

Cumbria Wind Energy Supplementary Planning Document

Supporting the Local Development Frameworks of Cumbria



July 2007

This Supplementary Planning Document has been prepared jointly by

Cumbria County Council
Allerdale Borough Council
Carlisle City Council
Copeland Borough Council
Eden District Council
Lake District National Park Authority
South Lakeland District Council

It supports 'saved' Local Plan Policies, 'saved' policies in the Joint Structure Plan 2006-2016 and policies in the emerging Local Development Frameworks being developed by each of the above local authorities.

The Supplementary Planning Document was adopted by the Cumbrian Local Planning Authorities as a as set out below following a period of public consultation during October – December 2006.

Allerdale Borough Council – 23 January 2008
Carlisle City Council – 9 September 2008
Copeland Borough Council – 25 January 2008
Cumbria County Council – 13 September 2007
Eden District Council – 25 October 2007
Lake District National Park Authority – 16 October 2007
South Lakeland District Council – 5 December 2007

Barrow Borough Council is committed to the production of the Supplementary Planning Document and will consider adopting it following the development of the Core Strategy of the Local Development Framework. Until then this document will be a material planning document for Barrow as it provides guidance to strategic renewable energy policy in the Joint Structure Plan.

Front cover photographs courtesy of Cumbria County Council and South Lakeland District Council.

The County Council acknowledges inputs on landscape capacity assessment, landscape and visual impact assessment, cumulative effects and design guidance from Coates Associates, Chartered Town Planners and Landscape Architects, Kendal

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NINE STEPS TO DEVELOPING A WIND ENERGY PROPOSAL

This guidance has been developed jointly by the Cumbrian local planning authorities to support the implementation of renewable energy policies in the Local Development Frameworks¹ and provide consistent guidance for wind energy development across the County. This section summarises the main issues addressed by the SPD and acts as the Executive Summary.

1 Understanding Climate Change

The need to tackle climate change is firmly on the UK's agenda. The Government's energy strategy is seeking an energy mix in the future that will reduce harmful CO₂ emissions. This includes the need for 20% of our energy to come from renewable sources by 2020. Wind energy, is a proven technology, and a key renewable source and important to the future UK energy mix. This guidance helps to facilitate new wind energy development in Cumbria to meet climate change objectives.

Find out more in Part 1 Section 1.

2 Understanding the Policy Framework

The full range of national, regional and local policies and strategies need to be understood when dealing with renewable energy schemes. Targets have been set at national and regional levels for renewable energy production and wind is set to play a big part in achieving these. Schemes that do not cause significant harm to a range of environmental, economic and social issues should be favourably considered through the planning system.

Find out more in Part 1 Section 1.

3 Understanding Wind Energy and its effects

A range of planning related issues need to be taken into account when developing a wind energy proposal. These are all equally important and planning policy requires these issues to be given careful consideration. These include aircraft and radar, biodiversity, community, cultural heritage, highways, landscape and visual, local amenity, local economy, soils and hydrology and telecommunications.

Find out more in Part 1 Section 2
Key guidance is highlighted in bold.

4 Understanding Cumbria

Cumbria has a high wind resource and lends itself well to wind energy development in that regard. Cumbria also has a high quality environment containing wide ranging nature conservation sites and species, a diverse historic legacy, important landscape character and many dispersed settlements throughout the countryside. A clear understanding of the environmental, economic and social issues is needed to determine the best place for wind energy development.

Find out more in Part 1 Section 2, Maps 1 – 6 and Part 2

¹ and relevant saved and Cumbria Joint Structure Plan policies.

5 Understanding the Local Community and Stakeholders

Engaging with the local community and other stakeholders at the pre and post application stages can bring many benefits. Positive engagement and good quality information can result in the community understanding a scheme better, and potentially taking ownership of it. This could reduce the time spent considering a planning application and assist in identifying constraints and opportunities for a scheme.

Find out more in Part 1 Section 2.
Key guidance is highlighted in bold.

6 Understanding the Local Planning Authority

It is important to engage with planning officers from the relevant local planning authority at an early stage. They can provide signposting to relevant policies and background information, contact with other officers and assist in interpreting guidance when developing a scheme. Pre application scoping meetings with officers, held very early on in the process, can help ensure that all relevant issues are considered and can help with the iterative design process.

7 Understanding Landscape Capacity

It is important that future decisions are made against a robust assessment of the landscape capacity of Cumbria to accommodate wind energy development. A detailed landscape capacity assessment that specifically relates to wind energy development provides the foundation for future development and decisions. This is based on landscape character, sensitivity and value.

Find out more in Part 2.
Key guidance is highlighted in bold.

8 Understanding Cumulative Effects

Future wind energy schemes will need to consider cumulative effects and demonstrate the potential impacts on aircraft and radar, biodiversity, cultural heritage, highways, landscape character and visual effects, local amenity, local economy soils and hydrology and, telecommunications.

Find out more in Part 1 Section 3.

9 Understanding Site Characteristics and Good Design

When working on the design of wind energy schemes the full range of technical, environmental and other characteristics of a site need to be considered. A thorough assessment of the characteristics on and surrounding the site is needed. If a site is initially considered appropriate, careful design can ensure a scheme relates well to its environs and can assist in mitigating adverse effects. This process should be integrated with the Environmental Impact Assessment, if one is required. This guidance signposts to advice on a range of issues and includes more detailed advice on landscape issues.

Find out more in Part 1 Section 4 and Part 2 Section 3
Key guidance is highlighted in bold throughout the SPD.

CUMBRIA WIND ENERGY SUPPLEMENTARY PLANNING DOCUMENT

Part 1

General Planning Guidance

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PART 1

SECTION 1

WHY THE GUIDANCE IS NEEDED

1 Why the guidance is needed

Climate Change

- 1.1 The need to tackle climate change is firmly on the UK's agenda. There is a body of scientific evidence that demonstrates that human activities are contributing towards global warming and climate change through rising carbon dioxide (CO₂) and other green house gas emissions. The consequences of climate change will be profound with rising costs for global and national prosperity, people's health and the natural environment. Action is needed now to reduce CO₂ and other harmful emissions and mitigate against the effects of climate change.
- 1.2 The Government has developed a strategy for tackling climate change² that takes a comprehensive approach to
- minimising the demand for energy
 - increasing energy efficiency
 - developing renewable energy sources
 - developing cleaner energy sources
- 1.3 The spatial planning system can help minimise the demand for energy and increase energy efficiency through planning new homes, jobs and infrastructure. It also has a role to play in supporting new renewable energy production. This could be wind, biomass, photovoltaics, geothermal and hydroelectric, both at a commercial and micro scale.
- 1.4 Renewable energy is an integral part of the Government's Energy Strategy. It is committed to produce 10% of the UK's electricity from renewable sources by 2010, and is aiming to produce 20% by 2020. In 2004 3.6% of our electricity was from a renewable source. In order to achieve this target regional and local Government are taking action to support renewable energy schemes. This guide is one approach that Cumbria is taking on this. As wind energy development will continue to have a major role in delivering national and regional renewable energy targets this guidance will focus exclusively on this type of renewable technology.

The role of wind energy developments

- 1.5 Renewable energy has an important role to play as an alternative to the increased use of fossil fuels and nuclear energy generation. There are a range of renewable energy technologies that are being exploited and developed to help deliver more renewable energy supplies. The UK is the windiest place in Europe and the Government see wind energy as playing a major role in delivering renewable energy over the next decade and beyond.
- 1.6 Wind energy development is a proven, viable and rapidly developing renewable energy technology. It continues to offer significant potential in the region and across Cumbria, particularly in meeting targets set for 2010 (10% of energy from renewable sources). In 2004 it provided 4.4% of the national renewable energy production, with large scale hydroelectric contributing 10.5% and bio fuels contributing 83.8%. Through the development of up to date policies and advice we can help facilitate more wind energy development and assist in tackling climate change.
- 1.7 The environmental benefits of wind energy are mainly linked to the contribution it has towards reducing the harmful impacts of climate change, without action climate change will jeopardise the landscape, biodiversity and human activities

² Energy White Paper 2003, Energy Review 2006 and Meeting the Energy Challenge, 2007.

across Cumbria. Wind energy can also bring about social and economic benefits through job creation in the manufacturing, construction and maintenance industry. The offshore wind schemes around the coast of Cumbria have already contributed to new work for Cumbrian companies. It can also support rural diversification providing an opportunity for farmers to sell or rent land to commercial wind energy companies or support community owned projects. It can also provide opportunities to power homes, buildings and businesses off the grid and provide educational opportunities. The environmental, economic and social benefits of renewable energy schemes are material considerations when dealing with planning applications.

- 1.8 However, careful consideration also needs to be given to any effects that may arise from renewable energy schemes. Wind energy schemes are no exception to this. Schemes need to be well designed, reflect local circumstances and demonstrate how any environmental, social and economic impacts have been minimised through careful site selection, design and other measures. These are also material planning considerations and as such, these issues will need to be addressed on a site by site basis to determine the most acceptable scheme for a site.

Policy Guidance

National Guidance

- 1.9 Planning Policy Statement 22: Renewable Energy (PPS22), 2004 sets out the Government's planning policy on renewable energy. The guidance advises that policies in regional spatial strategies and local development documents should promote and encourage, rather than restrict, such development. It encourages renewable energy development across England where the technology is viable and environmental, economic and social impacts can be addressed satisfactorily. PPS22 acknowledges that of all the renewable energy technologies, "wind turbines are likely to have the greatest visual and landscape effects" and that consideration should be given to cumulative impact of wind energy schemes. This Guidance seeks to highlight the range of effects likely with regard to wind energy development, indicates the potential scale of wind development in relation to landscape character and sets out detailed guidance to assist in assessing landscape, visual and cumulative effects.
- 1.10 Planning Policy Statement 1 and its emerging guidance on climate change will also apply and supersede or strengthen some guidance contained in PPS22. This seeks to encourage development that supports Government policy on climate change and sets out further guidance on the role of renewable energy. It is considered that the landscape capacity approach set out in this guidance is compatible with this emerging guidance.

Regional Guidance

- 1.11 The North West Sustainable Energy Strategy, July 2006, sets out the action needed to tackle climate change for the North West. This suggests that the greatest cross cutting impact in our region is likely to be increased risks of flooding. Other issues will include sea level rise and an increase in annual temperatures. This could lead to heat waves, moorland fires and a change in biodiversity as some species fail to evolve to the new climate conditions and habitats. It sets out a hierarchy for action that reflects the Government's approach above.
- 1.12 The Regional Spatial Strategy (RSS) for the North West of England contains planning policy and targets for delivering renewable energy and the NW Sustainable Energy Strategy. The indicative capacity break down of the targets

demonstrate the importance of wind energy development in meeting such targets. For up to date information on the targets consult the RSS. This guidance aims to support the development of wind energy schemes in Cumbria, which will contribute towards meeting the regional targets established in RSS.

Cumbria and Lake District Joint Structure Plan

- 1.13 The Cumbria and Lake District Joint Structure Plan 2001-2016 (JSP) supports the increasing use of renewable energy and the need to encourage greater energy efficiency and energy conservation. The policies of the JSP will be valid until the Regional Spatial Strategy is adopted. This will then set the strategic policy for renewable energy production. However, it is anticipated that the following policies from the JSP will be saved beyond this period by the Regional Assembly as a transitional arrangement until policies in the Local Development Frameworks are developed. This guidance will then be adopted as part of the Local Development Frameworks.
- 1.14 The SPD provides guidance and interpretation against two key policies of the Joint Structure Plan - Policies R44 and R45³. These recognise that renewable energy projects, ranging from large scale commercial developments through to domestic or community projects, each have their own locational characteristics and requirements. The JSP recognises that the development of wind energy within the County has been the most emotive given the visual impact and the influence it has on the character of important landscapes and their settings. In addition to these several other policies of the JSP apply and proposals will be judged against these also.
- 1.15 Under Policy R44, renewable energy developments will be favourably considered if a number of requirements are met. These relate to the effect on landscape character, biodiversity and the natural and built heritage; the effect on local amenity, economy and highways, aircraft operations and telecommunications; and that the proposals take all practical steps to reduce any adverse impacts. It also requires for the environmental, economic, social and energy benefits to be given significant weight and for measures to show how a proposal will be dealt with once operation ceases.
- 1.16 Under Policy R45, developments within the Lake District National Park (LDNP) or Areas of Outstanding Natural Beauty (AONBs) have to show that their scale, form, design, materials and cumulative impacts can be satisfactorily assimilated into the landscape or built environment and wouldn't harm their appearance. They must also be shown not to impact on the local community, economy, nature conservation or historic interests. In these areas wind schemes requiring more than one turbine or a turbine with a ground to hub height of 25 metres or more is unlikely to be acceptable.
- 1.17 A technical study⁴ was undertaken in 2003 to identify the potential for further grid connected renewable energy development in Cumbria. This took into account economic, social and environmental factors as well as technical and viability considerations. The study identified broad 'Areas of Search' for renewable energy developments in the County (including wind) and assessed broad capacities for the development of this technology. This study was used to inform the development of policy in the JSP. It was not adopted as part of the JSP, nor used to set targets for renewable energy or identify locations for development as PPS22 advises against making assumptions on technical and commercial feasibility of renewable energy projects, and having planning policies that rule out or place constraints on the

³ Contained in Appendix 1

⁴ Technical paper No 6: Planning and Renewable Energy Development in Cumbria by AXIS, CCC and LDNPA, 2003.

development of all, or specific types of, renewable energy technologies. As a result this Guidance moves away from broad Areas of Search. It does not identify specific locations where development will be acceptable; however, it does provide an indication of landscape capacity at a county wide level. This is obviously only one factor that will be considered by developers as they consider the characteristics and potential effects of appropriate sites for future development.

Local Plans and Local Development Frameworks

- 1.18 This document provides detailed guidance and interpretation for several saved policies and the emerging policies of the Local Development Frameworks for the Cumbrian Local Planning Authorities. These are set out in appendix 1. It is adopted as a Supplementary Planning Document for the Local Planning Authorities as set out on the inside of the front cover. This guidance will be given significant weight when dealing with planning applications.

Scope of Guidance

- 1.19 This Guidance replaces previous supplementary planning guidance for wind energy development issued in 1997. It applies to schemes of less than 50MW, which are normally determined by local planning authorities, where one or more turbines provide energy either directly to an individual or a group of buildings or for the sole purpose of producing electricity to support the national energy network. It applies to new schemes and extensions to, and re-powering of, existing schemes. Schemes above 50MW are determined by the Department for Business, Enterprise and Regulatory Reform (BERR).
- 1.20 The guidance is divided into two parts.
- Part 1 – guidance on addressing environmental, social and economic effects when preparing wind energy proposals.
 - Part 2 – technical guidance on landscape capacity, landscape and visual effects and carrying out landscape and visual impact assessments.
- 1.21 This Guidance supports the implementation of a range of policies. It sets out a consistent approach to be applied across the County to assist developers in preparing wind energy developments. Key guidance on a range of issues is highlighted in bold to summarise steps that should be taken when developing a wind energy scheme. It should be noted that they do not constitute policy. They are referenced as G* in Part 1 to refer to ‘guidance’ and LG* in Part 2 to refer to ‘landscape guidance’.
- 1.22 It is important that we look favourably on wind energy development that does not cause unacceptable harm to our built and natural environment. When preparing wind energy proposals a range of environmental, social and economic effects need to be considered. The guidance provides general advice on range of issues that must be dealt with for planning reasons. This includes aircraft and radar, biodiversity, cultural heritage, landscape and visual, local amenity, local economy, soils and hydrology and telecommunications.
- 1.23 However, as landscape and visual effects are recognised in national planning guidance as being more important for wind energy schemes than other renewable energy development, more detailed information is provided on these interrelated issues in Part 2. It is our experience that these are often the most controversial aspects of any wind energy proposal, and can be more difficult to mitigate than other issues, such as biodiversity.

- 1.24 This document does not provide guidance on other renewable energy development, offshore renewable schemes or micro-generation. The nature of other renewable schemes is likely to be small with few strategic consequences, such as small scale hydroelectric schemes, or likely to be large and unique, such as large scale hydro electric or a biomass plant. Local planning authorities will deal with such schemes on their own merits in relation to the relevant policy. Offshore schemes are not covered by the land use planning system and it is therefore inappropriate to provide guidance on this. However, where associated infrastructure is proposed on land, this guidance would apply.
- 1.25 Micro-generation wind turbines, which are sited on buildings or within their proximity, provide electricity to be used on site with the potential to export any surplus, are becoming more popular. Cumbrian local planning authorities support the principle of micro-generation, and such proposals will be dealt with on their individual merits against relevant policies. The local planning authorities may provide further guidance on this in due course.

Cumbria's Context

Wind Resource

- 1.26 The wind resource in Cumbria is greatest on west facing upland sites and along the coast. Map 1 shows estimated mean wind speeds in metres per second for values over 6.5metres/second.⁵ This provides a generalised indication of Cumbria's wind resource. It does not take into account that wind energy developments are now being built in areas of lower wind speeds or the technical, environmental or cultural constraints that may affect land. Neither does it provide a basis for individual development decisions.
- 1.27 Many of the windiest parts of Cumbria fall within national landscape designations. The Lake District National Park and Yorkshire Dales National Park, Arnside and Silverdale, North Pennines and Solway Coast Areas of Outstanding Natural Beauty have the highest value landscapes in Cumbria. Policies have been put in place to protect the landscape value of these areas and their settings, which limits the level of wind energy development that is likely to take place there.

The Nature of Schemes and Experience in Cumbria

- 1.28 In recent years a significant increase in the size and proportion of individual wind turbines has prompted a re-evaluation of the criteria under which the landscape and visual impact of schemes is assessed. Trends in turbine design are summarised in Table 1.1 below. This shows the ranges of heights to the hub/nacelle level, the overall diameter of blades, the overall height to blade tip, the spacing between turbines, and the installed capacity for typical schemes proposed between 1991 and 2004. Clearly the larger the turbines, the more electricity they can produce. While earlier turbines had an installed capacity of 400-600 kW, a single turbine today has a capacity in the range of 1.3 – 2.5 MW. For a given output, fewer turbines are needed than in past schemes. However, as the size of turbines and electricity output increase, so does the amount of space needed between each turbine.

⁵ ETSU Energy Technology Support Unit

Table 1.1 Trends in Turbine Design

Dimensions (m)	1991-93	1994-99	2000-04
Height to Hub	25	40-45	60-70
Diameter of Blades	24-33	37-47	62-94
Overall height	37-41.5	58.5-68.5	91-117
Spacing ⁶	72 – 132	111 – 470	186 - 940
Installed capacity	700kW	1 MW	2 – 2.5MW

- 1.29 In the last decade the number of sites that are operational or have permission for non-domestic wind turbine developments has increased significantly outside the Lake District National Park, with a few small scale schemes being developed within the National Park. These are identified in Map 2. The map also shows proposals that have been submitted as planning applications and those that have been refused or dismissed at appeal. The map shows a clustering of schemes in areas where there is the highest wind resource i.e. along the coast of West Cumbria, along the northern fringes of the Lake District National Park, in the Furness area and in the uplands to the north and east of Kendal.
- 1.30 More recently development opportunities are being found in less exposed inland locations and, for single or twin turbine developments, within the grounds of existing industrial sites. Cumbria has also seen a trend towards the extension of existing schemes and development either directly adjacent to existing sites or in very close proximity.

Landscape Designation Boundary Review

- 1.31 Natural England is currently working towards designating extensions to the Lake District and Yorkshire Dales National Parks. This work follows agreement in 2005 by the former Countryside Agency on broad areas adjacent to the Lake District and Yorkshire Dales National Parks, Arnsdale & Silverdale and the North Pennines Areas of Outstanding Natural Beauty that meet the statutory criteria for designation. This decision was informed by a report by Alison Farmer Associates⁷. It will be some time before the designation process is complete and any such extensions designated. It is not considered appropriate for this guidance to pre-empt this process, and the landscape capacity assessment has been carried out to reflect existing designation boundaries only.
- 1.32 If the review process results in the designation of new areas of land as National Park or Area of Outstanding Natural Beauty changes would be made to the SPD to reflect this. The relevant planning policies would apply to any new additions to nationally recognised landscape designations.

⁶ Taken from PPS 22 companion guide – spacing 3-10 times the blade diameter.

⁷ Recommended areas of search for land worthy of national landscape designation in the North West Region, Alison Farmer Associates 2005.

PART 1

SECTION 2

GUIDELINES FOR WIND ENERGY SCHEMES

2 Guidelines for Wind Energy Schemes

- 2.1 Wind energy development may have an effect on a range of environment, social and economic issues. Those that relate to the spatial planning system are listed below and covered in this section. All of these issues are important and will be considered equally by the local planning authority. Developers must consider how their proposals affect such issues and address any significant impacts that may arise. It is important, however, that developers do not resolve adverse effects on one issue at the expense of another.
- 2.2 For schemes of two turbines or more, and those with a hub height that exceeds 15m, a full Environmental Impact Assessment is required in accordance with the Environmental Assessment Regulations. This should be integrated into the design process and a range of specialist advisors may be needed at the start of this process to ensure the full range of issues set out below are properly considered. For schemes below the EIA threshold information should be provided on such issues through a planning statement to support an application.
- 2.3 The issues covered in this section include:
- Aircraft and Radar
 - Biodiversity
 - Community
 - Cultural Heritage
 - Highways & Rights of Ways
 - Landscape and Visual
 - Local Amenity
 - Local Economy
 - Soils and Hydrology
 - Telecommunications

Aircraft and Radar

- 2.4 Wind energy developments may cause adverse impacts on the use of aerodromes and radar and other navigation systems used for air traffic control and aircraft instruments. Early consultation between developers and statutory authorities can help with siting and mitigation measures.
- 2.5 The movement of a wind turbine can interfere with radar as it may be interpreted as a moving object. This could cause it to be mistaken for an aircraft or reduce the ability to track aircraft by radar in the vicinity of a wind energy development. Developers will need to consult with radar operators if a proposal falls within a 15km consultation zone, or the 30-32km advisory zone around both civil and military air traffic radar, respectively. The British Wind Energy Association (BWEA) website combines a proforma to aid consultation with stakeholders. Developers should use this (www.bwea.com/aviation). If, as a result of the above consultation, a negative impact is likely a developer will need to prove whether or not there will be an adverse effect on aviation interests.
- 2.6 Currently such issues may prevent development from taking place around the north, east and some coastal locations within Cumbria due to MoD sites and aircraft activity, such as Spadeadam in the north and Warcop in the east, and Carlisle Airport. In these, and other areas, flight paths will need to be determined and consideration given to see if action can be taken to mitigate against collision risks. Developers must consult with the Civil Aviation Authority and MoD to determine such issues and liaise with airfield management at civilian airfields.

G1

Developers should enter into early dialogue with aviation stakeholders to identify any key issues that need to be addressed.

2.7 Developers should follow good practice advice found in the following resources:

- DTI AMS Feasibility Study, June 2005.
www.dti.gov.uk/renewables/publications/pdf/windenergyaviation.pdf
- Wind farm impact on aviation radar interests DTI
<http://www.dti.gov.uk/energy/page18050.html>
- Wind energy and aviation interests: an interim guide, DTI
<http://www.dti.gov.uk/files/file17828.pdf>

Biodiversity

2.8 Wind energy schemes support the goal to reduce climate change and reduce potential changes to biodiversity globally and in the UK. They also have the potential to both enhance or adversely affect biodiversity and nature conservation interests. Cumbria is noted for a wealth of nature conservation interests. Some of these may be particularly rare or form part of wider biodiversity networks important on more than a local scale. It is crucial for any development to take these interests into account, reducing adverse effects and considering opportunities for enhancement.

2.9 Cumbria has many international and national statutory designations, and regional and local designations both for habitats and species. National guidance and circulars, along with local planning policies, provide protection from inappropriate development for areas and features of international and national importance. Additional policies provide protection for other areas and features of nature conservation interest and for enhancement.

2.10 The key international and national statutory site designations in Cumbria are shown on maps 3, 4, 5 & 6 and comprise:

International

- Special Areas of Conservation (SACs)
- Special Protection Areas (SPAs)
- Ramsar (wetlands) sites

National

- Sites of Special Scientific Interest (SSSIs)
- National Nature Reserves

For international sites, and features that they support, new schemes need to demonstrate that they will not adversely affect their conservation value. Schemes should not cause harm to habitats and species outside a designated site that may adversely affect the integrity of a site, or cause a significant decline in the size, distribution, structure or function of a population of a species for which a site was designated. In accordance with the Habitats Regulations an assessment needs to be carried out for each new development to determine if it would have a likely significant effect, alone or in combination with other plans or projects, on sites or features associated with an international designation. If likely significant effect is determined developers are expected to provide relevant information to the Local Planning Authority to enable it to carry out an Appropriate Assessment.

2.11 Any development that could have an adverse effect on the conservation objectives of a European or Ramsar wildlife site is not provided for in RSS Policy EM17, Policies R44 & R45, E34 and ST4 of the Joint Structure Plan 2001-2016 and policies in the emerging Local Development Frameworks and would not be in accordance with the development plan. It would not, therefore, have the benefit of S.38 of the 2004 Act at application stage. More guidance is contained in ODPM

Circular 06/2005⁸, PPS9 and PPS22 on this.

- 2.12 For national sites, wind energy schemes will need to demonstrate that they will not have an adverse effect on a SSSI. Strict measures would be taken to ensure that harmful effects on SSSIs are avoided or mitigated against. Exceptions will only be made where the benefits clearly outweigh the impacts on the interests of the SSSI and its contribution to the national network of SSSIs. More guidance is contained in ODPM Circular 06/2005, PPS9 and PPS22.
- 2.13 This guidance does not seek to set buffer zones around international or national designations; however developments proposed close to the boundaries of these designations will need to assess their effects on them.
- 2.14 In addition to international and national site designations there are a number of plant and animal species within England that are subject to special protection under the Habitats Regulations, the Wildlife and Countryside Act or their own legislation. Wind energy schemes will need to demonstrate that these are protected from adverse effects through the adoption of appropriate avoidance and mitigation measures.
- 2.15 There are also Regionally Important Geological/Geomorphological sites, County Wildlife Sites, and Local Nature Reserves. Development sited on or off such sites should not cause significant harm to these nature conservation interests.
- 2.16 It is also important for developers to consider the effects of development on non designated sites and species. Government policy seeks to protect priority habitats and species identified in the UK Biodiversity Action Plan and any additionally identified in the local Cumbria Biodiversity Action Plan. Many of these habitats and species extend outside protected sites, and consideration must be given to potential impacts when developing any scheme. If an assessment demonstrates harm a scheme could only be supported if the need for and benefits of the scheme clearly outweigh the harm and appropriate avoidance, mitigation and compensation measures are incorporated to protect and enhance biodiversity networks.
- 2.17 Habitats most likely to be affected are coastal habitats, upland habitats (acid grassland, heather moorland, blanket bog, flushes and mires), purple moor-grass and rush pastures, general open farmland, and connecting habitats such as hedgerows and small woods. A Key Species list is being developed for the county which will include protected, priority and Cumbria BAP species. It will be available from, and maintained by, the Cumbria Wildlife Records Centre.
- 2.18 Information on these interests should inform the early stages when selecting the location and designing a scheme. The maps at the back of Part 1 provide a broad indication of the international and national sites. There is a need to use information from Natural England, the Cumbria Biological Data Network through Tullie House Museum, Cumbria Wildlife Trust, RSPB, and local nature conservation groups
- 2.19 Effects on biodiversity can take place during the construction, operation or decommissioning phases of a wind energy scheme. They can arise from any element of the development including the foundations, access roads, moving turbines and ancillary buildings. Cumulative effects may also impact on biodiversity across a wide area arising from both wind energy and other development/activities; see more on this in section 3, Part 1. Such effects could cause negative impacts to habitats and species found within or outside a development site. Mitigation of such

⁸ Circular 06/05 Biodiversity and Geographical Conservation - Statutory Obligations and their impact within the Planning System.

effects would be required but in some circumstances a scheme might be so damaging that it may not be possible to mitigate or provide compensation against the effects.

- 2.20 New wind energy schemes may also provide the opportunity to enhance existing habitats and create new ones to support a range of species. These opportunities should be pursued where possible and be guided by biodiversity targets in the NW Regional Spatial Strategy and Cumbria BAP.
- 2.21 The experience of past wind energy development both in the UK and Europe has shown the main adverse effects on nature conservation to be:
- Direct habitat loss (eg for feeding, roosting, breeding etc)
 - Habitat damage (eg on site and off site due to hydrology impacts)
 - Interference with geological processes (eg slope profile)
 - Interference with hydrological processes (eg increased runoff, erosion)
 - Disturbance to, displacement of and collision with mobile species such as birds (eg for migration, feeding, nesting)
- 2.22 Once the habitats and species have been identified, developers need to consider the effect of the proposal on these, both alone and in combination with other developments. If adverse effects are identified appropriate mitigation needs to be considered. This could include moving the position or turbines, changing the height or number of turbines or, in some cases, seeking an alternative site. Consideration should be given to the opportunities for enhancing nature conservation with a site and its surrounds. In some cases compensatory habitat may be considered necessary to mitigate any potential habitat loss arising from a scheme. Developers will need to work closely with Natural England and others to ascertain the most appropriate approach to this. Further guidance on biodiversity issues can be found in 'Wind farm development and Nature Conservation, English Nature, RSPB, WWF and BWEA, 2001'.

G2

Developers should assess the effects of potential schemes, alone or cumulatively, on biodiversity sites, habitats and species and identify measures to avoid or mitigate harm to them and secure their conservation and enhancement.

Where a scheme, alone and in combination with other plans and projects, could have an impact on an internationally designated site, developers must carry out an assessment of the likely significant effect of the scheme in accordance with the Habitats Regulations.

Bats and Birds

- 2.23 The impact on bats and birds is of particular interest for wind energy development. All bats and some birds are protected species that need to be considered when developing a wind energy scheme. They are potentially at risk from wind turbines in the ways identified in paragraph 2.21 above.
- 2.24 For bats, in area where bat activity is likely, work will need to be carried out to establish roosts, flight lines, feeding areas, hibernation or swarming sites in the vicinity of a proposal as part of an EIA or planning statement. The results of such surveys should assist in identifying the appropriateness of the scheme, its design and layout. If a foraging habitat is likely to be affected by a scheme, then mitigation

measures would be expected to ensure additional habitat is provided for within the locality and to reduce the potential for harm, however it will take time to establish new habitat. Such work should be carried out in accordance with Bat Mitigation Guidelines, English Nature, 2005 and Bat Survey Guidelines, Bat Conservation Trust, April 2007.

- 2.25 The issue of birds and windfarms has been debated for more than a decade. Scottish National Heritage produced detailed guidance in 2005 on survey methods for assessing the potential impacts on birds from onshore wind farms. This provides guidance on how to determine the potential loss of habitat as a result of infrastructure, displacement of birds due to disturbance to feeding and breeding grounds, and the potential mortality due to collision with turbine blades. Such risks need to be determined for any wind energy development. Developers are expected to consider this guidance when drawing up schemes in Cumbria.
- 2.26 For birds an assessment will need to be carried out to establish any protected, priority or rare species in or within the vicinity of a site and any migratory routes and any habitats related to such species. Careful consideration needs to be given to SPA, SAC, and RAMSAR sites and species which are often associated with coastal and moorland/upland areas. Birds such as whooper swans, pink footed geese and greylag geese could be affected by wind energy schemes. Species are often associated with areas off the site for feeding, roosting and over wintering. This is particularly the case for Hen Harriers from the Newcastleton Hills SPA and others that over winter on moorland in the west of Cumbria. Areas close to international sites have had the greatest interest from wind energy development in the past and care needs to be taken to ensure there is no harm to these interests.
- 2.27 Assessments need to recognise that the species associated with such sites are often found elsewhere throughout Cumbria, particularly for over wintering. The RSPB is developing detailed information on areas such as these and developers should contact them early in the site selection process to determine if such species are likely to be associated with a site (www.rspb.org.uk/cumbriaspatialplanningguide). For example information is available for moorland areas in the west of the Cumbria that provide an over wintering habitat for Hen Harriers. In coastal locations attention also needs to be paid to issues of collision with migratory birds, as many fly along the coastal areas to reach feeding/breeding grounds in protected habitats around the Solway Firth, Duddon Estuary, Walney and Morecambe Bay areas. An assessment of potential impacts will need to be carried out and any mitigation measures determined to remove the potential for harm. These may relate to micro-siting and design or the creation of supporting habitat within the locality. This information should be part of the EIA or planning statement.
- 2.28 The cumulative impacts on bats and birds must also be assessed in relation to other proposed, approved or operational wind energy schemes. More information is provided on this in section 3, Part 1.

G3

Developers should pay particular attention to assessing the effects of wind energy schemes, alone and cumulatively with other developments, on bats, birds and other mobile species, both within and outside a site. Measure should be identified to avoid or mitigate harm to these species and secure their conservation and enhancement.

The role of the EIA

- 2.29 For schemes where an Environmental Impact Assessment is required it is the main tool used to look in detail at nature conservation interests both on and off site. The methodology used; analysis of data and assessment of impacts should be clearly expressed in the Environmental Statement. If a scheme does not require an EIA, but is in an area affected by such issues an assessment of impacts should still be carried out and included in the planning statement. Areas to address include:
- A habitat survey that describes in detail the plant communities present on the site highlighting areas of habitats with potentially high nature conservation value⁹.
 - Identification of habitats and species on site and within locality
 - Identification of protected and priority habitats and species, including those of local importance.
 - Migratory routes of any protected or priority bird/bat species.
- 2.30 When carrying out assessment and evaluation information from local nature conservation bodies and Cumbria Wildlife Records Centre will help with data collection and interpretation. However this will not replace the need for detailed site surveys to be carried out at the appropriate time of year.
- 2.31 Developers need to ensure they follow national guidance contained in:
- PPS 9 – Biodiversity and Geological Conservation
 - Planning for Biodiversity and Geological Conservation – A good practice guide
 - Circular 06/05 – Biodiversity and Geological Conservation – Statutory Obligations and their impact within the Planning System
- All can be found at www.communities.gov.uk
- 2.32 Developers should also follow good practice advice contained in:
- Survey methods for use in assessing the impacts of onshore windfarms on bird communities, Scottish National Heritage Guidance November 2005
www.snh.org.uk/strategy/renewable/sr-we00.asp
 - Wind Turbines and Sensitive Bird Populations, RSPB, 2007
 - Wind farm development and Nature Conservation, English Nature, RSPB, WWF and BWEA, 2001 www.bwea.com/ref/reports-and-studies.html
 - Scoping guidelines for the environmental impacts of projects, Environment Agency, 2002
www.environment-agency.gov.uk/commodata/acrobat/scoping_guidelines.pdf
 - Bat Survey Guidelines, Bat Conservation Trust, 2007
www.bats.org.uk/news_events/BatSurveys.asp
 - Bat Mitigation Guidelines, English Nature, 2005
<http://naturalengland.twoten.com/naturalenglandshop/docs/IN13.6.pdf>

⁹ Use of a Phase 2 Habitat Survey methodology and National Vegetation Classification survey

Communities

- 2.33 The benefits of renewable energy through the provision of wind turbines and the associated reduction in CO₂ emissions are shared by everyone in England. However, it is local communities that are directly affected by them.
- 2.34 Wind energy developments could have a range of positive or negative effects on nearby communities. They could provide landowners with the opportunity for rural diversification, provide local jobs and opportunities for community based schemes and educational resources. However, a range of planning related issues are often raised as concerns by the local community. These include landscape and visual effects, noise, shadow flicker and effects to the local economy. Although it is recognised that the concerns raised will often not be significant, and that negative effects may be localised in nature or could be mitigated against, in every case, developers need to consider if wind schemes will have a positive, negative or neutral effect on such issues. More guidance on what is expected is set out throughout the guidance. In addition to this, local communities often raise concerns relating to a reduction in house value; however this is not a relevant planning issue and is not addressed by this guidance.

Community engagement

- 2.35 It is important that developers engage with local communities early on, and throughout, the development process. Gaining an insight into local concerns early on in the process can help to identify community benefits, assist with planning the overall scheme and mitigate against any identified negative impacts.
- 2.36 Developers are expected to carry out positive engagement with community stakeholders early on in the process, both before a planning application is prepared and after it has been submitted to the local council for consideration. However, it is also helpful to continue liaison with the local community during the construction and operational stages too. As part of this process, developers might consider inviting people who live near wind energy development to meet with local communities to discuss the realities of living near them.
- 2.37 Local planning authorities also have a role in raising awareness of the potential for renewable energy through guidance such as this, training events with councillors and professionals, and supporting a range of community projects promoting renewable energy, such as Eden LA21 and local energy efficiency advice centres. Each planning authorities Statement of Community Involvement sets out how they will engage with communities affected by proposals for major development.
- 2.38 Community stakeholders could be involved in identifying constraints and opportunities such as landscape character, biodiversity enhancement, links to local schools and colleges, and community benefits that could result from a scheme. Information and examples showing how community concerns have been successfully dealt with elsewhere should be used. A package of exhibitions, newsletters, briefing packs and public meetings could be adopted. Community Liaison Groups could be set up with a representative sample of local stakeholders to discuss issues at the pre and post application stages. A dedicated person could be identified to carry out community liaison. Approaches such as this could help reduce the feeling that communities have no ownership of a scheme, which may be the case if they are presented with a finalised scheme at an exhibition or meeting. Recent studies have also suggested that lack of information or awareness on renewable energy can result in people feeling unable to give positive support¹⁰.

¹⁰ Community Benefits from Wind Power, Centre for Sustainable Development et al, 2005.

- 2.39 More advice on involving local communities is contained in the “Protocol for public engagement with wind energy development in England”, produced on behalf of the Renewables Advisory Board and DTI. Developers should follow this protocol when dealing with schemes in Cumbria.
- 2.40 Organisations and people to include in pre and post application engagement could include:
- landowners
 - local residents, businesses, schools, residents groups
 - local and Parish councils
 - other organisations that may be affected, eg MoD
 - local media (as they are often the mechanism that the local community receive information from)
 - local action group (particularly in areas subject to previous wind energy interest/applications)
 - local environmental, interest or other groups (who could also assist in disseminating information to the local community).

G4

Developers should engage with the local community early in the design process to help identify issues that could help influence the overall design of a scheme.

- 2.41 Developers should also follow good practice advice contained in:
- The Protocol for Public Engagement with Proposed Wind Energy Developments in England, for the DTI and Renewables Advisory Board, Centre for Sustainable Energy, October 2006, www.cse.org.uk/pdf/pub1079.pdf
 - Summary of recent research on public attitudes to wind development, Section 9, Wind Power in the UK, SDC 2005. www.sd-commission.org.uk/publications/downloads/Wind_Energy-NovRev2005.pdf

Benefits for communities

- 2.42 When developing a wind energy scheme developers should explore the potential for community benefits when engaging with the community. Although benefits that are not required directly as a result of a planning consent are not a material planning consideration, developers in Cumbria are encouraged to work more closely with local communities to explore how wind energy schemes can enhance community interests. However, it should be noted that such benefits will not outweigh any significant environmental harm that might be identified when considering an application
- 2.43 The Centre for Sustainable Development has recently published a good practice toolkit on benefits for communities, on behalf of the Renewables Advisory Board and DTI. Developers should follow the guidance in this toolkit when developing schemes in Cumbria. This builds on experience elsewhere in Europe where the provision of significant local benefits is built into the heart of wind energy developments. This may include community benefits, local taxes, creation of jobs and opportunities for local ownership. In the UK several developers have worked with the local community to provide them with voluntary contributions, often in the form of a community fund. The exact model followed and how the fund could be used for has varied across the UK. Developers could consider supporting the local community when engaging with community stakeholders and developing a

proposal, including opportunities for local cooperatives to purchase turbines as part of the development. This concept is supported and was pioneered in Cumbria. Experience should be taken from the Baywind scheme and its investment model. In addition financial contributions could support a range of other benefits, such as:

- site conservation and habitat creation
- improved footpath access
- job creation for site management/consideration initiatives
- educational visits to local schools/colleges
- grant funding for energy efficiency schemes

It should be noted that some of the above could be sought as part of a planning permission if they are considered relevant to the proposed development.

- 2.44 Although the current planning system does not support such community benefits as material planning considerations and the provision of community benefits is still voluntary it may help obtain community acceptance of a scheme, and reduce delays in the planning process due to community objections. In England community funds can be secured through a non planning legal agreement with a community group/trust. However, land management for biodiversity is a material planning consideration and could be agreed through a S106 agreement.

G5

The potential for community benefits should be explored with the local community and local planning authority.

- 2.45 More detailed advice can be found in the following resources:

- Delivering Community Benefits from Wind Energy Development Toolkit, Centre for Sustainable Energy, October 2006 www.cse.org.uk/cgi-bin/publications.cgi?publications
- Community benefits from wind power. A study of UK practice and comparison with leading European Countries, DTI 2005 www.dti.gov.uk
- Baywind Energy Cooperative www.baywind.co.uk

Cultural Heritage

- 2.46 The historic environment of Cumbria is one of the county's greatest assets. It includes a varied and beautiful landscape rich with a variety of monuments and diverse archaeology. The present landscape has been modified by man for over 10,000 years, helping to create the environment in which we live and work today. Archaeological remains could be vulnerable to destruction from wind energy schemes. When scoping and designing such development consideration needs to be given to potential effects on cultural heritage and the historic environment.
- 2.47 Designations of international and national importance currently include the World Heritage Site, Frontiers of the Roman Empire: Hadrian's Wall, St Bees Heritage Coast, North Pennines GeoPark, Grade I, II and II* listed buildings, conservation areas, registered historic parks or gardens, scheduled ancient monuments, and registered historic battlefields. The Lake District is currently under consideration for nomination as a World Heritage site and the National Parks and Areas of Outstanding Natural Beauty have cultural associations also.
- 2.48 For international and national designations and settings, schemes need to demonstrate that they would not compromise the objectives of the designation. If

any significant adverse effects on the qualities of the designation are identified the scheme would only be considered favourably if the harm is outweighed by an overriding need to meet local infrastructure needs and cannot be sited elsewhere, which is sited to minimise environment impacts and meets a high standard of design.

- 2.49 This guidance does not identify buffer zones around any international or national designations, but development proposed close to the boundaries of these designations will need to assess their effects on the their settings, including views associated with registered historic parks and gardens. Although PPS22 prevents the identification of buffer zones around international and national designations, World Heritage Sites can be more formally defined than other designations. This is the case for Frontiers of the Roman Empire: Hadrian's Wall which has been mapped and is linked to the Site's inscription on the World Heritage List. The effects of any scheme must be considered against this defined setting.
- 2.50 Experience suggests there is often flexibility in the design and siting of wind energy schemes which provides the opportunity to avoid direct damage to archaeological remains. However, when considering such issues, all other issues identified in this part of the guide also need to be taken into account. Any development should consider the effects it may have on the following aspects as part of the design and environmental assessment processes:
- Archaeological remains
 - Historic structures and buildings
 - Designed landscapes
 - Historic character and associations with the wider landscape
 - Designated and undesignated sites and areas
 - Effects on settings of significant designated and undesignated sites and areas
 - Effects on cultural landscapes such as National Parks and Areas of Outstanding Natural Beauty
- 2.51 Effects may occur through direct damage to any underlying archaeology from turbine foundations, access tracks, substation buildings and other associated structures. Development could also affect the settings of historic sites and compromise the visual amenity of a landscape. Due to the nature of wind energy developments they are often sited in open countryside, in high or exposed locations. Such areas may well be valued for their wildness, remoteness, tranquillity or well preserved historic remains and effects on these need to be assessed. Cultural features form part of the sensitivity analysis in the landscape capacity assessment in Part 2.
- 2.52 Developers are encouraged to contact the County Council's Historic Environment Records Section at an early stage of design to determine the extent of archaeological value of a site, and any potential impacts on the settings of historic buildings/remains/gardens and the wider landscape. In due course information will also be available from the Historic Landscape Characterisation work that is currently being undertaken.
- 2.53 In areas where particular sensitivities are expected, an archaeologist or historic specialist should form part of the design team and detailed surveys may be required. The EIA process, where required, should include an archaeological desk-based assessment of all the available documentary sources for the site together with a walkover survey. Depending upon the results of these surveys, it may also be appropriate to undertake an archaeological field evaluation comprising the

excavation of a series of trial trenches or the archaeological monitoring of any geotechnical test pits that may be dug, to allow for a fuller consideration of the presence/absence, nature, extent, quality and survival of archaeological remains within the development area. The design and siting of a scheme should avoid internationally and nationally important historic sites. If this is not possible mitigation measures will need to be explored. Conditions are likely to be attached to wind energy developments to ensure investigations are carried out during construction to record any archaeological value found on a site.

G6

An assessment of the effects of a proposal on international and national designations and their settings should be carried out. Negative effects should be reduced through appropriate mitigation.

2.54 Developers need to ensure they follow national guidance contained in:

- PPG15 Planning and the Historic Environment
- PPG16 Planning and Archaeology

These can be found at www.communities.gov.uk

2.55 Developers should also follow good practice advice contained in:

- Frontiers of the Roman Empire: Hadrian's Wall Management Plan www.hadrians-wall.org/WHS_management.aspx
- Wind Energy and the Historic Environment, English Heritage 2005, www.helm.org.uk

Highways and Rights of Way

2.56 The highways considerations associated with wind energy development are largely similar to those considered for other development. However, as stated in the design section later on in the guide, access to a site is an important consideration to ensure that the local network of roads can accommodate the large vehicles needed to transport the turbine components. Any scheme will need to satisfy the Highway Authority that it is acceptable.

2.57 An assessment of the full route to be used, including the site access, needs to be carried out in order to ensure that the road network can accommodate the loads and, where necessary, identify any measures that might be required. When considering such measures from a highway point of view consideration should also be given to any nature conservation interest on the route and landscape and visual effects. Cumbria has an extensive network of roadside verges of special nature interest and any effects on these should be assessed. More information on the roadside verges can be obtained from Cumbria County Council.

2.58 For public rights of ways care should be taken to ensure an adequate distance is provided between them and turbines. Fall over distance of a turbine is often considered an appropriate distance, but consultation with the local authority should be carried out to determine what is most appropriate on any scheme. The British Horse Society has recently issued new guidelines for bridleways that developers should take into account in any discussions.

G7

A formal transport assessment should be carried out for the route to a site and its access. When determining any improvement measure consideration should be given to biodiversity and landscape and visual effects.

The effect on all rights of ways and open access land should be considered and turbines should be sited at an appropriate distance from them.

Landscape and visual

- 2.59 Landscape and visual effects need to be considered when developing a wind energy development. Effects will vary depending on the size and number of turbines in a scheme, its location, the landscape characteristics and the sensitivity of view points or visual receptors. Effects may be minimised through careful siting and design.
- 2.60 This guidance contains detailed information on landscape and visual effects in Part 2. This level of guidance is included to provide an objective study on landscape capacity for the County and to ensure a strategic view can be taken on issues that can have an effect over several kilometres and a variety of landscapes.

Local Amenity

- 2.61 Noise and visual effects are widely agreed to be the main planning related issues that need to be considered with regard to local amenity. As visual effects are dealt with in more detail in Part 2, this section will only consider the issue of noise. Other local amenity issues could include shadow flicker and electromagnetic radiation, but any effects arising from these are rare and developers are guided to PPS22 Companion Guide for more advice on dealing with such issues.
- 2.62 Noise is produced from wind turbines in two ways:
- mechanically from the internal gearbox and generator, and
 - aerodynamically from the passage of the blades through the air.
- 2.63 Although it is commonly perceived that noise will cause an adverse impact on local amenity, well specified and designed schemes can be sited with sufficient distance from noise sensitive development to ensure increases in ambient noise levels are acceptable. Improvements in technology have significantly reduced the level of mechanical noise produced. The noise associated with most wind energy developments is usually low, and has been likened to the noise of wind in trees¹¹. It is also widely agreed that there will always be some background noise, even in rural areas, from farm machinery, local traffic, animals, the wind interacting with trees, and buildings etc.
- 2.64 When considering a proposal, developers should identify any noise sensitive development, such as residences, or quiet leisure based businesses, and carry out a noise assessment to determine whether or not there might be any potential impacts on them. In most cases, turbines can be sited at a suitable distance from such development so as not to cause undue harm. If this is not the case, developers should carry out design alterations to mitigate any unacceptable noise impacts. If necessary, the local planning authority may attach conditions to the consent for a scheme to ensure noise limits are not exceeded.
- 2.65 A noise assessment should be carried out against any existing background noise, in accordance with advice in the Companion Guide to PPS22 and ETSU-R-97 on

¹¹ PPS22 Companion Guide, P168, ODPM 2004

'The Assessment and Rating of Noise from Wind Farm'.¹² If, in the future, revised guidance is issued by the UK government on the assessment of noise, any development will be expected accord with this.

- 2.66 If consultation with the local community identifies that noise is a significant concern for a local community, developers could consider taking community members to visit one of the operational schemes in Cumbria.

G8

When determining the siting and design of turbines the proximity of noise sensitive developments must be considered along with appropriate mitigations to ensure that any turbine generated noise is at an acceptable level with other background noise.

A noise assessment must be carried out to ensure that any turbine generated noise is at an acceptable level with other background noise.

Developers must accord with guidance in

- PPG24 Planning and Noise
- The assessment and rating of noise from windfarms, ETSU-R-97, DTI:
<http://www.dti.gov.uk/energy/page21743.html>

More good practice advice can be found in the following resources:

- Guidelines for Community Noise World Health Authority:
www.who.int/docstore/peh/noise/guidelines2.html
- Health and Safety Executive Noise information: www.hse.gov.uk/noise

Local Economy

- 2.67 Consideration needs to be given to the local economy when developing a wind energy scheme. There is a diverse economy across Cumbria. Traditionally it has been characterised by manufacturing, agriculture, food processing, energy production, tourism, mining and quarrying. Some of these sectors, such as agriculture and manufacturing are in decline, but still make a significant contribution to the economy, whilst the service industries continue to grow.
- 2.68 Within Cumbria, economic benefits could arise for both the declining manufacturing and agricultural industries. Farmers could raise income from selling or renting land to commercial developers or by providing land for a community wind energy scheme. The manufacturing industries could benefit from providing components for the construction and maintenance of schemes. This has already been the case with the first offshore scheme near Barrow.
- 2.69 However, concerns are often raised by the local community with regard to potential adverse impacts on the local economy, and in particular the tourist economy. This accounted for 18% of total employment in 2005 and reflects Cumbria's high quality environment, landscapes and natural beauty. Concerns are often cited that any adverse impact to landscape character and visual quality could result in less people visiting Cumbria. Research is available to suggest that wind development could bring positive and negative benefits to tourism, however there is currently no evidence to suggest that the existing wind energy schemes in Cumbria, some of which have been built for a decade, have had a significant adverse economic effect on the tourist industry.

¹² And any subsequent revisions to this following research being undertaken by DTI in 2007 on the effects of aerodynamic modulation and health.

- 2.70 Consideration should also be given to employing local labour and using locally sourced and recycled materials, particularly for the construction of bases, access roads and other ancillary features. Investment could also be made in training the local workforce to help maintain developments over time. It is accepted that the interpretation of EU rules when tendering a scheme prevent a local preference, but steps should be taken to ensure local businesses are invited to tender for relevant aspects of a scheme.

G9

Developers should demonstrate the advantages and disadvantages for the local economy taking into account the local characteristics of the area and economy.

More advice on local resources can be found at:

- Envirolink North West www.envirolinknorthwest.co.uk/

Soils and Hydrology

- 2.71 Developers should consider the effect a scheme might have on the soils, hydrology and water quality of a site and its surrounding watercourses. Cumbria has areas of soils that can be easily harmed, be made unstable and that can take a long time to regenerate, such as peat. Disturbances to peat can release CO₂ into the atmosphere, however studies have shown that it is unlikely that this would be greater than the CO₂ saved by renewable energy production¹³.
- 2.72 Proposals that are being developed in areas with sensitive soils would need to demonstrate any harmful impacts and should avoid areas with such soil if they are identified as being of principal importance for the conservation of biodiversity¹⁴. It is important not to cause significant harm to the integrity of local watercourses as this could create harm to nature conservation interests in the vicinity of a proposal. Care needs to be taken when assessing such issues and should be included as part of the EIA or planning statement.

G10

Consideration should be given to effects on soils, hydrology and water quality in and around a site.

Development should avoid harming soils, hydrology and water quality that would negatively affect habitats of principal importance for the conservation of biodiversity, or other protected species or habitats.

Telecommunications

- 2.73 Developers need to consider the effects a scheme might have with radio signals, local TV reception and telecommunication systems as they have the potential to cause interference. This includes systems used by the police and emergency services.
- 2.74 Disturbance to TV reception may arise, particularly if wind turbines are sited between buildings and the local transmitter. Developers need to establish if this is likely to be the case and provide mitigation measures to reduce any negative impact. These might include the provision of satellite, cable or a more sensitive antenna to householders affected, repositioning of antennae to receive from a different source emitter, or the installation of a community re-broadcast facility. As technology advances and transmissions switch to digital TV then this issue may

¹³ Peat, Carbon Dioxide Payback and Windfarms, Renewable Energy Foundation, 2006

¹⁴ The list of habitats is available at www.defra.gov.uk/wildlife-countryside/habitats/habitats-list.pdf.

reduce further.

- 2.75 Many telephone and other communications systems rely on microwave radio links. These can be affected by wind turbines. The Office of Communications (OfCom) has information on licensed telecommunication systems and protects radio systems against interference. At the start of a scheme, developers are expected to contact OfCom to establish what systems might be affected by their proposal. Developers are also expected to contact all operators including the emergency services, such as police, ambulance, coastguard, fire and mountain rescue services, in an area to determine potential impacts and provide evidence of this to the local planning authority. Operators may impose a clearance zone around their systems or require re-routing to prevent interference. Generally careful micro-siting can mitigate against such impacts. Often the repositioning of a turbine by a few hundred metres can remove the interference. If this is not feasible, developers may be able to pay for the re-routing of a signal around a development. Conditions are likely to be attached to any consent to ensure the above issues are addressed during the construction phase. However, if negative impacts cannot be mitigated against it is unlikely approval will be given for a scheme. Again, as communications systems switch to digital links this issue may reduce.
- 2.76 There is often scope for the design and layout of a scheme to be amended to mitigate any adverse effects that might be identified from a technical evaluation of a site. However, care needs to be taken to ensure that other environmental impacts, and particularly landscape and visual impacts, are considered in tandem to this. Past experience has shown that technical constraints such as this often dictate the overall design and layout without equal regard being given to landscape and visual impacts, biodiversity and cultural heritage.

G11

Developers should contact OfCom at the outset of a project to determine any effects on telecommunications operators. This will assist with decisions on the final siting and design of a scheme and help identify any mitigation necessary.

Further guidance can be obtained from Ofcom by contacting windfarmenquiries@ofcom.org.uk

PART 1

SECTION 3

GUIDELINES FOR CUMULATIVE EFFECTS

3 Guidelines for Cumulative Effects

The importance of cumulative effects

- 3.1 Cumulative effect is a complex issue that will be increasingly relevant to the assessment of wind energy schemes. As there are already a number of wind energy developments across Cumbria, it is likely that increasing significance will be attached to cumulative effects in the future.
- 3.2 Although the geographic distribution of schemes in Cumbria is becoming more widespread (see Map 2), the focus of more and larger developments towards areas that have the best wind resource and the fewest technical constraints continues particularly across the Solway Basin/ West Cumbria and in Furness. Recent trends suggest that interest will increase in the Lune and Eden Valleys and around the Lake District National Park boundary. The combined effect of onshore schemes with offshore schemes also needs to be considered in coastal areas. Cumulative effects should also be considered with neighbouring areas outside Cumbria.
- 3.3 Cumulative effects may present an eventual limit to the extent of wind energy development in particular areas. PPS 22 firmly states the need to take account of cumulative impacts and it notes that: “*Such impacts should be assessed at the planning application stage and authorities should not set arbitrary limits in local development documents on the number of turbines that will be acceptable in particular locations*”. Such effects would need to be demonstrated. The case could arise where it can be demonstrated that cumulative effects are unacceptable and may, on its own, provide sufficient justification to refuse a scheme that is otherwise acceptable. Equally it could be demonstrated that new proposals could be located in proximity to other schemes without causing adverse cumulative effects.
- 3.4 The consideration of cumulative effects can only be undertaken on a case by case basis in the light of existing baseline conditions, accurate descriptions and visualisations of effects on key receptors, and relationships with other developments. These are impossible to predict at a broader level. This Guidance does not stipulate separation distances or the number of schemes that might be accommodated in the County as these are likely to vary depending on the details of a scheme and the issue being considered, such as landscape character or nature conservation interest.

What are Cumulative Effects?

- 3.5 Cumulative effect may occur as a result of more than one scheme being constructed and is the combined effect of all the developments, taken together. This may be in terms of their effect on landscape and visual amenity, bird populations and other wildlife, the historic environment, the local economy or any other matter. This section provides general advice that applies to a range of issues. More detailed advice on landscape and visual cumulative effects is contained in Part 2.
- 3.6 Where a scheme is being proposed in an area with another proposed, consented or operational scheme a cumulative assessment should be carried out to determine the overall effect on issues such as landscape character, visual amenity and nature conservation interest.
- 3.7 Scottish Natural Heritage has developed considerable experience in dealing with the cumulative effects of wind energy development and has published guidance dealing with this issue¹⁵. An earlier version of this informed the Companion Guide to PPS22¹⁶ and it is considered appropriate to draw on definitions from both of these sources. The advice in this section should be used to guide any cumulative impact assessment

¹⁵ Scottish Natural Heritage Guidance: Cumulative Effect of Windfarms, Version 2 revised 13.04.05
¹⁶ Planning for Renewable Energy: A Companion Guide to PPS22, ODPM 2004

carried out by developers.

G12

The cumulative effects should be assessed for all relevant planning issues set out in section 2:

- **Within an area already containing one or more operational or approved developments**
- **As an extension to an operational or approved development**
- **At the same time as one or more other developments are being proposed through a planning application within an area.**

Cumbria's experience

- 3.8 During the last decade the wind resource in and around Cumbria has been tapped by over 20 on and offshore schemes. There has been a marked clustering of schemes in areas with the highest wind resource, but this may change in the future as technology enables schemes to be built in areas with lower wind speeds. The following text highlights the range of issues that might need to be assessed as new scheme come forwards in these areas.

Solway Basin and West Cumbria

- 3.9 Across the Solway Basin and West Cumbria coastal belt considerable interest has focused on a sequence of landscape types from coastal margins and urban fringe through low rolling farmland to moorland and upland fringes. Cumulative issues affect landscape and seascape character across a substantial area between Carlisle and Whitehaven, some 50km long. A total of ten onshore schemes (61 turbines), from twin turbine to small wind farm size, have already been built or have planning approval. In addition there are seascape character effects arising from these and a scheme of 60 turbines, 12km offshore, at Robin Rigg. Several more onshore schemes are currently under consideration with scoping opinions being sought from prospective developers. . In a recent appeal decision the inspector recognised the perception that the Solway, on and offshore, is playing host to a significant number of wind turbines and “approaching the stage where the character across a number of types is shifting towards a distinct change”¹⁷. Some argue for a broader policy look at the environmental capacity of this area bounded by highly sensitive landscapes and nature conservation areas and species of international and national value, such as Frontiers of the Roman Empire: Hadrian’s Wall World Heritage Site, the Solway Coast AONB, Lake District National Park, St Bees Heritage Coast, Special Areas of Conservation, Special Protection Areas and protected species such as Hen Harriers.
- 3.10 Multiple developments across this area also raise issues of cumulative effects on visual amenity in respect of residents and tourists. Lower lying parts are heavily populated with a dense pattern of settlements and there is a need to ensure that schemes do not become too dominating or overbearing. The setting of Workington, already substantially surrounded by turbines, is an obvious example of this. However the sense of scale and character of smaller settlements and amenity of residents within them could be vulnerable. The experience of tourists in terms of both sequential views from routes such as Cumbria Coastal Way as well as static viewpoints from resorts, holiday parks and viewpoints need consideration. Prospects from popular open or elevated routes and viewpoints are particularly sensitive such as Hadrian’s Wall Trail and outer fell tops within the Lake District National Park.

¹⁷ Appeal Decision APP/G0908/A/05/1172183: Land at High Pow Farm, Bolton New Houses, Wigton

3.11 The high wind resource and proximity to the 33kv power lines provide good technical conditions for wind energy development along the coast. Developers will need to consider how best to design and site new schemes to be compatible with the characteristics of older schemes.

3.12 Issues that will need careful consideration by developers include:

- capacity for character change
- effects on international and national designations including landscape, nature and historic environment
- settings of international and national designations
- whether developments are overbearing/dominant
- effects on residents and visitors
- compatibility of small and larger newer turbines
- seascape character effects

Furness

3.13 In Furness the existing onshore pattern is a more clustered one focused on the open coastal urban fringe and moorland areas of this exposed peninsula, covering an area approximately 25km across. A total of five onshore schemes (32 turbines), of up to small wind farm size, have been built. A 30 turbine scheme is operational 7km offshore from Barrow and another hybrid gas and wind scheme has consent 7km off Walney Island. Three more offshore schemes are under consideration around 14.5km offshore, and interest in onshore schemes is set to continue. Cumulative effects that should be considered include skyline clutter, seascape capacity and effects on bird interests linked to the international and national nature conservation interests in the area. The coastal horizon naturally draws the eye in any peninsula landscape and onshore schemes on the coast, together with large offshore schemes, could result in a substantial portion of the horizon being developed. Any further schemes on the open moorland need to make sure they don't compromise the positive functional and sculptural image of the existing developments which are sufficiently spaced to form distinctive focal points in this open landscape. Picturesque estuarine compositions with fells in the Lake District National Park could be vulnerable as well as the sense of remoteness and wildness of dune belts and moorland.

3.14 Multiple developments here also raise the issue of cumulative effects on the visual amenity of residents and visitors. In an area striving to develop its tourism potential cumulative effects on views from popular coastal routes and attractions as well as the southern gateway into the Lake District National Park need serious consideration.

3.15 Issues that need careful consideration by developers include:

- effects on international and national designations including landscape, nature and historic environment
- settings of international and national designations
- effects on tourist experience
- skyline clutter
- maintaining sense of remoteness
- maintaining spacing between existing on/offshore schemes

- seascape character impacts

Lune Valley

3.16 Interest has also focused on the South Cumbria Low Fells with a string of applications west of the Lune Valley, and increasingly west of the Eden Valley. So far only one scheme has been successful on the fringes of the Lune Valley; 5 turbines at Lambrigg Fell. Further interest in this area is expected. The area of potential cumulative effects extends across the county border into Lancashire, stretching approximately 40km in total between Tebay and the existing development on Caton Moor, near Lancaster. Again skyline clutter is a key cumulative issue in the open receiving fells and moorland areas. Valley rims are especially sensitive in relation to scenic and relatively tight valley landscapes of the Lune and the setting of villages and towns within it such as Tebay, Sedbergh, Kirkby Lonsdale. Consideration of cumulative effects on the sense of remoteness and unspoilt qualities of the receiving uplands and the setting of adjacent national parks and prospects from them is also essential. This includes the views westwards from the Howgill Fells within the Yorkshire Dales National Park. This area also includes international and national nature conservation interests that should be considered.

3.17 Issues that need careful consideration by developers include:

- effects on international and national designations including landscape, nature and historic environment
- settings of international and national designations
- skyline clutter
- sensitivity of valley rim
- sense of remoteness

Greystoke and Inglewood

3.18 There has been growing interest recently in the area of limestone foothills and intermediate farmland fringing the north-eastern fells of the Lake District National Park. Two schemes at Lamonby and Skelton are awaiting decisions. Apart from the busy M6 and A66 corridors, along the western and southern boundaries, this area is relatively unspoilt with a peaceful backwater quality. Multiple developments could compromise these rural qualities. In the Inglewood area there may be some opportunity to complement repetitive patterns of geometric fields and shelterbelts. Developments might also correspond to character and occasional occurrence of other manmade verticals, such as the Skelton masts and electricity pylons, provided adequate separation ensures they have a simple image and visual conflicts of form and pattern with these existing verticals are avoided. However multiple developments across the more open and elevated foothills around Greystoke raise issues of visual clutter. Cumulative effects in respect of tourism and recreation should also be considered. Sequential views from the A66 north eastern 'gateway' into the northern Lake District National Park and the coast to coast national cycle route (NCR 71) demand consideration.

3.19 Issues to be considered include:

- effects on international and national designations including landscape, nature and historic environment
- settings of international and national designations
- relationship to repetitive patterns

- visual clutter
- impacts on recreation and tourism

Other areas within Cumbria

3.20 Although the above areas reflect the current experience of wind energy development in Cumbria it does not refer to all land within Cumbria. However, if in the future development extends beyond the above areas cumulative effects will need to be addressed in relation to both landscape and visual effects and other environmental, social and economic effects. The issues highlighted above may be relevant to these other areas, and other issues may become important.

Judging the acceptability of cumulative effects

- 3.21 This guidance does not seek to set thresholds that determine when cumulative effects are unacceptable. The local planning authority will need to make a judgement for each individual scheme following careful consideration of the information provided by a developer. When judging acceptability of a new proposal it is crucial to determine the “threshold” beyond which wind energy developments in a particular area become unacceptable. In other words, although the effect of a single scheme is limited, when added to the effect of other schemes in the area, operational, approved or proposed, it creates unacceptable cumulative impacts¹⁸. This information should be included as part of the Environmental Impact Assessment, where relevant, or be set out in a planning statement.
- 3.22 In order to meet government targets for renewable energy and help reduce negative climate change impacts multiple schemes may need to be accepted as a defining characteristic in some of Cumbria’s landscapes. However, landscape and visual effects, effects on certain bird populations, such as Hen Harriers, and other planning issues might limit the amount of wind energy development that can take place in some parts of Cumbria, unless overriding social, economic or environmental benefits are demonstrated.

G13

The limiting threshold for cumulative effects and wind energy developments should be based on a well-considered judgement informed by analysis of:

- **Degree or magnitude of change to an area, feature or species and the nature of the potential change reflecting the inherent sensitivity of the effected area, feature or species.**

¹⁸ Scottish Natural Heritage Guidance: Cumulative Effect of Windfarms, April 2005

PART 1

SECTION 4

GUIDELINES FOR SITING AND GOOD DESIGN

4 Guidelines for Siting and Good Design

Why is this important?

- 4.1 It is important for any scheme to take into account the full range of issues associated with wind energy development when determining site selection and the best design for a proposal.
- 4.2 The process of site selection, design and mitigation should be an iterative process informed by and responding to an ongoing environmental assessment. The full range of planning issues set out in section 2 should be considered by a developer, alongside economic and technical requirements from the outset of a project and throughout each stage of its development. However, economic and technical issues associated with wind energy development, such as the wind resource in the area and the cost of developing a project, are not material planning considerations and would not be taken into account when making a decision.
- 4.3 Part 2 provides more detailed guidance on siting and design with regard to landscape/townscape character and visual characteristics. It is considered important to focus on the landscape and visual impacts of wind energy developments in more detail due to their unique characteristics:
- prominently vertical,
 - significant movement
 - relative unfamiliarity in parts of Cumbria.

They are frequently located in open areas where they are highly visible and it is normally unrealistic to seek to conceal them. Individually or in groups, they will create distinctive features in the landscape.

Site Selection and Initial Sizing

- 4.4 When appraising a potential site's suitability and to help determine the most appropriate size and number of turbines it could accommodate the following issues will be considered by a developer at the outset:
- Can the site fit sufficient wind turbines to optimise energy production?
 - Is the site windy enough?
 - Is there grid infrastructure near the site?
 - Will large delivery vehicles be able to gain access to the site?
 - Is there enough distance between a site and dwellings, rights of way, roads?
 - Are aircraft, radar and telecommunications issues likely to arise?
 - Are there archaeological designations/sensitivities associated with the site?
 - Are there ecological designations/sensitivities associated with the site?
 - Are there landscape designations/sensitivities associated with the site and what is the landscape capacity?

The first three issues listed above are important technical issues that the developer will need to consider when determining the viability of a site. However, they are not relevant planning issues and will not be considered by the planning authority when it assesses an application. The effect of the development on the other issues will be considered fully by the planning authority.

G14

Developers should confirm the acceptability of a specific site and the appropriate size and number of turbines through a preliminary analysis of technical, environmental and local amenity issues.

Infrastructure and Ancillary Development

- 4.5 Infrastructure and ancillary development, including road access, foundations, transformers and substation buildings, fencing and electrical connections could effect a range of environmental issues. Sensitive vegetation and soil types such as heather, semi-natural grassland or peat may not readily recover from construction disturbance and could be vulnerable in both ecological and landscape terms. On sensitive soils such as peat ongoing consequences may arise from erosion or disruption to the integrity of natural drainage patterns.

G15

The effects of infrastructure need to be assessed as part of the overall design process in response to findings of more detailed environmental assessment.

Road access

- 4.6 Road access to a site needs to be able to accommodate trailers carrying the longest loads (blades are up to 45m long) as well as the heaviest and widest loads (generally cranes of 30 tonnes plus). In some rural locations these requirements can lead to significant 'indirect' impacts through the need to widen lanes (typically to 6m) or ease bends, necessitating in some cases the removal of boundary features such as stone walls or hedges or loss of roadside verges. These alterations may be left in place for the life span of the development or conditions may seek temporary remediation as there will be a requirement to reach the site for decommissioning, and possibly for repairs in the case of major component failure. This aspect should be considered at the start of the project.

G16

The effects of changes to roads and site access should be assessed throughout the lifetime of the development (construction, operation and decommissioning). Detail the nature and lifespan of any modifications to existing roads in the planning application and Environmental Statement.

- 4.7 On-site access tracks need to be constructed carefully, but need to meet the same weight and dimensional requirements as above. They are typically 5-6m wide. It may be possible to reduce some in width after construction (typically to 3-4m) sufficient to facilitate light maintenance vehicles however full width will inevitably be required as described above. Effects are likely to be greater where they have to negotiate steep slopes requiring zig zag routes, cut and fill and drainage channels above the track; or on cross wet marshy ground where more extensive foundations are likely to be required. They are also likely to be more visible in open featureless landscapes such as moorland. Access points to sites require large bell mouth entrances and appropriate visibility splays which will often involve the realignment of hedges or walls. Consideration of archaeology, ecology, hydrology and landscape and visual effects must also be taken into account as part of the design, during construction and the decommissioning phases of any development. Issues such as surface water run-off, negative impacts on sensitive soils and vegetation could be affected by a scheme.

G17

The effects of on-site access should be assessed throughout the lifetime of the development (construction, operation and decommissioning).

Bases

- 4.8 All wind turbines need to be mounted on reinforced concrete bases. These are likely to be left in situ once the development is decommissioned. As turbines become larger, these bases have increased in size and are now typically around 16-17m in diameter by 2-3m deep. Temporary features include a construction compound and hard standings next to each turbine which act as bases during turbine erection and component lay down areas (typically 50 x 50m). Although temporary they still have implications on sensitive soils and vegetation.

Transformers/Substations

- 4.9 Ancillary elements have the potential to compromise the design of a development and care is needed to minimise adverse effects on biodiversity and cultural heritage that might be associated with a site.

Electrical connection

- 4.10 Responsibility for the routing and design of the electrical connection from the site sub-station to the local electricity distribution network lies with the electricity Distribution Network Operator (DNO). This will be achieved by overhead power lines mounted on single or double poles or by lines laid underground. Since the latter are 6-20 times more expensive¹⁹ they may only be used for limited lengths or in special circumstances. The effects of connections should be regarded as material to the overall scheme design. Under grounding such power lines is preferable in landscape and visual impact terms, however, other environmental effects must also be considered when determining the best approach to take for a scheme. Infrastructure and ancillary developments should be carefully considered as part of the overall design of a scheme, using the following good practice principles:

G18

- **avoid sensitive soils and vegetation, eg peat bogs, heathers, grassland**
- **avoid changes with a negative impact on local hydrology**
- **provide construction and reinstatement method statements on sensitive sites**
- **integrate the layout with the grain of the topography/land patterns**
- **utilise existing tracks and access points**
- **minimise the length of tracks**
- **protect features such as trees or archaeological remains**
- **reinstate track verges with appropriate vegetation**
- **finish surface tracks to blend in with surroundings**
- **reduce extent and width of tracks after the construction phase**
- **remove tracks on decommissioning and reinstate appropriate vegetation**
- **locate and design ancillary elements in a way that minimises visual clutter**

¹⁹ Planning for Renewable Energy: A Companion Guide to PPS22, OPDM 2004

- utilise existing landform and vegetative cover to screen ancillary structures
- site and design the sub-station to appear as a simple element separated from the main development and characteristic of the receiving landscape
- enter into planning obligations to minimise the impact of consequential off-site electricity connections which could otherwise be severe

Mitigation, enhancement and compensation

- 4.11 Mitigation will primarily be achieved through careful siting and an iterative design process following the guidance above. However, in some cases it may not be possible to mitigate on site, and secondary mitigation measures may be employed to address residual impacts. These could include off-site planting to screen specific receptors or provide a compensatory habitat if a loss is likely as a result of a development. Experience has shown that wind energy developments present opportunities for enhancing both the development site and land outside the site, for example through restoration of hedgerows, stone walls and restoration and management of habitats such as heather moorland. When considering a planning application if appropriate mitigation, compensation or enhancement does not form part of the proposal, conditions may be attached to secure them and enable a development to go ahead.

G19

Consider environmental enhancement and compensation measures with reference to land management guidance set out in the Cumbria Landscape Strategy and, the Cumbria Biodiversity Action Plan.²⁰

Decommissioning and Site Restoration

- 4.12 Planning consent will require sites to be decommissioned following cessation of energy production. Restoration of a site should be considered as part of the decommissioning process. Details should be included within a planning application and should consider the pre development characteristics of the site and the landscape and nature conservation aims and objectives of the area.

G20

Consider restoration measures with reference to land management guidance set out in the Cumbria Landscape Strategy, the Cumbria Biodiversity Action Plan and other relevant guidance.²¹

²⁰ Cumbria Landscape Strategy, Cumbria County Council 1998, Cumbria Biodiversity Action Plan, Cumbria Biodiversity Partnership 2001.

²¹ Cumbria Landscape Strategy, Cumbria County Council 1998, Cumbria Biodiversity Action Plan, Cumbria Biodiversity Partnership 2001.

5 Description of a typical wind energy development and turbine

Wind turbines produce electricity by using the natural power of the wind to drive a generator. The wind is a clean, sustainable and free fuel source, it does not create emissions and it will never run out as it is constantly replenished by energy from the sun.

Wind energy development is characterised by one or more wind turbines. The average size of an onshore wind turbine installed in 2005 was approximately 2 MW. Wind turbines have an average working life of 20-25 years, after which the turbines can be replaced (repowering) with new ones or be decommissioned.

Utility scale turbines commonly average at between 70 – 125m in height when measured from the ground to the tip of an upright blade. The blades rotate around a horizontal hub. The hub is connected to a gearbox and generator, which are located inside the nacelle. The nacelle houses the electrical components and is mounted at the top of the tower. This type of turbine is referred to as a 'horizontal axis' machine.

An individual wind turbine will generate electricity for 70-85% of the time and its electricity output varies between zero and full output in accordance with the wind speed. The power available from the wind is a function of the cube of the wind speed. Therefore if the wind blows at twice the speed, its energy content will increase eight-fold. Turbines at a site where the wind speed averages 8 m/s produce around 75-100% more electricity than those where the average wind speed is 6 m/s.

Where there is more than one turbine, and particularly in a rural setting, they are linked together by access tracks. Ancillary infrastructure usually include crane hard standings during construction, a small single storey switch gear building, an anemometer mast to measure wind speed, and cables to transport the electricity to the electricity network.

Typical wind turbine features

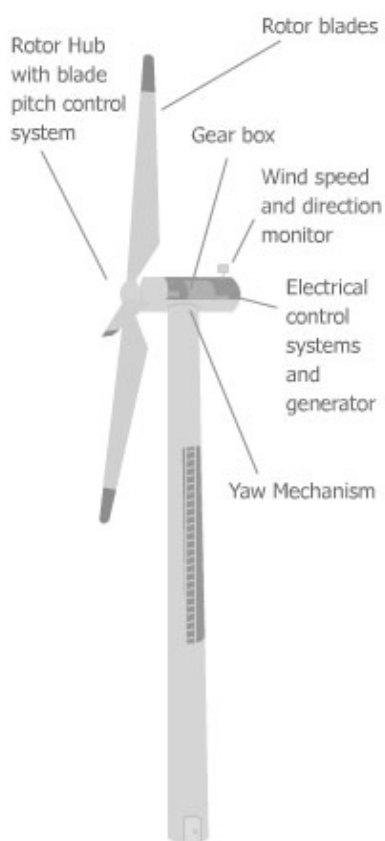


Figure 1 Diagram of a typical wind turbine

Rotor diameters range up to 80 metres, smaller machines (around 30 meters) are typical of the earlier turbines erected in Cumbria.

Blades are made of a fibreglass-reinforced polyester composite.

The blades can rotate at 10-30 revolutions per minute at constant speed, although an increasing number of machines operate at a variable speed.

Most wind turbines start generating electricity at wind speeds of around 3-4 metres per second (m/s), (8 miles per hour); generate maximum 'rated' power at around 15 m/s (30mph); and shut down to prevent damage at 25 m/s or above (50mph).

When the wind changes direction, motors turn the nacelle, and the blades along with it, around to face into the wind. The blades also 'pitch' or angle to ensure that the optimum amount of power is extracted from the wind.

Towers are mostly cylindrical and made of steel, though Lattice towers have been used in the past. Towers range from 25 to 75 meters in height. The height of the tower is usually referred to as height to hub.

Stand alone turbines usually range in capacity from a few hundred kilowatts to over 2 megawatts, with 5 Megawatt turbines in production. However, no power plant permanently operates at 100% of its capacity. The capacity factor of any power plant is the percentage of its generation against its theoretical maximum output. Were a 2MW turbine to be power limited to 1 MW; (becoming a 1 MW machine), the capacity factor would go up by 20%. The turbine however would deliver less energy, displace less carbon and have the same energy cost and environmental impact to build. Therefore, in the case of wind energy, where there are no fuel costs, capacity factor is not a reliable measure of efficiency.

The crucial parameter for energy output is the diameter of the rotor blades - the longer the blades, the larger the area 'swept' by the rotor and the greater the energy output.

Text adapted from information from the BWEA and the diagram is reproduced with its permission.

Map 1 Wind speed

Map 2 Wind development sites

Map 3, 4, 5 & 6 International & national wildlife sites

7 Glossary

Climate Change

A process of changes to weather patterns and temperatures largely caused by the emission of certain 'greenhouse gases' from earth, principally associated with the burning of fossil fuels.

CO₂ Carbon Dioxide

The main greenhouse gas formed by the combustion of all fossil fuels.

Compensation

The measures taken to offset or compensate for adverse effects that cannot be mitigated, or for which mitigation cannot entirely eliminate adverse effects.

Cumulative Effects

This is the result of more than one scheme being constructed and is the combined effect of all the developments, taken together. This may be in terms of their effect on landscape and visual amenity, bird populations, other wildlife, the local economy, tourism etc.

Energy Conservation

The reduction of energy consumed usually achieved by changing habits or patterns of use and not requiring significant investment.

Enhancement

To improve the quality of an area affected by a development.

Environmental Impact Assessment

The process used for describing, analysing and evaluating the range of environmental effects that are caused by a wind energy proposal.

Environmental Statement

The document supporting a planning application that sets out the findings of the Environmental Impact Assessment.

Greenhouse Gases

The six main gases contributing to climate change found in the upper atmosphere. They prevent some energy being re-transmitted into space. The gases include carbon dioxide CO₂, methane CH₄, nitrous oxide N₂O, hydroflourocarbons, perfluorocarbons and sulphur hexafluoride SF₆.

Landscape*

Human perception of the land conditioned by knowledge and identity with a place.

Landscape Capacity*

The degree to which a particular landscape character type or area is able to accommodate change without unacceptable adverse effects on its character. Capacity is likely to vary according to the type and nature of change being proposed.

Landscape Capacity Assessment

The process of describing, analysing and evaluating the landscape capacity of an area.

Landscape Character

A distinct pattern or combination of elements that occurs consistently in a particular landscape.

Landscape Character Classification

The process of describing, classifying and analysing the character of landscape reflecting the distinct pattern or combination of elements that occurs consistently in a particular

landscape.

Landscape Sensitivity*

The extent to which a landscape can accept change of a particular type and scale without unacceptable adverse effects on its character.

Landscape Value

The relative importance that stakeholders attach to a landscape for a variety of reasons including scenic quality, perceptual aspects such as wildness, remoteness or tranquillity that contribute to a sense of place, rarity, presence and influence of other conservation interests and special cultural associations.

Mega Watt

A watt is an electrical unit of power. A mega watt is a million watts.

Micro-generation

Very small scale power generation schemes, typically providing energy to a single household/office.

Mitigation

Measures, including any process, activity or design to avoid, reduce or remedy adverse effects of a development proposal.

Offshore

Location on the sea bed, below the mean low tide level, for a number of prospective renewable energy sources including wind, tidal and wave.

Ramsar Sites

Wetlands of international importance designated under the Ramsar convention 1971, which requires signatory countries to protect international important wetlands, especially those used by migratory water birds, and to use wetlands wisely.

Renewable Energy

Collective term for energy flows that occur naturally and repeatedly in the environment. It includes energy derived by the sun, such as wind, solar hot water, solar electric (photo-voltaics), hydro power, wave, tidal, biomass, biofuels, and from geothermal sources, such as ground source heat pumps. Energy from waste is not regarded as a renewable energy as it is not capable of being renewed by the natural ecological cycle.

Wind Energy Development

Development consisting of one or more wind turbines, access tracks, ancillary buildings, substation, anemometer masts and supporting infrastructure.

Zone of Visual Influence

The area within which a proposed development may have an influence or effect on visual amenity.

*As defined in the Glossary section of Guidelines for Landscape and Visual Impact Assessment 2nd edition, The Landscape Institute and Institute for Environmental Management & Assessment, 2002.

Abbreviations

AONB	Area of Outstanding Natural Beauty
BAP	Biodiversity Action Plan
CO ₂	Carbon Dioxide
EIA	Environmental Impact Assessment
LCA	Landscape Capacity Assessment
LDD	Local Development Documents
LDNPA	Lake District National Park Authority
MW	Mega Watt
PPS	Planning Policy Statement
RSS	Regional Spatial Strategy
SA	Sustainability Appraisal
SAC	Special Area of Conservation
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
SPD	Supplementary Planning Document
SPG	Supplementary Planning Guidance
ZVI	Zone of Visual Influence

8 Appendix 1

Policies relevant to the Supplementary Planning Document

Allerdale Borough Council, Cumbria County Council, Eden District Council and the Lake District National Park Authority have adopted this SPD against the following policies of the Cumbria Joint Structure Plan 2005-2016:

Policy R44:

Renewable energy outside the Lake District National Park and AONBs

Outside the Lake District National Park and AONBs proposals for renewable energy, including any ancillary infrastructure or buildings will be favourably considered if:

1. there is no significant adverse effect on the landscape character, biodiversity and the natural and built heritage of the area either individually or cumulatively through their relationship with other utility infrastructure,
2. there is no significant adverse effect on local amenity, the local economy, highways or telecommunications,
3. the proposal takes all practicable measures to reduce any adverse impact on landscape, environmental, nature conservation, historical and local community interests.

In considering applications for planning permission in relation to the above criteria, and other policies in this plan, the environmental, economic and energy benefits of renewable energy proposals should be given significant weight. There are additional requirements in the following cases:

Wind energy development

4. measures should be included to secure the satisfactory removal of structures/related infrastructure and remediation of land following cessation of operation of the installation.

New plant for the commercial generation of energy from biomass

5. shall be sited on existing industrial/employment sites or previously developed land that is well related to the resource catchment. Where practicable, measures to transport fuel and waste by water or rail shall be made.

Proposals for the recovery of energy from agriculture waste within existing farm units or sewage sludge

6. shall be well related to the activity, scale and character of the existing business enterprise and/or setting.

Policy R45:

Renewable Energy in the Lake District National Park and AONBs

Within the Lake District National Park and AONBs, proposals for renewable energy developments, including any ancillary infrastructure or buildings will be favourably considered if:

1. their scale, form, design, materials and cumulative impacts can be satisfactorily assimilated into the landscape or built environment and would not harm the appearance of these areas, and
2. they would not impact adversely on the local community, economy, nature conservation or historical interests.

In the case of wind energy, the development of more than one turbine or of a turbine with a ground to hub height of 25 metres or more is unlikely to be acceptable.

Carlisle City Council has adopted this SPD against policy CP8 of the Carlisle District Local Plan 2001-1016.

**Policy CP8:
Renewable Energy**

Proposals for any renewable energy will be favourably considered provided that all of the following criteria are satisfied:

1. there is no unacceptable visual impact on the immediate and wider landscape and townscape;
2. there is no adverse impact on biodiversity;
3. any new structures would be sensitively incorporated into the surrounding landscape/townscape and/or habitat and respect the local landscape character;
4. measures are taken to mitigate any noise, smell or other nuisance or pollutants likely to affect nearby occupiers, amenities and/or neighbouring land uses;
5. any waste arising as a result of the development is minimised and dealt with using a suitable means of disposal;
6. there would be no unacceptable levels of harm to features designated as of local, national or international importance;
7. adequate provision can be made for access and parking and the potential impact on the road network;
8. there would be no unacceptable conflict with any existing recreational facilities and routes;
9. there would be no unacceptable cumulative effects when proposals are considered together with any extant planning approvals or other existing renewable energy developments.

Copeland Borough Council have adopted this SPD against the following policies in the Copeland Local Plan

**Policy EGY 1:
Renewable Energy**

Proposals for any form of renewable energy development must satisfy the following criteria:

1. That there would be no significant adverse visual effects
2. That there would be no significant adverse effects on landscape or townscape character and distinctiveness
3. That there would be no adverse impact on biodiversity
4. That proposals would not cause unacceptable harm to features of local, national and international importance for nature or heritage conservation
5. That measures are taken to mitigate any noise, smell, dust, fumes or other nuisance likely to affect nearby residents or other adjoining land users

6. That adequate provision can be made for access, parking and any potentially adverse impacts on the highway network
7. That any waste arising as a result of the development would be minimized and dealt with using a suitable means of disposal
8. There would be no adverse unacceptable conflict with any existing recreational facilities and their access routes
9. That they would not give rise to any unacceptable cumulative effects when considered against any previous extant planning approvals for renewable energy development or other existing/approved utility infrastructure in the vicinity.

Developers are expected to actively consult with local communities in developing their proposals and to deliver significant benefits to the community where the scheme is to be sited wherever possible.

**Policy EGY 2:
Wind Energy**

Proposals for wind energy developments will be considered against the criteria of Policy EGY 1 with the additional requirement that:

There would be a scheme for the removal of turbines and associated structures and the restoration of the site to agriculture when the turbines become redundant.

South Lakeland District Council have adopted this SPD against the following policies of the South Lakeland Local Plan

**Policy C26
Wind Energy**

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

- (a) the proposal's energy contribution and other benefits outweigh any significant adverse impact on:
 - 1) the character and appearance of the landscape, nature conservation, archaeological or geographical interests;
 - 2) the amenity of residential properties by reason of visual impact, noise, shadow flicker or reflected light;
- (b) the proposal would not have a significant adverse impact on any nationally important landscape designation, including their visual amenity and setting;
- (c) the proposal would not cause significant damage to a site of international or national nature conservation importance;
- (d) effective measures are available to overcome any significant electromagnetic interference to transmitting or receiving equipment;
- (e) all power lines 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 cumulative effect of the proposal, with existing, permitted or other proposed wind energy schemes, should not have a significant adverse impact on the character and

appearance of the area;

- (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.

Policy C31

Cumulative Impact of Renewable Energy Projects

Assessments of new proposals for renewable energy developments shall take account of the cumulative effect of the development on the area if other similar renewable energy projects have been permitted within the same area.

