are the discrete geographical areas of a particular landscape type.
Landscape Character Assessment	The process of identifying and describing variation in the character of the landscape, and using this information to assist in managing change in the landscape. It seeks to identify and explain the unique combination of elements and features that make landscapes distinctive. The process results in the production of a Landscape Character Assessment.
Landscape Character Types (LCTs)*	Distinct types of landscape which are relatively homogenous in character. They are generic in nature in that they may occur in different areas in different parts of the country, but wherever they occur they share broadly similar combinations of geology, topography, drainage patterns, vegetation and historical land use and settlement patterns, and perceptual and aesthetic attributes.
Landscape capacity	The amount of specified development or change which a particular landscape and the associated visual resource is able to accommodate without undue negative effects on its character and qualities. (NE 2019)
Landscape character*	A distinct, recognisable and consistent pattern of elements in the landscape that makes one landscape different from another, rather than better or worse.
Landscape classification	A process of sorting the landscape into different types using selected criteria but without attaching relative values to different sorts of landscape.
Landscape constraints	Components of the landscape resource such as views or mature trees recognised as constraints to development. Often associated with landscape opportunities.

Term/abbreviation	Definition
Landscape effects*	<p>Effects on the landscape as a resource in its own right.</p> <p>An assessment of landscape effects deals with the effects of change and development on landscape as a resource. The concern here is with how the proposal will affect the elements that make up the landscape, the aesthetic and perceptual aspects of the landscape and its distinctive character. (GLVIA 3 2013, Para 5.1).</p>
Landscape fit	The relationship of a development to identified landscape opportunities and constraints in its setting.
Landscape patterns	Spatial distributions of landscape elements combining to form patterns, which may be distinctive, recognisable and describable e.g. hedgerows and stream patterns.
Landscape quality (condition)*	A measure of the physical state of the landscape. It may include the extent to which typical character is represented in individual areas, the intactness of the landscape and the condition of individual elements.
Landscape qualities	A term used to describe the aesthetic or perceptual and intangible characteristics of the landscape such as scenic quality, tranquillity, sense of wildness or remoteness. Cultural and artistic references may also be described here.
Landscape receptors *	Defined aspects of the landscape resource that have the potential to be affected by a proposal
Landscape resource	The combination of elements that contribute to landscape context, character, and value.
Landscape sensitivity	The sensitivity of the landscape to a particular development considers the susceptibility of the landscape and its value.
Landscape strategy	The overall vision and objectives for what the landscape should be like in the future, and what is thought to be desirable for a particular landscape type or area as a whole, usually expressed in formally adopted plans and programmes or related documents.
Landscape value*	<p>The relative value that is attached to different landscapes by society. A landscape may be valued by different stakeholders for a whole variety of reasons.</p> <p>The value of the Landscape Character Types or Areas that may be affected, based on review of any designations at both national and local levels, and, where there are no designations, judgements based on criteria that can be used to establish landscape value.</p>
Level of effect	Determined through the combination of sensitivity of the receptor and the proposed magnitude of change brought about by the development.
LLA	Local Landscape Area
Lux	A unit of illumination, the amount of light on a surface per unit area.

Term/abbreviation	Definition
Magnitude (of effect)*	A term that combines judgements about the size and scale of the effect, the extent of the area over which it occurs, whether it is reversible or irreversible and whether it is short term or long term in duration.
Mitigation	Measures which are proposed to prevent, reduce and where possible offset any significant adverse effects (or to avoid, reduce and if possible remedy identified effects). (GLVIA 3, 2013 Para 3.37).
Natural light	Light supplied by the sun, directly or indirectly, the moon and stars.
NSA	National Scenic Area
Perception	Combines the sensory (that we receive through our senses) with the cognitive (our knowledge and understanding gained from many sources and experiences).
Perceptual Aspects	A landscape may be valued for its perceptual qualities, notably wildness and/or tranquillity. (GLVIA 3, 2013 Box 5.1)
Photomontage*	A visualisation which superimposes an image of the proposed development upon a photograph or series of photographs.
Beneficial or Adverse Types of Landscape Effect	<p>The landscape effects may be beneficial, neutral, or adverse.</p> <p>In landscape terms – a beneficial effect would require development to add to the landscape quality and character of an area. Neutral landscape effects would include low or negligible changes that may be considered as part of the ‘normal’ landscape processes such as maintenance or harvesting activities. An adverse effect may include the loss of landscape elements such as mature trees and hedgerows as part of construction leading to a reduction in the landscape quality and character of an area.</p>
Beneficial or Adverse Types of Visual Effect	<p>The visual effects may be beneficial, neutral, or adverse.</p> <p>In visual terms – beneficial or adverse effects are less easy to define or quantify and require a subjective consideration of a number of factors affecting the view, which may be beneficial, neutral, or adverse. Opinions as to the visual effects of wind energy developments vary widely, however it is not the assumption of this assessment that all change, including substantial levels of change is an adverse experience. Rather this assessment has considered factors such as the visual composition of the landscape in the view together with the design and composition, which may or may not be reasonably, accommodated within the scale and character of the landscape as perceived from the receptor location.</p>
Probability of Effect	<p>The probability of a landscape and visual effect occurring as a result of this Development should be regarded as certain, subject to the stated project design and the continuance of the existing, baseline landscape resource, including known changes such as other permitted wind farm development.</p> <p>The probability of cumulative effects however is variable. Whereas those effects related to existing wind energy development and those under construction are considered as certain, effects related to development with planning consent are only considered as likely. Wind energy development sites for which there is a submitted planning application are considered as uncertain and other wind energy development for which no planning</p>

Term/abbreviation	Definition
	application has been made are considered as uncertain / unknown, as the level of uncertainty would be greater.
Proximity activated lighting	Lighting which is turned on by the detection of moving objects, such as aircraft detected by radar.
Rarity	The presence of rare elements or features in the landscape or the presence of a rare Landscape Character Type. (GLVIA 3 2013, Box 5.1)
RD	Rotor Diameter
Receptor	Physical landscape resource, special interest, or viewer group that will experience an effect.
Recreation Value*	Evidence that the landscape is valued for recreational activity where experience of the landscape is important. (GLVIA 3 2013, Box 5.1)
Representativeness*	Whether the landscape contains a particular character and/or features or elements which are considered particularly important examples.
Residual effects	Likely environmental effects, remaining after mitigation.
Scale Indicators	Landscape elements and features of a known or recognisable scale such as houses, trees, and vehicles that may be compared to other objects, where the scale of height is less familiar, to indicate their true scale.
Scenic quality	Depends upon perception and reflects the particular combination and pattern of elements in the landscape, its aesthetic qualities, its more intangible sense of place or 'genius loci' and other more intangible qualities. (GLVIA 3 2013, Box 5.1)
Seascape	Landscapes with views of the coast or seas, and coasts and adjacent marine environments with cultural, historical and archaeological links with each other.
Sense of Place (genius loci)	The essential character and spirit of an area: 'genius loci' literally means 'spirit of the place'.
Sensitivity*	A term applied to specific receptors, combining judgements of the susceptibility of the receptor to the specific type of change or development proposed and the value associated to that receptor.
Significance	A measure of the importance or gravity of the environmental effect, defined by significance criteria specific to the environmental topic.
Significant Effects	<p>It is a requirement of the EIA Regulations to determine the likely significant effects of the development on the environment which should relate to the level of an effect and the type of effect.</p> <p>The significance of an effect gives an indication as to the degree of importance (based on the magnitude of the effect and the sensitivity of the receptor) that should be attached to the impact described.</p> <p>Whether or not an effect should be considered significant is not absolute and requires the application of professional judgement.</p>

Term/abbreviation	Definition
Sky glow	<p>Significant – ‘noteworthy, of considerable amount or effect or importance, not insignificant or negligible’. The Concise Oxford Dictionary.</p> <p>Those levels and types of landscape and visual effect likely to have a major or important / noteworthy or special effect of which a decision maker should take particular note.</p>
SNH / NatureScot	Scottish Natural Heritage Now known as NatureScot.
Susceptibility*	The ability of a defined landscape or visual receptor to accommodate the specific proposed development without undue negative consequences.
Sustainability*	The principle that the environment should be protected in such a condition and to such a degree that ensures new development meets the needs of the present without compromising the ability of future generations to meet their own needs.
Temporary or permanent effects	Effects may be considered as temporary or permanent. In the case of wind energy development the application is for a 40 year period after which the assessment assumes that decommissioning will occur and that the site will be restored. For these reasons the development is referred to as long term and reversible.
Time depth	Historical layering – the idea of landscape as a ‘palimpsest’, a much written-over asset of landscape.
Townscape	The character and composition of the built environment including the buildings and the relationships between them, the different types of urban open space, including green spaces, and the relationship between buildings and open spaces.
True View Visuals	A mobile 3D augmented reality (AR) tool used to aid with the assessment. The True View Visuals tool indicates visibility of the proposed development to assist in confirming viewpoint positions as well as indicating limited or no visibility of turbines in particular locations. Whilst the images are indicative only, the AR tool provides a comparable image to the accurate wirelines produced.
Type or Nature of effect	Whether an effect is direct or indirect, temporary or permanent, beneficial (positive), neutral or adverse (negative) solus or cumulative.
Viewpoints	<p>Selected for illustration of the visual effects fall broadly into three groups:</p> <p>Representative Viewpoints: selected to represent the experience of different types of visual receptor, where larger numbers of viewpoints cannot all be included individually and where the significant effects are unlikely to differ – for example certain points may be chosen to represent the view of users of particular public footpaths and bridleways.</p> <p>Specific Viewpoints: chosen because they are key and sometimes promoted viewpoints within the landscape, including for example specific local visitor attractions, such as landscapes with statutory landscape designations or viewpoints with particular cultural landscape associations.</p>



Term/abbreviation	Definition
	Illustrative Viewpoints: chosen specifically to demonstrate a particular effect or specific issues, which might, for example, be the restricted visibility at certain locations. (GLVIA 3 2013, Para 6.19)
Visual amenity	The overall views and surroundings, which provide a visual setting or backdrop to the activities of people living, working, participating in recreational activities, visiting or travelling through an area.
Visual dominance	A visual effect often referred to in respect of residential properties that in relation to development would be subject to blocking of views, or reduction of light / shadowing, and high levels of visual intrusion.
Visual effect*	Effects on specific views and on the general visual amenity experienced by people.
Visual Receptors*	Individuals and/or defined groups of people who have the potential to be affected by a proposal.
Visual sensitivity	The sensitivity of visual receptors such as residents, relative to their location and context, to visual change proposed by development.
Visualisation	Computer visualisation, photomontage, or other technique to illustrate the appearance of the development from a known location.
WLA	Wild Land Area
Wireline / Wireframe	A computer-generated line drawing of the DTM (digital terrain model) and the proposed development from a known location.
Zone of Theoretical Visibility (ZTV)*	A map, usually digitally produced, showing areas of land within which, a development is theoretical visible.