Planning guidance for renewable energy

Produced for Lancashire County Council

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CLASP. Climate Change Local Area Support Programme

nwIEP north west improvement and efficiency partnership

maslen environmental part of the JBA Group

SQW

Contents

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1: Introduction

1.1 This document has been prepared by SQW and Maslen Environmental, for Lancashire County Council. Its purpose is to act as a guide and a starting point for planning officers within the County Council and the Lancashire local authorities (LAs) providing advice on planning issues associated with onshore renewable energy technologies. The advice within this guide should help LAs to develop appropriate planning policies and guidance (for inclusion in their Local Development Plans (LDPs) and to inform planning application decisions) concerning renewable energy. It also provides an introduction to the types and scales of technologies that fall within the renewable energy remit. This is one of a suite of documents that together comprise the final outputs from the Lancashire Sustainable Energy Study; the others being:

- 14 LA specific renewable energy resource assessment reports, produced in April 2011
- Technical study supporting the resource assessment reports, produced in April 2011
- LA specific GIS mapping of renewable energy potential, produced in April 2011
- Taking forward renewable energy deployment in Lancashire report, produced in July 2011
- Factsheets in Plain English to summarise the findings for each LA.

1.2 This document does not provide planning policy guidance; that is, the development of direct policies to guide planning decisions, but aims to provide an approach and assistance for the development of renewable energy policy relevant to a range of local circumstances. This guide should be seen as providing a framework, rather than an exhaustive manual. All of the Lancashire LAs are at different stages in the development of their LDPs, with differing levels of current policy guidance around renewable energy. The following advice will be more or less relevant depending on 'how far' LAs have progressed with the development of their own renewable energy planning policy guidance[1].

Context

1.3 The UK Renewable Energy Strategy (UKRES), published in 2009, sets out a framework to assist with the delivery of climate change targets. The UKRES states that 15% of the UK's energy demand is to be met by renewable energy sources by 2020, which should provide 30% of electricity, 12% of heat and 10% transport. Clearly this requires a 'step change' in the provision of renewable energy capacity in the UK and action at all geographic levels to help to plan and deliver this strategy between now and 2020. The Coalition Government has retained the commitment, made by the previous Labour Government, to obtain 15% of energy from renewables by 2020 by supporting the roll out of large and small scale

[1] See the *Taking forward renewable energy deployment in Lancashire* report.

technologies and will aim for a 34% reduction in greenhouse gas emissions by 2020 compared to 1990 levels.

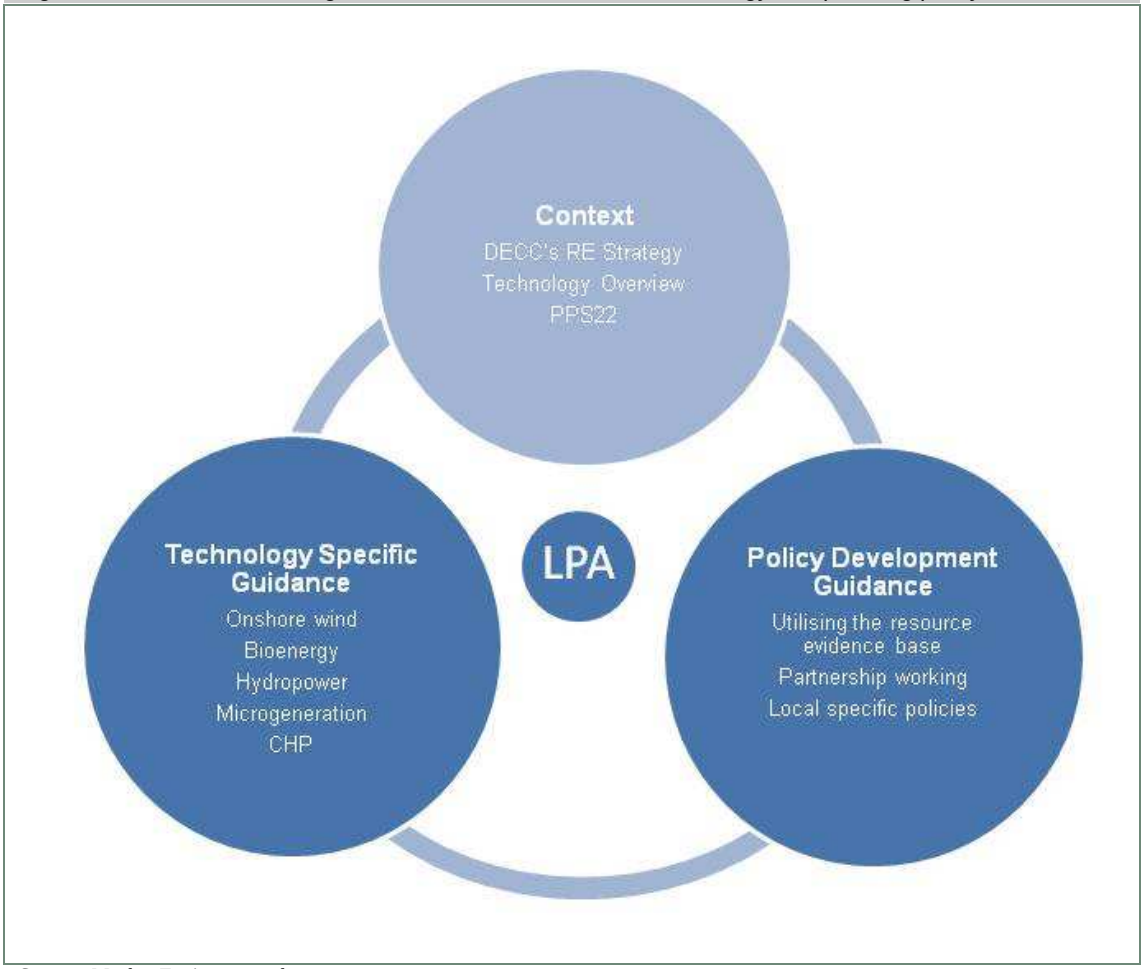
1.4 The current planning policy context is in a state of flux with considerable uncertainty, and therefore it is essential that LAs keep abreast of national developments to ensure that their own policy guidance and practice is up to date. The current overarching policy documents within which renewable energy planning guidance should be developed are Planning Policy Statement 22: Renewable Energy (PPS22) and the Climate Change Supplement to Planning Policy Statement 1: Delivering Sustainable Development. The latter reinforces the requirements of PPS22 and considers that there should be a presumption in favour of renewable energy development - it states that local planning policies should not require applicants to demonstrate the overall need for renewable energy.

1.5 At the regional level, Government has set out its intention to revoke RSS, and with it regional and sub-regional targets for the deployment of renewable energy. The current approach, reflected in the 2011 Memorandum of Understanding between DECC and the Local Government Group[2], is to "encourage all councils to take firm action – underpinned by locally ambitious targets and indicators". Therefore, LAs may consider whether they wish to develop local targets in their Core Strategies informed by the evidence base provided by this study. A more detailed overview of the current energy and planning policy context is contained in the *Taking forward renewable energy deployment in Lancashire* report.

1.6 As highlighted in Figure 1-1, this guide provides LAs with **general guidance on renewable energy planning policy development** (Section 2) as well as **advice on planning issues associated with a range of specific renewable energy technologies** (Section 3). The guide is supported by annexes providing a glossary of terms and sources of further useful information.

[2] http://www.decc.gov.uk/assets/decc/What%20we%20do/lc_uk/loc_reg_dev/1380-mou-lggroup-decc.pdf

Figure 1-1: The focus of this guide in the context of the national energy and planning policy framework



Source: Maslen Environmental

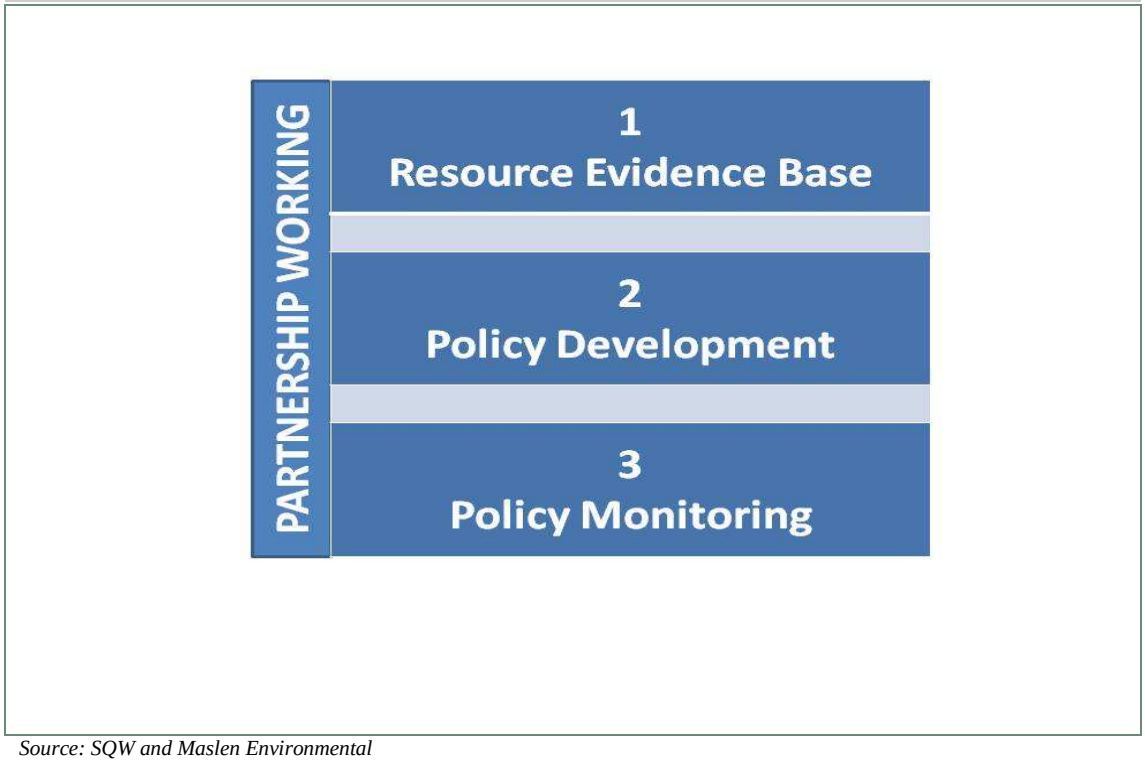
2: Renewable energy planning policy development guidance

2.1 This section identifies some of the key issues that need to be considered in developing local planning policy and guidance, including Core Strategies, Area Action Plans and Supplementary Planning Documents (SPDs), for renewable energy. The guidance follows the key principles identified within PPS2.

A Three Stage Process

2.2 The process for developing local level planning policies for renewable energy deployment can be seen as a three stage process as illustrated in Figure 2-1. The process involves developing and refining the evidence base to inform local policy development and monitoring, supported by partnership working.

Figure 2-1: Three stage process



Source: SQW and Maslen Environmental

Partnership working

2.3 A number of Lancashire's LAs are working together on developing joint Core Strategies such as the Central Lancashire authorities and in these cases a joint evidence base developed through a consistent approach is essential for the development of cross-authority policies.

2.4 In addition, there is a crucial need within LAs, especially as resources become more constrained, to work closely with colleagues in other departments (climate, transport,

economic development) and wider stakeholders such as the Energy Saving Trust in both the development and delivery of renewable energy planning policy.

2.5 In implementing planning policies and determining planning applications, LAs should work closely with developers and local communities considering the development of renewable energy schemes through pre-application discussions and by providing easily accessible clear and transparent planning guidance.

Stage 1 - Renewable Energy Resource/Capacity and Deployment Evidence Base

2.6 The 14 LA resource assessments and the *Taking forward renewable energy deployment in Lancashire* report provide a consistent evidence base, developed in line with the national DECC/DCLG methodology for renewable energy capacity assessments. They provide an assessment of the potential technical renewable energy capacity for each of the local authorities and the Lancashire sub-region as a whole at 2020, and then go on to identify how this is likely to be constrained by key environmental, economic, environmental, financial and social factors. Scenarios are also used to test out different technology mixes that could be deployed in the future. This evidence base, reflecting the local characteristics of each LA, is an important platform which renewable energy planning policies should reflect and address the opportunities and constraints identified.

Stage 2 – Policy Development

2.7 There are five main approaches through which planning policy and guidance for renewable energy can be provided within LPD documents[3]. These consist of:

2.8 **Criteria based policies** for the assessment of applications for renewable energy developments and the integration of renewable and low carbon energy targets (if these are to be provided). These policies are required by PPS22 and should be included within Core Strategies. The overall intention of criteria based policies is to ensure that the environmental, social and economic benefits of renewable energy schemes have been thoroughly and appropriately considered. Constraints to the development of renewable energy should be identified within criteria based policies.

2.9 Criteria based policies often adopt target setting to identify amounts/proportions of renewable energy that developments over a certain size should generate. The 'Merton Rule' is the groundbreaking planning policy, developed by Merton Council, which requires the use of renewable energy onsite to reduce annual carbon dioxide (CO2) emissions in the built environment. Merton developed the rule and adopted it in 2003, following which it has been adopted by many local authorities. Blackpool's proposed policy *G9 Energy requirements of new development* within its Core Strategy Preferred Option reflects this approach.

[3] Further guidance is available from 'Planning for Climate change guidance and Model Policies for Local authorities (TCPA for the Planning and Climate Change Coalition, November 2010).

Table 2-1: Criteria based policy example

Policy Env 5: Renewable energy of Hyndburn Borough Council's Core Strategy Development Plan Document includes a criteria based policy which states that:
In order to contribute towards the achievement of national renewable energy targets the Council will support development of new sources of renewable energy provided that:

- measures are taken to avoid and where appropriate mitigate any negative impacts of the effects on local amenity resulting from development, construction and operation of the schemes.
- the visual impact can be accommodated within the landscape and the development would not give rise to an unacceptable adverse cumulative impact when considered in the context of other existing or consented developments, and;
- measures are taken to avoid and where appropriate mitigate any negative effects of the development on nature conservation features, biodiversity and geodiversity, including habitats and species, and;
- the site is accessible and the development of supporting infrastructure does not itself result in unacceptable adverse impacts, and;
- developers have engaged with the community and local authority at an early stage prior to the formal submission of any proposals, and;
- large scale renewable energy developments make provision for direct community benefits over the period of the development.

Source: SQW

2.10 **Location specific policies** cover both site and broad locational policies for stand-alone renewable and low carbon energy developments. PPS22 sets out locational considerations and the need to consider potential for adverse effects on designated areas as well as identifying the areas where the resource is most plentiful.

Table 2-2: Location specific policy example

Policy EP19 of **Norwich City Council's Local Plan** – which provides an example of an LDF that has identified a site for energy development. It identifies the site of a former power station at Cremorne Lane as potentially suitable for a biomass power plant, utilising agricultural or forestry resources from the Yare valley and transporting them by water to the site.

The Policy notes that a planning application for a development of this type on the site will require an environmental impact assessment. This will consider the:

- Viability of transporting the raw materials to the plant by rail or river
- Visual effects of the proposed development on the Broads National Park and the Thorpe Ridge and Thorpse St Andrew Conservation Areas
- Effects the development would have on air quality.

Source: SQW

2.11 **Policies on integration with the built environment** relate to the setting of sustainable building and area wide standards or minimum carbon reduction targets for new development. These identify targets that exceed national requirements with regards to the Code for Sustainable Homes and BREEAM.

Table 2-3: Built Environment Integration policy example

Daventry and South Northamptonshire councils issued a joint SPD in 2007 that uses the Code for Sustainable Homes as a mechanism for reducing carbon emissions from new developments. Developers are now required to achieve Code level 2 for residential developments of fewer than ten dwellings, and Code level 3 for residential developments of more than ten. New non-residential developments over 1000m^2 must meet at least 10% of the predicted energy requirements with integrated renewables or contribute to a system of carbon off-setting in cases where these targets cannot be met.

Source: SQW derived fromRegen SW (http://www.regensw.co.uk/climate-change-pps/resources/good-practice-and-case-studies)

2.12 **Policies on community wide infrastructure** concerning the development of policies, to encourage district heating schemes. The provision of community-wide infrastructure for heat distribution needs to be considered as early as possible in the strategic planning process as it will underpin a range of related sustainable energy policies on district-wide and site-specific targets. Any such strategic planning will need to be supported by a robust set of spatial heat demand data, such as the heat maps provided as part of the Lancashire LA resource assessments, which will provide useful spatial intelligence in support of policy objectives.

Table 2-4: Community wide policy example

Plymouth City Council has adopted a community-scale approach on energy infrastructure for its city Centre. Policy CC05 of the City Centre and University area Action plan concerns the delivery of an integrated Combined Heat and Power and District Heating and Cooling network. Where a network is not yet established, proposals for larger scale developments will be encouraged to:

- Contribute towards the establishment of a network
- Include heating and cooling systems that allow future connection to a network.

Where a network is established, proposals for larger scale developments will be encouraged to:

- Connect to the network
- Make an offsite contribution towards local completion of the network.

Source: SQW

2.13 **Topic based Supplementary Planning Documents** provide greater detailed advice in relation to the deployment of specific technologies.

Table 2-5: Topic based SPD example

Cumbria Wind Energy Supplementary Planning Document Guidance

Cumbria County Council together with Eden District Council and the local planning authorities in Allerdale, Carlisle, Copeland, South Lakeland and the Lake District National Park developed a partnership to produce Supplementary Planning Document (SPD) guidance specifically focused on wind energy developments of less than 50MW installed capacity. The guidance aims to help local planning authorities determine wind energy development planning applications.

The partnership considers it important to look favorably on wind energy development that does not cause unacceptable harm to the built and natural environment. Therefore this SPD provides guidance information to address environmental, social and economic effects when preparing wind energy proposals as well as providing technical guidance on landscape capacity, landscape and visual effects and carrying out landscape and visual impact, aircraft and radar, biodiversity, cultural heritage, local economy, soils and hydrology and telecommunications.

The SPD guidance has been developed to support the implementation of renewable energy policies in the Local Development Frameworks and provide consistent guidance for wind energy development throughout England and Wales.

For more information visit

http://www.cumbria.gov.uk/planning-environment/renewable-energy/windEnergy.asp

Source: Cumbria County Council

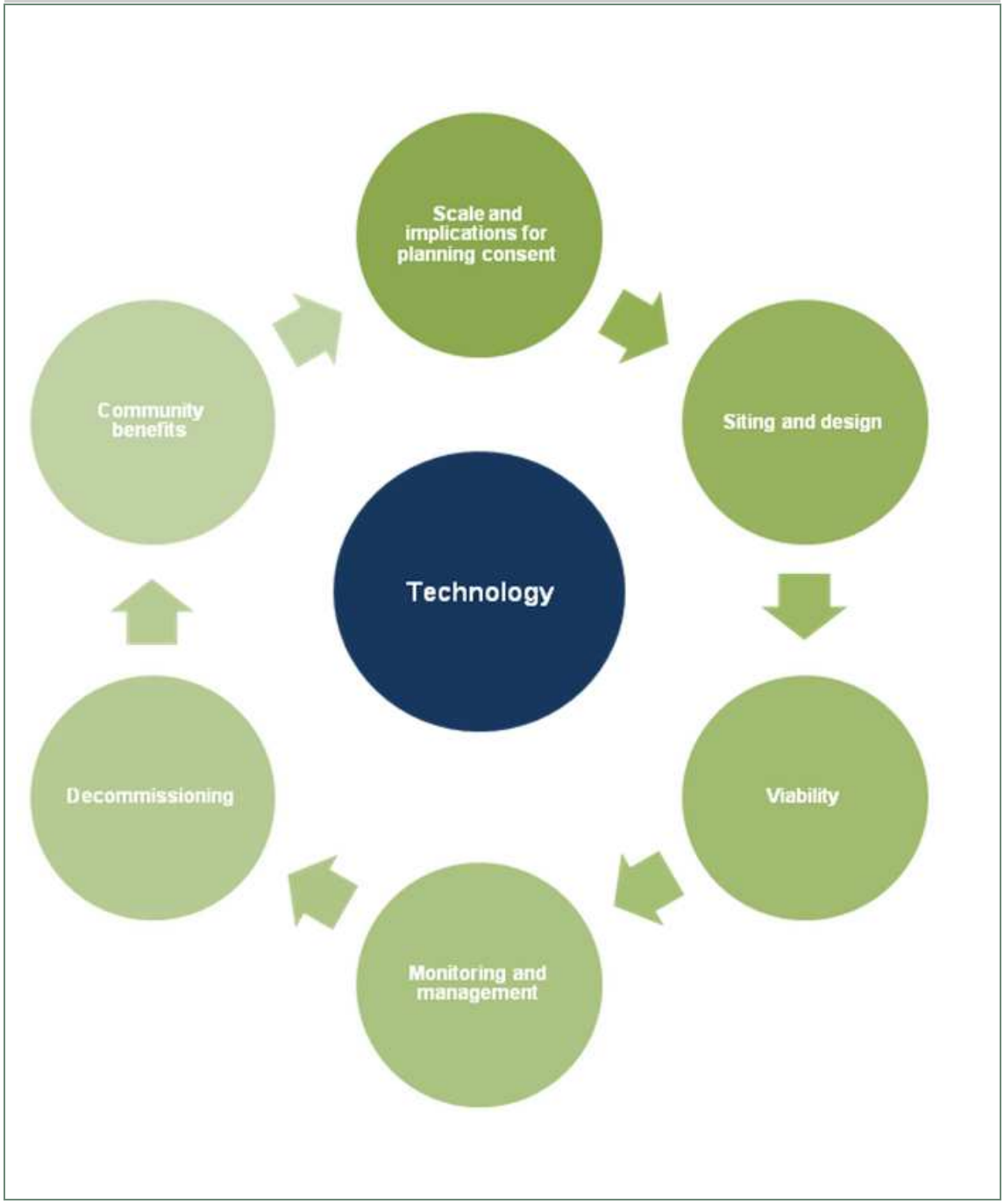
Stage 3 - Monitoring

2.14 Finally, monitoring of renewable energy planning policies is essential to understand their effectiveness and make amendments if required. Monitoring could include tracking the number of renewable and low carbon energy proposals which have been approved planning permission (or not), regularly updating the amount of renewable energy currently being generated (against targets if they have been developed) and helping to develop or refine targets. To supplement locally held data, information on existing renewable energy applications and generation can be obtained from DECC's Renewable Energy Statistics Database (RESTATS) and Renewable Energy Planning Database (REPD) as well as Ofgem's Feed-in-Tariff register. It is also essential that the economic, environmental and social impacts of renewable energy developments are monitored on an ongoing basis.

3: Renewable energy technology-specific guidance

3.1 In this section, guidance has been developed in relation to each of the individual renewable energy technologies. This information is intended to provide further consideration of the specific planning constraints that need to be taken into account when assessing planning applications.

Figure 3-1: Key planning considerations for renewable energy technologies



Source: SQW and Maslen Environmental

3.2 This section first considers the general issues of relevance to all technologies and then provides technology specific factsheets which include the key factors to be included in planning policy and guidance and to be taken into account in determining planning decisions.

Cross cutting issues affecting all technologies

Scale and implications for planning consent

3.3 Not all renewable energy developments will require planning consent. Many microgeneration installations - for example, non-intrusive solar photovoltaics away from Conservation Areas/Listed Buildings and heat pumps – will be covered by Permitted Development Rights via General Permitted Development Orders (GPDOs). It is important that local planning policy and guidance provides criteria to identify where planning consent is required in relation to different renewable energy technologies.

Siting and Design

3.4 The key criteria that need to be taken into consideration are identified in Table 3-1.

Table 3-1: Key siting and design criteria

Criteria	Issues to be considered
Availability of resource	Natural occurrence of the resource, which has been identified through the individual LA specific resource assessments produced as part of the study.
Accessibility	Access to the site and impact of additional traffic during construction, potential driver distraction from the developments e.g. flicker from wind turbines.
Landscape designations	Designated areas, such as National Parks, Areas of Outstanding Beauty and Sites of Special Scientific Interest are generally not appropriate for any developments other than the least visually intrusive microgeneration developments.
Visual impacts	Importance of considering the cumulative impact that can arise, even from the very smallest micro-installations if these are deployed in large numbers within a small area.
Environmental and/or archaeological interests	Consideration of impacts on biodiversity, habitats, soil, hydrology and geomorphology as well as the impact on listed buildings, Conservation Areas and archaeology.
Greenbelt	Within the greenbelt, there is a presumption against inappropriate development. Wind turbines and other large renewable energy developments can reduce the openness of the Greenbelt and therefore be classed as inappropriate development and refused consent.
Residential and other local amenities	Potential for economic growth, health considerations, impacts on visual amenity and potentially image which can have a negative or positive impact on economic growth.
Airfields/aerodromes, military, Met office radar and telecoms infrastructure	Proximity to power lines, radar and MOD constraints can all affect the siting of renewable energy developments, particularly wind turbines.

Source: SQW and Maslen Environmental

Suggested Policy Responses

3.5 The following policy responses should be adopted to address the constraints identified in Table 3-1:

- Adopt appropriate **criteria based** planning policies.
- **Environmental Impact Assessment (EIA) screening.** The requirements for an EIA of certain, generally larger scale developments need to be clearly understood and to be explained in screening opinions. Planning permissions can be struck down if there are flaws in the screening opinion.
- The requirements for criteria based **'Assessments of Impact'** such as for Landscape and Visual Impacts need to be clearly explained and scoped. When these are likely to be required, their extent needs to be described. The cost burden of undertaking and reviewing these can be quite considerable.
- **Access and Design Statements** offer the developer the opportunity to explain the rationale behind a number of the siting and design issues. The scope of and requirements for such statements need to be explained. In the statement or elsewhere, applications need to address the issue of the appropriateness of the scale of development proposed.
- **Mitigation.** The value and practicalities of mitigation need to be explained by the developer and planning conditions framed accordingly. These will range between and within different technologies depending on the scale and scope of the issue requiring mitigation.
- Local Authority **area based sensitivity studies** offer the opportunity to identify the least environmentally and culturally sensitive localities for renewable energy developments. For example, these could be based on settlements, population density, designations, waterways (flight paths for migratory birds) etc. Sensitivity studies could be used as a basis for area defined criteria based planning policies and/or incorporated into a topic based SPD.
- A **topic based Supplementary Planning Document** provides an opportunity to draw together all the issues and provide advisory guidance.

Viability

3.6 It is important for LA officers to understand and where possible, request more detail from developers as to the commercial viability of renewable schemes. A number of key issues and possible actionable responses are identified in Table 3-2 - this is not an exhaustive list.

Table 3-2: Viability issues and proposed responses

Issue	Potential response
Economic risks of development Availability of renewable energy resources directly affects the generating capacity and therefore a developer's economic return on investment. This return could affect the developer's ability to maintain the facility and support the local community with for example funds through Section 106 agreements or the Community Infrastructure Levy.	**Developer Commercially Confidentially Report** In order to address these issues, the developer should clearly identify the environmental, economic and social benefits to be derived from the project. All planning applications for renewable energy generation could contain a commercially confidential report setting out the economic, technical and physical case for site selection.
Access and Design Statements Access and Design Statements should be required to explain publicly site selection and design issues i.e. the technical feasibility of the project.	**(As above)** A commercially confidential report accompanying the application should set out the financial viability of the project and any proposed financial provisions for inclusion in accompanying agreements.
Grid Proximity The proximity to grid or directly to an end user can have a profound effect on the viability of a scheme. The grid and distribution network could restrict the value of renewable investment locally.	**Local Authority Grid Constraints Study** A detailed Local Authority Grid Constraints Study in cooperation with the network operators would indicate where the most favourable localities for grid connections lie and where restrictions currently or in time will limit the value of investment in new generating capacity. This could be explained and incorporated into a topic based SPD.

Source: SQW and Maslen Environmental

Monitoring and management

3.7 LA officers should understand how the developer will manage renewable energy schemes, to maximise output and ensure safety to surrounding communities.

Table 3-3: Monitoring issues and potential responses

Issue	Potential response
Monitoring output Throughout the life of renewable energy developments, energy output should be monitored. For all technologies, the amount of actual energy derived from an installed facility could be a lot less than anticipated and this could affect longer term viability, in particular equipment maintenance leading to premature redundancy.	**Monitoring output schedules** …should be required and may need to be cited within any planning conditions placed on the permission. These will be commercially confidential and the results should not be publicised, but used to improve performance and to enable LAs to build up a broader knowledge and understanding around productivity – this is particularly important for those LAs that have renewable energy generation targets.
Maximise output safely During the operation of renewable energy developments, frequent monitoring is required to minimise operational risks and maximise output.	**Monitoring safety schedules** ...should be requested and referred to in planning applications and may need to be cited in any planning conditions placed on the permission. These are referred to specifically within the individual technology guidance in the following technology factsheets
Monitoring impacts The wider impacts of renewable energy developments should be monitored to ensure that they are not contravening environmental regulations (e.g. with respect to noise, emissions etc) and also to provide more positive evidence in terms of job creation and unexpected environmental benefits	**Monitoring impact schedules** …should be requested and referred to in planning applications and may need to be cited in any planning conditions placed on the permission. The impacts to be monitored should relate back directly to the Environmental Impact Assessment of the development.

Source: SQW and Maslen Environmental

Decommissioning

3.8 When renewable energy facilities become redundant or reach the end of their consented period, they should be decommissioned and the site restored.

3.9 For example wind turbine developments are temporary and if not repowered are usually only commercially viable for a maximum of 25 years. It is therefore more important that the area is returned to its previous state.

Table 3-4: Decommissioning issues and potential responses

Issue	Potential response
Safe decommissioning Conditions should be in place to ensure facilities are decommissioned, deploying most appropriate techniques through qualified experts, in a timely manner.	**Decommissioning, restoration and aftercare plan** A decommissioning, restoration and aftercare plan is likely to be appropriate for most sites. The technical and financial provisions for this should be considered at the application stage.
Site restoration Facilities may include underground concrete foundations, underground cables, above ground structures including fences and access tracks, which require restoration.	**(As above)**
Premature redundancy It is important that there is consideration of premature redundancy and what happens next to the site and associated planning approval is a relevant discussion with developers at the application stage. The financial provisions could become critical if the site becomes prematurely redundant and is without funding in place to restore it.	**Risk Management Approach** A detailed risk management plan should be submitted along with the planning application to ensure premature redundancy and robust risk funding is available if repowering is required.
All of the above	**Topic based SPD** Requirements concerning both decommissioning and premature redundancy could be explained in a topic based SPD

Source: SQW and Maslen Environmental

Social, benefits, community resilience and Neighbourhood Plans

3.10 Neighbourhood Plans could come forward with a locally promoted facility and therefore, LAs should clarify how renewable planning issues can be incorporated into Neighbourhood Plans; for example, through topic based SPD.

3.11 Communities might support or promote schemes and Section 106 agreements (and/or the Community Infrastructure Levy) offer the opportunity for the developer to fund long term support for local communities affected by a proposal. It is important that the pros and cons are taken into account with regards to LAs developing a district wide Community Infrastructure Levy compared with ensuring that direct support is provided for communities located very close to the installations.

3.12 LAs should take a position on whether community promoted schemes should be actively promoted and encouraged; for example, through the use of a Local Development Order.

Technology factsheets

3.13 The following pages provide factsheets for each of the key renewable energy technologies detailing key issues to be considered in planning policy guidance development and in determining planning applications. The factsheets are set out in the following order:

- Commercial scale wind
- Biomass
- Hydropower
- Microgeneration (including small scale wind)
- Combined Heat and Power.

Onshore wind

Description	 • Commercial scale wind refers to on-shore wind farm developments for commercial energy generation and supply. The majority of these developments are connected to the national grid, however private-wire schemes are also an option and some already exist. Configurations of groups of wind turbines or individual turbines are used. Commercial scale wind uses 1.5 – 3MW turbine, 100m and are viable at a wind speed of over 5m/s at 45 m above ground level (agl) • Small scale wind energy developments can be installed on site and supply the on site demand before excess energy is discharged to the grid. They tend to be located in or next to built up areas so their potential is a function of the number of available sites rather than the density of sites that could be installed as with commercial wind developments. Small scale wind refers to turbines which have a capacity of less than 100Kw, with lower hub/tip heights of about 15m agl and are viable at lower wind speeds (4.5m/s at 10m agl)
Scale and implications	• **All** large scale wind turbines require planning consent • **Environmental Impact Assessment** is also commonly required
Siting and design	• **Wind resources**. The available wind resources in a locality can vary as a result of topography and other landscape features such as woodlands, this will affect detailed siting and turbine choice in order to maximise performance. • **Accessibility.** Physical/third party constraints can limit the buildability of a proposal at a particular site. For example highway access constraints could restrict the size of turbine, third party rights e.g. commoner rights might also restrict proposals. • **Landscape designations.** Designated and also non-designated landscapes with particular qualities can restrict the acceptability of wind turbines in the local landscape. Wind turbines introduce dynamic structures into the landscape and have the potential to alter landscape character and the visual qualities over a considerable distance.

	• **Visual impacts.** Local residents, existing and potential businesses and visitors can be adversely affected by the introduction of turbines into their view. • **Environmental and/or archaeological interests.** Designated and non-designated conservation sites, areas of historic interest and townscapes can all be adversely impacted by the introduction of turbines. This might be a direct impact for example disturbance to a site, species or building of interest or indirectly for example through impacts on the setting. • **Residential and other local amenities.** Wind turbines generate noise when in operation. They might become the dominant view for residents or create shadow flicker for residents. These can all contribute to reducing the quality of the local residential amenities. Such issues can be overcome by potential impacts being discussed at the pre-application stage and assessed using ETSU-R-97 regulations in liaison with Environmental Health Officers or a qualified noise consultant. • **Airfields/aerodromes, military, Met Office radar and telecoms constraints**. All these facilities can constrain the siting and design of wind turbines. • **Associated infrastructure.** Access tracks, ancillary buildings for electrical equipment, fencing and transmission lines are all usually a requirement for a turbine installation. They all could be classed as development and need to be considered as part of **any application.** • **Bird/bat strike.** There is the potential for birds and bats to be hit by turbine blades which could impact on local biodiversity. LAs should require details of bird/bat migratory routes at the pre-application stage. • **Safety.** Highway and public safety have been raised as planning objections to turbine developments in the past. However there are 2700 onshore turbines in operation in the UK and not one member of the public has been injured by them. • **Greenbelt.** Within the Greenbelt there is a presumption against inappropriate development. Wind turbines can significantly reduce the openness of the Greenbelt and therefore can be classed as inappropriate development and may be refused consent.
Viability	• The wind resources directly affect the generating capacity and therefore a **developer's economic return on investment**. The return on investment could affect the developer's ability to maintain the facility and support the local community with, for example, funds through Section 106 Agreements. • **Economics.** The proximity to grid or directly to an end user can have a profound effect on the viability of a scheme. • **Grid constraints.** The grid and distribution network could restrict the value of renewable investment locally.
Monitoring /	• **Noise.** Monitoring of the 'as built' facility can ensure noise is not greater than predicted. In the worst case scenario, noise levels can lead to nuisance and lack of LA credibility and trust.

Management	• **Shadow Flicker.** The impact of shadow flicker will usually be assessed at the application stage; however, it is not unusual for the LA to receive complaints when the site is operational. If these are beyond those predicted in the planning submission, then mitigation through operational control can be enforced through suitable planning conditions. • **Bird/bat strike.** Information on bird and bat strike is unlikely to be readily forthcoming from facility managers; however, this is valuable information in order to gain an overall understanding of the effects of turbines. • **Generated power.** The amount of actual energy derived from an installed facility could be a lot less than anticipated and this could affect longer term viability in particular equipment maintenance leading to premature redundancy.
Decommissioning	• **Decommissioning and landscape restoration.** A wind turbine facility when redundant or when at the end of its consented period will need to be decommissioned and the site restored. The facility may include underground concrete foundations, underground cables, above ground structures including fences and access tracks. A restoration and aftercare plan is likely to be appropriate for most sites. The technical and financial provisions for this should be considered at the application stage. The financial provisions could become critical for example in the case where the site becomes prematurely redundant and is without funding in place to restore it. • **Premature redundancy.** Consideration of premature redundancy and what happens next to the site and associated planning approval is a relevant discussion with developers at the application stage.

Source: SQW and Maslen Environmental

Biomass

Description

- Biomass is material of recent biological origin derived from plant or animal sources.
- Biomass is widely used to feed heating systems. Modern biomass heating technology is well developed and can be used to provide heat to buildings of all sizes either through individual boilers or via district heating systems.
- Biomass is increasingly being used to fuel electricity plants or combined heat and power plants due to the low carbon emissions associated with their use.
- Key biomass sources include: managed woodland, energy crops, waste wood, agricultural arisings, poultry litter, wet organic waste, municipal solid waste, commercial and industrial waste, landfill and sewage gas
- Three conversion processes are used to convert biomass to energy: direct combustion of solid biomass, pyrolysis and gasification of solid biomass, anaerobic digestion of solid or liquid biomass.

Scale issues

Heat applications

- Some plants may not require planning consent: heat (and small CHP) plants may be included within planning applications for new developments.
- Applications are likely to be for both boiler houses and fuel storage and could also be for district heating energy centres and heat networks.

Power stations and large CHP

- Power and CHP plant up to 50MW will always need planning consent and many will require an Environmental Impact Assessment (EIA) - site size determines requirements

	• A plant over 50MW will need to be submitted to DECC with LA input, in future this may include heat networks for distributing heat • Many of the issues are shared - differences are often down to scale and fuel source. Required **actions by LAs** • Below 50MW applications – screening decision, scoping opinion, consideration of EIA and planning decision/conditions • Liaison with developers • Local impact reports on applications to DECC for power stations over 50MW Liaison with LA departments (Environmental Health) and public agencies (e.g. Environment Agency is essential. Close liaison with the Environment Agency is shared across a number of renewable and low carbon installation types. Their responsibilities are not always fully understood by developers and communities and their regulatory role is often confused with LA functions. For example in the case of biomass, the Environment Agency has regulatory responsibility as detailed below. It is the LA's responsibility to explain these regulatory requirements to potential developers and local communities.
Other regulatory approvals	Under **the Environmental Permitting regime,** the Environment Agency regulates combustion installations over **50MW in size and over 3MW** if they use waste as a fuel. Permits are required which cover combustion processes, including the burning of biogas and operation of CHP plant. The type of permit usually depends on the size and output of the facility. Shredding and production of waste derived fuels can also be regulated, as is subsequent disposal of any residual materials such as by landspreading is also regulated. The Environment Agency also regulates large biofuel production facilities **Site Waste Management Plans:** any construction project in England costing over £300k needs a Site Waste Management Plan (SWMP). This covers new build, maintenance and alteration or installation/removal of services. **Wet Organic Wastes**: The treatment of wet organic wastes, Municipal Solid Waste (MSW) and Commercial and Industrial (C&I) wastes, combustion of landfill and sewage gases and associated energy recovery are all likely to fall under the Environmental Permitting Regulations. Some wastes will be classified as hazardous and be subject to special controls over the movement and disposal. **Energy crops:** the combustion of energy crops grown for this purpose is not a regulated waste management activity. However if such facilities ever receive waste at any point in the future, then a permit would be required. **An environmental permit or exemption is required for an anaerobic digester.** There are two exemptions and two standard permits available for anaerobic digestion activities. If an operator can not adhere to the terms and conditions of the exemptions or

	standard permits they should apply for a bespoke permit. In most cases operators will also need to get planning permission from the local planning authority. If the waste includes animal by-products the operator must have approval for their anaerobic digester from Defra's Animal Health department. These regulations are complicated **developers should seek appropriate specialist legal or technical advice**. Frequently there are specific trade associations who can direct developers to relevant information and expertise. The Environmental Services Association (ESA) and Chartered Institution of Wastes Management (CIWM) are waste industry bodies that could provide useful information. It might be useful to have these contacts listed as a resource.
Siting and design	**Access and traffic** • Construction access, traffic and deliveries • Operational access to highway and within site • Frequency and timing of deliveries • Size and type of fuel vehicles, tractor and trailer, skip articulated vehicles. **Emissions** • Emissions to air and water • Smoke or steam from heat/power plant • Steam from forced drying of fuel • Particulates and air quality • Leachate from fuel storage • Dust during fuel handling • Oil spillage from vehicles and equipment. **Cultural heritage** • Visual and activity impacts: on listed buildings, conservation areas, historic parks, battlefields • Impacts on settings • Disturbance to archaeology during construction.

Visual / landscape issues

- Choice of site and local siting issues: there is a big difference between a local heat plant and an industrial plant and between heat and power
- Appearance of plant and buildings/boilerhouse – materials, design, finish
- Scale of plant and buildings – energy centre /fuel/silos/stores/flue
- Fuel stockpiles
- Visible plume
- Fencing barriers/ screening.

Amenity, activity and noise

- Siting in relation to dwellings, offices, parks etc compared to existing background noise levels
- Activity levels on site: including fuel deliveries, fuel movement, staff vehicles
- Noise from any fuel processing and mechanical handling – chipper, hammer mill, screening, cranes, forklifts or loading shovels
- Noise of other plant and machinery
- Hours of operation.

Ecology and wildlife

- Very site dependent but even factory sites can have wildlife interests
- Reusing old buildings or felling trees – bats, owls etc
- Rural sites, proximity to nature conservation areas, sites of local nature conservation importance
- Undisturbed land – invertebrates, mammals, plants and mosses.

Hydrology, drainage, flooding and flood risk

- Large hard surfaced areas
- Potentially deep excavation for fuel storage

- Power stations classed as “essential infrastructure” – may need flood risk assessment and/or flood sequential test
- Underground grid connection or district heating pipes require trenching.

Construction
For large projects; as any large construction project
- Length of construction period and method
- Access onto highway and within site
- Traffic routes (and may need abnormal load routes)
- Working hours
- Site compound, lighting etc
- Health and safety and security
- Screen or replacement planting and landscaping.

Community benefits
- Carbon savings in comparison with grid electricity or fossil fuel
- Sustainability benefits
- Jobs in fuel supply and processing, maintenance, etc.
- Community Infrastructure Levy and/or Section 106 agreement.

Non-material issues that get raised by the public
- Fear that incineration will be carried out
- Running out of trees
- Cutting down trees, wildlife, views etc.
- Short rotation coppice and landscape impacts
- Alternative uses for wood

	• Property values.
Viability	• The security and quality of the biomass sources directly affect the generating capacity and therefore a **developer's economic return on investment**. The return on investment could affect the developer's ability to maintain the facility and support the local community with: for example, funds through Section 106 Agreements or the Community Infrastructure Levy. • **Economics**. Government incentive schemes (i.e. Feed In Tariffs, the Renewable Heat Incentive and Renewable Obligation Certificates for larger projects) and the proximity to grid or directly to an end user can have a profound effect on the viability of a scheme. • **Grid constraints**. The grid and distribution network could restrict the value of renewable investment locally.
Monitoring / Management	• **Noise, dust, odour.** In sensitive locations monitoring of the 'as built' facility can ensure noise, dust and/or odour is not greater than predicted. In the worst case scenario increased levels can lead to nuisance and lack of LA and Environment Agency credibility and trust. • **Generated power.** The amount of actual energy derived from and installed facility could be a lot less than anticipated and this could affect longer term viability in particular equipment maintenance leading to premature redundancy.
Decommissioning	• **Decommissioning and site restoration**. A facility when redundant or when at the end of its consented period will need to be decommissioned and the site restored. The facility may include substantial concrete foundations, underground cables, above ground structures including fences and access tracks. A restoration and aftercare plan is likely to be appropriate for most sites. The technical and financial provisions for this should be considered at the application stage. The financial provisions could become critical for example in the case where the site becomes prematurely redundant and is without funding in place to restore it. • **Premature redundancy.** Consideration of premature redundancy and what happens next to the site and associated planning approval is a relevant discussion with developers at the application stage.

Source: SQW and Maslen Environmental

Hydropower

Description		• Larger schemes possible on Lune, Ribble, Wyre (100kW) • Possibly 30-50 smaller schemes (20-100kW) • Many opportunities for very small schemes (< 20 kW) • Opportunities identified in Environment Agency mapping study and Forest of Bowland capacity study • In general hydropower opportunities are found in areas of medium-high sensitivity • High cost (>£.5m) but good viability (<8 year payback) for larger schemes • Upfront (risk) capital is needed • Environment Agency approval required • Planning rarely a barrier
Scale issues	• DECC announced in April 2008 that household scale microgeneration installations (<50kWs), which have little or no impact beyond the host property, can go ahead as they are eligible for permitted planning. **Hydropower schemes are not subject to permitted planning -** and unlikely to be in the near future. Hydropower developers should contact the Environment Agency at the earliest stage, before undertaking a feasibility study, for specialist advice. Developers will also require Environment Agency permits, through a permitting process.	
Siting and design	• **Water Resources.** The installation and operation of a hydro plant facility can have many impacts on water resources. These include water quantity and uses, water quality, ecological interests and recreational interests. Impacts can extend well beyond the site for example through changes in sediment transfer or effects on access to spawning grounds or even increasing flood risks locally. The potential impacts on fish are a particularly sensitive issue and adverse impacts can still arise following the introduction of mitigation measures. • **Environmental interests.** Designated and non designated conservation sites, areas/structures of historic interest and	

	townscapes can all be adversely impacted by the introduction of a hydropower facility This might be a direct impact for example disturbance to a site, species or building of interest or indirectly for example through impacts on the setting. • **Accessibility.** Physical and third party rights can limit the buildability of a proposal at a particular site. • **Residential and other local amenities.** Hydropower facility can generate noise when in operation. And can contribute to reducing the quality of the local amenities. • **Associated infrastructure.** Fish passes, access tracks, ancillary buildings for electrical equipment, fencing and transmission lines are all usually a requirement for a hydropower installation. They all could be classed as development and need to be considered as part of any application. • **Criteria based planning policies** could be jointly developed with the Environment Agency and build upon the current Environment Agency Hydropower Good Practice Guidelines. • The requirements for an **Environmental Impact Assessment** (EIA) need to be clearly understood and to be explained in screening opinions. This should be undertaken in association with the Environment Agency who may require their own EIA as part of their permitting for the facility. Planning permissions can be struck down if there are flaws in the screening opinion. • The requirements for criteria based **'Assessments of Impact' such as for Ecological or Water Resource Impacts** need to be clearly explained and scoped. When these are likely to be required their extent needs to be described. The cost burden of undertaking and reviewing these can be quite considerable. • Local Authority **area based sensitivity studies** offer the opportunity to identify the least environmentally and culturally sensitive localities for hydropower developments. These could be used as a basis for area defined criteria based planning policies and /or incorporated into a topic based SPD.
Viability	• The developer should clearly identify the **environmental, economic and social benefits** to be derived from the project. All planning applications for renewable energy generation could contain a commercially confidential report setting out the economic, technical and physical case for site selection. • **Environment Agency Permitting.** A hydropower facility will require one or more of the following permits in addition to a planning consent; impounding licence, abstraction licence, operating agreement, land drainage consent, fish pass approval and possibly an Environmental Permit. The developer should explain the full extent of the Environment Agency permits required for the planned facility and how it is intended to meet the necessary requirements for the issue of a permit. • The water resources directly affect the generating capacity and therefore a **developer's economic return on investment**. The return on investment could affect the developer's ability to maintain the facility and support the local community with: for

	example, funds through Section 106 Agreements and the Community Infrastructure Levy. • The **LA Planning Manager should liaise with the Environment Agency** permitting officer(s) at the outset of any inquiry relating to development of a hydropower scheme. Equally the Environment Agency should reciprocate if a developer contacts them first.
Monitoring/ Management	• **Noise.** In sensitive locations, monitoring of the 'as built' facility can ensure noise is not greater than predicted. In the worst case scenario, noise levels can lead to nuisance and lack of PA and Environment Agency credibility and trust. • **Generated power.** The amount of actual energy derived from and installed facility could be a lot less than anticipated and this could affect longer term viability in particular equipment maintenance leading to premature redundancy.
Decommissioning	• **Decommissioning and site restoration.** A facility when redundant or when at the end of its consented period will need to be decommissioned and the site restored. The facility may include substantial concrete foundations, underground cables, above ground structures including fences and access tracks. A restoration and aftercare plan is likely to be appropriate for most sites. The technical and financial provisions for this should be considered at the application stage. The financial provisions could become critical for example in the case where the site becomes prematurely redundant and is without funding in place to restore it. • **Premature redundancy.** Consideration of premature redundancy and what happens next to the site and associated planning approval is a relevant discussion with developers at the application stage.

Source: SQW and Maslen Environmental

Microgeneration

Description

Micro-wind turbines

- Microgeneration is defined under the Energy Act 2004 as <45kWs (micro-heat) and <50kWs (micro-electricity).
- Micro wind turbines can be building mounted or free standing. It is important to note that within the <50kW definition of micro-wind, multiple installations and the installation of some larger devices may also apply. For example a 50kW wind turbine, could be up to 25m in height.

Micro-CHP (Combined Heat and Power)

- Microgeneration is defined under the Energy Act 2004 as <45kWs (micro-heat) and <50kWs (micro-electricity).
- Micro-CHP is a small onsite technology which uses one fuel e.g. gas to produce heat and also electricity, as a side product, thereby saving on electricity bills. It also saves the losses associated with distribution of centralised electricity. At the domestic scale, micro-CHP products are coming onto the market e.g. to replace gas boilers.

Solar Photovoltaics (PV)

- Microgeneration is defined under the Energy Act 2004 as <45kWs (micro-heat) and <50kWs (micro-electricity).
- Solar photovoltaic (PV) cells harness energy from the sun to produce electricity. PV cells are formed into a panel that can be attached to the roof or walls of a building. Each cell is made from one or two layers of semiconducting material, usually silicon.

Solar water heating

- Microgeneration is defined under the Energy Act 2004 as <45kWs (micro-heat) and <50kWs (micro-electricity).
- Solar thermal heating systems use solar panels, called collectors, fitted to a roof. These collect heat from the sun and use it to warm water which is stored in a hot water cylinder. Liquid inside the solar panels absorbs solar radiation and heats up. This heat is transferred to a hot water cylinder by pipes. Your boiler tops up this stored heat to reach the temperature set on your cylinder thermostat.

Ground source heat pumps

- Microgeneration is defined under the Energy Act 2004 as <45kWs (micro-heat) and <50kWs (micro-electricity).
- Ground Source Heating (GSH) systems use the natural steady temperature of the ground to heat radiators, underfloor heating systems and hot water. Beneath the surface the ground stays at a fairly constant temperature, even in the middle of winter, so a GSH pump can be used throughout the year.

Air source heat pumps

- Microgeneration is defined under the Energy Act 2004 as

	<45kWs (micro-heat) and <50kWs (micro-electricity). • Air Source Heating (ASH) uses the temperature of the outside air to produce usable heat for space heating purposes. Acting like a fridge in reverse, the heat pump extracts heat from the outside air in the same way that a fridge extracts heat from its inside. Most systems are capable of extracting heat from outside temperatures as low as -15℃. Heat pumps are not self-sufficient a s they require electricity to run, but the heat they extract from the air is renewed naturally. There are two main types of ASH pump systems.
Scale issues	• Microgeneration facilities are **generally covered by General Permitted Development Orders (GPDOs) unless** within heritage or conservation areas where planning permission will be required.
Siting and design	**MICRO WIND** • The **available wind resources in the built environment can vary greatly** and turbulence can affect performance and equipment life. This will affect detailed siting and turbine choice in order to maximise performance and long term viability. • A range of interests can be **adversely affected** by the introduction of turbines into their view. These in particular include residents. • **Landscape and townscape designations** with particular qualities can restrict the acceptability of wind turbines of whatever scale. Wind turbines introduce dynamic modern structures into the landscape and have the potential to adversely alter landscape character and the visual qualities locally. • **Environmental interests such as conservation sites** can be adversely impacted by the introduction of small turbines. This might be a direct impact for example disturbance to a site or a species. • **Wind turbines generate noise** when in operation. This could contribute to reducing the quality of the local residential amenities. **SOLAR PV and SOLAR THERMAL** • **Landscape and townscape designations** with particular qualities can restrict the acceptability of installations particularly within heritage and conservation areas. Solar installations on roof tops may have the potential to adversely alter the built character and the visual qualities locally as they introduce new modern features and potentially reflective surfaces. This will

depend on location and aspect, and the general setting of the area.

MICRO CHP AND BIOMASS INSTALLATIONS

- These small scale installations for domestic or larger building related use will often require an ancillary building either to house the unit or for fuel storage. This requirement has the potential to impact on local amenities. **Retrofitting in designated landscapes and townscapes will require sensitivity.** New development offers the opportunity to integrate requirements into site and building design.

HEAT PUMPS

- There **may be issues over change of use** where trenched ground loops are introduced on land without the appropriate designation, for example on agricultural land. There may also be issues around drilling boreholes through contaminated land or into aquifers feeding water supplies and in areas with underground cavities, such as redundant mine workings.
- The greatest disturbance for ground source heat pumps is likely to be the **installation of the ground loop and the associated earth works and drilling.**
- Use of open loop systems, abstracting and return wells that flow ground water through heat pumps may **require permissions from the Environment Agency** (licence to investigate and an abstraction licence). Loops and heat exchangers may be sited in water courses, waterways or in ponds to feed heat pumps. Domestic systems in ponds are unlikely to require planning intervention, but larger commercial systems will require an Environmental Impact Assessment and involvement of the Environment Agency. Systems placed in rivers and canals will require permissions from British Waterways.
- Both domestic and non-domestic air source heat pump systems will require **planning intervention.** GDPOs are expected to apply to domestic air source heat pumps as soon as standards and safeguards have been developed. The main issues relate to noise and visual appearance.

ALL TECHNOLOGIES

- **Cumulative Impacts and Permitted Development Rights.** A single installation; for example, associated with a single household might have only negligible adverse impacts on the local amenities. However, if an installation is replicated several hundred times across a housing estate with either the same technology or with a disparate array of installed equipment, it has the potential to alter the character of an area. The relationship between PD and cumulative impacts needs to be understood, particularly where multiple installations of microgeneration is feasible; for example, where estates are under single management arrangements.

Viability	• Where planning approval is required, the applicant should clearly identify the **environmental, economic and any social benefits** to be derived from the project.
Monitoring/ management	• **Generated power.** The amount of actual energy derived from an installed facility could be a lot less than anticipated and this could affect longer term viability in particular equipment maintenance leading to premature redundancy.
Decommissioning	• Micro generation installations require less maintenance than other larger technologies but they still have the potential to become **redundant fairly quickly if not maintained.** This might be due to lack of income or change in tenure of buildings and lack of interest. Redundant and non maintained installations have the potential to add clutter to the urban fabric, present safety risks and reduce local amenity values.

Source: SQW and Maslen Environmental

Combined Heat and Power

Description		• Combined Heat and Power (CHP) sometimes known as Co-generation (or together with cooling – trigeneration) is the use of a single piece of plant to generate both heat and electricity. In conventional power generation large quantities of energy in the form of heat are wasted. By using this technique, the total energy conversion efficiency can reach 90%. • Combining this with sustainable fuels such as Biomass and domestic Energy Saving measures, Community Heating Schemes can provide low cost heating that has a minimal carbon footprint.
Scale issues	• Micro facilities are likely to be covered by General Permitted Development Orders, but **larger facilities will require planning permission.**	
Siting and design	• **Heat load.** A heat requirement in a locality is a pre-requisite for a CHP installation. CHP installations are most efficiently sited near the heat loads, usually industrial or housing developments. The scale of installation can vary greatly from microgeneration units for domestic use to large gas turbine units generating hundreds of MW's of electricity. One of the most effective ways to develop CHP efficiency is to create a decentralised balanced network of energy users connected to the installation; for example, a mix of domestic and commercial demand balancing day with night time demand. The installation of a CHP plant and the creation of a network of users both involve physical development. • **Developing a Network.** At the outset, the deployment of a CHP plant is unlikely to have a completed network of users, particularly where retrofitting plant. In these situations it is usual for the network to be extended with the addition of new subscribers who are unknown at the outset when planning approval is sought. This could require further planning consents and highway works consents. • **Accessibility.** Physical and third party constraints can severely limit the buildability and viability of a proposed network. • **Landscape and townscape designations.** Designated locations with particular built or natural qualities can restrict the acceptability of new development and creating a network.	

	• **Residential and other local amenities.** Air quality thresholds and Air Quality Management Zones could limit the size and type of plant applicable at any location.
Viability	• The developer should clearly identify the **environmental, economic and social benefits** to be derived from the project. All planning applications for renewable energy generation could contain a commercially confidential report setting out the economic, technical and physical case for site selection and in the case of CHP the network proposals. • The **heat load and the capacity** to deliver the heat through a network directly affect a developer's economic return on investment. The return on investment could affect the developer's ability to maintain the plant and network. • **Grid constraints.** The grid and distribution network could restrict the value of the electricity generated.
Monitoring/ management	• It is not unusual for the LA to receive complaints when the site is operational. In the case of CHP plant these **complaints might include noise and air quality.** These operational matters would normally be dealt with through Environmental Health Regulations, operational control can also be enforced through suitable planning conditions.
Decommissioning	• **Generated power.** The amount of actual energy derived from an installed facility could be a lot less than anticipated and this could affect longer term viability in particular, equipment maintenance leading to premature redundancy. • **Decommissioning and /or premature redundancy.** Consideration of redundancy and what happens to the plant and network is a relevant discussion with developers at the application stage.

Source: SQW and Maslen Environmental

Annex A: Glossary

This glossary explains the use of certain words and terms included in this guide in order to clarify their meaning as intended in the guide.

Access and design statement - a design and access statement is a written and illustrated report, accompanying a planning application. The statement shows how the applicant has analysed the site and its setting, and formulated and applied design principles to achieve good, inclusive design for buildings and public spaces; and how the developer or designer has consulted or will consult on the issues. The statement's scope and level of detail are determined by the nature of the development, the site and its context. The statement's purpose is to explain the background thinking that led to the planning proposal being drawn up. It is not just a description of the planning proposal.

Adaptation - involves adjustments to natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities.[4]

Air Source Heat Pumps - these use external air as a heat source or heat sink. A compressor, condenser and refrigerant system is used to absorb heat at one place and release it at another.

Anaerobic digestion - is a series of processes in which microorganisms break down biodegradable material in the absence of oxygen, the release of energy in this process can be harnessed to create a useable renewable resource.

Animal biomass - for the purposes of this study, animal biomass covers wet organic waste and poultry litter.

Areas based sensitivity studies - studies investigating the overall sensitivity of a given area based upon ecological, landscape and historic environment assessments.

Biodiversity - diversity of plant and animal life within a given area.

Bioenergy - renewable energy (solid or liquid form) made available from materials derived from biological sources.

Biomass - is a solid renewable energy source of biological material from living or recently living organisms (plant or animal) which can be used to generate electricity of heat.

BREEAM - Building Research Establishment Environmental Assessment Method is the most widely used environmental assessment method for buildings. It sets the standard for best practice in sustainable design and provides a way to measure a building's environmental performance.

Building regulations - these set standards for design and construction which apply to most new buildings and many alterations to existing buildings in England and Wales. Anyone

[4] Planning Policy Statement: Planning and Climate Change – Supplement to Planning Policy Statement 1, December 2007

undertaking building work which is subject to Building Regulations must, by law, meet the specific requirements. Building Regulations are separate from planning issues and the requirements of both must be met.

Climate change scenario - coherent and internally consistent description of the change in climate by a certain time in the future, using a specific modelling technique and under specific assumptions about the growth of greenhouse gas and other emissions and about other factors that may influence climate in the future.[5]

Code for Sustainable Homes - The Code for Sustainable Homes is an environmental impact rating system for housing in England & Wales, setting new standards for energy efficiency (above those in current building regulations) and sustainability which are not mandatory under current building regulations, but represent important developments towards limiting the environmental impact of housing.

Combined Heat and Power/Combined Cooling Heat and Power (CHP/CCHP) - the simultaneous generation of usable heat and power (usually electricity) in a single process, thereby reducing wasted heat and putting to use heat that would normally be wasted to the atmosphere, rivers, or seas. CHP is an efficient form of decentralised energy supply providing heating and electricity at the same time. CHP's overall fuel efficiency can be around 70-90% of the input fuel, depending on heat load; much better than most power stations which are only up to around 40-50% efficient.[6]

Community Infrastructure Levy - will be a new charge which local authorities in England and Wales will be empowered, but not required, to charge on most types of new development in their area. CIL charges will be based on simple formulae which relate the size of the charge to the size and character of the development paying it. The proceeds of the levy will be spent on local and sub-regional infrastructure to support the development of the area[7].

Core Strategy - key compulsory Local Development Document required by planning law. Core Strategies should be location specific rather than site specific and so may be illustrated by a key diagram or on Ordnance Survey proposals maps and may need to be expressed as criteria based policies. All other planning documents are developed within the context and framework of the Core Strategy.

Cumulative impact - impact resulting from the permanently increased impact caused by a number of developments within the same area. According to European Commission guidelines 1999 '*While assessing the potential cumulative impacts, the impact of another project is also assessed, the combination of which can lead to more extensive and severe impacts. Each project may have an insignificant impact on its own, but the combined effects may be considerable*'.

[5] Planning Policy Statement: Planning and Climate Change – Supplement to Planning Policy Statement 1, December 2007
[6] Planning Policy Statement: Planning and Climate Change – Supplement to Planning Policy Statement 1, December 2007
[7] CLG – The Community Infrastructure Levy – August 2008

DECC methodology - the Department of Energy and Climate Change (DECC) and the Department of Communities and Local Government (CLG) published the Renewable and Low-Carbon Capacity Assessment Methodology (produced by SQW and Land Use Consultants) in 2010 in order to help ensure a robust evidence base to support the deployment of renewable energy. The evidence produced by applying the methodology is designed to support local authorities and communities to make the most of opportunities for renewable energy deployment in their areas. DECC has provided funding to support the application of the methodology across the whole of England.

Decentralised energy supply - energy supply from local renewable and local low-carbon sources (i.e. on-site and near site, but not remote off-site) usually on a relatively small scale. Decentralised energy is a broad term used to denote a diverse range of technologies, including micro-renewables, which can locally serve an individual building, development or wider community and includes heating and cooling energy.

Decommissioning - is a general term for a formal process to remove something from active status. In renewable energy terms it could include the process of 'removal of use' of a wind turbine at it has come to the end of its useful life. All commercial scale wind farms must assess the decommissioning stage as part of the Environmental Impact Assessment.

Decommissioning and restoration plan - sets out proposed action to be taken should a renewable energy development cease to exist including the safe removal of the installation and returning the site to its original state.

Deployable capacity - the amount of technically available renewable energy capacity that is likely to be generated within a specific timescale.

Designated areas/protected landscapes - areas which are subject to a statutory designation on the basis of environmental or cultural characteristics e.g. National Park, Area of Outstanding National Beauty, and Conservation Area.

Development areas - part of a planning authority's area where development is anticipated, which could be an urban extension or town centres.

District Heating System - is a system for distributing heat generated in a centralised location for residential and commercial heating requirements such as space heating and water heating. The heat is often obtained from a cogeneration (CHP) plant burning fossil fuels but increasingly biomass.

Economic return on investment - performance measure used to assess the efficiency of a development by dividing the economic benefits of an investment by its costs. With large scale renewable energy developments, it is likely to be several years before a positive rate of return is shown – this time period is terms the 'pay back period'.

Energy crops - plants grown at a low cost for maintenance harvest and used to make biofuels or combusted for their energy content to generate heat or electricity. Usual crops are woody species such as willow or poplar, as well as temperate grasses such as miscanthus.

Energy efficiency - making the best or most efficient use of energy in order to achieve a given output of goods or services, and of comfort and convenience (not to be confused with energy reduction).

Environmental Impact Assessment - an assessment of the possible positive or negative impact and their significance that a proposed project may have on the environment, consisting of the natural social and economic aspects. The purpose of the assessment is to ensure that decision makers consider the environmental impacts when deciding whether to proceed with a project.

Environmental Permitting Regime - a new regulatory framework introduced in 2008 through the Environmental Permitting (England and Wales) Regulations 2007. The new regime combines two key legislative areas: Pollution Prevention and Control (PPC) (covering various heavy and some light industrial installations and operations) and licenses for waste management activities. The Environmental Permitting (England and Wales) Regulations 2007 require certain industrial and agricultural activities with a high pollution potential to have an Environmental Permit (issued by the Regulator i.e. Environment Agency or Local Authority). Such a permit can only be issued if certain environmental conditions are met, so that the companies themselves bear responsibility for preventing and reducing any pollution they may cause.

Feed in Tariff - a cashback scheme, supported by Government funding, that allows, individuals, organisations and local authorities to sell 'green electricity' to the grid.

Geomorphology - scientific study of landforms and the processes that shape them.

General Permitted Development Orders - **Permitted development** is an aspect of town planning which allows people to undertake minor development under a deemed grant of planning permission, therefore removing the need to submit a planning application. Permitted development is currently set out in the Town, Country and City Planning (General Permitted Development) Order 1995 (amended in 2008) and largely relates to domestic extensions etc.

Greenbelt - policy and land use designation used in spatial planning to retain areas of largely undeveloped, wild, or agricultural land surrounding or neighbouring urban areas. In essence, a green belt is an invisible line encircling a certain area, preventing development within that area.

Greenhouse gas emissions - the release of greenhouse gases (GHG) into the atmosphere. Greenhouse gases 'trap' energy radiated by the Earth within the atmosphere and include carbon dioxide (CO2), methane, nitrous oxide and fluorinated gases. Carbon dioxide is the main greenhouse gas in the UK.

Grid constraint - any factor that impacts on connection to the national grid at any given point, which would ultimately impact on harnessing renewable energy sources to provide electricity to the grid.

Ground source heat pumps - these use pipes buried underground to extract heat from the ground. This is usually used to heat radiators or underfloor heating systems and hot water.

Hydrology - study of the movement, distribution, and quality of water, including the hydrological cycle, water resources and environmental watershed sustainability

Hydropower - generation of power derived from the force of moving water.

Leachate - any liquid that, in passing through matter, extracts solutes, suspended solids or any other component of the material through which it has passed. Leachate is a widely used term in the environmental sciences where it has the specific meaning of a liquid that has dissolved environmentally harmful substances which may then enter the environment. It is most commonly used in the context of land-filling of putrescible (rotting) or industrial waste.

Load factors - this refers to the amount of theoretical maximum outputs likely to be generated from renewable energy source. For example, a modern wind turbine produces electricity 70-85% of the time, but it generates different outputs dependent on wind speed. Over the course of a year, it will generate about 30% of the theoretical maximum output. This is known as its load factor.

Local Authority Grid Constraints Study - a study analysing the constraints to grid connection within a specific local authority area

Local Development Documents - a set of documents specified in planning law which a local planning authority creates to describe their strategy for development and use of land in their area of authority. These must be listed, their purpose explained and timetable for production set out within the Local Development Scheme

Local Development Framework - the Local Development Framework or 'LDF' is the term used to describe the set of documents which will eventually include all of the planning authority's local development documents. LDFs, which were introduced by the Government in 2004, are intended to deliver sustainable development whilst reflecting the needs of local communities. They aim to deliver 'spatial planning', that is they must take into account social and environmental factors such as health and housing need and should not be purely focussed on the regulation and control of land.

Local Development Order - this is made by a planning authority in order to extend permitted development rights for certain forms of development, with regard to a relevant local development document.

Managed woodland - woodland which is controlled by felling, coppicing, planting, etc.

Microgeneration - Small-scale onsite low carbon and renewable energy technologies – also known as microgeneration which generated less than 45KW heat and 50KW for electricity, offer ways of producing energy from renewable, low carbon and carbon-neutral sources. They mostly harness solar energy such as wind, photovoltaics, solar thermal, biomass, hydro and heat pumps[8].

Mitigation - to adopt measures to lessen the impact or address any detrimental impacts of developments in line with the Environmental Impact Assessment for each development.

[8] http://www.decc.gov.uk/en/content/cms/what_we_do/uk_supply/energy_mix/renewable/explained/microgen/microgen.aspx

Climate change mitigation scenarios involve reductions on the concentrations of greenhouse gases, either by reducing their source or by increasing their sinks.

Neighbourhood Plan - Neighbourhood planning aims to develop partnerships between communities and government, built on co-operation and recognition of the creative ideas and skills that neighbourhoods have to offer. Neighbourhood plans document characteristics of the local community and its people as well as the social, cultural, economic and environmental aspects within the neighbourhood. They examine opportunities and challenges and propose activities or projects to address these. Suggestions and ideas may involve service delivery, capital works and community activities within that neighbourhood.

Poultry litter - poultry manure which consists of the original litter material (bedding in poultry operations such as wood shavings, sawdust, straw etc), feathers, and spilled feed.

Premature redundancy - the situation that arises where a renewable energy development becomes redundant before its expected lifespan is reached.

Regional Spatial Strategy - provided a regional level planning framework for the regions of England (outside of London). Their revocation was announced by the new Coalition Government on 6 July 2010.

Renewable and low-carbon energy - includes energy for heating and cooling as well as generating electricity. Renewable energy covers those energy flows that occur naturally and repeatedly in the environment – from the wind, the fall of water, the movement of the oceans, from the sun and also from biomass. Low-carbon technologies are those that can help reduce carbon emissions. Renewable and/or low-carbon energy resources include: biomass and energy crops; CHP/CCHP (and micro-CHP); waste heat that would otherwise be generated directly or indirectly from fossil fuel; energy-from-waste; ground source heating and cooling; hydro; solar thermal and photovoltaic generation; wind generation.

Renewable Heat Incentive - is very similar to the Feed-in Tariff, but a cashback scheme, again supported by Government, specifically for those who generate 'green heat'. In June 2011 the RHI will come into force.

Renewable Obligation Certificate - a Renewables Obligation Certificate (ROC) is a green certificate issued to an accredited generator for eligible renewable electricity generated within the United Kingdom and supplied to customers within the United Kingdom by a licensed electricity supplier. One ROC is issued for each megawatt hour (MWh) of eligible renewable output generated.

Retrofit - installing microgeneration or energy efficiency measures into existing properties.

Section 106 - Section 106 (S106) of the Town and Country Planning Act 1990 allows a local planning authority (LA) to enter into a legally-binding agreement or planning obligation with a landowner in association with the granting of planning permission. The obligation is termed a Section 106 Agreement. These agreements are a way of delivering or addressing matters that are necessary to make a development acceptable in planning terms. They are increasingly used to support the provision of services and infrastructure, such as highways, recreational facilities, education, health and affordable housing.

Site Waste Management Plan - sets out how resources will be managed and waste controlled at all stages during a construction project. These are required for all construction projects with an estimated cost of over £300K.

Shadow flicker - this occurs under a special set of conditions when the sun passes behind the hub of a wind turbine and casts a shadow over neighbouring properties. When the blades rotate, shadows pass over the same point causing an effect called 'shadow flicker'. Shadow flicker effects occur in various situations: travelling by road through a tunnel or under overhanging trees (dappled shadow effects), or standing within the shadowed area of wind turbine blades. This can cause a flickering effect which can affect people nearby and distract drivers of passing cars.

Solar Photovoltaics - is a method of generating electrical power by converting solar radiation into direct current electricity using semiconductor. Photovoltaic power generation employs solar panels composed of a number of cells containing a photovoltaic material.

Supplementary Planning Document - a Local Development Document that may cover a range of issues, thematic or site specific, and provides further detail of policies and proposals in a 'parent' Development Plan Document.

Supply chain constraint - in this context, this refers to constraints in the supply chain for renewable energy deployment which includes the manufacture, operation and servicing of installations. Constraints could relate to both access to the required hardware and access to the required skills.

Wet organic waste - biomass fuel arising from animal waste (slurry and manure).

Annex B: Sources of further advice

Table 3-5 provides some suggestions of organisations and resources from which further advice and guidance can be sought.

Table 3-5: Sources of further advice and guidance

BUSINESS LINK

The "Netregs" website is a useful source of guidance on how to comply with various environmental legislation (http://www.netregs.gov.uk/). Please note that this service is due to be transferred to the Business Link from March 2011 (http://www.netregs.gov.uk/netregs/help/124894.aspx).

ENERGY SAVINGS TRUST

England Planners Support Pack available from the Energy Savings Trust website (http://www.energysavingtrust.org.uk/business/Business/Local-Authorites/Planning-and-new-build/England-planners-support-pack)

Feed in Tariff tools and guidance available from the Energy Saving Trust website:

- For householders: http://www.energysavingtrust.org.uk/Generate-your-own-energy/Sell-your-own-energy/Feed-in-Tariff-scheme
- For local authorities: http://www.energysavingtrust.org/business/Business/Local-Authorities/Funding/Feed-in-Tariffs

ENGLISH HERITAGE

English Heritage has produced a range of guidance on renewable energy and is currently preparing guidance on 'setting' and will also be updating its guidance on Wind Energy and the Historic Environment: http://www.helm.org/server/show/nav.19691

ENVIRONMENT AGENCY

Environment Agency guidance on waste can be accessed from http://www.environment-agency.gov.uk/business/topics/waste/default.aspx. Information on site waste management plans can be accessed from: http://www.environment-agency.gov.uk/business/sectors/32729.aspx.

The link below references the Environment Agency's guidance on anaerobic digestion to help developers understand of the activity requires an environmental permit: http://www.environment-agency.gov.uk/business/sectors/37338.aspx.

Environment Agency advice on biowastes can be accessed from: http://www.environment-agency.gov.uk/business/topics/waste/105375.aspx

Environment Agency guidance on biomass can be obtained from: http://www.environment-agency.gov.uk/business/sctors/32595.aspx.

Further useful information can be obtained from the following:

- EA Position Statement on Biofuels for Transport
- Biomass Environmental Assessment Tool, Defra
- Guide for Developers, Environment Agency
- Environment Agency generating energy from biomass website:

  http://www.environment-agency.gov.uk/business/sectors/106844.asp

TOWN & COUNTRY PLANNING ASSOCIATION

Planning for Climate Change Guidance and Model Policies for Local Authorities (TCPA for the Planning and Climate Change Coalition, November 2010). http://www.tcpa.org.uk/data/files/pccc_guidance_web.pdf

LOCAL GOVERNMENT COMMUNITIES OF PRACTICE

Local renewable energy planning and deployment discussion forum for sharing good practice: http://www.communities.idea.gov.uk/comm/landing-home.do?id=11063283

Source: SQW