People and Planning Alnwick Local Development Framework

Planning for Renewable Energy
Supplementry Planning Document

Adopted November 2009



Northumberland County Council

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Appendicies

1 Introduction

Purpose of the SPD

1.1 This Supplementary Planning Document (SPD) forms part of the Alnwick Local Development Framework (LDF) and should be read in the context of the other Development Plan Documents (DPDs) specifically the core strategy. The SPD has statutory weight and is a material consideration in the determination of planning applications.

1.2 The purpose of the SPD is to provide detailed guidance to support the positive implementation of the LDF Core Strategy Policy S21 in relation to renewable energy.

Policy S21 Renewable Energy

Proposals for the generation of all types of renewable energy will be supported within the district where the scheme:

a) is fully in accordance with the Regional Spatial Strategy for the North East;

b) has no adverse impact on communities, residential amenity, the local economy and land use or where the impact can be satisfactorily mitigated;

c) reflects the Alnwick district Landscape Character Assessment; and, in the case of a wind farm,

d) is within the landscape's capacity to accommodate change and neither individually nor cumulatively gives rise to a wind farm landscape.

Developers of schemes that provide wind energy development of medium scale will be encouraged to seek opportunities of development in the broad areas of least constraint identified on the key diagram. The wider environmental, economic and social benefits of all renewable energy projects will be given significant weight.

1.3 Whilst it does not identify specific locations where development will be acceptable, as this is beyond its remit, the SPD does offer clear guidance on locational principles.

1.4 The Core Strategy contains a number of policies that provide clear guidance for the location of new renewable energy developments and also in Policy S3 key sustainability criteria that would need to be met. These provide a clear framework that underpins this SPD.

1.5 Reference is made to the full range of potential renewable energy technologies in this SPD. However, in accordance with the conclusions of the North East Regional Renewable Energy Strategy (RRES), published in 2005, and to fulfil the requirements of Core Strategy Policy S21, one chapter of the SPD focuses specifically on the technology identified as having most potential in the short to medium term, namely onshore wind.

1.6 The Core Strategy promotes energy efficiency and requires major developments to source a minimum of 20% of their energy requirements from on-site renewable energy installations (Policy S22: Energy Efficiency). To support the delivery of micro (small scale) renewable generation, this document also makes reference to technologies such as solar panels, small scale wind turbines and photovoltaic cells.

1.7 The intended audience for this SPD includes renewable energy developers, statutory consultees for renewable energy applications, and other organisations and/or individuals who may have an interest in renewable energy developments, both at the specific site/application level and more widely.

1.8 The remainder of this introductory chapter explains the identified need for renewable energy developments in the context of climate change predictions, provides an overview of the relevant policy context, and provides further detail on the preparation and structure of this SPD.

The Need for Renewable Energy

Climate Change

1.9 Global climate change is widely recognised as being one of the greatest social, economic and environmental challenges facing the world today. Northumberland's climate is already changing. Over recent years, there has been an increasing number of extensive rainfall and flooding events; the period May-June 2007 was the wettest period since records began in 1766.[(1)] There is evidence that the area, currently within Northumberland that is vulnerable to flooding, will extend and impact on many more householders and infrastructure than current flood maps indicate.[(2)] An increase in storm surge levels is also predicted which could lead to increased coastal erosion, over-tipping, breaching of defences and resultant tidal flooding inland.[(3)]

1.10 One of the principal causes of climate change is a rise in the concentration of carbon dioxide (CO2) and other greenhouse gases in the atmosphere, a major contributor being the use of fossil fuels to generate electricity.

1.11 Action is needed now to reduce CO2 and other greenhouse gas emissions. The Government has developed a strategy for tackling climate change that, with respect to energy, takes a comprehensive approach to:

- minimising the demand for energy;
- increasing energy efficiency;
- developing renewable energy sources;
- developing cleaner energy sources.

1.12 The spatial planning system has a key role to play in delivering both mitigation and adaptation measures to tackle climate change by assisting in minimising the demand for energy and by supporting new renewable energy production, in appropriate locations, both at the commercial and 'micro' scales.

1 Northumberland Strategic Partnership (December 2008) *The Heat is On: The Strategic Framework for Climate Change Planning in Northumberland.*
2 Sustaine and UKCIP (May 2008) *The North East Climate Change Adaptation Study*
3 Northumberland Strategic Partnership (December 2008) *The Heat is On: The Strategic Framework for Climate Change Planning in Northumberland.*

The Role of Renewable Energy

1.13 Renewable energy is the term used to describe energy flows that occur naturally and continuously in the environment, such as energy from the wind or sun. These sources are not depleted by being used.

1.14 Renewable energy has an important role to play as an alternative to energy generation using fossil fuels. The environmental, economic and social benefits of renewable energy schemes are important considerations when considering applications for such schemes.

1.15 The environmental benefits of renewable energy are linked mainly to the contribution it can make to responding to climate change. Without action, climate change will jeopardise wildlife, habitat integrity, the landscape and human activities across the UK, including Northumberland. In addition to powering homes, buildings and businesses, renewable energy can also bring about social and economic benefits through job creation in the manufacturing, construction and maintenance industries. The renewable energy sector in Northumberland has already contributed to new work for local companies. Renewable energy schemes can also support rural diversification, providing an opportunity for farmers to sell or rent land to commercial companies or support community-owned renewable energy projects, and can provide educational opportunities.

1.16 Careful consideration, however, also needs to be given to likely adverse effects that may arise from renewable energy schemes. Schemes need to be well designed, reflect local circumstances and demonstrate how any environmental, social, resource and economic impacts have been minimised through careful site selection, design, construction and other measures. These are also 'material planning considerations' and as such, will need to be addressed on a site-by-site basis.

The Policy Context for Renewable Energy

International Policy

1.17 At the United Nations Framework Convention on Climate Change at Kyoto, the UK made legally binding commitments to reduce its greenhouse gas emissions during 2008-2012. In 2007, European Union (EU) leaders agreed to adopt a binding target requiring 20% of the EU's energy (electricity, heat and transport) to come from renewable energy sources by 2020. Following this agreement, the European Parliament officially approved a new Renewable Energy Directive in December 2008.[4] The Directive should become law in 2009 and forms part of a wider range of measures to tackle climate change, known as the '20 20 by 20 deal'.

1.18 Under the Directive, each EU Member State has a legally binding minimum target for the amount of energy which must be produced from renewable sources. To ensure Member States stay on track to meet their targets, the Directive provides for minimum intermediate targets and requires Member States to submit National Action Plans detailing how they intend to achieve their targets. If a Member State's National Action Plan does not contain sufficient measures to reasonably enable the target to be met, or does not

4 COM(2008)30final.

meet their minimum target by 2020, the Commission can bring infringement proceedings. Ultimately, this could result in the imposition of substantial fines on non-compliant Member States.

National Policy

1.19 The UK's legally binding minimum target is 15%, which is challenging given the low level of energy in the UK which is currently generated by renewable sources (for example, it has been estimated that in 2006 only 4.6% of UK electricity was generated from renewable sources.[5]

1.20 During the summer of 2008, the UK government consulted on a new Renewable Energy Strategy (RES) which will seek to deliver the UK's share of the EU 2020 target. The consultation discussed a number of options which could be taken forward to help deliver renewable energy projects though the Town and Country Planning Act framework. The final RES is programmed for publication in the Spring of 2009.

1.21 In November 2008, the Climate Change Bill also set a legally binding target for reducing UK carbon dioxide emission by at least 26% by 2020 and at least 60% by 2050, compared to 1990 levels. Progress on generating electricity from renewable energy sources will be vital in meeting these targets.

1.22 Planning Policy Statement 22: Renewable Energy (PPS 22), published in 2004, requires Regional Spatial Strategies (RSS) and Local Development Documents to contain policies designed to promote and encourage the development of renewable energy sources. It requires RSS to include targets for renewable energy capacity in the region derived from assessments of the region's renewable energy resource potential. It also sets out how criteria based policies should be set and used to help deliver renewable energy developments across England where the technology is viable and environmental, economic and social impacts can be addressed satisfactorily. The 2007 Climate Change Supplement to Planning Policy Statement 1 (PPS 1) is also relevant as it states that that Regional Planning Boards should set regional targets for renewable energy generation in line with PPS 22, and ensure their ambition fully reflects opportunities in the region, is consistent with the Government's national targets and, where appropriate in the light of delivery, is periodically revised upwards.

Regional Policy

1.23 The North East Regional Renewable Energy Strategy (RRES), published in March 2005, sets out the actions necessary to promote viable renewable energy schemes to meet government targets. It provides regional and sub-regional targets for installed renewable electricity capacity by 2010, with a regional target of 454 megawatts (MW); of which, 212 MW is allocated to Northumberland. The Strategy recognises the challenging nature of these targets which makes positive planning for renewables in the shape of the RSS, LDF, and this SPD guidance, all the more important.

1.24 The RRES identifies onshore wind as the region's most significant resource and uses a number of assessments to identify broad locations for onshore wind. These are expected to broadly meet the 2010 targets but to achieve 2020 targets would require significant further development, principally at Kielder.

5 Defra (2008) *Sustainable development indicators in your pocket 2008*.

1.25 A review of the RRES was published in November 2005, with the intention that this should be read as a companion document to the published RRES. The main findings of this review were that:

- wind developer activity had increased significantly over the year;
- further work and discussions with the Ministry of Defence suggested that, at best, only one wind farm had any prospect of being developed in Kielder Forest in the short to medium term (identified in the RRES as a Strategic Renewables Resource Area);
- the region had a number of significant biomass projects coming through;
- the region was also host to the UK's largest biodiesel manufacturing plant (being completed in Middlesborough).

1.26 In line with national policy, the RSS for the North East looks to provide a positive framework for the development of renewable energy. It seeks to reduce energy demand through planning strategies, improve energy efficiency and sustainable construction (Policy 38) and sets challenging targets for the generation of power from renewables (Policy 39) which reflect the regional and sub-regional targets for installed renewable electricity capacity identified in the RRES.

1.27 Policy 40 sets out the broad considerations that those developing renewable energy schemes will have to take into account. The RSS acknowledges that in the short term, the most significant contribution to renewable energy is going to be onshore wind and for that reason, sets out specifically to guide wind developments to the strategic renewables resource area of Kielder and the areas of least constraint for wind on a medium scale (Policy 41). The RSS requires LDFs to identify the broad locations of these developments. Importantly, the RSS recognises that this does not remove the need for local authorities to consider renewable energy developments outside these areas of least constraint.

1.28 To understand the capacity of the landscape within the areas of least constraint to accommodate wind turbines, the Regional Assembly, County Council and Northumberland District Councils jointly commissioned and contributed to a series of Landscape Capacity Studies[6][7] for the areas of least constraint.

Local Planning Policy

1.29 Local Plan Policy CD35 on renewable energy is a 'saved policy' at the moment. As CD35 pre-dates the RSS, RSS Policy 40 criteria now cover most of the aspects set out in CD35 and, as the more up-to-date part of the Development Plan, Policy 40 would take precedence. On adoption of this SPD, Local Plan Policy CD35 will be rescinded (withdrawn).

1.30 Given Government advice that policy at local level should not repeat national and regional policy, and given that the RSS policies on renewable energy are very detailed, Policy S21 of the Core Strategy concentrates on what is important in the local context. The guidance within this SPD nevertheless recognises all relevant national, regional and local policy.

6 NERA (2007) *Wind Farm Development and Landscape Capacity Studies: North/South Charlton.* Report by Arup.
7 NERA (2006) *Windfarm Development and Landscape Capacity Studies: Knowesgate and Harwood Forest.* Report by Arup.

1.31 In line with the RSS, the Core Strategy identifies the three areas of least constraint for wind within the former Alnwick District at North and South Charlton, Harwood Forest and Knowesgate, and encourages larger commercial wind farms to locate in these areas.

1.32 The relevant plan policies extracts from the RSS and the Core Strategy statutory development plan policies referred to above are set out in the Appendix.

1.33 Policy S22 of the Core Strategy is designed to promote energy efficiency and requires major developments to source 20% of their energy requirements from embedded renewables. Other Core Strategy policies of particular relevance to renewable energy developments include:

- Policy S12 which provides protection for biodiversity and geodiversity.
- Policy S13 in respect of protection of Landscape Character.
- Policy S15 in respect of protecting the Built and Historic Environment.
- Policy S16 which requires a high standard of development design.

1.34 These, and other local policies, are referred to, where relevant, throughout this SPD.

1.35 It is important to note that Northumberland National Park Authority is the local planning authority responsible for providing detailed land use policy and guidance for Northumberland National Park. Therefore, this SPD only applies to the area of the former Alnwick District which lies out with the Northumberland National Park. Throughout the remainder of this document this area with be know as 'The SPD area'.

Preparation of the SPD

1.36 Land Use Consultants (LUC) was appointed to prepare the draft SPD for the formal consultation stage. To ensure objectivity, another environmental consultancy was appointed to undertake the required Sustainability Appraisal (SA)/Strategic Environmental Assessment (SEA) of the SPD, and to undertake an Appropriate Assessment in accordance with the Habitats Regulations (1994). These assessments have informed the production and contents of the SPD. A Consultation Statement stating who was consulted during the preparation of the SPD, setting out representations received and how these have been addressed is also available.

1.37 To ensure that the guidance is up-to-date and user friendly, the SPD 'signposts' rather than duplicates guidance available elsewhere, particularly given the evolving nature of related guidance on renewable energy technologies. To assist with this, the electronic version of the SPD includes 'hotlinks' to other relevant guidance and policy documents.

1.38 The SPD draws on documentation already available in relation to both renewable energy developments, and the former Alnwick District (including the environmental and planning opportunities and constraints for Alnwick identified in Annex 2 of the Regional Renewable Energy Strategy and the Sustainability Appraisal of the Core Strategy). Account is also taken of good practice examples of comparable SPDs prepared elsewhere in the UK.

1.39 The SPD is also informed by a study of the significant landscape and visual sensitivities relative to wind energy developments in the SPD Area. This work has also been undertaken by Land Use Consultants, and reflects the Alnwick landscape character appraisal. Further details of this component of the work are summarised in **Chapter 4** and available in full in a separate technical report. Landscape sensitivity is, however, only one factor that will be taken into account in considering appropriate locations for renewable energy developments.

Structure of the SPD

1.40 The structure of the SPD is outlined below.

- **CHAPTER 1 INTRODUCTION:** including the international, national, regional and local policy framework; and outlining the purpose and structure of the SPD.
- **CHAPTER 2 RENEWABLE ENERGY TECHNOLOGIES:** comprising a brief overview of the range of potential technologies, with emphasis on those technologies identified at the regional level as having most potential in the short to medium term.
- **CHAPTER 3 PLANNING ISSUES:** practical overarching guidance in relation to the criteria to be considered in determining applications for renewable energy developments in the SPD area, as set out in saved Policy CD35 of the Alnwick Local Plan, Policy S21: Renewable Energy of the Alnwick Core Strategy and Policy 40: Planning for Renewables of the North East Regional Spatial Strategy.
- **CHAPTER 4 FURTHER GUIDANCE FOR ONSHORE WIND DEVELOPMENTS:** a review of those issues where the potential impact of wind energy development is likely to differ significantly from that of other renewable energy developments and also addressing issues that are more unique to wind energy developments such as shadow flicker and interference with air traffic radar. Further information sources are also identified.
- **CHAPTER 5 THE APPLICATION AND IMPLEMENTATION PROCESS:** addresses the different consenting mechanisms; application and EIA requirements and stages; consultation; and the role of planning conditions and legal agreements.
- **APPENDIX:** The Appendix provides extracts of relevant planning policy from the statutory Development Plan Documents.

2 Renewable Energy Technologies

2.1 This Chapter comprises a brief overview of the range of potential renewable energy technologies. It is based on the Companion Guide to PPS 22,[8] supplemented by information from the Energy Saving Trust[9] from which further detail can be obtained if required. The RRES identifies onshore wind as the Region's most significant resource, followed by biomass, with some limited potential for small scale hydro schemes and, possibly in the longer term, deep water offshore wind and wave energy developments.

2.2 Offshore renewable energy developments fall outside the scope of the local authority planning process and are not dealt with in this SPD.[10] However, it is important to note that technologies such as tidal power and offshore wind may involve some onshore infrastructure such as connection to the electricity network. Whilst this may not be consented under land use planning legislation, the environmental considerations outlined in this SPD remain relevant.

Onshore Wind

2.3 The use of energy from wind to turn a rotor (generally comprising three blades) connected via a mechanical drive train to an electrical generator. These are all mounted on a tower, the height of which is approximately twice the length of a blade. The tower is usually of tubular steel construction although a lattice construction can be used for smaller turbines, with micro scale turbines able to be mounted directly onto buildings.

2.4 Wind turbines are available in a wide range of different sizes ranging from small roof-mountable domestic units to very large turbines with a rotor diameter of more than 100 metres(m) and a power output of several megawatts (MW). Below a cut-off wind speed of approximately 4 metres/second (m/s) (at the turbine hub), there is insufficient wind energy to generate electricity. Maximum power output generally requires wind speeds of greater than 12-15 m/s. When multiple turbines are deployed in a 'wind farm', an adequate separation between each (about 3-10 rotor diameters) is required to minimise energy loss due to wind shadowing from upwind turbines.

2.5 In addition to the turbines themselves, a wind farm typically requires additional infrastructure as follows:

2.6 Road access to the site and on-site tracks able to accommodate Heavy Goods Vehicles (HGVs) carrying long, heavy and wide loads (such as turbine blades and construction cranes). The on-site tracks may be downgraded for light vehicle use during the operational phase of the wind farm unless a major component failure occurs.

2.7 A temporary construction compound and lay down area for major components.

2.8 A concrete foundation pad for each turbine about 7-20 metres in diameter and flush with the ground.

8 ODPM (2004) *Planning for Renewable Energy: A Companion Guide to PPS 22*
9 www.energysavingtrust.org.uk/Generate-your-own-energy/Types-of-renewables
10 '*As landowner of the seabed and areas of foreshore by virtue of the Crown Estate Act 1961, The Crown Estate's permission is necessary to place structures on or pass cables over the seabed and its foreshore. In addition to permission from the landowner, potential developers also require statutory consents from a number of government departments responsible for the offshore wind development process.*' http://www.thecrownestate.co.uk/offshore_wind_energy.

2.9 An area of hard standing next to each turbine to act as a base for cranes during turbine erection, which is generally removed after construction.

2.10 One or more anemometer masts to monitor wind direction and speed, and a control building (often combined with the substation) to ensure that the turbines are operating correctly.

2.11 The output from each turbine is normally connected via underground cables to a small on-site electricity substation, from which electricity at the appropriate voltage is transmitted to the nearest suitable point of the local distribution network. The connection from substation to electricity network is the responsibility of the local Distribution Network Operator, which for the North East, is currently CE Electric UK. Connection may be via pole-mounted or underground cables. Underground cables are much more expensive and only cost effective over limited distances. Whilst avoiding the visual impact of pole-mounted cables, underground cables may have their own environmental impact due to the excavation work required.

The RRES Review (November 2005) estimated that Northumberland's potential onshore installed renewable electricity resource by 2010 would be 304-470 MW, of which 271-437 MW was commercial scale onshore wind.[11] As of February 2009, no wind farms connecting to the national electricity network were operational or under construction in the SPD area.[12]

Biomass

2.12 The combustion of wood or other plant materials in a stove or boiler to produce heat, generate electricity or a combination of the two. Although biomass combustion gives off carbon dioxide, this represents release of the gas that was absorbed when the plant material grew, thus biomass fuels are regarded as carbon neutral.

2.13 Typical biomass fuels include wood by-products from commercial forestry or parks maintenance; energy crops such as short rotation coppice willow or poplar or grasses such as Miscanthus; and clean wood waste from sawmills, furniture manufacture etc.

2.14 Three categories of biomass plant are currently used:

- Plant designed for electricity production: typically larger schemes of 10 to 40 MW, where excess heat is not used.
- Combined Heat and Power (CHP): typically 5 to 30 MW total energy output, primarily electricity but with 'waste' heat from the process captured for local use in other industrial processes or district heating. Biomass CHP is most likely to be viable when used to provide an electricity base load.
- Plant designed for heat production: these range in size from heating for a single home up to district heating systems with 5 MW thermal capacity.

11 NERA (2005) *North East Regional Energy Strategy Review September 2005* TNEI Services for NERA
12 Based on data published by the British Wind Energy Association www.bwea.com

2.15 Provided that there is a ready fuel supply within an economically viable travel distance, and sufficient fuel storage space on-site, biomass systems can be suitable for offices, industrial buildings, care homes, schools, sport centres and communally heated residential developments. Steam turbines are only employed in large schemes. This technology integrates well with wind power as CHP engines can be switched off during periods of high wind.

The RRES Review (November 2005) estimated that 21 MW (4-7%) of Northumberland's potential onshore installed renewable electricity resource by 2010 would be biomass.[13] The only significant biomass electricity generator in Northumberland identified in the RRES Review was co-firing at the ALCAN power station at Lynemouth, which supplies its power to the adjacent aluminium smelter. This scheme, located outside the SPD area, co-fires woodchip with coal and accounted for all of Northumberland's projected biomass electricity resource

Small Scale Hydropower

2.16 The use of water flowing from a higher to a lower level to drive a turbine connected to an electrical generator, with the energy generated proportional to the volume of water and vertical drop.

2.17 Hydropower is well established in England with most sites with the potential to generate more than 1 MW already developed. Schemes coming forward for development are therefore likely to be below 1 MW capacity, with the larger of these having the potential to supply power to the local distribution network and industrial users. Smaller, domestic schemes are standalone or are only capable of supplying a few homes.

2.18 The majority of suitable locations are likely to be for 'run of river' schemes, where a proportion of a river's flow is taken from behind a low weir and returned to the same watercourse downstream after passing through the turbine. There may also be potential, in isolated locations, for 'storage' schemes, where the whole river is dammed and flow released through turbines when power is required.

2.19 'Low head run of river' schemes are typically sites in lowland areas, often installed on historic mill sites using the existing channel system and weir or dam. They typically divert water from behind a weir along a 'leat' (channel) to a turbine intake which is screened to exclude debris and fish. After passing through the turbine, water is discharged along a 'tailrace' (channel) back into the river. The 'depleted reach' of river between leat entrance and tailrace exit will have reduced water flow whilst the turbine is running.

2.20 'High head run of river' schemes are typically found on steeper ground in upland areas and the diverted water is typically carried to the turbine via an enclosed penstock (pipeline). The length of depleted reach tends to be shorter as the water needs to travel a shorter horizontal distance to build up the same head. The volume of water diverted from the river to generate a given amount of power is also lower.

13 NERA (2005) *North East Regional Energy Strategy Review September 2005* TNEI Services for NERA

The RRES Review (November 2005) estimated that 6 MW (1-2%) of Northumberland's potential onshore installed renewable electricity resource by 2010 would be hydropower. This represented development of existing hydro generation at Kielder Water and as such, lies outside the SPD area. There is also some potential for micro hydro schemes linked to historic mill sites and weirs, although development may be discouraged by high capital costs and the relatively low head and volume of water in Northumberland's rivers.[14]

Solar Thermal

2.21 The use of the sun's energy to provide hot water. The systems use solar collectors, usually placed on the roof of a building, to preheat water for use in sinks, showers and other hot water applications. They do not provide enough energy for space heating. The technology may also be referred to as Solar Hot Water (SHW).

2.22 While the UK climate is not sufficiently hot and sunny to meet all domestic hot water requirements year round, a well designed system should meet 50-60% of demand during May-September. For best performance in the UK, the solar collectors (either flat plate or more efficient evacuated tube)[15] need to be inclined at an angle of 30°-40°, facing due south and clear of the shade of trees and buildings. Some flexibility may be necessary when installed on existing buildings but performance will be degraded. The collectors do not usually stand more than 12cm proud of the existing roof line, are generally dark coloured, and on a domestic building, are typically 3-5 m^2 in area. Although most commonly roof mounted, a free-standing ground structure is also possible and frequently used for swimming pools.

2.23 Solar thermal power represents the most easily installed and potentially cheapest renewable energy solution for domestic buildings. For non-domestic buildings, it is only appropriate if they have a high hot water demand, such as swimming pools, hotels and some industrial buildings.

The number of solar thermal installations in Northumberland is unknown. There is currently no regional or sub-regional target for renewable heat.

Photovoltaic (PV)

2.24 The conversion of solar energy using semi-conductor cells to generate electricity. Typically fitted as bolt-on panels to a roof, PV cells can also be incorporated into the fabric of a building as roof tiles, glass laminates or cladding. PV cells may also be attached directly to the appliances they power, such as lights or parking meters.

2.25 Similarly to solar thermal collectors, PV cells perform best in the UK when inclined at an angle of 20°-40°, facing due south and clear of the shade of trees and buildings. Some flexibility may be necessary when installed on existing buildings but performance

14 NERA (2005) *North East Regional Energy Strategy Review September 2005* TNEI Services for NERA
15 Flat plate systems consist of an absorber plate with a transparent cover to collect the sun's heat; evacuated tube systems consist of a row of glass tubes, each containing an absorber plate feeding into a manifold

will be degraded. PV systems may either be standalone, providing power for the particular dwelling or appliance to which they are attached or connected, with surplus electricity exported to the local distribution network. A typical array on a domestic dwelling would be 9-18 m^2 in area and produce 1-2 kW kilowatt) peak output.

2.26 PV is particularly suited to buildings that use electricity during the day such as offices, schools, and shops. Currently, it is unlikely to be the most cost-effective option as production costs are still relatively high and the pay-back period comparatively long, although costs should fall as demand for the technology grows.

The RRES Review (November 2005) estimated that just 0.25 MW of Northumberland's potential onshore installed renewable electricity resource by 2010 would be photovoltaics. **(16)**

Ground Source Heating and Cooling

2.27 Underground temperatures remain relatively constant relative to seasonal changes in air temperature. Ground source heat pumps take advantage of this fact by pumping a fluid through buried pipes in the winter and using the warmed water to provide space heating and in some cases, to pre-heat domestic hot water.

2.28 There are three main components to the system. Firstly, a circuit of pipes which is buried horizontally in a trench or vertically in a borehole and which absorbs heat from the ground. Secondly, a heat pump which works in a similar way to a domestic fridge by absorbing heat from the fluid in the pipes, transferring it to another location and then releasing it, in this case to a hot water tank. Thirdly, a distribution system, usually comprising underfloor heating or radiators for space heating. A similar process and the same system may be used for space cooling during the summer.

2.29 Ground source heating is likely to be most economically viable for retail units and hotels. It is also highly suitable for office, care home, residential, school and sport centre developments. Space and suitable ground conditions are required for the trenches or borehole in which the pipe network is laid.

Energy from Waste

2.30 Energy from waste processes are either biological or thermal. As explained below, not all thermal processes are considered a renewable energy source.

Thermal Processes

2.31 Waste can be used as a fuel for power generation by burning at high temperatures to release chemical energy. The Government's Renewables Obligations Order states that Renewable Obligation Certificates (ROCs) can only be claimed by electricity generators when the waste stream is at least 90% biomass or, in the case of generating stations using

16 NERA (2005) *North East Regional Energy Strategy Review September 2005* TNEI Services for NERA

pyrolysis or gasification technology, for the biomass fraction of the waste.[17] Only energy that meets the ROC definition is considered by PPS22 and, therefore this SPD, to be renewable. This renewable source is described under the heading of 'Biomass' above.

Biological Processes

2.32 When plant or animal matter is broken down by microbial action in the absence of air ('anaerobic digestion' AD), gas with a high methane content is produced. This methane can be captured and burned to produce heat, electricity or a combination of the two.

2.33 The main types of organic material feedstock used in AD are:

2.34 Sewage sludge: AD of sewage sludge currently takes place at many sewage treatment works in the UK, although only some of these schemes recover the energy from the sewage gas. Since sewage treatment is generally centralised in the UK, the digesters tend to be of a large scale.

2.35 Farm slurry: intensive livestock rearing produces large quantities of slurry (liquid manure) and AD is used widely in UK agriculture, generally in the form of small on-farm digesters from which biogas is captured and burned to heat farm buildings, although larger centralised schemes also exist.

2.36 Municipal solid waste (MSW): municipal waste contains a significant proportion of organic materials, including food, garden cuttings and paper, and the EU Landfill Directive requires that organic materials are progressively diverted from landfill. Energy extraction via AD therefore has the potential to contribute to both waste management and renewable energy targets.

2.37 In addition to biogas which can be used for energy generation, AD also produces a nitrogen-rich liquor which can be used as a fertiliser, and solids which can potentially be composted to produce soil conditioner, provided that toxic materials are removed from MSW prior to digestion.

The RRES Review (November 2005) estimated that landfill gas would contribute 5.4 MW (1-2%) and sewage gas 0.2 MW of Northumberland's potential onshore installed renewable electricity resource by 2010.[18] The landfill gas projection related to the expansion of existing installed capacity at the Seghill and Ellington Road landfill sites operated by SITA. Neither of these sites is within the SPD area.

3 Planning Issues

3.1 This Chapter provides practical, overarching guidance in relation to the criteria to be considered in determining applications for renewable energy developments in the SPD area. The criteria are set out in Policy S21: Renewable Energy of the Alnwick Core Strategy and Policy 40: Planning for Renewables of the North East RSS, which are reproduced in full in the Appendix.

17 http://www.berr.gov.uk/whatwedo/energy / sources/renewables/policy/renewables-obligation/what-is-renewables-obligation/page15633.html

18 NERA (2005) *North East Regional Energy Strategy Review September 2005* TNEI Services for NERA

3.2 This Chapter therefore provides guidance on the environmental, social and economic effects, both positive and negative, temporary or permanent, direct or indirect (355/5) that may result from renewable energy development. References are provided to additional related policy criteria from the RSS and the Alnwick Core Strategy, including Core Strategy Policies 12, 15 and 16.[19]

3.3 Potential effects from all stages of the development must be considered, from construction through operation and finally decommissioning and possible disposal. The criteria also apply to any associated works required for a renewable energy development, including connections to the electricity network, ancillary machinery or buildings and access routes. Proposals will be considered both in terms of their individual effects, and in terms of cumulative effects, when other developments of relevance are taken into account.

3.4 It is important to recognise that whilst the potential effects of renewable energy developments should be given full consideration:

- many possible effects can be avoided or reduced through careful siting and design, and through appropriate construction and operational practises in accordance with current environmental regulations and accepted good practice;
- without action to reduce CO_2 and other greenhouse gas emissions, climate change will continue to jeopardise biodiversity, the landscape, and human activities.

3.5 This guidance is relevant to all types of renewable energy technology, with key planning issues which may need to be considered for particular renewable energy technologies listed at the end of the Chapter. More detailed guidance for wind energy is provided in **Chapter 4**.

Landscape

Policy Context

3.6 RSS Policy 40 and Core Strategy Policy S21 detail the criteria to be considered in assessing a renewable energy development include its *'visual impact in relation to the character and sensitivity of the surrounding landscape'*, 'its *'effect on national and internationally designated…landscape areas'* (RSS Policy 40) and whether it *'reflects the Alnwick district Landscape Character Assessment'* (Core Strategy Policy S21).

3.7 Within the former Alnwick District the Northumberland National Park to the west, the Northumberland Coast Area of Outstanding Natural Beauty and Heritage Coast to the east, reflect the importance of the landscapes within the area. As clarified in PPS7 AONBs should be considered on a par with National Parks in terms of landscape importance and hence the approach to controlling development. The North East Regional Spatial Strategy, Policy 31 states that 'Strategies, plans and planning proposals should promote development appropriate to the special qualities and statutory purposes of areas in the Northumberland National Park, the Northumberland Coast and the North Pennines AONBs, and the Heritage Coast. While contributing to the implementation of the National Park and AONBs Management Plans having regard to landscape character assessments and the content of AONB/National Park.' Additionally with respect to the CROW Act 2000 Section 85:1

19 The intention is that the Core Strategy and this SPD will supersede relevant 'saved' policies from the Local Plan.

states that 'in exercising or performing any functions in relation to, or so as to affect, land in an area of outstanding natural beauty, a relevant authority shall have regard to the purpose of conserving and enhancing the natural beauty of the area of outstanding natural beauty.'

Possible Effects to be Taken into Consideration

3.8 Whilst the simplest definition of landscape is the 'appearance of land', a more comprehensive view of the landscape is normally adopted, taking account of historical and cultural associations, and the total 'experience' of the landscape. The European Landscape Convention defines a landscape as 'an area, as perceived by people whose character as a result of the action and interaction of natural and/or human factors'. The 'experience' of the landscape is influenced by natural and semi-natural features and processes; the use and management of the land, both now and historically; cultural associations and human activity, as well as geology, soils and landforms which help define the landscape.

3.9 Landscape 'character' is the direct product of the interaction of complex natural and human influences over thousands of years. Whilst this means that the landscape is dynamic and continues to change, the range, scale and speed of change have all increased in recent history and new development can adversely impact the fabric, character and quality of the landscape, if not managed carefully.

3.10 A landscape character SPD[20] is currently being prepared to guide change in such a way that the landscape character and local distinctiveness of the SPD area can be conserved, reinforced, and where necessary enhanced. This landscape character SPD will support implementation of Core Strategy Policy S13: Landscape Character which states that *'all proposals for development and change will be considered against the need to protect and enhance the distinctive landscape character of the district'.*

3.11 Under the direction of English Heritage, a programme to map the historic landscape of England, 'Historic Landscape Characterisation' (HLC), is currently underway. The essence of HLC is to map historic features that survive in the modern landscape. To do this, various attributes of the modern landscape, as seen on aerial photographs, modern and historic maps, are recorded to define areas that share common characteristics through time. The information is stored in a Geographic Information System (GIS) and used to describe a series of historic landscape types grouped under headings such as coast, communications, fieldscapes, industry, military, ornamental/parkland/recreation, rough land, settlement, water and woodland. A final report covering Northumberland is in preparation and will provide a new tool to help manage change in Northumberland's historic environment and wider landscape. Additionally there are also guidelines on Landscape and Visual Impact Assessment produced by the Landscape Institute and IEMA 2002 as referred to in **Chapter 4**. Advice on assessing renewable energy development impacts on the special qualities of the Northumberland Coast AONB is available from the Northumberland Coast AONB Team along with the AONB Management Plan.

20 Alnwick District Council (October 2008) *Landscape Character Supplementary Planning Document* (Draft)

3.12 Most renewable energy developments will result in some degree of landscape impact. It is, however, possible to minimise the scale of these impacts by careful consideration of the sensitivity of existing landscapes, and their ability to accommodate the development in question without significantly altering landscape character.

Sources of Further Advice

Natural England is the statutory body responsible for conserving and enhancing the landscape in England. The Council may consult Natural England on landscape issues when considering planning applications.

Early contact with Northumberland County Council's Conservation Team is also advised with respect to the relevance of the Historic Landscape Characterisation work to individual schemes.

Visual Amenity

Policy Context

3.13 Criteria to be considered in assessing a renewable energy development include '*its visual impact in relation to the character and sensitivity of the surrounding landscape'*, and *the visual impact of new grid connection lines* (RSS Policy 40) and its *'impact on communities and residential amenity'*(Core Strategy Policy S21).

Possible Effects to be Taken into Consideration

3.14 Visual impacts are the effects on people (such as residents, workers, travellers) of the changes in available views through intrusion or obstruction and whether important opportunities to enjoy views may be improved or reduced.

3.15 Public perception of renewable energy developments will be linked to their appearance in the landscape, and the changes people see in the views of the area. It is therefore important to consider the possible effects that a potential development will have on views within the area, including effects that occur during construction and during the operational life of the development. Effects on visual amenity relate to changes in views and the appearance and prominence of the development in those views. It is likely that most renewable energy developments will generate some visual impact; this must be considered in relation to the character and sensitivity of the surrounding landscape.

3.16 Landscape and visual impacts do not necessarily coincide. Landscape impacts can occur in the absence of visual impacts, for example where a development is wholly screened from available views, but nonetheless results in a loss of landscape elements and landscape character within the site boundary. Similarly, some developments, such as a new communications mast in an industrial area, may have significant visual impacts, but insignificant landscape impacts.[21]

21 Scottish Natural Heritage (2005) *A Handbook on Environmental Impact Assessment*

Sources of Further Advice

Both the Council and Natural England are likely to have an interest in effects on visual amenity. Consultation with the Council with regard to important viewpoints and important visual 'receptors' is recommended.

Built and Historic Environment

Policy Context

3.17 In line with the objectives of PPG15: Planning and The Historic Environment and PPG16: Archaeology and Planning, Policy 32 of the North East RSS requires that *'planning proposals should seek to conserve and enhance the historic environment of the region'* by, amongst other things, *'seeking to preserve, in situ, archaeological sites of national importance and, where appropriate, other archaeological remains of regional and local importance'*; and *'encouraging the refurbishment and re-use of appropriate disused or under-used buildings'*. The Core Strategy (Policy S15) is similarly committed to *'conserving the district's built and historic environment, in particular its listed buildings, scheduled ancient monuments, conservation areas and the distinctive characters of Alnwick, Amble, Rothbury and the villages'*. Policy 40 of the RSS requires consideration of effects on *'the region's World Heritage Sites and other national and internationally designated heritage sites or landscape areas, including the impact of proposals close to their boundaries'.*

3.18 It is important to note that in relation to design and the built environment, the Core Strategy (Policy S16 and supporting text) calls for new or regenerated buildings to maximise energy efficiency which *'may involve the use of…micro-renewable energy sources, such as solar panels or small-scale wind turbines*'.

Possible Effects to be Taken into Consideration

3.19 Renewable energy developments present both opportunities and risks in respect of the historic environment. Construction activity may disturb archaeological remains on-site whilst renewable plant may adversely affect the setting of Scheduled Monuments and listed buildings, the character and appearance of Conservation Areas and their settings or the historic interest of registered parks and gardens and their settings. Conversely, appropriately designed renewable energy schemes may allow dilapidated historic buildings to be brought back into use, for example with the installation of a small scale hydropower scheme in a disused water mill.

3.20 As discussed above under 'Landscape', a 'Historic Landscape Characterisation' (HLC) for Northumberland is currently underway. Based on historic features which survive in the modern landscape, this describes a series of historic landscape types and will provide a new tool to help manage change in Northumberland's historic environment.

Sources of Further Advice

Further information on planning in relation to heritage assets is available from PPG15: Planning and the Historic Environment and in relation to archaeological remains from PPG16: Archaeology and Planning. Specialist advice is available to both planners and developers from the Northumberland County Council archaeology team, who seek to encourage good management of archaeological and historic monuments across the County. English Heritage is the statutory body responsible for conserving and enhancing the historic environment in England and is a statutory consultee for the Council in planning applications that may affect nationally important historic assets. Developers may therefore also wish to contact English Heritage directly to seek advice in these cases.

Biodiversity and Geology

Policy Context

3.21 Under the Natural Environment and Rural Communities Act (2006), all local authorities and other public authorities in England and Wales have a duty to promote and enhance biodiversity in all of their functions. The Act aims to raise the profile of biodiversity and to make sure that it is considered in all local authority decisions and policies.[22]

3.22 Whilst the SPD area contains, or borders on, a number of UK and international protected sites of nature conservation interest, there is also a much wider biodiversity value. Policy 40 of the RSS requires consideration of effects *'on nature conservation sites and features, biodiversity and geodiversity, including internationally designated and other sites of nature conservation importance, and potential effects on settings, habitats, species and the water supply and hydrology of such sites.'* In accordance with PPS9: Biodiversity and Geological Conservation, Policy S12 of the Alnwick Core Strategy states that all development proposals will be considered against the need to protect and enhance the biodiversity and geodiversity of the District. The potential for a significant impact on biodiversity or geodiversity will be judged by reference to factors including the likelihood and severity of effects on:

- internationally, nationally, regionally or locally designated biodiversity or geological sites;
- habitats of any species protected under the Wildlife and Countryside Act 1981, the Conservation (Natural Habitats etc) Regulations 1994 or the Protection of Badgers Act 1992;
- habitats and species listed in the Northumberland Biodiversity Action Plan (BAP).[23]

22 Section 28G of the Wildlife and Countryside Act (as amended) also confers a duty requiring all public bodies in the exercising of their functions to take reasonable steps to further the conservation and enhancement of SSSIs (Sites of Special Scientific Interest).

23 Which acknowledges the priority habitats and species identified in the UK Biodiversity Action Plan.

3.23 In accordance with the Habitats Regulations (1994), an 'Appropriate Assessment' is required for any plan or project likely to have a significant effect on a European site of nature conservation importance.[24]

3.24 One of the key principles of national planning policy on biodiversity and geology is that the planning system should not just protect existing interest but enhance or restore it and *promote opportunities for the incorporation of beneficial biodiversity and geological features within the design of development'.*[25] Policy S12 of the Alnwick Core Strategy also reflects this principle.

Possible Effects to be Taken into Consideration

3.25 Any developments, including renewable energy developments, have the potential to adversely impact natural resources such as water quality or availability, which may in turn adversely affect local ecology. Construction of renewable energy developments, including access roads, connections to the electricity network and additional infrastructure required may also result in adverse effects on biodiversity through loss, fragmentation of, or damage to protected and priority BAP habitats and disturbance to species. A 'habitat network' is a series of suitable habitat patches, between which species can move. Any loss, fragmentation of, or damage to the integrity of habitat networks is of particular concern given the potential for subsequent effects on protected and priority BAP species. This is of increasing concern because habitat networks can facilitate the movement of both plants and animals to environments to which they are better suited as the climate changes. All of these potential impacts could affect internationally, nationally and locally designated areas.

3.26 Potential impacts on geological sites can include sterilisation or removal of features and disturbance, and specific impacts resulting from construction such as vibration, cabling and storage of material. Potential impacts on soils can also include sterilisation of the soil resource, the impact of construction on soil function (such as compaction and loss of top soil) and loss of ability to support agriculture/semi natural vegetation etc.

3.27 Further examples of works which may affect protected and priority BAP species include demolition of older buildings or roof spaces, removal of trees, scrub or hedgerows or alterations to watercourses.

3.28 In addition to these more general ecological considerations, hydropower schemes can create a barrier to fish migration, adversely alter both river levels and flows in the reach between the scheme intake and outflow, or change water quality. Damage to riverside habitats, for example by pipeline construction, may also be a potential concern. Advice on water abstraction and on protection of fisheries should be obtained from the Environment Agency.

3.29 In considering applications for renewable energy developments, the Council will take into account restoration or enhancement plans likely to be of benefit to internationally, nationally or locally important habitats or species, but only in addition to the delivery of any necessary avoidance, mitigation, or ultimately compensatory measures secured to maintain the condition and integrity of existing features.

24 Special Area of Conservation (SAC), Special Protection Area (SPA) or Ramsar site.
25 *PPS9: Biodiversity and Geological Conservation*

Sources of Further Advice

Where a proposed development may have significant biodiversity impacts, applicants are advised to discuss these with the Council's planning department and the County Ecologist at an early stage. In these cases, the planning application should provide information on the existing biodiversity interest, the expected effects on that interest and any proposals for mitigation or compensation.[26] Where trees could be affected by a proposed development, a suitably qualified arborist should be engaged to carry out a tree survey and prepare a plan for protecting these trees. Further guidance is available from BS5837 'Trees in Relation to Construction – Recommendations'.
Natural England is the statutory body responsible for promoting nature conservation and protecting biodiversity in England. The Council may consult Natural England on these issues when considering planning applications.

The Water Environment

Water Quality and Water Resources

Policy Context

3.30 Policy 40 of the RSS requires consideration of anticipated effects resulting from development construction and operation, including water pollution. Policy S16 of the Core Strategy requires consideration of sustainable urban drainage and sustainable water supply.

Possible Effects to be Taken into Consideration

3.31 The potential exists for the construction of a renewable energy development or associated works to adversely impact local surface or groundwater quality, for example due to silt from excavation or fuel from construction vehicles being washed into watercourses. Discharges to watercourses may also occur during operation, for example leachate from wood chip piles used as fuel for biomass energy.

3.32 Developers should ensure that necessary control measures are incorporated in their proposal to protect the water environment, for example by following good practice construction guidance.[27]

3.33 Abstraction of water may also be necessary, for example for use in a steam boiler, or for the operation of a hydropower scheme.

Sources of Further Advice

The Environment Agency is the statutory body responsible for regulating water quality and water abstraction in England. The Council may consult the Agency on these issues when considering planning applications and developers may therefore wish to contact the Environment Agency directly to seek advice.

26 Alnwick District Council (2008) *Validation Checklist: National list of local requirements* April 2008
27 For example: CIRIA (2001) *Control of Water Pollution from Construction Sites* CIRIA Report, C532

Flood Risk

Policy Context

3.34 In line with Planning Policy Statement 25: Development and Flood Risk, the North East RSS requires that in considering development proposals, the Council adopt a sequential, risk-based approach to development and flooding. This is set out in core strategy policy S3. This means that applicants will need to demonstrate there are no reasonably available sites in areas with a lower probability of flooding.

Possible Effects to be Taken into Consideration

3.35 Development in areas at risk from fluvial or coastal flooding places the development itself at direct risk of flooding. The consequences of this for renewable energy development will depend on factors such as whether the facility has on-site staff, whether it will continue to function in the event of flooding and whether it poses any contamination risk to water resources or soils. Many forms of development involve the construction of impermeable surfaces which increase the volume and rate of surface water runoff from a site and may contribute to a higher risk of surface water flooding downstream of the development. Schemes in rural areas may involve tree felling which may alter catchment hydrology and increase flood risk. Development in the floodplain reduces the area available for flood storage, which again may contribute to a higher risk of flooding downstream of the development.

3.36 The Council requires that planning applications for all development proposals of 1 hectare or more in Flood Zone 1 and any proposals in Flood Zones 2 or 3 are accompanied by a Flood Risk Assessment (FRA).

Sources of Further Advice

The Environment Agency is a statutory consultee[28] for the local planning authority in planning applications involving flood risk, under certain circumstances. Guidance on the circumstances requiring consultation, how to apply the PPS25 Sequential Test and how to determine which Flood Zone a proposed development site lies within, are provided in the Environment Agency's Flood Risk Standing Advice for England (PPS25) version 1.0.[29]

Traffic and Transport

Policy Context

3.37 Policy 40 of the RSS requires consideration of *'accessibility by road and public transport'* and also, where applicable, consideration of *'proximity to the renewable fuel source such as wood fuel biomass processing plants within or close to the Region's major woodlands and forests'.* Policy S11 of the core strategy clearly sets out the accessibility and traffic impact requirements for consideration.

28 Under The Town and Country Planning (General Development Procedure) (Amendment) (No 2) (England) Order 2006 (GDPO)

29 Available from http://www.pipernetworking.com/floodrisk/.

Possible Effects to be Taken into Consideration

3.38 Renewable energy developments may have significant transport requirements. During construction, heavy freight movements may be required to bring building materials and operational equipment to site. Ideally, sites should therefore be chosen which have adequate accessibility via the road network, although this may not always be possible.

3.39 Requirements during operation are likely to be most significant for biomass and energy from waste developments, where large volumes of fuel materials will need to be brought to the facility on a regular basis. To minimise unnecessary traffic movements, consideration should be given to the location of fuel sources for biomass and energy from waste facilities. The location of these sources, and of any alternative sources, should be identified in any planning application and, in line with the PPS22 Companion Guide, the maximum transport distance should ideally be less than 40km.

3.40 A significant transport requirement may necessitate new or upgraded transport infrastructure and an assessment of the sustainability impacts of this should form part of any planning application. Where no infrastructure upgrades are proposed, the implications of additional traffic on local roads should still be considered, for example the potential for increased driver delays, reduced pedestrian and cyclists amenity, noise and air quality impacts on adjacent land uses, and severance of wildlife habitats.

Sources of Further Advice

An application for any proposed development which has significant transport implications should be accompanied by a Transport Assessment. Further guidance is available in the Department for Transport's.[30] Early advice should be sought from the Highways Agency in respect of the Strategic Road Network and from the local Highway Authority[31] in respect of other roads.

Noise and Vibration

Policy Context

3.41 Policy 40 of the RSS requires consideration of anticipated effects resulting from development construction and operation, including noise.

Possible Effects to be Taken into Consideration

3.42 The Council recognises that all construction activity, including that associated with renewable energy developments, will inevitably generate a certain amount of noise, and potentially, vibration. Developers should ensure that appropriate control measures are incorporated in their proposal to minimise disturbance to neighbouring land uses, for example by following good practice construction guidance.[32] Where construction noise has been identified as a likely concern, consideration should be given to measures such as:

30 'Guidance on Transport Assessment'. Available from http://www.dft.gov.uk/pgr/regional/transportassessments/guidanceonta
31 For roads other than Trunk Roads in Northumberland, developers should contact the Highways Development Manager at Northumberland County Council.
32 For example, the BS5228 series of British Standards on *Noise and vibration control on construction and open sites*.

- restricting general hours of working to avoid sensitive periods such as evenings and weekends;
- locating temporary site compounds as far as practically possible from neighbouring residential dwellings and other 'sensitive receptors';
- fitting construction plant with appropriate noise control equipment, for example, silencers, mufflers and acoustic hoods;
- using site terrain and material stockpiles to screen work locations;
- providing a site contact number for local residents to use in the event of any particular concerns.

3.43 Operational noise from traffic and plant operations may also be significant with certain technologies, notably biomass and energy from waste developments. As industrial developments, noise assessment under *BS4142: Method for rating industrial noise affecting mixed residential and industrial areas* may be appropriate.

Sources of Further Advice

Further guidance on the factors that the Council will take into account in determining proposals for developments which generate noise is available from PPG24: Planning and Noise. The Council Environmental Health Officer may also be able to advise on whether or not there is a need for background noise monitoring in the vicinity of a proposed development site, to determine any likely increase in noise as a consequence of the development.

Air Quality

Policy Context

3.44 Policy 40 of the RSS requires consideration of anticipated effects resulting from development construction and operation including air quality and atmospheric emissions.

Possible Effects to be Taken into Consideration

3.45 Developers should ensure that necessary control measures are incorporated in their proposal to protect air quality. Consideration of potential effects during construction of a renewable energy development should include:

- dust emissions and the possible effect of these on local 'receptors' such as houses, farms and both light and heavy industry and biodiversity;
- emissions from construction and operational vehicles and the effect of these on local ambient air quality.

3.46 Construction activities such as earthworks, the handling of spoil and the movement of vehicles, both on and off site, can result in temporary 'fugitive' dust emissions if unmanaged. These emissions can give rise to 'nuisance effects' such as the soiling of buildings and washing etc., and if they persist over a long period of time, human health effects. Guidance advises that larger dust particles, which are primarily responsible for dust nuisance, will mainly deposit within 100m of sources.[33] As dust emitting activities respond well to dust control measures such as the covering of vehicle loads/stock piles and the use of dust suppressants such as water and of wheel wash facilities, it should be possible to eliminate or greatly reduce any adverse effects.

3.47 The National Air Quality Strategy for England and Wales has set health-related air quality objectives for eight air pollutants. For seven air pollutants, local authorities must periodically review and assess local air quality to identify any locations where air quality objectives are unlikely to be achieved. An Air Quality Management Area (AQMA) must be declared wherever the objectives are unlikely to be achieved by the dates they come into force. Construction traffic is likely to generate emissions of nitrogen oxides (NOX), fine particles (as PM10) and other combustion related pollutants.

3.48 All combustion processes involve emissions to air and air quality is therefore also an operational consideration for energy from waste proposals. Larger combustion facilities will need to meet the provisions of the Pollution Prevention and Control (England and Wales) Regulations 2000.

Sources of Further Advice

To consider the likely effects of vehicle emissions on local ambient air quality, the Design Manual for Roads and Bridges (DMRB)[34] and associated screening model, which predicts increases in traffic related pollutants, can be used.

An Air Quality Assessment (AQA) will be required for all proposals which may impact on air quality and further information on this can be obtained from the Council's Environmental Protection Department and from PPS23: Planning and Pollution Control.

Social and Economic Effects

General

Policy Context

3.49 In line with national planning policy (PPS22) and regional planning policy (RSS Policy 40), the Council will give significant weight to the wider environmental, economic and social benefits of achieving renewable energy targets when considering proposals for renewable energy development.

33 The Office of the Deputy Prime Minister (2005). *Minerals Policy Statement 2: Controlling and mitigating the environmental effects of mineral extraction in England - Annex 1: Dust*. Considered to apply also to other development types.

34 Department for Transport (2007)

3.50 Policy 40 of the RSS requires consideration of *'effects on agriculture and other land based industries'.* Core Strategy Policy S21 also requires '*no adverse impact on the local economy and land use'* unless '*the impact can be satisfactorily mitigated*'.

Possible Effects to be Taken into Consideration

3.51 In addition to the national carbon reduction, energy security and environmental technology industry skills and employment benefits that flow from deploying renewable energy sources, local economic benefits may also be realised, for example:

- development of local markets in biomass fuels or crops, supporting forestry or agriculture;
- diversification of farm incomes, e.g. from operation of an anaerobic digestion plant or cultivation of biomass crops;
- development of a local skills base and employment opportunities in renewable technology installation and maintenance;
- educational opportunities provided by any visitor centre linked to a renewable energy scheme, increasing awareness of environmental issues and the benefits of renewable energy.

3.52 When there are clear regeneration benefits associated with a proposed development, a planning application should be accompanied by an economic statement which references relevant regeneration strategy and describes matters such as job creation, floorspace requirement for each intended use, and any community benefits.[35]

Tourism and Recreation

Policy Context

3.53 As discussed below, under 'Cumulative Effects', Core Strategy Policy S21 includes a policy provision seeking to prevent developments which '*individually or cumulatively gives rise to a windfarm landscape*'. The definition of a windfarm landscape is provided by the Alnwick Core Strategy as 'a landscape that is dominated by wind turbines to the extent that the character of that landscape has been materially changed from its previous form. This seeks to support a level of renewable energy development which is compatible with goals for developing tourism across the District.

Possible Effects to be Taken into Consideration

3.54 Opinions are divided on the potential impacts of renewable energy developments on tourism. The Sustainable Development Commission reviewed available research on public attitudes to wind farms in 2005 and concluded, that '*there is no significant evidence that tourists are put off returning to an area by the presence of a wind development*' and cite an example of a wind farm in Cornwall becoming a tourist attraction.[36] However, concerns have been voiced, chiefly about the potential negative impacts of wind farms on

35 Alnwick District Council (2008) Op Cit.
36 Sustainable Development Commission (2005) *Wind Power: Your questions answered.*

the landscapes of the North East, for example Northumberland Tourism has stated that this form of renewable energy development could harm the region's tourist industry and associated revenues.[37]

3.55 An in-depth study on the impacts of wind development on tourism in Scotland was recently completed for the Scottish Government (2008).[38] The study covered four case study areas (Caithness & Sutherland; Stirling, Perth & Kinross; The Scottish Borders and Dumfries & Galloway) which between them exhibit a broad variety of landscapes, a number of which are not dissimilar to those found within Northumberland. The latter included economic and spatial analysis, face to face interviews with 380 tourists likely to have seen a wind farm during their visit, and an online survey with actual and potential visitors. Three-quarters of case study area respondents felt that wind farms had a positive or neutral effect on the landscape and the overarching conclusion of the study was, that provided spatial planning and marketing are carried out effectively, meeting Scotland's targets on renewable energy was compatible with also meeting its tourism targets.

3.56 Renewable energy development may also impact users of footpaths, cycle paths or bridleways, for example by temporarily or permanently blocking or diverting rights of way or altering viewpoints. The potential for such impacts should be assessed by the developer and any proposals to mitigate adverse effects identified. Advice with respect to equestrian usage is available from the British Horse Society.[39]

Residential and Workplace Amenity

Policy Context

3.57 'Amenity' effects in relation to air quality, noise, traffic and visual amenity are discussed above, in accordance with Policy 40 of the RSS. Core Strategy Policy S21 also requires *'no adverse impact on communities* [or] *residential amenity'* unless '*the impact can be satisfactorily mitigated*', and Policy S20 provides for open space, sport and recreation seeking to protect, retain, improve and enhance existing provision and create new provision where deficiencies exist.

Possible Effects to be Taken into Consideration

3.58 The effects on residential or workplace amenity of a particular proposal will vary according to factors such as the renewable technology employed, the scale of the installation, siting, and design considerations. With careful design and siting, many potential adverse effects can be avoided or adequately mitigated. Every proposal will therefore be judged on its merits and must include within a Design and Access Statement, a statement describing potential adverse effects on amenity and how these have been minimised. Key considerations in respect of particular renewable technologies are outlined in Table 3.1 (Page 29).

37 Warburton, Dan. (1 October 2008) *£4bn tourism industry at risk from wind farms*. The Journal. http://www.journallive.co.uk/north-east-news/todays-news/2008/10/01/4bn-tourism-industry-at-risk-from-wind-farms-61634-21935993

38 Glasgow Caledonian University, Moffat Centre and Cogentsi (2008) *The economic impacts of wind farms on Scottish tourism: A report for the Scottish Government.*

39 British Horse Society (no date) Wind Farms. Available from http://www.bhs.org.uk/DocFrame/DocView.asp?id=2659&sec=-1.

Community Benefits and the Planning Process

3.59 As stated earlier, planning policy requires significant weight to be given to the social and economic benefits of renewable energy proposals. However, community benefits such as payments into a Community Fund are not considered 'material considerations' and are normally negotiated separately from the determination of an application, after the planning merits of a case are settled. Further information on the role of planning obligations and legal agreements is provided in **Chapter 5**.

Cumulative Effects

Policy Context

3.60 Where more than one renewable energy scheme is proposed by one or more developers or where a single scheme is proposed in an area with existing schemes, the combined effect of all schemes taken together is known as the 'cumulative effect'. Although it is a fundamental principle of the planning system that each planning application is determined on its individual merits, cumulative effects are also recognised:

- '*Planning decisions should be based on…the potential impacts…on the environment of development proposals (whether direct, indirect, cumulative, long-term or short-term)*'.[40] In cases where EIA is required,'*in judging whether the effects of a development are likely to be significant, local planning authorities should always have regard to the possible cumulative effects with any existing or approved development.*'

3.61 Under the Habitats Regulations (1994), likely significant effects of any plan or project on a European site of nature conservation importance alone *or in combination* must also be considered.

3.62 PPS22 requires that planning authorities '*take into account the cumulative impact of wind generation projects'* and that such impacts should be assessed for each planning application rather than arbitrary limits being set in local development documents.[41] This SPD does not therefore attempt to define the number of renewable energy developments that can be accommodated in particular parts of the SPD area. However, the potential for cumulative effects on the landscape is recognised in Policy S21 of the Core Strategy which states that '*proposals for the generation of all types of renewable energy will be supported within the district where the scheme… is within the landscape's capacity to accommodate change and neither individually nor cumulatively gives rise to a windfarm landscape.*' Further guidance on interpreting the cumulative impact on the landscape is provided in **Chapter 4**. Policy 40 of the RSS also requires consideration of '*the cumulative impact of the development in relation to other similar developments'.*

Possible Effects to be Taken into Consideration

3.63 The cumulative effect of two developments may not simply be the sum of their separate effects, as illustrated by the following generic examples drawn from Scottish Natural Heritage (SNH) guidance:[42]

40 ODPM (2005) *PPS1 Delivering Sustainable Development*
41 ODPM (2004) *Planning Policy Statement 22: Renewable Energy*
42 SNH (2005) *Cumulative Effect of Windfarms: Version 2 revised 13.04.05*

- The construction of a new building in a rural setting may have a significant visual impact on an otherwise natural scene but the addition of a second building in close proximity to the first may only have a small incremental impact, the two buildings forming a single cluster.

- A single wind farm may give rise to a small increase in bird mortality that is deemed acceptable because it is within the bird population's natural ability to regenerate through reproduction. Addition of a second wind farm may be unacceptable, however, since it increases total bird mortality rates to a level that exceeds the population's ability to regenerate, causing it to go into permanent decline.

3.64 The issue of cumulative impacts can be complex. There may be circumstances when a planning authority is willing to accept cumulative impacts where, for example, this means that other, more sensitive areas can be protected from development.

Planning Issues Overview by Technology

3.65 Key planning issues which may need to be considered in respect of proposals for particular renewable technologies are listed in Table 3.1. Further information on the likely nature of these issues is available from the Companion Guide to PPS22.

3.66 It is important to note that many proposals for installation of domestic micro generation equipment are deemed 'permitted development' and do not require planning permission. Further details of the criteria for permitted development are provided in The Town and Country Planning (General Permitted Development) (Amendment) (England) Order 2008.[43]

Table 3.1 Key planning issues for particular renewable technologies

Technology	Key Planning Issues
Onshore Wind	See **Chapter 4**
Biomass	• Economic benefit to fuel suppliers. • Construction impact of plant and fuel storage area (e.g. temporary effects on amenity and permanent effects on archaeology). • Visual impact of plant, including chimney. • Noise from plant operations. • Effects of airborne and water borne emissions on health or ecology.

43 Superseded by Reg. 60 of the Habitats Regulations (1994) where there is a likely significant effect on a European site.

Technology	Key Planning Issues
	• Impacts of increased traffic required to bring biomass fuels to site and take away by-products including noise, congestion and impacts on air quality and climate change. • Impact on Heritage Assets.
Small scale hydro	• Scheme must be compatible with other river uses/needs, thus early liaison between the developer, the Council and statutory consultees is essential. • Construction impact of pipeline/channels, turbine house and weir/dam, including clouding of river by silt/mud. • Visual impact of the weir/dam, channels or pipelines, turbine house and power lines. • Ecological impact of alterations to the river's flow regime. • Impacts on protected/priority habitats and species including those associated with any related infrastructure/connection to the electricity network. • Impact on fishery due to potential for weir/dam to block the passage of migratory fish and need to protect fish and other freshwater animals from the turbines. • Impact on recreation and public access e.g. canoeing, fishing. • Impact on Heritage Assets.
Solar thermal	• Impacts on visual amenity and on a building's fabric may be relevant in some circumstances. • Installation on a listed building or within its curtilage is likely to require listed building consent. • Permitted development rights to alter an existing roofline do not necessarily apply in Areas of Outstanding Natural Beauty, Conservation Areas, Sites of Special Scientific Interest or the Northumberland National Park.
Photovoltaic	• Impacts on visual amenity and on a building's fabric may be relevant in some circumstances. • Installation on a listed building or within its curtilage is likely to require listed building consent. • Permitted development rights to clad the walls or to alter an existing roofline do not necessarily apply in Areas of Outstanding Natural Beauty, Conservation Areas, Sites of Special Scientific Interest or the Northumberland National Park.

Technology	Key Planning Issues
Ground source heating	• Construction impact of trench or borehole (effects on archaeology).
Anaerobic digestion	• Construction impact of plant and feedstock storage area (e.g. temporary effects on amenity and permanent effects on archaeology). • Impacts (noise, congestion etc.) of increased traffic required to bring feedstock to site and take away by-products. • Potential for odour nuisance and need for odour control. • Emissions to ground or watercourses e.g. from leakage of slurry. • Emissions to air e.g. from biogas vents, flare stacks, engine exhausts. • Visual impact of plant. • Impact on Heritage Assets.

4 Further Guidance for Onshore Wind Developments

4.1 The RRES and RSS for the North East acknowledge that in the short to medium-term, the most significant contribution to renewable energy will be from onshore wind. This Chapter provides further guidance for onshore wind developments.

4.2 In selecting a suitable site for wind energy development, a developer will need to have regard to a wide range of issues. Some of these, such as land ownership and the presence of adequate wind speeds, relate to technological or economic feasibility and should be considered by the developer before an application is made. Those issues that are relevant to the spatial planning process and may arise in relation to any type of renewable energy development have been described in **Chapter 3**. This Chapter:

- revisits these issues where the potential impact of wind energy development is likely to differ significantly from that of other renewable energy developments;
- addresses issues that are more unique to wind energy developments such as shadow flicker and interference with air traffic radar.

4.3 Specific reference is made to the characteristics of the SPD area where appropriate.

It is important to note that by providing further explanation in relation to a number of topic areas that are included in **Chapter 3**, the intention is not to imply that those not addressed further in this chapter, such as the built/historic environment and the water environment are not important considerations for wind energy developments.

4.4 Following a discussion of considerations at the site selection stage, the role of the 'design strategy' is then outlined. Good development design is a key aim of the planning process and, for wind farm developments, plays a critical role in seeking to avoid and reduce possible environmental impacts. The design strategy should consider the design and layout of all infrastructure components, including the tracks, on-site substation and any required forestry felling, in addition to the turbines. The reported strategy should explain why the selected design and layout is considered to represent the most appropriate balance of technical, environmental and economic considerations. Further information sources are also identified.

4.5 The issues covered in this Chapter are:

- landscape sensitivity and visual amenity;
- biodiversity and geology;
- operational noise;
- shadow flicker and reflected light;
- aircraft and radar;
- Telecommunications.

Again, it is important to note that the degree of coverage of these issues does not reflect their relative importance but rather the level of guidance in relation to each consideration that is felt necessary to assist in the successful implementation of Core Strategy Policy S21.

4.6 By virtue of their nature, size and location, many onshore wind developments will require an Environmental Impact Assessment (EIA). Further information on EIA requirements is provided in **Chapter 5**. For developments not requiring EIA, some information on the likely environmental effects of the proposal, and on any mitigation or enhancement proposed, will still be required.

4.7 The importance of the above issues is recognised in national planning guidance and in statutory consultation arrangements for wind farm applications. Developers must consider these issues in combination and take care that mitigation of one issue does not make another unacceptable.

Landscape Sensitivity and Visual Amenity

4.8 A study of landscape sensitivity and visual amenity has been carried out for the SPD area, drawing broad conclusions for areas outside the National Park. The results of the study are available as a technical report and are summarised below.

4.9 The study was based on a systematic analysis of the sensitivity of different landscapes to the effects of windfarm development, taking account of factors such as scale, tranquillity and movement. The study also included an analysis of patterns of visibility within the District, with the aim of identifying areas which are more or less prominent in the wider landscape.

4.10 Figure 4.1 shows the sensitivity of landscapes in the SPD area to windfarm development. It shows that the most sensitive landscapes are found along the coast, along the network of more intimate river valleys and in the remoter uplands of the Northumberland National Park. Landscape character areas with lower sensitivity include parts of the coastal plain which have been affected by industrial activity, some areas of upland moorland, and elongated ridge formed by Alnwick Moor.

4.11 Figure 4.2 shows the pattern of intervisibility within the SPD area and a 30km buffer around it. It highlights in red and orange those areas where the development of wind turbines would be most visible. It shows that the high ground, made up of ridges and moorlands running north east to south west through the district, are the most prominent areas. River valleys, by contrast, are more hidden in the wider landscape.

4.12 Table 4.1 draws these two parts of the assessment together. The study found no areas where low landscape sensitivity is combined with low levels of visibility. It found some areas where low landscape sensitivity is combined with high levels of visibility, suggesting that although the landscape is quite robust, development would be visible over a considerable distance, including from more sensitive neighbouring areas. This is likely to limit the capacity of such areas to accommodate windfarm development. The study also identified a number of areas where moderate or low landscape sensitivity combined with medium or medium to low levels of visibility. These are the areas that are judged most likely to have capacity to accommodate windfarm development whilst limiting the wider landscape and visual impacts.

Figure 4.1: Landscape Sensitivity

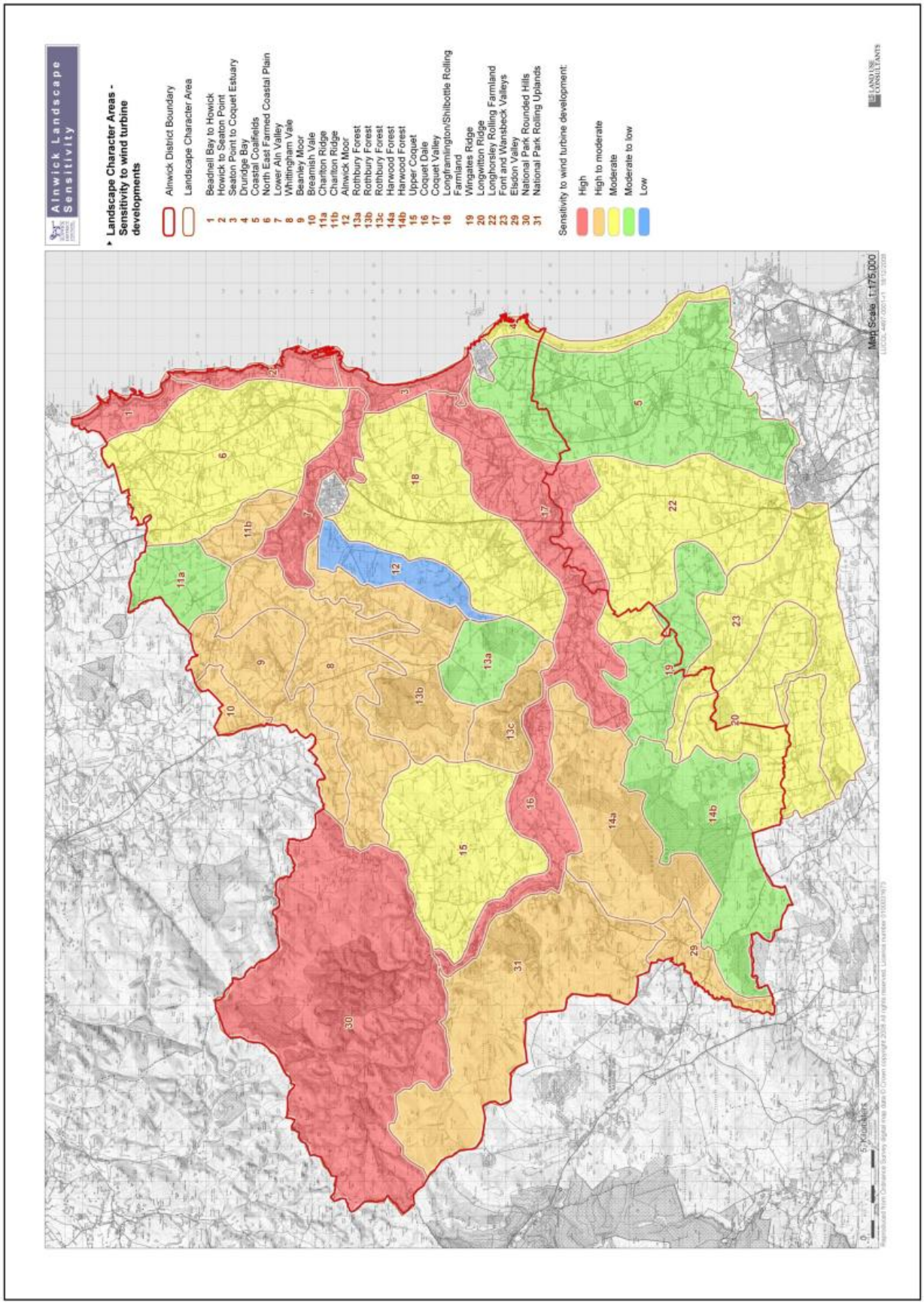


Figure 4.2: Patterns of Intervisibility

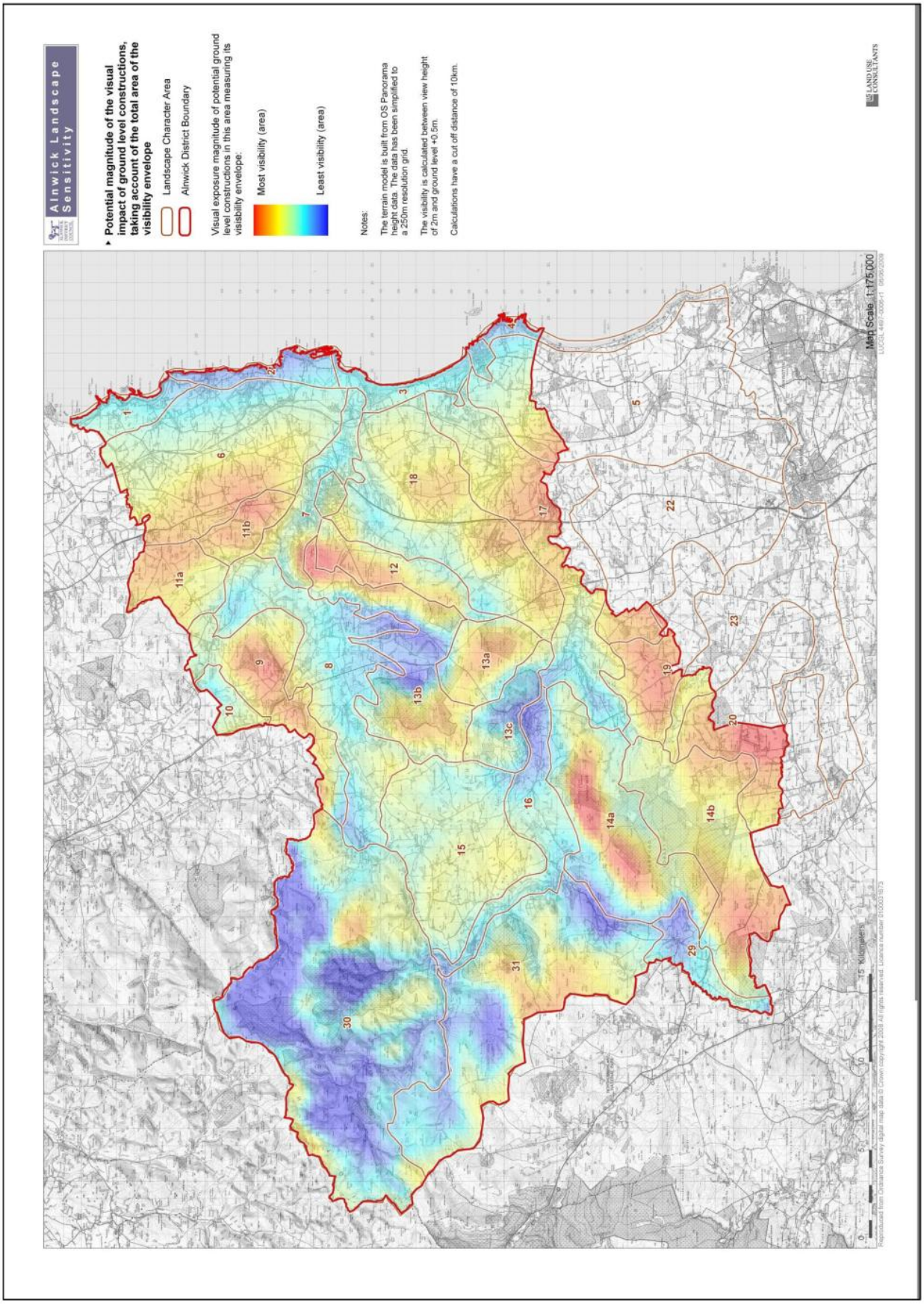


Table 4.1: Summary of Landscape Sensitivity, Intervisibility and Suitability for Windfarm Development

Landscape character number	Landscape character name	Part or all within the SPD area	Within National Park?	Landscape sensitivity	Intervisibility
1	Beadnell Bay to Howick	All	No	High	Low
		Guidance on location and scale of development The high landscape sensitivity of this area makes it unsuitable for windfarm development			
2	Howick to Seaton Point	All	No	High	Low
		Guidance on location and scale of development The high landscape sensitivity of this area makes it unsuitable for windfarm development			
3	Seaton Point to Coquet Estuary	All	No	High	Low
		Guidance on location and scale of development The high landscape sensitivity of this area makes it unsuitable for windfarm development			
4	Druridge Bay	Part	No	Moderate	Moderate-Low
		Guidance on location and scale of development The high landscape sensitivity of this area makes it unsuitable for windfarm development			
5	Coastal Coalfields	Part	No	Moderate-Low	Moderate
		Guidance on location and scale of development A relatively small part of this landscape character type is found in the SPD area. Although the landscape has relatively low sensitivity, it is a settled landscape and any development could be comparatively prominent. Any wind energy development should be limited in size, with a maximum of 12 turbines in a single scheme. Development should be sited away from settlements with consideration given to former mineral workings as possible locations. Consideration should be given to views from the Coquet Valley (higher sensitivity) immediately to the north. Regard should be given to the proximity of the adjoining AONB			
6	North East Farmed Coastal Plain	All	No	Moderate	Moderate
		Guidance on location and scale of development The scale and grain of the landscape means that windfarm development in this area should be limited to a single scheme with a maximum of 25 turbines. Development should be located away from the more sensitive coastal edge, focusing on the A1 corridor and the more open and simple landscapes in the western part of this area. Development in this area should be considered within the context of Landscape Character Area 11. Cumulative impacts with other developments, including those outside Alnwick and visible along the A1 should also be taken into account. Regard should be given to the proximity of the adjoining AONB			
7	Lower Aln Valley	All	No	High	Low
		Guidance on location and scale of development The high landscape sensitivity of this area makes it unsuitable for windfarm development			

Landscape character number	Landscape character name	Part or all within the SPD area	Within National Park?	Landscape sensitivity	Intervisibility
8	Whittingham Vale	All	No	Moderate-High	Low
		Guidance on location and scale of development The high landscape sensitivity of this area makes it unsuitable for windfarm development			
9	Beanley Moor	All	No	Moderate-High	Moderate-Low
		Guidance on location and scale of development The high landscape sensitivity of this area makes it unsuitable for windfarm development			
10	Breamish Vale	All	No	High	Low
		Guidance on location and scale of development The high landscape sensitivity of this area makes it unsuitable for windfarm development			
11a	Charlton Ridge	All	No	Moderate-Low	Moderate-Moderate High
		Guidance on location and scale of development Although the sensitivity of this landscape is relatively low, parts of the area are comparatively visible. This should be reflected in the scale and location of wind energy developments. Any windfarm development in this area should be limited to a maximum of 25 turbines in a single scheme. Development should be located in the north and east of this area in order to minimise visibility from the coastal plain. Development in this area should be considered within the context of Landscape Character Area 6. Cumulative impacts with other developments, including those outside Alnwick and visible along the A1 should also be taken into account.			
11b	Charlton Ridge	All	No	Moderate-High	Moderate-Moderate High
		Guidance on location and scale of development The high landscape sensitivity of this area makes it unsuitable for windfarm development			
12	Alnwick Moor	All	No	Low	High
		Guidance on location and scale of development Although the landscape sensitivity of this area is low, it is very visible in the wider landscape, including when viewed from more sensitive landscapes to the north and west (e.g. Lower Aln Valley and Whittingham Vale). Any development would therefore need very careful design and location to avoid extensive visual impacts. Proposals should demonstrate how such impacts have been avoided. Development should be limited to smaller scale schemes, totalling a maximum of 12 turbines, located on the less visible eastern edge of this Landscape Character Area. Development in this area should be considered within the context of Landscape Character Area 18. Cumulative impacts with other developments, including those along the A1 should also be taken into account.			
13a	Rothbury Forest	All	No	Low-Moderate	High
		Guidance on location and scale of development			

Landscape character number	Landscape character name	Part or all within the SPD area	Within National Park?	Landscape sensitivity	Intervisibility
		Although the landscape sensitivity of this area is moderate-low, it is very visible in the wider landscape, including when viewed from more sensitive landscapes to the north (e.g. Whittingham Vale) and in particular the National Park to the west. It could also be visible from coastal areas to the south east. Any development would therefore need very careful design and location to avoid extensive landscape impacts. Proposals should demonstrate how such impacts have been avoided. Development should be limited to a single scheme with a maximum of 12 turbines, located on less prominent fringes of this area.			
13b	Rothbury Forest	All	No	Moderate-High	High
		Guidance on location and scale of development The high landscape sensitivity of this area makes it unsuitable for windfarm development			
13c	Rothbury Forest	All	No	Moderate-High	Moderate-Low
		Guidance on location and scale of development The high landscape sensitivity of this area makes it unsuitable for windfarm development			
14a	Harwood Forest	No	Wholly within the National Park		
14b	Harwood Forest	All	No	Moderate-Low	Moderate-High
		Guidance on location and scale of development Although the landscape sensitivity of this area is moderate-low, it is visible in the wider landscape, including to the south, east and west, and from more sensitive landscapes to the north. Any development would therefore need careful design and location to minimise visual impacts. Proposals should demonstrate how such impacts have been avoided. Development should be limited to a single medium sized scheme of between 12 and a maximum of 25 turbines, located in the less prominent southern and eastern parts of this area. Development should be considered within the context of those parts of Landscape Character Types 19, 20 and 23 lying within the SPD area, both in terms of the potential for medium sized windfarm developments taking in more than one character area, and in terms of possible cumulative impacts resulting from more than one scheme in this broader area.			
15	Upper Coquet	All	No	Moderate	Low
		Guidance on location and scale of development Windfarm development in this area could have an impact on the human scale and relatively subtle topographic character of this landscape. Although the overall intervisibility is judged to be low, development in this area could be visible from the National Park and sensitive landscapes to the south (e.g. Coquet Dale and the Simonside Hills). Any development would therefore require very careful location and design to ensure that these impacts are minimised. Development should be limited to a single medium sized scheme of with a maximum of 12 turbines and should demonstrate that impacts on sensitive neighbouring landscapes are minimised.			
16	Coquet Dale	Part	Parts of southern valley slopes within National Park	High	Low
		Guidance on location and scale of development			

Landscape character number	Landscape character name	Part or all within the SPD area	Within National Park?	Landscape sensitivity	Intervisibility
		The high landscape sensitivity of this area makes it unsuitable for windfarm development			
17	Coquet Valley	Part	Small area at western extent within National Park	High	Moderate-Low
		Guidance on location and scale of development The high landscape sensitivity of this area makes it unsuitable for windfarm development			
18	Longframlington /Shilbottle Rolling Farmland	All	No	Moderate	Moderate-High
		Guidance on location and scale of development Any windfarm development in this area should be limited to a single scheme with a maximum of 12 turbines. Parts of this landscape character area are prominent in the wider landscape, so less visible locations in the west of this area should be considered. Any proposals should demonstrate how visual impacts have been minimised. There is a need to consider development in this area within the context of Landscape Character Area 12 (Alnwick Moor), both in terms of proposals which include more than one character area, and in terms of possible cumulative impacts. Regard should be given to the proximity of the adjoining AONB			
19	Wingates Ridge	Part	Very small area at western extent within National Park	Low-Moderate	Moderate-High
		Guidance on location and scale of development Although of lower landscape sensitivity, the elevated nature of this area means any development would be visible within the wider landscape. This should be reflected in the scale and location of wind energy developments. The northern part of the Landscape Character Area is less visible overall, but closer to the sensitive landscape of the Coquet Valley. A single scheme of with a maximum of 12 turbines could be considered in this area. There is also a need to consider development in this area within the context of Landscape Character Area 14b and those parts of areas 20, 22 and 23 within the SPD area, both in terms of the potential for medium sized windfarm developments taking in more than one character area, and in terms of possible cumulative impacts resulting from more than one scheme in this broader area.			
20	Longwitton Ridge	Part	No	Moderate	Moderate-High
		Guidance on location and scale of development This is not a large scale landscape and it is relatively visible within the wider landscape. Any wind energy development should be limited in size, with a maximum of 12 turbines in a single scheme. The area south of Landscape Character Area 14b is less prominent in the wider landscape and could be considered as a potential location. There is also a need to consider development in this area within the context of Landscape Character Area 14b and those parts of areas 19, 22 and 23 within the SPD area, both in terms of the potential for medium sized windfarm developments taking in more than one character area, and in terms of possible cumulative impacts resulting from more than one scheme in this broader area.			
22	Longhorsley	Part	No	Moderate	Moderate
		Guidance on location and scale of development			

Landscape character number	Landscape character name	Part or all within the SPD area	Within National Park?	Landscape sensitivity	Intervisibility
	Rolling Farmland	Any windfarm developments in this area should be limited to a single scheme with a maximum of 12 turbines, reflecting the moderate sensitivity of the landscape and moderate visibility within the wider landscape. Consideration should be given to views from the Coquet Valley (higher sensitivity) immediately to the north. Schemes in this area should be considered within the context of Landscape Character Area 19 immediately to the west, together with Landscape Character Area 14b and those parts of areas 19, 20 and 23 within the SPD area, both in terms of the potential for medium sized windfarm developments taking in more than one character area, and in terms of possible cumulative impacts resulting from more than one scheme in this broader area.			
23	Font and Wansbeck Valleys	Part	No	Moderate	Moderate
		Any windfarm developments in this area should be a single scheme of small to medium scale with between 1 and a maximum of 12 turbines, reflecting the scale and character of this valley landscape and its moderate visibility within the wider landscape. The limited extent of this landscape character area within the SPD area suggests that more than one development would be inappropriate. Schemes in this area should be considered within the context of Landscape Character Area 14b and those parts of areas 19, 20 and 22 within the SPD area, both in terms of the potential for medium sized windfarm developments taking in more than one character area, and in terms of possible cumulative impacts resulting from more than one scheme in this broader area.			
29	Elsdon Valley	No	Northern part within the National Park	Moderate-High	Low
		Guidance on location and scale of development The high landscape sensitivity of this area makes it unsuitable for windfarm development			
30	National Park Rounded Hills	No	Wholly within the National Park		
31	National Park Rolling Uplands	No	Wholly within the National Park		

4.13 Note: Guidance on location and scale of development applies only to those areas within the SPD area and outside the Northumberland National Park.

4.14 This study should be used as a starting point for more detailed site selection, scheme design and appraisal. The conclusions are drawn at the level of landscape character areas and it is acknowledged that within each there will more localised areas of higher and lower landscape sensitivity and visibility. There are also likely to be issues of cumulative landscape and visual impact which will further influence different areas' suitability for windfarm development. The following sections describe the key issues that should be reflected in the site selection and design of windfarms.

Site Selection

4.15 The size and modern appearance of wind turbines means that all wind farm developments will result in some degree of landscape and visual impact. It is, however, possible to limit these impacts by careful consideration of:

- the sensitivity of existing landscapes to wind farm developments;
- patterns of intervisibility and key views and viewpoints.

4.16 The following paragraphs discuss some of the key principles that should guide such consideration. This guidance is meant as a starting point for detailed Landscape and Visual Impact Assessment work during scheme development. Each scheme is different, and the relative importance of factors and principles described in this section will vary considerably. It is important that the development of wind farm proposals is based on the advice of experienced landscape designers and landscape planners. It should include GIS based intervisibility analysis to identify those areas from which a scheme would be visible, and the development of wireframes and photomontages to consider how the wind farm would appear from specific locations. An understanding of landscape character, and issues of visibility, should inform an iterative process of site selection, scheme design and mitigation.

Existing Landscapes

4.17 The focus should be on those landscapes more easily able to accommodate wind farm development. The following principles will help ensure that landscape character is reflected fully in the process:

- Avoid locating wind farm proposals in the most sensitive landscapes. In these locations, it is likely that the development of a wind farm could conflict with key landscape characteristics.
- Avoid locating wind farm proposals in places where there is likely to be an impact on nearby sensitive landscapes including nationally recognised designations. This is dependent on the intervisibility characteristics of a landscape. The size of modern turbines means they can often be seen from adjoining landscapes.
- Wherever possible, avoid locating a wind farm where it will span significantly different landscape character types. This will help create a consistent relationship between the layout of the wind farm and key characteristics and features.

4.18 Cumulative landscape impacts occur when a number of wind farms begin to influence the overall character and perception of a particular landscape.

Visibility

4.19 It normally makes sense to select locations which minimise the area from which a proposed wind farm would be visible. However, it is also important to consider the relative sensitivity of different viewpoints or receptors, and to use such an understanding to influence the layout and design of the scheme.

- All other things being equal, the aim should be to minimise the area from which a wind farm would be visible. This can be achieved, for example, by setting wind farms

back from escarpments or placing them where ridgelines will provide a degree of screening.

- It is also important to consider the nature and sensitivity of those areas from which a wind farm would be visible. Sensitive receptors and locations, including key viewpoints, tourist routes, heritage sites and recreation areas should be considered in terms of the likely impacts of a wind farm development.

4.20 Cumulative visual impacts occur where the observer is aware of more than one wind farm, within a single view, in different views from the same location or sequentially when moving through a landscape.

4.21 The landscape and visual elements aspects of wind farm development are closely related. Considering these two aspects together will, for example, ensure that the sensitivity of those landscapes from which the scheme would be visible is taken into account.

Considering Landscape Sensitivity and Visibility Issues Together

4.22 It is important to consider how factors relating to landscape sensitivity and visibility are brought together to inform site selection and scheme design. Ideally, windfarms will be located in areas which have lower landscape sensitivity and lower patterns of visibility.

4.23 Many areas, however, combine lower landscape sensitivity with higher levels of visibility or vice versa. Careful analysis of those areas from which a potential windfarm would be visible will help inform judgements about such areas, while good design can help ensure that visibility is kept to a minimum. A highly visible, but well designed scheme could have less significant impacts than one located in a very sensitive landscape but where fewer people will see it.

Role of the Design Strategy

4.24 Once a potential site has been selected, an understanding of landscape character and grain should influence the layout of the scheme, tying it into its context. The design strategy should be used to minimise the disturbance, damage or loss of valued habitats and species. Further guidance is available from the institute of Ecology and Environmental Management IEEM and below:

- Patterns of landscape character should be used to inform the broad layout and shape of the wind farm, following the flow and direction of the landscape, wrapping around hills rather than blanketing slopes and summits, or reflecting prominent ridgelines in a linear layout. While this will not ‘hide’ the wind farm, it means that the observer will be better able to ‘read’ the development in the landscape.

- The finer grain of the landscape should be used to inform the detailed layout of the wind farm turbines, tracks, cable routes and substation locations, for example taking cues from the underlying topography, built infrastructure (e.g. road or rail corridors), enclosures and field patterns, and patterns of woodland cover (e.g. woodland blocks). Again, this kind of alignment will help tie the development into the landscape, and reduce the potential for conflicting or discordant patterns.

4.25 The analysis of views of a wind farm from key locations including viewpoints, settlements and transport corridors should play a role in influencing the design and layout of the development. However, the design should not be based solely on one or two key views but should also consider the scheme's appearance in views form the wider landscape. The design process should explore the implications of different layouts, turbine numbers and turbine sizes. Issues to consider include:

- Seek to avoid conflict with other important landscape elements such as towers, monuments or other landmarks within key views.
- Aim to ensure that the wind farm is visible as a contiguous element within general views, rather than being broken into separate sections.
- Aim to achieve 'balance' within key or iconic views, for example by avoiding views made up of a larger number of turbines on one side of hill, and a smaller number on the other, or where turbines in one part of the view are spread out, but concentrated in another.
- Consider how the wind farm will appear from different locations, for example will it be silhouetted against the sky or back dropped against a hillside? Will the turbines be sunlit and more prominent at key times of day?
- Aim to avoid partial views of the wind farm, particularly where this results in just a few blade tips being visible from key locations.
- The visual analysis should also consider other elements of the wind farm, including access tracks, electricity substations and anemometer masts. In the case of access tracks, there is likely to be a need to balance the objective of minimising their length with the importance of fitting them to the natural topography and minimising the need for cuttings and embankments.

4.26 Considering the landscape and visual elements aspects of the wind farm development together will help inform the decision as to whether to have a smaller number of larger, higher output turbines, or a larger number of smaller turbines.

The Role of LVIA as a Tool in Understanding and Reducing Potential Landscape and Visual Impacts

4.27 Landscape and Visual Impact Assessment (LVIA) forms part of the wider Environmental Impact Assessment process and, as the title suggests, is designed to identify and evaluate the impacts of a proposal on landscape character and visual amenity. LVIA should include the proposed windfarm in conjunction with existing sites and sites under construction.

4.28 Key steps in LVIA are as follows:

- The collection and analysis of baseline information relating to:
  - Landscape and related policies;
  - The existing landscape of the site and its context, including designated landscapes;

- The existing visual relationship between the site and the surrounding area;

- Any existing and proposed windfarms in the surrounding landscape as part of a cumulative assessment (see below).

- The identification of potential impacts of the windfarm on the landscape and views of the site and the surrounding areas.

- The evaluation of the significance of these potential impacts. This is based on an analysis of the magnitude of change and the sensitivity of the landscape or visual receptor in question.

- The identification of potential mitigation measures to reduce these impacts.

- The identification of residual impacts that will remain once mitigation measures have been implemented.

4.29 The LVIA process can make use of a range of tools including:

- Computer generated maps showing 'zones of theoretical visibility' (ZTVs) from within which the windfarm is likely to be visible. These maps use digital contour information to calculate from where turbines of particular heights will be visible. They are usually based on 'bare ground topography' and do not, therefore, show the screening provided by trees or buildings.

- Wire frame drawings representing the view from key viewpoints, receptors transport corridors or settlements. These provide a simple representation of how the windfarm would be seen from the location in question.

- Photomontages, which are more realistic representations of the windfarm in a given view.

4.30 LVIA should be used as iterative process through out the processes of selecting suitable sites, developing and refining the scheme design and mitigation measures. Key inputs include:

- Identifying broad locations that are likely to be suitable for windfarm development, based on an analysis of the sensitivity of different landscape character types and the influence of existing windfarms, or those under construction / with planning consent (see below). Section 4 provides an overview of landscape sensitivity within the SPD area.

- Carrying out detailed analysis of potential sites based on more detailed landscape character analysis, site survey and computer based ZTV analysis to identify preferred site(s).

- Carrying out detailed analysis of preferred site and views to inform scheme layout and design, including the size and location of turbines, access tracks and other infrastructure. The aim is to create a legible and comfortable relationship with the character and structure of the landscape and to minimise visual impacts on sensitive receptors.

- Identifying residual landscape and visual impacts and design of mitigation measures and land management proposals.

4.31 The LVIA will be reported in the Environmental Statement submitted alongside the planning application. This should provide the planning authority, its consultees and the wider community with a clear and accurate description of the landscape and visual implications of the windfarm proposal.

Outline of Issues Relating to Cumulative Impact Assessment

4.32 Cumulative impacts occur due to the combined effects of a number of different windfarms. Cumulative landscape impacts occur when a number of windfarms begin to influence the overall character and perception of a particular landscape. Cumulative visual impacts occur where the observer is aware of more than one windfarm, within a single view, in different views from the same location or sequentially when moving through a landscape.

4.33 The issue of cumulative impacts can be complex. Firstly, there may be circumstances when a planning authority is willing to accept cumulative landscape and visual impacts where, for example, this means that other, more sensitive areas can be protected from development. Secondly, depending on the number of windfarm schemes and their status (existing or under construction, consented, the subject of a valid planning application or subject to a scoping report), there can be many permutations to consider, particularly when the size of the 'study area' (based on 30km radii around windfarms and therefore totalling up to120km across) is taken into account.

4.34 Cumulative assessments are normally carried out in stages:

- firstly considering the application site in conjunction with existing sites and those under construction;

- secondly by adding sites that have planning consent; and

- finally by adding sites that are the subject of a valid but as yet undetermined planning application. This last category will be more speculative than the others but provides the 'worst case' assessment of the scheme.

4.35 The process is normally informed by combining different schemes' ZTVs to identify those locations from where more than one development would be visible. Further wire frame analysis and the preparation of photomontages may be required to examine the cumulative visual impacts.

4.36 Factors to consider in interpreting the results of the cumulative visual assessment include:

- the arrangement of windfarms in the view, e.g. more than one visible in a single view (combined cumulative effect), windfarms visible in a number of different views from the same location (successive cumulative effect) or windfarms visible at different points when travelling through an area (sequential cumulative effect);
- the relationship of scale of the windfarms, including the number, size and design of turbines;
- the relationship between the layout of different windfarms, e.g. where one windfarm may be a group or a line of turbines, and another may be a laid out on a grid;
- the position of the windfarms in the view, e.g. on the skyline, or against the backdrop of land;
- the sense of distance between the windfarms and the distance between the viewer and different windfarms;
- the extent to which different windfarms appear to merge to create the impression of much larger issues, further raising issues of size and the compatibility of different layouts and designs;
- the relative prominence of the windfarms within key views, taking into account the composition of the view and the nature of foregrounds and any backdrops;
- the extent to which there are cumulative impacts with other vertical elements, for example prominent or skylined pylons or communications infrastructure.

4.37 Analysis should also explore the extent to which particular landscape character types or areas are affected directly (as the location of windfarms) or indirectly (forming part of the ZTV), taking account of their relative sensitivity to windfarm development and the extent to which their key characteristics are adversely affected by cumulative development.

Biodiversity

Site Selection

4.38 The policy context and many of the potential biodiversity impacts of wind energy developments are common to all renewable energy developments and are discussed in **Chapter 3**. The nature and location of wind farms can give rise to certain specific issues, however, which are covered here.

4.39 Given the inherent requirements for windy sites, wind farms are often proposed on, or in proximity to upland areas which may support habitats of national, European and international importance, including bogs, fens and heaths. 'Active' blanket bog and 'active' raised bog are listed as 'Priority Habitats' under Annex 1 of the Habitats Regulations 1994, as habitats in danger of disappearance for which the European Union has particular responsibility regarding conservation. Some fen habitats are also in Annex 1 of the Habitats Directive, and all fen habitats and bog habitats are priority habitats in the UK BAP.

4.40 Peatland habitats are complex hydrological systems that can be influenced by activities occurring beyond the boundaries of individual habitat patches. Indirect impacts can arise as a result of either temporary or permanent changes in the drainage pattern, quality or quantity of surface and ground water, and can result in down-slope droughting or up-slope flooding of peat-based habitats and/or cumulative or incremental impacts that collectively affect the ecological structure and/or functioning of bogs, mires and heaths.

4.41 Peatlands also hold large stocks of carbon (i.e. act as carbon 'sinks') and, during wind farm construction, carbon is lost from the excavated peat and from the area affected by drainage.

4.42 Conversely, carbon savings can arise due to habitat improvement and site restoration. These considerations have to be factored into any calculation of the likely overall contribution of a wind farm to reducing greenhouse gas emissions. Whilst methodologies for calculating the likely 'carbon balance' associated with individual wind farms have been the subject of much debate, there have been efforts recently to reach consensus on a consistent and robust approach.[44]

4.43 A commonly raised concern is the risk of 'bird strike' i.e. death or injury to birds flying through the swept area of the turbine blades. Whilst many birds will naturally avoid the hazard presented by wind turbines, bird strike is more likely to occur if the turbines are sited in a migration path or where high concentrations of birds are typically found. Potential impacts on habitats which are not themselves protected but which are associated with rare or protected bird species, for example areas used for feeding or roosting, should also be taken into account. These risks are most likely to represent a constraint to wind energy development where a site with bird interest protected under national (SSSIs and National Nature Reserves) or international (SAC, SPA, or Ramsar site) legislation or protected bird species outside of protected sites could be adversely affected. The Northumberland Coast, Lindisfarne, Holburn Lake and Holburn Moss SPAs/RAMSARs sites are areas that could be affected. Developers have made a commitment to undertake research work on the distribution and movements of pink-footed and greylag geese in Northumberland. Bats are also potentially at risk from death or injury when flying through the swept area of the turbine blades or from barotraumas as a result of the change in air pressure around turbines. Collision risk is greatest where turbines are sited on flight lines between roosting and feeding grounds. Core Strategy polices S3, S12 and S14 all provide criteria to consider development in these areas and if necessary provide mitigation.

Role of the Design Strategy

4.44 In addition to selecting sites that avoid bird migration paths and high densities of bird populations, it may be possible to reduce bird strike risks by ensuring an adequate separation distance between the swept areas of turbines within a wind farm. It may be possible to mitigate unavoidable habitat impacts through the creation of compensatory habitat elsewhere within the locality of a wind development.

4.45 The design strategy should be used to minimise the disturbance, damage or loss of valued habitats and species. As these may be water dependent, consideration should also be given to minimising disruption to hydrological conditions. Importantly, ground conditions such as deep peat do not present ideal conditions for wind farm construction.

44 See for example, The Scottish Government (2008) *Calculating carbon savings from wind farms on Scottish peat lands - A New Approach.*

Where priority peat related habitats have been identified, efforts should be made to locate wind farm components (turbines, tracks, compounds etc) out with peatland habitats where possible. Further guidance can be obtained from the Institute of Ecology and Environmental Management.

4.46 The design strategy should also acknowledge any specific areas within, or in proximity to, the development boundary, which may be suitable for habitat management or enhancement measures. For example, Habitat Management Plans could include measures such as blocking drains/installing dams, cessation of burning/peat cutting and reducing grazing pressures both to improve the condition of existing peatland habitats and to restore habitats lost previously. These measures can also have benefits for bird species such as waders, and protected mammals such as otter and water vole. Whilst the detail of management prescriptions and monitoring will often be agreed following the granting of consent, it is advisable to have a robust strategy, with aims and objectives that are agreed in principle by the main interested parties (developer, landowners and relevant consultees), at the point at which an application is submitted. As stated in **Chapter 3**, there measures should only be considered in addition to measures to maintain the condition and integrity of existing features.

Further Information Sources

4.47 Further information is available from the following publications:

- RSPB, WWF, English Nature and BWEA (2001) *Wind Farm Development and Nature Conservation*. Available from: http://www.bwea.com/pdf/wfd.pdf

- Langston R.H.W and PullanJ.D. (2003) *Wind farms and Birds: An analysis of the effects of wind farms on birds, and guidance on environmental assessment criteria and site selection issues.* BirdLife International on behalf of the Berne Convention. Available from: http://www.coe.int/t/dg4/cultureheritage/conventions/bern/T-PVS/sc23_inf12_en.pdf

- Communities and Local Government (2006) *Planning for Biodiversity and Geological Conservation: A Guide to Good Practice,* Available from:http://www.communities.gov.uk/publications/planningandbuilding/planningbiodiversity

- ODPM (2005) Circular 6/2005, *Biodiversity and Geological Conservation – Statutory Obligations and their Impact within the Planning System,* Available from: http://www.communities.gov.uk/documents/planningandbuilding/pdf/147570.pdf

- Natural England (2009) *Bats and onshore wind turbines - interim guidance. A*vailable from: http://naturalengland.etraderstores.com/NaturalEnglandShop/Product.aspx?ProductID=eb67a4f0-cd69-452e-beae-be4a4e7b51d7

Operational Noise

4.48 Wind turbines generate noise from two distinct sources; mechanical noise from the generator and gearbox and aerodynamic noise from the turbine blades as they move through the air. Modern designs have reduced the mechanical noise so that it is now

generally less than or at a similar level to the aerodynamic noise. The aerodynamic noise is generally unobtrusive in nature, having been described as similar to the noise of wind in trees.[45]

Site Selection

4.49 When selecting a suitable site for a wind development, developers should identify the location of noise sensitive receptors such as dwellings or businesses requiring quiet conditions. Where any such receptors which may be affected are present, a noise assessment should be carried out to determine appropriate noise limits above background levels. Developers should follow the assessment method set out in guidance from the Department for Business, Enterprise and Regulatory Reform (BERR) (see below). This guidance gives indicative noise levels thought to offer a reasonable degree of protection to wind farm neighbours, without placing unreasonable restrictions on wind farm development. The levels are set relative to background noise limits, rather than as absolute limits, with separate limits for day-time and night-time. They are presented in a manner that makes them suitable for noise related planning conditions.

Role of the Design Strategy

4.50 In determining the location of turbines within a chosen site, the turbine design to be used and operational parameters to be followed, developers should be mindful of the need to control noise at sensitive receptors, as determined by the noise assessment described above. Alterations should be made to site selection and design to ensure that these noise limits are not exceeded.

Further Information Sources

4.51 Relevant guidance on noise assessment and mitigation includes:

- *PPG24 Planning and Noise*, CLG Available from: http://www.communities.gov.uk/publications/planningandbuilding/ppg24
- *The Assessment and Rating of Noise from Wind Farms* ETSU-R-97, BERR. Available from: http://www.berr.gov.uk/whatwedo/energy/sources/renewables/explained/wind/onshore-offshore/page21743.Html

Shadow Flicker and Reflected Light

4.52 In sunny conditions, rotating wind turbine blades cast an intermittent shadow. When experienced through a narrow window opening, this can, under certain conditions, cause a phenomenon known as ‘shadow flicker’ which may be detrimental to residential or workplace amenity. Flickering at certain frequencies can also give rise to health problems in a small proportion of epileptics, although the latest generation of wind turbines operates outside these frequencies.

45 ODPM (2004) Planning for Renewable Energy: A Companion Guide to PPS 22

4.53 The potential for adverse effects associated with shadow flicker and reflected light can be avoided by site selection that avoids the possibility that wind turbines will be less than ten rotor diameters from potentially affected properties. Where this is not possible, developers should carry out an assessment to determine the expected incidence of shadow flicker at nearby properties.

4.54 Where significant shadow flicker effects are predicted on properties within ten rotor diameters of a turbine, mitigation may be available by changing the location of turbines within a selected site, by screening affected properties or by avoiding turbine operation during periods when shadow flicker would otherwise occur.

4.55 Flashes of reflected light from rotating wind turbine blades tended to be problem associated with early designs of turbine blades which had a glossy finish but is unlikely to be significant in modern designs which employ a matt or semi-matt finish.

Further Information Sources

4.56 Further information on the factors affecting shadow flicker:

- *Planning for Renewable Energy: A Companion Guide to PPS22*, CLG. Available from: http://www.communities.gov.uk/publications/planningandbuilding/planningrenewable

Aircraft and Radar

4.57 Wind turbines pose a potential threat to air traffic safety for two reasons. Firstly, they represent a collision risk for low flying aircraft. Secondly, they can interfere with ground-based air traffic control radar and aircraft landing instruments. With respect to ground-based aircraft tracking radar, rotating wind turbine blades present a moving target to the radar beam which can either be mistaken for an aircraft or create 'clutter' which interferes with the radar's ability to track aircraft in the same sector. Proliferation of wind turbines can have a significant cumulative adverse effect on the safety and efficiency of aircraft tracking. For a ground-based radar to be affected, it must be in line of sight of the wind turbine blades.

Site Selection

4.58 In line with Civil Aviation Authority (CAA) policy (see CAP 764 below), the CAA's Directorate of Airspace Policy (DAP), the Ministry of Defence (MoD Defence Estates), and the National Air Traffic Services (NATS) should be consulted on wind turbine proposals at an early stage in the planning process. Consultation with these bodies should be conducted using a standard British Wind Energy Association (BWEA) proforma (see below). This is submitted to the MoD which consults with its various departments, as well as with the CAA and NATS.

4.59 In carrying out its assessment, DAP will refer to the requirements set out in CAP 764. If a site falls within 30 kilometres of a safeguarded aerodrome, the CAA generally devolves responsibility for safeguarding to the aerodrome in question. Much of the southern part of the SPD area is potentially affected by Newcastle International Airport (NIA). The MoD submits holding objections to all wind energy proposals within line of sight of air defence radars, unless the developer can provide evidence that it will have no impact on the radars. Proposals within tactical training areas are also likely to raise objections. MoD

concerns in Northumberland include[46] the potential effects of any wind turbine proposed within 74km of its radar installations at Brizlee Wood, Boulmer and Brunton in Northumberland and any proposal within its Spadeadam or TTA 20T Tactical Training Areas which cover parts of Northumberland.

Role of the Design Strategy

4.60 Where significant impacts on aircraft or radar are identified, these may potentially be mitigated by alterations to the planned turbine height and/or the exact location and spacing of turbines on a site. Developers must submit clear evidence that NIA, MoD and NATS have been involved in the Design Strategy.

Further Information Sources

4.61 Further information on these issues and the standard consultation pro-forma to be used are available as follows:

- *CAP 764 - CAA Policy and Guidelines on Wind Turbines*, CAA. Available from: http://www.caa.co.uk/application.aspx?catid=33&pagetype=65&appid=11&mode=detail&id=2358

- *BWEA Wind Farm Developers Application Proforma. Available from*: http://www.bwea.com/aviation/proforma.html

Telecommunications

4.62 Wind turbines can interfere with electromagnetic transmissions by blocking or deflecting those requiring line of sight or by the scattering of transmission signals. A wide variety of such signals exist in Northumberland, including rebroadcast links (RBLs) to local TV or radio transmitters, telephony links and emergency services links.

Site Selection

4.63 The developer should take steps to identify any line of site radio and microwave signals that cross a potential site. Links crossing the site should be identified by consultation with Ofcom via email to windfarmenquiries@ofcom.org.uk. Ofcom will check whether any part of the wind farm site falls within 0.5 – 1.0km (depending on the signal frequency) of the path of a fixed link, and if so, will instruct the developer to contact the appropriate fixed link operator. Developers may also wish to contact interested bodies directly, including local utility companies and emergency services.

4.64 Scattering of signals mainly affects domestic TV and radio broadcasts. A wind farm can affect domestic television reception up to 5km from the wind farm. Terrestrial television transmissions for domestic reception within the UK are the joint responsibility of the BBC and Ofcom. The BBC can provide an online approximate assessment of populations that may suffer interference from a wind farm at a specified location (see link below). Developers should note, however, that *'the tool is not intended to be a substitute for an on-site survey where the potential for disruption to television services may more accurately be assessed*'.

46 North East Assembly (2005) *Regional Spatial Strategy for the North East submission draft June 2005: Technical Background Paper No.7 Energy*, June 2005.

Role of the Design Strategy

4.65 Where fixed link signals are potentially blocked by a proposed wind farm site, a detailed investigation of the likely impact should be sought from a competent supplier. It is often possible to mitigate impacts by careful siting of individual turbines within a site so that turbine blades avoid a buffer zone, typically 100m either side of the signal path.[47] Failing this, it may be necessary for the developer to pay for a signal to be re-routed around the wind farm.

4.66 Where site investigations reveal a likely impact on domestic radio or TV reception, various solutions are possible including upgrading of domestic aerials or delivery of the signal by other means, for example by cable. A member of the Confederation of Aerial Industries Ltd should be able to advise on technical solutions.

Further Information Sources

4.67 Guidelines and further information on television reception problems caused by wind farms are provided in:

- *The Impact of Large Buildings and Structures (Including Wind Farms) on Terrestrial Television Reception*, 2006, BBC and Ofcom. Available from: http://www.bbc.co.uk/reception/info/pdf/buildings_factsheet.pdf
- BBC online assessment tool: Available from: http://windfarms.kw.bbc.co.uk/cgi-bin/rd/windfarms/windfarm.cgi

47 ODPM (2004) *Planning for Renewable Energy: A Companion Guide to PPS 22.*

5 The Application and Implementation Process

5.1 This final Chapter:

- addresses the different consenting mechanisms for renewable energy developments;
- describes the circumstances under which Environmental Impact Assessment (EIA) is required and signposts further information on its procedures;
- provides a summary of who to consult and when during the development process;
- outlines the role of planning conditions and legal agreements .

Consenting Mechanisms

5.2 The following renewable energy developments in the SPD area will require planning permission from the Local Planning Authority:

- plant that generates heat only; or
- plant that generates electricity only/CHP plants with electrical output capacity of 50MW or less.

5.3 Renewable energy developments with an electrical output capacity of more than 50MW require the permission of the Secretary of State for Energy and Climate Change under section 36 of the Electricity Act 1989. The Council will be a statutory consultee in these cases. Where a section 36 consent is granted, this is likely to be accompanied by 'deemed planning permission' under section 90 of the Town and Country Planning Act 1990.

5.4 Renewable energy developments can be connected to the electricity network by means of an underground cable or overhead line. As outlined in **Chapter 2**, connection to the electricity network is the responsibility of the local Distribution Network Operator. Construction of an overhead line requires consent from the Secretary of State for Energy and Climate Change under section 37 of the Electricity Act 1989. Connection by underground cable may constitute 'permitted development' under The Town and Country Planning (General Permitted Development) (Amendment) (England) Order 2008.

5.5 Figure 5.1, adapted from a process diagram in guidance from the Sustainable Development Commission on wind energy development,[48] sets out the key development stages for a renewable energy facility in England, including the planning consent process at Figure 5.1b.

5.6 Further information on lodging a planning application and contact details for the Planning Team is available on the Council's website at:

- http://www.northumberland.gov.uk/default.aspx?page=731

48 SDC (2005) *Wind Power in the UK*.

Figure 5.1A THE RENEWABLE DEVELOPMENT PROCESS: ASSESSMENT STAGE

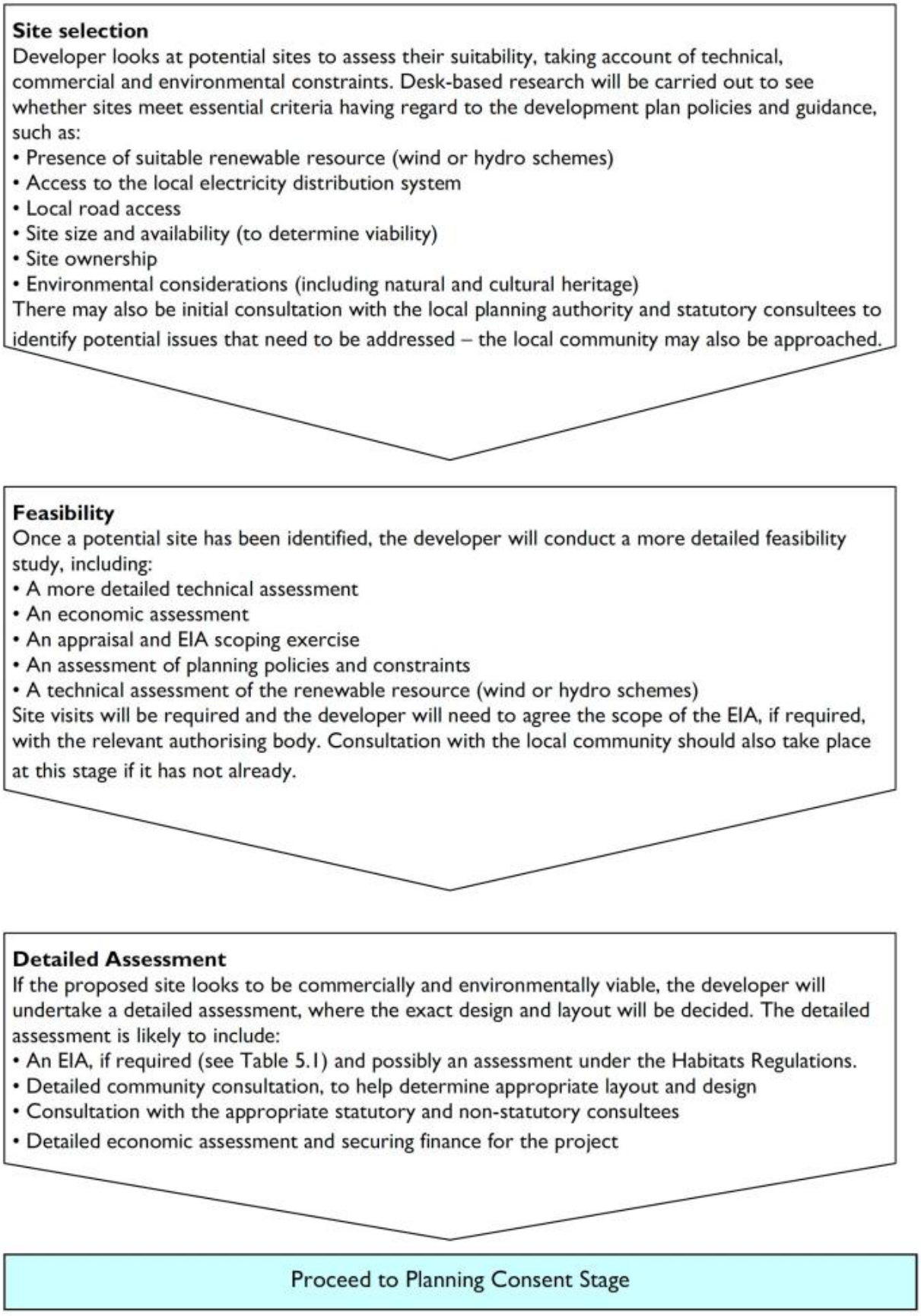


Figure 5.1B THE RENEWABLE DEVELOPMENT PROCESS: CONSENT STAGE

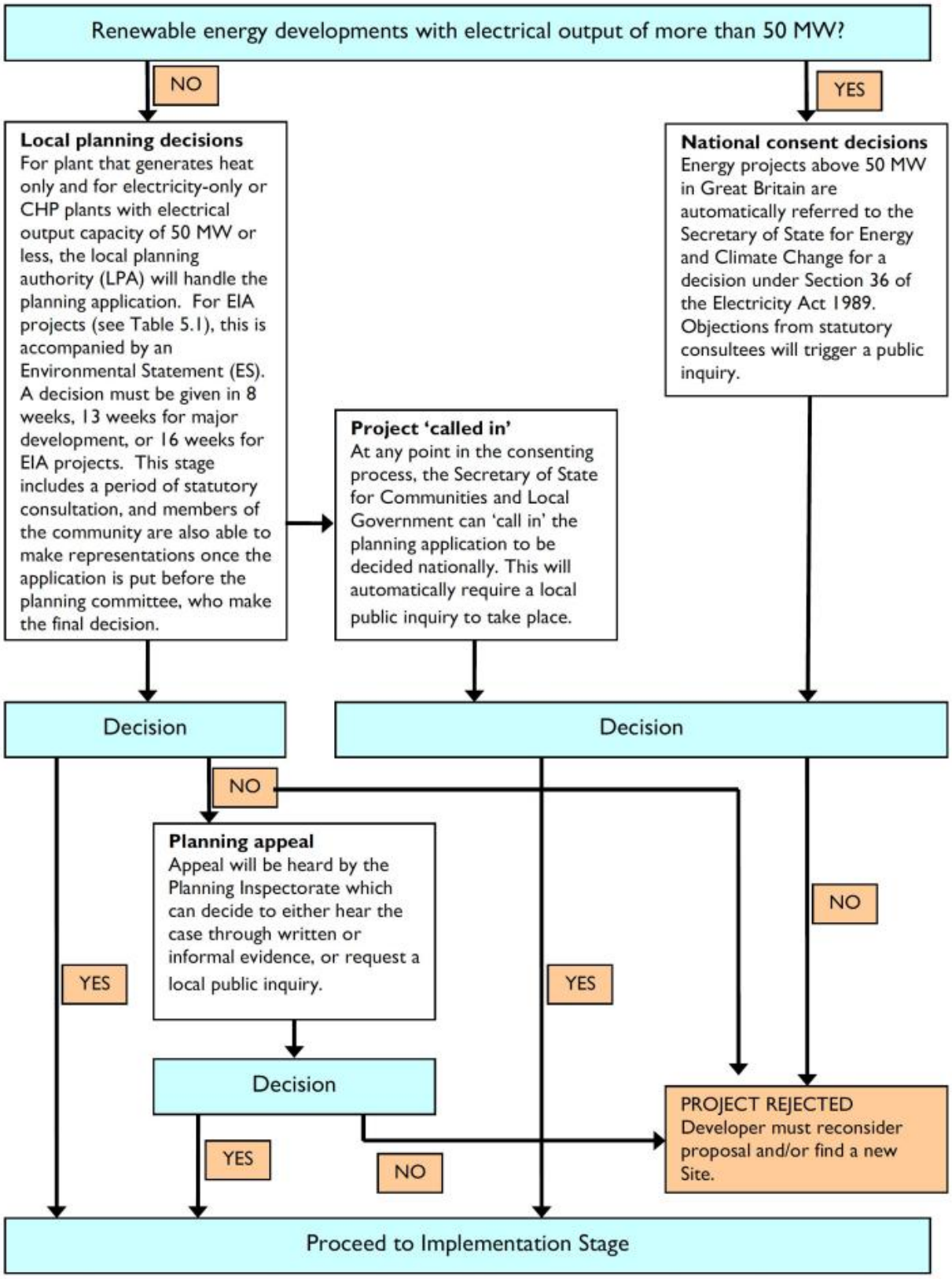
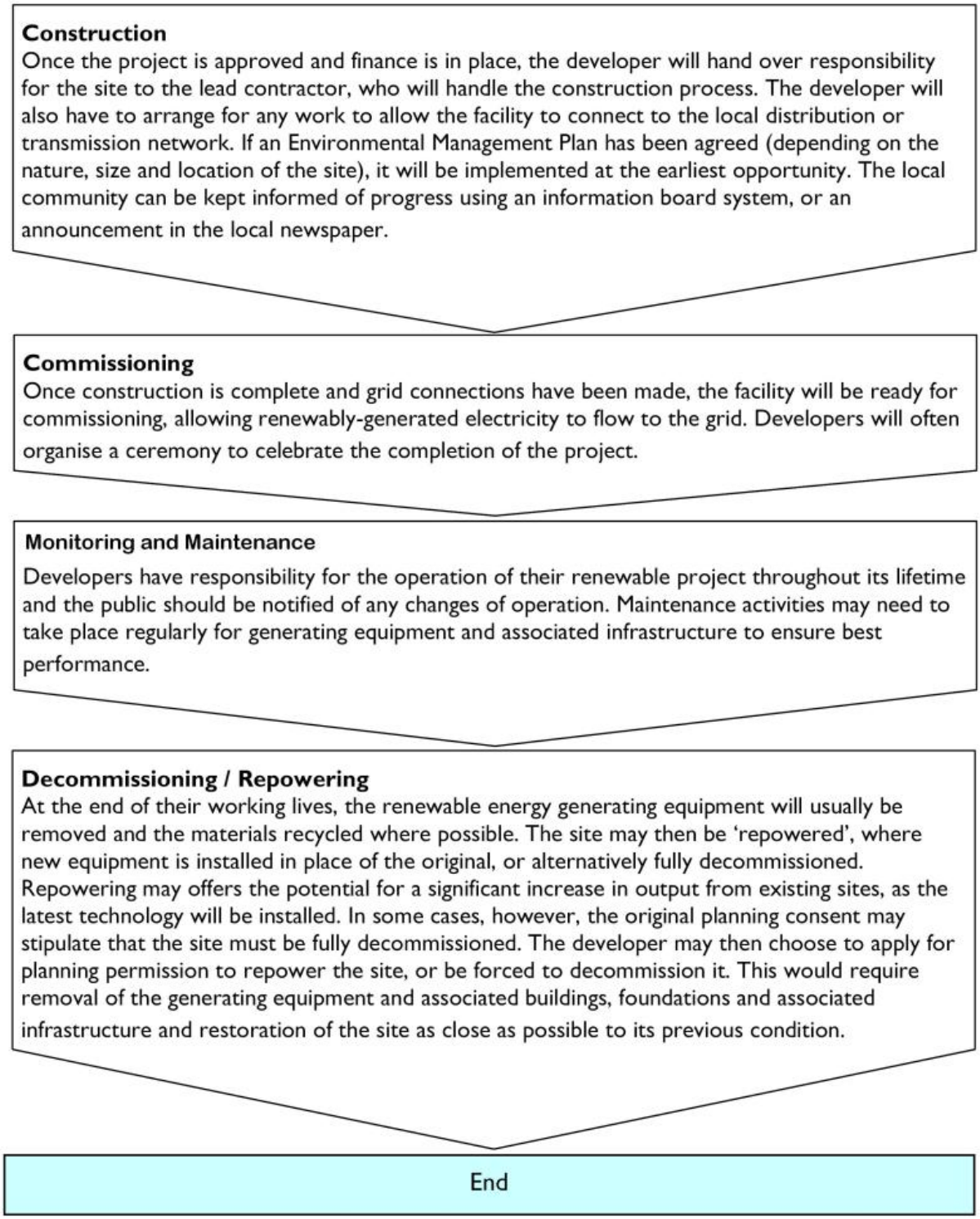


Figure 5.1C THE RENEWABLE DEVELOPMENT PROCESS: IMPLEMENTATION STAGE



Environmental Impact Assessment

Certain renewable energy development proposals require Environmental Impact Assessment (EIA) under EIA Regulations which implement the EU's Environmental Impact Assessment Directive 85/337/EEC as amended by 97/11/EC and 2003/35/EC.

The Regulations require EIA in every case for 'Schedule 1' developments. These include 'thermal power stations and other combustion installations with a heat output of 300 MW or more'. In addition, EIA may be required for any renewable energy development falling under Schedule 2 of the Regulations, as set out in Table 5.1. For Schedule 2 developments, if requested, the Council will provide a 'Screening Opinion' on the need for EIA, based on consideration of whether the project is likely to give rise to significant environmental effects. DETR Circular 2/99 states that significant effects are more likely for developments which:

- are of more than local importance;
- are in particularly vulnerable or sensitive locations;
- have unusually complex and potentially hazardous environmental effects.

In judging the likelihood of significant effects, the Council will also have regard to the thresholds and criteria set out in the Regulations and reproduced in Table 5.1. Where the 'applicable thresholds and criteria' in column 2 are not met, EIA will not normally be required, although it may still be necessary for development in an environmentally 'sensitive area'[49] or when directed by the Secretary of State. Where the 'indicative thresholds and criteria' in column 3 are exceeded, EIA is more likely to be required.

Table 5.1: Schedule 2: renewable developments which may require EIA[50]

Type of development	Applicable thresholds and criteria	Indicative thresholds and criteria
Industrial installations for the production of electricity, steam and hot water (unless included in Schedule 1)	The area of the development exceeds 0.5 hectare.	EIA will normally be required for power stations which require approval from the Secretary of State, i.e. those with a thermal output of more than 50 MW. The main considerations are likely to be the level of emissions to air, arrangements for the transport of fuel and any visual impact.
Installations for hydroelectric energy production	The installation is designed to produce more than 0.5 MW.	In addition to the physical scale of the development, particular regard should be had to potential wider impacts on ecology and hydrology. EIA is more likely to be required for new

49 As defined in the Regulations, and including National Parks, AONBs, SSSIs, World Heritage Sites, and scheduled monuments.
50 ODPM (2000) Environmental Impact Assessment: A guide to procedure

Type of development	Applicable thresholds and criteria	Indicative thresholds and criteria
		developments which have more than 5 MW generating capacity.
Installations for the harnessing of wind power for energy production (wind farms)	The development involves the installation of more than 2 turbines; or The hub height of any turbine or height of any other structure exceeds 15 metres.	The likelihood of significant impacts will generally depend on the scale of development, and its visual impact, as well as potential noise impacts. EIA is more likely to be required for commercial developments of five or more turbines, or more than 5 MW of new generating capacity.

5.7 In addition to the bodies which would be statutory consultees for any planning application, Natural England and The Environment Agency must be consulted in all cases where an Environmental Impact Assessment is undertaken.

5.8 Further information on the procedural requirements for EIA, including how to prepare an Environmental Statement is available in the CLG publication *Environmental Impact Assessment: A Guide to Procedures.*[51]

5.9 As stated previously, in accordance with the Habitats Regulations (1994), an 'Appropriate Assessment' is also required for any project likely to have a significant effect on a European site of nature conservation importance. The proposal must be able to demonstrate that it will not adversely affect the integrity of a European site, alone or in combination with other plans and projects. This includes avoiding adverse impacts on the features of interest for which the site is designated and avoiding deterioration or damage to any habitats on which they depend.

Consultation

5.10 Prior to submitting an application, renewable energy developers are encouraged to enter into pre-application discussions with the Council's Planning Team. During this pre-application period, the developer will be encouraged to consult with the statutory consultation bodies, the general public (for example via public exhibitions) and relevant non-statutory stakeholders, in order to identify potential areas of concern and address them at an early stage in the project planning process.

5.11 Once the Council Planning Team has received and validated an application, it will publicise and consult on the application. The statutory consultation bodies are set out by Government within Town and Country Planning (General Development Procedure) Orders. **Table 5.2** lists a number of statutory and non-statutory consultation bodies and their areas of interest. This list is not exhaustive and developers should discuss relevant stakeholders

51 Available from http://www.communities.gov.uk/publications/planningandbuilding/environmentalimpactassessment An updated version is expected shortly.

further with the Planning Team. Further consultees of particular relevance to wind energy development proposals are covered in **Chapter 4**above. The policies against which an application will be considered are detailed in **Chapter 3**.

Table 5.2:

Selected Statutory and Non-Statutory consultees: GEE Planning Fact Book

Consultation Body	Areas of interest of particular relevance to renewable energy development
Statutory consultees	
Environment Agency	Proposals involving work in the bed or on the banks of rivers and streams; development relating to the retention, treatment or disposal of slurry or sludge. Although non-statutory, the Council is also expected to consult the Environment Agency where proposals could lead to increased industrial discharge into a watercourse, where the proposed site is within 500m of a process subject to Integrated Pollution Control or Air Pollution Regulations or where development is proposed in areas at risk from flooding.
English Heritage	Proposals likely to affect the Hadrian's Wall World Heritage Site, Scheduled Ancient Monuments, Grade 1 and 11* Listed Buildings, Historic Parks and Gardens and Battlefields.
Natural England	Proposals involving the siting of new developments or extensions to existing developments where it appears to the Council that an area of particular ecological or geological sensitivity, AONB, National Park or Heritage Coast, impacts on major recreational routes such as National Trails and open access land or interest may be affected.
Highways Agency	Proposals resulting in material changes in traffic on or involving the formation, laying out or alteration of access to a trunk road.
Local Highway Authority i.e. Highways Development Manager at Northumberland County Council.	Proposals resulting in material changes in traffic on or involving the formation, laying out or alteration of access to a highway other than a trunk road.
Northumberland County Council Conservation Team	Proposals likely to affect the special qualities of Northumberland's natural and historic environment (expertise in archaeology, ecology, historic buildings, and marine conservation).

Consultation Body	Areas of interest of particular relevance to renewable energy development
Northumberland National Park Authority	Proposals likely to affect land in Northumberland National Park.
Non-statutory consultees	
Parish Council(s)	Proposals likely to affect land in a particular parish or parishes.
Northumberland Coast AONB Partnership	Proposals within or likely to affect the setting of the Northumberland Coast AONB.
Campaign to Protect Rural England	Proposals likely to adversely affect the landscape, amenity, tranquillity or other valued aspects of rural areas.
Northumberland Wildlife Trust; Northumberland County Ecologist	Proposals likely to affect valued species, habitats or geological interest.
Relevant wildlife NGO e.g. RSPB (bird interest); Bat Conservation Trust (bat interest); Mammal Society (mammal interest) as advised by Wildlife Trust, Natural England or County Ecologist.	Proposals likely to affect particular types of flora or fauna.
Ramblers Association; British Horse Society; Sustrans	Proposals likely to affect rights of way interests, bridleways or Sustrans cycle routes.
Sport England North East	Proposals which would lead to the loss of sports facilities.

The Role of Planning Conditions, Planning Obligations and Consideration of Community Benefits

Planning Conditions

5.12 Planning conditions are conditions attached to a planning permission.[52] They are imposed by a consenting authority such as the local planning authority (LPA), although the Council welcomes reasoned suggestions from developers. National policy guidance[53] requires planning conditions to be:

i. necessary;

ii. relevant to planning;

52 A consent under section 36 of the Electricity Act is likely to have conditions attached to both the consent and the deemed planning permission.

53 CLG (1995) *Circular 11/95: Use of conditions in planning permission*.

iii. relevant to the development to be permitted;

iv. enforceable;

v. precise; and

vi. reasonable in all other respects.

5.13 As an example, possible planning conditions in relation to wind energy development may cover:

- noise emissions from turbines;
- the size and colour of turbines;
- the design of ancillary buildings;
- limiting construction to specified times of year to avoid impacts on local flora and fauna;
- the need for turbines on a particular site to rotate in the same direction to reduce visual impact;
- the need for specialists, such as ecologists or archaeologists, to be present on site prior to and/or during construction to safeguard environmental interests on site.

5.14 More detailed guidance on planning conditions for onshore wind energy development is available from the Department for Business, Enterprise and Regulatory Reform (BERR)'s Onshore Wind Energy Planning Conditions Guidance Note (2007). Possible planning conditions relating to other renewable technologies are provided in the Technical Annex of the Companion Guide to PPS22.

5.15 The Council welcomes early discussion to establish planning conditions that may be relevant.

Planning Obligations (s106 agreements)

5.16 Planning obligations, also known as Section 106 (s.106) agreements,[54] are private agreements negotiated between a developer and a LPA or unilateral undertakings by a developer to an LPA, which are intended to make acceptable, development which would otherwise be unacceptable in planning terms. It is a fundamental principle of the planning system that planning decisions must be decided according to the relevant planning issues. Planning Policy Statement (PPS) 1: Delivering Sustainable Development states that planning decisions *'have to be taken in accordance with the development plan*[55] *unless other material considerations indicate otherwise'*. Planning issues or 'material considerations' include the number, size, layout, siting, design and external appearance of the proposed development together with landscaping, impact on the neighbourhood

54 Section 106 of the Town and Country Planning Act 1990.
55 *The relevant development plan for proposals in the SPD area comprises the North East RSS together with the Alnwick Core Strategy and other Development Plan Documents (DPDs) prepared by the Council.*

and availability of necessary infrastructure.[56] Planning issues relevant to particular renewable energy technologies are described in **Chapter 3** of this SPD and in the Companion Guide to PPS22.

5.17 To be valid, national policy[57] requires that a planning obligation be:

- relevant to planning;
- necessary to make the proposed development acceptable in planning terms;
- directly related to the proposed development;
- fairly and reasonably related in scale and kind to the proposed development; and
- reasonable in all other respects.
- Planning obligations may take various forms, for example:
- they may prescribe the nature of development, e.g. providing additional infrastructure such as widened access roads;
- they may compensate for loss or damage, e.g. contribute to compensatory open space or habitat lost to the proposed development;
- they may mitigate a development's impacts, e.g. correcting TV interference caused by wind turbines.

5.18 Where relevant, in the case of habitat management proposals for example, an agreement should include appropriate management provisions, and allow for monitoring of both the impacts and the effectiveness of any mitigation or compensation measures, with scope to amend the provisions as necessary.

5.19 Contributions may either be in kind or in the form of a financial contribution. The impacts of a proposed development may extend beyond the immediate development site and planning obligations are more flexible than planning conditions in that they can be used to mitigate or compensate for these off-site impacts.

5.20 The Council welcomes early discussion to establish any planning obligations that may be relevant.

Community Benefits

5.21 A report for the Department of Trade and Industry (now BERR) suggests that communities should routinely benefit from wind energy developments to sustain public support for future development and to avoid the risk that local communities may feel that wind developments are 'done *to* them'.[58] Experience from elsewhere in Europe indicates

56 DTI (2007) *Delivering community benefits from wind energy development: a tool kit*. A report for the Renewables Energy Advisory Board and DTI, May 2007.
57 ODPM (2005) *Circular 05/2005 Planning Obligations*
58 *Delivering community benefits from wind energy development: a tool kit*. A report for the Renewables Energy Advisory Board and DTI, May 2007

that this is best done by ensuring that local benefits are integral to the project from the outset. Various mechanisms are available for delivering local benefits, including benefits in kind, local ownership and local training and employment.

5.22 The report for the Department of Trade and Industry (as was) states that *'the most obvious and most common way for wind energy developments to provide community benefits is for money to be paid into a fund for the use of the community'.*[59] Although, as stated earlier, planning policy requires significant weight to be given to the social and economic benefits of renewable energy proposals, community benefits such as payments into a Community Fund are not considered material considerations and the Council will not therefore take them into account in its planning decisions.

5.23 Benefits in kind may be provided as an alternative, or in addition, to payments into a Community Fund. Community improvements may include local facilities such as a community centre; environmental improvements such as habitat restoration; tourism, recreation or education provision such as footpath improvements; or telecommunications improvements.

Further Information

5.24 Further information on the role of planning conditions, planning obligations and community benefits generally, and for renewable energy developments specifically, is available from the following sources:

- CLG (1995*) Circular 11/95: Use of conditions in planning permi*ssion.
- ODPM (2005) *Circular 05/2005 Planning Obligations*.
- ODPM (2004) *Planning for Renewable Energy: A Companion Guide to PPS 22*.
- BERR (2007) *Onshore Wind Energy Planning Conditions Guidance Note*. A report for the Renewables Energy Advisory Board and BERR, October 2007.
- DTI (2007) *Delivering community benefits from wind energy development: a tool kit.* A report for the Renewables Energy Advisory Board and DTI, May 2007.

59 *Delivering community benefits from wind energy development: a tool kit. A report for the Renewables Energy Advisory Board and DTI, May 2007*

Appendix

NORTH EAST REGIONAL SPATIAL STRATEGY

Policy 39: Renewable Energy Generation

Strategies, plans and programmes, and planning proposals should:

a. facilitate the generation of at least 10% of the Region's consumption of electricity from renewable sources within the Region by 2010 (454 MW minimum installed capacity);

b. aspire to further increase renewable electricity generation to achieve 20% of regional consumption by 2020;

c. facilitate the achievement of the following minimum sub regional targets to 2010:

Northumberland	212MW
Durham	82MW
Tyne & Wear	22MW
Tees Valley	138MW
Total	454MW

Policy 40: Planning For Renewables

Strategies, plans and programmes should support and encourage renewable energy proposals and identify renewable resource areas. In assessing proposals for renewable energy development significant weight should be given to the wider environmental, economic and social benefits arising from higher levels of renewable energy, and the following criteria should be considered:

a. anticipated effects resulting from development construction and operation such as air quality, atmospheric emissions, noise, odour, water pollution and the disposal of waste;

b. acceptability of the location and the scale of the proposal and its visual impact in relation to the character and sensitivity of the surrounding landscape;

c. effect on the region's World Heritage Sites and other national and internationally designated heritage sites or landscape areas, including the impact of proposals close to their boundaries;

d. effect of development on nature conservation sites and features, biodiversity and geodiversity, including internationally designated and other sites of nature conservation importance, and potential effects on settings, habitats, species and the water supply and hydrology of such sites;

e. maintenance of the openness of the Region's Green Belt;

f. accessibility by road and public transport;

g. effect on agriculture and other land based industries;

h. visual impact of new grid connection lines;

i. cumulative impact of the development in relation to other similar developments; and

j. proximity to the renewable fuel source such as wood-fuel biomass processing plants within or close to the Region's major woodlands and forests.

Policy 41: Onshore Wind Energy Development

Strategies, plans and programmes should provide a positive policy framework to facilitate onshore wind energy development within the following broad areas of least constraint for wind energy developments.

Kielder Forest has the potential to become a Strategic Renewables Resource Area, including large scale wind energy development.

The following areas have potential for medium scale development:

- South and West Berwick upon Tweed
- North/ South Charlton
- Knowesgate Area
- Harwood Forest
- Northern Coalfield south of Druridge Bay
- Kiln Pit Hill Area
- North Durham Upland Coalfield
- South Durham Upland Coalfield
- East Durham Limestone Area
- Tees Plain
- Teeside

Small wind farms in urban areas and on the urban rural fringe should also be supported, particularly within the following areas:

- Sunderland;

- South Tyneside; and
- Tees Valley.

The broad locations of these areas should be identified within Local Development Frameworks using Policy 40. Their identification does not preclude proposals being considered in other areas in terms of Policy 40.

ALNWICK CORE STRATEGY

Policy S21: Renewable Energy

Proposals for the generation of all types of renewable energy will be supported within the district where the scheme:

a. is fully in accordance with the Regional Spatial Strategy for the North East;

b. has no adverse impact on communities, residential amenity, the local economy and land use or where the impact can be satisfactorily mitigated;

c. reflects the Alnwick district Landscape Character Assessment; and, in the case of a wind farm,

d. is within the landscape's capacity to accommodate change and neither individually nor cumulatively gives rise to a wind farm landscape.

Developers of schemes that provide wind energy development of medium scale will be encouraged to seek opportunities of development in the broad areas of least constraint identified on the key diagram. The wider environmental, economic and social benefits of all renewable energy projects will be given significant weight.

Note: The landscape capacity for the areas of least constraint is established in the SPD on planning for renewables.

Policy S22: Energy Efficiency

New development of 10 or more dwellings or new buildings of more than 1000 sq m will be required to source a minimum of 20% of their energy requirement from on-site renewable energy installations. All development will be expected to demonstrate that through sustainable construction techniques and energy efficiency measures, CO_2 emissions will be reduced. All non residential development will be expected to reach a standard of BREEAM 'very good' or 'excellent' or equivalent rating. All residential development will be expected to reach at least level 3 of the Code for Sustainable Homes.

NORTHUMBERLAND

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