

APPENDIX 6A

1 LVIA METHODOLOGY

1.1 GUIDANCE

The assessment methodology follows the 'Guidelines for Landscape and Visual Impact Assessment' Third Edition (GLVIA3)¹. As recommended by GLVIA3, this is not a generic LVIA methodology, but has been tailored to be proportionate to the nature and location of the proposed Scheme. The methodology also considers the following guidance:

- Guidelines for Landscape and Visual Impact Assessment (GLVIA3)²;
- The Landscape Institute (2013), GLVIA3 Statement of Clarification 1/13³;
- Siting and Designing Windfarms in the Landscape, SNH⁴;
- Guidance: Assessing the Cumulative Impact of Onshore Wind Energy Developments, SNH⁵;
- Scottish Government, Onshore Wind Turbines: planning advice⁶
- Visual Representation of Wind Farms, Version 2.2, SNH⁷; and
- Visual Representation of Development Proposals, Technical Guidance Note 2019, The Landscape Institute⁸.

1.2 INTRODUCTION

The level of landscape and visual effect is determined through consideration of the 'sensitivity' and 'susceptibility' of the landscape or visual receptor to the proposed wind turbines and the 'magnitude of change' that would be brought about by the proposed wind turbines were they to be constructed.

The time period for the assessment covers the construction of the proposed wind turbines and associated infrastructure, to completion of the works and the commencement of its operation.

The assessment has involved a process of iterative design and re-assessment of any remaining, residual effects that could not otherwise be mitigated or 'designed out'. The type of effect is also considered and may be direct or indirect; temporary or permanent (reversible); cumulative; and positive, neutral or negative. The landscape and visual assessment unavoidably involve a combination of both quantitative and qualitative 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.

1.3 TERMINOLOGY

A description of the terms used in this LVIA are provided below.

¹ Landscape Institute and Institute of Environmental Management and Assessment, 2013, *Guidelines for Landscape and Visual Impact Assessment*, 3rd Edition, Routledge, London.

² Landscape Institute and Institute of Environmental Management and Assessment, 2013, *Guidelines for Landscape and Visual Impact Assessment (GLVIA3)*, 3rd Edition, Routledge, London

³ <https://www.landscapeinstitute.org/technical-resource/glvia3-clarifications/>

⁴ Scottish Natural Heritage, *Siting and Designing Windfarms in the Landscape*, Version 3a, (August 2017)

⁵ Scottish Natural Heritage, *Guidance: Assessing the Cumulative Impact of Onshore Wind Energy Developments*, 2012

⁶ Scottish Government, Onshore Wind Turbines: Planning Advice, May 2014

<https://www.gov.scot/publications/onshore-wind-turbines-planning-advice/>

⁷ Scottish Natural Heritage, *Visual Representation of Wind Farms*, Version 2.2, (February 2017)

⁸ The Landscape Institute, *Visual Representation of Development Proposals, Technical Guidance Note 06/19*, 17th September 2019

1.3.1 Sensitivity of Receptor

This is established by considering the value of the receptor and its susceptibility to change. Both these two aspects inform the sensitivity of landscape and visual receptors as set out in Sections 1.5.1 and 1.6.1 below. For the purposes of this LVIA, receptor sensitivity is classified on a four-point scale of: negligible, low, medium, and high (refer to Tables A1.4 and A1.11).

1.3.2 Resource / Receptor Value

For the landscape resource this is related to the value that is attached to different landscapes by society. A landscape may be valued by different people for different reasons. For visual receptors this relates to the recognition attached to a particular view (for example in relation to heritage assets or through planning designations) and indicators of value attached to views by visitors (for example through appearances in guidebooks or on tourist maps and the provision of facilities such as car parking and interpretation). For the purposes of the LVIA a receptor value is classified on a four-point scale of: negligible, low, medium, and high (refer to Tables A1.1, A1.2 and A1.9).

1.3.3 Susceptibility to Change

For landscape receptors this means the ability to accommodate a proposed development without undue consequences for the maintenance of the baseline situation and/or achievement of landscape planning policies and strategies

For visual receptors this is a product of the occupation or activity of people experiencing the view and the extent to which their attention or interest may therefore be focused on the views and visual amenity they experience.

For the purposes of this LVIA, susceptibility to change is classified on a three-point scale of: low, medium, and high (refer to Tables A1.3 and A1.10).

1.3.4 Magnitude of Change

This is gauged by assessing the type and amount of change predicted to occur in relation to the landscape or visual receptor. Factors influencing the magnitude of change include: size, scale and nature of change; geographical extent; and duration and reversibility of effect as set out in Sections 1.5.2 and 1.6.2 and associated tables.

For the purposes of the LVIA, magnitude of change is classified on a four-point scale of: negligible, small, medium, and large (refer to Table A1.8 and A1.14)

Where there is no change to the receptor, or indeed no view of the wind turbines, the magnitude of change is assessed as **No Change** which would result in **No Effects**.

1.3.5 Level of Effect

The level of landscape and visual effect is gauged by considering the magnitude of change along with the sensitivity of the receptor using professional judgement. For the purposes of the LVIA, level of effect is classified on a six-point scale of: negligible, minor, minor to moderate, moderate, moderate to major and major (Tables A1.15 and A1.16).

In line with best practice guidance set out in GLVIA3, in addition to assessing level, effects are classified as: beneficial, adverse or neutral, as well as direct and indirect. An effect is understood to be neutral when the predicted residual change would, on balance, result in neither an improvement, nor a deterioration of the landscape and visual resource compared with the existing situation.

1.4 BASELINE

The landscape and visual baseline of the assessment was established by undertaking a detailed desk study, fieldwork, and analysis of findings to create a detailed understanding of the existing landscape and visual context of both the site and surrounding landscape within the study area.

Establishing the landscape baseline included gathering data on the landscape character and how this varies through the study area; together with its geographic extent; and how it is experienced and valued.

The visual baseline establishes the areas from where the new components of the development can be seen, who can see them, the places where those who see them would be affected and the nature of views and visual amenity.

Together the established baseline provides an understanding of the components of the landscape and visual resource that may be affected by the development, which includes the identification of key receptors and viewpoints which represent such receptors. The baseline is of sufficient detail to enable a well-informed assessment of the likely landscape & visual effects on the baseline conditions of the Scheme.

The desk-based assessment has involved the following key activities:

- Familiarisation with the landscape and visual resources of the area within which the development would be located;
- Identification of landscape and visual resources likely to be significantly affected by the development;
- Preparation of Zone of Theoretical Visibility (ZTV) maps;
- Identification of the location of viewpoints, informed by the ZTV, that were used to inform the assessment of effects of both landscape and visual resources; and
- Identification of suitable study areas for the LVIA.

The desk-based assessment began with a review of legislation, policy and guidance including published landscape character assessments of the area and its wider context. This developed an understanding of the baseline environment within which the 45km radius study area, and 15 km radius detailed study area is located and has formed the basis of LVIA fieldwork.

Viewpoints identified through consultation and during desk studies were ground-truthed through fieldwork and their positions fixed prior to photography being undertaken. Landscape character types (LCTs) were reviewed during fieldwork and the descriptions contained in the published landscape character assessment were augmented where necessary. Landscape and visual receptors were also assessed to ensure they are accurately represented through desk-based assessment.

1.5 ASSESSMENT OF LANDSCAPE EFFECTS

In accordance with GLVIA3 the assessment of landscape and visual effects are separate but linked procedures; the landscape is assessed as an environmental resource in its own right, whereas visual effects are assessed on views and visual amenity experienced by people.

Both landscape and visual effects have been assessed at construction stage and during operation of the wind turbines.

1.5.1 Sensitivity

As noted above, the sensitivity of landscape receptors is assessed through consideration of their value and susceptibility to change. The process for determining landscape sensitivity is set out below.

Landscape Value

For landscape receptors, value concerns the importance of the landscape resource as evidenced by the presence of landscape designations and professional judgement. Susceptibility is concerned with the landscapes ability to absorb change brought about by the development.

Table A1.1 below illustrates how the value has been determined.

Table A1.1: Landscape Value Criteria

Value	Landscape Designations	Description
International / High	World Heritage Site	Internationally valued and designated landscapes.
National / High	National Park; AONBs; Registered Parks and Gardens of Special Historic Interest; Ancient Woodland	Nationally valued and designated landscapes.
Regional / Medium	Green Belt; Conservation Areas; Areas of High Landscape Value, Tree Preservation Orders (TPO)	Local authority landscape designations
Local / Low	Undesignated Landscape	Landscapes which are not designated nationally or locally.

The European Landscape Convention promotes the need to take account of all landscapes, with less emphasis on the special and more recognition that ordinary landscapes, such as community landscapes also have their own value. The criteria used to assess undesignated (community value) landscapes are set out using Box 5.1 in GLVIA3⁹, as per Table A1.2.

Table A1.2: Factors for Assessing the Value of Undesignated Landscapes

Factor	Criteria
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.
Scenic Quality	The term used to describe landscapes that appeal primarily to the senses (primarily but not wholly the visual senses).
Rarity	The presence of rare elements or features in the landscape or the presence of a rare Landscape Character Type.
Representativeness	Whether the landscape contains a particular character and/or features or elements which are considered particularly important examples.
Conservation interests	The presence of features of wildlife, earth science or archaeological or historical and cultural interest can add to the value of the landscape as well as having value in their own right.
Recreation value	Evidence that the landscape is valued for recreational activity where experience of the landscape is important.
Perceptual aspects	A landscape may be valued for its perceptual qualities, notably wildness and/or tranquillity.

⁹ Landscape Institute Guidelines for Landscape and Visual Impact Assessment, 3rd Edition, Box 5.1, Page 84
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Factor	Criteria
Associations	Some landscapes are associated with particular people, such as artists or writers, or events in history that contribute to perceptions of the natural beauty of the area.

Susceptibility of the Landscape Receptors to Change

This means the ability of the landscape receptor (whether it be the overall character or quality/condition of a particular landscape type or area, or an individual element and/or feature, or a particular aesthetic and perceptual aspect) to accommodate the development without undue consequences for the maintenance of the baseline situation and/or the achievement of landscape planning policies and strategies¹⁰.

Susceptibility of landscape receptors to change has been assessed using the criteria set out in Table A1.3.

Table A1.3: Landscape Receptor Susceptibility to Change

Susceptibility	Criteria
High	The landscape receptor is highly susceptible to the development because the key characteristics of the landscape have no or very limited ability to accommodate it without undue adverse effects taking account of the existing character and quality of the landscape.
Medium	The landscape receptor is moderately susceptible to the development because the relevant characteristics of the landscape have some ability to accommodate it without undue adverse effects, taking account of the existing character and quality of the landscape.
Low	The landscape receptor has low susceptibility to the development because the relevant characteristics of the landscape are generally able to accommodate it without undue adverse effects, taking account of the existing character and quality of the landscape.

Landscape Sensitivity

Table A1.4 sets out the sensitivity rating and criteria to be used in the LVIA, which results from a combination of value and susceptibility.

As has been noted above, the sensitivity of landscape receptors is defined in terms of the relationship between value and susceptibility to change.

Table A1.4: Landscape sensitivity criteria

Landscape sensitivity criteria		Value of Receptor		
		International/ National	Regional	Local
Susceptibility to change	High	High	High	Medium
	Medium	High	Medium	Low
	Low	Medium	Medium or Low	Low
	Negligible	Low	Negligible	Negligible

¹⁰ Landscape Institute Guidelines for Landscape and Visual Impact Assessment, 3rd Edition, Paragraph 5.40, Page 88

1.5.2 *Magnitude of Landscape Effects*

The determination of the magnitude of landscape and visual effects combines an assessment of the size or scale of change likely to be experienced as a result of each effect¹¹, the geographical extent of the area likely to be influenced and the duration and reversibility of effects.

Size or Scale

Judgements are needed about the size or scale of change in the landscape that is likely to be experienced as a result of each effect. GLIVIA 3 states that 'judgements should, for example, take account of:

- The extent of the existing landscape elements that would be lost, the proportion of the total extent that this represents and the contribution of that element to the character of the landscape – in some cases this may be quantified;
- The degree to which aesthetic and perceptual aspects of the landscape are altered either for example, removal of existing components of the landscape or by addition of new ones; and
- Whether the effect changes the key characteristics of the landscape, which are critical to its distinctive character.

Table A1.5 Magnitude of Landscape Change: Size/Scale of Change

Category	Description
Large	<p>A large extent of existing landscape elements would be lost / adjusted, the proportion that this represents within the landscape is considerable and the resultant change to the landscape character resulting from such a loss is large.</p> <p>Large scale alteration of the aesthetic and perceptual aspects of the landscape such as the removal of existing components of the landscape or by addition of new ones – for example, removal of hedges may change a small scale, intimate landscape into a large-scale, open one, or introduction of new buildings or tall structures may alter open skylines.</p> <p>The effect changes the key characteristics of the landscape & landscape, which are critical to its distinctive character.</p>
Medium	<p>A medium extent of existing landscape elements would be lost / adjusted, the proportion that this represents within the landscape is medium and the resultant change to the landscape character resulting from such a loss is medium.</p> <p>Medium scale alteration of the aesthetic and perceptual aspects of the landscape such as the, removal of existing components of the landscape or by addition of new ones.</p> <p>The effect changes some of the key characteristics of the landscape & landscape, which are critical to its distinctive character.</p>
Small	<p>A small extent of existing landscape elements would be lost / adjusted, the proportion that this represents within the landscape is low and the resultant change to the landscape character resulting from such a loss is low.</p> <p>Small scale alteration of the aesthetic and perceptual aspects of the landscape such as the, removal of existing components of the landscape or by addition of new ones.</p> <p>The effect changes a small number of the key characteristics of the landscape & landscape, which are critical to its distinctive character.</p>
Negligible	<p>A barely perceptible extent of landscape features and elements of importance to the character of the baseline are lost / adjusted.</p>

¹¹ Guidelines for Landscape and Visual Impact Assessment (page 90)

Category	Description
	There is a barely discernible change to aesthetic and / or perceptual attributes of landscape & landscape character and such changes occurs across a very limited geographical area and / or proportion of the landscape receptor. The effect changes a barely discernible number of the key characteristics of the landscape, which are critical to its distinctive character.
No Change	The proposals would not cause any change to the landscape & landscape character/ elements/features/characteristics.

Geographical Extent

The geographical area over which the landscape effects would be felt is also considered. This is dependent upon the nature of the proposal and the scale of effects upon the receiving landscape / landscape; however, in general effects may have an influence at the following scales:

- At the **site** level, within the wind farm site itself;
- At the level of the **immediate setting** of the site;
- At the scale of the **landscape type or character area** within which the proposal lies; or
- On a larger scale, influencing several landscape types or character areas.

Table A1.6 Magnitude of Landscape Change: Geographical Extent

Category	Description
Large	The change would affect all of the landscape receptors being assessed, as the development would occupy a large geographical extent, e.g., the change would be on a large scale, influencing several landscape types or character areas.
Medium	The change would affect a medium extent of the landscape receptors being assessed, as the development would occupy a moderate geographical extent, e.g., at the scale of the landscape type or character area within which the proposal lies.
Small	The change would affect a small part of the landscape receptors being assessed, as the development would occupy a small geographical extent, e.g., at the level of the immediate setting of the site.
Negligible	The change would affect only a negligible part of the landscape receptors being assessed, as the development would occupy a limited geographical extent, e.g., the site level, within the development site itself.
No Change	The proposals would not affect any of the landscape receptors being assessed

Duration and Reversibility of the Landscape Effects

Duration and Reversibility are separate but linked considerations.

Duration can usually be simply judged on a scale such as:

- Short-term: 0-5 years;
- Medium-term: 5-10 years; and
- Long-term: 10-40 years.

For the purposes of this assessment this Scheme has been assessed as long term.

Reversibility is a judgement about whether or not a development can be removed, and once removed can the landscape / landscape be fully restored. The examples in Table A1.7 indicate the type of land use and the respective assessment of reversibility defined in GLVIA3. Tables A1.5 to A1.8 set out the criteria used to assess the magnitude of landscape effects. Not all aspects of a criterion need to be met for an evaluation to be given.

Table A1.7 Magnitude of Landscape Change: Reversibility

Category	Description
Permanent	Permanent, is irreversible change to the landscape, for example housing development, as it not possible to remove the Wind turbines and restore the land to the original state.
Partially Reversible	Partially Reversible, change to the landscape, where the landscape can be restored to something similar to the landscape that was removed. For example, mineral developments, as it is possible to restore the land to something similar to the original state, but not the same state.
Reversible	Reversible, change to the landscape where the landscape can be fully restored. For example, a marine fish farm development, as it is possible to wholly remove the remove the Wind turbines and to restore the landscape to the original state. This also includes construction activities which are of temporary nature.

Overall Magnitude of Landscape Change

The overall magnitude combines size and scale, geographical extent, duration and reversibility as set out in Table A1.8.

Table A1.8: The Assessment of Overall Magnitude of Change

Category	Description
Large	<p>A large extent of existing landscape elements would be lost, the proportion that this represents within the landscape is considerable and the resultant change to the landscape character resulting from such a loss is large.</p> <p>The effect changes the key characteristics of the landscape, which are critical to its distinctive character.</p> <p>Large scale alteration of the aesthetic and perceptual aspects of the landscape and becomes a key additional aspect.</p> <p>The change would affect all of the landscape receptors been assessed as the development would occupy a large geographical extent.</p> <p>The effects are either of a long duration, permanent, or irreversible /reversible change to the landscape.</p>
Medium	<p>A medium extent of existing landscape elements would be lost, the proportion that this represents within the landscape is medium and the resultant change to the landscape character resulting from such a loss is medium.</p> <p>The effect changes some of the key characteristics of the landscape, which are critical to its distinctive character.</p> <p>Medium scale alteration of the aesthetic and perceptual aspects of the landscape.</p> <p>The change would affect a medium extent of the landscape receptors been assessed as the development would occupy a moderate geographical extent.</p>

Category	Description
	Partially Reversible, change to the landscape, where the landscape can be restored to something similar to the landscape that was removed. The effects are either of a long / or medium duration, permanent, or irreversible /reversible change to the landscape.
Small	A small extent of existing landscape elements would be lost, the proportion that this represents within the landscape is low and the resultant change to the landscape character resulting from such a loss is low. The effect changes a small number of the key characteristics of the landscape, which are critical to its distinctive character. Small scale alteration of the aesthetic and perceptual aspects of the landscape such as the, removal of existing components of the landscape or by addition of new ones. The change would affect a small part of the landscape receptors been assessed as the development would occupy a small geographical extent. The effects are either of a medium / or short duration and reversible change to the landscape.
Negligible	A barely perceptible extent of landscape features and elements of importance to the character of the baseline are lost. There is a barely discernible change to aesthetic and / or perceptual attributes of landscape character and such changes occurs across a very limited geographical area and / or proportion of the landscape receptor. The change would affect only a negligible part of the landscape / landscape receptors been assessed as the development would occupy. The effects are of short duration and reversible.

1.6 ASSESSMENT OF VISUAL EFFECTS

GLVIA3 defines the assessment of visual effects as:

"...the effects of change and development on the views available to people and their visual amenity. The concern here 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 as a result of the change or loss of existing elements of the landscape and/or the introduction of new elements".

Visual receptors are defined in GLVIA3 as:

"...people within the area who would be affected by the changes in views and visual amenity – usually referred to as 'visual receptors.' They may include people living in the area, people who work there, people passing through on road, rail or other forms of transport, people visiting promoted landscapes or attractions, and people engaged in recreation of different types".

The viewpoints themselves are not visual receptors.

People have different responses to views which are dependent upon context such as the:

- Location;
- Time of day;
- Season; and
- Degree of exposure to views.

Responses to views are also dependent upon the purpose of people being in a particular place such as:

- Recreation;

- Residence;
- Employment; and
- Passing through on roads, rail or other forms of transport.

As people move through the landscape, certain activities or locations may be specifically associated with the experience and enjoyment of the landscape, such as:

- The use of paths such as core paths, footpaths, bridleways, byways open to all traffic (BOATs) and National Trails;
- National or local cycle routes; and
- Tourist or scenic routes, and associated viewpoints on land or water.

1.6.1 Sensitivity of Visual Receptors

Each visual receptor, meaning the particular person or group of people likely to be affected at a specific viewpoint, should be assessed in terms of both the value attached to particular views and to their susceptibility to change in views and visual amenity.

Value of Views

The value attached to views should be made on judgements based on the following:

- Recognition of the value attached to particular views, for example in relation to heritage assets, or through planning designations; and
- Indicators of the value attached to views by visitors, for example through appearances in guidebooks or on tourist maps, provision of facilities for their enjoyment and references to them in literature or art.

The criteria used to assess the value of views are summarised in Table A1.9.

Table A1.9 Value Attached to Views

Value	Criteria
High	Views from and within landscapes / viewpoints of national importance, highly popular visitor attractions where the view forms an important part of the experience, or heritage assets, or through planning designations such as conservation areas, listed buildings, Gardens & Designed Landscapes / Registered Parks & Gardens or with important cultural associations, or where the view is deemed by the assessor to be of a high value.
Medium	Views from landscapes / viewpoints of regional/district importance, or visitor attractions at regional or local levels where the view forms part of the experience, or local planning designations, or with local cultural associations, or where the view is deemed by the assessor to be of a medium value.
Low	Views from landscapes / viewpoints with no designations, and not particularly popular as a viewpoint, with minimal or no cultural associations, or where the view is deemed by the assessor to be of a low small value.

Susceptibility of Visual Receptors to Change

The susceptibility of visual receptors to changes in views depends upon:

- “The occupation or activity of people experiencing the view at particular locations; and
- The extent to which their attention or interest may therefore be focussed on the views and the visual amenity they experience at particular locations.”¹²

The criteria used to assess the susceptibility of a visual receptor are summarised in Table A1.10.

Table A1.10 Visual Receptor Susceptibility to Change

Susceptibility	Type of Receptor
High	Residents at home; People whether residents or visitors, who are engaged in outdoor recreation, including the use of public rights of way, whose attention or interest is likely to be focused on the landscape and on particular views; Visitors to heritage assets, or to other attractions, where views of the surroundings are an important contributor to the experience; Communities where views contribute to the landscape setting enjoyed by residents in the area; and Travellers on road, rail or other transport routes along scenic routes, where the appreciation of the view contributes to the enjoyment and quality of the journey.
Medium	Travellers on road, rail or other transport routes. Users of public rights of way where the view is of moderate interest.
Low	People engaged in, outdoor sport or recreation which does not involve or depend upon appreciation of views of the landscape; People at their place of work, whose attention may be focussed on their work or activity, not on their surroundings; and where the setting is not important to the quality of working life. Road users, where the view is fleeting and incidental to the journey.

Sensitivity of Visual Receptors

The sensitivity of visual receptors is defined in terms of the relationship between the value of views and the susceptibility of the different viewers to the proposed change. Table 1.11 summarises the nature of the relationship but it is not formulaic and only indicates general categories of sensitivity. Professional judgements are made on the merit of the view based on the visual receptor, with Table A1.11 serving as a guide.

Table A1.11 Visual sensitivity criteria

Visual sensitivity criteria		Value of Receptor		
		High	Medium	Low
Susceptibility to change	High	High	Medium	Medium
	Medium	High	Medium	Low
	Low	Medium	Low	Low

¹² Ibid. 1. Paragraph 6.32

	Negligible	Low	Negligible	Negligible
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1.6.2 *Magnitude of Visual Change*

The magnitude of change to visual receptors is assessed in terms of the following:

- 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, including the proportion of the view occupied by the proposed development;
- The degree of contrast or integration of any new features or changes in the landscape with the existing or remaining landscape elements and characteristics in terms of form, scale and mass, line, height, colour and texture; and
- The nature of the view of the proposed development, in terms of the relative amount of time over which it would be experienced and whether views would be full, partial or glimpses.

Tables A1.12 to A1.14 set out the criteria used to assess the magnitude of visual change. Not all aspects of a criterion need to be met for an evaluation to be given.

Size or Scale

Table A1.12 Magnitude of Visual Change: Size /Scale

Criteria	Category
Large	The proposals would cause a complete or very large change in the view, resulting from the loss of important features in or the addition of significant new ones, to the extent that this would substantially alter the composition of the view and the visual amenity it offers. Views are often full or sequential.
Medium	The proposals would cause a clearly noticeable change in the view, resulting from the loss of features or the addition of new ones, to the extent that this would alter to a moderate degree the composition of the view and the visual amenity it offers. Views may be partial/intermittent.
Small	The proposals would cause a perceptible change in the view, resulting from the loss of features or the addition of new ones, to the extent that this would partially alter the composition of the view and the visual amenity it offers. Views may be partial only.
Negligible	The proposals would cause a barely perceptible change in the view, resulting from the loss of features or the addition of new ones, to the extent that this would barely alter the composition of the view and the visual amenity it offers. Views may be glimpsed only.
No change	The proposals would cause no change to the existing view.

Geographical Extent

The geographical extent of the visual change identified at viewpoints is assessed by reference to a combination of the ZTV and field work. The following factors are considered:

The geographical extent of a visual effect reflects:

- The angle of view in relation to the main activity of the receptor;
- The distance of the viewpoint from the Wind turbines; and
- The extent of the area over which the changes would be visible.

Table A1.13 Magnitude of Visual change: Geographical Extent

Criteria	Description
Large	The angle of view in relation to the main activity of the receptor is wide; The distance of the viewpoint from the development is close; and The extent of the area over which the changes would be visible is large.
Medium	The angle of view in relation to the main activity of the receptor is moderate; The distance of the viewpoint from the development is moderate; and The extent of the area over which the changes would be visible is moderate.
Small	The angle of view in relation to the main activity of the receptor is small; The distance of the viewpoint from the development is far; and The extent of the area over which the changes would be visible is small.
Negligible	The angle of view in relation to the main activity of the receptor is negligible; The distance of the viewpoint from the development is distant; and The extent of the area over which the changes would be visible is barely perceptible.
No Change	There are no changes to the existing view.

Duration and Reversibility of Visual Change

The following terminology, which considers whether views would be permanent and irreversible or temporary and reversible, is used to describe the duration of the visual change at representative viewpoints:

- Short-term: 0-5 years;
- Medium-term: 5-10 years; and
- Long-term: 10 to 40 years.

For the purposes of this assessment the wind turbines have been assessed as long term.

Reversibility is a judgement about whether or not a development can be removed, and once removed can the view be fully restored.

Overall Magnitude of Visual Change

The three factors that contribute to assessment of the magnitude of visual change are combined as shown in Table A1.14.

Table A1.14 Assessment of Magnitude of Visual Change

Magnitude evaluation	Description of criterion
Large	The proposals would cause a complete or very large change in the view, resulting from the loss of important features in or the addition of significant new ones, to the extent that this would substantially alter the composition of the view and the visual amenity it offers. Views are often full or sequential. The angle of view in relation to the main activity of the receptor is wide. The distance of the viewpoint from the development is close. The extent of the area over which the changes would be visible is large.
Medium	The proposals would cause a clearly noticeable change in the view, resulting from the loss of features or the addition of new ones, to the extent that this would alter to a moderate degree the composition of the view and the visual amenity it offers. Views may be partial/intermittent. The angle of view in relation to the main activity of the receptor is moderate.

Magnitude evaluation	Description of criterion
	The distance of the viewpoint from the development is moderate The extent of the area over which the changes would be visible is moderate.
Small	The proposals would cause a perceptible change in the view, resulting from the loss of features or the addition of new ones, to the extent that this would partially alter the composition of the view and the visual amenity it offers. Views may be partial only. The angle of view in relation to the main activity of the receptor is slight. The distance of the viewpoint from the development is slight. The extent of the area over which the changes would be visible is slight.
Negligible	The proposals would cause a barely perceptible change in the view, resulting from the loss of features or the addition of new ones, to the extent that this would barely alter the composition of the view and the visual amenity it offers. Views may be glimpsed only. The angle of view in relation to the main activity of the receptor is negligible. The distance of the viewpoint from the development is distant. The extent of the area over which the changes would be visible is barely perceptible.
No Change	There are no changes to the existing view.

1.7 NATURE OF EFFECT

The nature of an effect is also assessed. This is dependent on a number of criteria which vary between effects upon the landscape/landscape and effects on visual amenity. Effects are classified as beneficial, neutral or adverse according to the following definitions:

- **Beneficial** effects contribute to the landscape and visual resource through the enhancement of desirable characteristics or the introduction of new, positive attributes. The removal of undesirable existing elements or characteristics can also be beneficial, as can their replacement with more appropriate components;
- **Neutral** effects occur where the development neither contributes to nor detracts from the landscape and visual resource or where the effects are so limited that the change is hardly noticeable. A change to the landscape and visual resource is not considered to be adverse simply because it constitutes an alteration to the existing situation; and
- **Adverse** effects are those that detract from or weaken the landscape and visual resource 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 positive characterisation.

The LVIA describes the overall effects on receptors and explains the justification for each assessment. For each assessed effect, a conclusion has been drawn on whether the effect is beneficial, neutral or adverse.

1.8 LEVEL OF EFFECT AND CRITERIA

The level of landscape and visual effect has been assessed based on the sensitivity of the affected resource / receptor, and the magnitude of change caused by the proposed Wind turbines, as set out for each above in the preceding tables.

The combined sensitivity and magnitude used to determine the level of effect is summarised within Table A1.15 below. Note that effects can be either positive or negative, and in some cases, neutral (neither positive, nor negative).

Table A1.15 - Matrix for Determining Level of Effect

		Sensitivity (value / importance)			
		High	Medium	Low	Negligible
Magnitude of change	Large	Major	Moderate – Major	Minor – Moderate	Negligible
	Medium	Moderate – Major	Moderate	Minor	Negligible
	Small	Minor – Moderate	Minor	Negligible – Minor	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible

Effects predicted to be of major or moderate significance are considered to be 'significant' in the context of the EIA Regulations and are shaded in light grey in the above table.

It should be noted that the above matrix is intended as a framework for assessment only and that the level of effect will vary depending on the circumstances, the type and scale of development proposed, the baseline context and other factors. The gradations of magnitude of change and level of effect used in the assessment represent a continuum; the assessor has used professional judgement when gauging the level of effect.

Table A1.16 below provides a more detailed summary of the categories of effect.

Table A1.16- Categories of Landscape and Visual Effect

Level of Effect	Description of Landscape Effect	Description of Visual Effect
Major	Considerable change over an extensive area of a highly sensitive landscape, fundamentally affecting the key characteristics and the overall impression of its character.	The development would become a prominent feature and would result in a very noticeable change to an existing highly sensitive and well composed view.
Moderate	Small or noticeable change to a highly sensitive landscape or more intensive change to a landscape of medium or low sensitivity, affecting some key characteristics and the overall impression of its character.	The development would introduce some enhancing or detracting features to an existing highly sensitive and well composed view, or would be prominent within a less well composed and less sensitivity view, resulting in a noticeable improvement or deterioration of the existing view.
Minor	Small change to a limited area of landscape of high or medium sensitivity or a more widespread area of a less sensitive landscape, affecting few characteristics without	Where the proposed development would form a perceptible but not enhancing or detracting feature within a view of high or medium sensitivity or would be a more prominent feature within a poorly composed view of low sensitivity,

Level of Effect	Description of Landscape Effect	Description of Visual Effect
	altering the overall impression of its character.	resulting in a small improvement or deterioration of the existing view.
Negligible	No discernible improvement or deterioration to the existing landscape character.	No discernible improvement or deterioration in the existing view.
No Effect	The development would not affect the landscape receptor.	The development would not affect the view
Major	Considerable change over an extensive area of a highly sensitive landscape, fundamentally affecting the key characteristics and the overall impression of its character.	The development would become a prominent feature and would result in a very noticeable change to an existing highly sensitive and well composed view.

1.9 CUMULATIVE EFFECTS METHODOLOGY

The Cumulative LVIA (CLVIA) assesses the cumulative effects of the development in combination with other developments. In line with NatureScot guidance, and outlined in GLVIA3, cumulative effects for the purpose of this assessment are based on the following definitions:

- Cumulative Effects are defined as the additional changes caused by a proposed development in conjunction with other similar development or as the combined effect of a set of developments, taken together (SNH, 2012:12);
- Cumulative Landscape Effects are defined as effects that 'can impact on either the physical fabric or character of the landscape or any special values attached to it' (SNH, 2012:10);
- Cumulative visual effects are defined as 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 Wind turbines' (SNH, 2012:11);

A search has been undertaken using publicly available online data sources and information on planning authority planning portals of all cumulative sites within a 60km radius of the Wind turbines site. All developments likely to impact landscape and visual receptors has been considered. The search included:

- Development under construction;
- Consented but not yet constructed development;
- Development for which a valid planning application has been submitted; and
- Development which has been refused planning permission and which is subject of an appeal.

In order to ensure the LVIA assessment focuses on likely significant effects, a Detailed Study Area was limited to 15 km radius in line with section 1.2.2 'Study Areas' and section 7.21 (item 2) of GVLIA3. In line with paragraph 7.32 of GLVIA3, distance is also a determining factor in assessing the appropriate study area and professional judgement, knowledge of the study area and a review of the types of development beyond 15 km, to 25 km radius, have also been applied to determine the extents of the likely significant cumulative effects (Figure 9.1).

The assessment of effects considered all wind development within 25 km of the development at various stages in the planning process as prescribed above.

An assessment of the combined effects of all cumulative developments was undertaken to understand the cumulative effects on landscape and visual receptors.

Cumulative Landscape Effects

Cumulative landscape effects are determined using the same methodology as prescribed above in landscape effects in line with paragraph 7.27 of GLVIA3.

Cumulative Visual Effects

Cumulative visual effects are determined using the same methodology as prescribed above in landscape effects in line with paragraph 7.37 of GLVIA3. An assessment of whether the effects are combined (in combination/in succession, or sequential (frequently or occasionally) as per box 7.1 of GLVIA3 was used where such assessment was appropriate.

2 VIEWPOINTS AND VISUALISATIONS METHODOLOGY

Viewpoint selection followed good practice guidance and in particular paragraphs 6.18 to 6.20 of GLVIA3. The viewpoints chosen were used to aid the description of effects on both landscape and visual resources.

The selection of viewpoints was made on the basis of the following types of publicly accessible viewpoints, as follows:

- Representative viewpoints (for example, representing views of users of a particular footpath);
- Specific viewpoints (for example, a key view from a specific visitor attraction);
- Illustrative viewpoints (chosen to demonstrate a particular effect/specific issue);
- Any important sequential views, for example, along key transport routes; and
- Any additional viewpoints that have been requested by consultees at Scoping.

For the purposes of the LVIA, all of the viewpoints were taken from publicly accessible land.

Baseline photographic panoramas have been produced for each viewpoint to illustrate the nature of existing views in the direction of the wind turbines. A baseline photographic survey has been undertaken using a digital SLR camera in accordance with current good practice guidance¹³.

For all 22 viewpoints, computer rendered images (photomontages) and model have been prepared. These show the wind turbines superimposed on to the baseline photographic view to more accurately convey the appearance of the wind turbines in the view. These photomontage locations have been selected as they provide views of key users for a number of different receptors and users which would have varying degrees of interest and which demonstrate a particular view from vantage points, and core paths, recreational routes, or sequential views.

The methodology for photography follows GLVIA3 and the Landscape Institute's TGN 06/19 Visual Representation of development proposals. A full methodology for photomontage preparation is included in Technical Appendix 1.

Photographs were taken in RAW format using both a Nikon D3 Digital SLR full frame camera for viewpoint photography and visualisations. The time, date, altitude and grid coordinates for each frame were recorded.

¹³ Landscape Institute, 2019, *Technical Guidance Note 06/19 Visual representation of development proposals*
https://landscapewpstorage01.blob.core.windows.net/www-landscapeinstitute-org/2019/09/LI_TGN-06-19_Visual_Representation.pdf

3 ZTV METHODOLOGY

Ordnance Survey Terrain 5 dataset was used as the Digital Terrain Model (DTM) for the Bare Earth ZTV. This DTM is a 5 m by 5 m raster dataset that is representative of the land form across Great Britain.

The ZTV was produced using ArcGIS Pro 2.1 software, and the calculations were based on the proposed infrastructure. The ZTV is created by highlighting areas on the DTM where the blade tip or hub height of the proposed turbines may be visible, based on the DTM.

Viewpoint Photography

The viewpoints are prioritised based on their location in relation to the proposed site. This is so that viewpoints east of the site are visited in the morning and viewpoints west of the site are visited in the afternoon to guarantee where possible that the sun is behind the photographer at the time of any viewpoint photography being captured. Viewpoint location maps at 1:25,000 are printed for each viewpoint to aid location once on site.

Upon arrival at each proposed viewpoint location, minor adjustments to position are made in order to obtain as clear a view to the site centre as possible, avoiding trees, landscape or man-made obstructions where possible.

The tripod is set up. The camera is placed on the panoramic head in a portrait orientation where its height is confirmed and set at 1.6 m (please note: a portrait camera orientation is sometimes used in situations where the viewpoint is very close to a development in order that the top of the development is not cut off by the image boundaries). The head is then levelled followed by levelling of the camera itself using a hot-shoe spirit level. With the camera's viewfinder centred on the perceived site centre, exposure and focus settings are taken. These are then fixed manually on the camera so that they cannot be inadvertently altered. The head is rotated 90° to the left where the first frame of the 360° sequence is then taken. Each subsequent frame is taken using a 50% overlap of the previous frame until the full 360° sequence is captured.

The camera is then removed from the tripod and a viewpoint location photograph is captured showing the tripod in its position.

The camera and tripod configuration used is as follows:

Nikon D3 –Photography and Visualisations

- Camera body: Nikon D3 professional specification digital SLR (full frame CMOS sensor)
- Camera lens: Nikon AF 50mm f1.8 prime
- Tripod: Manfrotto 055MF4 with Manfrotto 438 ball leveller
- Panoramic head: Manfrotto 303SPH

Camera settings used for all photography:

- Camera mode: Manual Priority
- ISO: 200
- Aperture: f13
- Image format: RAW

The single frame photographs are opened in Adobe Photoshop CC2018 where they are checked and any dust spots are removed before being saved as a high resolution TIFF image.

Photos are stitched together to create panoramas from the individual images making up the required field of view. Stitching is done in PTGui Pro version 10.0.12 professional

photographic stitching software using the required projection settings. They are then checked and any further dust spots are removed before being saved as a high-resolution TIFF image.

4 PHOTOMONTAGE METHODOLOGY

In producing the computer model and verified view, the following methodology has been used:

- The wind turbines are located according to the scheme design and XYZ coordinates supplied;
- The arrangement and size of the wind turbines is modelled in accordance with the application;
- Viewpoint locations are inputted using GPS data collected on-site;
- 3DS max standard cameras are correctly positioned in virtual space; and
- The viewpoint photography is loaded and aligned into the environment background.

The cameras field of view is overwritten in 3DS max to match the field of view of the single photo the direction and viewing angle of each camera is aligned using GPS data and matched up to the surveyed reference points (provided by the surveyors).

The rendered images have been stitched in cylindrical projection using the PTGui Software.

The lighting in the model is matched as closely as possible to the lighting within the day and time of the photography for each viewpoint.

The stitched images are rendered for each viewpoint and merged with the full resolution base photographs using Adobe Photoshop; and

Any foreground elements within the panorama are masked out.