

The LANDMAP landscape aspect areas have been applied to the Study Area for individual assessment. There are 41 of these Landscape Assessment Units (LAU) in total. Areas of existing built development as identified within LANDMAP are excluded. This has been further updated through field survey and in consultation with the local planning authorities to exclude additional areas of development built since the initial LANDMAP assessments were made. Although areas of built development may have potential for roof mounted solar or other renewable technologies, that is beyond the scope of this assessment. Areas of inland water have also been excluded. The use of LANDMAP visual and sensory data to identify units with consistent landscape type is explained in the Methodology section below.

1.3 CONSULTATION

The current assessment has been developed in conjunction with Planning and Landscape officers from both Blaenau Gwent and Torfaen County Borough Councils. They have been involved in a liaison process to agree methodology, development scenarios and to bring their specialist local and planning knowledge to the assessment process. The developing assessment process has been made available via Arc GIS online enabling live comment and consideration of the study to be carried out at all stages of the project.



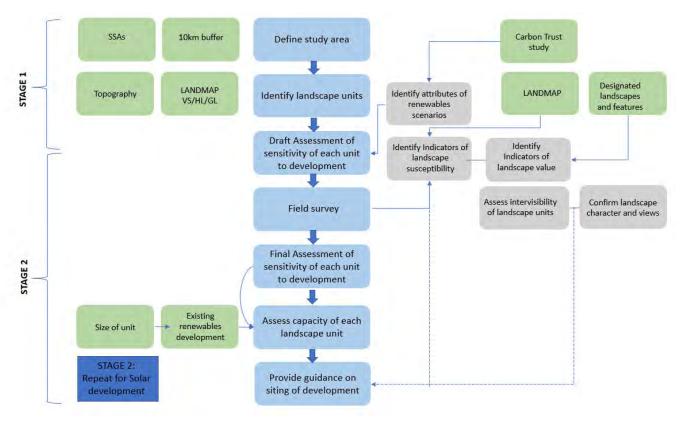
Page 5

2 METHODOLOGY

The methodology approach was based on the Natural England Sensitivity Assessment guidance, modified in line with Gillespies' Heads of the Valleys smaller scale wind turbine development report¹. Gillespies study further refined the method to utilise LANDMAP data and extends it to describe indicative capacity. The methodology applied in this study is aligned to this example, which has proved successful in this area in the past. The most significant change made is to the selection of landscape units, which are at a smaller scale for this study. The planning context has also changed significantly since 2015, and this report has adapted the method to acknowledge that and to include solar PV and larger scale wind turbine development.

Stage 1: Initial Assessment Framework has been carried out with an analysis and desk study of available GIS data mapping and satellite views. This resulted in the development of a refined methodology based on that developed for the previous study undertaken by Gillespies that includes additional susceptibility criteria assessment for solar development. It should be noted that this assessment has used the publicly available data current at the time of assessment. Whilst the conclusions and guidance outline in this assessment will remain broadly relevant any final assessment decision should always be checked against the latest currently available baseline data.

Stage 2: Evaluation of Sensitivity and Fieldwork will confirm landscape characteristics and baseline development information, assess extent of sensitive views and identify any additional indicators of susceptibility that should be taken into account.



Stage 3: Mapping of Landscape Sensitivity and Capacity Reporting.

61007

Sensitivity and Capacity Study for Renewable Energy Development

The results of the initial assessment and fieldwork have been reported in the form of digital proformas and captured onsite through the use of the Arc GIS collector app. A full baseline description and analysis of each landscape assessment unit accompanied with mapping for sensitivity and capacity for each area is included within the Landscape Assessment Unit Statements in Section 3.0. This has been repeated in the same format for both wind/turbine development and solar PV development.

2.1 LANDSCAPE ASSESSMENT UNITS

LANDMAP Visual and Sensory classification level 2, which identifies landform, was used to divide the study area into landscape units of similar type, termed Landscape Assessment Units (LAU). This was considered an appropriate scale to provide an overview of sensitivity, where susceptible landscape features are likely to be relatively consistent.

Adjustments were made where an anomaly in the LANDMAP Visual and Sensory assessment was identified for the central ridge of Mynydd Carn y Cefn in Blaenau Gwent, where the existing aspect area was recategorised from Upland Valley to Exposed Upland plateau. This is subject to confirmation and agreement by NRW.

The eight different types of landscape in the study area:

- Exposed Upland Plateau
- Upland Valleys
- Hills, Lower Plateau and Scarp Slopes
- Rolling Lowland

- Lowland Valleys
- Inland Water
- Built Development
- **Developed Unbuilt Land**

LANDMAP Visual and Sensory Classification Level 2 for the Study area is shown on Figure 3.0. Their division into the 38 LAUs is shown in the table below and on Figure 1.0. Regional landscape constraints are illustrated on Figure 2.0 with more local constraints shown on the figures accompanying the LAU statements in Section 3.

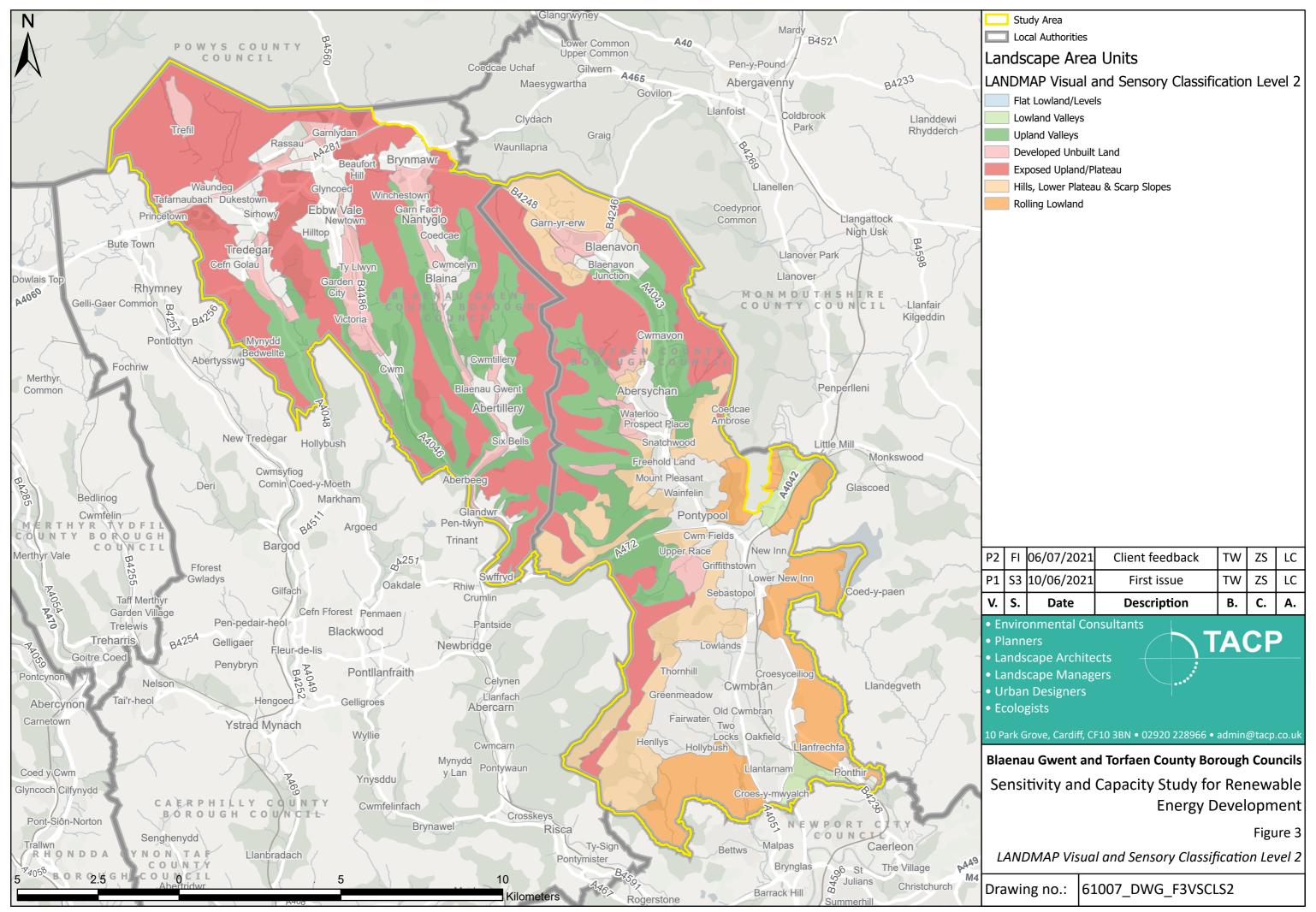
Missing LAU numbers relate to areas of built development or inland water that have been excluded from the assessment.

Table 2.1.1 Landscape Assessment Units

LAU Ref.	LAU Name	LAU Ref.	LAU Name
LAU 2	Trefil Quarry	LAU 32	Craig Swffryd
LAU 4	Trefil and Carno	LAU 33	Swffryd Wood
LAU 5	Rhymney Hill and Mynydd Bedwellte	LAU 34	Mynydd Coity Upland Ridge
LAU 7	Tredegar Open Space	LAU 35	Hills North of Blaenavon
LAU 10	Rassau A465 Corridor	LAU 36	Blaenavon
LAU 11	Sirhowy Valley	LAU 37	Mynydd Coity Eastern Valley Sides
LAU 13	Briery Hill and Cefn Manmoel	LAU 38	Cwm Du
LAU 16	Ebbw Vale	LAU 39	Hilltop above Gelli-Deg
LAU 18	Mynydd Carn y Cefn	LAU 40	Western Slopes of Mynydd Henllys
LAU 20	Ebbw Valley Sides and East of Carn-y-Cefn	LAU 41	Pantygasseg Valley & edge of Pontnewynydd
LAU 26	Cwm Celyn, Cwmtillery and Waun Wen Valley side	LAU 43	British Works West of Talywain
LAU 31	Cwm Cyffin	LAU 44	British Works on Mynydd Farteg Fawr

Page 8

¹ Gillespies LLP (2015) Heads of the Valleys Smaller Scale Wind Turbine Development: Landscape Sensitivity and Capacity Study Final Report. BGCBC.



LAU Ref.	LAU Name	LAU Ref.	LAU Name
LAU 45	Lower Slopes of Varteg Hill	LAU 52	Henllys Vale, Castell-y-Bwlch & Hollybush
LAU 46	Mynydd Twyn-Glas, Mynydd Maen, Mynydd Henllys Ridge	LAU 53	Lasgarn Farmland
LAU 47	Cwm-Y-Glyn and Cwm Lleucu, Twyn Calch Hillsides	LAU 55	Pontypool Park and environs
LAU 48	Cwmavon	LAU 56	A4042 Usk Road Corridor
LAU 49	Mynydd Maen, Mynydd Henllys sides above Cwmbran	LAU 57	Linafihangel Pont-y-Mael east of railway
LAU 50	Mynydd y Garn-Fawr, Mynydd Garnclochdy	LAU 58	Llantarnam Abbey & environs
LAU 51	Upper Race	LAU 59	Countryside east of Cwmbran

2.2 DEVELOPMENT TYPOLOGIES

A separate assessment has been made for wind and solar PV as two different development types. Not only are the attributes of the developments different, but the features of the landscape that are susceptible to each type of development differ as well.

BGCBC and TCBC have undertaken consultation with developers, as well as reviewing Government guidance, to provide the following development typologies:

2.2.1 WIND TURBINES

- Very Large: Tip height 181m to 250 metres at spacing of 0.9 km2 per turbine (most likely in PAA)
- Large: Tip height 151m to 180 metres at spacing of 0.24 km2 per turbine
- Medium: Tip height 121m to 150 metres at spacing of 0.24 km2 per turbine
- Small: Tip height less than or equal to 120 metres at spacing of 0.2 km2 per turbine

The height, number and density of turbines are all key attributes of the development in terms of landscape sensitivity and therefore the capacity assessment considers this.

It should be noted that in the 2015 study, very large was defined as turbines of 109m height or greater, or any development of more than five turbines. It concluded that all landscapes in the current study area were of high sensitivity to this scale of development. The landscape assessment units were, however, of a larger scale, reflecting the broader scope of the original study.

A 120m high feature has a potential viewshed between 3-7km, depending on local topography and intervening vegetation and built form. If placed on exposed upland it would be visible from surrounding upland locations, but not necessarily from intervening valleys. When considering turbine heights of 120m plus, it can be assumed that they will all have similar visual impact, as the potential zone of visibility is greater than the range of normal vision, even on a clear day.

A single turbine, although visible, would have less of a visual impact than several turbines in a group, which would appear as a mass rather than a point. There would also be a smaller landscape impact due to the footprint of the development. This assessment, therefore, considers group size as defining the scale of development, as follows:

Table 2.2.1 Wind turbine typologies

Single	1 turbine up to 180m height
Small group	1-3 turbines
Medium group	4-6 turbines
Large group	7-10 turbines

At planning stage, the capacity recommendations would need to be reviewed for cumulative effects with renewables development in neighbouring LAUs, where intervisibility between developments is likely. Included as an illustration of potential viewshed/visual impact of a single wind turbine considered by height rather than grouping. Figure A and B show the approximate viewshed of a 180m tall feature (calculated with Google maps viewshed tool, based on topographic data), located either on upland ridge or on upland valley side – both within areas identified in the Carbon Trust analysis of suitable sites.



Figure A 10km Viewshed generated by large scale turbine on Coity Mountain (550m AOD) exposed upland/plateau



Figure B 10km Viewshed from large turbine on upland valley side above Festival Drive (450m AOD)

2.2.2 SOLAR PV PANELS

- 1m x 2m size panels set in aluminium frames
- Arranged in parallel rows in an east-west direction approximately 5-8m wide
- Overall height above ground level 2-3m
- Tilted to the south at fixed or tracking angle of 20-40°
- Additional infrastructure including small scale buildings to house invertors and power,
- 2.5m high Security fencing and CCTV cameras mounted on 4.5m poles
- Minimum land area between 2 and 5 Ha

The height, massing and pattern of solar panels and associated infrastructure are key attributes of this type of development. Reflectiveness also needs to be considered as glare from reflective surfaces can travel long distances and prove very eye catching for visual receptors.

In assessing landscape capacity, the following scales of development have been assessed based on the underlying landscape topography and form and consistent with the most recent development schemes considered within the study area and surrounding authorities:

Table 2.2.2 Solar PV typologies

Small array	< 10Ha
Medium array	11-20Ha
Large array	21-30Ha
Very large array	31+Ha

It is considered to be unlikely that solar development beyond this size would be practicable within the study area.

2.3 LANDSCAPE AND VISUAL SUSCEPTIBILITY CRITERIA

Landscape susceptibility is the degree to which a defined landscape and its associated visual qualities and attributes might respond to a specific development type / development scenario without undue negative effects on landscape character and the visual resource.

The assessment also needs to reflect the values society places on our landscapes in addition to their intrinsic characteristics. This is established from existing designations, recreational use, and cultural and historic associations.

Sensitivity to different types of development is then evaluated by combining susceptibility and value indicators for each landscape unit.

Susceptibility and value criteria are broadly similar for both wind and solar development. However, some variations between the two development types have been applied due to their different attributes, scale size massing and height etc, having different effects on the landscape. Values of Low, Medium and High susceptibility are provided. A number of these criteria are interdependent with subtle variations that can be influenced by other factors such as intervisibility between LAUs. In these situations, further comment has been brought out in the Landscape Assessment Units Statements to highlight variations within the LAUs such as the significance of skylines and ridges and importance of consideration for siting to avoid breaks in skylines.

Sensitivity and Capacity Study for Renewable Energy Development

61007

Page | 11

The criteria were assessed using a combination of LANDMAP data, fieldwork, satellite imagery and OS mapping information. These are set out in the following tables.

A glossary of terms used as a part of the LANDMAP assessment is also given to provide clarity for the landscape and visual criteria used within the Landscape Assessment Unit Statements.

Table 2.3.1 Landscape and visual criteria with susceptibility to wind energy development

Criteria (LANDMAP category)	Susceptibility indicators:		
	LOW	MEDIUM	HIGH
Landscape			
Scale VS8: Scale	Vast or large-scale landscapes	Medium scale landscapes	Small scale landscapes
Landform VS4: Topographic form	Levels, plateaux, disturbed	High hills/ mountains	Hills/valleys, rolling land, undulating
Landcover pattern			
VS Classification level 3	Excavation, urban, upland moorland, upland grazing, Hillside and scarp slopes grazing, Lake,	Wooded upland and plateau, hillside and scarp slopes, village, mosaic upland and plateau, Hillside and scarp slopes mosaic, Mosaic rolling lowland	Open upland valleys, open/wooded mosaic, upland valleys, amenity land, informal open space, mosaic lowland valleys,
VS5: Landcover pattern	Development, open land, water	Mixture, woodland	Field pattern/mosaic
VS16: Pattern	Formal , Organised	Regular	Random
HL Classification level 3	Reclaimed land, extractive, processing manufacturing, communications, military	Marginal, woodland, recreational	Various fieldscapes, settlements, nucleated settlements, designed
Built Environment			
VS6: Settlement pattern	Urban, linear	Village, mixture, clustered	None, scattered rural/farm
Built form and infrastructure: Maps and fieldwork	Large / concentrated urban / modern settlements, industrial development and large sheds, pylons, masts, trunk roads, railways	Residential and smaller scale commercial development and structures	Unpopulated areas, presence of historic buildings / structures or settlement

Prepared by TACP for BGCBC & TCBC

Criteria (LANDMAP category)	Susceptibility indicators:		
	LOW	MEDIUM	HIGH
Visual			
Skylines and settings: Topographic data and fieldwork	Less prominent skylines Existing vertical features (modern development) Smooth, flat landscapes	Undulating landscapes	Prominent or distinctive skylines, Uninterrupted / undeveloped skylines, Distinctive / sensitive landscape features such as historic landmarks
Movement VS18: Level of human access; observation during fieldwork	Constant, frequent	Infrequent	Rare, occasional
Visibility, intervisibility b	etween units		
VS9: Enclosure	Enclosed, confined	Open	Exposed
VS22: Attractive views	Neither in or out	Out	Both in and out, within, into
VS23: Detractive views	Both in and out, within, into	Out	Neither in or out
Views into the area Field observation and mapping	Contributes little to wider landscape, limited views in	Some views, framed views in	Extensive views in from surrounding countryside
Views out of the area Field observation and mapping	Sparsely populated or inaccessible, limited views out	Some views, framed views out of the area	Landscapes with far reaching views, densely populated areas.
Typical Receptors: Desk study	Commercial, transport routes	Sports fields and other recreation not dependent on setting, workplaces	Residential, leisure, tourists
Scenic quality and character			
VS46: Scenic quality	Low	Moderate	Outstanding, High
VS47: Integrity	Low	Moderate	Outstanding, High
VS48: Character	Low	Moderate	Outstanding, High

Table 1.3.2 Landscape and visual criteria with susceptibility to solar farm development

Criteria (LANDMAP category)	Susceptibility indicators:		
Landscape	LOW	MEDIUM	HIGH
Scale VS8:Scale	Vast or large-scale landscapes	Medium scale landscapes	Small scale landscapes
Landform VS4: Topographic form	Levels, plateaux, disturbed	High hills/ mountains	Hills/valleys, rolling land, undulating
Landcover pattern			
VS7: Boundary type	Overgrown hedges, hedge with trees, fences with trees	Managed hedge, Clawdd	Fences, stone walls, slate fences, none
VS5: Landcover pattern	Development, open land, water	Mixture, woodland	Field pattern/mosaic
VS16:Pattern	Formal	Regular	Random
HL Classification level 3	Regular fieldscape, reclaimed land, extractive, processing manufacturing, communications, military, organised	Marginal, woodland, recreational, settlements, horticulture	Irregular fieldscape, designed
Built Environment			
VS6: Settlement pattern	Urban, linear	Village, mixture, clustered	None, scattered rural/farm
VS20: Use of construction materials	Inappropriate	Generally inappropriate	Appropriate, generally appropriate
Built form and infrastructure: Maps and fieldwork	Large / concentrated urban / modern settlements, major infrastructure (transport / communications / utility infrastructure / industrial elements)	Residential and smaller scale commercial development and structures	Unpopulated areas, presence of historic buildings / structures or settlement
Visual			
Visibility, intervisibility be	tween units		
VS9: Enclosure	Enclosed, confined	Open	Exposed
VS22: Attractive views	Neither in or out	Out	Both in and out, within, into
VS23: Detractive views	Both in and out, within, into	Out	Neither in or out
Views into the area Field observation and mapping	Contributes little to wider landscape, limited views in	Some views, framed views in	Extensive views in from surrounding countryside

Prepared by TACP for

Criteria (LANDMAP category)	Susceptibility indicators:		
Landscape	LOW	MEDIUM	HIGH
Views out of the area Field observation and mapping	Sparsely populated or inaccessible, limited views out	Some views, framed views out of the area	Landscapes with far reaching views, densely populated areas.
Typical Receptors: Desk study	Commercial, transport routes	Sports fields and other recreation not dependent on setting, workplaces	Residential, leisure, tourists
Scenic quality and character			
VS46: Scenic quality	Low	Moderate	Outstanding, High
VS47: Integrity	Low	Moderate	Outstanding, High
VS48: Character	Low	Moderate	Outstanding, High

Table 2.3.3 Criteria for assessing landscape value.

Type of value	Indicators of value			
	LOW	MEDIUM	HIGH	
Landscape Value	Landscape Value			
Designations	None	Local designations, Registered Landscape of Historic Interest, Ancient woodland	National Park, World Heritage Site,	
VS50: Overall visual sensory evaluation	Low	Moderate	High, Outstanding	
VS49: Rarity	Low	Moderate	High, Outstanding	
LH45: Overall habitats evaluation	Low	Moderate	High, Outstanding	
GL31: Rarity	Low	Moderate	High, Outstanding	
GL33: Overall geological evaluation	Low	Moderate	High, Outstanding	
HL38: Rarity	Low	Moderate	High, Outstanding	
HL35: Integrity	Low	Moderate	High, Outstanding	
HL40: Overall historic evaluation	Low	Moderate	High, Outstanding	

Type of value	Indicators of value		
	LOW	MEDIUM	HIGH
Visual Value			
Key views, vistas.			
Views to and from Important Landscape and Cultural Heritage Features (both within and outside of each assessment unit): Mapping and field survey with local knowledge	None or few, with little intervisibility between sites	Intermittent intervisibility from designated areas/national trails	Presence of and close views from National Trails, intervisibility with WHS or National Park
Aesthetic, perceptual and	d experiential		
Sense of place VS25	Weak, none	Moderate	Strong
Remoteness and tranquillity VS24: Perceptual and other sensory qualities	Noisy, unattractive, Threatening.	Sheltered, safe, settled	Attractive, remote, tranquil, wild

Table 2.3.4 Glossary of LANDMAP terminology.

Term	Definition
Character	The distinct and recognisable pattern of elements, features and qualities that occur within a particular landscape area.
Remoteness	Physical isolation and removal from the presence of people, infrastructure (roads and railways) and settlement.
Sense of Place	The character of a place that makes it locally distinctive i.e. different from other places. The essential character and spirit of an area (derived from genius lociliterally 'spirit of the place'
Threatening	Perceived danger posed by terrain and/or weather or other threat
Tranquillity	Sense of peace without disruptive noise or movement.
Wildness	The quality of an area which appears to be uninhabited and is often relatively inaccessible where the influence of human activity on the character and quality of the environment appears to have been minimal.

2.4 LANDSCAPE SENSITIVITY

Landscape sensitivity is the measure of resilience to change of the landscape to the type of development being assessed. Sensitivity was established by assigning each susceptibility and value criteria a score based

on its position in the overall range for each County Borough. The range was divided into low, medium and high scores. The total score for susceptibility was then combined with the total score for value as in the matrix below. The combined scores for each landscape unit represent the overall sensitivity to either wind or solar development of that area.

Table 2.4.1 Sensitivity matrix

Overall sensitivity	Value		
Susceptibility	LOW	MEDIUM	HIGH
LOW	VERY LOW	LOW	MEDIUM
MEDIUM	LOW	MEDIUM	HIGH
HIGH	MEDIUM	HIGH	VERY HIGH

The scores were checked against the following sensitivity criteria, using professional judgement and fieldwork records to confirm or adjust the score for each landscape unit accordingly.

Landscape Sensitivity to Wind Turbine Development is illustrated on Figure 4, whilst Landscape Sensitivity to Solar PV Development is illustrated on Figure 5.

Table 2.4.2 Typical sensitivity criteria for landscape units

Sensitivity	Assessment based on Susceptibility X Value to development type
VERY HIGH	Landscape and / or visual characteristics of the assessment unit are very susceptible to change and / or its values are high or high / medium and it is unable to accommodate the relevant type of development without significant character change or adverse effects. Thresholds for significant change are very low.
HIGH	Landscape and /or visual characteristics of the assessment unit are susceptible to change and / or its values are medium through to high. It may be able to accommodate the relevant type of development but only in limited situations without significant character change or adverse effects if defined in the relevant land parcel summary. Thresholds for significant change are low.
MEDIUM	Landscape and / or visual characteristics of the assessment unit are susceptible to change and / or its values are medium / low through to high / medium and / or it may have some potential to accommodate the relevant type of development in some defined situations without significant character change or adverse effects. Thresholds for significant change are intermediate
LOW	Landscape and / or visual characteristics of the assessment unit are resilient and of low susceptibility to change and / or its values are medium / low or low and it can accommodate the relevant type of development in many situations without significant character change or adverse effects. Thresholds for significant change are high.
VERY LOW	Landscape and / or visual characteristics of the assessment unit are robust or degraded and are not susceptible to change and / or its values are low and it can accommodate the relevant type of development without significant character change or adverse effects. Thresholds for significant change are very high.

2.5 LANDSCAPE CAPACITY

The landscape capacity assessment identifies the quantity and type of development that can be accommodated within a given LAU.

The assessment was based upon the following information and assessment sources:

- The overall sensitivity to renewable energy development derived from the landscape and visual sensitivity assessments.
- Operational and consented renewable energy development within and adjacent to each LAU (Figure 6.0). This also includes consideration of the PAA;
- The size of each LAU i.e., there may be scope for a larger number of developments within larger LAUs before a capacity threshold is reached. This will however depend on current land use, aspect and topography all of which may be limiting factors to accommodating further development.
- The agreed development typologies

This includes specific guidance for siting and potential mitigation within each area to aid planning officers in identifying suitable sites for renewables development and assessing submitted proposals.

This is intended to aid planning officers in identifying appropriate sites for renewables development, and potential mitigation strategies. It only provides strategic level guidance as it is anticipated that any proposed development will go through further detailed LVIA and other environmental assessments as part of the planning process.

Prepared by TACP for

