

# Suitable Areas for Wind Energy

## Technical Document



Updated May 2018



Barrow Borough Local Plan

Working together to support sustainable development within the Borough of Barrow-in-Furness





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## 1 Background

### 1.1 Purpose of this Paper

- 1.1.1 Renewable energy will continue to play an important role in the delivery of the nation's energy needs in order to ensure that the UK meets its climate change targets as agreed at international level. The Borough of Barrow in Furness shares a common characteristic of Cumbria in that its geographical position on the North West coast provides a reliable wind resource that has proven attractive to wind energy companies over the past 25 years.
- 1.1.2 Whilst there has been a significant emphasis towards offshore wind energy developments around the Cumbria coastline, the new Local Plan will require a formal policy structure to deal with potential applications for onshore projects. Wind turbines can form a very visible feature in the landscape due primarily to their rotating blades, although the sensitivity of landscapes and the size of wind turbines varies. Common concerns relating to onshore wind projects are the impact upon landscape character, effects on wildlife, and residential amenity arising from issues such as noise and shadow flicker.
- 1.1.3 The Council is responsible for determining applications for onshore renewable energy schemes up to 50MW generation capacity. The Planning Inspectorate will determine applications for installations with a generation capacity greater than the 50MW threshold.

### 1.2 Historical Context

- 1.2.1 The UK is committed to reducing its greenhouse gas emissions by 80% by 2050 <sup>1</sup> and obtaining at least 15% of its energy from renewable sources by 2020 <sup>2</sup>. These important landmark commitments were made against the background of a range of current national legislation and guidance on renewable energy which have their origins in the 1997 Kyoto Agreement, leading, in the early part of this century, to a flurry of new legislation, with particular importance being the EU Renewable Directives 2001 and 2009. These sought to identify the now accepted renewable source generation targets for member states. Taking the EU Directives forward was the role of The Department for Energy & Climate Change (DECC) which produced a UK Renewable Energy Strategy in 2009 identifying potential measures to meet these commitments. One key point in the strategy was that it confirmed the expectation that the main renewable resource would be wind power, both onshore and offshore.
- 1.2.2 During the period 2000-2010 the Crown Estate issued a series of 3 licensing rounds for offshore sites, the final round being in 2010. A number of sites off the Borough coastline were included within these rounds, Walney being granted an extension to its original Round 2 license in 2010.

### 1.3 Wind Energy Schemes in Barrow Borough

- 1.3.1 There have been two on-shore windfarms developed within the Borough. The first was Far Old Park located in an upland area east of Ireleth. This started generating

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<sup>1</sup> Climate Change Act 2008

<sup>2</sup> European Renewable Energy Directive 2009

power in 1999, consisting of 7 turbines with a total output of 4.62Mw and is currently operated by E.ON Climate & Renewables UK Ltd. The second is at Harlock Hill which is a 5 turbine scheme of 11.5Mw capacity operated by Baywind/Infinergy. The site straddles the boundary with South Lakeland District Council (SLDC), and as part of the project an older 1996 development located just over the boundary in SLDC, operated by Baywind Energy was replaced.

- 1.3.2 There are a number of single turbines operating across the Borough of varying sizes and output. Many were approved during 2008-2012, with a rush of applications arising from temporary government incentives in the form of subsidies for producers of wind energy. Following the ending of such subsidies the number of applications fell significantly, the last being in 2016.
- 1.3.3 During the period 2005-2014 a series of windfarms were constructed off the Borough's coast with 270 turbines of various sizes creating a total annual capacity of just under 1 gigawatt. In comparison, during January 2017, the UK generated some 14.5 gigawatts, two thirds arising from onshore installations, making the country the worlds 6th largest generator.<sup>3</sup>

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<sup>3</sup> Figures at 2017 GWEC

## 2 Policy Context

This section examines the current policy framework against which all onshore applications for wind turbines are considered. In the preparation of the new Local Plan all policies must conform to the National Planning Policy Framework (the NPPF). National policy adopts a positive approach to renewable energy, principally as a direct result of wider environmental initiatives to meet internationally agreed targets. Local Plans are recognised as a suitable vehicle to deliver these targets.

### 2.1 National Policy

- 2.1.1 Sustainable development is the “golden thread” running through the NPPF and thus at the heart of the planning system. Paragraph 7 identifies the environmental role of Planning in helping adapt to climate change by encouraging the movement to a low carbon economy. Furthermore there are twelve principles in paragraph 17 which underpin policy making and decision taking. These include the transition to a low carbon economy by encouraging the use of renewable resources including the development of renewable energy. Also relevant are the references to conserving and enhancing the natural environment and the conservation of heritage assets.
- 2.1.2 Chapter 10 of the NPPF refers directly to the “challenge of climate change”, with paragraph 93 confirming the need to support the delivery of renewable and low carbon energy and infrastructure. There is confirmation in paragraph 94 that planning authorities should adopt “proactive strategies” to mitigate and adapt to climate change. There is also an air of caution that planning policies should ensure that potentially adverse impacts, for example upon landscapes and heritage assets, are properly addressed (e.g. via cumulative landscape and visual impact studies).
- 2.1.3 The Framework seeks to ensure the protection and enhancement of valued landscapes and states at paragraph 109 that the planning system should contribute to and enhance the natural and local environment by protecting and enhancing valued landscapes. It confirms a requirement for Local Planning Authorities to set criteria based policies against which proposals for any development on or affecting protected landscape areas will be judged. Distinctions should be made between the hierarchy of international, national and locally designated sites, so that protection is commensurate with their status and appropriate weight is given to their importance and the contribution that they make to wider ecological networks.
- 2.1.4 Advice in paragraph 97 suggests that, through the Local Plan process, suitable areas where renewable energy development is appropriate should be identified.

### 2.2 Planning Practice Guidance (PPG)

- 2.2.1 From 2014, updated guidance within the PPG stresses the important role of the planning system in the delivery of new renewable and low carbon energy infrastructure, in those locations where the localised environmental impact is acceptable. The guidance also reaffirms the role of local plans in delivering development that has community backing. It replicates the NPPF document by encouraging the provision of positive strategies as a means of achieving this, but with the caution that this does not override valid environmental and community concerns.



The strategy should consider the local potential for renewables taking into account matters such as the range and falling costs of available technology, their varied impacts upon differing locations, and the need to avoid the imposition of any quotas upon delivery.

2.2.2 The PPG offers support for clear criteria based policies for renewable energy in Local Plans and states that the following factors should be taken into account in developing policies:

- Cumulative impacts, particularly on landscape and local amenity;
- Local topography;
- Heritage assets and their setting;
- The increased sensitivity of National Parks and Areas of Outstanding Natural Beauty;
- The importance of protecting local amenity.

2.2.3 There is also specific reference to the need to avoid the use of arbitrary buffer zones which can be viewed as a blunt instrument to prevent renewable schemes. Distance is part of the assessment of the potential impacts arising from a scheme but the local context of topography, local environmental matters and adjacent land uses, all have a role to play. An exception is made for set back distances that are recognised safety criteria.

## 2.3 Other Policy Considerations

2.3.1 The PPG was followed by a Ministerial Statement<sup>4</sup> in mid 2015 which changes the advice by introducing provision for local people to have the final say on wind farm applications. The guidance states that planning authorities should only grant planning permission for wind turbines provided that:

- The development is in an area identified as suitable for wind energy development in a Local Plan,
- If, following consultation, it can be demonstrated that the material impacts identified by the affected local communities have been fully addressed and the proposal has their backing.

## 2.4 Sub-Regional Policy Considerations

2.4.1 Cumbria County Council, in conjunction with four rural Districts and the National Park Authority, produced the Cumbria Wind Energy Supplementary Planning Document (SPD) in mid 2007. Recognising the potential of Cumbria's wind resource to deliver national targets, the role of the document was to provide robust and consistent guidance to all authorities in the determination of wind energy proposals. It would also serve as a blueprint for subsequent Plan policies.

2.4.2 Part 1 of the SPD provides guidance across a number of factors including aircraft and radar, biodiversity, community benefits, cultural heritage, highways, local amenity, local economy, soils and hydrology and telecommunication. The SPD does not specify minimum separation distances but does state that suitable distances

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<sup>4</sup> Rt Hon Greg Clark MP 18 June 2015



between turbines and homes must be established to avoid unacceptable noise impacts. Part 2 of the SPD includes an assessment of the capacity of Cumbria's varied landscapes to accommodate wind energy development.

- 2.4.3 The SPD document was subsequently adopted by the various authorities over 2007-2008. Barrow Borough Council (BBC) supported the document in principle and it became a material consideration for related applications. Cumbria County Council produced further regional documents relating to landscape character<sup>5</sup> and to the visual impacts of wind turbines<sup>6</sup>.

## 2.5 Local Considerations

- 2.5.1 Within the Saved Local Plan<sup>7</sup> there are two relevant wind energy policies; Policy D46 and Policy D47. Policy D46 identifies an "Area of Least Constraint" which is defined on the Proposals Map. Policy D47 provides a list of criteria against which all wind related applications are judged.

### **POLICY D46**

Development of wind turbines in the Borough will be permitted in the Area of Least Constraint defined on the Proposals Map, subject to details of the number, scale, design and location being acceptable.

### **POLICY D47**

The acceptability of wind energy installations will be judged according to whether the number, location, siting, size and design of proposals can be shown to satisfy the following criteria:

- a) An Environmental Impact Assessment is undertaken where the proposal is considered by the Authority to be significant in relation to its environmental impact. This must be adequate to assist the Authority to assess whether the energy contribution and other benefits outweigh any significant adverse effect on;
  - 1. The character and appearance of the landscape, nature conservation, archaeological or geological interests;
  - 2. The amenity of residential properties by reason of visual impact, noise, shadow flicker or reflected light;
- b) The proposal would not unduly dominate the appearance or visual amenities or setting of a settlement or part thereof, or intrude on the enjoyment of publicly accessible spaces within it;
- c) The proposal would not cause significant damage to a site of international, national or local nature conservation importance;

<sup>5</sup> Cumbria Landscape Character Guidance and Toolkit (2011)

<sup>6</sup> Cumbria Cumulative Impacts of Vertical Infrastructure Study (2014)

<sup>7</sup> Local Plan Review 1996-2006

- d) Effective measures are available to overcome any significant electromagnetic interference to transmitting or receiving equipment;
- e) All associated power lines, both on-site and off-site, are placed underground or do not appear prominent in the landscape;
- f) Adequate access for construction traffic is available or could be provided without harm to highway safety, visual amenity or nature conservation interests;
- g) The proposal, when assessed in the context of existing, proposed or permitted wind energy schemes, would not result in a cumulative visual effect which would have a significant adverse impact on the character and appearance of the area; and
- h) Realistic proposals are in place for the removal of redundant wind turbines and the restoration of the site.

In assessing the proposals against the requirements of this policy, full account will be taken of proposed mitigating measures, and of the County-wide Supplementary Planning Guidance “Wind Energy Development in Cumbria”.

2.5.2 Barrow Borough Council is currently finalising a new Local Plan. The Plan confirms a commitment to facilitating energy schemes without unacceptable impacts upon amenity, biodiversity, landscape and heritage. As part of the preparation the Council needed to consider its options in its approach to the handling of wind energy projects in the context of the NPPF encouragement of identifying appropriate areas.

- i. **Do Nothing:** The Local Planning Authority would not prepare a map which indicates the areas where wind energy developments may be supported. This would be contrary to the NPPF and the Ministerial Statement and may leave the Plan open to challenge.
- ii. **Allocate everywhere:** Whilst technically meeting the national advice this would leave the Authority at risk of dealing with numerous applications and potentially a large appeal casebook for those locations subsequently found to be unsuitable for various reasons.
- iii. **Identify areas where there are potentially the least constraints:** Using evidence base documents and mapped constraints this would narrow down the areas where wind energy projects may be suitable. This would also potentially reduce the number of speculative applications.

2.5.3 Option iii was chosen as the most appropriate taking into account the character of the Borough, including the environmentally sensitive nature of large tracts of the Borough as defined in the Cumbria Landscape document and the capacity issues that are raised in the Cumbria Capacity and Deployment Study. In addition, the Local Planning Authority has considered designations and constraints shown in Table 1 when mapping the potential areas where turbines could potentially be accommodated. Where a site has been identified as a suitable area for wind energy, this does not indicate that planning permission for turbines would automatically be granted. Applications should be subject to further supporting information from

applicants to show that their proposal accords with the appropriate policies in the Local Plan.

**Table 1: Designations and Constraints Considered During Assessment**

Designation / Constraint	Justification
Nationally Important Nature Conservation Sites, eg Sites of Special Scientific Interest, Natura 2000 Sites and 250m buffer	Necessary in the interests of biodiversity protection. National designations important for their valuable natural features wind energy projects. Constrained by nature interests, esp wildfowl locally, with increased risk of bird strikes and disturbance during roosting and breeding periods.  As protected by: <ul style="list-style-type: none"> <li>• Wildlife &amp; Countryside Act 1981</li> <li>• Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora, commonly known as the Habitats Directive.</li> <li>• Directive 2009/147/EC of the European Parliament and of the Council on the conservation of wild birds, commonly known as the Birds Directive.</li> <li>• Conservation of Habitats and Species Regulations 2010 (as amended).</li> </ul>
Green Infrastructure allocations in the emerging Local Plan as follows; Green Wedges, Green Spaces, Green Routes, Green Links, Green Corridors	Biodiversity consideration. Areas recognised for their recreational value and visual relief could be compromised by turbine development.
Local Geological Sites	Applied in the interests of biodiversity. Designated for their landscape interests, turbine developments considered likely to be intrusive upon their character arising from damage and /or disruption to geological features.
Health & Safety Executive (HSE) constraints; (HSE Explosives, HSE Nuclear Licensed, HSE Major Pipelines buffer, HSE Hazardous Substances)	Applied as a safety consideration. Sites with potential major hazards due to volume of stored materials and/or processes carried out. Likely to be potential conflicts between uses and the installation of turbines due to issues such as topple distances.
Defence Estates	Safety consideration. Based on MOD advice to safeguard defence facilities eg. air safety and protecting radar and comms installations from interference caused by blade movements.
North West Coastal Connections Proposed Corridor	Safety consideration and in recognition of the significance this national infrastructure project. Based upon industry standard <b><i>“Electricity Networks Association Engineering Recommendation L44 Separation between Wind Turbines and Overhead Lines, Principles of Good</i></b>

	<b>Practice”</b> as adopted by National Grid together with the need to provide sufficient space for the projects working corridor that would be compromised by the presence of turbines.
Development Cordons	Added in the interests of residential amenities. Cordons are drawn around recognised small and medium settlements. Current use of land precludes turbine development due to safety implications i.e. topple distances, and noise (ETSU-R-97), to sensitive buildings.
Scheduled Ancient Monuments & Conservation Areas	Added in the interests of protecting the historic environment, local amenity and justified by the following legislation; <ul style="list-style-type: none"> <li>• National Heritage Act 1983.</li> <li>• Ancient Monuments and Archaeological Areas Act of 1979.</li> <li>• Planning (Listed Buildings and Conservation Areas) Act 1990.</li> </ul>
Microwave Fixed Links + 50m	Creation of exclusion corridor due to potential for radio signal degradation based upon OFCOM industry standard.
Overhead Lines Electrical	Creation of exclusion corridors due to industry standards for safety; <b>“Electricity Networks Association Engineering Recommendation L44 Separation between Wind Turbines and Overhead Lines, Principles of Good Practice”</b> as adopted by National Grid.
Wildlife Corridors	Recognised for their ecological value, turbines likely to sever connectivity for species movements.
Urban Areas	Current use of land precludes turbine development due to safety implications i.e. topple distances, shadow flicker and noise (ETSU-R-97), to sensitive buildings.
Proposed Housing Allocations in emerging Local Plan	Conflicts of use in viability hence constraint in achieving housing targets, and arising from safety issues, i.e. topple distances, shadow flicker and noise (ETSU-R-97), to sensitive buildings.
Small slivers removed typically less than 0.5 hectares	Removed as considered unviable for commercial wind energy schemes, also likely to have access and or topography constraints.
Areas covering waterbodies, rail and roads	To take account of water pollution and safety considerations to transport links.

2.5.4 The suitable areas for wind energy development in Barrow Borough are shown on the Proposals Map and linked to Policy C6: Renewable and Low Carbon Energy Proposals in the Local Plan, which is reproduced below.



### **Policy C6: Renewable and Low Carbon Energy Proposals**

In order to contribute towards the achievement of national renewable energy targets the Council will support development of new sources of renewable energy provided that:

- a) Measures are taken to avoid and where appropriate mitigate any unacceptable negative impacts of the effects on local amenity resulting from development, construction and operation of the renewable energy schemes;
- b) The visual impact can be accommodated within the landscape and seascape and the development would not give rise to an unacceptable adverse cumulative impact when considered in the context of other existing or consented installations;
- c) Proposals do not have an unacceptable adverse impact on geodiversity, flood risk, or heritage assets and their setting;
- d) The site is accessible by suitable routes for construction and maintenance and the development of supporting infrastructure does not in itself result in unacceptable adverse impacts, including upon other infrastructure providers;
- e) Developers have engaged with the community and local authority at an early stage prior to the formal submission of any proposals;
- f) Large scale renewable energy developments make provision for direct community benefits over the period of the development;
- g) For proposals involving Wind Energy developments, the development is located in a 'suitable area' (identified on the Proposals Map) and following consultation, it can be demonstrated that the planning impacts identified by affected local communities have been fully addressed; and
- h) Development complies with Policy N3

## 3 Suitable Locations

### 3.1 Introduction

- 3.1.1 The NPPF requires planning authorities to have a positive strategy to promote energy from renewable and low carbon sources. It suggests that planning authorities should consider identifying suitable areas for renewable and low carbon energy sources and supporting infrastructure, where this would help secure the development of such sources (paragraph 97).
- 3.1.2 The above guidance was subsequently clarified by the Ministerial Statement<sup>8</sup> which resulted in the PPG being amended to confirm that planning authorities should only grant consent if the location was within an area previously identified as suitable in a Local Plan.
- 3.1.3 Accordingly, the purpose of this paper is to identify suitable areas for wind energy in the Borough, in order to ensure that the new Local Plan can be considered to be “sound” in its compliance with the NPPF and associated guidance for wind energy development.

### 3.2 Methodology

- 3.2.1 The NPPF suggests a standard methodology of area selection by following the advice within the National Policy Statement for Energy (EN-1) including the relevant section of the Overarching National Policy Statement for Renewable Energy (EN-3). The former, although focussed on the larger schemes that would be dealt with by the Planning Inspectorate rather than the Local Planning Authority,<sup>9</sup> provides useful guidance in the form of a set of factors that may influence energy operators site selection<sup>10</sup>. Consequently using the same format is likely to provide a robust template for a Local Planning Authority in formulating its preferred areas strategy. When a Local Planning Authority has carried out a site selection exercise the criteria that has steered the process should be made clear, as should the size of development considered appropriate for the area.
- 3.2.2 It is important to recognise that the national guidance refers to the identification of “areas” and not “sites”. More specific locations should be the role of the applicant to establish. The PPG leaves the methodology open to individual Local Planning Authorities to formulate their own, based upon local factors. However, it is suggested that landscape character is an important driver in establishing suitable areas and the appropriate level of development.
- 3.2.3 Hence the purpose of this document is to establish key considerations that have been taken into account when identifying suitable areas for siting wind turbines, including other policies in the Development Plan. Additional external considerations are the following local documents:

- Cumbria Renewable Energy Capacity and Deployment Study (2011)

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<sup>8</sup> Rt Hon Greg Clark MP 18 June 2015

<sup>9</sup> Localism Act 2011 made Planning Inspectorate responsible for determination of Nationally Significant projects i.e. onshore wind with an output greater than 50Mw

<sup>10</sup> Section 2.7 “Onshore Wind”

- Cumbria Wind Energy Supplementary Planning Document (2007)
- Cumbria Landscape Character Guidance and Toolkit (2011)
- Cumbria Cumulative Impacts of Vertical Infrastructure Study (2014).

### 3.3 The Potential for Wind Energy

#### **Cumbria Renewable Energy Capacity and Deployment Study (2011)**

- 3.3.1 The Study considers renewable energy potential across Cumbria and provides evidence to support policies within Local Plans. It considers an extensive range of renewable energy sources, and translates potential into a realistic deployable capacity up to 2030, in order to help Cumbria contribute towards the national renewable energy and climate change targets. The study revealed that Cumbria as a whole has a substantial potential renewable energy resource with commercial wind energy (defined as schemes >100kW) forming a key source, amounting to 63% of the overall identified potential capacity.
- 3.3.2 The document confirms the assertion that Barrow is considered to be the “Gateway to Britain’s Energy Coast”<sup>11</sup>, due to the ongoing development of offshore wind farms in the east Irish Sea. However, the overall potential renewable energy resource (eg solar, hydro, biomass etc.) is 191.9Mw, amounting to only 4% of the Cumbrian renewable total. Breaking this down into its component parts, the potential commercial wind resource was assessed at 47.8Mw out of a total of 3266 Mw.<sup>12</sup> This equates to just over 1%.
- 3.3.3 Using this as a base figure a series of other factors had to be introduced. The study recognised the landscape capacity constraints across the whole County which limit the potential for commercial wind farm development and undertook further assessment taking into account the guidance in the Cumbria Wind Energy SPD. The headline assumptions were:
- Three turbine sizes (large 2.5 Mw, medium 1 Mw and small 0.5Mw)
  - 5m/s wind speed
  - Different densities per square km dependent upon landscape, bird sensitivity and turbine size
  - Amount of non accessible areas (roads railways steep slopes, water bodies etc)
  - Exclusion areas ( Designated sites, heritage assets etc)
- 3.3.4 The results of the amended capacity assessment show a total reduction in potential capacity as shown below. The study indicates that whilst there was a near 25% reduction in potential capacity, the percentage of the contribution to the County total did not alter, which could indicate that other parts of the County are more sensitive to commercial onshore wind schemes.

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<sup>11</sup> Furness Enterprise

<sup>12</sup> Table 5-4 Cumbria Renewable Energy & Capacity Study



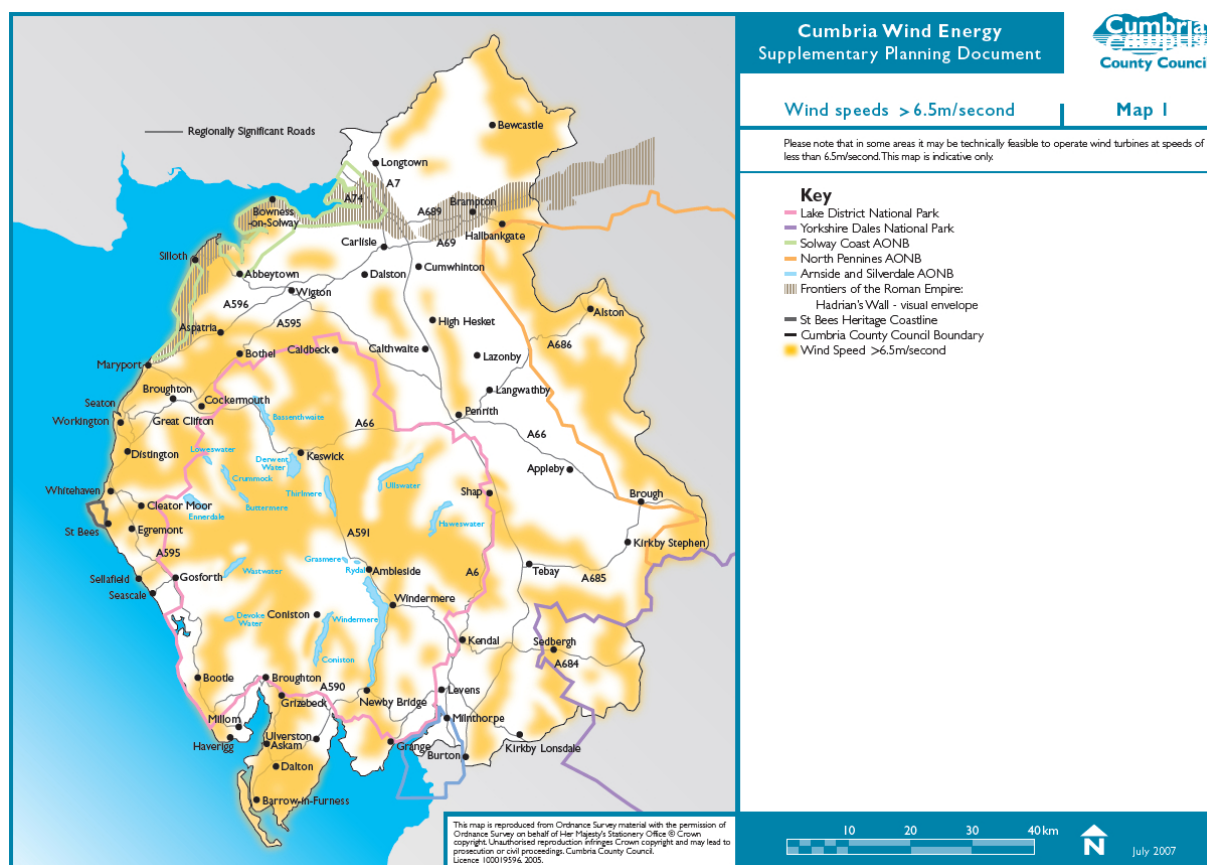
Table 2: Barrow Commercial Wind Capacity

Barrow Commercial Wind Capacity	Large(MW)	Medium (MW)	Small (MW)	Total (MW)	% of County total
Initial Technical Assessment	9.3	1.3	9.7	20.4	1
Assessment incorporating landscape considerations	6.5	0.9	8.0	15.4	1
% reduction	30.1%	30.7%	17.5%	24.5%	

### 3.4 Cumbria Wind Energy SPD

3.4.1 The Cumbria Wind Energy SPD gives a generalised overview of the overall wind resource in the County. It explains that due to the prevailing wind direction the wind resource in Cumbria is greatest on west facing upland sites and along the coast.

Figure 1: Estimated Mean Wind Speeds



Source: Cumbria County Council

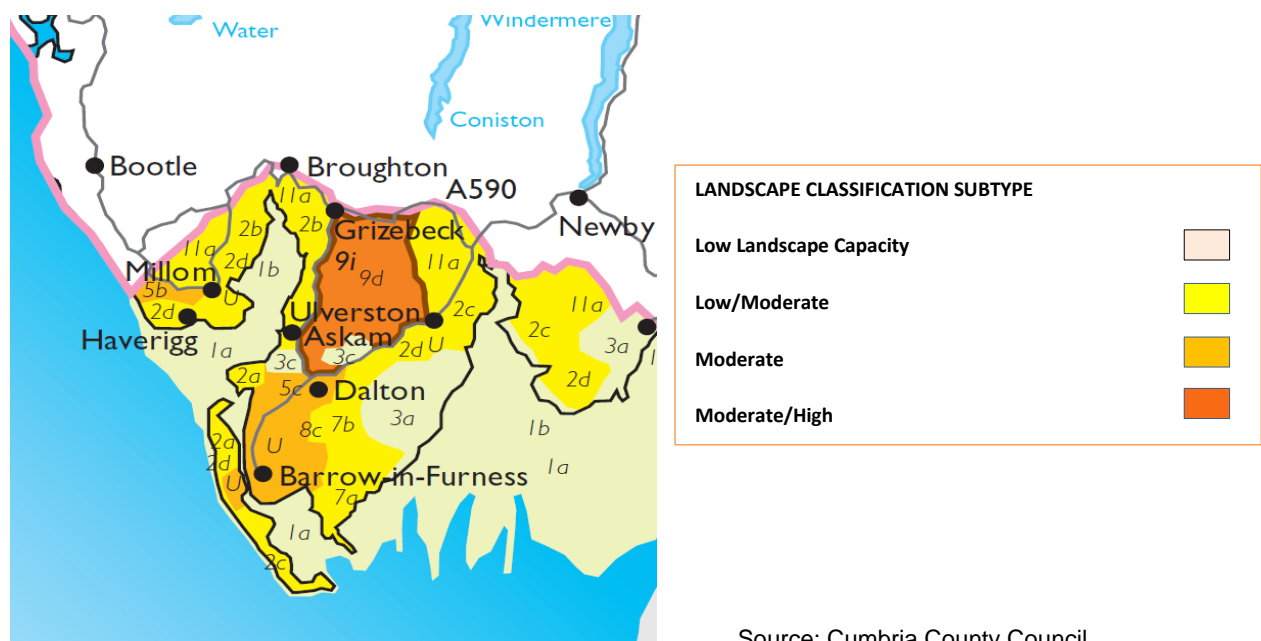
3.4.2 Figure 1 above (Map 1 of the SPD) shows estimated mean wind speeds in metres per second for values over 6.5metres/second noting that the windiest locations are often within the upland areas of the National Parks. The SPD also confirms the policy restrictions placed on wind energy schemes in such locations, a factor borne out in the 2011 Deployment Study where the County's resource potential was curtailed once landscape constraints were factored in. The map shows that almost the entire

Borough, principally due to its position located on the South West peninsula enjoys a wind speed over 6.5m per second.

### 3.5 Landscape Sensitivity and Capacity

- 3.5.1 Pylons, telecom masts and wind turbines, (collectively called vertical infrastructure) are a common feature in most areas. Turbines can have a greater visual impact due to their moving parts. The physical appearance of wind turbines set within rural landscapes means that this is a major consideration in the determination of planning applications. In making judgements on overall landscape sensitivity, consideration needs to be given to both the sensitivity of landscape character and visual sensitivity.
- 3.5.2 The Borough exhibits a mix of landscape character outside of the urban areas ranging from the dunes and beaches in the west to the rolling lowlands and drumlin fields in the east and the uplands and moorlands towards the north east. Each landscape type has a measured sensitivity capacity for being able to accommodate wind turbines. This is reproduced in the map extract below.

Figure 2: Landscape Sensitivity Capacity



### 3.6 Landscape Types

**Landscape type 2 Coastal Margins (sub types 2a Dunes and Beaches and 2d Coastal Urban Fringe):**

- 3.6.1 These are mainly flat open areas incorporating diverse characteristics from coastal margin to urban settlement edge.
- 3.6.2 Sub type 2a Dunes & Beaches is found around the Duddon Estuary consisting of dunes and flat raised beaches dominating semi natural grassland and isolated settlements linked by small roads and tracks;

- Energy infrastructure including tidal, large scale wind and pylons could be considered in the adjacent estuary and bay areas. These could have significant effects on natural coastal processes, habitats and the open seascape character.
- New facilities within these areas should be carefully sited so as to minimise their landscape and visual effects on this undeveloped natural seascape.
- Major and minor energy infrastructure in adjacent landscapes could compromise the remote qualities of these areas.

3.6.3 Sub Type 2d Coastal Urban Fringe encompasses Walney Island. It comprises of flat or gently undulating low lying land that is characterised by significant human intervention, in the form of urban industrial and leisure related development. The area is rich in ecology and heritage.

- Roads, railways, buildings and derelict sites detract from the open views of the beaches and sea.
- The views across adjacent landscapes to open sea and expansive sky are sensitive to new development that would enclose or interrupt these views.
- New or upgraded energy infrastructure could affect the character of the less well developed parts of the coastal fringe.

3.6.4 In terms of capacity the Coastal Margins group is judged to have a low/moderate capacity capable of accommodating a small group (3/5 turbines) with a large group (6/9 turbines) in extensive parts.

#### **Landscape Type 3 Coastal Limestone (sub type 3c Disturbed Areas):**

3.6.5 These form part of the unique Morecambe Bay limestones ranging from semi natural habitats to rolling landscapes and areas characterised by irregular man made landforms arising from early industrial activity.

3.6.6 Sub type 3c Disturbed Areas is found in 3 small areas north of Dalton in Furness. It is an undulating landform of glacial origin, with patchy woodlands and marsh areas, but also featuring abandoned and restored mine workings, quarries and reclaimed farmland.

- Landscapes should be restored and only high quality development of traditional character encouraged.
- Little scope for large scale projects due to ecological and landscape sensitivities.
- Enhance nature conservation value through increased planting and manage recreational pressures through sensitive designs.

3.6.7 In capacity terms the Coastal Limestone group is judged to have no capacity with all group types being inappropriate.

#### **Landscape Type 5 Lowland (sub types 5b Low Farmland and 5c Rolling Lowland):**

3.6.8 These areas include extensive areas of lowland pasture with some sub types being influenced by 20<sup>th</sup> century development.

3.6.9 Sub type 5b is found to the north of the town of Barrow and is characterised by intensely farmed undulating topography of an open nature.

- Energy infrastructure needs to be carefully managed to prevent this sub type becoming an energy landscape with prominent locations avoided and suitable mitigation employed such as strengthening green infrastructure e.g. woodlands.

3.6.10 Sub type 5c is found in the north east of Barrow and consists of a rolling topography of agricultural landscape, with irregular field patterns and varying levels of woodland and hedgerow.

- Subject to pressures for urban growth due to proximity to key towns, which if not carefully managed could erode the landscape character. Landscape and biodiversity enhancements should be sought as considerations of new development on the settlement edge.
- Potential upgrades to the electricity network could result in adverse landscape impacts.
- Energy infrastructure including large scale wind energy generation, pylons and substations should be carefully sited and designed to prevent this sub type becoming a wind energy landscape. Prominent locations should be avoided and appropriate mitigation should be included to minimise adverse affects.

3.6.11 The Lowland group is judged to have a moderate capacity for small groups of turbines.

**Landscape Type 7 Drumlins (sub type 7a Low Drumlins and 7b Drumlin Fields):**

3.6.12 A significant area of drumlins runs along the eastern boundary of the Borough from Lindal through to Rampside. These form a tract of rounded hills of varying height but are often steeply sided.

3.6.13 Sub Type 7a Low Drumlins is found in a small area north east of Rampside and the parallel alignment of broad rounded low hills gives a distinct grain to the landscape. Agricultural pasture is the dominant land use with irregular field patterns separated by small stone banks topped with hedgerows, and scattered farms linked by narrow lanes.

- There is pressure across the County for wind related schemes in locations where this sub type occurs.
- Some potential for wind related projects but subject to the avoidance of placing large scale infrastructure in locations within open and prominent positions where it could degrade the rural character.

3.6.14 Sub Type 7b Drumlin Field covers a large band running from Lindal along the eastern Borough boundary with South Lakeland as far as the coast road near Rampside. Key characteristics are the strong pastoral field pattern split by mature hedgerows.

- Large scale infrastructure projects that cut across the grain of the hills often dominate the drumlin landscape.
- Development on prominent hill tops should be avoided.

- Tall structures such as wind turbines should not be located in open and prominent areas where it could degrade the rural character.

3.6.15 The Drumlins group is judged to have a low/moderate capacity with potential for single turbines or a small group.

#### **Landscape Type 9 Intermediate Moorland & Plateau (sub type 9d Ridges):**

3.6.16 These areas are found in the north east of the Borough beyond Askam and Ireleth consisting of medium to large scale landscapes with wide horizons.

3.6.17 Sub Type 9d Ridges consists of distinct ridges with rounded hill summits. The landscape is a mix of moorland and managed farmland but large scale pylons and turbines form prominent vertical features.

- Upland locations offer higher wind speeds hence they are attractive for wind energy development
- The siting of large scale infrastructure in open and prominent areas should be avoided where it could degrade the open and expansive character
- The expansion of existing projects should be carefully managed in order to protect the landscape as the cumulative impact could be significantly harmful on the landscape character.

The Moorland group has a moderate/high capacity varying between small groups on the low plateaus to a large group, exceptionally a small farm of 16-25 turbines, on the Intermediate Moorland.

### **3.7 Cumulative Impacts**

#### **Cumbria Cumulative Impacts of Vertical Infrastructure Study (CIVI)<sup>13</sup>**

3.7.1 In 2013 Cumbria County Council commissioned a report that analysed the cumulative impacts of onshore “vertical infrastructure”<sup>14</sup> developments across the County and in neighbouring areas. The document recognises the pressure for renewable schemes due to the unique topography and position of the County, the cumulative impact of established schemes and potential future schemes.

3.7.2 The study considers the sensitivity of the landscape and the people using it to changes arising from existing vertical infrastructure developments. It combines these to provide an assessment of the relative significance of cumulative impacts upon landscape character and visual amenity across the county to date, and provides detailed guidance on how cumulative impacts of future proposals can be assessed by planning authorities. The document is a useful tool in the preparation of identifying suitable areas for wind energy schemes within the Borough.

3.7.3 Figures 3 and 4 are taken from the CIVI document; SIG04 identifies the overall significance of landscape effects from all scales of vertical infrastructure. Map SIG33

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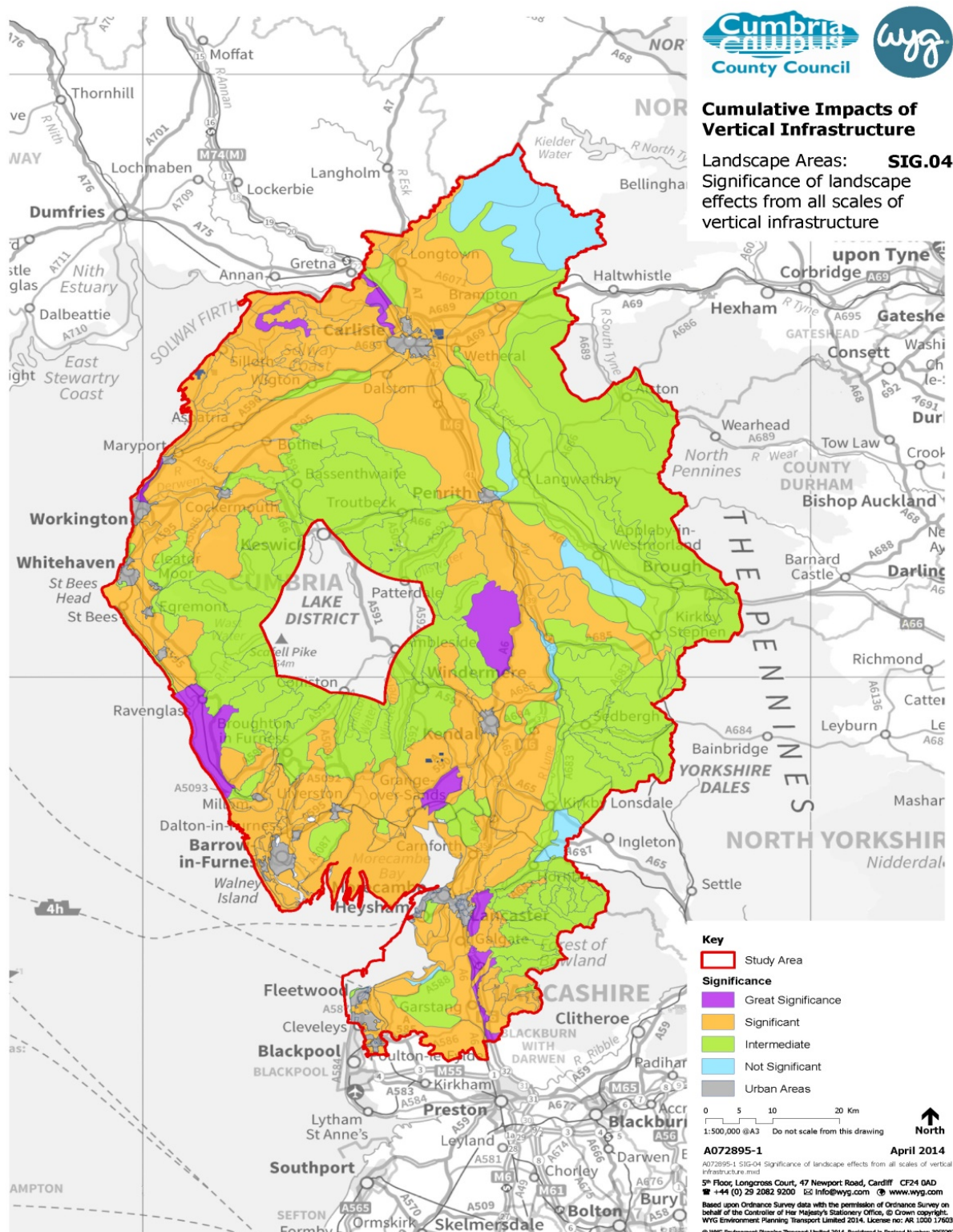
<sup>13</sup> Published 2014 by Cumbria CC, authored by WYG consultants.

<sup>14</sup> Classed as energy and communications development characterised by vertical elements: principally wind turbines, communication masts and pylons carrying power lines, over 15m in height. Buildings such as generator halls were excluded.



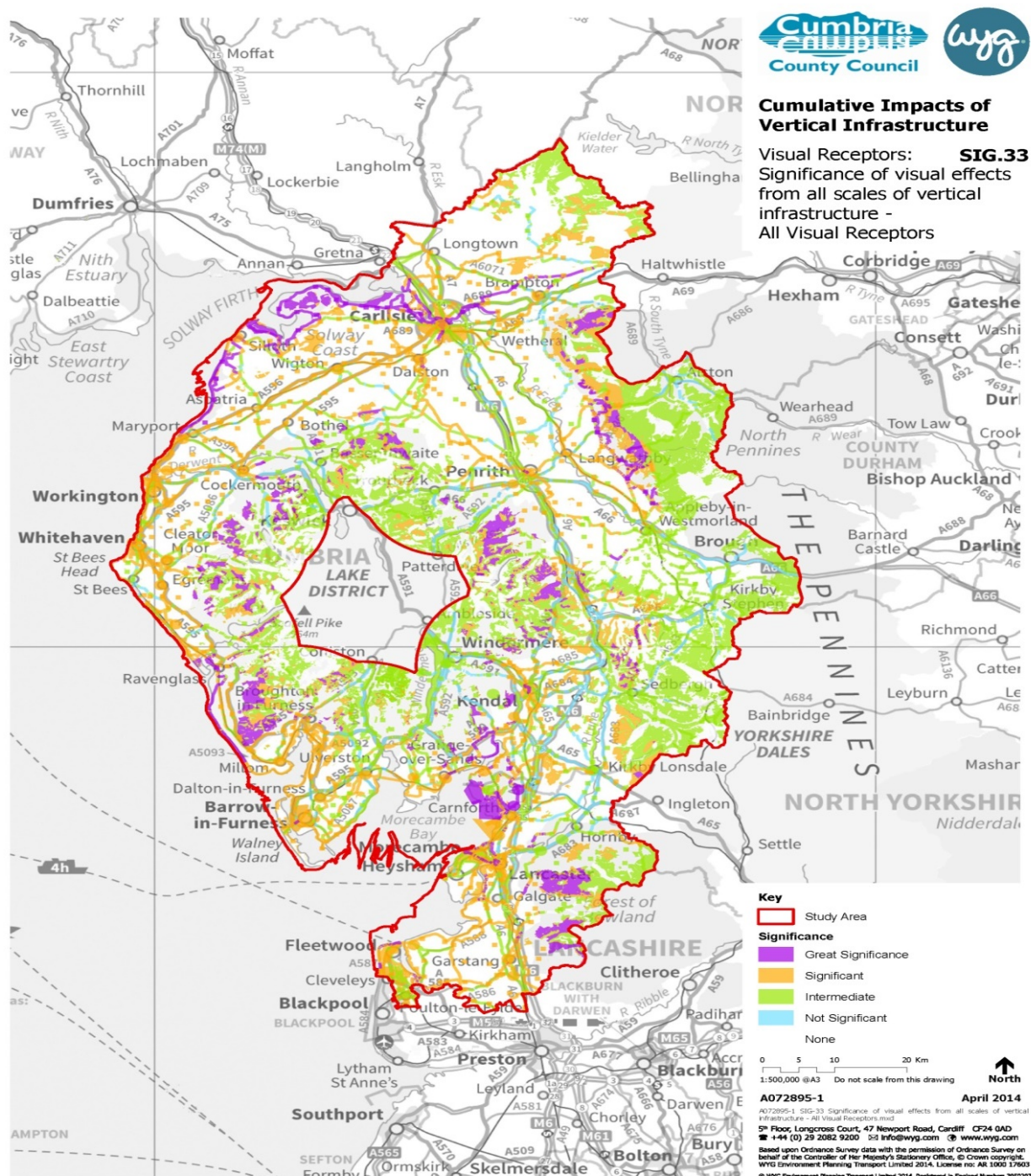
identifies the overall significance of visual effects from all scales of vertical infrastructure.

Figure 3: Overall Significance of Landscape Effects from All Scales of Vertical Infrastructure



Source: Cumbria County Council

Figure 4: Overall Significance of Visual Effects from All Scales of Vertical Infrastructure



Source: Cumbria County Council



### 3.8 Other Material Considerations

#### Shadow Flicker

- 3.8.1 This is described on the government's website<sup>15</sup> as “the flickering effect caused when rotating wind turbine blades periodically cast shadows through constrained openings such as the windows of neighbouring properties”. The likelihood and magnitude of shadow flicker depends on a number of conditions coinciding including the position and height of the sun, wind speed, cloudiness and position of the turbine in relation to a sensitive receptor (for example a residential property). In November 2010, the Department of Energy and Climate Change commissioned consultants Parsons Brinckerhoff to produce a report to update the government's evidence base on shadow flicker. It concluded that as was previously stated in the PPG, shadow flicker occurs within 130 degrees either side of north and within a distance equal to 10 rotor diameters. Using careful design and positioning of the turbines, the issue is capable of being mitigated to avoid any significant impact upon neighbours. Turbines can be turned off remotely at the relevant time of day/year to prevent flicker occurring for example.

#### Safety

- 3.8.2 There are various aspects of safety when considering wind turbine proposals. In some cases these can be quite specific to the location such as in highland areas where “ice throw” from blades has been an issue, turbine heights in areas of low flying, interference with radar, or more general such as topple distances in proximity to buildings where the guide is the height to the blade tip plus 10%. The Department of Transport recommends that wind turbines should be no nearer to a road than their height plus 50 metres or a total of one and a half times their height, whichever is the lower. Further consultation should be undertaken with the Highways Authority for all other publicly maintained highways.
- 3.8.3 National guidance “Renewable and Low Carbon Energy” published in June 2015 states that; “Safety may be an issue in certain circumstances, but risks can often be mitigated through appropriate siting and consultation with affected bodies:”

#### Noise

- 3.8.4 Sources of wind turbine noise can be divided into two categories –mechanical and aerodynamic. Mechanical noise is associated with the movement of mechanical components for example within the nacelle from the gearbox and generator, whilst aerodynamic noise arises from the movement of the blade through the air, and is commonly described as “swish” or “slap”. This arises as the rear of the blade washes through the air disturbed by the leading edge. Careful design of the blade profile, essentially the trailing edge, can reduce the level of swish by reducing vibration across the blade surface.
- 3.8.5 The potential for noise from turbines is often a concern for neighbours and one way of mitigation is to ensure suitable distances between the turbine and sensitive properties. The current established recommended good practice is contained within

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<sup>15</sup> <https://www.gov.uk/government/news/wind-turbine-shadow-flicker-study-published>

'The Assessment and Rating of Noise from Wind Farms' (ETSU-R-97), June 2013. This provides a framework for the measurement of wind farm noise and gives indicative noise levels calculated to offer a reasonable degree of protection to wind farm neighbours, without placing unreasonable restrictions on wind farm development. It identifies that factors such as turbine type, turbine size, and local topography all have a role to play.

- 3.8.6 There is also a growing concern regarding amplitude modulation (AM) which is a feature of the character of wind farm noise. Over the period since ETSU there have been numerous studies into AM which is caused by the cyclical nature of the blades moving through the air, and is often referred to as a "thump" at distances of up to 2km and a more localised "swish" noise in the immediate vicinity. This is frequently cited as the potential cause of reported health impacts and psychological annoyance in nearby residential properties.
- 3.8.7 In October 2016 DECC published its report into AM<sup>16</sup>. The government website states that this is not planning guidance but accepted "good practice" from the Institute of Acoustics. Developers and Planning Authorities are encouraged to consider the research if an AM planning condition would be appropriate.

### Minimum Separation Distance

- 3.8.8 Focussing on the issues of shadow flicker, noise (in its various forms) safety and the visual aspects of turbines has lead many Planning Authorities to consider a policy that requires a minimum separation distance, or buffer zone, between turbines and neighbouring properties. During the period 2010-2012 a number of Private Members Bills were presented in Parliament in an attempt to provide a legal basis for separation distances between turbines and dwelling, dependent upon the size of the turbine. None progressed further than the House of Lords hence there is no set minimum distance in English planning policy.
- 3.8.9 Following the consolidation of planning guidance (PPGs and PPSs) into the NPPF in 2012, the guidance note to PPS22 Renewable Energy remains extant. The document refers to "*The minimum desirable distance between wind turbines and occupied buildings calculated on the basis of expected noise levels and visual impact will often be greater than that necessary to meet safety requirements. Fall over distance (i.e. the height of the turbine to the tip of the blade) plus 10% is often used as a safe separation distance*" (paragraph 51).
- 3.8.10 The Welsh Assembly has adopted guidance of a 500m distance, whilst in Northern Ireland the figure is 10x the rotor size but not less than 500m. In Scotland, the policy guidance refers to a separation distance of up to 2km between areas of search and settlements, but importantly not individual dwellings, with account to be taken of local factors.
- 3.8.11 Various English Planning Authorities have sought to introduce enforceable separation distances within planning policies or supplementary guidance but

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<sup>16</sup> <https://www.gov.uk/government/publications/review-of-the-evidence-on-the-response-to-amplitude-modulation-from-wind-turbines>

generally to no avail. Milton Keynes Council had its SPD, quoting a separation distance, quashed in the High Court in mid 2013. Other Authorities have adopted separation policies but acknowledging that they have no potential weight in law. A trawl of numerous appeals shows that the Inspectorate relies upon an assessment of issues such as noise, shadow flicker, and to a lesser extent (dependent upon location), the visual impact, upon which to base a separation argument.

- 3.8.12 Members of the Council's Planning Policy Working Group have asked for a buffer distance to be considered as part of the emerging Plan policies. The assertion in this paper is that, based upon all available information, a blanket restriction would be unworkable. Instead the policies should be clear on the extent of local constraints and take account of the issues raised by each development in order that each can be satisfactorily addressed. Working through each issue would be a more robust way of dealing with an application in order to reach an appropriate decision.

### **Existing Wind farms**

- 3.8.13 The Borough has two existing windfarms where wind energy development has previously been deemed acceptable. One of these windfarms is now partially excluded from the 'suitable areas' identified in Policy C6.

Any future applications to extend the operational life of this windfarm, as existing or in a different form, would require supporting documentation which would test the impacts arising from any increase in the number or dimension of the turbines.

Any applications relating to existing windfarms will be determined in accordance with the Development Plan and any material considerations.

## 4 Recommendations

### 4.1 Summary

- 4.1.1 Central government makes it clear through national guidance and ministerial statements, that Planning Authorities have an essential role in helping the UK meet its global obligations on renewable energy. The NPPF<sup>17</sup> states that local authorities;
- “Should have a positive strategy to promote energy from renewable and low carbon sources; and should design their policies to maximise renewable and low carbon energy development while ensuring that adverse impacts are addressed satisfactorily, including cumulative landscape and visual impacts”*
- 4.1.2 This document has identified potential locations within which wind energy developments may be suitable, in keeping with NPPF guidance for Authorities to adopt a positive stance on renewable technology. These areas are shown on the Proposals Map. The identification of such areas does not infer that planning permission will be granted but it establishes a guideline that gives clarity to applicants and stakeholders alike.
- 4.1.3 The analysis indicates that the Borough has locational advantages in common with most of Cumbria due to suitable wind speeds, topography and coastal position. However this is countered by several layers of constraints, ranging from landscape character and capacity to restrictions arising from existing and proposed infrastructure.
- 4.1.4 Proposals will continue to be judged against national guidance and local policies at all times, including valid County wide documents, and it remains for applicants to demonstrate that suitable mitigation can be achieved to overcome relevant material considerations. The Authority will continue to have a positive strategy to promote renewable energy generation and to assess applications on a case-by-case basis.
- 4.1.5 It is considered that adopting standardised residential separation distances, which would rule out a significant proportion of wind turbine applications without assessing the site specific impacts, does not conform to the current advice within the NPPF.
- 4.1.6 This paper has identified various broad areas and two existing wind farm locations within the Borough where wind related developments may be acceptable, subject to specific issues being addressed. This is based upon an assessment of local issues and constraints set against the national background of policies, ministerial statements, and appeal decisions.

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<sup>17</sup> CLG (2012) National Planning Policy Framework

<http://www.communities.gov.uk/planningandbuilding/planningsystem/planningpolicy/planningpolicyframework/>



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Working together to support sustainable development within the Borough of Barrow-in-Furness

