

Appendix 5.2 Landscape and Visual Impact Assessment Methodology

- 5.1 The landscape and visual impact assessment (LVIA), presented in Chapter 5, has been carried out in accordance with the principles contained within:
- Landscape Institute and Institute of Environmental Management and Assessment, (2013) Guidelines for Landscape and Visual Impact Assessment: Third Edition, hereafter "GLVIA3".
- 5.2 This assessment has also been informed by guidance contained within the following documents:
- Countryside Agency (2004) Topic Paper 6 Techniques and criteria for judging landscape sensitivity and capacity;
 - Design Commission for Wales (2014) Designing Wind Farms in Wales;
 - Gillespies LLP (2014) Planning Guidance for Wind Turbine Development Landscape and Visual Impact Assessment Requirements;
 - Landscape Institute (2011) Practice Advice Note, Photography and photomontage in Landscape and Visual Impact Assessment. Advice Note 01/11;
 - Natural Resources Wales (2017) LANDMAP Information Guidance Note 1. LANDMAP and Special Landscape Areas;
 - Natural Resources Wales (2013) Guidance Note 3 LANDMAP and LVIA for onshore windfarms;
 - Natural Resources Wales (2016) LANDMAP Guidance Note 4: LANDMAP and the Cultural Landscape;
 - Natural Resources Wales (2016) LANDMAP Guidance Note 5: LANDMAP and the Geological Landscape; and
 - Natural Resources Wales (NRW) (2016) LANDMAP Methodologies, with regard to;
 - Geological Landscape;
 - Landscape Habitats;
 - Visual and Sensory;
 - Historic Landscape; and
 - Cultural Landscapes.
 - Scottish Natural Heritage (2012) Assessing the Cumulative Impacts of Onshore Wind Energy Developments;
 - Scottish Natural Heritage (2017) Siting and Designing Wind Farms in the Landscape. Version 3;
 - Scottish Natural Heritage (2017) Visual Representation of Wind Farms. Version 2.2.

Methodological Overview

5.3 The key steps in the methodology for assessing both landscape and visual effects were as follows:

- A study area of 15 km radius was defined from the outmost turbines in all directions;
- The area in which the Proposed Development may be visible was established through ZTV mapping and field work;
- The landscape of the study area was analysed and landscape receptors identified, in particular the aspect areas defined by the LANDMAP study;
- The visual baseline was recorded in terms of the different groups of people who may experience views of the Proposed Development (visual receptors), the places where they will be affected, and the nature of views and visual amenity;
- Viewpoints were selected and agreed with relevant stakeholders (see Table 5.1 in the LVIA Chapter);
- Likely significant effects on landscape and visual receptors were identified; and
- The significance of landscape and visual effects was judged with reference to the sensitivity of the receptor (susceptibility and value) and magnitude of effect (a combination of the scale of effect, geographical extent, duration and reversibility).

Method for Assessing Landscape Effects

5.4 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).

Landscape Sensitivity

5.5 The sensitivity of a landscape receptor to change is defined through professional judgements on susceptibility and value as set out in Table 1. Further information on each criterion is provided below.

Table 1: Sensitivity of Landscape Receptors

Sensitivity of Landscape Receptors			
	Higher	↔	Lower
Susceptibility	Attributes that make up the character of the landscape offer very limited opportunities for the accommodation of change without key characteristics being fundamentally altered by wind	↔	Attributes that make up the character of the landscape are resilient to being changed by wind energy development.

Sensitivity of Landscape Receptors			
	energy development, leading to a different landscape character.		
Value	<p>Landscapes with high scenic quality, high conservation interest, recreational value, important cultural associations or rarity or uniqueness.</p> <p>Areas or features designated at a national level e.g. National Parks or NSAs or key features of these with national policy level protection.</p> <p>LANDMAP aspect areas with an “Outstanding” overall evaluation score.</p>	↔	<p>Landscape of poor condition and intactness, limited aesthetic qualities, or of character that is widespread.</p> <p>Areas or features that are not formally designated.</p> <p>LANDMAP aspect areas with a “Low” overall evaluation score.</p>

Susceptibility

- 5.6 Susceptibility means “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 Proposed Development without undue consequences for the maintenance of the baseline situation and/or the achievement of landscape planning policies and strategies” (GLVIA3 para. 5.40).
- 5.7 For wind energy development, a series of criteria are used to evaluate susceptibility of landscape character types or areas to wind energy development as set out in Table 2 below. These criteria are drawn from a range of published sources relating to wind farm development, including Siting and Designing Windfarms in the Landscape (SNH, 2017) and GLVIA3.

Table 2: Criteria to Determine Susceptibility to Wind Turbines

Characteristic/ attribute	Aspects indicating lower susceptibility to wind energy development	↔	Aspects indicating higher susceptibility to wind energy development
Scale	Large scale	↔	Small scale
Landform	Absence of strong topographical variety Featureless, convex or flat	↔	Presence of strong topographical variety or distinctive landform features
Landscape pattern and complexity	Simple Regular or uniform	↔	Complex Rugged and irregular
Settlement and human influences	Presence of contemporary structures e.g. utility, infrastructure or industrial elements	↔	Absence of modern development Presence of small scale, historic or vernacular settlement

Characteristic/ attribute	Aspects indicating lower susceptibility to wind energy development	↔	Aspects indicating higher susceptibility to wind energy development
Naturalness	Low degree of naturalness	↔	High degree of naturalness
Skylines	Non-prominent/screened skylines Presence of existing modern man-made features	↔	Distinctive, undeveloped skylines Skylines that are highly visible over large areas or exert a large influence on landscape character Skylines with important historic landmarks
Inter-visibility with adjacent landscapes	Little inter-visibility with adjacent sensitive landscapes or viewpoints	↔	Strong inter-visibility with sensitive landscapes Forms an important part of a view from sensitive viewpoints
Perceptual aspects	Close to visible or audible signs of human activity and development Weak sense of place or local distinctiveness	↔	Remote from visible or audible signs of human activity and development Strong sense of place or local distinctiveness

5.8 The LANDMAP approach records the five aspect layers separately, and different attributes are therefore considered in relation to each of the aspect layers. The principal attributes to be considered against each aspect layer are noted in Table 3, though all attributes may be considered against all aspect layers, where appropriate.

Table 3: Attributes Considered for LANDMAP Aspect Susceptibility

Aspect layer	Attributes considered (see Table 5.3)
Visual and sensory	Scale; Landform; Landscape pattern and complexity; Settlement and human influence; Skylines; Inter-visibility with adjacent landscapes; and Perceptual aspects
Cultural landscape	Landscape pattern and complexity; Settlement and man-made influence; Perceptual aspects
Geological landscape	Scale; Landform; Landscape pattern and complexity; Skylines
Historic landscape	Landscape pattern and complexity; Settlement and man-made influence; Skylines
Landscape habitats	Landscape pattern and complexity; Naturalness

5.9 Susceptibility is recorded as high, medium or low.

Value

5.10 Landscape value, for the purposes of the LVIA, is determined with reference to:

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

- review of LANDMAP aspect areas and their overall evaluation score as set out in Table 4 below.

5.11 LANDMAP gives each aspect area an ‘overall evaluation’ score which records a scale of landscape importance. This score is underpinned by individual scores attributed to a series of ‘evaluation criteria’ for each aspect area. The terms used are set out in the table below, which is based on Table 1 LANDMAP Guidance Note 1: LANDMAP and Special Landscape Areas (NRW, 2017).

Table 4: Attributes Considered for LANDMAP Aspect Susceptibility

Overall evaluation score	Definition of importance to the LANDMAP layer
Outstanding	International or national
High	Regional or county
Moderate	Local
Low	Little or no importance

5.12 Internationally and nationally designated landscapes, or those with an “Outstanding” overall evaluation score, would generally indicate landscape of higher value whereas those without formal designation (such as a widespread or common character type without high scenic quality, or those with a “Low” overall evaluation score) are likely to be of lower value. Value is recorded as ‘national’, ‘regional’, ‘local’ or ‘low’.

Nature of Effect (Magnitude of Landscape Change)

- 5.13 The nature of the effect on each landscape receptor (magnitude) is reported in terms of its scale, geographical extent, duration and reversibility.
- 5.14 The magnitude of change is defined as ‘high’, ‘medium’ or ‘low’ and is based on combining professional judgements on scale; geographical extent; duration and reversibility as set out below. Further information on each criterion is also provided.

Table 5: Nature of Landscape Effect (Landscape Magnitude)

Nature of Landscape Effects (Landscape Magnitude)			
	Higher	↔	Lower
Scale	Extensive loss of landscape features (and) or elements, and/or change in, or loss of key landscape characteristics, and/or creation of new key landscape characteristics.	↔	Some loss of landscape features (and) or elements, and/or change in or loss of some secondary landscape characteristics.
Geographical Extent	Change in landscape features and/or character extending considerably beyond the immediate site and affecting the	↔	Change in landscape features and/or character extending contained within the immediate site and affecting only a small

Nature of Landscape Effects (Landscape Magnitude)			
	whole of or multiple landscape character types/areas.		part of the landscape character type/area.
Duration	Changes experienced for a period of 25 years or more.	↔	Changes experienced for a short period of up to 5 years.
Reversibility	Change to features, elements or character which cannot be undone or only partly reversible after a long period.	↔	A temporary landscape change which is reversible following the completion of construction, or decommissioning of the development.

Scale

- 5.15 For landscape elements/features this depends on the extent of existing landscape elements that will be lost or changed, the proportion of the total extent that this represents and the contribution of that element to the character of the landscape.
- 5.16 In terms of landscape character, this reflects the degree to which the character of the landscape will change by removal or addition of landscape components, and how the changes will affect key characteristics.
- 5.17 This assessment of scale is described as being ‘imperceptible’, ‘small’, ‘medium’ or ‘large’.

Geographical Extent

- 5.18 Geographical extent over which the landscape effect will be felt is described as being at the ‘site level’, at the ‘level of the immediate surroundings of the site’, at the ‘scale of the landscape type/character area’, or ‘widespread’ affecting several landscape types or character areas

Duration

- 5.19 GLVIA3 states that “*duration can usually be simply judged on a scale such as short term, medium term or long term.*” For the purposes of this assessment, duration has been determined in relation to the phases of the Development, as follows:
- ‘short-term’ effects are those that occur during construction, and may extend into the early part of the operational phase, e.g. construction activities;
 - ‘medium-term’ effects are those that occur during part of the operational phase, e.g. relating to mitigation planting, where effects may cease or reduce on maturation of planting; and
 - ‘long-term’ effects are those which occur throughout the operational phase, e.g. presence of turbines, or are permanent effects which continue after the operational phase.

Reversibility

5.20 Reversibility is reported as reversible, partially reversible or not reversible (permanent), and is related to whether the change can be reversed (e.g. effects arising from presence of construction traffic will cease at the end of construction, whereas effects arising from presence of new built development will be not reversible). Wind energy developments may be decommissioned, and the effects of turbines are therefore considered reversible, though other elements may be permanent.

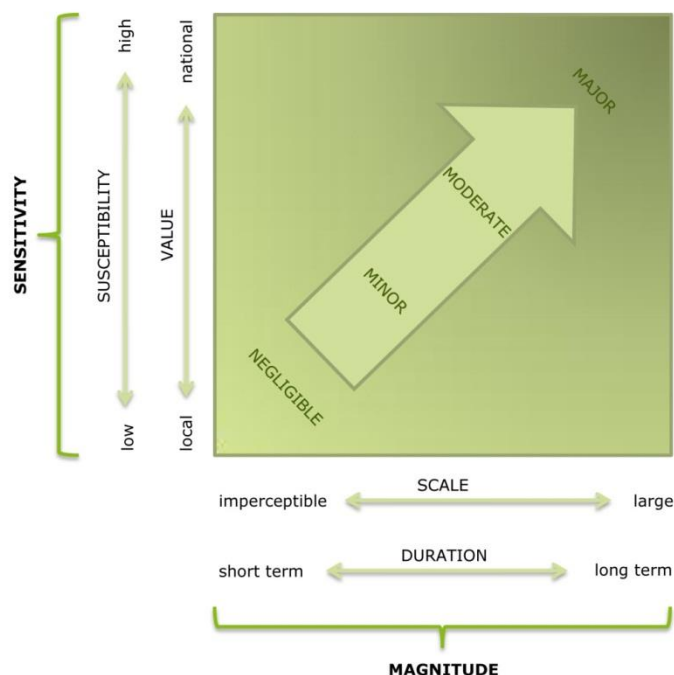
Significance of Landscape Effects

5.21 Judgements on sensitivity and magnitude were combined to make an informed professional assessment on the significance of each effect.

5.22 Although a numerical or formal weighting system was not applied, consideration of the relative importance of each aspect was made to feed into the overall decision. Levels of effect are identified as 'negligible', 'minor', 'moderate' or 'major' where effects of 'moderate' and above are considered significant in the context of the EIA Regulations.

5.23 This determination requires the application of professional judgement and experience to take on board the many different variables which need to be considered, and which are given different weight according to site-specific and location-specific considerations in every instance. Judgements are made on a case by case basis, guided by the principles set out in Diagram 1.

Diagram 1



Direction of Effects

5.24 The direction of effect (beneficial, adverse or neutral) is determined in relation to the degree to which the Proposed Development fits with landscape character and the contribution to the landscape that the development makes. With regard to wind energy development there is a broad spectrum of response from the strongly positive to the strongly negative. However, taking a precautionary stance, potential effects are assumed to be adverse unless otherwise specifically stated in the text.

Method for Assessing Visual Effects

5.25 Visual effects are experienced by people at different locations around the study area. Visual receptors are the people who will be affected by changes in views or visual amenity at different places, and they are usually grouped by what they are doing at that place (residents, motorists, recreational users etc.).

5.26 Judging the significance of visual effects requires consideration of the nature of the visual receptors (sensitivity) and the nature of the effect on those receptors (magnitude).

Visual Sensitivity

5.27 GLVIA3 states that the nature of visual receptors, commonly referred to as their sensitivity, should be assessed in terms of the susceptibility of the receptor to change in views/visual amenity and the value attached to particular views. The

nature of the effect should be assessed in terms of the size and scale; geographical extent; duration and reversibility.

5.28 Judgements on sensitivity and magnitude are then combined to form a judgement regarding the overall significance of visual effect. The following sections sets out the methodology used to evaluate susceptibility and value, when considering the sensitivity of the visual receptor, and size and scale; geographical extent; duration and reversibility, when considering nature of effect (magnitude).

5.29 The sensitivity of a visual receptor to change is defined as 'high', 'medium' or 'low' and is based on combining professional judgements on susceptibility and value as set out in Table 6 below. Further information on each criterion is also provided.

Table 6: Sensitivity of Visual Receptors

Sensitivity of Visual Receptors			
	Higher	↔	Lower
Susceptibility	Viewers whose attention or interest is focused on their surroundings including communities/ individual residential receptors/ people engaged in outdoor recreation/ visitors to heritage assets or other attractions where views of the surrounding area an important contributor.	↔	People whose attention is not on their surroundings (and where setting is not important to the quality of working life) such as commuters/ people engaged in outdoor sports/ people at their place of work.
Value	Views may be recorded in management plans, guide books, and/or which are likely to be experienced by large numbers of people. Views may be associated with nationally designated landscapes; local authority designated landscapes; designed views (vistas) recorded in citations for historic parks, gardens/scheduled monuments etc.	↔	Views which are not documented or protected. Views which are more incidental, and less likely to be associated with somewhere people travel to or stop, or which may be experienced by smaller numbers of people.

Susceptibility of Receptor

5.30 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 focussed on views (GLVIA3, paragraph 6.32).

Table 7: Susceptibility of Visual Receptors

Susceptibility	Receptor Group
High	Viewers whose attention or interest is focussed on their surroundings, including: Communities where views contribute to the landscape setting enjoyed by residents; People engaged in outdoor recreation (for example users of rights of way whose interest is likely to be focussed on the landscape); and/or Visitors to heritage assets or other attractions where views of surrounding are an important contributor to experience.
Medium	People travelling on scenic routes and tourist routes, where attention is focussed on the surrounding landscape, but is transitory; and/or people at their place of work whose attention is focussed on the surroundings and where setting is important to the quality of working life.
Low	People travelling more rapidly on road, rail or transport routes (not recognised as scenic routes);

Susceptibility	Receptor Group
	people engaged in outdoor sport or recreation which does not involve or depend upon appreciation of views of the landscape; and/or people at their place of work whose attention is not on their surroundings (and where setting is not important to the quality of working life).

View Value

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

- planning designations;
- recorded as important in relation to heritage assets (such as designed views recorded in citations of Historic Parks and Gardens or views recorded as of importance in Conservation Area Appraisals); and
- 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.

5.32 Judgements on value of views are recorded as of international / national value, regional / local value and community value according to Table 8 below.

Table 8: Definitions of Value Attached to Views

Value	Description
International/ National Value	Views recorded in World Heritage Site Management Plans or associated with nationally designated landscapes (perhaps identified in management plans), designed views recorded in citations for historic parks and gardens/scheduled monuments or a view regularly used in guide books for that part of the country.
Regional/ Local Value	Views associated with local authority designated landscapes or recorded as of importance in Conservation Area Appraisals or experienced by a visitors to an area as well as the local community.
Community Value	Views valued at a community level and likely to be experienced mostly by the local community.

Nature of Visual Effect (Magnitude of Visual Change)

5.33 The magnitude of change is defined as ‘High’, ‘Medium’ or ‘Low’ and is based on combining professional judgements on scale; geographical extent; duration and reversibility as set out below. Further information on each criterion is also provided.

Table 9: Nature of Visual Effect (Visual Magnitude)

Nature of Visual Effects (Visual Magnitude)			
	Higher	↔	Lower
Scale	A large visual change resulting from the Development is the most notable aspect of the view perhaps	↔	A small or some visual change resulting from the Development as a minor or generally unnoticed

Nature of Visual Effects (Visual Magnitude)			
	as a result of the development being in close proximity, or because a substantial part of the view is affected, or because the Development introduces a new focal point and/or provides contrast with the existing view and/or changes the scenic qualities of the view.		aspect of the view perhaps as a result of the development being in the distance, or because only a small part of the view is affected, and/or because the Development does not introduce a new focal point or is in contrast with the existing view and/ does not change the scenic qualities of the view.
Geographical Extent	The assessment location is clearly and without doubt representative of similar visual effects over an extensive geographic area.	↔	The assessment location clearly represents a small geographic area.
Duration	Visual change experienced over 25 years or more.	↔	Visual change experienced over a short period of up to 5 years.
Reversibility	A permanent visual change which is not reversible or only partially reversible following decommissioning of the Development.	↔	A temporary visual change which is reversible following the completion of construction, or decommissioning of the Development.

Scale of Effect

5.34 The scale of change depends on:

- the extent 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 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 whether views will be full, partial or glimpses.

5.35 The assessment of effects assumes winter conditions, this being the worst case situation with minimal screening by vegetation and deciduous trees.

5.36 In this assessment scale is described as being imperceptible, small, medium or large.

Geographical Extent of Effect

5.37 This records the extent of the area over which the changes would be visible e.g. whether there is only one point from where the Proposed Development can be glimpsed, or whether similar views can be gained from large areas.

- 5.38 In this assessment geographical extent is described as being ‘localised’ or ‘widespread’.

Duration of Effect

- 5.39 Duration is reported as ‘short term’, ‘medium term’ or ‘long term’, as defined within GLVIA3.

Reversibility of Effect

- 5.40 Reversibility is reported as reversible, partially reversible or not reversible, and is related to whether the change can be reversed (e.g. effects arising from presence of construction traffic will cease at the end of construction, whereas effects arising from presence of new built development will be not reversible).

Significance of Visual Effects

- 5.41 Judgements on sensitivity and magnitude were combined to make an informed professional assessment on the significance of each effect.
- 5.42 Although a numerical or formal weighting system was not applied, consideration of the relative importance of each aspect was made to feed into the overall decision. Levels of effect are identified as ‘negligible’, ‘minor’, ‘moderate’ or ‘major’ where effects of moderate and above are considered significant in the context of the EIA Regulations.
- 5.43 This determination requires the application of professional judgement and experience, giving due consideration to the many different variables which are given different weight according to site-specific and location-specific considerations in every instance. Judgements are made on a case by case basis, guided by the principles set out in Diagram 1.1.

Direction of Effects

- 5.44 The direction of effect (positive, negative or neutral) is determined in relation to the degree to which the proposal fits with the view and the contribution to the view that the development makes, even if it is in contrast to the existing character of the view.
- 5.45 With regard to wind energy development there is a broad spectrum of response from the strongly positive to the strongly negative. However, taking a precautionary stance, potential effects are assumed to be adverse unless otherwise specifically stated in the text.

Cumulative effects

- 5.46 As with the LVIA, the cumulative LVIA (CLVIA) deals with landscape and visual receptors separately. The scope of the CLVIA aims to focus on the likely significant additional effects arising from the Proposed Development in combination with other operational or planned wind farms.
- 5.47 Significant cumulative effects are more likely to occur where wind farms lie in closer proximity, and there is greater certainty of an effect occurring when other developments being considered are operational or consented. Those developments at an earlier stage of the process (i.e. valid planning applications) are less certain and may change as the process progresses. As such there is a lower level of certainty associated with cumulative effects arising from interactions with them.
- 5.48 The CLVIA has focused on the assessment of ‘additional’ cumulative effects, i.e. the effect of adding the Proposed Development to a baseline of other built or unbuilt wind farms. Where ‘total’ cumulative effects (i.e. assessment which considers the effects if all current, past and future proposals are deemed present, including the Development) are considered to be significant, then reference is also made to these.
- 5.49 The identification of wind energy schemes for consideration in the cumulative assessment has been undertaken in accordance with the recommendations set out in Planning Guidance for Wind Turbine Development: Landscape and Visual Impact Assessment Requirements (2014). Wind farms included in the assessment are listed in the Future Baseline section, below.

Methodology for the Assessment of Cumulative Effects

- 5.50 The methodology for the assessment of cumulative landscape and visual effects considers the criteria set out in the LVIA methodology of this chapter. In addition, attention was paid to the following:
- The arrangement of wind farms in the landscape or view;
 - The relationship between the scale and layout of the wind farms, including turbine size/proportion/number of turbines;
 - The position of the wind farms within the landscape, e.g. in similar landscape or topographical context; or within the view, e.g. on the skyline, against the backdrop of land;
 - The distances between wind farms, and their distance and direction from the receptor; and
 - The cumulative effect of ancillary development, e.g. access tracks.
- 5.51 The CLVIA has taken consideration of cumulative landscape effects e.g. on the physical fabric of the landscape and on landscape character.

- 5.52 In terms of cumulative visual effects, the CLVIA has taken consideration of:
- combined effects (where several developments are within the observer's same arc of vision);
 - successive effects (where the observer has to turn to see the various developments); and
 - sequential effects (where the observer has to move to another location to see different developments).
- 5.53 Both additional and total (also known as combined) effects are considered where appropriate in the assessment.