

Appendix 10.2

Assessment Method

Definitions and Approach

359 The general methodology adopted is that described in the Guidelines for Landscape and Visual Impact Assessment (GLVIA3, Third Edition 2013).

360 Several individual, but linked, studies have been undertaken to assess the effects of the proposed Renewable Energy Park on both landscape and visual receptors.

361 The aim of the report is to establish, using accepted criteria, the significance of any change or impact to the character of the local landscape and to the character of the broader area, as a consequence of the Renewable Energy Park. It also aims to determine whether the proposed development would have significant visual impacts.

362 The term 'receptor' is used in the report to mean the physical landscape resource, special interest or viewer group that has the potential to experience an effect.

Identifying Landscape and Visual Effects?

363 This assessment has sought to identify the key landscape and visual receptors that may be affected by the changes that may be caused by the proposed development.

364 The assessment of effects on landscape as a resource in its own right, draws on the description of the development, the landscape context and the visibility and viewpoint analysis to identify receptors, which, for the proposed development include the following:

365 The landscape fabric of the site;

366 The key landscape characteristics of the local context;

367 The 'host' landscape character area which contains the proposed development;

368 The 'non-host' landscape character areas where there is the potential for secondary effects beyond the host landscape character area; and

369 Landscape designations on a national or local level (where relevant).

370 The locations and types of visual receptors within the defined study areas are identified from Ordnance Survey maps and other published information (such as walking guides), and from fieldwork observations. The visual receptor is the user of a space or linear route. Examples of visual receptors include the following:

- Those people using spaces within settlements and dwelling in private residences;
- Users of National Cycle Routes and National Trails;
- Users of local/regional cycle and walking routes;
- Those using local rights of way – walkers, horse riders, cyclists;
- Users of open spaces with public access;
- People using major (Motorways, A and B) roads;
- People using minor roads; and

- People using railways.

Receptors Assessment of Landscape and Visual Effects

- 371 In GLVIA3 the LI and IEMA set out in paragraphs 5.39 and 5.40 that: *“Landscape receptors need to be assessed firstly in terms of their sensitivity, combining judgements of their susceptibility to the type of change or development proposed and the value attached to the landscape. In LVIA sensitivity is similar to the concept of landscape sensitivity used in the wider arena of landscape planning, but is not the same as it is specific to the particular project or development that is being proposed and to the location in question”.*
- 372 *“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 proposed development without undue consequences for the maintenance of the baseline situation and/or the achievement of landscape planning policies and strategies.”*
- 373 The sensitivity of receptors to landscape or visual change determines the physical extent of individual studies.
- 374 The sensitivity of the receptor is analysed in conjunction with the magnitude of change to obtain an objective and consistent assessment of the level of impact.
- 375 The measure of sensitivity also reflects the number of people within the landscape who are likely to perceive the changes, including residents and visitors.
- 376 The assessment of effects on the landscape resource includes consideration of the potential changes to those key elements and components, which contribute towards recognised landscape character or the quality of designated landscape areas; these features are termed a landscape receptor. Landscape character is defined as being *“a distinct and recognisable pattern of elements that occur consistently in a particular type of landscape. Particular combinations of geology, landform, soils, vegetation, land use, field patterns and human settlement create character”.*
- 377 The assessment of visual amenity requires the identification of potential visual receptors that may be affected by the development. The visual resource is defined as the nature and quality of a particular landscape or view (known as visual amenity).
- 378 As noted, following the identification of each of these various landscape and visual receptors, the effect of the development on each of them is assessed through consideration of a combination of:
- 379 Their overall sensitivity to the proposed form of development that includes the value attached to the receptor following the baseline appraisal, combined with the susceptibility of the receptor to the change proposed, determined during the assessment stage; and
- 380 The overall magnitude of change that will occur - based on the size and scale of the change, its duration and reversibility.

Defining Receptor Sensitivity Receptors

- 381 A number of factors influence professional judgment when assessing the degree to which a particular landscape or visual receptor can accommodate change arising from a particular development. Sensitivity is made up of judgements about the **‘value’** attached to the receptor, which is determined at baseline stage, and the **‘susceptibility’** of the receptor, which is determined at the assessment stage when the nature of the proposals, and therefore the susceptibility of the landscape and visual resource to change, is better understood.

- 382 Susceptibility, defined in GLVIA3, Page 158, indicates: ‘the ability of a defined landscape or visual receptor to accommodate the specific proposed development without undue negative consequences’. Susceptibility of visual receptors is primarily a function of the expectations and occupation or activity of the receptor. A degree of professional judgement applies in arriving at the susceptibility for both landscape and visual receptors and this is clearly set out in the technical tables within this assessment.
- 383 A location may have different levels of sensitivity according to the types of visual receptors at that location and any one receptor type may be accorded different levels of sensitivity at different locations.
- 384 **Table 1** provides an indication of the criteria by which the overall sensitivity of a landscape receptor is judged within this assessment, and considers both value and susceptibility independently on a scale of high to low.

Table 1: Landscape Sensitivity Criteria

Category	Landscape Receptor Value Criteria	Landscape Susceptibility to Change Criteria
High	Nationally/Internationally designated/valued countryside (e.g. AONB, NP) and landscape features; many distinctive landscape characteristics; very few landscape detractors.	Strong / many distinctive landscape elements/aesthetic/perceptual aspects; very few landscape detractors; landscape receptors in good/excellent condition. Landscapes with clear and widely recognised cultural value. Landscapes with a high level of tranquillity. The landscape has a low capacity for change as a result of potential changes to defining character
Medium	Undesignated countryside and landscape features; some distinctive landscape characteristics; few landscape detractors.	Some distinctive landscape elements/aesthetic/perceptual aspects; few landscape detractors; landscape receptors in fair condition. Landscape is able to accommodate some change as a result.
Low	Undesignated countryside and landscape features; few distinctive landscape characteristics; presence of many / notable landscape detractors.	Few distinctive landscape elements/aesthetic/perceptual aspects; presence of landscape detractors; landscape receptors in poor condition. Landscape is able to accommodate large amounts of change without changing these characteristics fundamentally.

- 397 For visual receptors, judgements of susceptibility and value are closely interlinked considerations. For example, the most valued views are those that people go and visit because of the available view, and it is at those viewpoints that their expectations will be highest and thus most susceptible to change.
- 398 For this reason the sensitivity of visual receptors is defined using a process that combines both susceptibility and value as indicated by the criteria in **Table 2**.

Table 2: Visual Receptor Sensitivity

Category	Visual Receptor Sensitivity Criteria
High	<p>View of clear value (which may be to or from a recognised heritage asset or other important viewpoint) but may not be formally recognised e.g. framed view of high scenic value, or destination hill summits, including promoted viewpoint e.g. interpretative signs. References in literature and art and/or guidebooks tourist maps. In addition it may also be inferred that the view is likely to have value e.g. to local residents.</p> <p>Examples may include views from residential properties, especially from rooms normally occupied in waking or daylight hours; national public rights of way e.g. National Trails and nationally designated countryside/landscape features with public access which people might visit purely to experience the view; and visitors to heritage assets of national importance. In addition, views from recreational receptors where there is some appreciation of the landscape e.g. golf and fishing; local public rights of way, access land and National Trust land, also panoramic viewpoints marked on maps; road routes promoted in tourist guides for their scenic value, plus main roads within nationally important landscapes (e.g. AONBs or National Parks).</p>
Medium	<p>View is not promoted or recorded in any published sources and may be typical of the views experienced from a given receptor.</p> <p>Examples may include people engaged in outdoor sport other than appreciation of the landscape e.g. football and rugby or road users on minor routes passing through rural or scenic areas.</p>
Low	<p>View of clearly lesser value than similar views experienced from nearby visual receptors that may be more accessible.</p> <p>Examples may include road users on main road routes (motorways/A roads) and users of rail routes or people at their place of work (where the place of work may be in a sensitive location). Also views from commercial buildings where views of the surrounding landscape may have some limited importance.</p>

- 410 This approach enables the assessor to make consistent judgements when assessing overall sensitivity of any landscape or visual receptor, as determined by combining judgements of their susceptibility to the type of change or development

proposed, and the value attached to the landscape, as set out at paragraph 5.38 of GLVIA3. However, it should be noted that the assessment of overall sensitivity can change on a case-by-case basis.

- 411 For example a high susceptibility to change and a low value may result in a medium overall sensitivity, unless it can be demonstrated that the receptor is unusually susceptible or is in some particular way more valuable. A degree of professional judgement applies in arriving at the overall sensitivity for both landscape and visual receptors.

Magnitude of Change

- 412 The magnitude of any landscape or visual change is determined through a combination of the scale of the development or change, the geographical extent of the change and the duration and reversibility of the change. The magnitude of change is considered for each receptor.

Theoretical Visibility Analysis

- 413 The potential visibility of the proposed solar farm development within this landscape has been identified on a Zone of Theoretical Visibility (ZTV) map created electronically using digital terrain models (Figure 5.4.1: Extent of Theoretical Visibility (ZTV) 5km Radius Study Area (B/W Mapping)).

- 414 ZTVs are intervisibility maps that have been generated with a proprietary computer-based intervisibility package (ReSoft WindFarm package), the Ordnance Survey Terrain 5 and Terrain 50 data (to create a bare earth digital terrain model or DTM), aerial photography and target points on the solar panel arrays.

- 415 In this instance, two types of ZTVs have been generated:

- 416 **Basic terrain-based ZTVs** – these use the bare earth DTM only and do not include the screening effects of buildings and vegetation (see LVIA Figures L1 & L2). The basic terrain-based ZTVs illustrate the locations in the study area where the proposed other solar farm would be completely screened by intervening landform (no colour on the ZTV) and the locations where landform may permit views of at least one of the target points on the solar farm under analysis. However, there will be locations within these zones where the solar panels would, in reality, be screened by buildings and vegetation.

- 417 **ZTV with Visual Buffers** – this uses the DTM and also existing visual buffers (woodlands, buildings and hedgerows). The locations and extents of the visual buffers have been digitised from aerial photography and generalised heights have been used in the calculations - 10m (woodland), 8.4m (buildings, based on a typical two-storey residential property) and 2m (hedgerows) (see LVIA Figure 4.4: Extent of Theoretical Visibility (ZTV) Detailed Study Area (with Visual Buffers)). The ZTV with visual buffers represents a better estimate of the likely extent of visibility when the proposed development is first constructed but is still an approximation due to the generalised heights used in the calculations. The resultant figures show the ZTV with Visual Buffers rather than the ZTV.

- 418 Some features blocked out as buffers in the calculations, such as woodlands and hedgerows, and may be taller or shorter than the heights used. In addition, not all vegetation is included in the model and the heights of the woodlands and hedgerows will also vary seasonally and will tend to increase over time, in particular, those hedgerows included in the Landscape and Habitat Enhancement Plan, identified for positive management.

- 419 The new hedgerows, hedge gap planting and hedgerow management proposed in the Landscape and Habitat Enhancement Plan have not been included in the model for this ZTV. Accordingly, should the proposed enhancement measures prove effective the visibility of the scheme will be further reduced.

- 420 The undulating landform and abundance of hedgerows and other strong landscape features on and around this proposed development site provide an effective but variable degree of screening which these ZTVs cannot illustrate accurately. Also, these ZTVs do not illustrate the effects of distance and so do not illustrate the true extent of “visual impact”. They are valuable a tool for the assessor and determining authority to be used, in conjunction with field visits and other visual representations.
- 421 The ZTV has been modelled using 5m OS data and is based on 3m tall arrays. The blocks of woodland, treelines and shelterbelts, and untrimmed hedges within the context of the site have been digitised as exclusion zones with a height of 10m. The hedges have been included, modelled with a 2m height, representing worst-case-scenario and taking into account some local landform undulations.
- 422 Viewpoints that would illustrate the range of views of the proposed development were identified first from the ZTV and were subsequently visited. All roads and all of the public rights of way within the ZTV within a 2km radius of the site were visited together with the public highway access points to all residential properties within the ZTV and a 1km radius of the site.
- 423 Receptor locations from which views of the proposed development are not likely to occur will receive no change and therefore no effect. With reference to the Zone of Theoretical Visibility (ZTV) and site survey, the magnitude of change is defined for receptor locations from where visibility of the proposed development is predicted to occur. Photographs supported by annotations were created for the views experienced from local viewpoints to illustrate the location of the proposed solar farm in each view (**Viewpoints 1-13**). This is so that decision makers, consultees and the public can visualise the context of the proposed development.
- 424 **Table 3** provides an indication of the criteria by which the size/scale of change at a landscape or visual receptor is judged within this assessment.

Table 3: Scale of Change Criteria

Category	Landscape Receptor Criteria	Visual Receptor Criteria
High	Total / notable loss or alteration to one or more key element/feature/characteristic of the baseline condition. Addition of elements that are prominent and may conflict with the key characteristics of the existing landscape.	The proposed development will be clearly noticeable and the view would be fundamentally altered by its presence.
Medium	Partial loss or alteration to one or more key element/feature/characteristic of the baseline condition. Addition of elements that may be evident but do not necessarily conflict with the key characteristics of the existing landscape.	The proposed development will form a new and recognisable element within the view that is likely to be recognised by the receptor.

Low	Minor loss or alteration to one or more key element/feature/characteristic of the baseline landscape. Addition of elements that may not be uncharacteristic within the existing landscape.	The proposed development will form a minor constituent of the view being partially visible or at sufficient distance to be a small component.
Very Low	Very minor loss or alteration to key element/feature/characteristic of the baseline landscape. Addition of elements may not be uncharacteristic within the existing landscape	The proposed development will form a very minor component of the view, and the view whilst slightly altered would be similar to the baseline situation
Negligible	Barely discernible loss or alteration to key element/feature/characteristic of the baseline landscape. Addition of elements not uncharacteristic within the existing landscape	The proposed development will form a barely noticeable component of the view, and the view whilst slightly altered would be similar to the baseline situation

443 **Table 4** below provides an indication of the criteria by which the geographical extent of the area affected is adjudged within this assessment:

Table 4: Geographical Extent Criteria

	Landscape Receptor Criteria	Visual Receptor Criteria
Range from Largest to Smallest	Large-scale effects influencing several landscape types or character areas.	Direct views at close range with changes over a wide horizontal and vertical extent.
	Effects at the scale of the landscape type or character areas within which the proposal lies.	Direct or oblique views at close range with changes over a notable horizontal and/or vertical extent.
	Effects within the immediate landscape setting of the site.	Direct or oblique views at medium range with a moderate horizontal and/or vertical extent of the view affected.
	Effects at the site level (within the development site itself).	Oblique views at medium or long range with a small

horizontal/vertical extent of the view affected.

Effects only experienced on parts of the site at a very localised level. Long range views with a negligible part of the view affected.

No Effect No Effect

460 The third, and final, factor, in determining the magnitude of change is duration and reversibility. Duration and reversibility are separate but linked considerations. Duration is judged according to the temporally defined terms of:

- Long-term (15 years+);
- Medium-term (5 to 15 years);
- Short-term (1-5 years);
- Temporary under 12 months.

461 Reversibility is a more subjective judgement about the prospects and practicality of the particular effect being reversed in time, such as over a growing season or a generation. The categories used in this assessment are set out below:

- Permanent with unlikely restoration to original state e.g. major road corridor, power station, urban extension etc;
- Permanent with possible conversion to original state e.g. agricultural buildings, retail units;
- Partially reversible to a different state e.g. mineral workings;
- Reversible after decommissioning to a similar original state e.g. wind energy or solar development; and
- Easily and quickly reversible e.g. temporary structures such as and including site compounds and construction plant.

Magnitude of Effect

462 In assessing the significance of landscape or visual impacts the GLVIA3 (paragraph 3.22) recommends that practitioners should: *“take account of the nature of the effects, as well as the nature of the receptors”*. By combining the sensitivity (or nature) of receptor (**Table 1 or Table 2**) with the magnitude of change (nature of effect) (combination of **Tables 3, 4** and the duration of effect) the significance of impact is determined. Having taken such a wide range of factors into account when assessing sensitivity and magnitude at each receptor, the magnitude of effect can be derived by combining the sensitivity and magnitude in accordance with a matrix. This process is recorded in **Table 5**. The same process applies to effects on both landscape and visual amenity receptors.

Table 5: Degrees of Landscape or Visual Amenity Impact Magnitude and Significance

Impact Magnitude					
High	Moderate	Moderate/ Moderate to Substantial	Moderate to Substantial	Moderate to Substantial / Substantial	Substantial
Medium / High	Slight to Moderate /Moderate	Moderate	Moderate /Moderate to Substantial	Moderate to Substantial	Moderate to Substantial /Substantial
Medium	Slight to Moderate	Slight to Moderate/ Moderate	Moderate	Moderate /Moderate Substantial	Moderate to Substantial
Medium / Low	Slight / Slight to Moderate	Slight to Moderate	Slight to Moderate /Moderate	Moderate	Moderate/ Moderate to Substantial
Low	Slight	Slight / Slight to Moderate	Slight to Moderate	Slight to Moderate / Moderate	Moderate
Very Low	Slight / Negligible	Slight	Slight / Slight to Moderate	Slight to Moderate	Slight to Moderate / Moderate
Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
Receptor Sensitivity	Low	Medium / Low	Medium	Medium / High	High

513 The GLVIA also states out that: *“The regulations specify that an EIA must consider direct effects and any indirect, secondary, cumulative, short-, medium- and long-term, permanent and temporary, positive and negative effects of the development. This means that in LVIA thought must be given to whether the likely significant landscape and visual effects:*

514 *Result directly from the development itself (direct effects) or from consequential change resulting from the development (indirect and secondary effects), such as alterations to a drainage regime which might change the vegetation downstream with consequences for the landscape, or requirement for associated development, such as a requirement for mineral extraction to supply material or a need to upgrade utilities, both of which may themselves have further landscape and visual effects:*

515 *Are additional effects caused by the proposed development when considered in conjunction with other proposed developments of the same or different types (cumulative effects);*

- 516 *Are likely to be short-term or carry on over a long period of time;*
- 517 *Are likely to be permanent or temporary, in which case the duration, as above, is important;*
- 518 *Are judged to be positive (beneficial) or negative (adverse) in their consequences for landscape or for views and visual amenity (this is sometimes referred to as the 'valency' of the effect but as this word has a formal definition relating to chemistry it is best avoided).*

Residual Effects

- 519 Residual effects are those that remain once the landscape mitigation and enhancement measures have taken effect, likely to be 5-7 years post-completion of the development. This assessment provides an assessment of both the residual effects, and also those at Year 1, when the proposals will be at their most visible, and where mitigation is only partially effective.
- 520 The landscape and visual effects will be considered against the landscape baseline, which includes published landscape strategies and policies. Changes involving the addition of large-scale man-made objects are typically considered to be adverse as they are not usually actively promoted as part of published landscape strategies. It is inevitable that a proposal to site a new solar energy development in the UK will result in some significant landscape and visual effects in the immediate locality and context of the development site. Significant effects are not necessarily adverse or, if adverse, are not necessarily unacceptable.
- 521 Solar panels and PV developments can generate a range of responses from negative to positive or neutral and as such, the nature of any effect is subjective and will vary from individual to individual. There is currently no research giving evidence-based information on the consensus of opinion as to the threshold above which significant changes in the view would have an unacceptable effect on visual amenity. Some people find solar Farms to be attractive features, whilst others may consider that they detract from the view. This will influence the threshold at which people consider unacceptable effects will occur.