Hare Hill Repowering and Extension

Technical Appendix 6.1: Landscape and Visual Impact Assessment Methodology

Prepared for: **ScottishPower Renewables (UK) Limited**

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MVGLA
Landscape Architecture

CONTENTS

Glossary of Terms

Term	Description
Baseline studies	Work done to determine and describe the existing environmental conditions against which any future changes can be measured or predicted and assessed
Cumulative effects	The additional changes caused by a proposed Development in conjunction with other similar developments or as the combined effect of a set of developments, taken together.
Dark adaptation	The process by which our eyes switch from photopic (cone mediated) vision to scotopic (rod mediated) vision after moving from a lit area to a dark one.
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 effects	Effects directly attributable to the proposed Development.
Environmental Impact Assessment	Environmental Impact Assessment (EIA) is a means of carrying out, in a systematic way, an assessment of the likely significant environmental effects from a development.
Environmental Impact Assessment Regulations	The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (EIA Regulations)
Indirect effects	Effects resulting indirectly from the Proposed Development as a consequence of the direct effects. Indirect effects often occur 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.
Key Characteristics	Those combinations of elements which are particularly important to the character of the landscape and help to give an area its particularly distinctive sense of place.
Landscape character	The distinct and recognisable pattern of elements that occur consistently in a particular type of landscape that makes one landscape different from another, rather than better or worse.
Landscape receptors	Aspects of the landscape resource that have the potential to be affected by the proposed Development.
Landscape value	The relative value or importance attached to different landscapes by society. A landscape may be valued by different stakeholders for a variety of reasons (often as a basis for designation or recognition), because of its quality, special features (including perceptual aspects such as scenic beauty), tranquillity or wildness, cultural associations, or other conservation issues.
Magnitude (of change)	The combination of judgements about the size and scale of the predicted effect, the extent of the area over which it occurs, whether it is reversible or irreversible and whether it is short or long term in duration.
NatureScot	Scottish Natural Heritage rebranded to 'NatureScot' in August 2020.
proposed Development	The proposed Hare Hill Windfarm Repowering and Extension.
Photomontage	A visualisation which superimposes an image of a proposed development upon a photograph or series of photographs.
Residential Visual Amenity Threshold	Where visual effects would result in serious harm to living conditions or residential amenity

Term	Description
Residual effects	Effects attributable to the proposed Development following consideration of any proposed design mitigation and/or enhancements.
Scenarios	Combinations of potential future wind farm developments, currently at different stages in the planning system, used in the cumulative assessment.
Scoping Report	Consultation report which described the Project and identified the potential impacts from the proposed Development, and the proposed scope of the assessment.
Sensitivity	The specific receptors' (landscape or visual) vulnerability to change. Sensitivity is assessed by combining judgements of the susceptibility of the receptor to the specific type of change or development proposed and the value related to that receptor. Viewpoint sensitivity depends on the context of the viewpoint; its importance; the current occupation and viewing opportunity of the groups of people being considered; and the number of people affected.
Significance of effect	A measure of the importance or gravity of the environmental effect as defined by significance criteria specific to the environmental topic.
Site	Area within the application boundary within which the proposed Development lies.
Study area	The area included in the LVIA.
The Applicant	ScottishPower Renewables (UK) Limited
Visual amenity	The overall pleasantness of views enjoyed by people of their surroundings or to the visual setting or backdrop to the activities they enjoy whilst: living; working; recreating; visiting or travelling through an area.
Visual receptors	Individuals and/or groups of people who have the potential to be affected by the proposed Development.
Wireline	A 2D visualisation which lays a grid over the 3D terrain model to illustrate landform.
Zone of Theoretical Visibility (ZTV)	A map showing areas of land within which a development is theoretically visible.

List of Abbreviations

Abbreviation	Description
AOD	Above Ordnance Datum
cd	candela, SI unit of luminous intensity
CLVIA	Cumulative Landscape and Visual Impact Assessment
CZTV	Cumulative Zone of Theoretical Visibility
DTM	Digital Terrain Model
EAC	East Ayrshire Council
EALWCS	East Ayrshire Landscape Wind Capacity Study
ECU	Energy Consents Unit
EIA	Environmental Impact Assessment

Abbreviation	Description
EIA Report	Environmental Impact Assessment Report
GDL	Gardens and Designed Landscapes
GLVIA3	Guidelines for Landscape and Visual Impact Assessment, Third Edition.
HH	Hare Hill Wind Farm (existing)
HHE	Hare Hill Wind Farm Extension (existing)
HHR1	Hare Hill Wind Farm Repowering and Extension (Phase 1 of the proposed Development)
HHR2	Hare Hill Wind Farm Repowering and Extension (Phase 2 of the proposed Development)
IEMA	Institute of Environmental Management and Assessment
ISEP	Institute of Sustainability and Environmental Professionals (formerly IEMA)
km, m, cm mm	Kilometres, metres, centimetres, millimetres
LCT	Landscape Character Type
LI	Landscape Institute
lux, microlux	SI unit of illuminance
LVIA	Landscape and Visual Impact Assessment
NPF4	National Planning Framework 4
OS	Ordnance Survey
RMSE	Root Mean Square Error
RVAA	Residential and Visual Amenity Assessment
SNH	Scottish Natural Heritage (now NatureScot)
SPR	ScottishPower Renewables (UK) Ltd
T1, T2, …	Turbine 1, turbine 2 (and subsequent numbering)
VP1, VP2…	Viewpoint 1, viewpoint 2 (and subsequent numbering)
ZTV	Zone of Theoretical Visibility

Technical Appendix 6.1: Methodology for the Landscape and Visual Impact Assessment

Introduction

1.1 The Landscape and Visual Impact Assessment (LVIA) considers:

- Effects during construction and operation on the landscape character of the Site and the surrounding study area;
- Effects during operation on views across the study area towards the proposed Development, including views from key viewpoint locations agreed through consultation, from settlements, and as part of sequential experiences along routes, including those used by recreational receptors;
- Cumulative effects on landscape character and views should other consented or in-planning windfarm sites be present; and
- The implications of landscape and visual effects on the special qualities and integrity of designated landscapes.

1.2 This assessment is conducted in accordance with the principles contained within the following documents:

- *Guidelines for Landscape and Visual Impact Assessment, Third Edition* (referred to hereafter as GLVIA3) (Landscape Institute, Institute of Sustainability and Environmental Professionals (ISEP) (formerly Institute of Environmental Management and Assessment (IEMA)), 2013);
- Siting and Designing Windfarms in the Landscape (Scottish Natural Heritage (SNH), 2017);
- Visual Representation of Wind Farms: Guidance (SNH, 2017); and
- Assessing the Cumulative Landscape and Visual Impact of Onshore Wind Energy Developments (NatureScot, 2021).

Scope of Assessment

Study Area

1.3 NatureScot guidance (SNH, 2017) suggests that for turbines of over 150 metres (m) to blade tip, an initial study area of 45 kilometres (km) radius should be considered, followed by refinement of the study area to focus on potential significant effects. A tip-height Zone of Theoretical Visibility (ZTV) map to 45 km is shown on **Figure 6.1** at a scale of 1:400,000, and on **Figures 6.3a and 6.3b** at a scale of 1:100,000 scale. The study area was reduced to allow reporting to focus on the extent of likely significant effects, following analysis of the ZTV, fieldwork and assessment.

1.4 Landscape effects were considered for landscape character within 15 km of the outer turbines. Visual effects were considered for locations across a wider area, but those reported on in detail are within an area of approximately 25 km radius for viewpoints and routes, and approximately 10 km radius for settlements.

1.5 An assessment of effects on visual aspects of residential visual amenity at nearby properties was focussed on properties within 2.5 km of the outer turbines (see **TA 6.5**).

1.6 The extent of study areas assessed was based on professional judgement and from experience of working on similar types of projects. The study area for each receptor group was set out in the Direct

Scoping submitted to the Energy Consents Unit (ECU) (November 2023) and informed by the Scoping Opinion (May 2024) by East Ayrshire Council (EAC).

Elements Scoped Out of Assessment

1.7 To allow focussing of the assessment, the scoping exercise identified where receptors are unlikely to be affected by the proposed Development, either through having little or no theoretical visibility, or being distant from the proposed Development, those receptors have been scoped out of the LVIA. In addition to this, the scope of reporting was further focussed on those effects that were found to be significant or contribute to the meaningful discussion of landscape and visual effects of the proposed Development.

1.8 Scoped out of the LVIA, on the basis of initial fieldwork and ZTV coverage, are the following elements (distances from the outer turbines):

- Effects on landscape character beyond approximately 15 km;
- Effects on views from viewpoints beyond approximately 25 km, although there would be locations where the proposed Development would be visible at greater distances;
- Effects on views from routes beyond approximately 25 km;
- Effects on views from local paths (Core Paths and locally promoted paths) beyond approximately 5 km;
- Effects on views from settlements beyond approximately 10 km;
- Effects on designated landscapes beyond approximately 25 km;
- Cumulative effects with turbines of less than 50 m to blade tip; and
- Decommissioning effects, which are similar to, but in reverse of construction effects, reducing on completion.

1.9 Viewpoint selection was also a form of containing the scope of the assessment, through the selection of representative viewpoints, rather than exhaustive inclusion of all locations identified as receiving theoretical visibility within the ZTV.

Phasing of the Proposed Development

1.10 As the proposed Development would be constructed in two phases, with a duration of nine years between Phase 1 and Phase 2, the LVIA considers a number of phased scenarios. These, and the reasoning for them are set out in **Chapter 6: Landscape and Visual Assessment**.

Baseline Methodology

1.11 Desk studies were undertaken to provide information about the baseline landscape and visual resource and to inform fieldwork and the evaluation of effects. For this work, the following data sources have been consulted:

- Ordnance Survey (OS) topographic and geological maps;
- Scottish Landscape Character Types Map and Descriptions (NatureScot, 2019);
- EAC Local Development plan 2, East Ayrshire Landscape Wind Capacity Study (EALWCS) (Carol Anderson Landscape Associates, 2018);
- EAC Adopted Local Development Plan 2 (EAC, 2024);
- East Ayrshire Local Landscape Area Boundary Review (EAC, 2021); and

- SiteLink (NatureScot, 2025).

1.12 Field survey work was carried out during several visits under differing weather conditions, between August 2023 and March 2025. Records were made in the form of field notes and photographs. Field survey work included visits to viewpoint locations, and designated landscapes, and extensive travel around the wider study area to consider potential effects on landscape character and on experiences of views seen from routes.

Methodology for the Assessment of Effects

Graphics Production

1.13 Graphics and visualisations are provided to support the assessment of effects and are listed in full in **Section 6.1.1** of this Technical Appendix. Visualisations for the assessment viewpoints have been produced in accordance with current good practice guidance from NatureScot (SNH, 2017) and the Landscape Institute (LI, 2019) and are shown in **Volume 2b LVIA Figures**.

Data Used for Modelling

1.14 The following data was used for modelling:

- OS Terrain® 50 height data (DTM) (50 m grid spacing, 4m root mean square error, RMSE) for wider landscape modelling;
- OS Terrain® 5 mid-resolution height data (digital terrain model (DTM)) (5 m grid spacing, 2.5 m RMSE) for detailed modelling where required;
- OS 1:50,000 scale raster data; and
- OS 1:250,000 scale raster data.

ZTV Mapping

1.15 The OS DTM is used as an input to produce map-based graphics and ZTV mapping. ZTVs use the turbine dimensions (tip height and hub height) and DTM and assume a viewer height of 2 m. The calculation uses a '*bare ground*' computer generated terrain model, which does not take account of potential screening by buildings or vegetation.

1.16 This is considered to over-emphasise the extent of visibility of the proposed Development and therefore represents a '*maximum potential visibility*' scenario. Separate ZTVs are run from the tip heights (**Figure 6.1**) and hub heights (**Figure 6.2**) of the proposed turbines, which can be used to indicate the proportion of the turbines likely to be visible. They take into consideration earth curvature and use a refraction coefficient of 0.075. The ZTVs of the proposed Development were calculated to show the number of turbines visible to blade tip height or hub height.

1.17 ZTVs were created to show theoretical visibility of operational windfarms within 25 km of the proposed Development (see **Figure 6.9a**). Cumulative ZTVs (CZTVs) were also created to illustrate the potential combined visibility of the proposed Development with consented or in-planning windfarms (see **Figures 6.9b** and **6.9c**).

1.18 To create the ZTVs shown on **Figures 6.9a** to **6.9c**, a ZTV to tip height of each windfarm was generated (based on the tip height of each turbine to a radius in accordance with the current NatureScot guidance (SNH, 2017), and then combined with the proposed Development ZTV. The ZTVs were set up to show the number of windfarms (rather than the number of turbines) visible and are colour-coded to distinguish between areas where the proposed Development is predicted to be visible (either on its own, or in conjunction with other windfarms), and areas where other windfarms would be visible, but the proposed

Development would not be visible. The ZTVs do not necessarily identify which other windfarms would be visible, but paired CZTVs are provided where necessary to analyse the relationships between key cumulative windfarms.

1.19 The aviation lighting ZTV (**Figures 6.10a** and **6.10b**) was modelled as an aggregate of the minimum vertical viewing angle calculated for all turbines, all of which would be lit. This ZTV therefore shows the minimum vertical viewing angle for these turbines, i.e. the angle closest to the horizontal for the brightest light, which is not necessarily the closest turbine. Whilst the ZTV does not indicate which turbine would be the brightest, it indicates the least amount of downward reduction in lighting intensity.

Viewpoint Photography

1.20 The methodology for photography is in accordance with guidance from NatureScot (SNH, 2017) and the LI (LI, 2019). The focal lengths used are in accordance with recommendations contained in guidance and are stated on the figures. Photography was undertaken by MVGLA between August 2023 and February 2025. Photography was taken in optimal visibility conditions wherever possible, though unpredictable weather and short daylight hours in autumn/winter make more distant viewpoints harder to get ideal photographs for.

1.21 The location of each viewpoint and information about the conditions was recorded in the field in accordance with the guidance. The camera used for the photography was a Nikon D610 Full frame sensor digital SLR with a fixed 50 mm focal length lens.

1.22 A tripod with vertical and horizontal spirit levels was used to provide stability and to ensure a level set of adjoining images. The camera was set at 1.65m from ground level and orientated to take photographs in landscape format. A panoramic head was used to ensure the camera rotated about the no-parallax point of the lens to eliminate parallax errors between the successive images and enable accurate stitching of the images. The camera was moved through increments of 24° (degrees) and rotated through a full 360° at each viewpoint.

1.23 Weather conditions and visibility were considered an important aspect of the field visits for the photography. Where possible, visits were planned around clear days with good visibility. Viewpoint locations were visited at times of day to ensure, as far as possible, that the sun lit the scene from behind, or to one side of the photographer. South facing viewpoints can present problems particularly in winter when the sun is low in the sky. Photographs facing into the sun were avoided where possible to prevent the wind turbines appearing as silhouettes.

Visualisations

1.24 Photographic stitching software PTGui© and Adobe Photoshop© was used to stitch together the adjoining frames to create panoramic baseline photography.

1.25 The same terrain data used to produce the ZTVs was also used to generate wireline drawings, using ReSoft Windfarm software. The DTM includes the Site, viewpoint locations and all landform visible within the baseline photography towards the Site. Turbine and viewpoint location coordinates were entered. Photomontages have been constructed to show the candidate turbine with the specified tip height, hub height and rotor diameter. Infrastructure elements and forest removal are also shown where they would be visible.

1.26 The stitched photographs were matched to the wirelines using Adobe Photoshop. Wirelines were produced using a viewer height of 1.65 m above the terrain height. The panoramic baseline photographic images were imported into the Adobe Photoshop© software and from each viewpoint the wireline views of the landform model with proposed turbines were carefully adjusted to obtain a match. Fixed features on the ground, such as mountain summits, buildings and roads, were located in the model and used as markers to help with the alignment process where necessary. Each view was rendered taking account of the sunlight conditions and the position of the sun in the sky at the time the photograph was taken. Blade

angle and orientation adjustments were also made to represent a realistic situation. Adobe Photoshop© software was used to combine the images and mask out (remove) turbines or sections of turbines which were located behind foreground elements in the original photograph. Location and rendering of infrastructure took a similar process, Adobe Photoshop© software was used to render forest removal areas once aligned with the wireline and photograph.

1.27 Finally, where applicable the images were converted from Cylindrical Projection to Planar Projection using PTGui© software.

Dusk Photomontages Showing Aviation Lighting

1.28 Photography for night-time photomontages to illustrate potential effects of aviation lighting was carried out in the evening. A set of photographs was taken prior to sunset to ensure that the camera was correctly set up, and to allow cross reference between lights caught on dark photographs and buildings caught on day time photographs. A series of photograph sets were taken over a period of about an hour and a half from sunset to full darkness. This enabled the photographer to take multiple sets as the sky darkened, with varied camera settings. Downloaded sets were then reviewed to select a set that best matched NatureScot advice on having the sky relatively dark and other lights in the landscape on, but the form of the landscape still visible.

1.29 Photomontage illustrations prepared for night-time views using photography taken during twilight were produced using the same method as for daylight photomontages, with turbines rendered in black as silhouettes. Images of aviation lights are provided for indicative illustration only and have been modelled on the basis of approximately 200 candela (cd) with some attenuation for distance.

Figure Layout

1.30 The dimensions for each image (printed height and field of view) are in accordance with NatureScot requirements (SNH, 2017). Photography information and viewing instructions are provided on each page where relevant. Thumbnail maps are provided for location reference. A 5-centimetre (cm) rule is provided on each page to guide viewers when zooming in on electronic copies of the figures.

1.31 For each viewpoint, pages include:

- The first A3 height x A1 width format page contains 90° baseline photography and wireline to illustrate the wider landscape, visual and cumulative context. These are shown in cylindrical projection and presented on an A1 width page;
- Additional pages in the same format are provided if necessary to illustrate wider cumulative visibility up to 360°; and
- The subsequent pages contain 53.5˚ wireline (showing the LVIA baseline) and photomontage of the view towards the proposed Development. These images are shown in planar projection and presented on an A1 width page.

Assessment Structure

1.32 Consideration of potential effects on landscape and visual amenity are related but distinct components of LVIA. The methodologies used to assess potential landscape, and visual effects are broadly similar, but in order that the differences are clear, the methodologies for assessing significance for landscape and visual effects, and the assessment sections themselves, are set out separately.

1.33 The LVIA considers the potential effects of the addition of the proposed Development to the existing landscape, against a baseline that includes existing windfarms (and those under construction). The Cumulative LVIA (CLVIA), considers the potential changes in effects with the addition of the proposed Development, relating to a baseline landscape that includes windfarms that may or may not be present in

the landscape in the future (e.g. consented schemes developments that have not yet been built, or undetermined applications).

1.34 The operational phase elements of the proposed Development, i.e. turbines, tracks, battery storage units, substation and other infrastructure, are considered to be long-term elements as they would be in situ for the 35 years. They are theoretically reversible upon decommissioning. This is taken to be the case for all effects but is not repeated for each receptor.

1.35 Using a precautionary approach, unless otherwise stated, all likely effects identified are considered to be negative or adverse.

1.36 The assessment is based on the candidate turbine specification (see **Chapter 5: Development Description**), with an awareness that there may be hub height or rotor diameter changes within the parameters of the application, depending on the turbine model selected at the time of construction.

Identification of Landscape Effects

1.37 Judging the significance of landscape effects requires consideration of the nature of the landscape receptors (sensitivity) and the nature of the effect on those receptors (magnitude of change). GLVIA3 states that the nature of landscape receptors, commonly referred to as their sensitivity, should be assessed in terms of the susceptibility of the receptor to the type of change proposed, and the value attached to the receptor. The nature of the effect on each landscape receptor should be assessed in terms of its size and scale, geographical extent, duration, and reversibility. These aspects are brought together, to form a judgement regarding the overall significance of effect. The following sections set out the methodology used to evaluate landscape effects.

Sensitivity of Landscape Receptors

1.38 The sensitivity (or '*nature*') of landscape receptors is assessed in terms of the susceptibility of the receptor to the type of change proposed and the value attached to the receptor.

1.39 The susceptibility of the landscape relates to "the ability of the landscape receptor (whether it be the overall character or quality/condition of a particular 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 strategies" (GLVIA3, Page 88).

1.40 Criteria that inform judgements of landscape susceptibility to the type of development being proposed include:

- Landscape scale;
- Landform;
- Skylines;
- Pattern and complexity;
- Inter-visibility with adjacent landscapes;
- Settlement and man-made influences; and
- Perceptual influences.

1.41 The value of a landscape is recognised as being a key contributing factor to the sensitivity of landscape receptors. Value is informed with reference to:

- A review of designations upon the landscape and the level of policy importance that they signify (such as landscapes designated at international, national, local or community level); and

- Other criteria that indicate value, including landscape quality, scenic quality, rarity, representativeness, conservation interests, recreation value, perceptual aspects, and artistic associations.

1.42 It should be noted that whilst landscape designations at an international or national level are likely to be accorded the highest value, it does not necessarily follow that all such landscapes have a high susceptibility to all types of change, and conversely, undesignated landscapes may also have high value and susceptibility to change. There may be a complex relationship between the value attached to a landscape and its susceptibility to change. Therefore, the rationale for judgements on the sensitivity of the landscape needs to be clearly set out for each receptor.

1.43 Judgements of relative sensitivity of different Landscape Character Types (LCTs) to windfarm development also has cognisance of other assessments of landscape character and sensitivity covering the study area such as EALWCS (Carol Anderson Landscape Associates, 2018).

1.44 Sensitivity of the receptor is a consideration of susceptibility to change and value, and is described using High, Medium and Low. It is based on an evaluation of criteria such as those set out in **Table 1**, using professional judgement to balance several factors that may raise or lower the level of sensitivity. '*High*' is assigned to a receptor that meets all or most of the criteria indicating higher sensitivity, or where one or more criteria are considered to be sufficiently important to outweigh other lower' criteria. '*Low*' is assigned to receptors where criteria fall into the lower part of the scale. '*Medium*' is assigned to receptors where criteria are mixed or of intermediate sensitivity.

Table 1: Sensitivity of the Receptor - Landscape

Criteria tending towards Higher or Lower Sensitivity		
Higher ⟷		Lower
Susceptibility to Change	• Contains features vulnerable to change or loss that would in turn alter key landscape characteristics. • Complex, rugged, irregular landform with strong topographical features and distinctive skylines. • Few modern artefacts present, presence of small scale, historic or vernacular settlement. • Remote from visible or audible signs of human activity and development.	• Robust landscape, with few or no vulnerable features, and potentially able to accommodate particular types of change without altering landscape characteristics. • Simple, regular landform without strong topographical features, non-prominent or screened skylines. • Presence of large-scale structures e.g. utility, infrastructure or industrial elements. • Close to visible or audible signs of human activity and development.
Value	• Relatively rare or 'unique' landscape or LCT. • Designated landscape with national policy level protection.	• Ubiquitous or extensive landscape type. • A landscape without formal designation.

Magnitude of Landscape Change

1.45 Judgements regarding the magnitude of landscape change consider the size, scale, and geographical extent of the landscape effect, and its duration and reversibility.

1.46 For landscape elements/features, the size and scale of change depends on the extent of existing landscape elements that would be lost or changed, the proportion of the total extent that this represents (i.e. rarity) and the contribution of that element to the character of the landscape. For LCTs, the size and

scale of change depends on the degree to which the character of the landscape is changed through alteration to the key characteristics of the landscape.

1.47 Given that windfarms currently exist in the study area, the scale and size of change also considers the relationship between the proposed Development and other windfarms in the landscape, including consideration of:

- The arrangement of windfarms in the landscape, e.g. developments that are clustered or dispersed;
- The position of the windfarms in the landscape, e.g. in similar landscape or topographical contexts;
- The distances between windfarms, and their distances from the viewer;
- The relative perceived scales of the windfarms in the landscape; and
- How the proposed Development fits with the pattern of windfarm development in the baseline, and whether it intensifies the presence of windfarms or fills a gap, leading to a total effect that is greater than the sum of its parts, e.g. creating a '*windfarm landscape*'.

1.48 The geographical extent of landscape change is the area over which the landscape change being described would occur. Geographical extent is described as being limited to the Site, to the local area, or a wider area, which is defined in each case.

1.49 The duration of changes to the character of the landscape is taken as being short-term and temporary for construction and long term and theoretically reversible for operational effects.

1.50 Size/scale, geographical extent and duration/reversibility are combined to form a judgement as to the overall magnitude (nature) of the landscape change, recorded as **High**, **Medium**, **Low** or **Negligible**.

1.51 Magnitude of change is described using criteria such as those set out in **Table 2**, using professional judgement to balance several factors that may raise or lower the magnitude judgement. '*High*' is assigned to a change that meets the criteria indicating higher changes, or where one or more criteria are considered to be sufficiently important to outweigh other lower criteria. '*Low*' or '*Negligible*' is assigned to receptors where criteria fall into the lower part of the scale, '*Medium*' is assigned to receptors where criteria are mixed or of intermediate levels.

Table 2: Magnitude of Change to the Landscape

Criteria tending towards Higher or Lower Magnitude of Change		
	Higher ⟷	Lower
Scale	• Large changes or extensive loss of key features.	• Small changes to key features, little or no loss of features.
Geographical Extent	• Large areas affected by change. • Changes perceived as close to the receptor.	• Limited area affected. • Changes perceived as distant from receptor.

Judging the Levels of Landscape Effect and Significance

1.52 In judging significance, sensitivity of receptors has to be considered in combination with predicted magnitude of change. As set, sensitivity and magnitude are evaluated by considering a range of aspects. Considering all aspects in a multifaceted assessment and assigning more or less weight to individual aspects as appropriate, the overall level of effect is identified. This assessment of the level of effect draws

on fieldwork, consultation and guidance provided in GLVIA3. It does not use a matrix or scoring of sensitivity against magnitude of change, an approach which is not supported by GLVIA3.

1.53 Four levels of effect are used in this assessment: **Major**, **Moderate**, **Minor** and **Negligible**. Effects that are **significant** in the context of EIA regulations include **Major** and **Moderate** effects.

1.54 **Table 3** out various criteria and descriptions that are used to guide judgments as to the level of effect.

Table 3: Levels of Effect - Landscape

<table>
<tr><th colspan="4">Criteria tending towards Higher or Lower Effect</th></tr>
<tr><td>Major</td><td>Moderate</td><td>Minor</td><td>Negligible</td></tr>
<tr><td colspan="2">HIGHER LEVEL OF EFFECT
Effects on landscapes sensitive to changes in character or perception.
Large scale changes which introduce new, non-characteristic or discordant or intrusive elements into the landscape.
These may be long term/ irreversible effects.</td><td colspan="2">LOWER LEVEL OF EFFECT
Effects on less sensitive landscapes.
Small changes or changes which are well integrated into the landscape, often involving features already present.
These may be reversible effects or of short duration.</td></tr>
<tr><td colspan="2">Significant</td><td colspan="2">Not Significant</td></tr>
<tr><td>Substantial changes affecting the character of the landscape or the elements therein.</td><td>Changes affecting the character of the landscape or the elements therein.</td><td>Slight changes affecting the character of the landscape or specific elements therein.</td><td>No or minimal perceptible changes affecting the character of the landscape or specific elements therein. Note that this includes no impact.</td></tr>
</table>

Identification of Visual Effects

1.55 Visual effects are experienced by people at different locations around the study area, at static locations (for example settlements or viewpoints) and transitional locations (such as sequential views from routes). Visual receptors are the people who would be affected by changes in views at these places, and they are usually grouped by what they are doing at these places (for example residents, motorists, recreational users etc.).

Sensitivity of Visual Receptors or Views

1.56 The sensitivity (or '*nature*') of visual receptors is assessed in terms of the susceptibility of the receptor to the type of change proposed and the value attached to the receptor. The susceptibility of visual receptors to changes in views/visual amenity is a function of the occupation or activity of people experiencing the view and the extent to which their attention is focused on views (GLVIA3, page 113). Viewers of higher susceptibility to changes in views are those whose attention or interest is focused on their surroundings, including:

- Communities where views contribute to the landscape setting enjoyed by residents;
- People engaged in outdoor recreation (including users of public rights of way whose interest is likely to be focused on the landscape); and
- Visitors to heritage assets, advertised viewpoints or other attractions where views of the surroundings are an important contributor to experience.

1.57 Viewers of lower susceptibility to changes in views include the following:

- Travellers on road, rail or transport routes (not recognised as scenic routes);
- People engaged in outdoor sport or recreation which does not involve or depend upon appreciation of views; and
- People at their place of work whose attention is not on their surroundings.

1.58 Recognition of the value of a view is determined with reference to:

- Planning designations (such as designated landscapes at a local or national level);
- Importance in relation to heritage assets (such as designed views recorded in citations of designated landscapes or views recorded as of importance in Conservation Area Appraisals); and
- Indicators of the value attached to views by visitors, for example through appearances in guide books or on tourist maps, provision of facilities for their enjoyment and references to them in literature and art.

1.59 The sensitivity of views and visual receptors may involve a complex relationship between a viewer's susceptibility to change and the value attached to a view. The rationale for judgements of sensitivity of visual receptors are set out for each receptor in relation to both susceptibility and value.

1.60 Susceptibility and value are combined to form a judgement as the overall sensitivity of the visual receptor, recorded as '*High*', '*Medium*' and '*Low*'. It is based on an evaluation of criteria such as those set out in the **Table 4**, using professional judgement to balance several factors that may raise or lower the level of sensitivity.

1.61 '*High*' is assigned to a receptor that meets all or most of the criteria indicating higher sensitivity, or where one or more criteria are considered to be sufficiently important to outweigh other lower criteria. '*Low*' is assigned to receptors where criteria fall into the lower part of the scale. '*Medium*' is assigned to receptors where criteria are mixed or of intermediate sensitivity.

Table 4: Sensitivity of the Receptor - Visual

Criteria tending towards Higher or Lower Sensitivity		
	Higher ⟷	Lower
Susceptibility to Change	• Residents. • People engaged in outdoor recreation such as walkers. • Tourists on scenic routes and visitors to heritage assets or advertised viewpoints.	• Road users, or those on transport routes (not scenic routes). • People whose outdoor activities do not involve or depend on appreciation of views, and those at work.
Value	• Designated viewpoint advertised on OS maps and in tourist information. • Location within an area (nationally) designated for landscape/scenic values. • Views with higher scenic quality, unaffected by overt or intrusive man-made elements.	• Viewpoints not advertised on OS maps or tourist information. • Location not within an area designated for landscape/scenic values. • Views with lower scenic quality, including overt or intrusive man-made elements.

Magnitude of Visual Change

1.62 Judgements regarding the magnitude of changes to views consider the size and scale, and geographical extent of the visual effect, and its duration and reversibility.

1.63 The size and scale of a visual change depends on:

- The scale of the change in 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 view with the existing elements in the view and their characteristics in terms of form, scale and mass, line, height, colour, texture and lighting; and
- The nature of the view of the proposed Development, in terms of the relative amount of time over which it would be experienced along routes and whether views would be full, partial or glimpses.

1.64 All changes to views are considered as they would occur in winter conditions, being the maximum case situation with minimal screening by vegetation and deciduous trees. Wirelines and ZTV maps are calculated on the basis of bare ground and therefore also demonstrate the maximum extent of visibility possible, in the absence of buildings or vegetation.

1.65 Given that windfarms currently exist in the study area, the scale and size of change also considers the relationship between the proposed Development and other windfarms seen in the landscape, including consideration of:

- The arrangement of windfarms in the view, e.g. developments seen in one direction or part of the view (combined views), or seen in different directions (successive views in which the viewer must turn) or developments seen sequentially along a route;
- The relationship between the scale of the windfarms, including turbine size, proportions and number;
- The position of the windfarms in the view, e.g. on the skyline or against the backdrop of land;
- The distances between windfarms, and their distances from the viewer, and
- How the proposed Development fits with the pattern of windfarm development visible.

1.66 It should be noted that the assessment considered the differences in turbine sizes between windfarms in terms of their appearance from each assessment location, rather than relying on comparisons in numerical terms.

1.67 The geographical extent of visual changes records the extent of the area over which the changes would be visible, e.g. whether this is a unique viewpoint from where the proposed Development can be glimpsed, or whether it represents a large area from which similar views are gained. Some viewpoints used in the assessment have been selected to represent typical views from wider areas; others have been selected as specific views. The geographical extent of the visual effect is defined in each case.

1.68 The duration of changes to views is taken as being short-term and temporary for construction effects and long term and theoretically reversible for operational effects.

1.69 Size/scale, geographical extent and duration/reversibility are combined to form a judgement as to the overall magnitude of the visual change, recorded as **High**, **Medium**, **Low** or **Negligible**. Magnitude of change is described based on an evaluation of criteria such as those set out in **Table 5**, using professional judgement to balance several factors that may raise or lower the magnitude judgement.

1.70 '*High*' is assigned to a change that meets the criteria indicating higher changes, or where one or more criteria are considered to be sufficiently important to outweigh other 'lower' criteria. '*Low*' or '*Negligible*' is assigned to receptors where criteria fall into the lower part of the scale, '*Medium*' is assigned to receptors where criteria are mixed or of intermediate levels.

Table 5: Magnitude of Change to Visual Amenity

Criteria tending towards Higher or Lower Magnitude of Change		
	Higher ⟷	Lower
Scale	• proposed Development is large in the view. • Large proportion of the view affected.	• proposed Development forms a small feature in the view; • Small proportion of the view affected.
Geographical Extent	• Large areas affected by change. • Changes perceived as close to the receptor. • Changes viewed over prolonged section(s) of a route.	• Limited area affected; • Changes perceived as distant from receptor.

Judging the Levels of Visual Effect and Significance

1.71 As for landscape effects, visual effects are judged on the combined aspects of susceptibility, value, size and scale, geographical extent, duration and reversibility. In the same way, four main levels of effect are used, **Major**, **Moderate**, **Minor** and **Negligible**. **Major** and **Moderate** effects that are considered to be **significant** in the context of EIA regulations.

1.72 **Table 6** sets out various criteria and descriptions that are used to guide judgments as to the level of effect.

Table 6: Levels of Effect - Visual

<table>
<tr><th colspan="4">Criteria tending towards Higher or Lower Effect</th></tr>
<tr><td>Major</td><td>Moderate</td><td>Minor</td><td>Negligible</td></tr>
<tr><td colspan="2">HIGHER LEVEL OF EFFECT
Effects on people who may be particularly sensitive to changes in views/ visual amenity, or at recognised viewpoints or from recognised scenic routes.
Large scale changes which introduce new, non-characteristic or discordant or intrusive elements into the view.
These may be long term/ irreversible effects.</td><td colspan="2">LOWER LEVEL OF EFFECT
• Effects on people who are generally less sensitive to changes in views/ visual amenity.
• Small changes or changes which are well integrated into the view, often involving features already present in the view.
• These may be reversible effects or of short duration.</td></tr>
<tr><td colspan="2">Significant</td><td colspan="2">Not Significant</td></tr>
<tr><td>The proposed Development results in substantial changes in the view and may become a defining influence or key focal point in the view.</td><td>The proposed Development results in clearly visible changes to the view and may form an important but not defining element of the view.</td><td>The proposed Development results in slight changes to the view, and is neither dominant nor prominent, but is visible in the view.</td><td>The proposed Development results in hardly perceptible changes to the view, may go unnoticed as a minor element in the view, or is not visible.</td></tr>
</table>

Assessment of Cumulative Effects

The Aim of the Cumulative Assessment

1.73 The methodology for the CLVIA is similar to that set out for the LVIA, although it focuses on the role played by the proposed Development amongst other windfarms that are consented or in-planning at the time of writing.

1.74 The key difference between LVIA and CLVIA is that some of the windfarms in the cumulative baseline do not currently exist. The judgements made in the LVIA are made in the context of the landscape, all its features and characteristics, the existing nature, quality and type of available views etc., that exist at the time of the assessment, and therefore includes all existing windfarms (operational or under-construction). The way in which the proposed Development relates to existing windfarms is set out in the LVIA, and the cumulative effect of this '*scenario*' forms an element of the LVIA. In this sense the LVIA represents the '*first level*' of a cumulative assessment (that which would consider introducing the proposed Development into the landscape in the context of existing wind farms).

1.75 The '*next levels*' of the CLVIA include windfarms that may be consented but not yet built and those that may be undetermined applications (including those under appeal). These possible future developments are assumed to be present for the purposes of CLVIA. In the consideration of cumulative effects, particular attention is given to the relationships between windfarms in the cumulative baseline, and how those relationships would change with the addition of the proposed Development.

1.76 The aim of the CLVIA is to "describe, visually represent and assess the ways in which a proposed wind farm would have additional impacts when considered together with other existing, consented or proposed wind farms" (NatureScot, 2021). A cumulative assessment considers different cumulative scenarios, in addition to the existing baseline scenario:

- Consented Scenario: the addition of the proposed Development in the context of operational, under construction and consented windfarms, i.e. a likely future scenario; and
- In-Planning Scenario: the addition of the proposed Development in the context of operational, under construction, consented, undetermined planning applications and windfarm developments currently at appeal, i.e. a less certain future scenario.

1.77 Regarding sites a scoping stage, NatureScot guidance states "Occasionally it may be appropriate to include proposals in an assessment which are at earlier stages of development (including at scoping), particularly where clusters of development or "hotspots" emerge, or where proposals are adjacent to one another. However, a degree of pragmatism is required to enable proposals to progress to determination, and to cater for proposals which may not yet be in the public domain" (NatureScot, 2021). No scoping stage sites were identified as being close enough to warrant detailed assessment in a review of developments to be included in the CLVIA.

The Stages of Assessment

1.78 The assessment of effects in the LVIA includes a range of components or types of effect that must be identified in order to inform the decision maker on what '*contribution is made by*' or '*role played by*' the proposed Development in the context of the overall accumulation of windfarms in the study area. Therefore, it considers both additive effects (which might be seen as quantitative effects) and '*overall*' or '*in the round*' effects (which might be seen as qualitative effects). Logical analysis and reasoning need then to be applied to judge the significance of the effect.

1.79 To undertake a CLVIA further information is required to inform the assessment, and further professional judgements would be necessary as part of the assessment. Further information required for the CLVIA includes:

- Preparation and analysis of combined ZTVs that focus on those areas where significant effects are most likely, and those developments with which significant effects are most likely;
- Information setting out the differing baseline scenarios against which judgement are made;
- Analysis of existing and / or emerging patterns of windfarm development in the landscape;
- Information regarding;
    - The directions of view in which the proposed Development is visible in context of other developments;
    - Proximity of the proposed Development to viewer and relative to other developments; and
    - Composition, setting, scale and size of developments and how the proposed Development compares with these; and
- Visualisations (wireframes) showing the proposed Development relative to other developments.

1.80 The cumulative windfarms are shown on **Figures 6.8a** to **6.8d**, and wireline visualisations (**Figures 6.11** to **6.27**), in accordance with NatureScot (SNH, 2017) guidance.

1.81 Taking a precautionary approach, the sensitivity of receptors used for the cumulative scenarios is taken to be the same as that identified in the LVIA.

Identification of Scope

1.82 The process for identifying windfarms to be considered in detail in the cumulative scenarios excluded single wind turbines of less than 50 m to blade tip height. Data was collected for windfarms within 45 km of the proposed Development; those within approximately 25 km are shown on **Figures 6.8a** to **6.8d**. The assessment of effects focussed on those with the potential to have significant cumulative relationships with the proposed Development, which tended to be those within approximately 15-20 km of the proposed Development. In order to allow time for the cumulative assessment and the production of supporting visualisation wirelines, a cumulative cut-off date of 11th March 2025 has been applied.

Levels of Effect

Additional Effects

1.83 The levels of additional cumulative effect are set out as **Major**, **Moderate**, **Minor** or **Negligible** using the same considerations set in the LVIA methodology and taking the level of effect to be the additional change as a result of the proposed Development to the scenario baseline (as if it were existing).

1.84 The levels of effect identified in the cumulative scenarios are compared with the effects identified in the LVIA (the existing scenario), by means of description, which sets out whether the change in baseline means there would be increased or reduced effect created by the proposed Development in that context.

Combined Effects

1.85 Combined or synergistic effects, effects for which the overall change is greater than the sum of the parts, are relevant for cumulative relationships between windfarms where there may be, for example, several discrete win farms, which together create the sense of a group or band of windfarms across the landscape. These types of effects relate to patterns of development across the landscape and the role that the proposed Development plays in altering the sense of wind energy development in the surrounding area.

1.86 Patterns of development are discussed in the LVIA and the cumulative assessment, and are considered using a series of thresholds or levels to indicate the degree to which the area is characterised by wind energy development, including:

- A landscape with occasional windfarms: wind turbines or windfarms are seen as separate isolated features within the LCT, too infrequent and of insufficient significance to be perceived as a characteristic of the area;
- A landscape with windfarms; wind turbines or windfarms are seen as a key characteristic of the landscape, but not of sufficient dominance to be a defining characteristic of the area; and
- A windfarm landscape: wind turbines or windfarms appear as a dominant characteristic of the area.

1.87 A significant in-combination cumulative effect would be one in which the introduction of the proposed Development would cause a change from one level to the next. Not significant effects are those in which the introduction of the proposed Development may cause an increase in the perceptions of windfarms in the landscape but would not alter the degree to which the area is characterised by wind energy development (using the levels set out above).

Implications of Effects for Designated Landscapes

1.88 The implications for designated landscapes as a result of the proposed Development are considered against the values, aims and/or special qualities of the designated areas and whether the proposed Development would compromise the integrity of the designation. This section, necessarily at the end of the chapter, does not draw conclusions about effects on designated areas, to avoid double counting of effects over the same areas of landscape as the landscape assessment, or the same views as the assessment of effects on views and visual amenity. Instead, the section draws out which effects (identified in the assessment sections) would affect the special qualities of the area and the reasons for which it was designated, to conclude on whether the integrity of the designated area would be affected.

Assessment Limitations

1.89 Limitations to the LVIA include a reliance on bare-ground modelling for wireframes and ZTVs used in graphics, which does not take account of potential screening by buildings and vegetation, or subsequent modifications to landform since the DTM was created.

1.90 The theoretical visibility indicated by the bare-ground models is therefore an over-estimation of visibility. Actual visibility is described for receptors based on fieldwork and is illustrated in photomontages. It was noted during fieldwork that forest plantations around the Site were at varying stages of harvest. The potential for loss of screening through felling or loss of trees in storms is taken into account in the assessment and discussed specifically where appropriate.

1.91 Whilst the issues relating to theoretical and actual screening have been identified, it is considered that there is sufficient information to enable an informed decision to be taken in relation to the identification and assessment of likely significant effects on landscape and visual amenity.

1.92 It should be noted that illustrations and modelling cannot replace the need for site visits and can only be used to represent what people may see from the viewpoint. Whilst accuracy of modelling is essential, modelling can only be as accurate as the data used and cannot be used to replace field visits. It is noted also that the movement of the turbines may render them more noticeable in the view than static photographs/photomontages can portray.

1.93 Limitations to the cumulative assessment include the uncertainty of whether the proposed windfarms would be built in the future. This includes consented schemes developments that may or may not be built. The assessment also relies on available data up to the 11 March 2025, and it should be noted

that the locations and specifications of turbines may change for proposed and consented developments schemes before they are built, through redesign and/or micrositing.

References

- Assessing the Cumulative Landscape and Visual Impact of Onshore Developments (NatureScot, 2021).
- EAC Local Development Plan 2, East Ayrshire Landscape Wind Capacity Study (EALWCS) (Carol Anderson Landscape Associates, 2018).
- EAC Adopted Local Development Plan 2 (EAC, 2024).
- East Ayrshire Local Landscape Area Boundary Review (EAC, 2021).
- *Guidelines for Landscape and Visual Impact Assessment, Third Edition* (GLVIA3) (Landscape Institute, Institute of Sustainability and Environmental Professionals (ISEP) (formerly Institute of Environmental Management and Assessment (IEMA)), 2013).
- Ordnance Survey (OS) topographic and geological maps.
- Scottish Landscape Character Types Map and Descriptions (NatureScot, 2019).
- SiteLink (NatureScot, 2025).
- Siting and Designing Windfarms in the Landscape (Scottish Natural Heritage (SNH), 2017).
- Visual Representation of Wind Farms: Guidance (SNH, 2017).