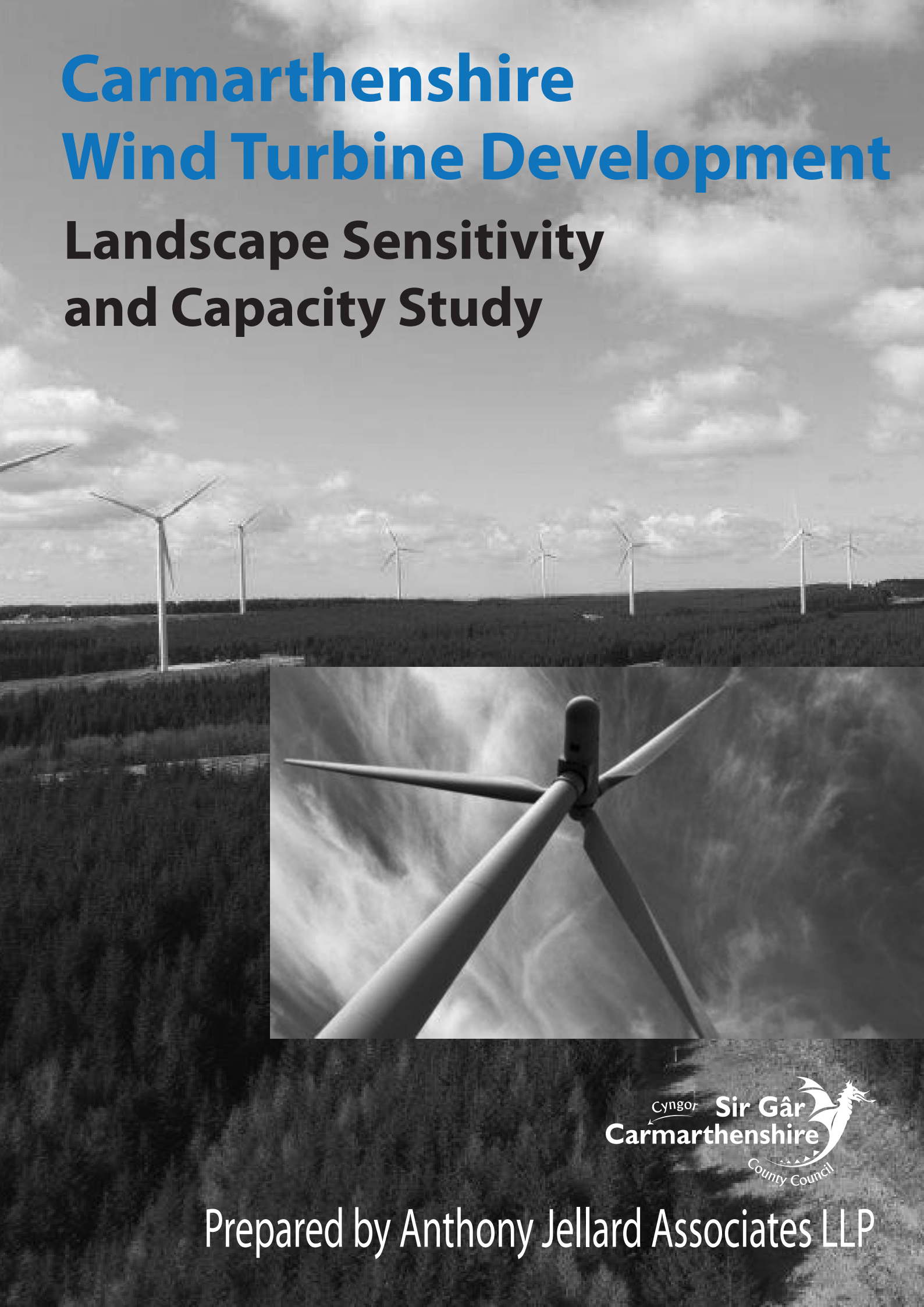


Carmarthenshire Wind Turbine Development

Landscape Sensitivity and Capacity Study



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Section 1:

INTRODUCTION

1.1 This study was commissioned by Carmarthenshire County Council. The study area extends over all of the County of Carmarthenshire, except for the following exclusions:

- areas which lie within the administrative area of the Brecon Beacons National Park Authority;
- areas along the coastal fringe and within the intertidal zone along the sea coast, since these areas are considered to be impracticable for wind turbine development;
- specific urban areas of the County which are defined as such by the LANDMAP Visual and Sensory Aspect datasets¹.

1.2 The Welsh Government is committed to increasing the amount of electricity generated from renewable sources as part of its overall strategy to tackle climate change. In the short to medium term, wind energy continues to offer the greatest potential (for activities within the control of the planning system in Wales) for delivering renewable energy. Wales has an abundant wind resource and power generation using this resource remains at present the most commercially viable form of renewable energy. In recent years, there has been a significant number of planning applications to local authorities in Wales for the erection of single or multiple wind turbines which have the potential to result in significant effects on the receiving landscape.

1.3 *The overall purpose of this study is to provide guidance to inform the appropriate design and siting of wind turbine development through setting out a baseline assessment of landscape and visual sensitivity and capacity in relation to different turbine development classifications.* The study will form a useful tool for the Local Planning Authority's Planning Policy and Development Management Officers in the assessment of the landscape and visual effects of proposals for wind turbine development. The study is intended to provide a baseline to help achieve a context for consistent and robust decision making, by both officers and elected members, when considering planning applications for wind turbine development, and as guidance for developers.

1.4 The study is primarily intended for the consideration of applications for wind turbine developments on sites located outside the Strategic Search Areas (SSAs) that were identified in 2005 in Technical Advice Note 8: *Planning for Renewable Energy*, of Planning Policy Wales, as likely to be most suitable for large scale (over 25MW) onshore wind developments. Technical Advice Note 8 identified two Strategic Search Areas which lie wholly or partly within the administrative County of Carmarthenshire: SSA E Pontardawe, and SSA G Brechfa Forest. Importantly, Technical Advice Note 8 states that '*not all land within the SSAs may be technically, economically and/or environmentally suitable for major wind power proposals*'.² Annex D to Technical Advice Note 8, which deals specifically with landscape and visual impacts, advised local planning authorities to undertake local refinement studies in order to guide wind farm development. Such a refinement study was undertaken for both SSAs. This study has taken account of the presence of these SSAs. It has made

¹Newcastle Emllyn, Whitland, St Clears, Laugharne, Carmarthen, Burry Port, Kidwelly, Llanelli, Llangennech, Ammanford, Glanaman, Upper Brynaman, Llandysul (part), Llanybydder, Llandeilo and Llandovery

² TAN 8 July 2005, paragraph 2.4, p.5

appropriate judgments as to what effect the proximity of a SSA might have when assessing the landscape sensitivity and capacity for wind turbine developments in nearby areas outside their boundaries.

1.5 The South Wales Landscape Liaison Group (comprising representatives of 13 local authorities, 2 National Park Authorities and representatives of Natural Resources Wales (NRW) and the Welsh Government), identified the need to develop consistent guidelines and clarity for local authorities and applicants in the consideration of proposals for single and groups of wind turbines. The assessment approach used in this study was informed by the pilot study undertaken in 2015 for a consortium of five constituent authorities responsible for the 'Heads of the Valleys' area of South Wales, and carried out on behalf of the South Wales Landscape Liaison Group.

1.6 *This is a strategic study and does not attempt to be prescriptive at an individual site level.* It does not replace the need for Carmarthenshire County Council to consider individual planning applications on merit; nor does it absolve developers from their responsibility to prepare and submit as part of their planning application a specific landscape and visual impact assessment, carried out in accordance with current professional guidance.

National Planning Policy

Planning Policy Wales, Edition Eight (January 2016)

1.7 Land use planning policies for the Welsh Government, as set out in the national planning guidance contained within Planning Policy Wales (PPW), establish amongst other policies the Government's objectives for the conservation and improvement of natural heritage, in particular the protection of native habitats, trees and woodlands and landscapes with statutory designations. The LANDMAP³ information system is endorsed as an important resource to use for landscape assessment. All forms of renewable energy are promoted where they are environmentally and socially acceptable.

1.8 PPW Edition 8 confirms the Welsh Government's commitment to energy efficiency and sustainable renewable energy in the following manner:

*'The Welsh Government is committed to playing its part by delivering an energy programme which contributes to reducing carbon emissions as part of our approach to tackling climate change (see 4.5) whilst enhancing the economic, social and environmental wellbeing of the people and communities of Wales in order to achieve a better quality of life for our own and future generations. This is outlined in the Welsh Government's Energy Policy Statement Energy Wales: A Low Carbon Transition (2012).'*⁴

1.9 In providing more specific advice, PPW goes on to state that:

³PPW Edition 8, paragraph 5.3.12, p.85; LANDMAP is the officially promoted approach to landscape assessment in Wales; its information system is administered by Natural Resources Wales

⁴ *Planning Policy Wales*; Edition 8 (January 2016); paragraph 12.8.1, p.178

'Planning policy at all levels should facilitate delivery of both the ambition set out in Energy Wales: A Low Carbon Transition and UK and European targets on renewable energy. The Renewable Energy Directive contains specific obligations to provide guidance to facilitate effective consideration of renewable energy sources, high-efficiency technologies and district heating and cooling in the context of development of industrial or residential areas, and (from 1 January 2012) to ensure that new public buildings, and existing public buildings that are subject to major renovation fulfil an exemplary role in the context of the Directive. The issues at the heart of these duties are an established focus of planning policy in Wales, and in this context both local planning authorities and developers should have regard in particular to the guidance contained in Technical Advice Note 8: Planning for Renewable Energy, and Planning for Renewable Energy – A Toolkit for Planners'.⁵

Technical Advice Notes

1.10 PPW is supported by a series of Technical Advice Notes (TANs). TAN 8: *Planning for Renewable Energy* identifies seven 'Strategic Search Areas' (SSAs) where the Welsh Government decided that large scale (over 25MW) onshore wind turbine development should be concentrated. TAN 8 states that: *'most areas outside SSAs should remain free of large wind power schemes'*.⁶ However, it acknowledges that *'there may be further opportunities for the development of wind farm or other renewable energy schemes on urban/industrial brownfield sites up to 25MW within Wales and these should be encouraged.'*⁷ TAN 8 also notes that there may be some potential for smaller community-based and domestic wind farm schemes less than 5MW elsewhere.⁸

1.11 Annex D to TAN 8⁹ states that, within and immediately adjacent to the SSAs, there is an *'implicit objective in TAN 8 to accept landscape change i.e. a significant change in landscape character from wind turbine development'*. Outside the SSAs, *'the implicit objective is to maintain the landscape character i.e. no significant change in landscape character from wind turbine development.'* An important caveat is that, in spite of the implicit objective for landscape change in SSAs, TAN 8 states that the SSA boundaries are 'broad brush' and that not all areas within SSAs may be suitable for major wind turbine development.

1.12 TAN 12: *Design* advocates appraisal of the character of the landscape as a part of successful design development, noting that: *'The way in which development relates to its urban or rural landscape or seascape context is critical to its success. Because of this, an understanding of landscape quality, including its historic character, is fundamental to the design process.'*¹⁰

1.13 This study responds to the advice in TAN 12 that *'Local planning authorities are responsible for assessing adequately the relative qualities of their local landscape. The development plan may specify the local authority's landscape design expectations or it could also have a role in the preparation of design guidance and SPG for specific developments or in specific areas.'*¹¹ The intention is to ensure that adverse landscape impacts are limited, by locating wind turbine

⁵ *Planning Policy Wales*; Edition 8 (January 2016); paragraph 12.8.2, pp.178-179

⁶ TAN 8 July 2005, paragraph 2.13, p.7

⁷ TAN 8 July 2005, paragraph 2.11, p.7

⁸ TAN 8 July 2005, paragraph 2.12, p.7

⁹ TAN 8 July 2005; Annex D at paragraph 8.4

¹⁰ TAN 12 May 2016; paragraph 5.5.1, p.33

¹¹ TAN 12 May 2016; paragraph 5.5.3, p.34

development in areas where the landscape is able to accommodate it without significant harm. TAN 12 cites the use of LANDMAP as *'one method of assessment which has the potential to provide a framework and information base from which good design and management can be developed.'*¹² This study has based its judgments upon current published LANDMAP data, across all five Aspects, and a critical review of the content of these datasets¹³.

Local Policy Context

1.14 The following Carmarthenshire County Council planning policies contained within the Carmarthenshire Local Development Plan (as adopted by the County Council on December 10th 2014) are considered to be specifically relevant to this study.

1.15 Strategic Policies:

'SP2 Climate Change

Development proposals which respond to, are resilient to, adapt to and minimise for the causes and impacts of climate change will be supported. In particular proposals will be supported where they:

- a) Adhere to the waste hierarchy and in particular the minimisation of waste;*
- b) Promote the efficient consumption of resources (including water);*
- c) Reflect sustainable transport principles and minimise the need to travel, particularly by private motor car;*
- d) Avoid, or where appropriate, minimise the risk of flooding including the incorporation of measures such as SUDS and flood resilient design;*
- e) Promote the energy hierarchy by reducing energy demand, promoting energy efficiency and increasing the supply of renewable energy;*
- f) Incorporate appropriate climate responsive design solutions including orientation, layout, density and low carbon solutions (including design and construction methods) and utilise sustainable construction methods where feasible.*

Proposals for development which are located within areas at risk from flooding will be resisted unless they accord with the provisions of TAN 15.'

'SP11 Renewable Energy & Energy Efficiency

Development proposals which incorporate energy efficiency measures and renewable energy production technologies will be supported in areas where the environmental and cumulative impacts can be addressed satisfactorily. Such developments will not cause demonstrable harm to residential amenity and will be acceptable within the landscape. Each proposal will be assessed on a case-by-case basis.

Large scale wind farms will only be permitted within Strategic Search Areas.'

'SP14 Protection and Enhancement of the Natural Environment

Development should reflect the need to protect, and wherever possible enhance the County's natural environment.

¹² TAN 12 May 2016; paragraph 4.11, p.15

¹³ This critical review concluded that Cultural Aspect data was of little value in informing the assessment process for this study

All development proposals should be considered in accordance with national guidance/legislation and the policies and proposals of this Plan, with due consideration given to areas of nature conservation value, the countryside, landscapes and coastal areas, including those outlined below:

- a) Statutory designated sites including Ramsar sites, SPAs, SACs, SSSIs and National Nature Reserves;
- b) Biodiversity and Nature Conservation Value, including protected species and habitats of acknowledged importance as well as key connectivity corridors and pathways; (Policy EQ4 and EQ5);
- c) Regional and Locally important sites (and their features) including Local Nature Reserves and RIGS; (see Policy EQ3)
- d) Areas of identified Landscape and Seascape quality; (including SLAs)
- e) Features which contribute to local distinctiveness, nature conservation value or the landscape; (See Policy EQ5)
- f) The Open Countryside; (see Policy GP2)
- g) The best and most versatile agricultural land; (Grade 2 and 3a)
- h) Natural assets: including air, soil (including high carbon soils) controlled waters and water resources. (see Policies EP1 and EP2).'

'SP17 Infrastructure

Development will be directed to locations where adequate and appropriate infrastructure is available or can be readily provided. The LDP therefore supports the economic provision of infrastructure by allocating sites in identified settlements and in accordance with the Settlement Framework.

Renewable energy generation and associated utilities infrastructure will be permitted where:

- a) They have regard to their setting;
- b) Incorporate landscaping;
- c) Do not conflict with the areas built, historic, cultural and nature conservation and landscape qualities. (Policy SP13 and SP14)

Planning Obligations relating to developer contributions towards necessary infrastructure improvements may be sought subject to Policy GP3.'

1.16 Specific Policies:

'Policy GP1 Sustainability and High Quality Design

Development proposals will be permitted where they accord with the following:

- a) It conforms with and enhances the character and appearance of the site, building or area in terms of siting, appearance, scale, height, massing, elevation treatment, and detailing;
- b) It incorporates existing landscape or other features, takes account of site contours and changes in levels and prominent skylines or ridges;
- c) Utilises materials appropriate to the area within which it is located;
- d) It would not have a significant impact on the amenity of adjacent land uses, properties, residents or the community;
- e) Includes an integrated mixture of uses appropriate to the scale of the development;
- f) It retains, and where appropriate incorporates important local features (including buildings, amenity areas, spaces, trees, woodlands and hedgerows) and ensures the use of good quality hard and soft landscaping and embraces opportunities to enhance biodiversity and ecological connectivity;

- g) *It achieves and creates attractive, safe places and public spaces, which ensures security through the 'designing-out-crime' principles of Secured by Design (including providing natural surveillance, visibility, well lit environments and areas of public movement);*
- h) *An appropriate access exists or can be provided which does not give rise to any parking or highway safety concerns on the site or within the locality;*
- i) *It protects and enhances the landscape, townscape, historic and cultural heritage of the County and there are no adverse effects on the setting or integrity of the historic environment;*
- j) *It ensures or provides for, the satisfactory generation, treatment and disposal of both surface and foul water;*
- k) *It has regard to the generation, treatment and disposal of waste.*
- l) *It has regard for the safe, effective and efficient use of the transportation network;*
- m) *It provides an integrated network which promotes the interests of pedestrians, cyclists and public transport which ensures ease of access for all;*
- n) *It includes, where applicable, provision for the appropriate management and eradication of invasive species.*

Proposals will also be considered in light of the policies and provisions of this Plan and National Policy (PPW: Edition 8 and TAN12: Design (2014)).'

'Renewable Energy

Policy RE2 Local, Community and Small Wind Farms

Local, Community and Small wind farms or individual turbines will be permitted provided the following criteria can be met in full:

- a) *The development will not have an unacceptable impact on visual amenity or landscape character through: the number, scale, size, design and siting of turbines and associated infrastructure;*
- b) *The development will not have an unacceptable cumulative impact in relation to existing wind turbines and other renewable energy installations and those which have permission;*
- c) *The siting, design, layout and materials used should be sympathetic to the characteristics of the land-form, contours and existing features of the landscape;*
- d) *The development would not cause demonstrable harm to statutorily protected species, and habitats and species identified in the Local Biodiversity Action Plan;*
- e) *Turbines and their associated infrastructure will not be sited in, or impact upon archaeological resources, the setting and integrity of Conservation Areas, Listed Buildings or other areas of historic value;*
- f) *Proposals will not cause an unreasonable risk or nuisance to, and impact upon the amenities of, nearby residents or other members of the public;*
- g) *No loss of public accessibility to the area, and existing bridleways and footpaths will be safeguarded from development with no permanent loss to their length and quality;*
- h) *Turbines and associated infrastructure will, at the end of the operational life of the facility, be removed and an appropriate land restoration and aftercare scheme agreed;*
- i) *The development will not result in significant harm to the safety or amenity of sensitive receptors and will not have an unacceptable impact on roads, rail or aviation safety;*
- j) *The development will not result in unacceptable electromagnetic interference to communication installations; radar or air traffic control systems; emergency services communications; or other telecommunications systems.'*

(This policy is applicable to all wind energy projects generating less than 25MW.)

'Environmental Qualities – Built & Natural Environment

Policy EQ1 Protection of Buildings, Landscapes and Features of Historic Importance

Proposals for development affecting landscapes, townscapes buildings and sites or features of historic or archaeological interest which by virtue of their historic importance, character or significance within a group of features make an important contribution to the local character and the interests of the area will only be permitted where it preserves or enhances the built and historic environment.'

'Policy EQ6 Special Landscape Areas

Special Landscape Areas are designated in the following locations and as identified on the Proposals Map:

*Tywi Valley
Carmarthenshire Limestone Ridge
Teifi Valley
Drefach Felindre
Bran Valley (North of Llandovery)
Mynydd Mallaen
Llanllwni Mountain
North Eastern Uplands
Mynydd y Betws
Gwendraeth Levels
Pembrey Mountain
Swiss Valley
Talley
Lwchwr Valley
Lower Taf Valley
Cothi Valley
Cwm Cathan
Carmarthen Bay and Estuaries*

Proposals for development which enhance or improve the Special Landscape Areas through their design, appearance and landscape schemes will be permitted (subject to the policies and proposals of this plan).'

Section 2:

METHODOLOGY

Overview of Study Methodology

2.1 Wales is unique within the UK in having implemented LANDMAP, a consistent approach to the assessment of the landscape across the whole country, recorded in a publicly accessible database. This sensitivity study is based on current published LANDMAP data supplemented, as appropriate, by other sources of information and field survey.

2.2 The methodology identifies a number of landscape characteristics, captured as responses to interrogation of the LANDMAP datasets. These responses constitute indicators of the susceptibility of the landscape to wind turbine development.

Table 1: *Typologies*¹ sets out the parameters used to define the different scales of wind turbine development used in the assessment.

Table 2: *Definition of Sensitivity* sets out the definitions of sensitivity.

Table 3: *Criteria for Assessing Landscape and Visual Sensitivity to Wind Turbine Development* sets out in detail:

- which LANDMAP questions have been used to inform the study;
- why these questions and their responses have been chosen as indicators of landscape susceptibility to wind turbine development; and
- how these responses have been interpreted so as to indicate higher or lower susceptibility.

Table 3 also indicates where other sources of information have been used to inform the assessment, and where field survey work has been particularly important in providing additional information which has been taken into account.

Table 4: *Criteria for Establishing Landscape Value* sets out the relevant criteria for establishing landscape value.

2.3 In the absence of any 'Landscape Character Areas' having been identified by previous landscape character assessment work within the study area, discrete 'Landscape Units' have been identified, demarcated and mapped throughout the county for this study. LANDMAP data – and in particular the Visual and Sensory Aspect Areas – was reviewed both as desk exercise and field survey to address key characteristics including scale, landform, sense of place, landcover and visual receptors. As a result of this process it was determined that the LANDMAP Visual and Sensory Aspect Areas could effectively be used as the basis for the Landscape Units. In some instances, Visual and Sensory Aspect Areas have been combined to form Landscape Units where they share similar key characteristics, as detailed in Appendix 3.

¹ Refer to Glossary of Terms in Appendix 1 for explanation of this term and how it is used in this study

2.4 For each Landscape Unit, its *Landscape Value* has been established, using both the LANDMAP Data - in particular 'Overall Evaluations' of 'High' or 'Outstanding' - and the presence or proximity of international, national and local designations (for landscape conservation, biodiversity conservation, geological conservation or historic landscape conservation). In the LANDMAP terminology, an 'Outstanding' evaluation is one considered to be of international or national importance; a 'High' evaluation is one considered to be of Regional or County importance.

2.5 For each Landscape Unit, an *overall evaluation of sensitivity* for each of the wind turbine typologies has also been attributed. The sensitivity assessments take account of:

- the identified landscape susceptibilities;
- the value placed on the landscape; and
- the presence of operational or consented wind turbine development within or visible from the Landscape Unit [based on data received March 2016].

2.6 An *indicative capacity for wind turbine development* has then been attributed to each Landscape Unit. This capacity assessment is based on a combination of the sensitivity of the unit, the size of the Landscape Unit, and the presence or proximity of operational turbines within the Unit, or visible from the Unit.

2.7 Section Five of this study *provides generic guidelines for the location of* different parameters of *wind turbine developments*. Specific guidance for each Landscape Unit is also provided. Unit-specific guidelines consider, in particular, landscape or cultural designations within the Unit, the characteristics of the landscape occurring within the unit, and intervisibility with neighbouring Landscape Units.

2.8 The methodology for the study is described in detail in the following text.

Table 1: Typologies

	Turbine development blade tip height	Number of turbines
Micro	25m or less (or roof mounted)	1 turbine
Small	50m or less	Up to 3 turbines
Medium	80m or less	Up to 4 turbines
Large	109m or less	Up to 5 turbines
Very Large	More than 109m	Any number of turbines
<i>Note: Any group of six or more turbines will belong in the 'Very Large' typology, irrespective of turbine height</i>		

Stage One: Assessment Framework

Guidance

2.9 The methodology was based upon the ‘Heads of the Valleys’ pilot study, informed by the other documents listed in *Appendix 2*, including reference to the guidance developed by Scottish Natural Heritage for wind turbine developments, widely accepted in England and Wales. There is, as yet, no corresponding guidance developed specifically for use in Wales, however the guidance contained within the following documents is particularly relevant:

- *Guidelines for Landscape and Visual Impact Assessment*; Third Edition, April 2013; published by The Landscape Institute and the Institute for Environmental Management and Assessment (GLVIA3). This is the industry standard for undertaking landscape and visual assessments.
- *LANDMAP Guidance Note 3: Using LANDMAP for Landscape and Visual Impact Assessment of Onshore Wind Turbines*; published by Natural Resources Wales May 2013 (Guidance Note 3).

2.10 Both GLVIA3 and Guidance Note 3 advocate the use of professional judgement and an understanding of landscape character, in order to assess what makes one landscape more or less susceptible than another to a particular form of development. Key to this is a thorough understanding of which aspects of the landscape, physical and perceptual, are particularly susceptible to the type of development proposed.

Data Sources

2.11 The assessment was informed by data gathered from the baseline information sources listed in *Appendix 3*. Current published LANDMAP Aspect Datasets were the primary documentary source, supplemented by reference to Ordnance Survey maps, relevant historic landscape characterisation assessments, extensive fieldwork and consultations with the client’s project officers, including the Carmarthenshire County Council’s landscape officer.

2.12 LANDMAP is the Welsh approach to landscape assessment and its current published datasets have been extensively used to inform this study, in accordance with GLVIA3 advice. LANDMAP is an all-Wales, Geographical Information System-based landscape resource where landscape characteristics, qualities and influences on the landscape are recorded and evaluated into a nationally consistent dataset. LANDMAP comprises five spatially-related layers of data - described as Aspects - Cultural Landscape, Geological Landscape, Historic Landscape, Landscape Habitats, and Visual and Sensory. Information on each Aspect is detailed in the ‘*LANDMAP Overview: Guidance for Wales*’ (CCW 2008).

2.13 Each of the five spatial layers is subdivided into discrete geographical units (Geographical Information System (GIS) polygons), referred to as ‘*Aspect Areas*’. Each mapped Aspect Area is defined by its recognisable landscape characteristics and qualities. Accompanying each Aspect Area is a description (known as a ‘*Collector Survey*’ record), which describes and documents the landscape character, qualities and features. Management recommendations are also provided, together with an overall evaluation score, graduated from ‘*little or no importance*’ to ‘*international importance*’. Each Collector Survey records information from the unique perspective of the LANDMAP Aspect concerned,

with each of the five LANDMAP Aspect being produced independently. Therefore, when key characteristics are referred to across several Aspects for the same geographic area, the value of their importance is typically emphasised.

2.14 An important caveat is incorporated into GLVIA3 in respect of the use of existing landscape character assessment information. The guidance advises that existing landscape character assessment information should be critically reviewed.² As part of such a critical review, we concluded that, although Guidance Note 3 recommends that data from *all five* LANDMAP layers should be used in any assessment, the Cultural Landscape information within the study area was considered to be insufficiently detailed to be of significant use for the purposes of this study. There are only a small number of Cultural Aspect Areas which cover the whole of the county of Carmarthenshire and, because of their geographical extent, they provide little information to assist in distinguishing one Landscape Unit from another, whereas the other four Aspect datasets have identified, demarcated and evaluated much smaller geographical areas.

Study Area

2.15 *Figure 02* shows the Carmarthenshire study area which comprises the Carmarthenshire County Council local authority administrative area, but excludes that part of the geographical County which lies within the administrative area of the Brecon Beacons National Park Authority.

2.16 In addition to the Brecon Beacons National Park (BBNP), areas of particular landscape interest shown on *Figure 03* are the Pembrokeshire Coast National Park (PCNP), which lies adjacent to the north western section of the study area; seven Registered Landscapes of Historic Interest in Wales: Preseli; Taf and Twyi Estuary; Lower Teifi Valley; Drefach and Velindre; Tywi Valley; Black Mountain and Mynydd Myddfai; and Dolaucothi, and eighteen Special Landscape Areas (SLAs), designated by the County Council, that encompass river valleys, upland and coastal landscapes.

2.17 The study area includes the TAN 8 Strategic Search Area G; Brechfa Forest and the extreme north western part of SSA E: Pontardawe, shown on *Figure 05*

2.18 *Figure 04* shows the very distinctive topography within the study area.

Landscape and Visual Sensitivity Criteria

2.19 Current published LANDMAP data was used to provide a consistent, independently verified description of the characteristics of the landscape, physical and perceptual, which may potentially be affected by wind turbine development.

2.20 *Table 3* sets out:

- the characteristics that have been identified as indicators of susceptibility to different parameters of wind turbine development, and an explanation of how they affect landscape and/or visual susceptibility;

² GLVIA3; paragraph 5.13, p.77; and *Summary Advice on Good Practice*, pp.93-94

- the LANDMAP question responses and other sources of information that have been used to establish the characteristics present in each Landscape Unit;
- the LANDMAP evaluations and other sources of information that have been used to establish the value of each Landscape Unit.

2.21 A landscape that is highly valued by society may still have potential to accommodate some wind turbine development in the appropriate location, provided that it fits with the characteristics of the receiving landscape. In statutorily designated landscapes (national parks and Areas of Outstanding Natural Beauty), wind turbine development is acceptable as long as it does not compromise the purpose of the designation. In landscapes which are not statutorily protected by such designations, wind turbine development is acceptable, provided that it does not compromise the qualities and values attributed to the landscape. Conversely, a landscape that has no formal designation may actually be highly sensitive to wind turbine development, if it has particular landscape or visual characteristics that are very susceptible to wind turbine development.

2.22 The susceptibility of each Landscape Unit within the study area was assessed against each of the susceptibility criteria as described in *Table 3*, and graded using a three-point scale of susceptibility: high, medium or low. *Table 3* shows how LANDMAP responses or evaluations have been used to indicate susceptibility to wind turbine development. The *Sensitivity and Capacity Tables* for each Landscape Unit form *Section Four* of this Study.

2.23 In accordance with GLVIA3, judgements regarding landscape and visual sensitivity are derived from combining judgements about the susceptibility to change arising from the specific proposals with judgements about the value attributed to the landscape and visual receptors.

2.24 In common with most wind turbine landscape sensitivity studies, the final assessment of sensitivity combines:

- judgements relating to landscape susceptibility;
- judgements relating to visual susceptibility;
- the value attributed to the landscape; and
- the presence and nature of visual receptors.

Table 2: Sensitivity

Sensitivity*	Definition
Low	The key characteristics of the Landscape Unit are not very vulnerable to change and could accommodate wind turbine development of the specified typology, if carefully designed and sited.
Medium	The key characteristics of the Landscape Unit may be vulnerable to change but could accommodate some wind turbine development of the specified typology, if sensitively designed and sited.

High	The key characteristics of the Landscape Unit are vulnerable and likely to be adversely affected by wind turbine development of the specified typology.
*Note that the assessment of <i>overall sensitivity</i> for each LU is based on a five-point scale as detailed at section 2.28 below.	

Stage Two: Assessing Landscape and Visual Sensitivity

Baseline Assessment

2.25 The first step of the process involved a detailed review of the following information:

- Ordnance Survey maps and aerial photography;
- Designated and nationally/regionally valued landscapes, including the BBNP and PCNP, SLAs, Registered Historic Landscapes, Registered Parks and Gardens;
- Information from LANDMAP datasets;
- Natural and Built Heritage GIS mapping data; and
- Existing wind turbine developments within the study area.

2.26 The findings of the desk surveys, which were subsequently refined following field survey work, are presented in *Section Four*. They include an overview of the key landscape characteristics of the study area, a description of existing and consented wind turbine developments and their effect on the landscape, and comments on any issues of existing and potential cumulative effects.

Assessing the Sensitivity of Landscape Units

2.27 Sensitivity assessment sheets for each Landscape Unit were prepared, as presented in *Section Four*. The key features of each Landscape Unit are described and evaluated against the susceptibility criteria described in *Table 3* using a three-point grading: high, medium or low. Those characteristics which are considered particularly susceptible to wind turbine development are highlighted. The value attached to the landscape is established according to the criteria set out in *Table 4*.

2.28 A judgement on the overall sensitivity to change of each Landscape Unit is made in association with each wind turbine development typology identified in *Table 1*, based on a five-point sensitivity scale: low; low-medium; medium; medium-high; and high. This process involved a balanced approach, considering all of the assessed criteria. These evaluations represent the judgement of two qualified and experienced chartered landscape architects, based on desk-top studies and field surveys. The evaluations of sensitivity are not based on a mathematical formula. Sensitivity can vary locally within the Landscape Units identified, and the overall evaluation represents the general sensitivity across the Landscape Unit, so as to reflect the strategic nature of this study. The guidance notes provide some additional information regarding variations within Landscape Units.

Field Survey

2.29 As part of the assessment process, field surveys were undertaken to help test and refine the findings and provide additional information, as detailed in *Table 3*.

2.30 The first step in the process was to assess the existing landscape of the study area, including its distinctive characteristics, existing landscape designation(s), existing views and the context of existing renewable energy development.

2.31 Based on the results of the field surveys, the draft evaluations of Landscape Unit sensitivity were refined and the final sensitivity assessment and accompanying summary tables for each Landscape Unit were prepared.

Stage Three: Assessing Landscape Objectives and Capacity

2.32 This stage in the study applied professional judgement to determine the most appropriate landscape objective(s) and the relative capacity of each of the identified Landscape Units. The sensitivity to each wind turbine typology was derived from the landscape and visual susceptibility criteria (including issues of intervisibility), the value of the landscape and the potential for cumulative effects.

Landscape Objectives

2.33 There is an implicit objective in TAN 8 [Annex D para. 8.4] to accept landscape change within and immediately adjacent to SSAs, for there to be no significant change outside SSAs, and no change in landscape character from wind turbine development within national parks and Areas of Outstanding Natural Beauty (AONBs). This has been expressed as the following three landscape objectives:

Objective 1 Landscape Protection - no change to the integrity and quality of landscape character within nationally designated landscapes.

Landscape protection is applicable to those landscapes where the conservation of the landscape resource and the visual experience of the landscape have been assessed to be of very high importance. This objective seeks to retain or reinforce the present character, quality and integrity of the landscape.

Objective 2 Landscape Accommodation - maintain the landscape character

Landscape accommodation is applicable to those landscapes where the conservation of landscape character and visual amenity has been assessed to be of moderate to high importance. This objective seeks to retain the overall character, quality and integrity of the landscape, whilst accepting that occasional small to medium scale developments may be allowed. Such developments may have an effect on the local landscape, but should not bring about significant adverse changes in character. Wind turbines should not become either the dominant or the key characteristic of a landscape.

Objective 3 Accept Landscape Change – within and adjacent to SSAs

Within - and immediately adjacent to - the SSAs, the implicit objective is to *accept a significant change in landscape character* resulting from wind turbine development. Whilst it is accepted that the area is one whose landscape character may be allowed to change, not all locations in a SSA may be suitable in landscape or visual terms.

2.34 Each Landscape Unit is assigned a landscape objective, or in some cases two landscape objectives (i.e. where part of the unit lies within a SSA), to assist the local authority's decision-making when determining new applications. These landscape objectives then form the basis for recommendations on the wind turbine development typologies which may be appropriate in each of Landscape Units. The threshold of landscape change that may arise from development varies, but it is assumed that there is typically greater capacity for wind turbine development in areas of lower sensitivity where landscape change is considered more acceptable, whilst areas of higher sensitivity - particularly those which are designated - are likely to have very limited or no capacity.

Indicative Landscape Capacity

2.35 An overall indicative landscape capacity has been derived for each Landscape Unit by considering the following factors:

- Landscape Sensitivity - overall sensitivity of the Landscape Unit to wind turbine development based on the landscape and visual susceptibility and value criteria [as set out in Tables 3 and 4] and presence of existing/consented wind turbines;
- Landscape Objective – the objective(s) assigned to that Landscape Unit
- Size – larger Landscape Units may have scope for a greater amount of development than smaller units.

2.36 Whilst the indicative overall capacity assessed for each Landscape Unit will help to identify the type of development which could be potentially accommodated, it does not follow that planning applications for wind turbine developments in line with the indicative capacity for any given Landscape Unit will always be appropriate; likewise, for those Landscape Units that lie within or adjacent to SSAs, '*not all of the land within SSAs may be technically, economically and/or environmentally suitable*' for wind turbine development.³

Guidance on Siting and Design

2.37 Guidance has been provided for each Landscape Unit, detailed in *Section 4*. This identifies the likely key landscape and visual issues, both in terms of opportunities and also constraints which may reduce the potential for a given Landscape Unit to accommodate wind turbine development.

2.38 Generic guidance has also been developed to accompany the Landscape Unit specific guidance, contained in *Section 5*.

³ TAN 8 July 2005, paragraph 2.4, p.5

Table 3:

Criteria for Assessing Landscape and Visual Susceptibility to Wind Turbine Development

Landscape Criteria			
LANDMAP and other data sources	Susceptibility to Wind Turbine Development		
	Low	Medium	High
Scale			
<p><i>A large scale expansive landscape is typically less susceptible to large wind turbine developments than a small scale, intimate landscape.</i></p> <p>A large height differential between valley floors and hill tops may help reduce susceptibility by lessening the perceived size of the turbines, but care has to be taken to ensure that the apparent scale of the landform is not diminished by the height of the turbines. Single and narrow ridges are more susceptible to wind turbine development than plateau or broad ridges, especially where the slopes of the ridge are well defined/steep and/or with rock outcrops</p>			
VS8: Scale	vast or large scale landscapes	medium scale landscapes	small or intimate scale landscapes
Landform			
<p>Landforms that are smooth, regular and convex, or flat and uniform are likely to be less susceptible to wind turbine development than complex varied landforms with distinctive landmarks, where visible wind turbines may have a detrimental effect on the appearance and experience of the landform. Complex landforms may provide some screening opportunities for turbines but care has to be taken not to dominate intricate landforms</p>			
VS4: Topographic Form	levels, plateau, disturbed	high hills/mountains	hills/valleys, rolling land/ undulating
Landcover Pattern			
<p><i>This criterion is not concerned with the particular material sensitivity of a type of landcover (which is considered in ecological assessments) but with the character of the landscape created through the landcover pattern.</i></p> <p>Simple uncluttered landscapes with sweeping lines and a consistent groundcover are likely to be less susceptible to wind turbine development. Areas of large scale commercial forestry and intensive farming may also indicate lower susceptibility. Complex landscapes comprising a variety or mosaic of characteristic or susceptible landscape features such as trees and woodlands, irregular field patterns and hedgerows are typically more vulnerable to change arising from wind turbine development. Tree and woodland cover offers the potential to screen small scale turbines in certain situations (particularly in combination with undulating landform), although care must be taken not to allow turbines to detract from or dominate locally distinctive features such as tree knolls, ancient specimen trees or avenue trees.</p>			

Where landscape complexity is due to visible past or current commercial/industrial influences this indicates lower rather than higher sensitivity

VS Classification Level 3	excavation, upland moorland, upland grazing	wooded upland and plateau, open/wooded hill and lower plateau, hill and lower plateau grazing, hillside and scarp slopes grazing/moorland/mosaic, village, mosaic upland and plateau, flat open lowland farmland, flat wooded lowland, lowland wetland, open/wooded rolling lowland, open/wooded lowland valleys,	open upland valleys, open/wooded mosaic upland valleys, hill and lower plateau mosaic, mosaic lowland valleys, mosaic rolling lowland, flat lowland mosaic, amenity land, informal open space, other coastal wild land, dunes and dune slack
VS5: Landcover Pattern	development, open land	mixture, woodland	field pattern/mosaic
VS16: Pattern	formal	regular	random
HL Classification Level 3	reclaimed land, extractive, processing, manufacturing; communications; military; nucleated settlement	marginal land, woodland, non-nucleated settlement, other settlement	various fieldscapes, water and wetland, recreation, designed

Built Environment

This criterion is concerned with the presence of built structures and human intervention present in the landscape. Modern wind turbines are a distinctive built form which can influence the nature of built environment over considerable areas of the landscape.

The presence of modern structures such as wind turbines, transport, utility or communications infrastructure or industrial development may reduce landscape susceptibility to wind turbine development, as may the visible influences of quarrying or landfill.

The frequency of built form and human intervention in more contemporary densely settled areas, and intervening brownfield sites, may also indicate a reduced susceptibility to the introduction of wind turbines.

However, in all of these cases, care must be taken to avoid further visual conflict or significant cumulative change through the introduction of additional vertical structures which may be locally incongruous.

Areas which are more sparsely settled and/or characterised by a long-established, traditional or historic built character - including historic structures - are likely to be more susceptible to wind turbine development

VS6: Settlement Pattern	urban, linear	village, mixture, clustered	none, scattered rural/farm
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VS20: Use of Construction Materials	inappropriate	generally inappropriate	appropriate, generally appropriate
VS25: Sense of Place	weak, none	moderate	strong
Built Form (observation and mapping)	presence of large scale buildings and infrastructure	medium scale buildings and infrastructure	presence of small scale/ human scale built form e.g. residential
Presence of large scale development/ infrastructure (observation and mapping)	overhead lines carried on steel towers; communications masts; large sheds; trunk roads, multiple-track railway lines	overhead lines carried on double wood poles; residential and smaller scale commercial development; major roads; single-track railway lines	none
Visual Criteria			
LANDMAP Data Source and other data sources	Susceptibility to Wind Turbine Development		
	Low	Medium	High
Skylines and Settings			
<p>Landscapes with distinctive ridges or skylines are likely to be more susceptible to wind turbine development than skylines that are less prominent or which have been affected by existing contemporary structures, such as electricity or communications infrastructure.</p> <p>The presence of distinctive or historic landscape features such as hilltop monuments, church towers or vernacular villages, increases susceptibility</p>			
Topographic Data and Observation	smooth, flat landscapes	undulating landscapes	distinctive ridge lines and focal points
Local Knowledge – including information provided by the client group	monotonous uniform skyline, industrial skyline	rolling/gently undulating skyline	presence of distinctive or historic skyline features
Movement			
<p><i>Turbines can draw the eye by introducing movement into the landscape. (This criterion is also linked to the consideration of Remoteness/Tranquillity under the section below which deals with 'Aesthetic, Perceptual and Experiential Criteria').</i></p> <p>Landscapes that are already affected by movement are therefore likely to be less susceptible, whilst landscapes which are valued for their tranquillity will be more susceptible.</p>			

VS18: Level of Human Access	constant, frequent	infrequent	rare, occasional
Observation During Field Survey	busy, presence of industrial scale movement (e.g. opencast mining)	human presence noticeable but not busy; gentle movement	quiet, calm
Visibility, Key Views, Vistas			
<p><i>The likelihood of turbines being highly visible in the landscape depends on the scale of the development, the landform in which the development is sited and the screening opportunities of landcover, especially buildings, trees and woodlands.</i></p> <p>Landscapes which are visually contained, with consequently limited inward and outward views, are likely to be less susceptible than open landscapes with extensive inward and outward views. The availability of views of these landscapes from neighbouring areas will also influence susceptibility. Rural landscape which forms a backdrop to settlement will be more susceptible to changes arising from conspicuous wind turbines.</p> <p>Landscapes which are experienced from tourist routes, national or regional trails and other recognised visitor locations are more susceptible to wind turbine development.</p> <p>Similarly, close proximity to settlement - which increases the chance of adverse effects on visual amenity - may increase an area's susceptibility</p>			
VS9: Enclosure	enclosed, confined	open	exposed
Presence of views into the area (observation and mapping)	limited or no views into the area	some views, framed views into the area	extensive views of the area from the surrounding countryside
Presence of views out of the area (making it more visually susceptible to development outside the area) (observation and mapping)	limited views out of the area	some views, framed views out of the area	extensive views out of the area to the surrounding countryside
Inter-visibility, Associations with Adjacent Landscapes			
<p><i>Landscape units which have limited inter-visibility (inward and outward views to and from adjoining landscapes) are likely to be less susceptible than units which have extensive views.</i></p> <p>Where adjoining landscapes are inter-visible and are of higher susceptibility this increases the susceptibility of the landscape unit. The setting of designated landscapes may be more susceptible where it is considered that the setting contributes positively to the overall scenic quality of that designated landscape</p>			
VS22: There are attractive views	neither in or out	out	both in and out, within, into or out

VS23: There are detractive views	both in and out, within, into or out	out	neither in or out
Observation during Field Survey	limited or no views into or out of the unit.	framed views and intermittent views, both into and out of the unit	extensive views both into and out of the unit
Typical Receptors			
Types of Receptors (desk study)	industrial or commercial, transport routes	other places of work; institutional	residential; leisure, tourists
Views to/from Important Landscape, Historic Landscape and Cultural Heritage Features			
<p><i>Landscapes which are important to the views within - or the setting of - key designated landscape and cultural heritage areas/focal features are likely to be more susceptible. Areas of significant intrinsic historic landscape character and potential for preserved archaeological evidence would be more sensitive to wind turbines.</i></p> <p>These include National Parks, Areas of Outstanding Natural Beauty (AONB), World Heritage Sites (WHS), Registered Historic Landscapes, Registered Parks and Gardens, and Special Landscape Areas. This is particularly the case where their identified special qualities or key characteristics are likely to be affected by wind turbine developments.</p> <p>They also include Conservation Areas; National Trails, National and Regional Cycle Networks and other promoted routes; and key/focal designated sites (including Scheduled Ancient Monuments), landmarks or visitor attractions, such as historic hill forts/castles/church towers and monuments or memorials</p>			
Views to/ from landscape and cultural heritage features (observations from field survey and mapping, and local knowledge)	none or few, little inter-visibility between designated areas or key focal sites	intermittent inter-visibility from designated areas/key focal sites/ national trails and other promoted routes/monuments/memorials	National Park, AONB, WHS, inter-visibility between sites; presence of and close views from National Trails and other promoted routes, monuments or memorials
Aesthetic, Perceptual and Experiential Criteria			
LANDMAP Data other data sources	Susceptibility to Wind Turbine Development		
	Low	Medium	High
Scenic Quality and Character			
<p><i>Areas of, high scenic quality, high integrity, with a strong sense of place and local distinctiveness will typically be more susceptible to wind turbine development than less scenic areas, or those with a weak sense of place or which lack distinctiveness.</i></p> <p>These include landscapes designated for their natural beauty (<i>see section above</i>) – including locally-designated Special Landscape Areas – but also areas of undesignated landscape, including areas which are locally distinctive or have a strong character.</p> <p><i>For this criterion, this LANDMAP data has been supported by field observation</i></p>			

VS46: Scenic Quality	Low	Moderate	Outstanding, High
VS47: Integrity	Low	Moderate	Outstanding, High
VS48: Character	Low	Moderate	Outstanding, High
Remoteness/Tranquillity			
<p><i>Areas which are relatively remote and have a perceived remote, wild and/or tranquil character and lack built development have increased susceptibility to wind turbines, when compared to landscapes which exhibit signs of modern development and higher levels of movement. Tranquillity is defined as being a state of calm and quietude associated with peace, considered to be a significant asset of landscape.</i></p> <p>Adjacent or nearby conspicuous turbine development can undermine the special qualities and setting of such areas.</p> <p>Where the development is associated with and in keeping with the scale and character of other forms of development in the local context, such as large modern farmsteads (including those with intensive livestock units) or solar PV installations, the effects on perception of one or more wind turbines may be lessened</p>			
VS24: Perceptual and other Sensory Qualities	noisy, unattractive, threatening	sheltered, settled, safe	attractive, remote, tranquil, wild
Observation during Field Survey	accessible/frequented/busy	secluded/interrupted	inaccessible/remote

Table 4:

Criteria for Assessing Landscape Value

Value Criteria			
LANDMAP and other data sources	Landscape Value		
	Low	Medium	High
Landscape Value			
<p>Landscapes that are formally designated for their scenic, designed or recreational value are likely to be more sensitive to wind turbine development than undesignated areas. The degree of sensitivity depends on the nature of the proposal and the landscape qualities which are valued by the designation. The hierarchy of the designation has a bearing on sensitivity of a landscape. Internationally and nationally designated landscapes such as National Parks, WHS and AONBs are considered to be very sensitive, followed by regional and local designations such as Special Landscape Areas (SLAs). Landscape value is formally recognised by designation, but value can also be informed by published documentation such as tourist leaflets; art and literature.</p> <p>Areas which are predominantly recognised by Outstanding or High LANDMAP evaluations on the Visual and Sensory, Landscape Habitats or Geological Layer are also likely to be more sensitive to wind turbine development</p>			
Designation	none	local designations (SLA), local parks and gardens	National Park, WHS, Registered Landscape of Historic Importance
VS50: Overall evaluation	low	moderate	high to outstanding
VS49: Rarity	low	moderate	high to outstanding
LH45: Overall evaluations (habitats)	low	moderate	high to outstanding
GL31: Rarity	low	moderate	high to outstanding
GL33: Overall evaluation (geology)	low	moderate	high to outstanding
Historic Value			
<p>Areas designated for their international, national or regional historic or cultural heritage value, such as World Heritage Sites, are likely to be more sensitive to wind turbine development, especially if the character or the perception of the landscape in which they are located is likely to be significantly altered. Registered Landscapes of Historic Interest and Registered Parks and Gardens are not protected by designation but are considered to be of national value in Wales. Areas which are predominantly recognised by Outstanding or High LANDMAP overall evaluations in the Historic layer are likely to be more highly sensitive to wind turbine development</p>			
Designated sites	none	local designations (SLA)	WHS, Registered Historic Landscapes. Frequent Listed Buildings or

			scheduled ancient monuments
HL38: Rarity	low	moderate	high to outstanding
HL35: Integrity	low	moderate	high to outstanding
HL40: Overall evaluation	low	moderate	high to outstanding
In addition to the above, the Aesthetic, Perceptual and Experiential susceptibility criteria may also be indicators of the value placed on a landscape			

Section 3:

LANDSCAPE CONTEXT

Landscape Character

3.1 The study area includes a wide variety of landscape character, ranging from exposed upland moorland to enclosed lowland wooded valleys, and rolling open farmland to river estuaries and coastal cliffs and marshes. Although those areas of Carmarthenshire which lie within the Brecon Beacons National Park are excluded from this study, significant areas of the County have local landscape designations which assist in their protection, and the identification and delineation of Special Landscape Areas is based upon an analysis and understanding of landscape character. Also, there are large tracts of the County's landscape which are of such importance in respect of their landscape history that they have been included on the Register of Landscapes of Historic Interest in Wales. Areas included on the Register have been subject to specialist historic landscape characterisation study, in addition to landscape character evaluation based upon all five aspects within the LANDMAP methodology.

3.2 PPW (Edition 8, 2016) sets out the aspirations for renewable energy development, whilst also establishing the Government's objectives for conservation and improvement of natural heritage. PPW is supported by TAN8 which, for all land outside the identified Strategic Search Areas, sets the objective of maintaining the landscape character, *i.e. no significant change from wind turbine development*. Parts of the study area are protected by both statutory and non-statutory landscape designations. The disposition of these landscape designations is illustrated on *Figure 9*, and the key designations related to landscape character and value are outlined below. *Figure 10* illustrates cultural heritage features within the study area.

National Parks

3.3 The Brecon Beacons National Park is contiguous with the majority of the eastern boundary of the study area, from north of Glanamman to near Llandovery. The Pembrokeshire Coast National Park abuts a small area in the extreme west of the study area near the A478. These areas are excluded from this study.

Open Access Land

3.4 In May 2005, the Countryside and Rights of Way Act (CRoW Act) of 2000 came into force, which set in motion a procedure for clearly identifying and mapping areas of 'Access Land' (open country and/or common land); approximately twenty percent of the land area of Wales is mapped as Access Land where the public have a right of access on foot. A notable proportion of land within the study area is mapped as Access Land, where the public have a right to access and enjoy the countryside, and the spatial disposition of this Access Land is illustrated on *Figure 11*. The largest of these areas lies in the northern parts of Carmarthenshire.

3.5 It is recognised that wind turbine development may occur in open country and on common land. However, each wind turbine would be regarded as a building, therefore the turbine itself and the developed land immediately around it would be classified as 'excepted land', under Schedule 1

of the CRoW Act. Any application for wind turbine development on common land would be subject to the provisions of the Commons Act 2006.

Registered Historic Landscapes (Wales)

3.6 The Register of Landscapes, Parks and Gardens of Historic Interest in Wales aims to assist planners and developers introduce changes and new developments in ways that will cause the least harm to the historic character of the landscape. Inclusion on the Register does not confer statutory protection, but it does help to highlight the cultural heritage importance of particular areas of the landscape. It should be noted that the two categories of interest for these Registered Historic Landscapes – ‘Outstanding’ and ‘Special’ – relate to the nature of the historical composition of the areas in question:

‘All landscape areas identified on the Register are of national importance in the Welsh context. The difference between the landscapes of outstanding historic interest ..., and the landscapes of special historic interest ..., therefore, is one of degree, and not quality of historic interest.’¹

There is no implied difference between these categories in terms of the inherent value of the landscape identified, or their sensitivities to development or changes in the management of the landscape.

3.7 There are six Registered Historic Landscapes located wholly or partially within the study area; and another which abuts the study area. These are summarised below, and the disposition of these Registered Landscapes is shown on *Figure 03*; in addition, their relationship to the Landscape Units identified is also summarised in tabular form at *Appendix 3*.

3.7.1 The *Preseli Registered Landscape of Outstanding Historic Interest* comprises a large area of exposed upland located for the most part to the west of the study area, but with a small section lying within it. Much of this high, open and rugged landscape is in Pembrokeshire and lies within the nearby Pembrokeshire Coast National Park. It is a prominent area of land, visible for many miles around, with high crags on the summits of the hills, which has a long and complex history of human settlement and religious and cultural associations.

3.7.2 The *Taf and Tywi Estuary Registered Landscape of Outstanding Historic Interest* includes that length of the Tywi Valley from just downstream of Carmarthen as far as the open sea at its mouth; from where it stretches eastwards, to include Kidwelly, Pembrey Forest and the land almost to Burry Port; and westwards along the coast to Pendine and beyond. It also includes the estuary of the river Taf and the lowest reaches of its valley to the west, upstream from Laugharne stretching almost up to St Clears. It is comprised of an extensive area of coastal lowland, cliffs, marshes, sand dunes and intertidal sand bars situated within the estuaries of the Rivers Taf, Tywi, and Gwendraeth, containing diverse evidence of activity from the prehistoric period onwards.

3.7.3 The *Tywi Valley Registered Landscape of Outstanding Historic Interest* is a very long sinuous tract of land running from the boundary of the Taf and Tywi Estuary Registered Landscape downstream of Carmarthen along the whole length of the Tywi valley upstream to the BBNP boundary to the east of Llandovery and as far as the southern shores of the Llyn Brianne reservoir. It is a long, narrow river valley of renowned scenic quality from its source in the south of the Cambrian

¹ *Guide to Good Practice on Using the Register of Landscapes of Historic Interest in Wales in the Planning and Development Process*; Cadw, CCW and Welsh Government; 2nd Edition, 2007; paragraph 1.6, p.9

Mountains to its estuary in Carmarthen Bay, containing ancient route corridors and the setting for an unrivalled group of planned landscapes.

3.7.4 The *Dolaucothi Registered Landscape of Outstanding Historic Interest* is a small confined area of northern Carmarthenshire, centred on the upper part of the middle reaches of the narrow Cothi river valley. It is part of a lowland river valley and landed estate situated on the southern fringes of the Cambrian Mountains, containing well-preserved evidence for gold-working from Roman and recent times.

3.7.5 The *Black Mountain and Mynydd Myddfai Landscape of Outstanding Historic Interest* comprises the foothills and slopes on the north west side of the Black Mountain, bounded by Mynydd Myddfai on the north - rising to 440m Above Ordnance Datum (AOD) - and a ridge of slightly lower hills to the south west, which overlooks the Tywi valley east of Llandeilo. It is a rolling upland landscape comprising mountains and foothills dissected by valleys, rich in diverse evidence of land use from the prehistoric period to the recent past. All of this registered Landscape lies within the BBNP, but its presence has an influence on the adjoining land within the study area.

3.7.6 The *Lower Teifi Valley Registered Landscape of Special Historic Interest* occupies that section of the Teifi valley between the open sea at Cemaes Head and a point upstream of the village of Cenarth, and so lies mostly within the neighbouring county of Ceredigion. The River Teifi is one of Wales's principal and most historically famous rivers and the estuary and lower valley sections identified contain diverse and significant evidence for continuity of land use and activity from the prehistoric period to the recent past.

3.7.7 The small *Drefach and Velindre Landscape of Special Historic Interest* comprises the valleys and headwaters of three short tributaries to the Teifi valley in north Carmarthenshire, which became one of the foremost areas of the Welsh woollen textile industry in the late 19th and early 20th centuries. Despite mechanisation and the development of factory-scale production, the area remained closely tied to its agrarian economic roots and it includes a remarkable concentration of mills and factories, physical evidence for the use of water power, industrial housing and important related, and earlier, historic and cultural associations.

Registered Parks and Gardens

3.8 There are eighteen Registered Parks and Gardens of Special Historic Interest located within the study area. Although not protected by statutory designation, they have been formally recognised and are nationally valued within Wales, as they form an important and integral part of the historic and cultural fabric of Wales. These are summarised below, and the disposition of these Registered Parks and Gardens is shown on *Figure 03*; in addition, details of these sites and their relationship to the Landscape Units is included in tabular form at *Appendix 3*. The grading system used on the Register is similar to that used for Listed Buildings and indicate the following qualities:

- Grade I: Parks and gardens which by reason of their historic layout, features and architectural ornaments considered together make them of exceptional interest;
- Grade II*: Parks and gardens which by reason of their historic layout, features and architectural ornaments considered together make them of great quality;

- Grade II: Parks and gardens which by reason of their historic layout, features and architectural ornaments considered together make them of special interest.

3.8.1 *Aberglasney* is a Grade II* site located to the west of the small village of Llangathen, some 5.5km to the west of Llandeilo. It is comprised of pleasure grounds, formal gardens, woodland garden and associated features surrounding a long established country mansion which is a Grade II* Listed Building. Its essential setting borders a stretch of the main A40 trunk road to the south of the hamlet of Broad Oak.

3.8.2 *Derwydd* is a Grade II site is within a small valley formed by the upper reaches of the Afon Marlas, north-west of Llandybie and some 6km to the north of Ammanford. There are pleasure gardens around the house, a Grade II* Listed Building, and the survival of some specimen trees, as well as a walled kitchen garden.

3.8.3 *Dolaucothi* is a Grade II site immediately to the east of the village of Pumpsaint in the north-east of the county. The house of Dolaucothi stood about 1.6km to the north-east of the village. The site comprises landscaped parkland with shrubberies and a walled garden, providing the setting for two Grade II Listed Buildings.

3.8.4 *Edwinsford* lies within the Cothi valley to the north-west of Talley and this Grade II site straddles the River Cothi to the west of the B4337. Edwinsford House is a Grade II* Listed Building, around which are pleasure gardens, parkland and woodland, the essential setting stretching westwards to the edge of the river.

3.8.5 *Glynhir* is a former mansion located to the east of Llandybie in the east of the county. This is a Grade II site comprised of a small pleasure ground associated with the house - a Grade II Listed Building - a walled orchard and kitchen garden, and woodland walks traversing the steep valley side. It is noted for its stunning views of natural waterfalls and the essential setting lies to the east of this upper reach of the River Loughor.

3.8.6 *Golden Grove* is a Grade II* site situated above the southern side of the Tywi Valley to the south-west of Llandeilo. It was for a long time one of the most important estates in west Wales and is comprised of formal terraces, gardens and pleasure grounds surrounding the present mansion, a Grade II Listed Building. There is also an arboretum, a pinetum, a deer park and parkland. The substantially wooded essential setting stretches northwards from the northern boundary of the site down the upper slopes of the Tywi Valley towards the B4300 road, meeting it at North Lodge. Parts of the grounds are open to the public as a country park.

3.8.7 *Laugharne Castle* lies at the heart of Laugharne village on the very edge of the Taf estuary. The site is Grade II and comprised of a reinstated early nineteenth-century garden, with earlier features within the castle wards and defensive walls. The site's essential setting is drawn close to the eastern and southern site boundaries and abuts the foreshore, with open views across the water to the east and south-east. The castle is a Grade I Listed Building and Castle House is a Grade II* Listed Building.

3.8.8 *Llanmiloe House* is located at the centre of Llanmiloe village, located about 1.6kms to the east of Pendine. It is a Grade II site containing a well-preserved Edwardian garden with much original planting. Its essential setting covers steep wooded slopes to the north-west and north of the site. There is a significant view out to the south over the flat coastal marsh of West Marsh and beyond to the sand dunes of Pendine Burrows.

3.8.9 *Llechdwnni* lies within the rolling farmland to the north of Kidwelly, a short distance to the east of the Gwendraeth Fach valley, and about 2kms south-east of Llandyfaelog. It is a Grade II site. There is a survival of an unusual and early walled garden and formal pool, associated with one of the former most historic houses in the south of the county, the old house being a Grade II Listed Building. Its essential setting stretches to the north and south of the site and there are a number of significant views out from the site: from north around to the north-west; and from south-east around to the south-west.

3.8.10 *Llwynywormwood* is a landscaped park with drives remaining, a vestigial lake and a walled kitchen garden, located around 1.58kms north of the village of Myddfai, some 3kms to the south of Llandovery. The dramatic ruins of Llwyn y Wormwood house are situated at the top of the southern slope of the Afon Ydw valley overlooking the parkland to the north. It is a Grade II site, with a Grade II Listed barn. There are significant views out to the north from the ruins. The essential setting extends out to the west across the river, enclosing the wooded valley side, and to the south-east, encompassing Penhill Wood.

3.8.11 *Maesyrcrugiau Hall*, formerly known as the Manor Hotel, is located about 1.5km south of the village of Maesyrcrugiau, in the Teifi valley in the north of the county. It is a Grade II site comprised of a formal terrace, pond and garden area (immediately in front of the house); and ponds, a summerhouse and woodland walks. There is a significant view out to the north-west.

3.8.12 *Middleton Hall* is an extensive tract of land situated on rolling ground above the southern bluff of the Tywi Valley, some 14km to the east of Carmarthen. This Grade II site is a landscaped park created by Sir William Paxton, which has a double-walled garden, cascades, bridges and remains of extensive water features. There are significant views out to the north-east and south-east. The core of the park, including the mansion site, stable block, pleasure garden site and walled kitchen garden, has been converted into the National Botanic Garden of Wales.

3.8.13 *Pantglas* is located some 12km to the north of Carmarthen and about 1.5km to the north-west of the ancient settlement of Llanfynydd. It is a Grade II site, comprised of formal terraces and gardens around the house, a Grade II Listed Building, informal plantings of woody exotics and shrubs towards the lake, and a small classical bridge leading to woodland walks and parkland. The essential setting stretches south-westwards from the south-western boundary for about 300 metres.

3.8.14 *Parc Howard* lies on the northern outskirts of Llanelli, immediately to the west of the A476 road to Cross Hands. It is a municipal park with lawns, flower beds a bandstand and other amenity features. The mansion, bandstand, gates and railings are all Grade II Listed Buildings. The essential setting extends to encompass the cemetery abutting the southern boundary and the land to the north-west as far north as Pentrepoeth Road. It is now surrounded by urban development.

3.8.15 *Paxton's Tower* is an impressive and conspicuous landmark for miles around, from which there are spectacular and panoramic views, particularly over the Tywi Valley to the north. It is a folly tower and a Grade II* site. The tower itself and the nearby gate lodge are Listed Buildings, Grade II* and Grade II, respectively. The site's essential setting incorporates the upper wooded slopes of the Tywi valley on its northern flank. The noted significant views point from this feature are in an arc from west around to the north-east. There are views to the south-west over the nearby Middleton Hall landscape.

3.8.16 *Plas Dinefwr* is set in rolling parkland just to the north-west of the market town of Llandeilo. This is a Grade I site, an outstandingly beautiful and picturesque eighteenth-century landscaped park incorporating the remains of a mediaeval castle. Also present are a small formal garden, a walled garden, a walled kitchen garden and utilitarian structures including an ice house, a dovecote and service quarters. There are numerous Listed Buildings present, including: Old Dynevor Castle, Grade I; Plas Dinefwr house, Grade II*; inner and outer courtyard ranges, Grade II* and St Tyfi's church, Grade II. The site's essential setting extends beyond the southern and south-western boundaries right up to and including the River Tywi. It also includes a small area at King's Lodge Wood, where it meets the A40 trunk road. There are significant views noted thus: westwards across the site from Parc Lan-fawr in the east; westwards from Plas Dinefwr over the deer park; and to all points of the compass from the elevated site of Old Dynevor Castle. It is managed by the National Trust and is closely associated with the town of Llandeilo.

3.8.17 *Stradey Castle* lies on the western edge of the town of Llanelli on slightly elevated ground just over 1 km to the north-west of the town centre. The site is Grade II and encloses the Stradey Castle Grade II* Listed Building. It has a formal terraced garden overlooking parkland, water features and woodland walks, as well as a walled kitchen garden. The essential setting stretches westwards from the western site boundary, across the narrow valley of the Afon Dulais, and includes the steep woodland areas on Stradey Hill. There are significant views out from the Castle itself in an arc around from south-west to south-east.

3.8.18 *Taliaris* is a Grade II site situated on the western side of the Dulais valley some 4km north of Llandeilo and 5km south of Talley. It has a small formal garden surrounding the house, a Grade I Listed Building, pleasure grounds to the west, parkland to the south and two walled gardens to the east. It also has an artificial lake now set in woodland. There are significant views out to the south from the house.

Special Landscape Areas

3.9 Special Landscape Areas are a local landscape designation. There are eighteen areas of land within Carmarthenshire, encompassing river valleys, upland and coastal landscapes, which the County Council have designated as Special Landscape Areas. This local landscape designation aims to provide additional safeguards against unsympathetic changes which may occur through development or changes in land management.

Landscape Types

3.10 The eighty discrete Landscape Units which have been identified within the study area contain representations of 20 'landscape types' that have been determined using LANDMAP data at Classification Level 3 for the Visual and Sensory Aspect. Below is a description of each of the landscape types identified. The descriptions give an indication of the complexity and diversity of the landscape character of Carmarthenshire, albeit within a relatively large geographic area. These areas range from distinctive linear river valleys, rich with historic interest, through settled rolling rural landscapes, old colliery villages set in relict *coedcae*, to large areas of upland moorland and forestry – all of which reflect both the geological processes and geophysical forces which have shaped the landscape of the county, and the more recent mining and rural land uses.

3.11 *Figure 06* shows the landscape types occurring within Carmarthenshire, and illustrates that upland areas are most prevalent in the northern and eastern parts of the county, with lowland areas generally located in the southern and western parts.

3.12 The following text describes the landscape types that lie within the study area [as defined at Section 1.1, above].

Upland Grazing

3.13 This landscape type covers upland with greater than 50% grassland land cover. Generally there are very few field boundaries in this landscape type and grazing is for sheep, at low stocking densities. There is very little built development in this landscape type and it is generally restricted to scattered farmsteads. The elevated nature of this landscape type generally allows good intervisibility between this landscape type and other elevated landscape types in the surrounding area.

Upland Moorland

3.14 This landscape type covers upland areas with greater than 50% moorland, generally with a lack of field boundaries. There is variation in the nature and amount of built development in this landscape type; such development includes telecommunications masts and wind turbines. The generally exposed character of this landscape type often affords intervisibility between it and other landscape types in the area, including parts of the BBNP.

Mosaic Upland and Plateau

3.15 This landscape type covers upland and plateau areas that consist of significant areas of coniferous forest growing amongst moorland and rough grazing. There is very little built development in this landscape type and it is generally restricted to scattered farmsteads; a small number of telecommunication masts may be visible in skyline views. The generally elevated location of this landscape type often affords intervisibility between it and other landscape types in the area.

Open Upland Valley

3.16 This landscape type is characterised by upland valley sides that generally comprise pasture fields with a mixture of boundary types. The elevated nature of the upper valley sides within this landscape type affords some intervisibility with other landscape types in the surrounding area, including parts of the BBNP. Built development is generally characterised by scattered farmsteads and dwellings.

Mosaic Upland Valley

3.17 This landscape type is characterised by high valley areas that have a patchwork of small pockets of woodland. This landscape type tends to be smaller scale than the adjacent upland landscape types, and with reduced intervisibility. The built environment is generally restricted to scattered farmsteads and smaller settlements.

Hillside and Scarp Slopes Grazing

3.18 This landscape type is characterised by rough grazing on land that has greater than 10-degree slopes. This landscape type is often located on upper valley sides or lower hillsides, and often forms an area of transition between lowland and upland. The built environment is generally restricted to scattered farmsteads and smaller settlements. The generally elevated location of this landscape type often affords intervisibility between it and other landscape types in the surrounding area.

Hillside and Scarp Slopes Moorland

3.19 This landscape type is characterised by moorland cover on sloping land generally with a lack of field boundaries. This landscape type is often located on upper valley sides or lower hillsides, and also often forms an area of transition between lowland and upland. There is very little built development within this landscape type. The generally elevated location this landscape type often affords intervisibility between it and other landscape types in the area.

Hillside and Scarp Slope Mosaic

3.20 This landscape type is characterised by a patchwork of coniferous woodland cover among rough grazing on landform that is sloping, steeply in places, and characterised by a regular pattern of medium-sized fields, bounded by a combination of hedges, fences and stone walls. The built environment is generally restricted to scattered farmsteads.

Hill and Lower Plateau Grazing

3.21 This landscape type is characterised by grazing land on plateau or gently rounded hills. Fields are either bounded by a combination of hedges and hedgerows, or are unenclosed; there are few trees. There is a variation in amount of built development which occurs in this landscape type; these include wind turbines. The generally exposed character of this landscape type affords some intervisibility between it and other landscape types in the surrounding area.

Hill and Lower Plateau Mosaic

3.22 This landscape type is characterised by a mosaic of rough grazing land and forestry on plateau or gently rounded hills. Fields are generally medium to large and bounded by mixture of banks and fences. The built environment is generally restricted to scattered farmsteads.

Wooded Hill and Lower Plateau

3.23 This landscape type is characterised by large areas of coniferous and mixed forestry on plateau or gently rounded hills. There is little built development which occurs in this landscape type and it is generally restricted to scattered farmsteads and agricultural holdings of upland grazing; telecommunication masts may be visible in some skyline views. However, large wind turbine developments have recently been consented within this landscape type. The elevated position of

this landscape type affords some intervisibility between it and other landscape types in the surrounding area.

Open Lowland Valley

3.24 This landscape type covers land within valley landform with a valley-floor-to-ridge height of >50m. It is generally insignificantly wooded but may contain some hedgerow trees and riparian vegetation. There is a variation in the amount and type of built development occurring in this landscape type; this ranges from scattered farmsteads to larger settlements. The generally enclosed character of this landscape type affords very limited intervisibility between it and other landscape types in the surrounding area.

Mosaic Lowland Valley

3.25 This landscape type covers land within valley landform with a valley-floor-to-ridge height of >50m. The amount of built development in this landscape type ranges from scattered farmsteads to areas with larger settlements and their associated infrastructure. There are also occasional incidences of field-scale solar PV schemes. The generally enclosed character of this landscape type affords very limited intervisibility between it and other landscape types in the surrounding area.

Wooded Lowland Valley

3.26 This landscape type is characterised by enclosed wooded valleys, of predominantly broadleaved woodland, interspersed with areas of grazing. There is a variation in the amount and type of built development in this landscape type; this ranges from scattered farmsteads to small settlements. The enclosed character of this landscape type restricts any intervisibility between it and other landscape types in the surrounding area.

Open Rolling Lowland

3.27 This landscape type is characterised by gently sloping, undulating land. It is generally insignificantly wooded, but may contain hedges with some hedgerow trees and scattered small areas of woodland. There is a variation in amount and type of built development in this landscape type; this ranges from scattered farmsteads to settlements, with associated transport corridors and infrastructure. The generally open character of this landscape type affords some intervisibility between it and other landscape types in the surrounding area.

Mosaic Rolling Lowland

3.28 This landscape type is characterised by a patchwork of fields bounded by hedges and hedgerow trees and scattered woodland on a gently undulating landform. There is a variation in the amount and type of built development present in this landscape type; this ranges from scattered farmsteads to settlements, with associated transport corridors and infrastructure. There are also occasional incidences of field-scale solar PV schemes. The generally enclosed character of this landscape type affords very limited intervisibility between it and other landscape types in the surrounding area.

Wooded Rolling Lowland

3.29 This landscape type is characterised by gently sloping, undulating land, with predominantly broadleaved woodland interspersed with fields bounded by hedgerows. There is a variation in the amount and type of built development occurring in this landscape type; this ranges from scattered

farmsteads to small settlements. The enclosed character of this landscape type restricts any intervisibility between it and other landscape types in the surrounding area.

Flat Open Lowland

3.30 This landscape type is characterised by predominantly level land with any slopes less than 3 degrees; this can include broad valleys and valley bottoms. It is generally insignificantly wooded but may contain some hedgerow trees and riparian vegetation. There is a variation in the amount and type of built development in this landscape type; it ranges from scattered farmsteads to small settlements. The open character of this landscape type affords some intervisibility between it and other landscape types in the surrounding area, which is limited by the nature of surrounding landform.

Flat Lowland Mosaic

3.31 This landscape type is characterised by a patchwork of fields bounded by hedges and hedgerow trees and scattered woodland on a predominantly level landform. There is a variation in the amount and type of built development in this landscape type; it ranges from scattered farmsteads to wildlife centres. The generally enclosed character of this landscape type affords very limited intervisibility between it and other landscape types in the surrounding area.

Flat Wooded Lowland

3.32 This landscape type is characterised by forestry on predominantly level land. The built environment is restricted to visitor centre buildings and infrastructure. The generally enclosed character of this landscape type affords very limited intervisibility between it and other landscape types in the surrounding area.

Landscape Units

3.33 It should be noted that the Landscape Units referred to in this study are not derived from any previous landscape character assessment, but have been specifically identified, delineated and mapped for the purposes of the study; they are also described briefly in the following paragraphs. The boundaries between units are indicative and neighbouring units may share characteristics. *As a result, any proposals close to a Landscape Unit boundary should also consider the adjoining Landscape Units when carrying out detailed assessment and following guidelines. Section Four, below, contains a detailed sensitivity and capacity assessment for each discrete Landscape Unit.*

1. Efailwen Uplands

3.34 The delineation of this Landscape Unit closely corresponds to the boundary of the Hill and Lower Plateau Grazing landscape type in the area. It lies at an elevation of between approximately 150m AOD and 289m AOD at Carn Wen stretching north-westwards from Whitland. The A478 main road between Narberth and Cardigan crosses the area from north to south, with a roadside picnic site and promoted viewpoint to the Pembrokeshire Coast National Park (PCNP) which is contiguous with the northern boundary of this Unit.

2. Cwmfelin Boeth & Mid Taf Valley

3.35 This Landscape Unit comprises a combination of two landscape types that share common landscape characteristics and susceptibility criteria, including scale, topography, enclosure and perceptual qualities. The town of Whitland lies adjacent to the south-eastern boundary, and the

main Carmarthen to Haverfordwest railway line intermittently crosses and re-crosses much of the south western boundary. This Unit has a small number of wind turbines both operational and consented, and a consented field-scale solar PV installation.

3. Upper Cwm Taf

3.36 A complex Landscape Unit founded upon a steep-sided and largely wooded river valley located between two areas of upland, with scattered farms and occasional small settlements, including Login and Llanglydwen. The promoted recreational route of the Landsker Borderland Trail crosses the central southern part of this Unit.

4. Cwm Gronw

3.37 This is a steep-sided lowland valley with a mosaic of grassland, broadleaved and coniferous woodland. It includes an area of parkland at Whitland Abbey, with scattered farmsteads as the dominant built form, with only the larger settlement of Llanboidy at its centre. The promoted recreational route of the Landsker Borderland Trail crosses the southern part of this Unit.

5. Brandy Hill & Whitehill Down

3.38 This Landscape Unit is based upon the two adjacent areas of Mosaic Rolling Lowland landscape types that share common characteristics and susceptibility criteria. The area is crossed by the busy A477 trunk road corridor, with its recent realignment not yet assimilated into the landscape, and high-voltage overhead lines carried on steel lattice towers bisect the long axis of this Unit. The telecommunication tower at Brandy Hill marks the highest point within the Unit at 205m AOD. The Unit has a small number of operational wind turbines.

6. Llanddowror, Old Pale & Whitland Woods

3.39 This Unit is based upon a complex series of well-wooded (predominantly broad-leaved woodland) river valley and valley sides, with small areas of more open grassland. The northern area lies within the Taf Valley Special Landscape Area. Built form consists of scattered farms and the small settlements of Llanddowror and New Mill.

7. Marros Hills

3.40 This Landscape Unit closely corresponds to the Mosaic Rolling Lowland landscape type and incorporates the lowland valleys that dissect the southern slopes overlooking the coastal marshes. The PCNP lies adjacent to the south western boundary of this Unit and the south eastern area lies within the Carmarthen Bay and Estuary Special Landscape Area. Built form consists of scattered farms and the settlement of Pendine; there are a number of operational or consented wind turbines, and a consented field-scale solar PV installation.

8. Whitland to St Clears

3.41 This Landscape Unit closely corresponds to the Mosaic Lowland Valley landscape type. It includes a part of the Taf valley, although the majority of the area consists of south-facing undulating farmland. The transport corridors of both the A40 trunk road, and the main Carmarthen to Pembroke Dock and Carmarthen to Haverfordwest railway lines run across the area along the valley floor from east to west. There are scattered farmsteads as well as the small towns of St Clears and Whitland.

9. Lower Taf Valley

3.42 This Landscape Unit, situated to the south-west of St Clears, is characterised by a relatively open valley with a well-defined valley floor. Some enclosure is provided by areas of woodland on the valley sides. Built form is limited to scattered farmsteads on sides of the valley, and the southern boundary abuts the village of Llanddowror. Most of this Unit lies within the Taf Valley Special Landscape Area. The main A477 road between the A40 at St Clears and Pembroke Dock crosses the eastern half of this Unit, on a recently constructed alignment which by-passes Llanddowror, and is not yet assimilated into the local landscape. The main Carmarthen to Pembroke Dock railway traverses the westernmost area.

10. Llanboidy & Blaenwaun Uplands

3.43 This elevated area of exposed and highly dissected plateau – with views of the Preseli Hills in the PCNP - is classified as upland by LANDMAP, on account of its exposure rather than its landscape, which is characterised by improved grassland and little tree cover, with scattered farms and small settlements. There are a number of operational or consented wind turbines present, including the long-established wind farm near Llanboidy.

11. New Mill Valley

3.44 This secluded Landscape Unit comprises a relatively narrow and steep-sided river valley with some areas of woodland that increase the sense of enclosure. There are only a few scattered farmsteads, although the large village of Laugharne lies immediately adjacent to the short easternmost boundary.

12. Cwm Cych & Cych Slopes

3.45 This Landscape Unit is based upon two adjacent areas of the Mosaic Lowland Valley landscape type that share common characteristics and susceptibility criteria. This steeply-sloping, complex valley-side landscape – with a mix of deciduous and coniferous woodland – has scattered farmsteads, with only hamlets at Capel Iwan and Cwmorgan. It is enclosed to the east by the adjacent Upland landscape type at Moelfre and Pen y Garn.

13. West & East Marsh

3.46 This distinctive Landscape Unit comprises a combination of two adjacent areas of Flat Open Lowland Farmland landscape types that share common landscape characteristics and susceptibility criteria. It is an exposed area of coastal grazing land set inland immediately adjacent to the Pendine Burrows sand dunes, with scattered farmsteads being the only form of development, other than the Ministry of Defence buildings and related infrastructure at West Marsh.

14. Cenarth Slopes

3.47 This well-wooded area of rolling lowland lies between the Teifi and Cych valleys and the upland of Penrherber, overlooking the southern side of the Afon Teifi valley. The areas of broadleaved and mixed woodland create a feeling of enclosure and limit the number of open views out from this Unit. There is a mix of scattered farms and holiday chalets/caravan parks, set within a mosaic pattern of mature hedges and woodland; and the southern edges of the villages of Cenarth and Newcastle Emlyn are contiguous with sections of the northern boundary of this Landscape Unit, which lies within the Teifi Valley Special Landscape Area.

15. West Carmarthenshire Valleys

3.48 This complex Landscape Unit comprises a dense network of narrow, steep-sided valleys that strongly dissect the broad area of upland plateau located to the north-west of Carmarthen and north of St Clears. The valley sides are typically well-wooded with a mix of broad-leaved and coniferous trees. Scattered farmsteads and small settlements are connected by network of narrow roads with high hedges that contribute to the sense of enclosure; there are some views into this Unit from the adjacent plateau area.

16. Penrherber Uplands

3.49 This extensive Landscape Unit represents a transitional area between upland and lowland and lies on the western edge of an area of upland plateau to the south of Newcastle Emlyn. It is composed of three separate compartments, all of which are characterised by enclosed grazing with low hedges set on a rolling landform. Scattered farms are connected by a network of minor roads; there are a small number of operational or consented wind turbines.

17. Pen y Garn & Moelfre

3.50 These two conspicuous, distinctly-rounded hills of grazing land, enclosed by banks and fences, rise above the adjacent plateau landscape. There are few trees or shrubs apart from several small conifer plantations. This rather remote and very exposed Landscape Unit has a small number of operational and consented wind turbines.

18. Lower Taf & Cywyn Valleys

3.51 This wide valley Landscape Unit extends over the lowland between Carmarthen and St Clears, with some areas of woodland on the southern slopes, and well-vegetated field boundaries with hedgerow trees, producing a mosaic landcover pattern. It is an important communications corridor, with both the A40 trunk road and the Carmarthen to Pembroke Dock main line railway line running across the area. Overhead high-voltage lines carried on steel lattice towers cross the southernmost part of this unit, and there is a consented field-scale solar PV installation.

19. Coombe Valley

3.52 A secluded, steep-sided and wooded valley set amongst a wider landscape of rolling farmland and estuary between the villages of Llangynog and Llanybri. This attractive and quiet Landscape Unit is largely unspoilt by any development, with the exception of high-voltage overhead lines carried on steel lattice towers pylons that cross its extreme northern area.

20. Drefach Velindre

3.53 This Landscape Unit comprises a network of well-wooded valleys incised into the plateau to the south of the Teifi valley, with a pattern of linear settlements consisting largely of terraced cottages, reflecting the influence of the previously significant woollen textile industry. The woodland and hedgerow field boundaries, combined with steep valley sides, provide a marked degree of enclosure that affords few views out to adjacent Landscape Units.

21. Trevaughan Slopes

3.54 This Landscape Unit comprises two geographically separate areas, classified as the same Mosaic Rolling Lowland landscape type, that lie to the north west and west of Carmarthen. It is an agricultural landscape of improved grassland, hedgerows and small woods with scattered farmsteads and settlements; there is some newer development in the eastern compartment of this

Unit, where it shares a boundary with the northern edge of Carmarthen. There are a small number of operational or consented wind turbines.

22. Llanybri Coastal Hills

3.55 This Landscape Unit comprises a broad tract of rolling hills set along the western side of the Afon Twyi estuary and along part of the lower estuary of the Afon Taf, dissected by a number of small, steep-sided valleys. It is an agricultural landscape of pasture fields and well-developed hedgerows planted on steep banks, and some small areas of woodland, that together give rise to the distinctive mosaic landcover pattern. The settlement pattern is one of mainly scattered farmsteads, with villages at Llanybri and Llansteffan; overhead high-voltage lines carried on steel lattice towers cross the northern part of this unit. There are a very small number of operational or consented wind turbines.

23. Tywi Estuary Slopes

3.56 This Landscape Unit comprises several geographically separate areas, classified as the same Mosaic Lowland Valleys landscape type, that lie along both sides of the Afon Tywi estuary. They are typically steep-sided and well-wooded, with attractive views out across the estuary. Settlement is sparse, with only scattered farmsteads and houses. Overhead high-voltage lines carried on steel lattice towers cross the north-eastern part of this Unit.

24. Rhos Slopes

3.57 This Landscape Unit is composed of a highly dissected, gently sloping plateau which lies between the lowland river valley to the north and the upland plateau to the south. It is an agricultural landscape of rectilinear fields bounded by hedges with some hedgerow trees. The settlement pattern is a mixture of scattered farmsteads and small linear settlements, such as Saron and Rhos along the A487 main road.

25. Rhos Blaen Esgair

3.58 This Landscape Unit is an area of rough grazing land and conifer plantations set on a gently rolling plateau dissected by a complex river valley landform. Fields are relatively large and bounded by banks and fences, with a distinct lack of hedges and hedgerow trees. The settlement pattern is a mix of isolated, scattered farmsteads and small linear settlements such as Hermon. There are some operational or consented wind turbines.

26. Teifi Valley

3.59 This linear Landscape Unit comprises a combination of several landscape types that share common landscape characteristics and susceptibility criteria. It is a well-wooded valley and valley sides with farmland, hedgerows and trees along the lower middle reaches of the Afon Teifi and, in places, it is relatively narrow, with views generally restricted to the valley floor and slopes.

27. Cwm Duad & Gwili Valley

3.60 This linear Landscape Unit comprises a complex and sinuous lowland valley, running north-westwards from the northern edge of Carmarthen. It is well-wooded with grazing land bounded by hedgerows. The area is an important local communication corridor, with both the A484 main road to Cardigan and the heritage attraction of the Gwili Steam Railway running along the valley floor. There is a mixture of scattered farmsteads and the villages of Bronwydd, Cynwyl Elfed and Cwmduad.

28. Llansaint Coastal Hills & St Ishmael Coastal Slopes

3.61 This Landscape Unit is based upon the two adjacent areas of Mosaic Rolling Lowland landscape types that share common characteristics and susceptibility criteria. Predominately grazing land, with distinctive red soils, these rolling hills and slopes have extensive views over the adjacent Tywi and Gwendraeth estuaries. Predominantly scattered farmsteads and occasional larger settlements: with the larger nucleated village of Llansaint situated on the hill top, and the contrasting linear settlement of Ferryside along the edge of the Tywi estuary. The south-eastern boundary abuts the western edges of Kidwelly. The main railway line between Llanelli and Carmarthen hugs the coastline along the southern, western and north-western edges of this Landscape Unit, but only minor local access roads cross the quiet farmland. Overhead high-voltage lines carried on steel lattice towers cross the northernmost part of this Unit. There are a small number of operational or consented wind turbines and field-scale solar PV installations.

29. Pembrey & Penybedd Forest

3.62 This Landscape Unit is founded upon a distinctive area of continuous coniferous forest plantation adjacent to the coast. Formerly occupied by the Pembrey Royal Ordnance Factory, the southern part has been incorporated into a Country Park, and this recreational use is facilitated and enhanced by the presence of the Wales Coast Path, the starting point for the promoted long distance recreational path of St Illtyd's Walk, and part of the National Cycle Route 4.

30. Pembrey Levels & Motor Sports

3.63 This small but distinctive Landscape Unit is based on the Flat Open Lowland Farmland landscape type. It consists of a motor sports centre, situated on the disused airfield, within a wider landscape of open farmed land bounded by a mixture of hedges and fences that often lie along ditches. It has a high degree of transportation influence, through the presence of the main A484 road between Llanelli and Carmarthen, and the main Llanelli to Carmarthen railway line, which runs roughly parallel to the road at close quarters.

31. Bancyfordd Uplands

3.64 This Landscape Unit is founded on a large area of gently sloping upland to the south of Llandysul and west of Pencader. It has an indented boundary along much of its length and is characterised by rectilinear fields, interspersed with scattered farmsteads connected by small roads bounded by hedgebanks. It is generally open with few trees or woodlands. There are a small number of operational or consented wind turbines present.

32. Gwendraeth Levels

3.65 This distinctive Landscape Unit is based on the Flat Lowland Mosaic landscape type and comprises low lying fields and areas of wetland, with drainage ditches and overgrown hedges that create a significant degree of enclosure and create a sense of remoteness. Built form is typically scattered farmsteads and isolated houses, although the north-western edge lies adjacent to the town of Kidwelly. The main A484 Llanelli to Carmarthen road crosses the extreme north-western corner of this Unit, but otherwise the area is rather quiet and secluded. The Wales Coast Path traverses part of the north-western section of the Unit and the St Illtyd's Walk crosses the southernmost section.

33. Llanpumsaint Hills

3.66 This elevated Landscape Unit located just south of Llanpumsaint consists of rolling hills of hedged fields and scattered farmsteads, bordered on three sides by the Afon Gwili, with links to the higher upland that rises to the east. Tributary stream to the Afon Gwili have incised valleys into the southern and western edges of this landscape. The settlement pattern is mostly in the form of scattered farmsteads and hamlets, with larger linear settlements set along the main A485 Carmarthen to Lampeter road, such as at Rhydargaeau.

34. Llanpumsaint Basin

3.67 This extensive Landscape Unit lies along the middle reaches of the Afon Gwili, and is characterised by a broad valley floor and steep valley sides that are often wooded. The eastern boundary is heavily indented by fingers of dense coniferous woodland plantation at the edges of the Brechfa Forest. The area is crossed by the main A485 Carmarthen to Lampeter road, running north-south, and contains a mix of scattered farmsteads and hamlets, with linear settlements along the main road and larger settlements at Alltwalis and Llanpumsaint. There are a small number of operational or consented wind turbines.

35. Afon Siedi, Pentrecwrt & Cwm Tyweli

3.68 This complex Landscape Unit is made up of the narrow river valley of the Tyweli and its tributaries, with an outlying compartment to the west around Pentrecwrt, and consists of a mosaic of fields and hedges, with wooded areas on the valley sides. Settlement is a mix of scattered farmsteads, hamlets and the larger linear settlement of Pencader. The south-eastern part of this unit lies adjacent to Brechfa Forest SSA, and the operational Alltwalis wind farm is a prominent feature visible from parts of this Unit.

36. Gwendraeth Fach

3.69 At the lower end of the Gwendraeth Fach river valley, this large and essentially linear Landscape Unit is based upon a shallow valley, composed of a mosaic of fields, hedges and some woodland, with a mix of scattered farmsteads and smaller settlements. The latter are small villages set at crossing points or overlooking the river, such as Llangyndeyrn and Llandyfaelog. There is a strong sense of place and it has a relatively unspoilt and secluded rural atmosphere. It runs from the A40 near Porthyrhyd in the north-east south-westwards to its southernmost extremity which abuts the northern edge of the town of Kidwelly, at the edge of the Gwendraeth estuary.

37. Mynydd Tre-beddau

3.70 This Landscape Unit is comprised of two physically separate compartments, located on the western slopes of the Cambrian Mountains, and is predominantly upland grazing, with some of the area adjacent to the conifer plantations of Brechfa Forest. Tributary valleys of the Afon Tyweli to the west strongly incise the north-western boundary of the southern compartment of this area. The northern compartment overlooks a significant tract of the Teifi valley and is bounded on the south-eastern side by the open exposed plateau moorland of Mynydd Llanllwni. The wind turbines at Alltwalis wind farm are a prominent local landmark, and the majority of the area lies within the Brechfa Forest SSA.

38. Gwendraeth Fawr

3.71 This Landscape Unit is founded upon a lowland river valley of small fields and hedges flanked to the north by the Carmarthenshire Limestone Ridge SLA. It stretches along the valley from the

villages of Drefach and Tumble in the north-east, south-westwards to reach the north-eastern edge of the town of Kidwelly on the Gwendraeth estuary. Evidence of the area's mining history is still apparent in the distinctive linear colliery village settlements – as at Trimsaran, Pontyates and Pontyberem – together with old railways and land restored from extensive previous opencast mining operations. The Ffos-Las racecourse is a large new development centred on a reclaimed opencast mining site north of Trimsaran, which has radically changed the character of the southern part of the valley. There are also a number of consented field-scale solar PV installations.

39. Millennium Coastal Park

3.72 This long linear Landscape Unit is based upon a narrow tract of coastal fringe fronting the Loughor Estuary, between the edge of Pembrey village in the west and the Trostre district of the south-eastern part of Llanelli in the east. The northern boundary has a substantially urban backdrop. The eastern section of the level land stretching from the southern edge of Llanelli to the salt marsh and sea wall has been developed as National Wetlands Centre to create a network of wetland habitats. The recreational use is reflected by a number of walk-ways, cycleways and bird hides, and the proximity of the Wales Coast Path. There are extensive views over the estuary to the north coast of Gower.

40. Mynyddystyfflau Carn

3.73 This Landscape Unit is founded upon a large area of grazed plateau situated to the south of Brechfa Forest, with some unenclosed areas of common land and small conifer plantations. Its boundary is heavily indented. The settlement pattern in this secluded area is restricted to scattered farmsteads and there are few roads. There are a small number of operational or consented wind turbines.

41. Middleton Hall & Hills

3.74 This is a large area of rolling lowland farmland situated between the Tywi Valley and the Gwendraeth Fach, characterised by medium-sized fields with managed hedges and a mainly scattered settlement pattern. The eastern boundary lies adjacent to the BBNP. The A48 trunk road Carmarthen and Cross Hands runs across the central part, but the remainder of the area remains unaffected by this busy road. The Llanelli to Llandeilo section of the A483 to the north of Llandybie crosses the extreme eastern section of the area; and the A484 Carmarthen to Llanelli road crosses the extreme western section. The distinctive roof of the great glasshouse at the National Botanic Garden of Wales is a local landmark within the landscape. There are a small number of operational or consented wind turbines and field-scale solar PV installations

42. Swiss Valley

3.75 This is relatively small Landscape Unit consists of a steep-sided well-wooded valley formed by the Afon Lliedi, containing two water storage reservoirs but with no settlement, except for part of the hamlet of Horeb in the northernmost part. It is an attractive and peaceful area, with a strong sense of place, popular with walkers and cyclists from nearby Llanelli and beyond. This access is facilitated by the footpath/cycleway along the former mineral railway line along the western side of the valley, and the St Illtyd's Walk promoted long distance recreational path which crosses the valley between the two reservoirs. The south-eastern boundary abuts the main A476 road between Llanelli and Cross Hands, and the housing areas in the district of Swiss Valley, but the valley itself is substantially secluded and tranquil.

43. Mynydd Llanllwni

3.76 This Landscape Unit is an extensive, exposed and unenclosed area of heather moorland on gently undulating plateau landform. The southern part wraps around a deeply incised river valley within Brechfa Forest. There are attractive extensive views, in particular northwards across the Teifi Valley and south-east towards the Brecon Beacons. The entire Landscape Unit lies within the area designated as SLA. There is little built form apart from the telecommunication masts located at the high point of 408m AOD, a prominent feature in some views. Whilst there are no wind turbines operational or consented within this Landscape Unit, the central area is situated within the Brechfa Forest SSA. Furthermore, the southern and eastern parts of this Unit lie adjacent to Brechfa Forest, an area with consented wind farms.

44. Dyffryn Teifi Mid Section

3.77 This is relatively large linear Landscape Unit that comprises the southern sides of the Teifi Valley, between a point just south of Lampeter in the north-east, and the village of Llandysul in the south-west, with Llanybydder village close to the centre at its northern edge. It is an area of gently sloping agricultural land with well-defined hedged field boundaries and some deciduous woodland. Apart from these larger villages, there is a mixture of settlement that ranges from scattered farms to larger linear settlements, for example at Llanllwni. The main A485 road between Carmarthen and Lampeter cuts across the southern section to Llanybydder, from where it runs close to the northern boundary as far as Cwmann, close to the Ceredigion boundary, where it joins the A482 running up from the south-east.

45. Crwbin Ridge

3.78 This very large linear Landscape Unit is based upon the strong feature of a broad ridge of exposed high land, including areas of unenclosed common land, enclosed pasture, and several limestone quarries. It is comprised of two areas of land separated by the narrow valley north of Llandybie, aligned north-east to south-west, stretching from the BBNP boundary to the village of Mynyddygarreg to the east of Kidwelly. The Llyn Lech Owain Country Park, with its coniferous forestry plantations and a lake, is situated in the eastern part of the Unit. There is a mix of scattered settlements and larger linear settlements associated with the quarries. There are a small number of operational or consented wind turbines. The ridge is cut by the A48 trunk road north of Cross Hands. It is also crossed by overhead high-voltage lines carried on steel lattice towers within the central part of this unit, between Pontyberem and Pont-henri. There are extensive views out from this ridge in many locations.

46. Brechfa Forest

3.79 This Landscape Unit is based upon a large area of upland plateau which is dominated by commercial forestry plantations, with tracks, areas of clear-felling and compartments with different stages of growth. However, within the plantations, old field boundaries and the remains of farmsteads are still visible as evidence of the previous agricultural land use. The majority of the unit lies within SSA G Brechfa Forest; there is a large consented wind farm (Brechfa Forest West), and the operational wind farm at Alltwalis is a prominent feature to the west.

47. Mynydd Sylen, Llanelli Hills & Pembrey Coastal Hills

3.80 This is relatively large Landscape Unit is composed predominantly of the Mosaic Rolling Lowland landscape type, but has smaller areas that share common landscape characteristics and

susceptibility criteria. It wraps around the Swiss valley Landscape Unit which is close to its centre. It is characterised by rolling hills and small valleys with a strong network of field boundary hedgerows and some small patches of woodland. There are scattered farms and several larger settlements; the southern parts are adjacent to the urban edge of Llanelli. It is traversed by the A48 trunk road in the easternmost section, as well as the A476 main road from Llanelli to Cross Hands. Also, high-voltage overhead lines carried on steel lattice towers run across the eastern part of the unit. There are a number of operational and consented wind turbines present, and a number of field-scale solar PV installations

48. Lower Cothi Valley

3.81 This Landscape Unit comprises a rural lowland valley running southwards from near the village of Brechfa almost to Pontargothi in the south. It has a mosaic of hedge-bounded fields and riparian woodland on the valley floor along the lower reaches of the River Cothi. On the east and west, the valley sides rise steeply and are a mixture of pasture, woodland and bracken. There are scattered farmsteads linked by minor roads from which there are attractive views along the river.

49. Gwernogle

3.82 This Landscape Unit comprises a complex steep-sided wooded upland valley nestled amongst the higher plantation of Brechfa Forest, into which the valley is incised. There is a mixture of farmland and woodland on the valley floor, with scattered farmsteads and the small village of Gwernogle. There are no wind turbines operational or consented within this Unit. However, the eastern parts of this Unit lie adjacent to Brechfa Forest, an area with consented and planned wind farms.

50. Llangennech Slopes & Llanelli Levels

3.83 This Landscape Unit is in the extreme south-eastern part of the county. It is an area of gently undulating land lying between the upper reaches of the River Loughor estuary and the edges of the linked settlements along the south-eastern fringe of Llanelli, including Trostre, Bynea, Bryn and Llangennech, as well as Hendy to the north of the M4 Motorway. It is a mix of grazing and brownfield land, and its character is strongly influenced by transport and other infrastructure. It is traversed by main and local railway lines, the M4 Motorway in the extreme northern section, the A484 Llanelli to Swansea main road in the south and the A4138 forms the boundary between Llangennech and the M4. High-voltage overhead lines carried on steel lattice towers cross the centre of this Unit. There are also consented field-scale solar PV installations.

51. Mid Cothi Valley

3.84 This small scale attractive river valley with its mosaic of fields, hedges and woodland that provide a sense of enclosure is the basis for this Landscape Unit. Built form mainly scattered farmsteads with several larger settlements at the small villages of Brechfa and Abergorlech on the valley floor at bridging points on the river. The high degree of integrity and strong character of the area are reflected by its designation as an SLA.

52. Tywi Slopes Northern

3.85 This Landscape Unit is a relatively large linear tract of rolling hills and valleys above the northern side of the Tywi valley that extends from the north-eastern edge of Carmarthen eastwards

to Llanwrda. It is composed of two physically separate areas, bisected by the lower reaches of the Cothi Valley (Landscape Unit 48). It is an agricultural landscape composed mainly of grazing land with scattered farmsteads with occasional larger settlements, as at Salem and Capel Isaac. There are a small number of operational and consented wind turbines.

53. Dyffryn Tywi Valley Sides & Dinefwr Park

3.86 This is a narrow linear Landscape Unit closely corresponding to the northern valley sides and incorporating Dinefwr Park immediately west of Llandeilo. The majority of this Unit lies within the Tywi Valley SLA and consists of undulating fields bounded by hedgerows with attractive views over the valley. There are some parkland landscapes, notably at Dinefwr Park, a Registered Park and Garden site. Built form is generally scattered farmsteads with occasional small villages, connected by a mixture of smaller roads and the A40 trunk road between Carmarthen and Llandeilo is a main route along the long axis of the Unit.

54. Mynydd Figyn

3.87 A distinctive broad ridge of exposed upland grazing - mostly enclosed grassland and some areas of common land - forms the basis for this Landscape Unit. It is aligned north-east to south-west between the land north of Llanfynydd and the high ground of Mynydd Cynros to the west of Talley. It is a remote rural area with only a few scattered farmsteads. There are extensive views to the north-west across the adjacent Cothi Valley to Brechfa Forest, and south-east across the Tywi Valley to the BBNP.

55. Cross Hands - Capel Hendre

3.88 This Landscape Unit is founded upon a large area of the former coalfield between the Amman Valley to the east and the head of the Gwendraeth Fawr valley in the west, with part of the Crwbin Ridge (Landscape Unit 45) forming a high backdrop to the north. It is a significant area of undulating land with a highly distinctive pattern of linear settlement, created by a network of former small colliery villages set amongst grazing land and restored opencast coal mining sites, with strong hedgerow field boundaries in many places - a relict coedcae landscape pre-dating the coalfield settlements. There is also recent large scale commercial development at Cross Hands adjacent to the busy A48 trunk road which traverses the western section of this Unit, with the main A476 road from Cross Hands to Llanelli in the south-west, and the main A483 road from the A48 to Ammanford and Llandeilo passing through the south-eastern section. There are a small number of operational and consented wind turbines and some field-scale solar PV installations.

56. Esgairdawe & Rhydcymerau Basin

3.89 This large rural Landscape Unit comprises a series of valleys that run north-eastwards from the edge of Brechfa Forest. It is a lowland agricultural landscape of hedge-bounded fields, with areas of deciduous woodland and coniferous plantations. The settlement pattern is predominantly one of scattered farmsteads, with the only substantial village being Rhydcymerau in the south-west. There are no wind turbines operational or consented within this Unit. However, the western parts of this Unit lie within and adjacent to the Brechfa Forest SSA, an area with consented wind farms.

57. Llŵchwr Valley

3.90 This narrow linear Landscape Unit runs along the River Loughor and the Carmarthenshire county boundary. It has an open floodplain with large irregular-shaped fields and drainage ditches. The slopes are more wooded and with smaller hedge-bounded fields. It is a secluded rural area, with a settlement pattern based primarily upon scattered farmsteads, situated predominantly on the valley sides, with the only village being Llanedi. There are only minor roads into this area, but the B4297 forms part of the south-western Unit boundary. High-voltage overhead lines carried on steel lattice towers cross the southernmost section to the south of Llanedi.

58. Dyffryn Tywi Floodplain

3.91 This long linear Landscape Unit occupies the floor of the Tywi valley between Carmarthen and Llandeilo. It is composed of a wide, level agricultural valley floor and the broad river that meanders across the full width of the floodplain, with the village of Nantgaredig being the limit of the tidal reach. It is mostly improved pasture land, with some arable, with fields generally bounded by managed hedgerows. There are also some areas of parkland. Settlement is predominantly in the form of scattered large farmsteads, with the only small villages being Nantgaredig, with its linear form crossing the floor of the valley, and Llanarthne on the south side of the river to the east. This entire Unit lies within the Tywi Valley SLA.

59. Llanfynydd, Cwmdu, Halfway & Talley

3.92 This Landscape Unit comprises a combination of three landscape types that share common landscape characteristics and susceptibility criteria. It comprises lowland valleys, rolling farmland with hedges and hedgerow field boundaries and some areas of woodland. Settlement pattern is generally one of scattered farmsteads with few villages, notably the historic lakeside settlement of Talley in the north and Llanfynydd in the south-west. There are only minor local roads in this mainly quiet rural area, except for the B4302 between Talley and Llandeilo which crosses the easternmost section.

60. Llansawel Hills

3.93 This is a Landscape Unit situated to the north of the village of Llansawel is comprised of steep slopes and hilltops which is characterised by a regular pattern of grassland fields with a mixture of hedgerows and fences. There are several large areas of deciduous and coniferous commercial forestry, and only scattered farmsteads with no larger settlements. There are no wind turbines operational or consented within this unit. However, the south-western part of this Unit lies adjacent to Brechfa Forest, an area with consented wind farms.

61. Banc Beli-Tew

3.94 This relatively small Landscape Unit forms a distinct local skyline, a ridgeline orientated north-east to south-west, and is generally composed of open upland grazing, with some hedged field boundaries on the lower slopes. It is a remote area with very few roads and a sparse population, in a very few scattered farmsteads.

62. Marlas/Llŵchwr Valley & Slopes

3.95 This linear Landscape Unit is comprised of the pastoral landscape of the lowland valley of the Marlas running northwards from near its confluence with the River Aman, where it becomes the River Loughor, to the north of Llandybie. It is strongly influenced by the residential and industrial

development in the adjacent urban area of Ammanford, and the transport corridor of the main A483 road from the A48 to Llandeilo and the railway between Llanelli and Llandeilo.

63. Llansawel Basin

3.96 This relatively large Landscape Unit combines gently rolling lowland with flatter valley bottom, the majority of which is improved grassland, with hedgerows and a small amount of woodland cover. There is a mix of built form that ranges from mostly scattered farmsteads to the occasional larger settlements at Llansawel and Pumsaint. The main A482 road linking the A40 to Lampeter runs through the northern section, whilst the B4302 branches off this road at runs south-westwards towards Talley.

64. Mynydd Pencarreg & Upper Cothi Catchment

3.97 A relatively large, secluded Landscape Unit situated in the north-eastern corner of the county that is mostly composed of unenclosed upland grazing with some large blocks of coniferous woodland plantation. The area is sparsely settled, especially on the north-eastern parts, with only a few roads leading to scattered farmsteads and no larger settlements. The main A482 road between the A40 and Lampeter crosses the south-western area. The northern section is rather remote. There are a small number of operational and consented wind turbines.

65. Mynydd y Betws Northern Slopes & Cwm Cathan

3.98 This large Landscape Unit occupies the lower edges of the high ground on the southern side of the Aman valley, in an arc from the south of Ammanford in the west around to above Gwaun Cae-Gurwen in the east. It comprises a combination of two landscape types that share common landscape characteristics and susceptibility criteria. It is an area of sloping land dissected by gullies and small valleys, often wooded, with fields of rough grazing often bounded by hedgerows. There is a marked urban fringe character all along the Aman valley on the northern boundary of this Unit, on the lower slopes that still bear the signs of the former coal mining and restored opencast sites, but the remainder of the Unit is characterised by scattered farmsteads and houses along minor roads. There are no wind turbines operational or consented within this Unit. However, the southern parts of this unit lie within and adjacent to SSA E: Pontardawe, an area that contains the operational wind farm at Mynydd y Betws in the adjacent Landscape Unit (Nr 68 Mynydd y Betws).

66. Dyffryn Tywi Valley Sides South & Gelli Aur

3.99 This long linear Landscape Unit stretches along the southern side of the Tywi valley between the edge of Carmarthen and Llandeilo. It is composed of several landscape types that share common landscape characteristics and susceptibility criteria. The north-facing slopes are characterised by medium-sized fields within a strong pattern of boundary hedgerows and blocks of coniferous and mixed woodland; there is also an area of parkland landscape at Gelli Aur Country Park. Settlement is mainly in the form of scattered farmsteads with a few small villages, often set along the B4300 road.

67. Black Mountain Southern Slopes

3.100 This is essentially a Landscape Unit which occupies the northern slopes of the Aman valley, with a wider part in the west, to the north of Ammanford and east of Llandybie. It lies adjacent to the BBNP and there are strong visual links to the unsettled land that rises up to the Black Mountain. It is mainly a rural area of small to medium-sized fields of grazing bounded by hedgerows and stone walls. The lower slopes are characterised by an urban fringe of suburban development and also bear

the signs of former coal mining. There are a very small number of operational and consented wind turbines.

68. Mynydd y Betws

3.101 This Landscape Unit is based upon a wide tract of exposed upland moorland landscape, situated between the upper sides of the Aman valley in the north and the county boundary in the south, with extensive views of the BBNP to the north. It is dominated by the fifteen 110 metre-high wind turbines and associated infrastructure of Mynydd y Betws wind farm, which has been in operation since April 2013. Although this area lies within a SLA, its character has now been very substantially altered by the construction of the wind farm and its associated infrastructure. High-voltage overhead lines carried on steel lattice towers also cross the south-western section of this Unit. The long-distance promoted recreational footpath of St Illtyd's Walk crosses the eastern section in an arc and has a link to the Gower Way promoted footpath at the county boundary.

69. Caio Hills

3.102 This Landscape Unit of rolling hills, situated to the west of Llandovery and north of the Tywi valley, is a mix of enclosed grazing and small blocks of conifer forestry, with scattered farmsteads. The distinctive, more exposed high upland plateau of Mynydd Mallaen rises to the north west of this area. The settlement pattern is mostly in the form of scattered farmsteads, served by minor roads, and no substantial settlements. The main A482 road between the A40 at Llanwrda and Lampeter crosses the centre of the Unit. The northern areas to the east of Caio are rather remote and heavily forested.

70. Cwm Dulais

3.103 This Landscape Unit consists of two separate compartments, based upon two well-wooded valleys, which are located above the northern side of the Tywi valley to the north of Llanwrda, to the west of Llandovery. The western compartment is centred on the narrow and sinuous wooded valley of the Afon Dulais, the course of which is closely followed by the main A482 road from the A40 at Llanwrda to Lampeter. The eastern compartment is centred on the smaller valley of the Afon Mynys and is very secluded. Both valleys have a sparse settlement pattern with predominantly scattered farmsteads, accessed from a network of narrow minor roads.

71. Upper Cothi & Tywi Valleys

3.104 This is a deeply incised area of river valleys to the north-east of Pumsaint, wrapping around the north side of Mynydd Mallaen. These mosaic lowland valleys narrow to the north, and are bordered by steep wooded slopes that rise up to unenclosed upland areas. It is an attractive and unspoilt pastoral landscape of hedged fields, with some areas of woodland, and scattered farms with no substantial settlements. Both valleys lie within the Cothi Valley SLA and the Tywi Valley SLA, respectively.

72. Mynydd Mallaen

3.105 This Landscape Unit is composed entirely of a large mass of high exposed upland plateau, which forms an impressive and distinctive landscape feature in the north-east of the county, and is also an important backdrop to the attractive lowland valleys of the Upper Cothi and Tywi valleys. It has extensive elevated views, that include areas of the BBNP to the south, and lies within the Mynydd Mallaen SLA. It is a very remote area with a marked absence of settlement.

73. Middle Tywi Valley

3.106 This Landscape Unit is founded upon an attractive lowland valley in that section between the edge of Llandovery in the south and the village of Rhandirmwyn in the north. It is characterised by pastoral farmland with strong field boundaries and some woodland areas and has a strong sense of place. Settlement ranges from scattered farmsteads to a few small settlements, served by minor roads. The uplands of on both sides of the valley form attractive backdrops, and the valley lies within the Tywi Valley SLA.

74. Fforest, Llandovery

3.107 This small Landscape Unit of steeply rising upland grazing land situated to the north of Llandovery forms a strong backdrop to the Middle Tywi Valley. Fields generally lack field boundaries and there are only a few scattered farmsteads and very few minor roads. It lies within the Tywi Valley and Bran Valley SLAs.

75. Upper Tywi Catchment

3.108 This large Landscape Unit of exposed rolling upland plateau lies in the north-eastern corner of Carmarthenshire, adjacent to the county boundary with Powys. It consists of a mosaic of enclosed upland pasture and unenclosed rough grazing, with large areas of coniferous woodland plantation, and very few scattered farmsteads. It is remote and has little road access.

76. Bran Floodplain

3.109 This linear Landscape Unit is based upon a broad lowland river valley located north of Llandovery. It consists of a mosaic of hedged fields and riparian vegetation, with a sparse settlement of scattered farms and isolated dwellings set along the main A483 road leading from Llandovery northwards into Powys. There are few minor roads. It lies within the Bran Valley SLA.

77. Bran Slopes

3.110 This Landscape Unit comprises the fields, conifer and broadleaved woodland on the slopes which wrap around the Bran floodplain. The main A483 road from Llandovery leading northwards into Powys traverses the northern section of this area. The scenic route of the Heart of Wales railway line runs along the whole of the western side of the valley and the railway viaduct at Cynghordy is a distinctive local landmark. The majority of this unit lies within the Bran Valley SLA.

78. Pentre-Ty-Gwyn

3.111 This Landscape Unit is contained by the higher forested slopes of Crychan to the north and the BBNP to the south and east, with the Afon Gwydderig running along much of its southern edge. It is a rolling agricultural landscape of fields, hedges and blocks of woodland, with scattered farmsteads and a small settlement at Pentre-ty-gwyn. Its eastern section is secluded, accessed only by a few minor roads

79. Cwm Gwennol Llandovery

3.112 This Landscape Unit is a narrow, linear river valley running north-eastwards up from the valley of the Afon Gwydderig, situated between the Halfway Forest and Crychan to the east of Llandovery. It is characterised by forested slopes, some of which has been clear felled, and is secluded, with only a few scattered farms. The higher land to the south east is dominated by coniferous woodland plantations that add to the sense of enclosure.

80. Crychan & Halfway Forest

3.113 This is a large upland Landscape Unit that lies adjacent to the county boundary with Powys in the north east of Carmarthenshire. It is dominated by extensive commercial coniferous forestry plantations clothing the hills and the plateau edge, dissected by small river valleys with small areas of broad-leaved woodland. It is rather remote and has very little settlement and very few roads.

Section 5:

GUIDANCE FOR WIND ENERGY DEVELOPMENT

Factors Relating to Design

Introduction

5.1 The following generic guidance is to be read in conjunction with the specific guidance provided for each of the Landscape Units identified and described in *Section 4*, above. This guidance is provided in order to aid the integration of wind turbines into the receiving landscape, through the consideration of the most appropriate siting and good design.

Turbine Selection

5.2 There is a wider range of design and colour options for smaller turbines, and these matters should be carefully considered in relation to the landscape characteristics of the area in which they are to be located. This is particularly important when other turbines are present, in order to ensure that there are no conflicting design characteristics within the same locality.

Turbine Colour

5.3 The colour should be chosen to help assimilate the turbine into the receiving landscape. The same colour should be used for all external components of the turbine and should be non-reflective. A pale grey is commonly used because it minimises the visibility of the turbines when they are seen against the skyline, which is how most large scale turbines are viewed. However, muted colours (such as mid to darker greys, or blue-grey tones) for the surface finish of towers, hubs, nacelles and rotor blades should be preferred where there is a significant factor of a land or vegetation backdrop to be considered, when the proposed turbine(s) is/are viewed from sensitive visual receptor locations on higher ground within the zone of visual influence; this is particularly relevant to micro and small turbines sited within or adjacent to dense coniferous or broadleaved woodland.

5.4 In all cases, the aim should be to minimise the visibility and reflectivity of the external surfaces of all turbine components.

Turbine Size and Scale

5.5 Small scale turbines are likely to have fewer landscape and visual effects than large scale commercial models. However, they can still visually dominate the nearby landscape or important component features of that landscape. Identifying the main landscape and visual characteristics of the landscape in which the turbines are to be sited is therefore an important determinant in selecting the most appropriate size. Landscapes with a simple, strong and mainly horizontal form are generally able to accommodate taller turbines and large turbine groups, as the height of turbines appears more proportionate to the landscape. Small scale turbines, smaller groupings or individual turbines tend to be more suited to smaller scale, more complex landscapes where there are other features such as buildings, trees or hedges.

5.6 It is also important to understand that smaller turbine rotors appear to rotate more rapidly than larger rotors. If smaller turbines are sited close to larger turbines and appear in the same horizontal arc of view, the relative speeds of rotation can appear discordant, with the tendency of the more rapid movement to draw the eye to the smaller turbines. This may consequently increase the visual effects of the whole of the group of turbines, even though the larger turbines may be more distant (*see also paragraph 5.30, below*).

Turbine Layout

5.7 Although there may be scope to design a small group of turbines as a coherent visual image, this may be difficult where there are other built elements such as buildings, wood poles, steel lattice towers and communications masts present. Where possible, turbine layout should respond to existing landscape patterns, whether field boundaries, buildings or vegetation patterns. Turbine layout should always seek to avoid the occurrence of overlapping rotor blades - or the 'stacking effect', caused when one or more turbines are seen as closely juxtaposed when viewed from sensitive receptor locations, resulting in discordant multiple rotor movements being seen within the same angle of view.

5.8 In all cases, turbine layout should respect the underlying landform and, where possible, groups of turbines should be located at very similar elevations.

Micro-siting

5.9 Relocation of one or more wind turbines from their original position, referred to as micro-siting, often takes place during construction, due to unforeseen circumstances, such as ground conditions. This can affect the original design concept, particularly the relationship with nearby vertical features such as trees and masts. It is preferable that developers undertake pre-application ground surveys to collect geophysical data at appropriate sufficient degree of detail, so as to minimise the requirement for micro-siting at the construction stage.

5.10 It is important to ensure that micro-siting considerations may not only affect wind turbine locations, but also the horizontal and vertical alignment of access tracks, and that these factors are properly considered at the stage of assessing the predicted landscape and visual effects of any wind turbine proposal.

Ancillary Infrastructure

5.11 Landscape and visual impacts of any ancillary developments and visual conflicts between turbines and ancillary structures should be minimised by:

- Sensitive siting and design of ancillary equipment and infrastructure (e.g. using local landform, locally appropriate materials, architectural style and colours to more successfully integrate them into their surroundings);
- Using turbines with integral transformers;
- Siting turbines as close as possible to the point of use or grid connection, so as to avoid long sections of overhead power lines or cable runs (more applicable to large scale wind farm developments). In particularly sensitive locations, placing the grid connection underground is the preferred option;
- Utilising existing tracks to avoid tree and hedgerow or other vegetation removal, which may have adverse landscape effects. New tracks, if absolutely necessary, should follow existing landscape features, such as field and woodland boundaries, wherever possible;

- Minimising cut and fill operations, following contours closely wherever possible for access track alignments;
- Designing fencing or walling to fit the local situation, whilst maintaining the required security;
- Identifying locations for new tree and shrub planting to provide long term screening or assimilation, and requiring the appropriate re-seeding of cutting slopes or embankments, in preference to a reliance upon natural regeneration to re-establish vegetation cover.

Factors Relating to Site Context

Landscape Character

5.12 This component of the study provides the basis for identifying the key landscape characteristics of the site and the wider area. It also identifies the sensitivity of the landscape to different scales of turbines, and any special qualities which should be protected. However, this is a *strategic* study and - in all cases - *turbine applications must be considered on their individual merits*; and detailed analysis is required in order to fully appreciate the nature of the development, the characteristics of the site and its surroundings. Impacts on landscape character are likely to be related to:

- Scale of the landscape – whether it is small or large, and whether the proposed turbine(s) is/are of an appropriate scale;
- Topography – turbines can dominate small scale or intricate landform if not carefully sited;
- Skylines – turbines can interrupt the simplicity of skylines or ridges, even if located below such features;
- Settlement pattern – turbines should be sensitively sited in relation to existing buildings and their relationship with the landscape;
- Influence on the tranquillity of the landscape – turbines create movement, the amount depending on the particular model, and this disturbance to tranquillity can be greatly enhanced by a darker land or vegetation backdrop, where typical pale surface colours for turbines proposed in mitigation for skyline effects are rendered completely ineffective.

Areas with a Sense of Remoteness

5.13 Rural areas which are particularly valued for their remoteness can be affected by the introduction of turbines, although this is less likely to be the case if the turbines are of an appropriate scale and if located close to farms or other existing buildings. However, incremental erosion of the special qualities of remoteness and tranquillity should be avoided. Some locations close to centres of population are valued as an important recreational resource yet have a sense of being unspoilt and remote, even though they are close to urban areas. Locating turbines in these areas should be very carefully considered.

Valued Landscapes and Cultural Heritage Assets

5.14 This study identifies landscapes which are designated for their internationally, nationally or regionally valued qualities. It must be emphasised that this is a strategic study and - in all cases – wind turbine applications must be considered on their individual merits. Therefore, detailed and specific

analysis will be required, in order to fully appreciate the nature of the development, the site and its surroundings and the likely effects on any locally designated or valued landscapes, including their essential setting, where appropriate. The siting of turbines should therefore be carefully considered so as to protect views to and from important landscape and cultural heritage focal features (including Listed Buildings and Scheduled Ancient Monuments (SAMs), and their wider landscape setting, including the defined 'essential setting' of registered parks and gardens¹.

Factors Relating to Siting

Landform

5.15 Smaller turbines have greater potential to utilise landform (often in combination with vegetation) to help reduce their visual impact than larger scale turbines. It is important that the scale of turbine does not overwhelm the scale of the landform.

5.16 The human eye tends to be drawn towards the skyline, and turbines should be set back from the edges of plateaus, ridges and skylines, so as to reduce their visibility within the wider landscape. The siting of turbines on distinctive or prominent summits or skylines should generally be avoided, in preference to side slopes or gently undulating landform below ridgelines.

5.17 Wind turbine developments should preferably be grouped upon the level or gentler sloping parts of the site, so that the development appears to be less visually confusing when viewed from different elevations and directions.

Landscape Pattern

5.18 Turbines can be sited to reflect the landscape pattern, for example field and woodland boundaries. Conversely, care must be taken not to site turbines so that they conflict with noticeable patterns in the landscape.

5.19 The grouping and numbers of turbines can affect how they appear in the landscape. For example, several dispersed turbines could be grouped to form a single feature in a visually complex landscape, whilst in a larger scale landscape, a larger single turbine with the same generating capacity may be preferable.

5.20 A small group of smaller scale turbines is most likely to be preferable where sited on valley floors and on lower valley slopes.

Focal Features

5.21 Turbines are likely to become focal features in the landscape. Care is required to ensure that they do not cause visual conflict or competition with other focal points. The siting of turbines should

¹ *The Essential Setting is a concept developed for the register in order to safeguard areas adjacent to the historic parks and gardens which, although outside them, form an essential part of their immediate background and without which, in their present state, the historic character of the site in question would be diluted and damaged.* Register of Parks and Gardens of Special Historic Interest in Wales: Carmarthenshire, Ceredigion and Pembrokeshire; Part 1: Parks and Gardens; Cadw, CCW and Welsh Government; 2002; Explanatory Notes, page xv

therefore be carefully considered so as to protect views to and from important landscape and cultural heritage focal features.

5.22 Turbines can draw the eye to features which would otherwise remain unnoticed. For example, a turbine sited next to an isolated farm could draw attention to its presence when the farm itself is partially hidden by either landform or trees.

Settlements and Urban Landscapes

5.23 Turbines should be carefully sited in relation to nearby settlements, buildings and other structures. In sparsely settled rural landscapes, turbines should be located near to existing buildings or structures. Views to or from, or on the approach to settlements (including dispersed properties), should be carefully considered when siting wind energy developments. Turbines should be located in the least visually prominent location. The selection of the scale and design of turbines may be influenced by its proximity to a settlement.

5.24 Turbines should be sited to minimise impacts on views obtainable from promoted or locally-valued publicly accessible viewpoints.

Woodlands and Trees

5.25 Although trees and woodlands can cause turbulence which interferes with the efficiency or longevity of turbines, in some locations there may be the opportunity to screen or assimilate small scale turbines by locating them close to trees and woodland. Care should be taken to site turbines so that they do not visually dominate or compete with prominent vegetation such as parkland trees, trees on knolls, and avenues.

5.26 Locate turbines where there is no need to fell trees and woodlands, particularly where these are important features in the local landscape.

5.27 Seasonal variation in broad-leaved vegetation cover should be considered when using trees to screen turbines. The felling and re-stocking regimes of commercial forestry should also be considered when locating turbines close to commercial forestry plantations, as well as factors relating to the possible premature clear-felling of woodland which may be required because of an outbreak of tree disease (such as *Phytophthora* on larch, or Chalara die-back of ash *Hymenoscyphus fraxinea*).

Cumulative Considerations

5.28 Potential cumulative landscape and visual effects should be carefully considered on a case by case basis, assisted by the production of Zones of Theoretical Visibility (ZTVs) and appropriate visualisations (preferably from viewpoint locations agreed with the appropriate Carmarthenshire County Council planning officers).

5.29 All relevant operational, consented and proposed turbines should be taken into account, in addition to other types of renewable energy development – including field-scale solar PV installations - which together may give rise to cumulative landscape or visual effects.

[Refer to Pembrokeshire and Carmarthenshire: *Cumulative Impact of Wind Turbines on Landscape and Visual Amenity Guidance* (April 2013) for detailed guidance on how to assess cumulative impacts].

Cumulative Effects in Combination with Micro Typology Developments

5.30 Groups of micro turbines can be prominent in some locations, by drawing the eye to their rotating blades. Rotation speeds vary considerably between small and larger bladed turbines which, if viewed together, can create visual disturbance and discordant effects. Variations in rotor blade diameter should therefore be avoided.

Cumulative Effects in Combination with Other Small Typology Developments

5.31 Multiple small typology wind turbine developments can dominate the landscape. Turbines should not create visual clutter and adverse cumulative effects in combination with existing built development, and vertical structures such as high-voltage overhead power line steel lattice towers and communications masts. To avoid this, consider the following principles:

- Avoid inconsistent turbine height, layout and design between multiple wind energy developments that are inter-visible;
- Identify opportunities to lessen intervisibility between multiple developments – intervening landform, woodlands and forestry plantations are all useful in this respect.

Cumulative Effects in Combination with Larger Turbines in an area

5.32 Smaller turbines when seen in combination with large turbines can create a confusing visual image. This can be lessened by:

- Using turbine layouts of a similar arrangement where more than one turbine group is present;
- Avoid situations where turbine rotation speeds are perceived as being significantly different.