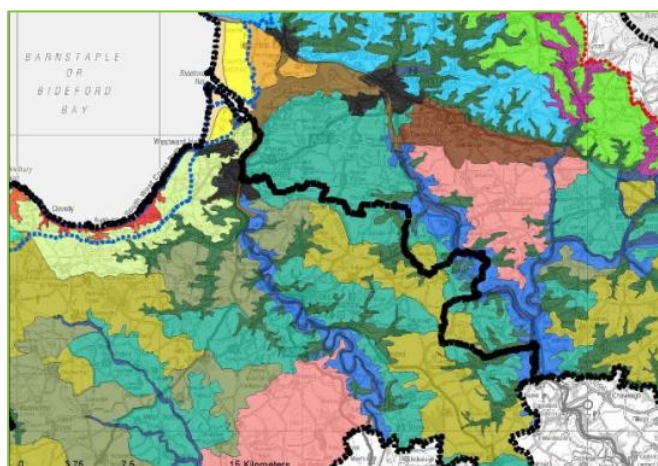


Devon Landscape Policy Group Advice Note No. 2: Accommodating Wind and Solar PV Developments in Devon's Landscape

Guidance on minimising harm to the distinctive character and special qualities of Devon's landscape through sensitive siting and design

Final Report

Prepared by LUC June 2013



Project Title: DLPG Advice Note No. 2: Guidance on the Siting, Design and Assessment of Wind and Solar PV Developments in Devon

Client: Devon County Council (on behalf of Devon Landscape Policy Group Members)

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Fullabrook Windfarm on the North Devon Downs (© Andrew Bowman)

Solar PV Development at Five Mile Hill near Pathfinder Village, Teignbridge District. Photo credit Olwen Maidment, Teignbridge District Council.

Pause for Breathtaking View! The 'Summer House' near Mouthmill, North Devon. Photographer Cynthia Snowdon.

Extract from a Landscape Character Types Map

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Prepared by LUC June 2013**

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1 Introduction

- 1.1 This guidance promotes good siting and design of wind and solar PV development that takes account of the special qualities and distinctive characteristics of Devon's landscape. The guidance aims to show how these development types may be accommodated whilst minimising harm to Devon's landscape and protecting what people most value.
- 1.2 The National Planning Policy Framework establishes a presumption in favour of sustainable development unless any adverse impacts would significantly and demonstrably outweigh the benefits (NPPF, para. 14). The benefits of renewable energy generation resulting from these development types are clear. However, their potential adverse effects on the landscape are less easy to define and articulate. This guidance is therefore intended to support balanced decision-making that takes landscape character into account when weighing up the benefits and adverse effects of these developments.
- 1.3 The guidance has been commissioned by Devon County Council on behalf of the Devon Landscape Policy Group. Funding for the guidance has been provided jointly between Devon County Council and Natural England.
- 1.4 Consistent Devon-wide guidance is justified by the National Planning Policy Framework (NPPF) duty to co-operate on planning issues that cross administrative boundaries. Development associated with climate change mitigation is identified as a strategic priority to which this duty applies together with the conservation and enhancement of the natural and historic environment, including landscape. The effects of a wind or field-scale solar PV development proposal on a specific landscape type or area may have more than local significance, since:
 - Variations in landscape character and quality in Devon rarely adhere to administrative boundaries, as evident in Devon's landscape character assessments and designation boundaries for nationally and internationally protected landscapes;
 - Wind or field-scale solar PV development proposals have the potential to harm the special qualities and distinctive characteristics of an area and these landscape and visual effects can extend across administrative boundaries. These development proposals also have the potential to result in adverse cumulative landscape effects when taking into account existing or planned similar development in neighbouring administrative areas. The NPPF (paragraph 97) requires these effects to be addressed satisfactorily.
- 1.5 This Advice Note therefore seeks to ensure that planning applications received for these development types in Devon are of a high standard, drawing upon Devon's most up to date landscape character assessments, and containing clear and relevant information that is necessary and material to the determination of the planning application, giving people the information they need to make informed decisions. It includes Devon-specific guidance on how to undertake assessments of these development types as part of planning applications, and is intended to supplement rather than replace other existing relevant guidance.
- 1.6 The guidance is intended for use by a range of audiences involved in the preparation, presentation, review and consenting of wind and solar PV energy development proposals in Devon. This includes:
 - Planning authorities in Devon, in connection with their duties to plan positively for renewable energy and manage development whilst protecting and enhancing Devon's environment;
 - Wind and solar PV energy developers who seek to take into account the special qualities and distinctive characteristics of Devon's landscape and secure a high standard of design in their development proposals.

What is the Devon Landscape Policy Group?

The Devon Landscape Policy Group comprises an informal partnership of officers from planning authorities, National Parks, AONB Partnerships and Natural England. Originally set up in 2005 to develop the Devon Landscape Character Assessment programme, the Group now works under the National Planning Policy Framework duty to co-operate, promoting consistent landscape policy and guidance within Devon. For more information go to:

http://www.devon.gov.uk/index/environmentplanning/natural_environment/landscape/landscapecharacter/landscapepolicygrp.htm

Need for the Guidance

- 1.7 Devon is faced with a wide range of challenges arising from a changing climate. Balancing the need to support the transition to a low carbon future (a core planning principle of the National Planning Policy Framework, NPPF¹) and the need for energy security (as recognised in the National Policy Statement for Renewable Energy Infrastructure, EN-3) with the management of Devon's distinctive and valued landscape is one of these challenges.
- 1.8 The NPPF states that planning authorities should "take account of the different roles and character of different areas, promoting the vitality of our main urban areas, protecting the Green Belts around them, recognising the intrinsic character and beauty of the countryside and supporting thriving rural communities within it".
- 1.9 The growing number of planning applications, particularly outside designated areas (as shown on DECC's renewables map²), raises concerns about the potential effect of renewable energy developments on the character and quality of Devon's landscape, especially cumulatively.
- 1.10 The NPPF also calls for valued landscapes to be protected and enhanced (109), with the greatest weight being given to conserving landscape and scenic beauty in National Parks and Areas of Outstanding Natural Beauty (AONBs) (115). There is a presumption against 'major developments'³ in protected landscapes (116). For Devon this is significant, given that some parts of Devon are of national importance for their natural beauty (this includes two National Parks and five areas of Outstanding Natural Beauty, AONBs). However, even developments outside protected landscapes can affect their special qualities.

¹ Department for Communities and Local Government (March 2012) National Planning Policy Framework.

² <http://restats.decc.gov.uk/app/pub/map/map/>

³ For solar PV 'major development' in planning terms applies to development carried out on a site having an area of 1 hectare or more. For wind turbines the EIA Regulations Schedule 2, 3(i) states that a wind energy development may be considered "major development" if more than two turbines or the hub height is greater than 15m.

How landscape character and quality is protected in Devon

Devon's landscape is protected by a range of mechanisms including statutory and non-statutory designations, national planning policies and European conventions. Designated landscapes in Devon comprise:

International

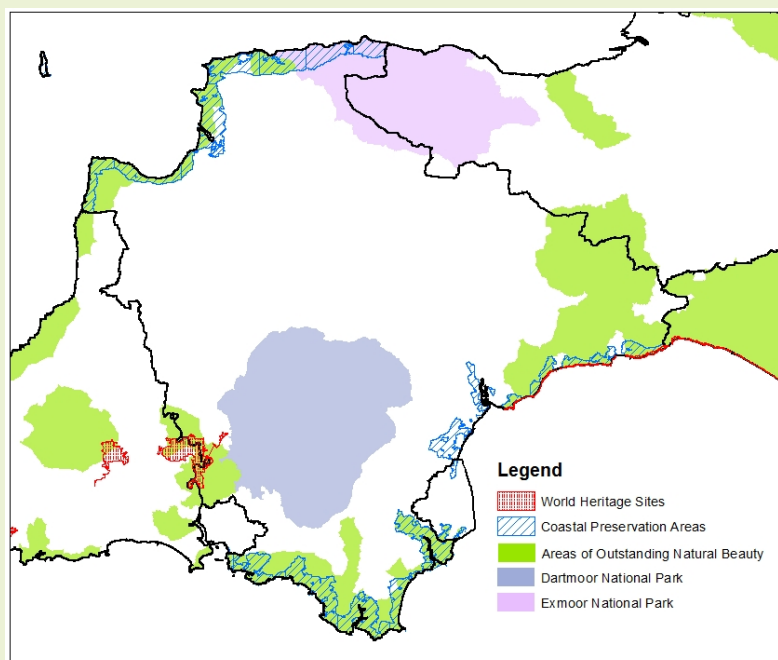
- World Heritage Sites

National

- National Parks (statutory)
- Areas of Outstanding Natural Beauty (AONB) (statutory)
- Heritage Coast (non-statutory)

Local

- Areas of Great Landscape Value (AGLV)⁴
- Undeveloped coast⁵ /Coastal Preservation Area



As well as these designations, Devon's landscape character assessments (LCAs) seek to safeguard the distinctive characteristics and special qualities of all Devon landscapes by promoting guidelines for the protection and management of each landscape area or type. Local landscape policies in Devon refer to the Devon Landscape Character Assessment, reflecting the requirements of the European Landscape Convention.

- 1.11 Also, the NPPF requires planning authorities to approve applications for renewable energy if its impacts are (or can be made) acceptable (para 98).
- 1.12 In planning for renewable energy, local authorities are encouraged to take a positive approach by identifying suitable and unsuitable areas for renewable energy generation and its supporting infrastructure (paragraph 97). This approach is also encouraged by the Planning and Climate

⁴ Areas of Great Landscape Value were in the process of being phased out across the county as each Local Planning Authority (LPA) prepared criteria-based landscape policies linked to a shared landscape character evidence base. However, the National Planning Policy Framework now allows LPAs to retain local landscape designations and local designations are being retained in some districts.

⁵ The Devon Landscape Policy Group (DLPG) is advising all Devon planning authorities to use the Coastal Preservation Area designation from the former Devon Structure Plan to define the undeveloped coast until such time as a joint understanding and policy position on this strategic issue is agreed under the duty to co-operate. To assist this, the DLPG is preparing Advice Note 3 on defining and maintaining the character of Devon's undeveloped coast, at time of writing.

Change Coalition⁶ as part of its good practice guide for local authorities. The generic siting guidance in this document will therefore assist in this process by identifying commonly agreed criteria to assess suitability of specific sites. Identification of suitable and unsuitable areas for these development types on a map is outside the scope of this guidance, although the information it contains could be used as the basis for further local landscape sensitivity assessment similar to those prepared for both Cornwall and Torridge District. This does not preclude the need for site specific landscape and visual impact assessment, which will always be required. Although the landscape character assessments (LCA) for Devon contain strategies for protecting, managing and planning landscapes, they are not specifically focused on renewable energy development. This guidance will therefore supplement those strategies.

- 1.13 The NPPF also promotes good design and suggests that "Permission should be refused for development of poor design that fails to take the opportunities available for improving the character and quality of an area and the way it functions" (para. 64, NPPF). The generic guidance on design will assist in clarifying what is considered by landscape professionals as good design in relation to the landscape context.
- 1.14 For nationally significant energy infrastructure projects⁷, the Overarching National Policy Statement for Energy (EN-1)⁸ recognises that virtually all of these will have effects on the landscape and states that for these projects the aim should be to *minimise harm* to the landscape.
- 1.15 Devon has good conditions to produce wind and solar electricity and is expected to make its contribution to the UK Government target to obtain 15% of its energy consumption (electricity, heat and transport) from renewables by 2020. The 2009 UK Renewable Energy Strategy makes it clear that local government has a leadership role in meeting this target.

Planning Authorities in Devon

Planning authorities in Devon comprise:

- *Unitary Authorities*
- *Local Authorities*
- *National Park Authorities*
- *Devon County Council*

All of these can be determining authorities for wind and solar PV development planning applications requiring planning consent below 50MW output. Devon County Council would however not normally determine these applications unless: a) they were the applicant, or b) the application site falls within a mineral or waste site. Planning applications for major energy infrastructure projects of national significance are determined by the Secretary of State.

Source of the Guidance

- 1.16 The first study in Devon to consider the potential for locating wind energy development within the landscape whilst conserving the character of the landscape was undertaken in 1993 by Nicholas Pearson Associates⁹. This study, commissioned by North Devon District Council, set out which character zones would be most preferential in relation to the siting of wind energy development.
- 1.17 More recently, Torridge District Council commissioned LUC to prepare an 'Assessment of the Landscape Sensitivity to Onshore Wind Energy & Field-Scale Photovoltaic Development in Torridge

⁶ Planning for climate change – guidance for local authorities (April 2012) [<http://www.tcpa.org.uk/pages/planning-for-climate-change-guidance-for-local-authorities-2012.html>]

⁷ The Planning Act 2008 sets out the thresholds for nationally significant infrastructure projects in the energy sector and this includes onshore wind farms of more than 50 megawatts.

⁸ DECC (2011) Overarching National Policy Statement for Energy (EN-1)

⁹ Nicolas Pearson Associates (1993) 'Landscape Implications of Windfarm Development in North Devon'

District¹⁰. Appendices 3 and 4 of the Torridge assessment contained generic guidance on siting and design, and on cumulative landscape assessment.

- 1.18 LUC was commissioned to prepare this guidance in consultation with the Devon Landscape Policy Group (DLPG) and other consultees listed in Appendix 1. The intention has been to adapt and update the generic siting, design and cumulative assessment guidance LUC prepared as part of the above Torridge District Council assessment, for application throughout Devon.

Embedding this Advice Note in the Planning Process

This Advice Note is the outcome of co-operation across administrative boundaries between officers of Devon planning authorities and their immediate neighbours. It is based on evidence of Devon's landscape character and quality as expressed through Devon's landscape character assessment evidence bases and protected landscape designations, neither of which conform to administrative boundaries. Preparation of the Advice Note has also involved informal consultation with wider stakeholders as detailed under 'Acknowledgements', including RegenSW members and the National Trust.

The DLPG therefore requests that this Advice Note is recognised as evidence of complying with the Duty to Co-operate.

A Duty to Co-operate Protocol is currently being drafted by the Devon Planning Officers Group (DPOG). The Protocol will identify the need to cooperate on matters relating to the conservation and enhancement of the natural and historic environment, including landscape, and will call upon the Devon Landscape Policy Group to issue jointly agreed consistent advice and policy on landscape issues that planning authorities can then take forward and embed in Development Plan Documents as they are prepared and reviewed. It is therefore the intention that this Advice Note will be taken forward and used consistently as a Devon-wide supplementary planning document for each Devon Planning Authority, with local relevant information appended to the Advice Note following the template included in Appendix 1. It is not the intention for the content of the Advice Note to be changed or varied by individual authorities as this could result in inconsistent outcomes that do not meet the Duty to Co-operate.

Scope of the Guidance

- 1.19 This guidance considers wind energy developments and free standing solar PV developments that require planning consent. It does not cover roof mounted PV panels.
- 1.20 This guidance is focussed on the potential effects of wind energy and solar PV development on landscape character and how this is perceived through what we see. It does not cover specific ecological issues associated with nature conservation designations or, in the case of wind turbines, bird flight paths; specific cultural heritage/archaeological issues associated with individual designated heritage assets and their settings; technical issues (such as the fact that trees and woodland can create turbulence making siting of turbines more difficult); or residential amenity issues resulting from visual impact on private views or resulting from 'shadow flicker' (which only theoretically occurs in rooms within ten rotor diameters of a turbine¹¹ under specific conditions). These are all issues that will need to be taken into account in site selection and effects will need to be reported at the time when individual proposals are being put forward – e.g. through the Environmental Impact Assessment (EIA) process.
- 1.21 This technical document, written by landscape architects, provides guidance on the siting, design and assessment of wind energy and solar PV developments and provides some guidance on how sensitivity criteria can be used in assessing applications and in proactively managing change. It does not indicate what is acceptable from a policy perspective. The policy perspective is being addressed by the Devon Landscape Policy Group through development of a policy position (see Appendix 3).

¹⁰ <http://www.torridge.gov.uk/index.aspx?articleid=7340>

¹¹ ODPM (2004) Planning for Renewable Energy: A Companion Guide to PPS22, para. 76.

Structure of the Guidance

Chapter 2 examines the potential effects that may arise from wind energy developments and presents generic guidance on the siting, design and assessment of wind energy developments.

Chapter 3 examines the potential effects that may arise from free standing solar PV developments and presents generic guidance on the siting, design and assessment of solar PV developments.

Chapter 4 presents guidance on managing change, considering how the sensitivity criteria in chapters 2 and 3 can be used in assessing applications and in proactively managing change.

This is followed by **Acknowledgements** and a **Glossary**.

Appendix 1 contains a template for recording local information (it is intended that this Advice Note will be taken forward and used consistently as a Devon-wide supplementary planning document for each Devon Planning Authority, with local relevant information appended to the Advice Note).

Appendix 2 contains a guide to types and scales of development that are referred to in the guidance and which may be used to provide consistency across Devon when describing developments.

Appendix 3 contains the Devon Landscape Policy Group's policy position regarding renewable energy development in Devon.

Siting, Design and Assessment of Wind Energy Developments

2 Siting, Design and Assessment of Wind Energy Developments

Potential landscape effects of wind energy developments

- 2.1 The European Landscape Convention (ELC) defines landscape as: “*An area as perceived by people, whose character is the result of the action and interaction of natural and/or human factors*” (Council of Europe 2000). Development can affect the character of a landscape as perceived by people, and that this can be from a static view, from views experienced when moving through a landscape, and also through other senses e.g. noise.
- 2.2 People’s response to landscapes (both rural and urban) and the forces that act on them are personal and may change over time according to their cultural values. For example, there are varying attitudes to wind energy development depending on individual attitudes to the principle and presence of wind energy generation.
- 2.3 In order to minimise effects on the landscape through siting and design, it is important to first understand the characteristics of wind energy development and how they may affect the landscape.



Wind Farm at Stowford Cross, Bradworthy in the Western Culm Plateau of Torridge District

- 2.4 Wind turbines are substantial vertical structures that are highly visible within the landscape and it is not always possible to avoid significant effect on at least some views when developing wind energy development. The movement of the blades is a unique feature of wind energy developments, setting them apart from other stationary tall structures in the landscape such as masts or pylons. Wind energy development may affect the landscape in the following ways:
 - i. Construction of turbines and associated infrastructure may result in direct loss of landscape features, including hedgerows and Devon hedge banks. This may include road ‘improvements’

such as road widening, junction improvements or removal of vegetation that might be necessary in order to transport larger turbine components to site. This is a particular issue for rural lanes where Devon hedge banks and hedgerow trees are distinct and valued features of the wider landscape.



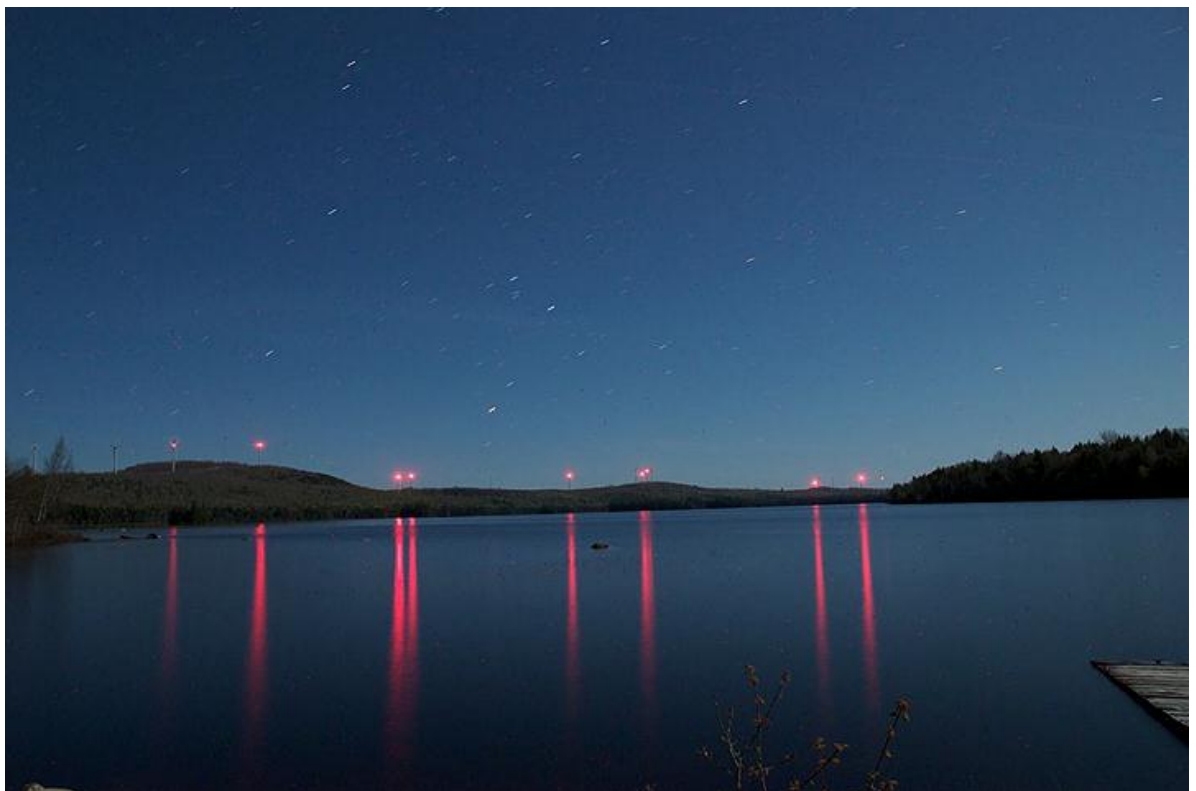
Access to Toddleburn Wind Farm © Copyright Walter Baxter

- ii. Movement of rotor blades is a unique feature of wind energy development and may affect characteristics of stillness, remoteness and solitude which are characteristics of parts of Devon - larger models having slower rotor speeds than smaller models.
- iii. The presence of turbines may increase the influence of built development on the landscape – this may be the case for scattered single turbines as well as for wind farms.
- iv. Turbines (particularly larger models) may be perceived as out of scale in relation to human scale features in the landscape.
- v. Turbines on skylines may compete with existing landmark features for prominence where prominent undeveloped skylines or landmark features are characteristic of the landscape (particularly larger scale turbines).
- vi. Access tracks may be highly visible, particularly in open upland landscapes or undeveloped landscapes that currently may not contain tracks.
- vii. Ancillary buildings and security requirements (such as fencing) may introduce new features into the landscape.
- viii. Use of land for renewable energy development may enable management of land in the traditional way, such as maintaining small fields and hedgerows that are characteristic of Devon.
- ix. Road upgrades on access routes may alter the character of rural roads.



Carraig Gheal Wind Farm, Scotland (photo: C A Blackwell Ltd)

- x. Lighting of turbines (for aviation safety) may introduce a source of light that would affect local amenity or intrinsically dark landscapes that are recognised as being an important characteristic of Devon.



Lights at Rollins Wind Project, Lincoln, Maine (photo: Rainer Egle)

Cumulative issues

- 2.5 As larger numbers of wind energy developments are built, it is increasingly necessary to consider their cumulative effects. Multiple developments can adversely affect the character of the landscape and people's perceptions of it. Development of multiple proposals may eventually result in a situation where wind energy developments become the overwhelming influence on the landscape. Guidance is provided under para 3.14 and para 3.27 onwards.

Siting, Design and Assessment of Wind Energy Developments

- 2.6 This section provides generic guidance on the siting, design and assessment of wind energy development in Devon. It will help ensure that adverse landscape and visual effects¹² are addressed satisfactorily, including cumulative landscape and visual effects, as required by paragraph 97 of the NPPF.
- 2.7 The guidance should be read alongside any other landscape strategies and guidelines contained within Devon's landscape character assessments as well as strategies aimed specifically at wind energy development (e.g. the Assessment of the Landscape Sensitivity to Onshore Wind Energy & Field-Scale Photovoltaic Development in Torridge District).

Initial Scheme Planning and Siting

- 2.8 The initial focus in planning a wind energy scheme is on site selection and identifying the appropriate type and scale of wind energy development [NB see **Appendix 2** for generic definitions of size/scale of wind energy development to be used across Devon]. Since wind turbines cannot be hidden, careful site selection as well as choice of turbine type and layout of turbines is the most effective way of minimising landscape and visual effects. The layout and design of a wind energy development should be informed by landscape and visual impact assessment (LVIA).

Understanding Landscape Character, Quality and Sensitivity

- 2.9 For each possible development area, the baseline landscape character, quality and potential sensitivities to wind energy development should be considered. This will include consideration of landscape character types/areas and landscape designations.
- 2.10 A programme to deliver a landscape character assessment (LCA) for Devon in line with national guidance was substantially completed in 2011. The programme was a joint venture between Devon planning authorities and AONB partnerships, guided by the advice / input of Natural England. The programme identified 68 Devon Character Areas and 37 landscape character types across Devon – information on these can be accessed from: http://www.devon.gov.uk/index/environmentplanning/natural_environment/landscape/landscapecharacter.htm
- 2.11 Devon also has a number of protected landscapes (as set out in the box on page 3) that are valued for their special qualities.
- 2.12 Since there are often local variations in landscape character and sensitivity within a landscape character area or type, a site-specific analysis should be undertaken to identify specific landscape and visual issues at any given site. The following table sets out aspects that might indicate higher or lower sensitivity to wind energy development.
- 2.13 Judgements on landscape sensitivity need to take into account all criteria to come to a balanced view – not all criteria will be necessarily be equally weighted (the balance may be tipped by just one particularly sensitive criteria) and scoring systems should be avoided. There may be conflict

¹² Landscape impacts (or effects) derive from changes in the physical landscape, which may give rise to changes in character and how it is experienced. This may in turn affect the perceived value ascribed to a landscape. Visual impacts (or effects) relate to the changes that arise in the composition of available views as a result of changes to the landscape, to people's responses to the changes, and to the overall effects with respect to visual amenity.

between some criteria. For example, a landscape containing greater signs of modern development would indicate a lower sensitivity, but could also include more human scale features which indicate higher sensitivity to medium or large-scale wind turbines. Conversely, an upland moorland may lack signs of modern development or human scale features, indicating lower sensitivity, yet its special qualities of remoteness and wildness may make it highly sensitive to change from development. **Any judgement will need to take into account all criteria and provide a balanced view.**

Table 2.1 Aspects that might indicate higher or lower sensitivity to wind energy development

Landform and scale				
A smooth gently sloping or flat landform is likely to be less sensitive to wind energy development than a landscape with a dramatic rugged landform, distinct landform features (including prominent headlands and cliffs) or pronounced undulations. Larger scale landforms are likely to be less sensitive than smaller scale landforms - because turbines may appear out of scale, detract from visually important landforms or appear visually confusing (due to turbines being at varying heights) in the latter types of landscapes. Information sources: Devon Landscape Character Assessment; Ordnance Survey basemaps; Topography data (Ordnance Survey Panorama); fieldwork.				
Examples of sensitivity ratings				
Lower sensitivity				Higher sensitivity
an extensive lowland flat landscape or elevated plateau, often a larger scale landform	a simple gently rolling landscape, likely to be a medium-large scale landform	an undulating landscape, perhaps also incised by valleys, likely to be a medium scale landform	a landscape with distinct landform features, and/or irregular in topographic appearance (which may be large in scale), or a smaller scale landform	a landscape with a rugged landform or dramatic landform features (which may be large in scale), or a small scale or intimate landform

Land cover pattern and presence of human scale features				
Simple, regular landscapes with extensive areas of consistent ground cover are likely to be less sensitive to wind energy development than landscapes with more complex or irregular land cover patterns, smaller and / or irregular field sizes and landscapes with frequent human scale features that are traditional of the landscape, such as stone farmsteads and small farm woodlands¹³. This is because large features such as wind turbines may dominate smaller scale traditional features within the landscape. Information sources: Devon Landscape Character Assessment; Ordnance Survey basemaps; Google Earth (aerial photography); fieldwork.				
Examples of sensitivity ratings				
Lower sensitivity				Higher sensitivity
a very large-scale landscape with uniform groundcover and lacking in human scale features	a landscape with large-scale fields, little variety in land cover and occasional human scale features such as trees and domestic buildings	a landscape with medium sized fields, some variations in land cover and presence of human scale features such as trees, domestic buildings	a landscape with irregular small-scale fields, variety in land cover and presence of human scale features such as trees, domestic buildings	a landscape with a strong variety in land cover and small-scale / irregular in appearance containing numerous human scale features
Tracks / transport pattern				
Landscapes that are devoid of tracks will be particularly sensitive to wind energy development because it will be more difficult to absorb permanent new tracks into the landscape without change to character in these areas. In addition, if a Landscape Character Type has a rural road network which contributes to landscape character (e.g. winding narrow lanes bounded by high hedgerows or sunken lanes), this aspect of character may be affected by access works to enable HGVs carrying turbines to a site. This characteristic therefore also influences sensitivity. Information sources: Devon Landscape Character Assessment; Ordnance survey basemaps showing presence of tracks; fieldwork.				
Examples of sensitivity ratings				
Lower sensitivity				Higher sensitivity
a landscape containing existing roads and vehicular tracks, and no restrictions in terms of narrow hedged lanes	a landscape containing existing roads and vehicular tracks, and few restrictions in terms of narrow hedged lanes	a landscape containing some existing roads and vehicular tracks, including some restrictions in terms of narrow hedged lanes	a landscape containing few lanes or vehicular tracks, and these are predominantly narrow lanes bounded by high hedgerows	a landscape devoid of roads or vehicular tracks

¹³ Human scale features are aspects of land cover such as stone walls, hedges, buildings which give a 'human scale' to the landscape

Skylines				
Prominent and distinctive and/or undeveloped skylines, or skylines with important landmark features, are likely to be more sensitive to wind energy development because turbines may detract from these skylines as features in the landscape, or draw attention away from existing landform or landmark features on skylines. These include the skylines of elevated coastlines and coastal headlands. Important landmark features on the skyline might include historic features or monuments. Information sources: Devon Landscape Character Assessment; fieldwork.				
Examples of sensitivity ratings				
Lower sensitivity				Higher sensitivity
a large-scale flat or plateau landscape where skylines are not prominent and/or there are no important landmark features on the skyline	a large-scale landscape where skylines are not prominent and/or there are very few landmark features on the skyline – other skylines in adjacent LCTs are more prominent	a landscape with some prominent skylines, but these are not particularly distinctive. There may be some landmark features on the skyline.	a landscape with prominent skylines that may form an important backdrop to views from settlements or important viewpoints, and/or with important landmark features	a landscape comprising prominent or distinctive undeveloped skylines or skylines with particularly important landmark features
Perceptual qualities				
Landscapes that are relatively remote or tranquil (due to freedom from human activity and disturbance and having a perceived naturalness or a strong feel of traditional rurality with few modern human influences) tend to increase levels of sensitivity to wind energy development compared to landscapes that contain signs of modern development (as the development will introduce new and uncharacteristic features which may detract from a sense of tranquillity and or remoteness/ naturalness). Information sources: Devon Landscape Character Assessment; CPRE's Tranquillity and Intrusion mapping; Ordnance Survey basemaps (presence / absence of development, settlement, structures).				
Examples of sensitivity ratings				
Lower sensitivity				Higher sensitivity
a landscape with much human activity and development such as industrial areas or a port	a rural landscape with much human activity and dispersed modern development	a rural landscape with some modern development and human activity	a more naturalistic landscape and / or one with little modern human influence and development	a remote or 'wild' landscape with little or no signs of current human activity and development

Historic Landscape Character				
Due to intrinsic historic landscape character significance, or potential for preserved archaeological evidence, historic landscape types (HLTs) such as rough ground with earlier remains, prehistoric fields, watermeadows, and fields with a medieval historic character type such as strip fields, enclosures (strips) and enclosures – medieval have a higher sensitivity to larger scale wind energy development due to their strong historic qualities. Some more recent but discrete enclosed landscapes may also be sensitive, such as 'barton' fields. Lower sensitivity landscapes include industrial landscapes, coniferous plantations, airfields, and post medieval/modern enclosures. Information sources: Devon Landscape Character Assessment; Devon HLC.				
Examples of sensitivity ratings				
Lower sensitivity		↔		Higher sensitivity
majority of the landscape covered by least sensitive HLTs	majority of the landscape covered by lower sensitivity HLTs, but may include some small areas of higher sensitivity	majority of the landscape covered by medium sensitivity HLTs or a mixture of higher and lower sensitivity HLTs	majority of the landscape covered by higher sensitivity HLTs, but may include some small areas of lower sensitivity	the majority of the landscape covered by higher sensitivity HLTs
Scenic and special qualities				
Landscapes that have a high scenic quality (which may be recognised as a National Park, Heritage Coast or AONB) will be more sensitive than landscapes of low scenic quality. This is particularly the case where their special qualities (as recorded in the Landscape Character Assessment or designation documents) are likely to be affected by wind energy development. Scenic and special qualities may relate to landscapes that are not designated as well as landscape designated for their natural beauty. Information sources: National Park and AONB 'Statements of Significance' in Management Plans; Devon Landscape Character Assessment 'special qualities and features'; information on Areas of Great Landscape value (if relevant).				
Examples of sensitivity ratings				
Lower sensitivity		↔		Higher sensitivity
landscape has low scenic quality such as an industrial area or despoiled land – special qualities will not be affected by wind energy development	landscape has low-medium scenic quality, or special qualities are unlikely to be affected by wind energy development	landscape has a medium scenic quality and some of the special qualities may be affected by wind energy development	landscape has a medium-high scenic quality – most of the special qualities are likely to be affected by wind energy development	area has a high scenic quality (likely to be recognised as National Park/AONB/ Heritage Coast) and the scenic qualities will be affected by wind energy development

- 2.14 These criteria can be used to help make decisions on sensitivity of individual development sites or Landscape Character Types across Devon. It is likely that all landscapes within Devon would be susceptible to change to some degree as a result of accommodating wind energy development. This is not surprising given the scale and nature of this type of development and the rural character of the majority of the county. However, some landscapes may be more or less sensitive than others. It should also be noted that landscapes may have differing sensitivity to different sizes/scales of development (e.g. height and number of wind turbines). The presence of existing similar developments in the same landscape unit should not affect the 'inherent' sensitivity of a landscape to a type of development. This is a cumulative issue that is dealt with later in the guidance.

Representative Views

- 2.15 It will be important to consider views to the site, including widely recognised iconic views and acknowledged important views to, from, or between heritage assets¹⁴. This may be aided by generation of a zone of theoretical visibility (ZTV). Guidance on producing ZTVs for wind energy development is contained in Scottish Natural Heritage Guidance on the Visual Representation of Windfarms¹⁵.

Generic Guidance on Siting Wind Energy Developments

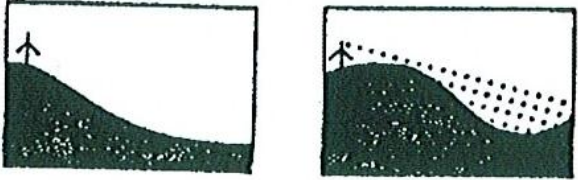
- 2.16 The following provides some generic guidance on siting wind energy development in Devon, focussing on minimising landscape and visual effects. It is recognised that technologies need to be sited and designed to ensure a reasonable output.
- 2.17 In all cases the strategy for the relevant landscape character area within Devon's landscape character assessments should be considered when choosing potential sites for wind energy development. The following guidance should be followed for siting any wind energy development, whether it comprises one small turbine or multiple large turbines:
- i. Site wind energy developments away from dramatic rugged landforms or valued distinct landform features (including prominent headlands).
 - ii. Seek to avoid siting wind turbines where they would detract from the undeveloped character of the coast. This relates to designated Coastal Preservation Areas in Devon which should be regarded as equivalent to 'undeveloped coast'¹⁶ until there is joint agreement between Devon coastal authorities on how to define and maintain the character of Devon's undeveloped coast.
 - iii. Seek to avoid areas valued for their remoteness¹⁷, areas free from human influence and perceived 'untamed' naturalness e.g. the upland moors.
 - iv. Because of intrinsic historic landscape character significance, or potential for preserved archaeological evidence, avoid siting wind energy development on land recorded as the following within Devon's HLC: rough ground with earlier remains, prehistoric fields, watermeadows, and fields with a medieval historic character type such as strip fields, enclosures (strips) and enclosures - medieval. Some more recent but discrete enclosed landscapes may also be sensitive, such as 'barton' fields, particularly when associated with a Listed historic farmstead.
 - v. Seek to avoid areas where ground level disturbance affects landscapes that are difficult to restore (e.g. deep peat or bog).
 - vi. Ensure siting of turbines does not adversely affect the distinctive characteristics and special qualities of Devon's National Parks, AONBs or Heritage Coasts (as set out in designation documents and Management Plans).

¹⁴ More information on this can be found in English Heritage (2005) Wind Energy and the Historic Environment and English Heritage (2011) The Setting of Heritage Assets

¹⁵ Scottish Natural Heritage (2006) Visual Representation of Windfarms: Good Practice Guidance. [NB Scottish guidance has been quoted as there is no equivalent English guidance.]

¹⁶ DLPG Advice Note No. 3 Protecting the character of Devon's undeveloped coast

¹⁷ Remoteness can be described as freedom from human activity and disturbance and having a perceived naturalness or a strong feel of traditional rurality with few modern human influences.

- vii. Ensure siting of turbines does not damage the special qualities of the landscape as recorded in the Devon Landscape Character Area descriptions.
 - viii. It is generally less distracting to see a substantial part of a turbine rather than blade tips only – this may be a particular consideration for views from sensitive viewpoints or those frequented by a larger number of viewers.
 - ix. Significant effects on views from important viewpoints (including views which are integral to the character of conservation areas and recognised /iconic views), popular tourist and scenic routes, and settlements should be avoided where possible or minimised through careful siting.
 - x. Consider locations in association with business parks and reclaimed, industrial and man-made landscapes where other landscape sensitivities are not compromised.
 - xi. Consider the landscape effects of transmission infrastructure when siting development, aiming for sites that will minimise the need for above ground transmission infrastructure, particularly through AONBs, National Parks and Heritage Coasts. Undergrounding cables may mitigate effects in sensitive locations.
 - xii. Consider sites where areas of existing vegetation could screen ground-level features of wind energy developments (such as fencing, tracks and transformers).
 - xiii. The visibility of turbines from valleys and lower ground may be reduced if they are located on high plateau with concave or steep wooded slopes (image taken from 'The Landscape Implications of Windfarm Development in North Devon' North Devon District Council 1993).
- 
- xiv. It is preferable to site turbines where they do not prevent the understanding and appreciation of historic landmarks features such as hilltop monuments or church towers.
 - xv. Protect the character of conservation areas (including views integral to their character), the setting to listed buildings (where the character of the landscape is an important part of a listed building's setting), the character of Devon's Cultural Trails¹⁸, and Registered/ local historic parks and gardens/battlefields (including views to and from, particularly designed views)¹⁹.
 - xvi. When siting medium or large-scale wind energy development (i.e. those with multiple turbines over 50m tip height), select sites in simple, regular landscapes with extensive areas of consistent ground cover over landscapes with more complex or irregular land cover patterns, smaller field sizes and landscapes with frequent human scale features (subject to satisfying other sensitivities).
 - xvii. When siting medium or large-scale turbines (i.e. those over 50m tip height), avoid selecting sites on important undeveloped or distinctive skylines, or skylines with important cultural or historic landmark features (including skylines of elevated coastlines and coastal headlands).
 - xviii. When selecting sites consider potential effects of transporting turbines to site, and the possible limitations presented by winding narrow lanes bounded by Devon hedges.
- When siting single turbines the following guidance should be considered:
- xix. Consider siting turbines so they are perceived as part of other built development /in association with a building group where effects on amenity allow. For example, there may be some opportunity to site smaller single turbines in relation to farm buildings with larger scale single turbines sited in relation to larger businesses or community buildings - development should be commensurate with (or reflect) the scale of the associated buildings.
- When siting multiple turbines the following guidance should be considered:

¹⁸ http://www.devon.gov.uk/index/environmentplanning/natural_environment/areas_of_outstanding_natural_beauty.htm

¹⁹ The relevant Historic Environment Service should be approached directly to obtain advice on development that could affect these assets.

- xx. Locate turbines on the most level part of a site or following contours to avoid a discordant variation of turbine heights.
- xxi. Ensure the size and grouping of turbines responds to landscape character, reinforcing the difference between distinct landscape character types.
- xxii. Seek to keep a turbine group within one landscape character type (particularly as perceived in sensitive views) so that turbines do not span across marked changes in character on the ground, such as changes in topography.

Detailed Layout and Design

- 2.18 The next stage in planning a wind energy scheme is the detailed layout and design. Alternative options should be investigated to find the optimum layout and design of a wind energy development. The NPPF (para. 66) expects applicants to work closely with those directly affected by their proposals to evolve designs that take account of the views of the community²⁰. The landscape and visual impact assessment (LVIA) may aid this process. The following should be considered:
- Layout and number of turbines;
 - Size, design and proportion of turbines;
 - Requirement for, and location of, transformers;
 - Site access including potential need for road upgrades, design of access tracks and onsite cables;
 - Requirement for, and location of, borrow pits;
 - Location and restoration of construction compounds and any fencing;
 - Location of monitoring masts;
 - Design of lighting (if required);
 - Location and design of substation building(s);
 - Land management changes including opportunities for habitat creation/ enhancement appropriate for the character area, set out in a landscape management strategy.
- 2.19 The following provides some generic guidance for the detailed layout and design of wind energy developments in Devon:

Site Layout

- i. When developing multiple turbines, ensure that turbines read as a coherent group in all the main views – aim for a composition that is visually balanced, simple and consistent in image as it is viewed from various directions, minimising views of blade tips only in views (which can be distracting).
- ii. When developing multiple turbines, seek to avoid 'stacking' of turbines when seen from one direction as far as possible (such as is experienced when looking along a row).
- iii. When developing multiple turbines, seek to avoid siting turbines which are remote from the rest of the group – maintain a clear balanced cluster.
- iv. Ensure turbine size does not overwhelm the scale of distinct hills and ridges.
- v. When developing multiple turbines, ensure cluster size is in proportion with the scale of the landscape, including landform features and landscape elements such as woodlands and fields..

²⁰ A Public Engagement Protocol for the South West [<http://www.cse.org.uk/pdf/pub1036.pdf>] outlines a series of responsibilities aimed at local planning authorities and wind energy developers for promoting more effective public engagement within the development of wind energy projects.

- vi. Ensure wind turbines respect the hierarchy of elements in the landscape and do not compete with, or create clutter when seen together with, other man-made landscape elements such as pylons.
- vii. In urban fringe or industrial contexts, developments should respond to the scale of the built form and sit comfortably alongside buildings or structures.
- viii. Use information on landscape scale contained within published landscape character assessments to inform choice of turbine size and cluster size.
- ix. Ensure the layout and design of the development responds to other wind energy developments in the same type of landscape to minimise cumulative effects – this is more important the closer sites are together.

Turbine Design

- i. Ensure the height of turbines does not overwhelm the scale of hills, ridges, or historic monuments.
- ii. Ensure that the proportion of rotor diameter to tower height is balanced - short blades on a tall tower or long blades on a short tower may look unbalanced. Aim for a ratio of approximately 1:1 for tower height: blade diameter for medium and large turbines.
- iii. Three bladed turbines tend to look more balanced than two bladed turbines.
- iv. Tubular steel towers tend to look simpler and less 'industrial' than lattice towers.
- v. Hubs are more aesthetically pleasing when oval shaped with flowing lines, rather than 'boxy' shapes.
- vi. Simple, pale grey coloured turbines will be most suitable for most turbines over 25m to tip (to reduce contrast with the sky and match existing turbines in Devon). However, in some cases darker colours may be suitable for very small turbines to help them blend into their setting.
- vii. Opinion is divided about how effective graduated bases (usually from green to grey) are at integrating turbine towers into the landscape [ref photo below] and may be appropriate in certain situations.
- viii. All turbines on a site should rotate at the same speed and direction.
- ix. Speed of blade rotations should be kept as low as possible (particularly on smaller turbines) to reduce visual impact.
- x. Avoid use of advertising on turbines, particularly in rural areas.



Example of graduated colours and company name on a turbine tower

Ancillary Features

- i. Minimise the width and length of new tracks introduced into the landscape, using existing routes wherever possible.
- ii. Any new tracks should follow contours, avoiding steep slopes or wet ground where possible, and following field boundaries or woodland edges where possible – in some cases this may result in slightly longer lengths of track being required.
- iii. Ensure the surface of tracks blend into the surrounding landscape and aim to re-vegetate tracks (in full or in part) following construction.
- iv. Minimise works to offsite roads, particularly rural roads, and prevent damage and alterations to stone walls, hedges, flower rich verges, trees, historic bridges and gateposts - repair and replace any features affected ensuring materials and planting are in keeping with local context and character (see the guidance in Highway Management in Devon's Protected Landscape for more information).
- v. Where possible, house transformers within the turbine towers to reduce their visual effects.
- vi. Substation and control buildings should be carefully sited and should generally avoid high or exposed locations – use existing buildings where possible, or existing and locally occurring vegetation to screen new buildings.
- vii. Ancillary features should match the local vernacular where they are visible (e.g. using locally occurring materials on substations, control buildings, and transformer cabins if not housed within the turbines).
- viii. Avoid use of urbanising elements in rural situations, such as kerbs, and minimise areas of hard surfacing, fencing and lighting.
- ix. Ensure on-site cables are buried underground (without damage to existing Devon hedges or archaeology) to minimise effects on landscape character and visual amenity – on-site grid connections should be underground wherever possible and crane hard standings re-vegetated during operation of the turbines.
- x. If lighting is required on turbines for aviation purposes, use infra-red lighting to minimise visual effects at night, particularly in protected landscapes and darker areas as identified by CPRE (para. 125 of NPPF encourages limiting the impact of light pollution from artificial light on local amenity and intrinsically dark landscapes).

Land Use/ Landscape Enhancement

- xi. Continue the existing land use underneath the turbines so that the landscape flows underneath and around the turbines, or link land use to adjoining land uses especially if this can create more robust semi natural habitats and reduce habitat fragmentation.
- xii. Provide enhanced management of landscape features, habitats and historic assets as part of a development, including contributing to wider landscape scale targets and projects in Devon's Biodiversity Action Plan and Landscape Character Assessment as well as management objectives within local landscape character assessments.
- xiii. Encourage traditional management of farmland including maintaining small fields and hedgerows.
- xiv. Developers should provide a design statement to set out how the design has evolved, how the design responds to landscape character, how visual issues have been addressed and how this guidance has been taken on board.
- xv. Developers should provide a land management plan for land surrounding/under installations to demonstrate proposed land use and management through the operational phase and restoration/aftercare after decommissioning.

Designing for Multiple Developments

- 2.20 As larger numbers of wind energy developments are built, it is increasingly necessary to consider their cumulative effects. Without an agreed strategy or thresholds of acceptable change for a particular landscape or area it is difficult for developers and decision makers to determine acceptable limits to development. A landscape strategy may help indicate how much development might be accommodated in a landscape. However, in the absence of thresholds or landscape strategies the guidance below can assist in minimising cumulative effects.
- i. When designing a wind energy development it is important to consider how the scheme fits with other existing, consented and proposed schemes (including within neighbouring planning authorities) to minimise cumulative effects²¹.
 - ii. If wind energy development already exists in a particular type of landscape, further wind energy development should continue this pattern of development (e.g. small cluster on hill tops, or single turbines associated with buildings), as long as the existing development is considered appropriate in the context of landscape character.
 - iii. Ensure multiple developments do not obscure distinctive landforms and are in scale with ridges and hills.
 - iv. If two or more wind energy developments are clearly visible in the same view and appear in the same type of landscape they should appear of similar scale and design (including the number of blades and proportion of rotor diameter to tower height), unless the existing design is considered inappropriate – the closer they are to each other the more important this is.
 - v. Ensure any wind energy scheme, or extension to an existing scheme, takes account of landscape sensitivity as well as any landscape strategies for wind energy development that may be available.
 - vi. It will be important to ensure that wind energy developments do not have a defining influence on the overall experience of the landscape and that some open views devoid of turbines are maintained within Devon.
 - vii. As multiple wind energy developments are built they may 'compete' with the landscape's original foci – it is important to maintain a hierarchy of focal points so that the original foci can still be appreciated in the landscape.
 - viii. Consider views from settlements when designing multiple wind energy developments – avoid 'surrounding' a settlement with wind turbines.
 - ix. Consider views from protected landscapes when designing multiple wind energy developments – avoid 'surrounding' a protected landscape with wind turbines.
 - x. Individual wind energy developments should generally appear visually separate from each other unless specifically designed to create the appearance of a single combined wind farm.
 - xi. When designing wind farm extensions it will be important that scale of turbines (including the proportion of rotor diameter to tower height) and rotation speeds are compatible.

Landscape and Visual Impact Assessment

- 2.21 A landscape and visual impact assessment (LVIA) is a key part of assessing the effect of proposed wind energy developments, including as part of the EIA process. EIA may not be required for all wind energy developments. Nevertheless, it is likely that a landscape and visual impact assessment or appraisal (LVIA) will be required to accompany the planning application. The level of detail required will be dependent upon the sensitivity of the site and the nature of the proposal and its potential effects. Pre-application discussion with the relevant planning authority is strongly recommended for all wind energy applications. This will provide an opportunity to agree

²¹ The Devon Landscape Policy Group are currently promoting the development and use of a common protocol allowing each Devon LPA to record and map renewable energy developments across Devon in a consistent way that is compatible with Cornwall Council's mapping, including wind and solar PV.

the scope, level of detail and presentation of the LVIA, and ensure that it is based on accurate and up to date information. The LVIA should address the key landscape issues raised by the proposals, providing information that is relevant, necessary and material to the decisions to be made. All turbine applications potentially affecting an AONB, National Park or the undeveloped coast will automatically require a LVIA.

- 2.22 General guidance on LVIA is provided in the Landscape Institute and Institute of Environmental Management and Assessment's 'Guidelines for Landscape and Visual Impact Assessment'²². However, the following guidance sets out the type of information that could be expected to be submitted as part of a LVIA for a wind energy development in Devon. In addition, LVIA's for EIA developments should comply with the scoping opinion given by the planning authority where this has been sought.

Project description

- 2.23 The planning application should include a description of the project at each phase in its life cycle in sufficient detail to allow the assessment of landscape and visual effects including:
- i. the location, layout and dimensions or extent of all plant and structures (including plans, elevations and sections);
 - ii. a description of the scale and duration of project activities during construction, operation, and decommissioning (including method of construction and traffic generation);
 - iii. information on site access including HGV routes for transport of turbines, including any need for removal of landscape features;
 - iv. location and size of borrow pits, temporary lay down areas, construction compounds, materials storage, crane hard standings, turbine foundations, internal tracks, temporary anemometer masts, and site cable runs;
 - v. plans for site reinstatement after construction and management of the land during operation;
 - vi. number and type of turbines (including form, materials, colour, blade rotation speed, location of transformers inside or outside turbines);
 - vii. location, size and appearance of substation and control building;
 - viii. location and appearance of any signage, lighting, fencing and on-site grid connection;
 - ix. plans for landscape mitigation and/or enhancement measures;
 - x. plans for decommissioning (removal of turbines and ancillary structures, proposals for restoration and future land management e.g. through provision of a landscape management plan).
- 2.24 The LVIA should highlight those aspects of the development that are the key sources of landscape and visual change.

Baseline studies

- 2.25 The baseline studies should set out the existing conditions within the study area. The study area should be informed by the recommended zone of theoretical visibility (ZTV) distances set out on p.36 of Scottish Natural Heritage's 'Visual Representation of Windfarms' and should be agreed with the relevant planning authority. Information on landscape features, landscape character and landscape designations should be provided, drawing on the Devon Landscape Character Assessment, any relevant District/Unitary/AONB landscape character assessments and management plans for designated landscapes²³. A field survey should be undertaken to supplement desk based information. A description of relevant policies and plans should also be included and the relevant Parish Plan consulted, where available, to understand local landscape values.

²² Landscape Institute and Institute for Environmental Management and Assessment (2013) Guidelines for Landscape and Visual Impact Assessment, 3rd Edition, Routledge.

²³ http://www.devon.gov.uk/index/environmentplanning/natural_environment/areas_of_outstanding_natural_beauty.htm

- 2.26 The landscape baseline should be evaluated in accordance with the 'Guidelines for Landscape and Visual Impact Assessment'²⁴.
- 2.27 A zone of theoretical visibility (ZTV) for both hub and tip heights should be prepared to indicate the area over which the wind turbine(s) may be seen. This should be used, alongside fieldwork, to identify representative assessment viewpoints. These viewpoints should be discussed and agreed with the planning authority and other stakeholders. The number of viewpoints required will vary depending on the size of the development and sensitivity of the location. Priority should be given to views from distances of less than 5km for smaller turbines and 10km for medium or large turbines, and from sensitive locations (e.g. residential areas, areas popular with visitors or for outdoor recreation where views may be focussed on the landscape and recognised /iconic views). If the development is visible from a protected landscape there will be a requirement for at least one viewpoint from that landscape.

Mitigation

- 2.28 As a consequence of the assessment process there are likely to be modifications to the scheme design to minimise landscape and visual effects, particularly for larger schemes. In addition, there may be measures to prevent, reduce or offset significant adverse effects. These should be described in terms of relationship to/conservation of valued landscape features, relationship to landscape character (particularly topography, scale, landform and landscape pattern), and appearance from sensitive viewpoints and designated landscapes²⁵. All mitigation measures should be described and an indication of how they will be implemented provided. A description of the main reasons for site selection and any alternatives in site design or layout would also be helpful.

Enhancement

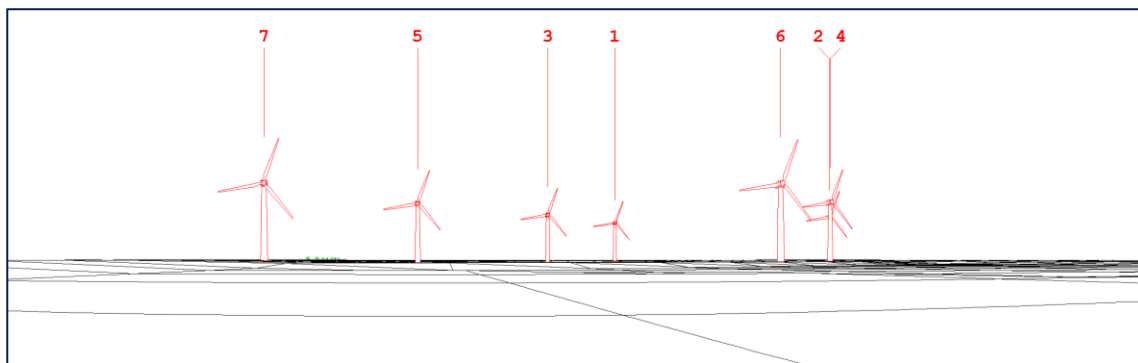
- 2.29 Enhancement aims to improve the character and quality of the landscape. It may take many forms, including improved land management or creation of new landscapes or features. The NPPF (para 64) acknowledges that "Permission should be refused for development of poor design that fails to take the opportunities available for improving the character and quality of an area and the way it functions". Landscape enhancement, as part of a proposal, will be looked upon favourably.

Description of effects

- 2.30 This section should systematically identify and describe the likely effects of the proposal, identifying magnitude of change as a deviation from baseline conditions. Methods should be clearly set out. The assessment should cover effects at construction, operational and decommissioning phases and should consider direct, indirect, secondary, short, medium and long term effects. Effects on landscape features/fabric, landscape character, landscape values and visual amenity should be assessed.
- Effects on landscape features/fabric should consider loss of elements (e.g. hedges, trees).
 - Effects on landscape character should describe the direct changes that will occur to the character of the landscape in which the proposal is located and the indirect changes to character of landscapes from where wind turbines will be visible – this should include how the wind energy development will affect perceptions of character and how widespread and prominent the changes will be.
 - Effects on landscape values should also describe any potential changes in special qualities of landscapes as recorded in Devon's Landscape Character Assessments. Particular weight should be given to protecting the special qualities of protected landscapes (i.e. AONB and National Parks), focussing on the reasons for designation referred to in their Management Plans.
 - Effects on visual amenity should describe and illustrate the extent of visibility and record changes in views from the representative assessment viewpoints with reference to wireline images and photomontages.

²⁴ Note that the 3rd Edition of the GLVIA has just been published and methods/ terminology should be consistent with this new guidance. This edition also contains guidance on mitigation.

²⁵ Refer to inset box on page 3.



Example of a wireline image

- Effects on settlements and individual properties should also be considered where relevant.

Assessment of significance

- 2.31 The significance of effects should be assessed by reference to the Landscape Institute's Guidelines for Landscape and Visual Impact Assessment (3rd Edition). The assessment should identify which effects are considered to be significant in the context of the EIA Regulations (for EIA development), as well as which are adverse or beneficial. Methods should be clearly set out and any assumptions clearly stated.

Presentation of the LVIA

- 2.32 The document should be clear and logical in its layout and presentation. It should be a balanced document providing an unbiased account of the landscape and visual effects, with reasoned and justifiable arguments. A glossary of technical terms and reference list would also be helpful. For EIA development, a non-technical summary should be provided to enable a non-specialist to understand the landscape and visual effects of the proposal – this should include a summary description of the development, the aspects of landscape character and visual amenity likely to be significantly affected, and the mitigation measures to be implemented.

Maps and Illustrations to Accompany an LVIA:

- 2.33 The number of maps and illustrations may vary according to the sensitivity of the site and type of proposal. However, as a guide, the following illustrations will typically be required as part of an LVIA for EIA development (see next section for maps and figures required as part of a cumulative assessment):
- A site layout plan showing position of turbines, access and internal tracks, compounds, borrow pits, substation and all ancillary elements in the context of the physical landscape fabric;
 - National character areas within the study area;
 - Devon County Landscape Character Areas/Types and relevant District landscape character areas/types (distance dependent upon scale of development);
 - National landscape designations and open access land within the study area;
 - Local landscape designations closer to the site (distance dependent upon scale of development);
 - Mapping of historic parks and gardens, conservation areas, scheduled monuments, listed buildings and Devon's cultural trails may also be relevant to the LVIA (this information may also be recorded in the cultural heritage assessment)²⁶ ;
 - Tip height Zone of Theoretical Visibility within study area clearly indicating distance radii from the site (plus version zoomed in to show more detail if required);

²⁶ The applicant should speak to the relevant LPA to determine which features will need to be mapped and the Council can provide information on designations to the applicant

- viii. Hub height Zone of Theoretical Visibility within study area clearly indicating distance radii from the site (plus version zoomed in to show more detail if required);
 - ix. A map showing viewpoint locations, overlaid onto the Zone of Theoretical Visibility (may be combined with above maps if relevant);
 - x. Zone of Theoretical Visibility overlaid onto character areas and designations (likely to be more than one map);
 - xi. Photographs, wirelines and photomontages for viewpoints, provided and reproduced at a minimum viewing distance of 30-50cm²⁷.
- 2.34 Maps and illustrations should be produced in accordance with SNH's Guidance on the Visualisation of Windfarms²⁸ and the Landscape Institute's Guidance Note²⁹ where relevant. Visualisations should be provided at a comfortable viewing distance (between 40 and 50cm) so that they can accurately convey landscape scale and magnitude of effect.

Cumulative Landscape and Visual Impact Assessment of On-shore Wind Energy Developments

- 2.35 Cumulative assessment as part of Environmental Impact Assessment (EIA) is required under the EU Directive on EIA (Directive 97/11/EC amending Directive 85/337/EEC on the assessment of the effects of certain public and private projects on the environment), which was implemented from 1999. It refers to 'an additional cumulative effect that is additional to the impact to be expected from the developments taken individually' (The Council of the European Union, 1997). The Landscape Institute defines cumulative landscape and visual effects as '*additional changes to landscape and visual amenity caused by the proposed development in conjunction with other developments (associated with or separate to it) or actions that have occurred in the past, present or are likely to occur in the foreseeable future*'³⁰. Cumulative effects can trigger the EIA process. Even if EIA is not required, it is likely that a cumulative landscape and visual impact assessment or appraisal (CLVIA) will be required to accompany the planning application. This is particularly likely in future given the potential for multiple single turbines to result in cumulative effects on Devon's landscape.
- 2.36 The key good practice guidance for undertaking a Cumulative Landscape and Visual Impact Assessment (CLVIA) of wind energy developments is Scottish Natural Heritage's guidance 'Assessing the Cumulative Impact on Onshore Wind Energy Developments' (March 2012). Although this is Scottish Guidance, there is no existing equivalent in England and therefore this is typically used by practitioners and decisions makers as the key good practice guidance, particularly for EIA development.
- 2.37 SNH's guidance states that the purpose of CLVIA is to 'describe, visually represent and assess the ways in which a proposed windfarm would have additional impacts when considered in addition to other existing, consented or proposed windfarms' (para. 55, SNH, 2012). It suggests that a CLVIA should identify effects on landscape character, designated landscapes³¹, designed landscapes, and visual receptors. The guidance identifies two types of effect on visual amenity: combined effects occur where the observer is able to see two or more developments from one viewpoint, in combination or in succession; and sequential effects occur when the observer has to

²⁷ 30cm is the minimum requirement set out in Scottish Natural Heritage (2006) Visual Representation of Windfarms and Landscape Institute Advice Note 01/11. SNH's preferred requirement is 40-50cm. It is recommended that each Devon planning authority establishes what the 'comfortable' viewing distances is for each Member of their Development Management Committee, and allow for this to be known by the applicant. This exercise was carried out for Devon County Council Members in 2011 and the overwhelming majority had a comfortable viewing distance of between 40-50cm.

²⁸ Scottish Natural Heritage (2006) Visual Representation of Windfarms: Good Practice Guidance [NB although this is Scottish, it provides some useful guidance]

²⁹ Landscape Institute (2011) Advice Note 01/11 Photography and photomontage in landscape and visual impact assessment

³⁰ Landscape Institute and Institute for Environmental Management and Assessment (2013) Guidelines for Landscape and Visual Impact Assessment, 3rd Edition, Routledge

³¹ Designated landscapes in Devon include National Parks, Areas of Outstanding Natural Beauty (AONBs), and Areas of Great Landscape Value.

move to another viewpoint to see different developments, travelling along regularly-used routes like major roads or popular paths.

- 2.38 The guidance introduces the idea of proportionate assessment i.e. the need to focus on the most significant effects likely to influence decision-making.

Differences between LVIA and CLVIA

- 2.39 Although both cumulative and non-cumulative landscape and visual impact assessment (CLVIA and LVIA respectively) consider the effects of a wind energy development on views and on the landscape character of the surrounding area, there are differences in the baseline against which the assessments are carried out.
- 2.40 For LVIA, the baseline is the existing landscape, which includes any existing wind energy developments. This is a known baseline that can be clearly defined. For CLVIA, the baseline is to some extent uncertain, and is partially speculative. This is because wind energy developments considered as part of the baseline should include not only those existing in the landscape, but also those which are consented but not yet built and also those in the process of being determined by the relevant planning authority. The baseline may therefore include (in addition to existing wind energy developments):
- wind energy developments currently under construction;
 - wind energy developments which have been granted planning consent but are not yet constructed; and
 - wind energy developments that are the subject of a valid planning application that has not yet been determined³².
- 2.41 Schemes that are at the pre-planning or scoping stage are not generally considered in the assessment. They should only be included "if absolutely necessary to make a realistic assessment of potential cumulative effects"³³. The list of schemes to include should be agreed with the relevant planning authority who will need to decide what is reasonable and proportionate to request for specific applications. The Devon Landscape Policy Group is currently developing a mapping protocol for Devon planning authorities³⁴.

Guidance for Devon

- 2.42 CLVIA for wind energy developments within Devon should be broadly based on SNH's approach to CLVIA, modified to take account of the issues raised above. The level of detail required will be dependent upon the sensitivity of the site, the nature of the proposal and other existing and proposed schemes, and the potential for cumulative effects. A pre-planning application meeting with the relevant LPA may provide an opportunity to discuss scope. The following presents some guidance on undertaking CLVIA of wind energy developments in Devon.

Study Area and Sites to be included in the CLVIA

- 2.43 In Devon, it is suggested that the CLVIA focuses on potentially significant cumulative effects and that a study area is selected to enable these significant effects to be reported. Study areas will depend on the size of the turbine(s) and the size and location of other existing and proposed schemes within the landscape – and initial areas of search may need to be up to 30km or 35km from the proposal for larger proposals. The recommended distances for ZTVs set out in Table 2 (p.36) of Scottish Natural Heritage's 'Visual Representation of Windfarms Good Practice Guidance' may provide a useful starting point. All existing and proposed wind energy developments should be considered within this initial area of search (including offshore wind farms, if relevant). The

³² SNH guidance on the cumulative impact of onshore wind energy developments (2012) suggests that it may be necessary to agree 'cut off dates' beyond which any newly submitted planning applications would not need to be included in the cumulative assessment. This is to enable applications to progress.

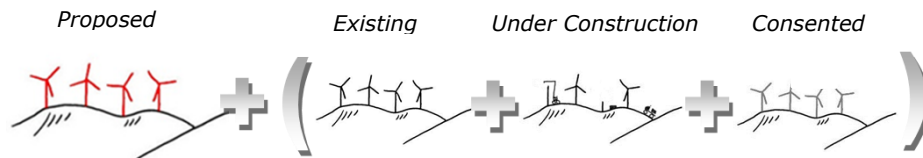
³³ Para 7.14 of the 3rd Edition Guidelines for Landscape and Visual Impact Assessment.

³⁴ This will provide the basis for data relating to the planning status of renewable energy developments in Devon to be recorded, mapped and published by planning authorities in a way that is consistent with their neighbour and with Cornwall Council.

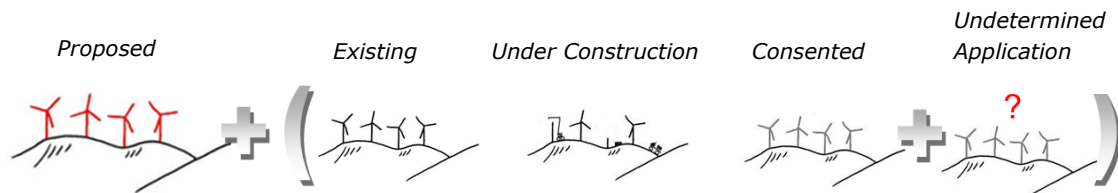
assessment may then focus in on 'hotspot' areas to identify likely significant effects. This will help keep the assessment proportional to the scale of the project and the nature of its likely effects.

Scenarios for Assessment

- 2.44 Applicants should assess the cumulative landscape and visual effects of different scenarios, if applicable³⁵. This may include, for example, a scenario that considers the proposed development in the context of other existing, under construction and consented wind energy developments (a fairly certain scenario, see top diagram) as well as a scenario that considers the proposed development in the context of other existing, under construction and consented wind energy developments as well as undetermined applications (a less certain scenario, see bottom diagram).



Likely scenario (proposed development plus existing, under construction and consented wind energy developments)



Less likely scenario (proposed development plus existing, under construction and consented wind energy developments and submitted but undetermined planning applications)

Cumulative ZTV Analysis

- 2.45 For larger schemes, a cumulative ZTV (CZTV) can be useful to inform the cumulative visual impact assessment. Where this is considered useful, Zones of Theoretical Visibility (ZTVs) to the tip height for each of the other wind energy developments should be generated to a fixed radius depending on the tip height of the turbines. Recommended distances for ZTVs are set out in Table 2 on p.36 of Scottish Natural Heritage Guidance on the Visual Representation of Windfarms.
- 2.46 Production of paired ZTVs for the proposal with each of the other wind energy developments can be useful to indicate interactions between each development with the proposal being assessment, and an analysis of the paired ZTVs can be included in the CLVIA report.
- 2.47 All the ZTVs may then be combined to produce a cumulative ZTV (CZTV). The CZTV should show the number of wind energy developments visible and should make the distinction made between areas where the proposed development is predicted to be visible (either on its own, or in conjunction with other wind energy developments), and areas where other wind energy developments will be visible but the proposed development will not, through different colours or other symbology. This may be divided into a CZTV of all existing and consented schemes (a fairly certain scenario) and a CZTV of all existing, consented schemes and undetermined applications (a less certain scenario), if considered useful.

Choice of Viewpoints for CLVIA

- 2.48 A number of viewpoints should be selected to illustrate cumulative visual effects arising from the wind energy development being assessed, in combination with other existing and proposed wind energy developments. These selected viewpoints may be the same as, or a subset, of the main

³⁵ This may be applicable if there are schemes at different stages of the planning process that may result in significant cumulative effects in conjunction with the proposed development.

LVIA viewpoints, or they may be different. In any case they should be selected specifically to illustrate cumulative effects, including representing the worst-case. These should be agreed with the relevant LPA.

Baseline Evaluation for the CLVIA

- 2.49 The sensitivity of the landscape and visual resource will be the same as that recorded in the LVIA. However, SNH guidance on CLVIA recommends that key routes should also form part of the cumulative assessment. If routes are included in the assessment their sensitivity will also need evaluating. Key routes should be selected with reference to guidance published by Scottish Natural Heritage (SNH, 2012) and should include well used or important routes (e.g. National and Regional Trails³⁶ and well used tourist routes) that may be affected by cumulative effects.

Preparing Cumulative Visualisations

- 2.50 Cumulative wireframes set beneath photographs, and/or photomontages should be prepared from viewpoints to illustrate the nature and degree of cumulative change to the landscape and views.

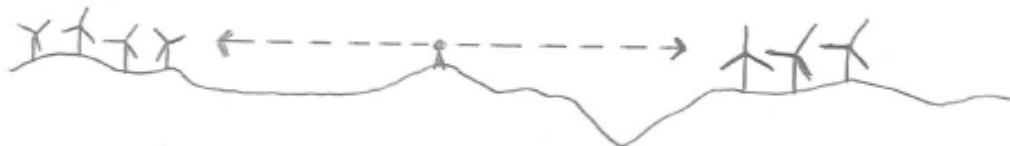
Describing and Assessing Effects

Magnitude of Cumulative Change to Landscape

- 2.51 The magnitude of cumulative change to landscape character is the influence the additional wind energy development will have on the character of the area which is informed by:
- The distance over which the development will have an influence on landscape character in combination with other wind energy developments;
 - The siting of the wind energy development being assessed in relation to other existing and proposed wind energy developments (and their relationship to landscape types);
 - The design of the wind energy development being assessed in relation to other existing and proposed wind energy developments (including number, size, type and layout of turbines);
 - Whether key characteristics of the surrounding landscape are affected by the cumulative impact.
- 2.52 It will also be important to consider the combined effect of tracks, buildings and other ancillary features of the wind energy developments on the landscape.

Magnitude of Cumulative Change to Views

- 2.53 The magnitude of cumulative change to views should be described taking into account the following considerations:
- The arrangement of developments in the view, e.g. developments seen in one direction or part of the view, or seen in many directions;



- The visibility/prominence of the Proposed Development compared to the other existing and proposed schemes;

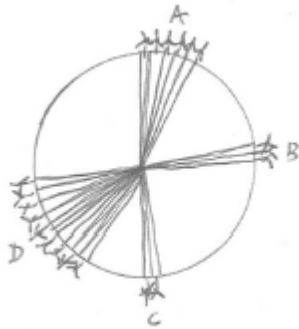


- The relationship between the various sizes and layouts of the developments;

³⁶ http://www.devon.gov.uk/public_rights_of_way



- The extent to which the Proposed Development increases the angle of view occupied by wind energy developments (or the degree to which the Proposed Development adds to the extent of visible turbines);



- Whether the Proposed Development appears as an extension to an existing wind farm or introduces development into a new part of the view;



- In the case of magnitude of change to routes (sequential effects), the relative duration of views of wind energy developments from routes.

2.54 The CLVIA may also consider cumulative effect on views from settlements through use of CZTVs, 3D wireline analysis and visits to the settlements.

Effect on Designated Landscapes

2.55 The CLVIA should set out the implications of cumulative effects on designated landscapes within the study area.

Significance

2.56 The assessment should identify which effects are considered to be significant in the context of the EIA Regulations (for EIA development), as well as which are adverse or beneficial.

Figures

2.57 The number of maps and illustrations may vary according to the sensitivity of the site, the nature of the proposal and other existing and proposed schemes, and the potential for cumulative effects. However, as a guide the following illustrations will typically be required as part of a CLVIA for EIA development :

- Location map³⁷ (with individual turbine locations) for all operational, consented and application sites within the study area, presented on a 1:50,000 or 1:25,000 OS base with concentric distance bands.

³⁷ The Devon Landscape Policy Group is currently developing a map of renewable energy developments across Devon.

- Paired ZTVs of the proposed development with each other proposal (useful for larger schemes).
- CZTV for existing and proposed wind energy developments in combination with the proposed development (useful for larger schemes - more than one CZTV may be required showing different scenarios, as set out in the guidance above).
- CZTVs overlaid onto landscape character areas, landscape designations and cumulative assessment viewpoints as relevant.
- Visualisations (comprising wireframes and photomontages of up to 360 degrees annotated with site name, status (operational, consented, application), and distance to nearest turbine, and clearly labelled to indicate how the images should be held and viewed).

References/ Further Reading

Cornwall Council (2012) Renewable Energy Planning Guidance Note 3: The development of onshore wind turbines.

The Countryside Agency and Scottish Natural Heritage (2002) Landscape Character Assessment – Guidance for England and Scotland

Landscape Institute and Institute for Environmental Management and Assessment (2013) Guidelines for Landscape and Visual Impact Assessment, 3rd Edition, Routledge.

Landscape Institute (2011) Photography and photomontage in landscape and visual impact assessment: Landscape Institute Advice Note 01/11.

Natural England (2010) Making Space for Renewable Energy: Natural England's Approach to Assessing On-Shore Wind Energy Development (Catalogue Code: NE254).

Scottish Natural Heritage (2006) Visual Representation of Windfarms: Good Practice Guidance.

Scottish Natural Heritage (2009) Siting and Designing Windfarms in the Landscape, Version 1.

Scottish Natural Heritage (2009) Assessing the impact of small-scale wind energy proposals on the natural heritage [<http://www.snh.gov.uk/planning-and-development/renewable-energy/onshore-wind/general-advice-and-information/>]

Scottish Natural Heritage (2012) Guidance: Assessing the Cumulative Impact on Onshore Wind Energy Developments.

Siting, Design and Assessment of Solar PV Developments

3 Siting, Design and Assessment of Solar PV Developments

Potential landscape effects of free standing solar PV developments

- 3.1 The ELC defines landscape as: “*An area as perceived by people, whose character is the result of the action and interaction of natural and/or human factors*” (Council of Europe 2000). Development can affect the character of a landscape as perceived by people, and that this can be from a static view, from views experienced when moving through a landscape, and also through other senses e.g. noise.
- 3.2 People’s response to landscapes (both rural and urban) and the forces that act on them are personal and may change over time according to their cultural values. For example, there are varying attitudes to wind energy development depending on individual attitudes to the principle and presence of wind energy generation.
- 3.3 In order to minimise effects on the landscape through siting and design, it is important to first understand the characteristics of free standing solar PV development and how they may affect the landscape (and in turn economic, social and community values).



Solar PV Development at Benbole Farm, Cornwall (photo credit: Melanie Downes)

- 3.4 Free standing solar PV developments, although not particularly prominent in height, can occupy substantial areas of ground which may be visible, particularly if located on slopes. Landscape effects may include the following:
 - i. Single panels or small rows of panels on farms will have less of an impact than ‘field-scale’ developments that may be accompanied by buildings/ cabinets, tracks, and security fencing.
 - ii. As extensive developments, field-scale solar PV developments may be particularly visible in open landscapes or on upper slopes of hillsides, especially where covering significant areas. Much of Devon is undulating and this can exacerbate the effect.



Solar PV Development near Strete Raleigh, East Devon (photo credit Andy Leithgoe)

- iii. Solar panels, en-masse, tend to reflect the sky - for example, on a sunny day they can appear blue while on a cloudy day they can appear a metallic grey – this can make them stand out from their landscape context.



Solar PV Development at Five Mile Hill, Teignbridge (photo credit Andy Leithgoe)

- iv. The perceived urban/industrial character of large areas of free-standing solar PV panels and associated infrastructure means they can increase the perceived human influence on the landscape and erode the intrinsically rural character of Devon's countryside, including landscapes that form a setting to heritage assets.
- v. Solar PV developments will change the land use and appearance of a field or fields, affecting land cover patterns and the character of landscapes.
- vi. The regular edges of solar PV developments may be conspicuous in more irregular landscapes (particularly where they do not follow contours or where field boundaries are irregular in form).

- vii. The height of racks (up to 3m) means that they may overtop typical hedgerow/ hedgebank field boundaries.
- viii. Screen planting around solar PV development, or management changes such as allowing hedges to grow higher, can change the sense of enclosure of a landscape.
- ix. Construction of the solar PV development may result in damage to landscape features such as hedgerow/ hedgebank field boundaries.
- x. Structures, including free-standing panels, security fencing, and other hard, built elements, can appear out of place in landscapes that are perceived as wild, natural or remote from development, and that are valued for these qualities.
- xi. Ancillary buildings and security requirements (such as fencing and/or CCTV) may introduce new and unfamiliar features into Devon's rural landscape.



The height of racks means that they may overtop typical hedgerow/ hedgebank field boundaries (photo credit: Melanie Downes)

- xii. Access tracks will be necessary on field scale schemes with central inverters (central inverters cannot be delivered and maintained using temporary tracks).
- 3.5 Photovoltaic technology requires absorption of sunlight to allow for the conversion of energy to take place and therefore very little light energy is lost through reflection. Glare is further minimised through the use of translucent coating materials to improve light transmittance through the glass³⁸. Nevertheless panels do change under different atmospheric conditions, tending to reflect the light and colour of the sky, and the appearance of the panels under different atmospheric conditions is an important consideration in terms of the visual effects of schemes.

³⁸ www.wheeljanemasterplan.co.uk



Solar Farm near Aysford, Mid Devon, under different lighting conditions (photo credits: Andy Leithgoe)

Cumulative issues

- 3.6 Cumulative effects of multiple schemes are a significant issue for planning authorities to deal with because free standing solar PV developments tend to cluster around grid connection points. Development of multiple proposals may eventually result in a situation where solar PV developments become the overwhelming influence on the landscape.

Siting, Design and Assessment of Solar PV Developments

- 3.7 This section is designed to provide generic guidance on the siting and design of free standing solar PV development in Devon. It will help ensure that adverse landscape and visual effects³⁹ are addressed satisfactorily, including cumulative landscape and visual effects, as required by paragraph 97 of the NPPF.
- 3.8 The guidance should be read alongside any other landscape strategies and guidelines contained within the Devon Landscape Character Assessment as well as strategies aimed specifically at solar PV development (e.g. the Assessment of the Landscape Sensitivity to Onshore Wind Energy & Field-Scale Photovoltaic Development in Torridge District).

Initial Scheme Planning and Siting

- 3.9 The initial focus in planning a solar PV development is on site selection and identifying an appropriate type and scale of solar PV development [NB see **Appendix 2** for generic definitions of sizes of solar PV development to be used across Devon]. Careful site selection is the most effective way of minimising landscape and visual effects. The layout and design of a solar PV development should be informed by landscape and visual impact assessment.

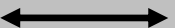
Understanding Landscape Character, Quality and Sensitivity

- 3.10 For each possible development area, the baseline landscape character, quality and potential sensitivities to solar PV development should be considered. This will include consideration of landscape character types/areas and landscape designations.
- 3.11 A programme to deliver a landscape character assessment (LCA) for Devon in line with national guidance was substantially completed in 2011. The programme was a joint venture between Devon planning authorities and AONB partnerships, guided by the advice / input of Natural England. The programme identified 68 Devon Character Areas and 37 landscape character types across Devon – information on these can be accessed from:
http://www.devon.gov.uk/index/environmentplanning/natural_environment/landscape/landscapecharacter.htm
- 3.12 Devon also has a number of protected landscapes (as set out in the box on page 3) that are valued for their special qualities.
- 3.13 Since there are often local variations in landscape character and sensitivity within a landscape character area or type, a site-specific analysis should be undertaken to identify specific landscape and visual issues at any given site. The following table sets out aspects that might indicate higher or lower sensitivity to solar PV development.
- 3.14 Judgements on landscape sensitivity need to take into account all criteria to come to a balanced view – not all criteria will be necessarily be equally weighted (the balance may be tipped by just one particularly sensitive criteria) and scoring systems should be avoided. There may be conflict between some criteria. For example, when considering sensitivity to solar PV development, a landscape with a very small-scale field pattern and with a high sense of enclosure might score lower sensitivity for 'sense of enclosure/openness' but higher for 'field pattern and scale'. **Any judgement will need to take into account all criteria and provide a balanced view.**

³⁹ Landscape impacts (or effects) derive from changes in the physical landscape, which may give rise to changes in character and how it this is experienced. This may in turn affect the perceived value ascribed to a landscape. Visual impacts (or effects) relate to the changes that arise in the composition of available views as a result of changes to the landscape, to people's responses to the changes, and to the overall effects with respect to visual amenity.

Table 3.1 Aspects that might indicate higher or lower sensitivity to solar PV development

Landform				
A flat or gently undulating lowland landscape or extensive plateau is likely to be less sensitive to solar PV development than a landscape with prominent landforms and visible slopes, including coastal headlands. This is because arrays of solar PV panels will be less easily perceived in a flat landscape than on a slope, especially higher slopes. Information sources: Devon Landscape Character Assessment; contours from the Ordnance Survey basemaps; Topography data (Ordnance Survey Panorama); fieldwork.				
Examples of sensitivity ratings				
Lower sensitivity				Higher sensitivity
a lowland flat landscape or extensive plateau	a gently undulating lowland landscape or plateau	an undulating landscape with hidden areas as well as some visible slopes	a landscape with many prominent, visible slopes or an upland landscape	very steep landform and exposed, visible slopes
Sense of openness / enclosure				
A landscape with a strong sense of enclosure (e.g. provided by land cover such as woodland or high hedgebanks) is likely to be less sensitive to solar PV development than an open and unenclosed landscape because the development will be less easily perceived, especially at a distance, in an enclosed landscape. Information sources: Devon Landscape Character Assessment; Google Earth / aerial photographs; fieldwork.				
Examples of sensitivity ratings				
Lower sensitivity				Higher sensitivity
a very well enclosed landscaped – perhaps provided by thick, high hedgebanks and hedgerows, tree belts and woodland	relatively high levels of enclosure provided by hedgebanks and thick hedgerows with frequent hedgerow trees	a landscape with some open and some more enclosed areas – likely to be a rural landscape with some hedgebanks and hedgerows and tree belts	an open landscape with little sense of enclosure (low, few or no hedgebanks or hedgerows, few trees)	an extremely open landscape such as an unenclosed plateau with no field boundaries or trees

Field pattern and scale				
Landscapes with small-scale, more irregular field patterns are likely to be more sensitive to the introduction of solar PV development than landscapes with large, regular scale field patterns because of the risk of diluting or masking the characteristic landscape patterns. This would be particularly apparent if development takes place across a number of adjacent fields where the field pattern is small and intricate (bearing in mind that the height of panels could exceed that of a hedge/ hedgebank). Information sources: Devon Landscape Character Assessment; Devon Historic Landscape Characterisation; Ordnance survey 1:25K basemap (showing field patterns); Google Earth (aerial photography); fieldwork.				
Examples of sensitivity ratings				
Lower sensitivity				Higher sensitivity
a landscape with large-scale, regular fields of mainly modern origin	a landscape which is mainly defined by large, modern fields	a landscape with a mixture of large-scale, modern fields and some smaller, more historic enclosure	a landscape dominated by ancient, small-scale field patterns with a few isolated areas of modern enclosure	a landscape characterised by small-scale, ancient field patterns
Landcover				
Since PV panels introduce a new land cover (of built structures) , landscapes containing existing hard surfacing or built elements (e.g. urban areas, brownfield sites or large-scale horticulture) are likely to be less sensitive to field-scale solar PV development than highly rural or naturalistic landscapes. Information sources: Devon Landscape Character Assessment; Google Earth (aerial photography); fieldwork.				
Examples of sensitivity ratings				
Lower sensitivity				Higher sensitivity
an urban or 'brownfield' landscape	an area of large scale horticulture	a rural landscape, perhaps with some brownfield sites or urban influences	a rural landscape , perhaps with some areas of semi-natural land cover	a landscape dominated by semi-natural land cover
Perceptual qualities				
Landscapes that are relatively remote or tranquil (due to freedom from human activity and disturbance and having a perceived naturalness or a strong feel of traditional rurality with few modern human influences) tend to increase levels of sensitivity to solar PV development compared to landscapes that contain signs of modern development (as the development will introduce new and uncharacteristic features which may detract from a sense of tranquillity and or remoteness/ naturalness). Information sources: Devon Landscape Character Assessment; CPRE's Tranquillity and Intrusion mapping; Ordnance Survey basemaps (presence / absence of development, settlement, structures).				
Examples of sensitivity ratings				

Lower sensitivity				Higher sensitivity
a landscape with much human activity and development such as industrial areas or a port	a rural landscape with much human activity and dispersed modern development	a rural landscape with some modern development and human activity	a more naturalistic landscape and / or one with little modern human influence and development	a remote or 'wild' landscape with little or no signs of current human activity and development
Historic Landscape Character Due to intrinsic historic landscape character significance, or potential for preserved archaeological evidence, historic landscape types (HLTs) such as rough ground with earlier remains, prehistoric fields, watermeadows, and fields with a medieval historic character type such as strip fields, enclosures (strips) and enclosures – medieval have a higher sensitivity to solar development. Some more recent but discrete enclosed landscapes may also be sensitive, such as 'barton' fields. Lower sensitivity landscapes include industrial landscapes, coniferous plantations, airfields, and post medieval/modern enclosures. Information sources: Devon Landscape Character Assessment; Devon HLC.				
Examples of sensitivity ratings				
Lower sensitivity				Higher sensitivity
majority of the landscape covered by least sensitive HLTs	majority of the landscape covered by lower sensitivity HLTs, but may include some small areas of higher sensitivity	majority of the landscape covered by medium sensitivity HLTs or a mixture of higher and lower sensitivity HLTs	majority of the landscape covered by higher sensitivity HLTs, but may include some small areas of lower sensitivity	the majority of the landscape covered by higher sensitivity HLTs

Scenic and special qualities				
Landscapes that have a high scenic quality (which may be recognised as a National Park, Heritage Coast or AONB) will be more sensitive than landscapes of low scenic quality. This is particularly the case where their special qualities (as recorded in the Landscape Character Assessment or designation documents) are likely to be affected by solar PV development. Scenic and special qualities may relate to landscapes that are not designated as well as landscape designated for their natural beauty. Information sources: National Park and AONB 'Statements of Significance' in Management Plans; Devon Landscape Character Assessment 'special qualities and features'; information on Areas of Great Landscape Value (if relevant).				
Examples of sensitivity ratings				
Lower sensitivity		↔		Higher sensitivity
landscape has low scenic quality such as an industrial area or despoiled land – special qualities will not be affected by solar PV development	landscape has low-medium scenic quality, or special qualities are unlikely to be affected by solar PV development	landscape has a medium scenic quality and some of the special qualities may be affected by solar PV development	landscape has a medium-high scenic quality – most of the special qualities are likely to be affected by solar PV development	area has a high scenic quality (likely to be recognised as National Park/ AONB/ Heritage Coast) and the scenic qualities will be affected by solar PV development

- 3.15 The sensitivity table could be used to help make decisions on sensitivity of individual Landscape Character Types across Devon. It is likely that all landscapes within Devon would be susceptible to change to some degree as a result of accommodating field scale solar PV development. This is not surprising given the scale and nature of this type of development and the rural character of the majority of the county. However, some landscapes may be more or less sensitive than others. It should also be noted that landscapes may have differing sensitivity to different scales of development (e.g. area of panels proposed). The choice of site and size of development should respect the specific sensitivity of the area concerned. The presence of existing similar developments in the same landscape unit should not affect the 'inherent' sensitivity of a landscape to a type of development. This is a cumulative issue that is dealt with later in the guidance.

Representative Views

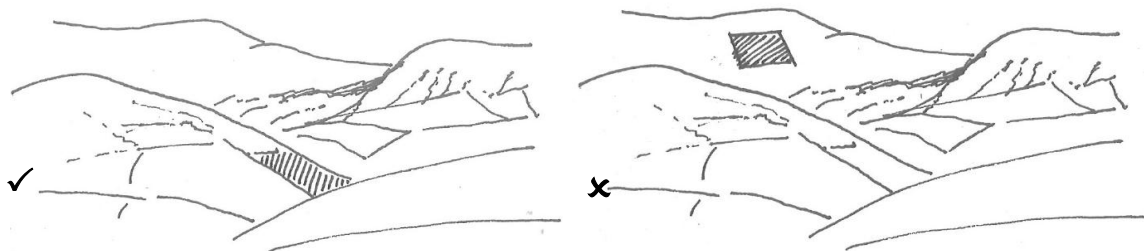
- 3.16 It will be important to consider views to the site including recognised /iconic views and acknowledged views from heritage assets⁴⁰. This may be aided by generation of a zone of theoretical visibility (ZTV).

Generic Guidance on Siting Solar PV Developments

- 3.17 The following provides some generic guidance on siting solar PV development in Devon focussing on minimising landscape and visual effects. It is recognised that technologies need to be sited and designed to ensure a reasonable output.

⁴⁰ More information on this can be found in English Heritage (2005) Wind Energy and the Historic Environment and English Heritage (2011) The Setting of Heritage Assets

- i. Site solar PV development on lower slopes/within folds in gently undulating lowland landscapes or on flat plateau sites rather than on upper slopes or coastal headlands.



- ii. Any PV development on plateau landscapes should generally be set back from edges to minimise effects on views from surrounding areas.
- iii. Site development in landscapes with a sense of enclosure (e.g. provided by woodland or high hedges) rather than in open and unenclosed landscapes.
- iv. Consider views from local viewpoints, popular routes, recognised /iconic views, and designated landscapes when considering the siting of solar PV development in the landscape - site panels in areas where they can be well concealed or integrated into sensitive views.
- v. When siting development, consider the appearance of the development as viewed from the 'backs' and 'sides' (where frames will be more visible) as well as from the 'front'.
- vi. For sites that are overlooked by higher ground the design of the site and how it integrates with the landscape will be particularly important.
- vii. Prehistoric enclosures and medieval enclosures (including strip fields) are likely to be more sensitive to the introduction of solar PV development than more modern fields.
- viii. Because of intrinsic historic landscape character significance, or potential for preserved archaeological evidence, avoid siting solar PV development on land recorded as the following within Devon's HLC: rough ground with earlier remains, prehistoric fields, watermeadows, and fields with a medieval historic character type such as strip fields, enclosures (strips) and enclosures - medieval. Some more recent but discrete enclosed landscapes may also be sensitive, such as 'barton' fields, particularly when associated with a Listed historic farmstead.
- ix. Ensure sites do not span across marked changes in character on the ground.
- x. Site field-scale PV development away from areas of 'undeveloped coast'⁴¹.
- xi. Site field-scale PV development away from areas valued for their remoteness⁴², areas free from human influence and perceived 'untamed' naturalness e.g the upland moors.
- xii. Significant effects on views from important viewpoints (including views which are integral to the character of conservation areas and viewpoints in sensitive areas including recognised /iconic views), popular tourist and scenic routes and settlements should be minimised.
- xiii. Sites in naturalistic landscapes will be more sensitive than sites in areas containing existing hard surfacing or built elements (e.g. urban areas, brownfield sites or large-scale horticulture).
- xiv. Consider providing enhanced management of landscape features, habitats and historic assets as part of a development, including contributing to wider landscape scale targets and projects in Devon's Biodiversity Action Plan, guidelines in Devon's Landscape Character Assessment, and landscape management objectives set out in local landscape character assessments.
- xv. Consider how panels will be transported to site – many rural lanes are very narrow and have high hedges either side. Damage should be avoided, but if damage occurs reinstatement will be required.

⁴¹ DLPG Advice Note No. 3

⁴² Remoteness can be described as freedom from human activity and disturbance and having a perceived naturalness or a strong feel of traditional rurality with few modern human influences.

- xvi. Ensure siting of solar PV development does not adversely affect the distinctive characteristics and special qualities of Devon's National Parks or AONBs or Heritage Coasts (as set out in designation documents and Management Plans) - the more visible a development is in the landscape, the higher the risk that it may affect scenic quality/natural beauty.
- xvii. Ensure siting of solar PV development does not harm the special qualities of the landscape as recorded in Devon's landscape character area descriptions.
- xviii. Protect the character of conservation areas (including views integral to their character), the setting to listed buildings (where the character of the landscape is an important part of a listed building's setting), the character of Devon's Cultural Trails⁴³, and Registered/ local historic parks and gardens/battlefields (including views to and from, particularly designed views)⁴⁴.

Detailed Layout and Design

- 3.18 The next stage in planning a solar PV development is the detailed layout and design. Alternative site layouts should be investigated to compare the effects of different designs and to find the optimum layout and design of a solar PV development. The NPPF (para. 66) expects applicants to work closely with those directly affected by their proposals to evolve designs that take account of the views of the community. The landscape and visual impact assessment (LVIA) may aid this process. The following should be considered:
- Layout and number of panels (including extent);
 - Site access and transporting panels to site;
 - Location of onsite cables;
 - Location and restoration of construction compounds;
 - Type of security arrangements;
 - Location and design of cabinets/ building(s) to house inverters, transformers, switchgear/ substations and spare parts;
 - Land management changes (hedges and land beneath panels) including opportunities for habitat creation/ enhancement appropriate for the landscape type/ character area as set out in a relevant landscape management strategy.
- 3.19 The following provides some generic guidance on the detailed layout and design of solar PV development in Devon:

PV Panels

- i. Ensure the area of development is in scale with the landscape in which it lies – it is likely that areas with smaller scale fields will accommodate smaller developments (information on landscape scale contained within published landscape character assessments may provide an indication of suitable development sizes).
- ii. Fit panels comfortably into the fields (for example avoiding straight edges in irregular landscapes).
- iii. Existing Devon hedges, trees and hedgerows should be retained and protected. Trees should be protected in accordance with BS 5837:2012 Trees in relation to design, demolition and construction as appropriate, and hedges and hedgerows should be protected to similar standards. The location of the protective fences needs to be informed by professional judgement but a minimum distance of 4m from the base of the hedge or hedgerow would be expected.

⁴³ http://www.devon.gov.uk/index/environmentplanning/natural_environment/areas_of_outstanding_natural_beauty.htm

⁴⁴ The relevant Historic Environment Service should be approached directly to obtain advice on development that could affect these assets.

- iv. Careful consideration should be given to the location of solar panels so that vegetation does not have to be felled as a result of shading.
 - v. Minimise height of panels so that they will be as unobtrusive as possible in the landscape – in areas with Devon hedges aim to site them below the height of the Devon hedge.
 - vi. When designing the layout of panels, consider the appearance of the development as viewed from the 'backs' and 'sides' (where frames will be more visible) as well as from the 'front'.
 - vii. Dark, recessive colours in natural hues and non-reflective materials for structures associated with the pv panels (including frames, fencing and ancillary structures) are generally considered to be less visually intrusive than shiny materials and bright colours.
 - viii. Landform modelling (less than 2m high) can sometimes assist in reducing the visual/landscaping impact of a proposed solar installation. However, it should be in keeping with landscape character, not have detrimental visual/landscape effect itself and management should be consistent with neighbouring uses.
 - ix. Ensure the panels/arrays follow contours and fit within existing enclosure patterns - avoid siting panels that are remote from the rest of the group.
 - x. Maintain land uses on the site that fit with the character of the area and manage vegetation under the solar panels to avoid the site becoming overgrown e.g. by grazing – mulching large areas should be avoided (including plastics to suppress weed growth), particularly on visible sites. Land use should be set out in a landscape management strategy for the lifespan of the development.
 - xi. On greenfield sites minimise trenching and concrete foundations - use pile driven or screw anchored bases (as opposed to concrete bases) where archaeological constraints allow. On decommissioning ensure the ground is fully restored - any concrete should be broken up, removed from site and the area backfilled and reseeded.
- In addition, when designing a scheme across multiple fields the following guidance should be considered:
- xii. Preserve the legibility of field patterns by minimising the number of adjacent fields that are developed and setting PV panels back from the edges of fields. This will also enable effective hedgerow management.
 - xiii. Designing a site layout around existing hedgerows/ woodland will help to break up the massing of panels.
 - xiv. Seek to avoid dominating character in a local area – maintain a diversity of landcover types in any one area.

Ancillary Features

- i. Use existing access points and minimise introduction of new tracks into the landscape – consider using existing tracks or laying temporary surfaces to transport panels onto site where possible. Avoid access tracks between rows of panels as far as possible.
- ii. Avoid use of urbanising elements in rural situations, such as kerbs, and minimise areas of hard surfacing, urban style fencing, gates and lighting (particularly in the darkest landscapes).
- iii. Ensure on-site cables are buried underground (without damage to existing Devon hedges or archaeology) to minimise effects on landscape character and visual amenity - grid connections should be underground wherever possible.
- iv. House inverters in existing buildings where possible, particularly where these are of local vernacular and located near the site.
- v. Cabinets or buildings should be carefully sited and should generally avoid high or exposed locations – use existing and locally occurring vegetation to screen such features.
- vi. Ensure new buildings constructed as part of a solar PV development match the local vernacular, in terms of colours used and scale.

- vii. Use existing or new landscape features to integrate security features into the landscape e.g. security fencing. Set fences back from hedge boundaries on the site's perimeter to reduce their overall height when viewed from outside the site and use planting to screen views of the fences.
- viii. Landscape features used for security or screening should be in character with the landscape – different features may be appropriate for different landscapes e.g. ditches, berms (bunds), tall crops, hedges or tree lines. Ensure any planting is of locally occurring species and in character with the landscape.
- ix. Minimise the use of security lighting – aim to use passive infra-red (PIR) technology where possible and ensure that any visible lighting is designed and installed in a manner which minimises glare or light spill into the surrounding landscape (para. 125 of NPPF encourages limiting the impact of light pollution from artificial light on local amenity and intrinsically dark landscapes).

Land Use/ Landscape Enhancement

- i. Screening development will be important – however, letting hedgerows grow higher should only be employed where it fits with local landscape character, restores traditional management practices, does not result in deterioration of the hedge and does not produce unreasonable shading of panels. Use native or locally naturalised tree and shrub species for any screening.
- ii. Consider opportunities to provide enhanced management of landscape features and habitats as part of a development, including contributing to wider landscape scale targets and projects in the AONB and National Park Management Plans, Devon's Biodiversity Action Plan and Devon's Landscape Character Assessment.
- iii. Encourage traditional management of farmland including maintaining small fields and hedgerows, and grazing of land. Allow hedge tree regeneration or, where appropriate, planting of native or locally naturalised tree species in hedges.
- iv. Any development must be reversible and enable full restoration of the site to its original state once the installation is decommissioned.
- v. Developers should provide:
 - o a design statement to set out how the design has evolved, how the design responds to landscape character, and how visual issues have been addressed.
 - o agreed mitigation measures accompanied by a 'concept landscape design plan' showing any proposals for landscape and ecological mitigation.
 - o details of proposed land management for land surrounding/under installations to demonstrate proposed land use and management through the operational phase and 5 years after decommissioning.

Designing for Multiple Developments

- 3.20 Cumulative effects of multiple schemes are a significant issue for planning authorities to deal with. Without an agreed strategy or thresholds of acceptable change for a particular landscape or area it is difficult for developers and decision makers to determine acceptable limits to development. A landscape strategy may help indicate how much development might be accommodated in a landscape. However, in the absence of thresholds or landscape strategies the guidance below can assist in minimising cumulative effects.
- i. Ensure any solar PV development takes account of landscape sensitivity as well as any landscape strategies for solar PV development that may be available.

- ii. When designing a solar PV development it is important to consider how the scheme fits with other existing, consented and proposed schemes (including within neighbouring planning authorities) to minimise cumulative effects⁴⁵.
- iii. Aim for similarity of design between schemes that fall in the same type of landscape (in terms of siting, layout, scale, form and relationship to key characteristics) to maintain a simple image and reinforce links between landscape characteristics and design response.
- iv. When designing extensions it will be important that scale and appearance of panels are compatible.
- v. Individual solar PV developments should generally appear visually separate unless specifically designed to create the appearance of a single combined development.
- vi. It will be important to ensure that solar PV developments do not have a defining influence on the overall experience of the landscape and that some open views devoid of PV developments are maintained within Devon (i.e. ensure the overall 'green hills' character remains in Devon – ensuring PV developments do not dominate).
- vii. Ensure the area of development is in scale with the landscape in which it lies.
- viii. If two or more solar PV developments are clearly visible in the same view and appear in the same Landscape Character Type they should appear of similar scale (unless the first development is considered too large for its landscape context) and their design should relate to the underlying landscape in the same way.
- ix. Consider views from settlements when designing multiple solar PV developments – avoid 'surrounding' a settlement.

Landscape and Visual Impact Assessment

- 3.21 LVIA is a key part of assessing the effect of proposed solar PV developments, including as part of the EIA process. EIA may not be required for solar PV development (although cumulative effects can trigger an EIA). Nevertheless, it is likely that a landscape and visual impact assessment or appraisal (LVIA) will be required to accompany the planning application. The level of detail required will be dependent upon the sensitivity of the site and the nature of the proposal and its potential effects, but any formal application should include enough information to assess any potential effect on the site during construction, operation and decommissioning of a solar development. Pre-application discussion with the relevant planning authority is strongly recommended for all free standing solar applications and this will provide an opportunity to agree the scope (including agreement on the radius to be used for ZTV), level of detail and presentation of the LVIA, and ensure that it is based on accurate and up to date information. The LVIA should address the key landscape issues raised by the proposals, providing information that is relevant, necessary and material to the decisions to be made. All turbine applications potentially affecting an AONB, National Park or the undeveloped coast will automatically require an LVIA.
- 3.22 General guidance on LVIA is provided in the Landscape Institute and Institute of Environmental Management and Assessment's 'Guidelines for Landscape and Visual Impact Assessment'⁴⁶. However, the following guidance sets out the type of information that could be expected to be submitted as part of a LVIA for a solar PV development in Devon. In addition, LVIAs for EIA developments should comply with the scoping opinion given by the planning authority where this has been sought.

Project description

- 3.23 The planning application should include a description of the project at each phase in its life cycle in sufficient detail to allow the assessment of landscape and visual effects including:

⁴⁵ The Devon Landscape Policy Group are currently promoting the development and use of a common protocol allowing each Devon LPA to record and map renewable energy developments across Devon in a consistent way that is compatible with Cornwall Council's mapping, including wind and solar PV.

⁴⁶ Landscape Institute and Institute for Environmental Management and Assessment (2013) Guidelines for Landscape and Visual Impact Assessment, 3rd Edition, Routledge.

- i. the location, layout, orientation and dimensions or extent of all plant and structures (including plans, elevations and sections) including area of array with proposed separation buffers from hedgerows;
- ii. a description of the scale and duration of project activities during construction, operation, and decommissioning (including method of construction and traffic generation);
- iii. information on site access including routes for transport of panels, including any need for removal of landscape features;
- iv. location and size of temporary lay down areas, construction compounds, materials storage, temporary fencing, foundations and site cable runs;
- v. excavation/levelling details and soil removal estimates (if applicable);
- vi. plans for site reinstatement;
- vii. number and type of PV panels (including form, frame height, materials, colour, base size and mounting type);
- viii. details of any tracking or moving mechanisms;
- ix. location, specification and design of any structures, roads, hardstanding or storage buildings, temporary and permanent;
- x. location and appearance of any signage, security features, lighting, fencing and onsite grid connection point (substation/ switchgear cabinet);
- xi. plans for landscape mitigation measures and/or landscape enhancement;
- xii. plans for decommissioning (removal of panels and ancillary structures, proposals for restoration and future land management).

3.24 The LVIA should highlight those aspects of the development that are the key sources of landscape and visual change.

Baseline studies

- 3.25 The baseline studies should set out the existing conditions within the study area. The study area should be agreed with the relevant planning authority. Information on land use, landscape features, landscape character and landscape designations should be provided, drawing on the Devon Landscape Character Assessment, relevant District/Unitary/AONB Landscape Character Assessments and management plans for designated landscapes⁴⁷. A field survey should be undertaken to supplement desk based information. A description of relevant policies and plans should also be included and the relevant Parish Plan consulted, where available, to understand local landscape values.
- 3.26 The landscape baseline should be evaluated in accordance with the 'Guidelines for Landscape and Visual Impact Assessment'⁴⁸.
- 3.27 A zone of theoretical visibility (ZTV) should be prepared to indicate the area over which solar panels may be seen. Representative assessment viewpoints should be identified (with the aid of the ZTV) and discussed and agreed with the relevant planning authority and other stakeholders where relevant. The number of viewpoints required will vary with the location and scale of the proposal. Priority should be given to views from distances of less than 3km, views from sensitive locations (e.g. residential areas, areas popular with visitors or for outdoor recreation where views may be focussed on the landscape and recognised /iconic views), and views from elevated locations. These should include the clearest views of the development and if the development is visible from a protected landscape there will be a requirement for at least one viewpoint from that landscape. The purpose for selection should be recorded within the LVIA.

⁴⁷ http://www.devon.gov.uk/index/environmentplanning/natural_environment/areas_of_outstanding_natural_beauty.htm

⁴⁸ Note that the 3rd Edition of the GLVIA has just been published and methods/ terminology should be consistent with this new guidance. The 3rd edition also includes guidance on mitigation.

Mitigation

- 3.28 As a consequence of the assessment process there are likely to be modifications to the scheme design to minimise landscape and visual effects. In addition, there may be measures to prevent, reduce or offset significant adverse effects. These should be described in terms of relationship to/conservation of valued landscape features, relationship to landscape character and appearance from sensitive viewpoints and designated landscapes. All mitigation measures should be described and an indication of how they will be implemented provided. A description of the main reasons for site selection and any alternatives in site design or layout would also be helpful.

Enhancement

- 3.29 Enhancement aims to improve the character and quality of the landscape. It may take many forms, including improved land management or creation of new landscapes or features. The NPPF (para 64) acknowledges that "Permission should be refused for development of poor design that fails to take the opportunities available for improving the character and quality of an area and the way it functions". Landscape enhancement, as part of a proposal, will be looked upon favourably.

Description of effects

- 3.30 This section should systematically identify and describe the likely effects of the proposal, identifying magnitude of change as a deviation from baseline conditions. Methods should be clearly set out. The assessment should cover effects at construction, operational and decommissioning phases and should consider direct, indirect, secondary, short, medium and long term effects. Effects on landscape features/fabric, landscape character, landscape values and visual amenity should be assessed.
- Effects on landscape features/fabric should consider loss of elements (e.g. hedges, trees).
 - Effects on landscape character should describe the direct changes that will occur to the character of the landscape as described in the Devon Landscape Character Areas (i.e. with reference to Landscape Character Areas and Landscape Character Types as appropriate) – this should include how the solar PV development will affect perceptions of character and how widespread and prominent the changes will be.
 - Effects on landscape values should also describe any potential changes in special qualities of landscapes as recorded in Devon's Landscape Character Assessments. Particular weight should be given to protecting the special qualities of protected landscapes (i.e. AONB and National Parks), focussing on the reasons for designation referred to in their Management Plans.
 - Effects on visual amenity should describe and illustrate the extent of visibility and record changes in views from the representative assessment viewpoints with reference to photographs and visualisations, taking into account changes in reflectivity and potential glare under different atmospheric conditions (see para. 3.5).
 - Effects on settlements and glint and glare at any properties with a clear view of the site should also be considered.

Assessment of significance

- 3.31 The significance of impacts should be assessed by reference to the Landscape Institute's Guidelines for Landscape and Visual Impact Assessment (3rd Edition). The assessment should identify which impacts are considered to be significant in the context of the EIA Regulations (for EIA development), as well as which are adverse or beneficial. Methods should be clearly set out and any assumptions clearly stated.

Presentation of the LVIA

- 3.32 The document should be clear and logical in its layout and presentation. It should be a balanced document providing an unbiased account of the landscape and visual effects, with reasoned and justifiable arguments. A glossary of technical terms and reference list would also be helpful. For EIA development a non-technical summary should be provided to enable a non-specialist to understand the landscape and visual effects of the proposal – this should include a summary description of the development, the aspects of landscape character and visual amenity likely to be

significantly affected, the likely significant effects and the mitigations measures to be implemented.

Maps and Illustrations to Accompany an LVIA:

- 3.33 The number of maps and illustrations may vary according to the sensitivity of the site and type of proposal. However, as a guide, the following illustrations will typically be required as part of an LVIA for EIA development (see next section for maps and figures required as part of a cumulative assessment):
- i. A site layout plan showing position of arrays, access arrangements, location of any compounds, and all ancillary elements in the context of the physical landscape fabric (this may already form part of the planning application in which case it can be cross-referenced);
 - ii. National character areas within the study area;
 - iii. Devon-wide and District/Unitary/AONB Landscape Character Areas/Types within the study area;
 - iv. National and local landscape designations and open access land within the study area;
 - v. Mapping of historic parks and gardens, conservation areas, scheduled monuments, listed buildings and Devon's cultural trails may also be relevant to the LVIA (this information may also be recorded in the cultural heritage assessment)⁴⁹ ;
 - vi. Zone of Theoretical Visibility within study area or an indication of extent of visibility (including the proportion of the site which will be theoretically visible if possible, and clearly indicating distance radii from the site);
 - vii. A map showing viewpoint locations overlaid onto the Zone of Theoretical Visibility (may be combined with above maps if relevant);
 - viii. Zone of Theoretical Visibility overlaid onto character areas and designations (if considered useful);
 - ix. Photographs and visualisations for viewpoints to illustrate the location and extent of development in the landscape, provided and reproduced at a minimum viewing distance of 30-50cm⁵⁰.

Cumulative Landscape and Visual Impact Assessment of Solar PV Developments

- 3.34 Cumulative assessment is required under the EU Directive on Environmental Impact Assessment (EIA) Directive 97/11/EC amending Directive 85/337/EEC on the assessment of the effects of certain public and private projects on the environment, which was implemented from 1999. It refers to 'an additional cumulative effect that is additional to the impact to be expected from the developments taken individually' (The Council of the European Union, 1997). The Landscape Institute defines cumulative landscape and visual effects as 'additional changes to landscape and visual amenity caused by the proposed development in conjunction with other developments (associated with or separate to it) or actions that have occurred in the past, present or are likely to occur in the foreseeable future'⁵¹. Even if EIA is not required, it is likely that a cumulative landscape and visual impact assessment or appraisal (CLVIA) will be required to accompany the planning application.

⁴⁹ The applicant should speak to the relevant LPA to determine which features will need to be mapped and the Council can provide information on designations to the applicant

⁵⁰ Landscape Institute Advice Note 01/11 recommends a viewing distance between 30 and 50cm. It is recommended that each Devon planning authority establishes what the 'comfortable' viewing distances is for each Member of their Development Management Committee, and allow for this to be known by the applicant. This exercise was carried out for Devon County Council Members in 2011 and the overwhelming majority had a comfortable viewing distance of between 40-50cm.

⁵¹ Landscape Institute and Institute for Environmental Management and Assessment (2013) Guidelines for Landscape and Visual Impact Assessment, 3rd Edition, Routledge.

Differences between LVIA and CLVIA

- 3.35 Although both cumulative and non-cumulative landscape and visual impact assessment (CLVIA and LVIA respectively) consider the effects of a solar PV development on views and on the landscape character of the surrounding area, there are differences in the baseline against which the assessments are carried out.
- 3.36 For LVIA, the baseline is the existing landscape, which includes any existing solar PV developments. This is a known baseline that can be clearly defined. For CLVIA, the baseline is to some extent uncertain, and is partially speculative. This is because solar PV developments considered as part of the baseline should include not only those existing in the landscape, but also those which are consented but not yet built and also those in the process of being determined by the relevant planning authority. The baseline may therefore include (in addition to existing solar PV developments):
- Solar PV developments currently under construction;
 - Solar PV developments which have been granted planning consent but are not yet constructed; and
 - undetermined solar PV development applications.
- 3.37 Schemes that are at the pre-planning or scoping stage are not generally considered in the assessment. They should only be included "if absolutely necessary to make a realistic assessment of potential cumulative effects"⁵². The list of schemes to include should be agreed with the relevant planning authority who will need to decide what is reasonable and proportionate to request for specific applications. The Devon Landscape Policy Group is currently developing a mapping protocol for Devon planning authorities.

Guidance for Devon

- 3.38 The level of detail required will be dependent upon the sensitivity of the site, the nature of the proposal and other existing and proposed schemes, and the potential for cumulative effects. A pre-planning application meeting with the relevant LPA may provide an opportunity to discuss scope. However, the following presents some guidance on undertaking CLVIA of solar PV developments in Devon.

Study Area and Sites to be included in the CLVIA

- 3.39 It is suggested that the CLVIA focuses on potentially significant cumulative effects and that a study area is selected to enable these significant effects to be reported. Study areas will depend on the size and location of other existing and proposed schemes within the landscape and will vary with type of landscape, but initial areas of search may be up to 10km from the proposal. All existing and proposed solar PV developments should be mapped within that area⁵³. The assessment may then focus in on 'hotspot' areas to identify likely significant effects - these 'sub-areas' might be less than 10km from the development. This will help keep the assessment proportional to the scale of the project and the nature of its likely effects

Scenarios for Assessment

- 3.40 Applicants should assess the cumulative landscape and visual effects of different scenarios, if applicable⁵⁴. This may include, for example, a scenario that considers the proposed development in the context of other existing and consented solar PV developments (a certain scenario) as well as a scenario that considers the proposed development in the context of other existing, consented solar PV developments as well as undetermined applications (a less certain scenario).

⁵² Para 7.14 of the 3rd Edition Guidelines for Landscape and Visual Impact Assessment.

⁵³ The Devon Landscape Policy Group are currently developing a map of renewable energy developments across Devon which should aid this process.

⁵⁴ This may be applicable if there are schemes at different stages of the planning process that may result in significant cumulative effects in conjunction with the proposed development

Cumulative ZTV Analysis

- 3.41 Creating Zones of Theoretical Visibility (ZTVs) for each development, and overlaying these to create a CZTV, could help indicate areas where the proposed development is predicted to be visible (either on its own, or in conjunction with other solar PV developments), and areas where other solar PV developments will be visible but the proposed development will not. This can help focus the assessment.
- 3.42 More than one CZTV may be produced to cover more certain and less certain scenarios e.g. a CZTV of all existing and consented schemes (a certain scenario) and a CZTV of all existing, consented schemes and undetermined applications (a less certain scenario).

Choice of Viewpoints for CLVIA

- 3.43 A number of viewpoints should be selected to illustrate cumulative visual effects arising from the solar PV development being assessed, in combination with other existing and proposed solar PV development. These selected viewpoints may be the same as, or a subset, of the main LVIA viewpoints, or they may be different. In any case they should be selected to specifically to illustrate cumulative effects, including representing the worst-case. These should be agreed with the relevant LPA prior to submission of planning application and preferably at the scoping stage.

Baseline Evaluation for the CLVIA

- 3.44 The sensitivity of the landscape and visual resource will be the same as that recorded in the LVIA. Assessment of effect on key routes may also form a part of the cumulative assessment and if routes are included their sensitivity will also need evaluating. Key routes should be selected with reference to guidance published by Scottish Natural Heritage (SNH, 2012) and should include well used or important routes (e.g. National and Regional Trails⁵⁵ and well used tourist routes) that may be affected by cumulative effects.

Preparing Cumulative Visualisations

- 3.45 Cumulative visualisations may be required from viewpoints to illustrate the nature and degree of change to the landscape and views. This is particularly important in cases where significant cumulative effects are predicted.

Describing and Assessing Effects

Magnitude of Cumulative Change to Landscape

- 3.46 The magnitude of cumulative change to landscape character is the influence the additional solar PV development will have on the character of the area which can be judged by considering:
- The distance over which the development will have an influence on landscape character in combination with other existing and proposed solar PV developments;
 - The location and design of the solar PV development being assessed in relation to other existing and proposed solar PV developments;
 - The size and scale of the solar PV development being assessed in relation to other existing and proposed solar PV developments;
 - Whether key characteristics of the surrounding landscape are affected by the cumulative impact.
 - It will also be important to consider the combined effect of fences, tracks etc. on the landscape.

Magnitude of Cumulative Change to Views

- 3.47 The magnitude of cumulative change to views should be described taking into account the following:

⁵⁵ http://www.devon.gov.uk/public_rights_of_way

- The arrangement of developments in the view, e.g. developments seen in one direction or part of the view, or seen in many directions;
- The relationship between the various sizes and layouts of the developments;
- The position of the solar PV developments in the view, e.g. within folds in the landscape or on exposed hillsides;
- The apparent distances, from the viewer, and between developments; and
- In the case of magnitude of change to routes (sequential effects), the relative duration of views of solar PV developments from routes.
- It will also be important to consider the combined effect of tracks on views. The CLVIA should also consider effect on views from settlements.

Effect on Designated Landscapes

- 3.48 The CLVIA should set out the implications of cumulative effects on designated landscapes within the study area.

Significance

- 3.49 The assessment should identify which effects are considered to be significant in the context of the EIA Regulations (for EIA development), as well as which are adverse or beneficial.

Figures

- 3.50 The number of maps and illustrations may vary according to the sensitivity of the site, the nature of the proposal and other existing and proposed schemes, and the potential for cumulative effects. However, as a guide the following illustrations may be required as part of a CLVIA:
- Location map⁵⁶ for all operational, consented and application sites within the study area, presented on a 1:50,000 or 1:25,000 OS base with concentric distance bands.
 - CZTV for existing and proposed solar PV schemes in combination with the proposed development (CZTVS may be particularly useful for larger schemes - more than one CZTV may be useful to show different scenarios, as set out in the guidance above).
 - CZTVs overlaid onto landscape character areas/ types, landscape designations and cumulative assessment viewpoints where this helps understand the assessment.
 - Photographs or visualisations of up to 360 degrees to show the proposed development in the context of other developments - annotated with site name, status (operational, consented, application), distance to each development, and clearly labelled to indicate how the images should be held and viewed.

References/ Further Reading

Cornwall Council (2011) Renewable Energy Planning Guidance Note 2: The development of large scale (>50kW) solar PV arrays [<http://www.cornwall.gov.uk/default.aspx?page=25182>]

The Countryside Agency and Scottish Natural Heritage (2002) Landscape Character Assessment – Guidance for England and Scotland

Landscape Institute and Institute for Environmental Management and Assessment (2013) Guidelines for Landscape and Visual Impact Assessment, 3rd Edition, Routledge.

Landscape Institute (2011) Photography and photomontage in landscape and visual impact assessment: Landscape Institute Advice Note 01/11.

RegenSW (2010) Planning for solar parks in the south west of England [http://regensw.s3.amazonaws.com/solar_parks_event_note_november_2010_cb7bd1d625965fdf.pdf]

⁵⁶ The Devon Landscape Policy Group is currently developing a map of renewable energy developments across Devon which should aid this process.

Natural England (2011) Technical Information Note TIN101 Solar parks: maximising environmental benefits [<http://publications.naturalengland.org.uk/file/102004>]

Managing Landscape Change

4 Managing Landscape Change

- 4.1 This section is included to provide some advice on managing landscape change, both through development management, and proactively through forward planning. It is likely to be of interest to development management teams and Council Members in assessing applications, as well as developers and their consultants preparing planning applications.

Reviewing Applications

- 4.2 When determining planning applications for renewable and low carbon energy, the NPPF encourages local planning authorities to “approve the application if its impacts are (or can be made) acceptable” (para. 98).
- 4.3 It is important to note that a significant effect is not the same as an unacceptable one and the judgement on acceptability will need to balance the adverse effects of a project against the benefits of the project (and is not a landscape judgement alone).
- 4.4 However, in considering whether the development can be accommodated in the landscape, the following criteria may be considered:

- i. **Landscape character and sensitivity:** Does the development respond to landscape character (as set out in published landscape character assessments) and respect key landscape sensitivities?
- ii. **Landscape quality:** Are the special qualities of Devon’s landscapes conserved, particularly in protected landscapes?
- iii. **Potential for harm:** Will any distinctive characteristics or special qualities of the existing landscape (as set out in the Devon Landscape Character Assessment) be adversely affected by the proposals? And to what extent will they be affected? Is the development in line with Landscape Character Assessment recommendations and guidance?
- iv. **Sensitive siting:** Has the development been sensitively sited, or could the development proposal be better sited within land under the applicant’s control?
- v. **Sensitive design:** Has the scheme been designed to firstly avoid harm, and secondly minimise any unavoidable harm?
- vi. **Additional mitigation/ landscape enhancement:** Have opportunities been taken to mitigate significant adverse effects and have opportunities for landscape enhancement been included?

- 4.5 In order to judge whether multiple developments can be accommodated in the landscape it is useful to understand the aspirations for that landscape. Deployment strategies for particular types of renewable energy development may provide a view on the relative amounts of development that might be accommodated in different types of landscape and this may assist decision makers in making judgements on acceptability. In the absence of deployment strategies each development has to be determined on its own merits and on an assessment of cumulative effects. Planning applications should demonstrate how development proposals respond to the landscape character and minimise harm to valued characteristics, features and qualities.
- 4.6 In addition to this, the Devon Landscape Policy Group has developed a policy position which is included as Appendix 3.

Proactively Managing Change

- 4.7 The NPPF recognises that the landscape is changing, particularly as a result of climate change, and paragraph 94 encourages planning authorities to adopt proactive strategies to mitigate and

adapt to climate change and paragraph 97 encourages local planning authorities to “have a positive strategy to promote energy from renewable and low carbon sources”.

- 4.8 The Planning & Climate Change Coalition’s guidance for local authorities⁵⁷ recommends that local authorities “*identify the most and least environmentally sensitive areas for deployment of different renewable energy technologies and communicate this to developers and communities, making explicit what criteria have been applied.*” (para. 3.4 a.ii). Criteria linked to the Landscape Character Assessment evidence base would allow local authorities to fulfil this recommendation. Assessment at a Devon-wide scale would be useful for strategic planning at that scale, and a District level assessment would be more useful for planning at the District scale.
- 4.9 It would be beneficial to have consistency throughout Devon and the Landscape Sensitivity Study for Torridge⁵⁸ could be used as a basis for further debate as part of the development of local plans. The approach used in Torridge is set out in the box below:

An Assessment of the Landscape Sensitivity to Onshore Wind Energy & Field-Scale Photovoltaic Development in Torridge District

The Torridge Study was undertaken in two parts:

- i) to assess the sensitivity of the landscape to wind energy developments and field-scale solar PV developments;
- ii) to develop a ‘landscape strategy’ for deployment of each technology in each Landscape Character Type (to give an indication of the relative amounts of development that might be accommodated in different Landscape Character Types).

i) Landscape Sensitivity Assessment

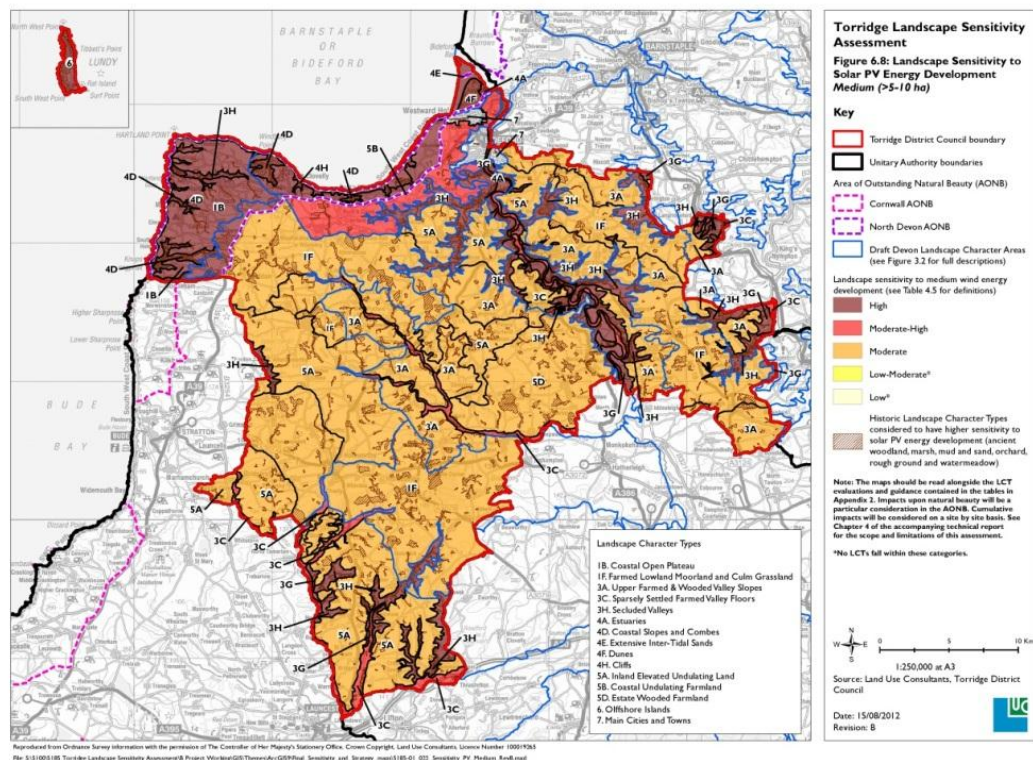
The Torridge study used the following definition of landscape sensitivity:

Landscape sensitivity is the extent to which the character and quality of the landscape is susceptible to change as a result of wind energy/field-scale solar PV development.

The assessment of landscape sensitivity assessment was based on an assessment of landscape character using carefully defined criteria, similar to those set out in Tables 3.1 and 4.1 of this report. The criteria were assessed individually and then the results are drawn together into a summary discussion on landscape character sensitivity for that landscape type. A judgement was then made on landscape sensitivity to different sizes/scales of development (height of wind turbines and size of solar PV development) on a five point scale. An example of landscape sensitivity mapping from Torridge District is included overleaf:

⁵⁷ Planning & Climate Change Coalition (April 2012) Planning for Climate Change – guidance for local authorities

⁵⁸ LUC (2011) An Assessment of the Landscape Sensitivity to Onshore Wind Energy & Field-Scale Photovoltaic Development in Torridge District [http://www.torridge.gov.uk/index.aspx?articleid=7340]



ii) Landscape Strategies

The results of the landscape sensitivity study indicated that all landscapes within the District would be susceptible to change to some degree as a result of accommodating wind energy development and field-scale solar PV development. However, the Council recognised the need to maximise opportunities for renewable energy generation while at the same time ensuring that the important characteristics of the landscape were not unacceptably harmed. A landscape strategy was therefore developed for each Landscape Character Type, based on the following considerations:

- Avoiding significant harm to the key characteristics of a landscape type whilst accepting that some change might be required in order to accommodate renewable energy generation;
- Responding to locations where new energy infrastructure is best accommodated and where the character or features of the landscape make them less suitable (as indicated by the comparative sensitivities of landscapes across Torridge and set out in the landscape sensitivity assessment);
- Maintaining the diversity of landscapes across Torridge (i.e. ensuring that the design of any scheme responds to landscape character);
- Retaining areas of undeveloped landscape in the most undeveloped areas of Torridge (for example along the undeveloped coast);
- Allowing continued experience of the undeveloped character of the landscape in-between wind energy and field-scale photovoltaic developments;
- Maintaining the natural beauty of the AONB.

While the landscape sensitivity analysis gave an indication as to the comparative sensitivity of different landscape character types to renewable energy development, the 'landscape strategy' gave an indication of the relative amounts of development that might be accommodated taking into account the above criteria.

Each Landscape Character Type was given one of five broad landscape strategies:

A '**landscape without wind energy/solar PV development**' – a landscape within which no wind energy/ solar PV developments are located. There may, however, be distant views of wind energy/free standing solar PV developments located in clearly different types of landscape, which may be perceptible under conditions of good visibility.



A '**landscape with very occasional wind energy / solar PV development**' – a landscape in which there are very occasional very small-scale turbines, usually associated with farm buildings, or some very occasional very small-scale PV installations. There may be views of larger scale wind energy/solar PV developments located in clearly different types of landscape, which may be perceptible under conditions of good visibility.



A '**landscape with occasional wind energy/solar PV development**' – a landscape within which one or more wind energy/ solar PV developments are located. In this landscape, the wind energy/ solar PV developments are usually clearly separated and whilst each wind energy/ solar PV development influences the perception of the landscape at close proximity, they do not have a defining influence on the overall experience of the landscape (developments would not result in a significant cumulative impact on the landscape character type or area as a whole or overall change of landscape character type). The landscape would not be dominated by wind turbines/ solar PV development.



A '**landscape with wind energy/solar PV development**' – a landscape within which several wind energy/ solar PV developments are located, and where the landscape may be perceived as having wind energy/ solar PV developments visible in more than one direction, and where wind energy/ solar PV developments are a defining characteristic of the landscape character type or area. It will still be possible to appreciate the character of the landscape without wind farms/ solar PV developments dominating every view within that landscape.



A '**wind farm/solar PV landscape**' – a landscape where turbines/solar PV panels are the overwhelming influence on the landscape character of the area. All other landscape features are seen in the context of extensive wind energy/solar PV development.



More information can be found at <http://www.torridge.gov.uk/index.aspx?articleid=7340>

Acknowledgements

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Melanie Hinde, Devon County Council (DCC) Landscape Officer and chair of the DLPG led on the commission and made contributions to planning policy aspects of the Advice Note in collaboration with Andy Bowman, Joe Keach, and George Marshall of DCC, and Pauline Warner of South Hams District Council. The DLPG is grateful to Natural England and Devon County Council for providing funding support for the Advice Note preparation.

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Documents held by Devon County Council landscape officer record the comments received on previous drafts and how these have been taken into account in the final version. These are published at:
http://www.devon.gov.uk/index/environmentplanning/natural_environment/landscape/landscape-policy-guidance.htm

Photographs used in the guidance were kindly donated by:

Front cover: Andrew Bowman, Olwen Maidment and Cynthia Snowdon

Wind Farm at Stowford Cross, Bradworthy, p.9: LUC

Access to Toddleburn Wind Farm, p.10: Walter Baxter

Carraig Gheal Wind Farm, Scotland, p11: C A Blackwell Ltd

Lights at Rollins Wind Project, Maine, p.11: Rainer Egle

Graduated turbine tower, p.20: LUC

Solar PV Development at Benbole Farm, Cornwall, p.35: Melanie Downes

Solar PV Development near Strete Raleigh, East Devon, p.36: Andy Leithgoe

Solar PV Development at Five Mile Hill, Teignbridge, p.36: Andy Leithgoe

Solar PV development as viewed from the back, p37: Melanie Downes

Two images of a Solar PV Development near Aysford, Mid Devon, p.38: Andy Leithgoe

Solar PV Development at Five Mile Hill, p.75: Olwen Maidment

Solar PV Development in the South Hams, p.75: SCG Associates

Solar PV Development at Ayshford Court Farm, Mid Devon, p.76: Andy Leithgoe

The map illustrating cumulative effects of wind and solar PV in Devon and neighbouring counties in Chapter 1 was the result of a student project by Bath University GIS Group, commissioned by Andy Bowman, Senior Planner at DCC.

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Tamar Valley AONB

Torbay Council

East Devon AONB

Exeter City Council

Plymouth City Council

Dorset County Council

Glossary

AGLV	Area of Great Landscape Value
AOD	Above Ordnance Datum (sea level).
AONB	Area of Outstanding Natural Beauty
Characteristic	A distinctive element of the landscape that contributes to landscape character for instance a particular hedgerow pattern or sense of tranquillity.
Cumulative effects	The summation of effects that result from changes caused by a development in conjunction with other past, present or reasonably foreseeable actions.*
ELC	European Landscape Convention
GIS	Geographic Information System.
HLC	Historic Landscape Character
HLT	Historic Landscape Types
Landscape character	The distinct, recognisable and consistent pattern of elements that occur in a particular landscape and how these are perceived. It reflects particular combinations of geology, landform, soils, vegetation, land use and human settlement.
Landscape character areas	Single unique areas that are the discrete geographical area of a particular landscape type.
Landscape character types (LCT)	Distinct types of landscape that are relatively homogenous in character. They are generic in nature in that they may occur in different areas in different parts of the country, but share broadly similar combinations of geology, topography, drainage patterns, vegetation, historic land use and settlement pattern.
Landscape feature	A prominent eye-catching element, for example, wooded hilltop or church spire.*
Landscape sensitivity	The relative extent to which the character and quality of the landscape is susceptible to change as a result of a particular type of development.
LCT	Landscape character type.
Mitigation	Measures, including any process, activity or design to avoid, reduce, remedy or compensate for adverse landscape and visual effects of a development project.+
NPPF	National Planning Policy Framework March 2012 (Department for Communities and Local Government)
Skyline	The outline of a range of hills, ridge or group of buildings seen against the sky.
Viewing distance	'Viewing Distance' is the distance between a viewer's eye and a printed image. The 'correct viewing distance' is the distance at which the perspective in the printed image most closely reconstructs the perspective of the landscape as it appears from the viewpoint.
Visualisation	Computer simulation, photomontage or other technique to illustrate the appearance of a development.*
Wirelines	Also known as 'wireframes' or 'computer generated line drawings'. These are computer generated line drawings based on digital terrain models (DTM), that illustrate the three-dimensional shape of the landscape in combination with additional elements.+
Zone of Theoretical Visibility, ZTV	This represents the area over which a development can theoretically be seen, based on digital terrain data. This information is usually presented on a map base (also known as the Zone of Visual Influence, ZVI).+

* As defined by the Landscape Institute and Institute of Environmental Management and Assessment (2002)

+ Taken from Scottish Natural Heritage (2006) Visual Representation of Windfarms: Good Practice Guidance

Appendix 1: Local Template

Introduction

This document provides a local supplement to the Devon Landscape Policy Group Advice Note No. 2 “Accommodating Wind and Solar PV Developments in Devon's Landscape”.

It has been prepared by [insert name].

Local Features as Size Comparators

In order to visualise how the different turbine heights and solar PV areas set out in the Devon guidance relate to features in [insert local planning authority area] **Table 1** sets out some comparable features.

Table 4 Familiar Features as Size Comparators

Feature	Size	Size category used in this guidance
Height		
Area		

Insert photos of features where possible

Local Context

Use this section to set out the local landscape context – this could include local landscape policy, landscape designations and landscape classifications/ guidance relevant to the area.

Local Guidance

Use this section to any additional guidance relevant to the area in question.

Members of the Devon Landscape Policy Group who may be contacted to provide further general guidance on the content of the Advice Note include:

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Melanie Hinde	Landscape officer	Devon County Council	Melanie.hinde@devon.gov.uk

For pre-application advice on site-specific proposals, please contact your local planning authority.

Appendix 2: Types and Scales of Development

The following presents a guide to types and scales of development that are referred to in the guidance and which may be used to provide consistency across Devon when describing developments.

It should be noted that the descriptive titles given to each size band are relative to the typical sizes of development coming forward at the time of writing. Sizes are indicative and transitions between bandings are gradual.

Wind Energy Developments

The key components of wind energy developments are the wind turbines, which may be grouped together into a 'wind farm'. For wind energy development variables may include turbine heights and turbine cluster sizes. There is no height threshold definition for 'major development' as defined in Article 8 of the Town and Country Planning (Development Management Procedure) (England) Order 2010. However, the EIA Regulations (Schedule 2, 3(i)) states that a wind energy development may be considered "major development" if more than two turbines OR hub height is greater than 15m. Whether the development then needs EIA is subject to the screening criteria in Schedule 3.

Turbine heights

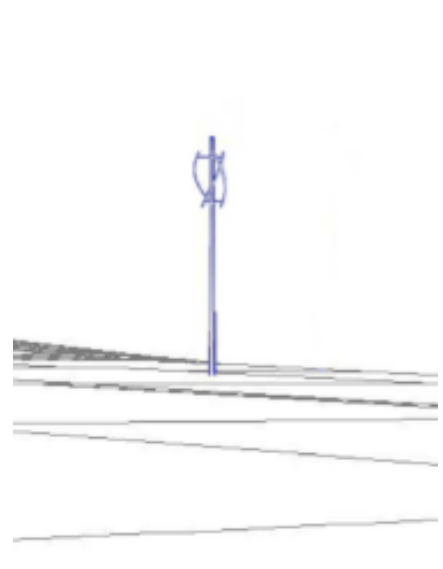
- Very small turbines (approx. <25 metres to blade tip, excludes roof mounted turbines);
- Small sized turbines (approx. 26-50 metres to blade tip);
- Medium sized turbines (approx. 51-75 metres to blade tip);
- Large turbines (approx. 76-110 metres to blade tip);
- Very large turbines (approx. 111-150m to blade tip).

Turbine cluster sizes⁵⁹

- Single turbine
- Small-scale clusters (up to 5 turbines)
- Medium scale clusters (6-10 turbines)
- Large-scale clusters (11-25 turbines)
- Very large-scale clusters (>26 turbines)

The majority of wind turbines consist of horizontal axis three-bladed turbines on a steel tower (see left photos below), although two bladed turbines (see middle photo below) and vertical axis turbines (see right photo below) also exist.

⁵⁹ Turbine cluster size refers to a cluster of turbines within a single development (or an extension to single development).



Depending on the scale and design of the turbine, the transformer may be located inside or outside the tower. The tower itself sits on a buried concrete foundation which is hidden from view. In addition to the turbines themselves, developments involving large-scale wind turbines typically require access tracks, an area of hardstanding next to each turbine to act as a base for cranes during turbine erection (these can be removed or covered over during operation), underground cables connecting the turbines (buried in trenches, often alongside tracks), one or more anemometer mast(s) to monitor wind direction and speed, a control building (to ensure the turbines are operating correctly), a substation, and possibly also lighting and borrow pits to provide construction materials for the access tracks.

Free Standing Solar PV Developments

The key components of solar PV developments are the solar PV panels, which may occur as one solar panel, or a small row of solar panels, in a field, or as a much larger array⁶⁰ of panels across one or more fields ('field-scale solar PV'). It is worth noting that 'major development' in planning terms⁶¹ applies to development carried out on a site having an area of 1 hectare or more, which equates to anything larger than the 'very small' category below.

Solar PV development areas

- Very small: < 1 ha (2.5 acres)
- Small: >1 to 5 ha (2.5 to 12.4 acres)
- Medium: >5 to 10 ha (12.4 to 25 acres)
- Large: >10 to 15 ha (25 to 37 acres)
- Very large: over 15 ha (over 37 acres)

The panels are supported by a frame and positioned at a fixed angle between 20-40 degrees from the horizontal, facing south. Some developments contain panels that can be manually rotated several times a year to enable the arrays to track the sun and so ensure maximum capture of the sun's energy, while others feature fixed panels which are positioned to face in a southerly direction. Technology does exist to allow for automatic tracking, although this is rarer. The elevation of panels above ground level (usually reaching no more than 3m) allows growth of vegetation beneath and between the arrays, and the associated grazing of stock. Larger developments will also be accompanied by inverters (which may be housed within new or existing buildings), transformer and underground power cables, an on-site power house, security fencing, CCTV and possibly also access tracks to bring the solar panels to a site.

In order to visualise how these different turbine heights and solar PV areas relate to other structures in Devon **Table A1** sets out some comparable features.

⁶⁰ An 'array' may be defined as a systematic arrangement of objects, usually in rows and columns

⁶¹ as defined in Article 8 of the Town and Country Planning (Development Management Procedure) (England) Order 2010

Table A4 Familiar Features as Size Comparators

Feature	Size	Size category used in this guidance
Height		
Domestic buildings	6-10m	Very small
Mature deciduous trees (depending on species)	10-25m	Very small
Hartland Point Radar Station	23.8m	Very small
132kV L7 pylon	28m	Small
Widcombe in the Moor Church	36m	Small
275kV L3 pylon	38m	Small
Hartland/Stoke Church	39m	Small
400kV L6 pylon	50m	Small
Nelson's Column, London	52m	Medium
Three turbines at Stowford Cross, Bradworthy, (in the Western Culm Plateau of Torridge District)	75m (to blade tip)	Upper end of medium
Big Ben, London	90m	Large
Turbines at Fullabrook Wind Farm, North Devon	110m (to blade tip)	Upper end of large
Huntshaw Cross Mast	164m	Taller than the largest wind turbine
Area		
Football pitch	0.6-0.8 ha	Very small
Car park for around 500 cars ⁶²	Up to 1 ha	Very small
Sandy Park Rugby Ground	1 ha	Small
Average field size in Devon ⁶³	4.1 ha	Small
Solar PV Development at Five Mile Hill near Pathfinder Village, Teignbridge District	1.25ha	Small
Car park for around 2700 cars e.g. Westpoint Arena, Exeter	Up to 5ha	Small
Approximate site area for planning applications for Eastcombe Farm and Great Knowle Farm solar farms	8ha each	Medium

⁶² Based on an assumption of a car parking space being 2.4m x 4.8m with a 6m wide aisle

⁶³ Taken from 'Hedgerow Management: A Study of Farmers' and Contractors' Attitudes 2000'

Feature	Size	Size category used in this guidance
(2.4MW and 2.1MW)		
Car park for around 5300 cars	Up to 10ha	Medium
Blue Post Solar Farm, South Hams	10Ha	Upper end of medium
Eden Project (whole pit) in Cornwall (near St Austell)	15 ha	Large
Car park for around 8000 cars	Up to 15ha	Large
Exeter County Cricket Ground	15.8 ha	Very large



Aerial view of the Sandy Park Rugby Ground (1ha, upper end of the 'very small' size category) Copyright © 2013 Google Image © 2013 Infoterra Ltd & Bluesky



*Solar PV Development at Five Mile Hill near Pathfinder Village, Teignbridge District (1.25ha, 'small' size category).
Photo credit: Olwen Maidment, Teignbridge District Council*



Blue Post Solar Farm currently being constructed in the South Hams (10Ha, upper end of the 'medium' size category or lower end of the 'large' size category). Photo credit: SCG Associates.



Solar PV Development at Ayshford Court Farm, Mid Devon (15Ha, upper end of the 'large' size category), photo credit: Andy Leithgoe



Aerial view of the Eden Project (15ha, upper end of the 'large' size category) © 2013 Google Image © 2013 Getmapping plc

Appendix 3: DLPG's Policy Position: Towards consistent local landscape policy and guidance on renewable energy development in Devon

The following text has been developed by the Devon Landscape Policy Group:

In response to the National Planning Policy Framework (NPPF), the Overarching National Policy Statement for Energy (EN-1) and the strategic priority to conserve and enhance Devon's landscape, planning authorities in Devon are encouraged to formulate local policies and guidance which are consistent with the following:

- 1. Planning applications for wind and solar pv developments will be expected to include a satisfactory assessment of the effects of the proposals on the landscape and visual resource, including cumulative landscape and visual effects (NPPF 97, 116).*
- 2. Planning applications for wind and solar pv developments will be expected to include a 25 year management plan.*
- 3. Approval for wind and solar pv development will normally be given unless:*
 - A. Harm to the landscape has not been, or could not be, minimised to acceptable levels through reasonable mitigation measures (ref EN-1, 5.9.17 and NPPF 65); or*
 - B. Proposals are poorly designed in that they fail to take the opportunities available for improving the distinctive character and valued qualities of Devon's landscape and the way it functions (ref NPPF 64); or*
 - C. The scale, nature and sensitive landscape location of the proposals would result in adverse effects to the distinctive character and special qualities of the landscape that are:*
 - i. Inconsistent with the stated objectives of the area (NPPF 58); and*
 - ii. Are considered so harmful (either in isolation or in combination with the effects of other existing, planned and proposed development or with other adverse environmental effects of the proposals) as to outweigh the benefits, taking into account the duration and reversibility of effects (ref EN-1, 5.9.14-16).*
- 4. In considering the above, great weight will be given to conserving and enhancing the special qualities and distinctive character of National Parks, Areas of Outstanding Natural Beauty and the undeveloped coast (NPPF114, 115).*
- 5. Where permission is granted on the basis that the benefits of the proposals outweigh predicted harm to the landscape, the applicant will be required to agree appropriate enhancement measures to offset such harm within the landscapes affected, proportionate to the likely harm predicted.*