Managing Landscape Change:

Renewable & Low Carbon Energy Developments – a Landscape Sensitivity Framework for North Yorkshire and York

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Above: NYMNPA / photograph of Boulby Cliffs by Mike Kipling
Cover Image: NYMNPA / photograph of farmed landscape in North York Moors National Park by Mike Kipling

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Glossary of Terms

RLCE – Renewable and Low Carbon Energy

Landscape character – The distinct and recognisable pattern of elements that occurs consistently in a particular type of landscape and how this is perceived by people. It reflects particular combinations of geology, landform, soils, vegetation, land use and human settlement. It creates the particular sense of place of different areas of the landscape.

Landscape quality (or condition) – A term based on judgements about the physical state of the landscape, and about its intactness, from visual, functional and ecological perspectives. It also reflects the state of repair of individual features and elements which make up the character in any one place.

Landscape value – The intrinsic value that is attached to a landscape, often (but not always) reflected in designation or recognition. It expresses national or local consensus as to the (degree of) importance of a landscape, for reasons including landscape quality, scenic (or visual) quality, wildness and tranquillity, natural and cultural heritage interests, cultural associations and recreational opportunities.

Amenity – The benefits afforded to people by a particular area in terms of what is seen and experienced. Amenity includes not just visual amenity and views but also the experience of landscape in its widest sense. Different groups of people such as walkers, residents and motorists may have different amenity expectations.

Landscape impacts – Changes in the physical landscape that give rise to changes in its character and how it is experienced, and may in turn affect the value attached to a landscape. Landscape impacts may be beneficial (for example where a characteristic feature is restored) or adverse (for example where a characteristic feature is damaged or lost).

Visual impacts – Changes in the appearance or perceptions of a particular area or view as a result of development or other change. Visual impacts can be beneficial (for example where a new view is opened up) or adverse (for example where an existing view is affected by the addition of an intrusive feature).

Cumulative impacts – The combined impacts that occur, or may occur, as a result of more than one project being constructed, giving rise to accumulating landscape and visual changes where developments are seen simultaneously (at the same place, in the same field of view), in succession (at the same time, but not in the same field of view) or in sequence (on travelling through an area).

Landscape sensitivity – A term based on the inherent sensitivity to change of a landscape in both landscape character and visual terms (as a result of its type of character, visibility etc). In Environmental Impact Assessment the term sensitivity may also be used to encompass the value placed upon the landscape.

Visual sensitivity – The sensitivity of visual receptors (viewers and views) to changes in the appearance of the landscape. Sensitivity depends on the location and context of the viewpoint, the expectations and occupation or activity of the viewer, and the importance or value of the view.

Landscape capacity – A term used to indicate – generally for the purposes of planning policy or guidance – the extent to which a landscape can accommodate specific types of change or development. Capacity assessment should identify key aspects of the specific change or development that are likely to have an impact on the landscape.

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Magnitude – A combination of the scale, extent and duration of an effect. The nature and degree of change to the landscape resource, the scale of the change in view resulting from the loss or addition of features, the degree of contrast or integration of new features in the landscape, the angle and distance of view, the extent of the area over which the changes would be visible, and the duration of the effects are all relevant considerations.

Impact significance – A term that is not absolute and can only be defined in relation to each development and its location. The two principal criteria determining significance are the sensitivity of the landscape or viewer and the magnitude of the effect.

How to Use this Sensitivity Framework

PURPOSE OF THIS FRAMEWORK

This framework is specifically designed to inform those who devise local planning policy and make development management decisions for renewable and low carbon energy (RLCE) developments in North Yorkshire and York. The framework primarily concerns the role of landscape sensitivity in these processes, particularly at a local level, though the principles presented could apply at any level.

A number of relevant studies have been completed in the North Yorkshire and York sub-region that provide guidance on the potential to deliver RLCE. The purpose of this framework is to utilise this information to provide a useful reference document for use by policy makers and development managers at local authorities within the sub-region.

The framework is designed to encourage a positive approach to RLCE development, using established principles and best practice guidance specific to landscape planning, management and assessment.

The aims of the framework are:

- To enable local authorities within the sub-region to encourage sustainable development and facilitate a positive approach to RLCE through informed planning practice;
- To review existing studies specific to RLCE and landscape sensitivity, and provide advice on how to make best use of existing information in policy development and development management;
- To identify key issues relating to RLCE and landscape sensitivity that policy makers and development managers need to consider and/or seek clarification on, from colleagues, developers and other stakeholders at different stages of the planning process;
- To signpost relevant policy, guidance (statutory and non-statutory) as well as other toolkits and guides where appropriate.

SCOPE OF THIS FRAMEWORK

It is important to note that in developing this framework **no new landscape sensitivity or capacity assessment has been undertaken**. Furthermore, it has been assumed that there are no plans to instigate new studies of this type within the sub-region at the present time. As such, this framework has been devised as a guide to existing information to help planning officers to understand the information already available, and how best to apply existing studies to planning related decision making.

The framework has been produced to assist decision making at a local level whilst providing consistency of approach at a more strategic level throughout North Yorkshire and York. As such, **the framework primarily utilises data produced at the county or sub-regional level**, with reference to local level information where appropriate, to ensure consistency of approach across the area.

Information and data used to inform this framework has been taken from existing studies which relate to landscape character and landscape sensitivity at a county or sub-regional scale. These studies have been produced for different purposes over a period of time and due to the specific objectives of individual studies, there are a small number of discrepancies between the outcomes of each report, some of which apply to the assessment of landscape sensitivity undertaken. It is important to note that **this framework does not attempt to resolve discrepancies between existing information sources**, but instead provides guidance on the limitations of each of the studies and provides a hierarchical approach to their use, depending upon the purpose of its application. This information is provided in section 3.4.1 of the framework.

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In addition to that outlined above, this framework is not intended to be an exhaustive guide to the subject of landscape sensitivity, nor has it been designed to provide a rigid, step by step guide to planning practice. Instead, this framework aims to provide sufficient flexibility to enable officers and development managers to apply the guidance and tools provided as they see fit, to help facilitate a positive approach to RLCE within the context of wider planning, environmental and technical constraints.

Specifically, the framework includes appraisal methodologies for both policy development and development management, together with a series of tools which are intended for use in a variety of planning related applications. Standard pro-formas are provided to help extract relevant information from key sources to enable appraisal using the tools provided. Two pro-formas are provided to allow greater flexibility in the choice of source information and can be used independently or in combination as part of the appraisal process.

Although the framework includes guidance on practical application of the appraisal methodology, including a number of case studies and worked examples, policy makers and development managers should be best placed to determine and identify specific applications for what is intended to become *their* framework.

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WHERE TO GO IF YOU WANT…

A summary of the **planning policy context** of renewable and low carbon energy (RLCE) or overview of landscape character	GO TO: Section 2
To understand the concepts of **landscape character**, **landscape sensitivity** and **landscape capacity**	GO TO: Section 3.4.2
To use landscape sensitivity to **develop planning policy** specific to RLCE	GO TO: Section 3.2
To use landscape sensitivity to make **development management** decisions	GO TO: Section 3.3
To refer to **current guidance and best practice** relating to RLCE or landscape sensitivity, landscape character or visual impact	GO TO: Section 3.5
To see examples of how to use this framework using **case studies** specific to the sub-region	GO TO: Section 4
To use any of the **Tools** produced to support this framework or to use the landscape sensitivity **Pro-Forma**	GO TO: Appendix

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1 Introduction

NYMNPA / photograph of moorland near Newtondale Gorge by Chris Ceaser

Aecom was commissioned by North Yorkshire and York (NY&Y), via Local Government Yorkshire and Humber (LGYH), to develop a sensitivity framework and an appraisal methodology for using landscape sensitivity as a tool for policy development and decision making in relation to renewable and low carbon energy (RLCE) development within the sub-region. The framework has been developed in consultation with a 'Steering Group' comprising representatives from a number of planning authorities within the sub-region[1]. The Steering Group have reviewed the emerging framework and given valuable feedback at key stages throughout its development. Comments received from the Steering group have been incorporated into the final draft of the framework.

The role of the Local Planning Authority (LPA) in policy development and decision making relating to RLCE is growing in relevance and both current and emerging government policy guidance reflects this. The 2008 Climate Change Act introduced a duty in the 2004 Planning and Compulsory Purchase Act (Section 19 1A) which states:

[1] North Yorkshire County Council, North York Moors National Park Authority, Hambleton District Council, and Selby District Council.

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"that Development plan documents must (taken as a whole) include policies designed to secure that the development and use of land in the local planning authority's area contribute to the mitigation of, and adaptation to, climate change."

The Climate Change Act also set a legally binding target to reduce UK carbon emissions by 34% on 1990 levels by 2020, 50% reduction by 2025, and 80% reduction by 2050.

In addition, the UK Low Carbon Transition Plan 3 sets out an approach to meeting national carbon saving targets and the UK is committed to supply 15% of gross energy consumption from renewable sources by 2020. The UK Renewable Energy Strategy 4 anticipates that renewables will need to contribute around 30% of electricity supply, 12% of heating energy and 10% of transport energy to meet this target.

The recently published consultation draft of the National Planning Policy Framework (NPPF) (July 2011) provides a guide to emerging national planning policy guidance. It is intended to replace planning policy statements (PPS) once approved and sets out aims for local planning policy in relation to renewable energy development, along with guidance for LPAs in development of positive policy and decision making in relation to RLCE[2]. The approach advocated in the NPPF is twofold, as follows:

"1. LPAs to identify areas (within LDF) suitable for renewable and low-carbon energy sources, and supporting infrastructure, where this will help secure development of RLCE.

2. Where proposals come forward outside of these areas, develop frameworks to determine planning decisions based on criteria used to identify suitable areas. Emphasis on developers to demonstrate an alternative location meets with the criteria used in plan-making."

Current guidance, which will be superseded by the NPPF once finalised, includes the supplement to PPS1: Planning and Climate Change which describes the role of planning authorities in relation to RLCE development. It states that:

"In developing their core strategy and supporting local development documents, planning authorities should provide a framework that promotes and encourages renewable and low carbon energy generation. Policies should be designed to promote and not restrict renewable and low-carbon energy and supporting infrastructure.

In particular, planning authorities should:

- not require applicants for energy development to demonstrate either the overall need for renewable energy and its distribution, nor question the energy justification for why a proposal for such development must be sited in a particular location;

- ensure any local approach to protecting landscape and townscape is consistent with PPS22 and does not preclude the supply of any type of renewable energy other than in the most exceptional circumstances;

- alongside any criteria-based policy developed in line with PPS22, consider identifying suitable areas for renewable and low-carbon energy sources, and supporting infrastructure, where this would help secure the development of such sources, but in doing so take care to avoid stifling innovation including by rejecting proposals solely because they are outside areas identified for energy generation; and

- expect a proportion of the energy supply of new development to be secured from decentralised and renewable or low-carbon energy sources."

[2] page 89 http://www.communities.gov.uk/documents/planningandbuilding/pdf/1951736.pdf and page 42 http://www.communities.gov.uk/documents/planningandbuilding/pdf/1951811.pdf

This framework aims to provide LPAs within the North Yorkshire and York sub region with a guide to assist with the above using existing studies and available information, in order to help encourage a proactive and positive approach to RLCE policy development and decision making in line with current and emerging guidance.

In addition to the above, it is worth noting that LPAs are not only responsible for decision making at a local/sub-regional level, but also would be key stakeholders at a national level should a nationally significant energy infrastructure project be proposed within the sub-region. Planning decisions for 'nationally significant energy infrastructure projects' (as set out in Part 3 of the Planning Act 2008) are currently made by the Infrastructure Planning Commission (IPC). It is proposed to replace the IPC with the Major Infrastructure Unit (MIU) who will be established within the Planning Inspectorate, with Ministers as arbiters, during 2012. An example of a Nationally Significant Infrastructure Project is a large scale wind farm development (above 50MW) which would be subject to an IPC or MIU and Ministerial decision rather than at a local level. Although Local Planning Authorities are not specifically responsible for decision making in these circumstances, they are responsible for the production of a 'local impact report' which will be considered by the IPC and form part of the decision making process. DECC has produced guidance for projects of this type and the appraisal methods set out in this document will also provide a basis for production of local impact reports.

The types of RLCE considered within this framework are aligned with those identified in the regional capacity study undertaken by Aecom and published in April 2011, namely:

- District heating and Combined Heat and Power (CHP)
- Commercial scale wind energy
- Hydro energy (small scale, low head)
- Biomass (including use in co-firing and energy generation from dedicated energy crops, managed woodland, industrial wood waste and agricultural arising, or straw)
- Energy from Waste (EfW) (including energy generation from slurry, food and drinks waste, poultry litter, municipal solid waste, commercial and industrial waste arisings, landfill gas production and sewage gas production)
- Microgeneration (including small scale wind energy, solar, heat pumps, small scale biomass boilers)

The format of this report has been agreed in principle with the steering group in response to the brief. In summary, the Framework report includes the following chapters and information:

- **Guidance and Policy Context**: Providing a brief review of the relevant policy context and background information, including:
    - Planning policy at a national, regional and local level;
    - Introduction to the landscape context of the sub-region;
- **Presentation of a framework for policy development and decision making in NY&Y, relevant to RLCE and Landscape Sensitivity**, which includes:
    - An introduction to how the appraisal methodology will assist in policy development and decision making
    - A guide to the key reference documents in terms of:
        - Key features of each study;
        - Limitations of each study;
        - Function of each study in relation to the aims of the framework;

  - Presentation of an appraisal methodology;
  - An introduction to the tools developed to assist in the appraisal process;
  - Definition of key concepts;
  - Signposting to existing guidance related to landscape sensitivity and RLCE;

- **Case Studies**: Presentation of three case studies to demonstrate the practical application of the appraisal methodology relevant to the following landscapes within the study area:

  - Vale of Mowbray;
  - The Humberhead Levels; and
  - The North York Moors National Park.

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2 Guidance and Policy Context

NYMNPA / photograph of Rosedale by Chris Ceaser

This section provides a brief guide to the policy context for RLCE, gives examples of local policies relevant to landscape and RLCE, and signposts key documents which will assist in the application of this framework at a local level.

2.1 National Planning Policy Guidance

Existing national planning policy guidance specific to RLCE, some of which is cited in the introduction to this report, includes the following current and emerging documents:

- **Draft National Planning Policy Framework (**NPPF), Department for Communities and Local Government (DCLG), July 2011. This document has been published in draft for consultation, but is intended to replace Planning Policy Statements (PPS) once approved;

- **Planning Policy Statement (PPS) 1: Delivering Sustainable Development**, and the **Planning and Climate Change Supplement to PPS 1**[3] (to be replaced by NPPF)

- **Planning Policy Statement (PPS) 22: Renewable Energy and Planning for Renewable Energy: A Companion Guide to PPS22** (to be replaced by NPPF)

- **Renewable and Low-carbon Energy Capacity Methodology: Methodology for the English Regions**, SQW Energy on behalf of the Department of Energy Climate Change (DECC), January 2010

- **Town and Country Planning (General Permitted Development) (Amendment) (No.2) (England) Order 2008**

2.1.1 Nationally Significant Infrastructure Projects

Planning decisions for nationally important energy infrastructure projects (usually large scale) are currently made by the Infrastructure Planning Commission (IPC). It is proposed to replace the IPC with the Major Infrastructure Unit (MIU) within the Planning Inspectorate, with Ministers as arbiters, in 2012. Although Local Planning Authorities are not responsible for decision making they are responsible for the production of a 'local impact report' which will be considered by the IPC/MIU and ministers as part of the decision making process. The following guidance has been recently produced to assist the decision making process:

- **Overarching National Policy Statement for Energy** (EN-1) (DECC) laid before Parliament for approval in June 2011. Provides guidance on the production of local impact reports as part of IPC decision making for nationally significant infrastructure projects, including RLCE, including a section of generic effects on a range of environmental resources including landscape and visual, and biodiversity.

- **National Policy Statement for Renewable Energy Infrastructure** (EN-3) (DECC) laid before Parliament for approval in June 2011. Provides advice on 'good design' for energy infrastructure and specific guidance in relation to commercial scale, onshore wind.

2.2 Regional Policy Context

At the time of this report, the status of regional planning policy is under review. However, reference to the Yorkshire and Humber Plan (2008) is included here for completeness and for the purposes of information. It includes numerous references to renewable energy development and the role of local authorities in promoting its delivery in line with PPS 1 and PPS 22, including policy ENV5: Energy in the chapter on Environment. Policies ENV8: Biodiversity, ENV9: Historic Environment and ENV10: Landscape which provide guidance on the role of local development frameworks in safeguarding and enhancing these features of the environment and their influence on the character of the landscape within the region.

[3] http://www.communities.gov.uk/documents/planningandbuilding/pdf/ppsclimatechange.pdf

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2.3 Local Policy Context

At a local level there are a variety of local plans and local development frameworks relevant to the study area with which it is assumed readers will be familiar, so are not listed here in full. The Local Government Yorkshire and Humber can provide a list of local documents if required.

The following references are included as examples of local planning policy both within North Yorkshire and York and throughout the UK, which have been developed with specific reference to RLCE in relation to landscape. Much, but not all, of the RLCE/landscape specific policy is focussed on wind energy development as effects on the landscape are a key consideration in decision making in this area. The following examples include policy developed within Scotland (as well as England) as pressures for wind development, in particular, are relevant there, albeit in the context of the Scottish planning system.

2.3.1 Examples from North Yorkshire and York Sub-Region

Within North Yorkshire and York, the **North York Moors** has adopted a **Supplementary Planning Document** (SPD) specific to Renewable Energy (April 2010) as part of their LDF[4]. The National Park is a particularly sensitive landscape and the focus of much of the guidance relates specifically to landscape character and the potential visual impacts of RLCE development, so is of particular relevance to this framework. Due to the sensitivity of the landscape setting to RLCE development, the guidance is focussed on micro-renewables only, as this type of development is deemed to be most appropriate within the National Park. The content of the SPD is described in more detail in section 3.2.1 of this framework report, with reference to policy development.

The **Yorkshire Dales National Park** has also developed a **SPD** related to RLCE[5] which has been devised to support Policy U6 of the Yorkshire Dales Local Plan 2006. The SPD is similar to that produced for the North York Moors National Park, and focussed on micro-renewables, as it is considered that they are the most appropriate RLCE solutions within the sensitive landscape setting of the National Park. Although the SPD does include some design guidance, it is focussed more on planning implications and less on design responses to the landscape setting than that produced for the North York Moors.

Harrogate District Council has also recently published a draft Renewable and Low Carbon Energy SPD[6] in September 2011. The SPD provides useful information on a range of designated planning and environmental constraints (including the Nidderdale AONB) associated with development within the district and provides specific guidance relating to the 'general suitability' of each RLCE technology within the Nidderdale AONB, based purely on the potential for landscape impact. The SPD discusses the following RLCE technology individually, setting out the pros, cons and issues related to each: wind turbines (commercial scale and micro), heat pumps, hydro power, solar power; and, biomass (including energy crops, wood fuelled and anaerobic digestion). It also provides guidance on how to minimise any potential harmful effects, and a number of local case studies where technologies have already been installed with a summary of lessons learned.

[4] http://www.northyorkmoors.org.uk/uploads/publication/10724.pdf
[5] http://www.yorkshiredales.org.uk/fr/No%20Pics/mtb-home/mtb-tandcs/mtb-home/index/lookingafter/climatechange/cc-whatyoucando/cc-renewableenergy/cc-p-energyproductionguide.pdf
[6] http://www.harrogate.gov.uk/Documents/DDS%20LDF%20Planning/DS-P-LDF_draftRenewableEnergySPD.pdf

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2.3.2 Examples from the Rest of the UK

Huntingdonshire Council has used a landscape capacity study for wind development as the basis for a **supplementary planning document** (SPD)[7] within their LDF. The SPD was adopted in September 2006 and provides a guide for decision making in relation to the geographic acceptability of **wind development**.

Rochdale Metropolitan Borough Council adopted a **SPD on Energy and New Development** (2008)[8]. It includes guidance on numerous types of **RLCE** including solar, wind, biomass, hydro, CHP, and heat pumps. In addition, Rochdale MBC cites the landscape capacity study for wind energy in the South Pennines as part of the evidence base for the emerging core strategy and LDF[9]. Within the draft Core Strategy, Policy G3 deals specifically with the issue of RLCE development and includes consideration of the potential effects on landscape and visual character of the borough in relation to RLCE. It makes specific provision for protection of landscape character in relation to grid connections and ancillary structures associated with a number of types of RLCE development.[10]

The **East Lothian Local Plan** (Adopted 2008) specifically mentions a **landscape capacity study** undertaken for the area which was used to develop policy specific to wind energy development (**Policy NRG3: Wind Turbines**). Landscape character, visual impact and cumulative effects are cited as key considerations to determining the acceptability of wind energy development. There is also reference to decision making in relation to roof top wind turbines (domestic scale) and solar energy installations in the explanatory text of the policy[11].

[7] http://www.huntingdonshire.gov.uk/SiteCollectionDocuments/HDCCMS/Documents/Planning%20Documents/PDF%20Documents/Local%20Development%20Framework/Binder2.pdf

[8] http://www.rochdale.gov.uk/pdf/2008-06-30_LDF_SPD_Energy_Adopted.pdf

[9] http://www.rochdale.gov.uk/planning_and_building_control/local_development_framework/main_ldf_policy_documents/ldf_-_evidence_base.aspx

[10] http://rochdale-consult.limehouse.co.uk/portal/planning_policy/core_strategy/publication_draft_consultation?tab=files

[11] page 49 of http://www.eastlothian.gov.uk/downloads/ELLP_2008_Adopted_Text.pdf

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2.4 Landscape Character: Context

2.4.1 European Landscape Convention (ELC)

Created by the Council of Europe, the European Landscape Convention[12] is the first international convention to focus specifically on landscape. The convention promotes landscape protection, management and planning, and European co-operation on landscape issues and was signed by the UK Government in February 2006 (the ELC became binding from March 2007). One of its defining principles is that it applies to all landscapes, including ordinary or even degraded landscapes, as well as those that are afforded formal protection.

The ELC defines landscape as:

'"Landscape" means an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors'

The explanatory report which accompanies the convention[13] expands on this definition and states that:

'"Landscape" is defined as a zone or area as perceived by local people or visitors, whose visual features and character are the result of the action of natural and/or cultural (that is, human) factors. This definition reflects the idea that landscapes evolve through time, as a result of being acted upon by natural forces and human beings. It also underlines that a landscape forms a whole, whose natural and cultural components are taken together, not separately.'

In other words, particular combinations of natural and or human factors, such as: geology, hydrology, landform, soils, vegetation, ecology, land use, field patterns, historic or cultural features/associations, and human settlement, and the interaction between these elements consistently across an area or zone, create character and in turn give an area a sense of place.

The explanatory note also highlights the purpose of the convention in relation to the role of local planning authorities, which applies to all authorities within England. It states that:

"The general purpose of the Convention is to encourage public authorities to adopt policies and measures at local, regional, national and international level for protecting, managing and planning landscapes throughout Europe so as to maintain and improve landscape quality and bring the public, institutions and local and regional authorities to recognise the value and importance of landscape and to take part in related public decisions.'

A Landscape Characterisation Project has been undertaken for North Yorkshire County Council, and was published in May 2011. The report of the North Yorkshire Landscape Characterisation Project (North Yorkshire and York Landscape Characterisation Project (CBA), May 2011) provides details of the relevance and implications of the ELC at a sub-regional and local level, so is not repeated here. However, as an introduction, the report states that:

"The principles of the Convention apply to landscapes everywhere of whatever quality and in any condition. This includes urban and peri-urban areas; towns, villages and rural areas; the coast and inland areas; outstanding or protected landscapes; and ordinary or degraded landscapes. A key principle underpinning the European Landscape Convention is to integrate into regional and town planning policies measures based on landscape character assessment methods aimed at protecting, managing and planning the landscape. In conjunction with the active

[12] http://conventions.coe.int/Treaty/en/Treaties/Html/176.htm
[13] http://conventions.coe.int/Treaty/en/Reports/Html/176.htm

participation of interested parties, the Convention encourages the identification and assessment of the character, forces for change and value of the landscape to inform the definition of landscape quality objectives."

There are numerous examples both within the sub-region and nationally, of local planning policy development which embraces the aims of the ELC, using a landscape character based approach to the protection of landscape at a local level, such as policy EQ2 of the Harrogate Core Strategy, for example.

2.4.2 Landscape Character in North Yorkshire and York

Within North Yorkshire and York, landscape character has been defined at national, county and local levels.

At a national level, the landscape character of England has been characterised by The Countryside Agency (now Natural England) and the results presented in The Character Map of England (2005). England has been divided into 159 areas with similar landscape character, which are called National Character Areas (NCAs), previously known as Joint Character Areas (JCAs), of which sixteen cover the Study Area[14]. Characterisation at the national scale defines areas broadly, at 1:250,000 scale.

At a county level, the recently completed North Yorkshire and York Landscape Characterisation Project (CBA, May 2011) uses the framework of NCAs and divides the county into 9 Primary Landscape Units (PLU), which in turn are subdivided into 39 Landscape Character Types (LCT). The 2011 study provides a more detailed level of assessment and defines character areas at a scale of 1:50,000. The study also provides guidance in relation to the sensitivity of the landscape resource to change, further details of which are described in section 3.4.6 of this framework, and which are illustrated in graphic form in tool T5, appended to this report.

The report of the Landscape Characterisation Project for North Yorkshire County Council provides useful information in relation to the relevance of landscape character in planning policy. It states that:

"In England and Scotland, Landscape Character Assessment is widely acknowledged as an appropriate way to look at the whole landscape, not just areas protected by designations, because it provides a structured, robust and largely objective approach for identifying character and distinctiveness. It does this by mapping and describing the variations in physical, natural and cultural attributes and experiential characteristics that make one area distinctive from another at a range of spatial scales. Landscape Character Assessment also recognises how landscapes have changed over time, and acknowledges the changing influences of human activities and the impacts of economic development. The 'character approach' is a valuable tool for helping make informed decisions about how landscape should be managed in the future."

Landscape characterisation has also been undertaken at a local level, typically at a scale of 1:25,000. A number of District Councils have produced a Landscape Character Assessment for their areas, at varying times over the past twenty years, the majority of which divide districts into Landscape Character Areas (LCA), which nest within the county level study. In addition, a number of landscape character assessments have also been undertaken in that time for areas of nationally designated landscape (National Parks and AONBs), five of which lie within the sub-region. The following landscape character assessments are relevant to the study area:

- Forest of Bowland AONB (2009);
- Harrogate Borough (2004) – also covers Nidderdale AONB;
- North York Moors National Park (2003);
- Craven District (2002);
- Yorkshire Dales National Park (2001);

[14] Countryside Character Volume 3: Yorkshire & The Humber (Countryside Commission). Available on Natural England Website here: http://www.naturalengland.org.uk/ourwork/landscape/englands/character/areas/yorkshumber.aspx

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- Selby District (1999);
- Ryedale District: northern half (1999);
- York (1996).
- Howardian Hills AONB (1995);
- Scarborough Borough (1994);
- Nidderdale AONB (1992);
- Hambleton District (1991);

For further information on the concept of landscape character see section 3.4.2 of this framework.

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3 A Framework for the Application of Landscape Sensitivity in Policy Development and Decision Making for RLCE

Photograph of Knabbs Ridge Windfarm by G X Megson

3.1 How to Use this Framework

The primary function of this Framework is to provide an appraisal methodology to assist in policy development and planning decision making. This section of the Framework sets out two appraisal methodologies: one relating to policy development; and another relating to development management. This section also introduces key reference documents and a number of tools, specifically designed to guide LPAs and assist policy makers and development managers.

A number of existing studies have been undertaken specific to both RLCE and landscape sensitivity in North Yorkshire and York. The appraisal methodology and guidance within this Framework are primarily based on this existing information. No additional primary data collection has been undertaken as part of this study, in accordance with the project brief. As such, the appraisal methodologies show how to make best use of existing studies relating

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to both RLCE and landscape sensitivity, specific to North Yorkshire and York. Of these studies, three Key Reference documents have been identified, which form the basis of the framework. The Key Reference (KR) documents are:

KR1 'The Energy Opportunities Study' - Low Carbon and Renewable Energy Capacity in Yorkshire and Humber (Aecom), March 2011

KR2 'The Sensitivity Study' - Delivering Sustainable Energy in North Yorkshire: Recommended Planning Guidance (LUC and NEF), October 2005

KR3 'The Character Study' - North Yorkshire and York Landscape Characterisation Project (CBA), May 2011

An introduction to each of the key reference documents is outlined in section 3.2 of this report with reference to the **Key Features** of each study, **Limitations** of each study in relation to landscape sensitivity, and the proposed **Function** and application of each study in relation to the aims of this framework.

To make best use of the existing information it is important to understand a number of **key concepts** including landscape character, landscape sensitivity and landscape capacity and how these relate to policy development and development management. Each concept is defined as part of this framework and specific guidance is included in section 3.4.2.

The appraisal methodologies illustrate how to gather and apply information relating to landscape sensitivity and show how it can be used to inform policy development and development management. The practical application of the appraisal methodology itself is intended to help explain the concept of landscape sensitivity, thus assisting in the process of policy development and decision making through improved understanding.

Capabilities on project:
Environment

3.2 Policy Development

An appraisal methodology for using landscape sensitivity to assist in RLCE related policy development is illustrated in Figure 1. The appraisal methodology should be read in conjunction with:

- the three **key references** (summarised in section 3.4.1);
- **tools** provided within the appendix of this framework (and introduced in section 3.6);
- a number of **key concepts** identified in section 3.4.2; and
- the appraisal methodology for development management (illustrated in Figure 2 of this framework).

A Landscape Sensitivity Framework Pro-Forma has been produced, primarily as a companion to the Development Management appraisal methodology set out in section 3.3, but also to support the application of landscape sensitivity in Policy Development. The pro-forma directly corresponds to the process of development management (as illustrated in Figure 2) but is also referenced in Figure 1 which is specific to the application of landscape sensitivity in policy development. The pro-forma is included in Appendix B which also includes guidance on how to use it.

Figure 1 (below) sets out the appraisal methodology for policy development which seeks to apply landscape sensitivity to three areas of policy development:

1. Development of Strategic Policy using this Framework and existing information sources to create robust policy criteria and evidence bases;

2. Development of planning and or design related guidance based on the likely effects of RLCE development, landscape sensitivity and landscape character assessment, to ensure guidance is specific to place; and

3. Identification of areas, specific sites, or zones for RLCE development using landscape sensitivity and an appraisal of landscape constraints and opportunities which are specific to place.

Further detail on how to apply landscape sensitivity to policy development is provided in section 3.2.1.

Capabilities on project:
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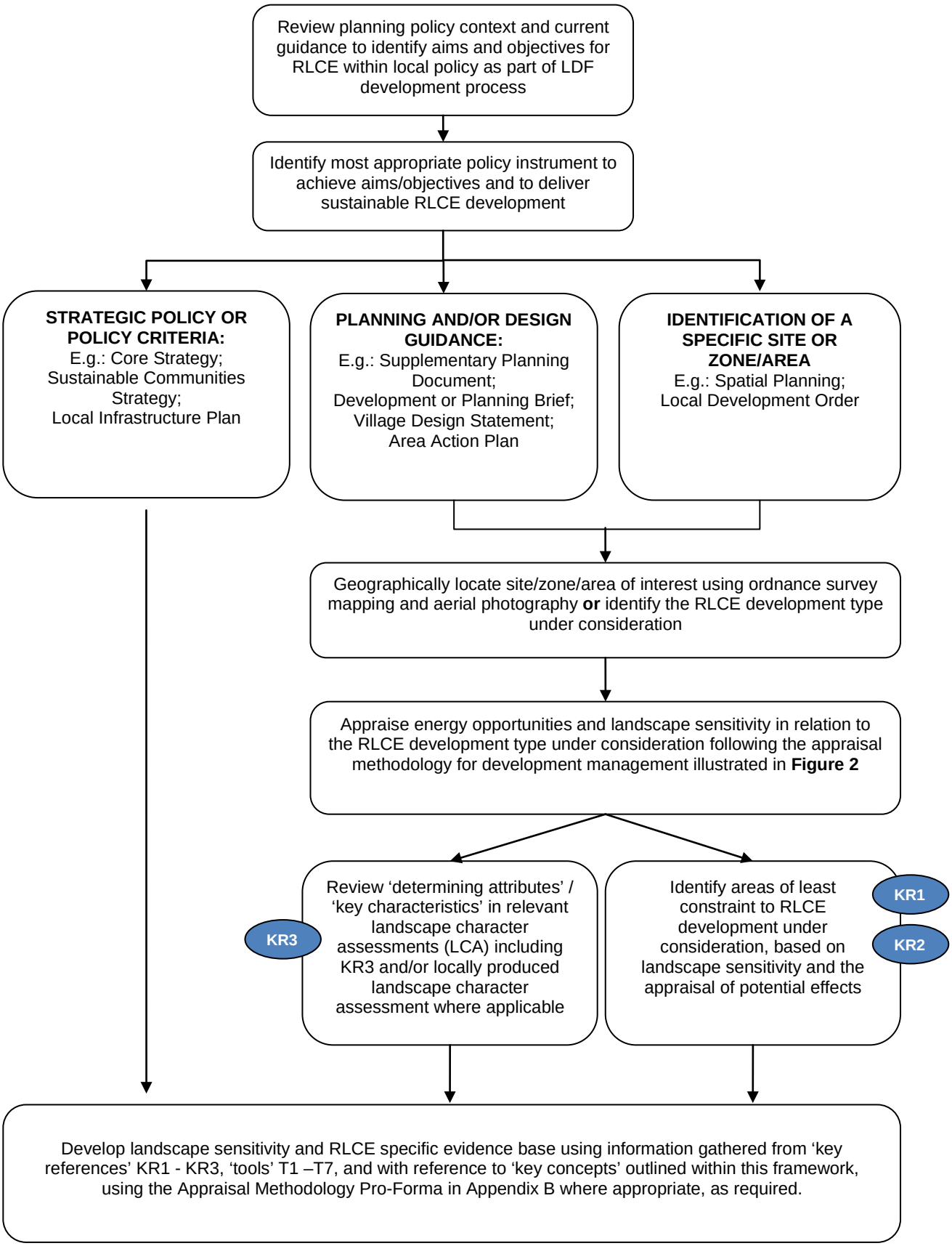

Figure 1: Appraisal Methodology for the Application of Landscape Sensitivity in Policy Development

Capabilities on project:
Environment

3.2.1 Potential Uses for the Appraisal Methodology in Policy Development

The appraisal methodology is intended to provide a flexible framework for the application of landscape sensitivity in RLCE policy development. Although some guidance is provided below, the methodology is not intended to provide a definitive guide to all the potential applications and uses of this framework in assisting policy development. Rather, it is envisaged that LPAs are best placed to identify and decide where best to utilise this appraisal methodology in relation to specific needs within a specific locality. The planning advisory service (PAS) has supported a number of pilot studies to test policy development, some directly relevant to RLCE. Their website provides examples of policy development from authorities across the country and ideas for future policy development[15].

As part of this framework, three case studies have been produced which provide worked examples of the appraisal methodology and associated pro-forma to illustrate its use. It is envisaged that the appraisal methodology could be used to inform the development of a number of policy instruments based on information gathered using the pro-forma. The pro-forma itself could be included as part of the evidence base or policy development process. The appraisal methodology could be used to inform a number of policy instruments and suggested opportunities for its application are summarised below to stimulate ideas.

Core Strategy policy or other policy documents within a Local Development Framework (LDF)
The appraisal methodology and pro-forma could be used as part of the evidence base for proposed policy, or to assist in the identification of policy criteria. This could be particularly relevant to policies aimed at the conservation and/or enhancement of the countryside, or landscape character in general, as a direct response to RLCE development in landscapes of differing sensitivity, to accord with the aims of the European Landscape Convention.

Identification of Sites/Zones/Areas
Through identification of areas or sites of energy opportunity, and lower landscape sensitivity (using KR1, KR2, KR3), the appraisal methodology (in combination with the wider Framework) could help to identify areas of least constraint for RLCE development, in considering spatial planning requirements. In practice, this could be achieved by appraising each county landscape character type (LCT) within a specified area using the pro-forma provided, to help identify those areas of least constraint to a specific RLCE development type. It is important to note the limitations of existing information sources (summarised in section 3.4.1) and it should be noted that no landscape capacity assessment for RLCE development exists for the sub-region.

Local Development Orders (LDO)
Landscape Sensitivity and Energy Opportunity constraints (as identified in KR2 and KR3) could be considered as part of a wider appraisal and assessment process to identify sites and/or areas which could be subject to an LDO, in order to encourage RLCE development on key sites. Alternatively, and again in combination with wider study, the framework and appraisal methodology could also be used to identify geographic areas of least constraint to RLCE. An LDO could be adopted to include, for example, micro-renewables as permitted development within such areas.

Local Infrastructure Plans (LIP)
The appraisal methodology could be used to inform the initial production and ongoing development of local infrastructure plans where they seek to promote RLCE as part of the plan. This could include guidance on the suitability of specific areas or sites to accommodate certain types of RLCE development.

[15] Development of LDO for renewable energy (http://www.pas.gov.uk/pas/core/page.do?pageId=662387#contents-5) and SPD (http://www.pas.gov.uk/pas/aio/553457)

Capabilities on project:
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Area Action Plans (AAP), Planning and Development Briefs, and Village Design Statements
Within a framework of Landscape Sensitivity and Landscape Character at a county and local level, the likely effects of RLCE development and details of potential mitigation measures could be used to inform design guidance for Area Action Plans (AAP), Planning and Development Briefs, and Village Design Statements. Local as well as county level landscape character assessment (KR3) could help to determine constraints and opportunities of an area or site in design terms. The appraisal methodology pro-forma could be used as part of the evidence base for the development of design guidance.

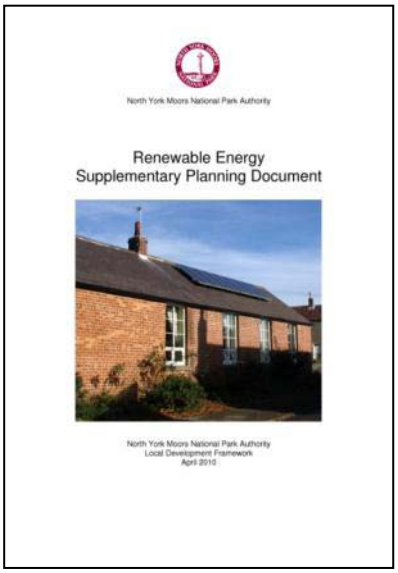
Supplementary Planning Documents (SPD)
The appraisal methodology would be particularly useful in informing production of SPD, be it related to development of RLCE in general, or specific to a single type of RLCE or area. The appraisal methodology could inform a variety of SPDs focussing on RLCE, for example:

- an SPD focussed on design of RLCE in response to landscape sensitivity or character; or
- an SPD providing guidance relating to the information required to support a planning application for certain type of RLCE, particularly in areas where there might be significant development pressure; or
- an SPD relating to the potential suitability of specific RLCE type within a district, i.e. wind turbines.

The appraisal methodology presented in Figure 1 and accompanying pro-forma could themselves be included within an SPD to illustrate the way in which an LPA is applying landscape sensitivity to policy development, if and where appropriate. Similarly, the appraisal methodology and accompanying pro-forma developed to assist with development management (introduced in section 3.3 and presented in Figure 2) could also be included in an SPD to illustrate how landscape sensitivity is being applied to the development management process.

3.2.2 An Example from North Yorkshire and York

As noted in section 2.3.1, the North York Moors has produced an SPD for Renewable Energy[16]. To help illustrate the above, a summary of the contents of the SPD is provided below as an example of how LPAs could apply landscape sensitivity in policy development. However, it should be noted that the landscape of the National Park is considered to be of high sensitivity throughout, due to the unique character of the landscape of this nationally designated landscape. As such, the approach taken is not necessarily directly replicable elsewhere within the sub-region.



The landscape sensitivity of the North York Moors to RLCE development was identified in the SPD using Key Reference 2 (KR2: The Sensitivity Study) of this framework. The SPD states that:

"In assessing the North York Moors National Park the following conclusions were drawn:

- *Almost the entire area was identified as having a landscape of high sensitivity to wind energy development (sensitivity relates to the vulnerability of the landscape to changes)*

[16] http://www.northyorkmoors.org.uk/uploads/publication/10724.pdf

- *A similar pattern of sensitivity was identified in respect of commercial scale biomass (c. 1 MW plant)*
- *The study suggests that domestic scale wind turbines, smaller biomass plants and small scale hydro schemes (using existing structures) would therefore be more appropriate in the National Park."*

As such, the SPD focuses on small scale RLCE and micro-generation. The purpose of the SPD includes a number of items related to landscape character and sensitivity. It states that:

"This Supplementary Planning Document aims to ensure that appropriate renewable energy developments can be supported within the National Park by:

- *Providing information on and interpretation of renewable energy policy;*
- *Providing information on different renewable energy technologies and setting out the planning issues associated with renewable technologies in the North York Moors National Park;*
- *Establishing what type of renewable energy developments are likely to be appropriate in the Park whilst meeting statutory Park purposes;*
- *Setting out design advice to ensure that renewable energy developments are appropriate to the locality;*
- *Providing an overview of the issues likely to be associated with a planning application;*
- *Providing guidance on the types of renewable energy which may integrate well with different uses;*
- *Providing guidance on implementing the requirement for 10% of predicted CO2 emissions to be displaced by renewable energy for developments of over 5 houses or other uses over 200sqm, including a template for performing the associated calculations;*
- *Setting out what should be submitted with your planning application; and*
- *Directing you to further sources of information."*

To achieve these aims, the document contains a guide to the existing policy context of RLCE and crucially links guidance to related policy within the Core Strategy of the LDF. This includes Development Policy 3 - Design, which itself sets out the importance of design in maintaining and enhancing the character of the landscape.

In addition, and specific to landscape character and sensitivity, the SPD provides guidance on the appropriateness of different RLCE development types within the National Park. This includes guidance relating to landscape and biodiversity, as well as other planning considerations such as economy, pollution, transport, and noise where appropriate. Each RLCE development type is considered in detail and the guidance relating to each RLCE development type includes:

- a guide to key planning considerations which includes both landscape and visual effects;
- examples of best practice in terms of design and siting; and
- a list of key design considerations in relation to the sensitive landscape setting of the Park;
- a list of sources for additional information.

For example, the key design considerations given for a proposed micro-biomass development are:

"• Consideration should be given as to how deliveries of fuel or timber will be made and/or how products will be taken from the site;

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- *Use the smallest size flue possible (subject to meeting Building Regulations requirements) and locate this to minimise visual impact;*
- *Colour the flue to blend with the background (for example, dark green against a backdrop of trees) or use trees or woodland to screen the flue;*
- *Consider undergrounding any new grid connection."*

The SPD also includes additional guidance on the practicalities of RLCE in relation to development types and technical requirements including:

- Guidance on the practical requirements for integration of RLCE to other development types e.g. residential, commercial, agricultural etc.; and,
- A guide to making a planning application for RLCE, including a list of typical information required to accompany an application for each RLCE development type.

3.3 Development Management

An appraisal methodology has also been developed specific to development management. Figure 2 sets out a process for using landscape sensitivity, specifically aimed at informing decision making as part of the development management process. It uses the information in the three key reference documents (outlined in paragraph 3.1 above) and provides a guide to the practical application of landscape sensitivity in the decision making process. A series of other 'Tools' have also been produced to provide guidance and to assist in the decision making process, all of which relate to specific tasks set out in the appraisal methodology. These tools are described in section 3.6.

The Landscape Sensitivity Framework Pro-Forma provides a companion to the appraisal methodology for development management. The pro-forma provides a useful aid in extracting the necessary information from the Key References and Tools, and directly corresponds to the process illustrated in the appraisal methodology. The pro-forma is included in Appendix B which also includes guidance on how to use it.

Figure 2 below sets out the appraisal methodology for development management which has three stages:

1. Identification of areas of energy opportunity for RLCE
2. Identification of potential effects of RLCE development
3. Influencing design and siting of RLCE development

Further detail on how to apply landscape sensitivity to development management is provided in section 3.3.1.

A Note about Appraisal of Smaller Scale Schemes and/or Using District/Local Landscape Character Assessment

The appraisal methodology presented in Figure 2 and associated pro-forma can be used to appraise RLCE development of all types and scales. However, where proposals for smaller scale development (e.g. micro generation) are under consideration it may be more appropriate to apply the methodology only in part (rather than in its entirety), and/or with reference to district, or local level landscape character assessment.

The use of a local level assessment (in addition to the county level assessment presented in KR3) as the basis of an appraisal may be of a more appropriate scale for appraisal of smaller development proposals. As such, a slightly amended pro-forma is provided in Appendix B to facilitate appraisal of development proposals using local level landscape character assessments. This pro-forma could also be used to appraise larger scale proposals in combination with an appraisal using the standard pro-forma.

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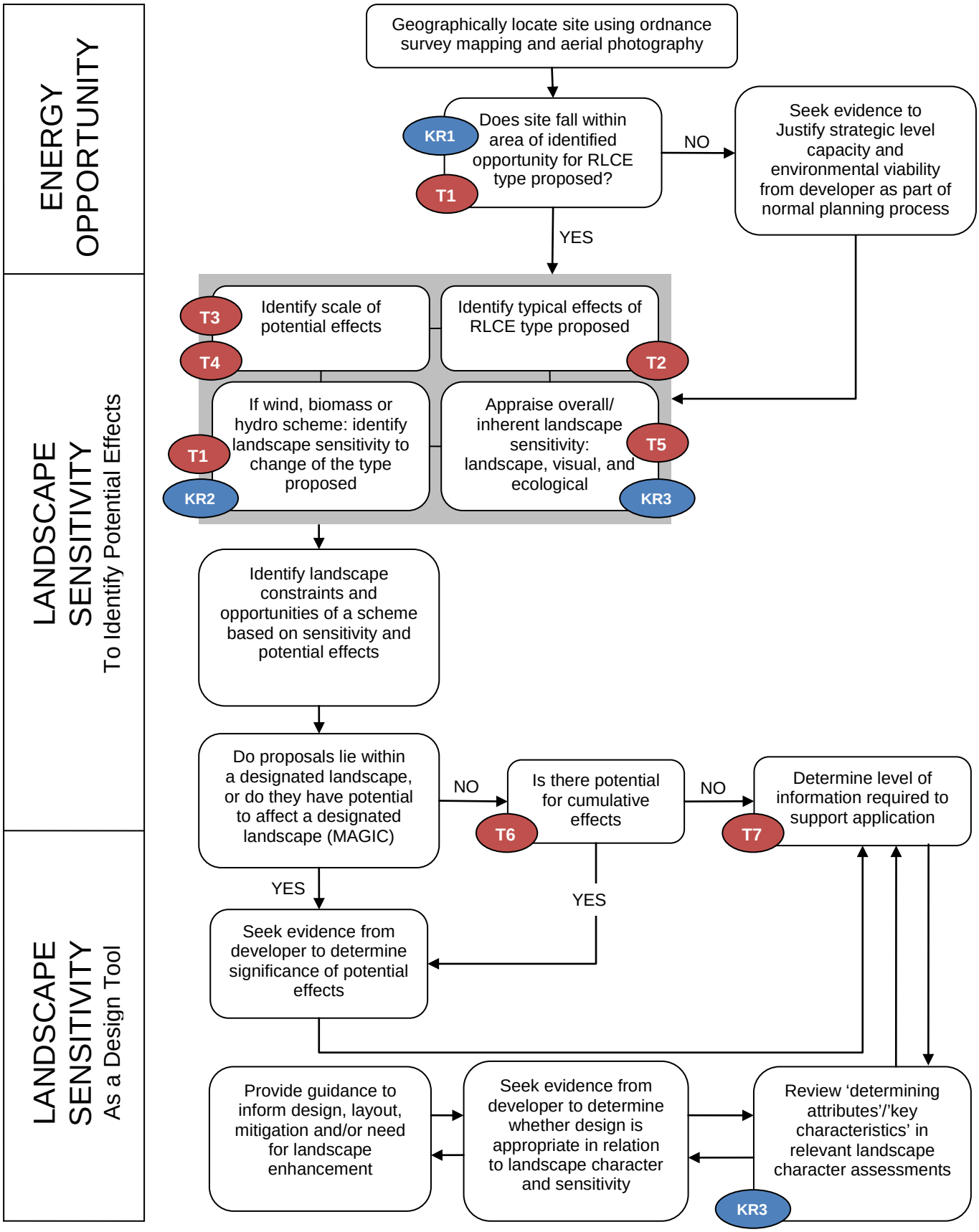

Figure 2: Appraisal Methodology for the Application of Landscape Sensitivity in Development Management

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3.3.1 Potential Uses for the Appraisal Methodology in Development Management

The Appraisal Methodology has been designed to allow for flexibility in terms of its practical application and as such does not refer to any specific application type or individual procedure within the development management process. It can be applied in its entirety, or in part, to any number of situations where decision making may be required as part of the planning process. This level of flexibility allows the LPA to adapt the methodology to suit specific requirements to a particular application or process.

It is envisaged that the Landscape Sensitivity Framework Pro-Forma (in Appendix B) be used in combination with the appraisal methodology for completion by Development Managers. Once completed, this Pro-Forma could be used as a file note to evidence decision making, or be issued to an applicant in the form of an advice note. The Pro-Forma has been designed to be flexible and can be altered to suit the needs of the LPA or a specific application.

The following example situations are provided to illustrate potential uses for the appraisal methodology and to stimulate ideas.

Responding to EIA Scoping/Screening Opinions
The appraisal methodology could be used to help determine whether a development proposal is likely to have a significant landscape impact due to the typical effects of a development of the type proposed, and/or the sensitivity of the landscape within which it is proposed. The pro-forma could be included in the consultation response.

Consultation Responses and Pre-Application Advice
The appraisal methodology and pro-forma could be used as the basis of advice relating to the suitability of a particular RLCE development proposal with reference to landscape specific opportunities and constraints. It could assist in deciding whether the siting and/or design of a proposal takes the sensitivity and character of the landscape setting sufficiently into account. The appraisal methodology could also be used to determine where additional information might be required from the applicant. Again, the pro-forma could be issued as part of a consultation response.

Developing Validation Requirements or the Appropriate Level of Information Required to Determine an Application
The appraisal methodology and pro-forma could be used to determine the likely landscape effects of a particular RLCE development. This information could be used to identify and advise on the level of information required to be submitted by an applicant, in order to determine a planning application.

Determining a Planning Application
The appraisal methodology and pro-forma could be used to help determine a planning application. It could identify whether the application meets policy requirements concerning landscape sensitivity, landscape character, energy opportunity and design.

Developing Appropriate Planning Conditions
The appraisal methodology could be used to determine the type and nature of planning conditions specific to the type of RLCE proposed and the landscape context.

Local Assessments
The appraisal methodology could assist in the preparation of Local Assessments, required by IPC (soon to become MIU) as part of the Nationally Important Infrastructure Projects (NIIP) decision making process. Although decision making for NIIP is not the responsibility of LPAs, local assessments may be required to inform decision making by

the IPC (soon to become MIU and ministers). Local Assessments are produced by LPAs to provide local level information where it is deemed relevant to the development and/or the decision making process. Where NIIP related to RLCE are proposed, it may be appropriate to include information relating to the landscape sensitivity context of the area, to influence both design and decision making.

Three worked examples are included as Case Studies in Section 4 of this Framework to illustrate the application of the pro-forma and appraisal methodology in relation to Development Management.

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3.4 Introduction to Key References, Concepts and Tools

Figures 1 and 2 outline appraisal methodologies for application of landscape sensitivity in both policy development and development management. They refer to a number of appraisal methodology Tools developed to assist in the process (e.g. T1) and make reference to three Key References (e.g. KR1) which contain much of the information required to assist in the process. This section provides a guide to these Key References and Tools, as well as a number of key concepts which underpin them.

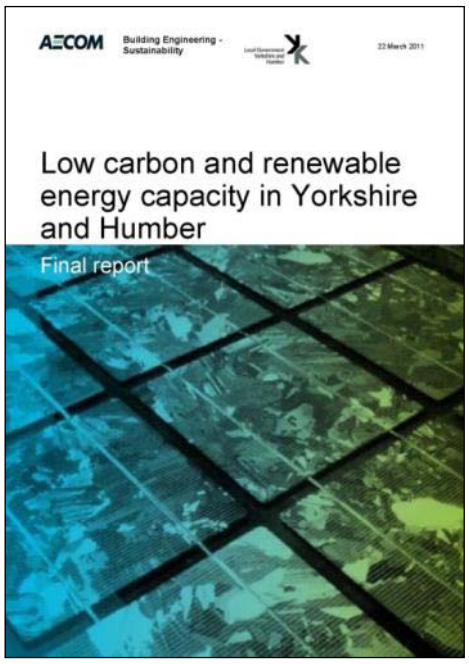
3.4.1 Key References

A number of published studies, relevant to North Yorkshire and York, can assist in both RLCE decision making and policy development within the sub-region. These studies form the basis of the appraisal methodology, in combination with established processes used in decision making and policy development. A summary of each of the Key References is outlined below, with reference to the key features, limitations and assumptions, and the proposed function and application of each study in relation to the aims of this framework.

KR1: The Energy Opportunities Study

(Low Carbon and Renewable Energy Capacity in Yorkshire and Humber (Aecom), March 2011)

3.4.1.1 Key Features



The Energy Opportunities Study (EOS) identifies energy opportunities for specified RLCE development types in the sub-region in accordance with the DECC methodology[17]. The RLCE development types considered are:

- District heating and CHP
- Commercial scale wind energy
- Hydro energy (small scale, low head)
- Biomass (including use in co-firing and energy generation from dedicated energy crops, managed woodland, industrial wood waste and agricultural arising, or straw)
- Energy from Waste (EfW) (including energy generation from slurry, food and drinks waste, poultry litter, municipal solid waste, commercial and industrial waste, landfill gas production and sewerage gas production)
- Micro-generation (including small scale wind energy, solar, heat pumps, small scale biomass boilers)

The EOS uses Energy Opportunities Plans (EOPs) to illustrate geographic areas of opportunity for a number of the RLCE types identified within the

[17] Renewable and Low carbon Energy Capacity Methodology, DECC (January 2010)

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sub-region where it is possible and/or practical to spatially identify such areas. This includes: commercial scale wind, district heating, and hydro developments over 1MW in size. The EOPs also illustrate current RLCE schemes (either operational schemes or those with planning consent) and proposed schemes (those in planning). The EOP for North Yorkshire and York is illustrated in Figure 56[18] and individual EOPs for each Local Authority within the sub-region can be found in Appendix B of the report.

In accordance with the DECC methodology, areas of opportunity are based on the combination of the technical accessibility of the resource, the physical accessibility of the resource and the economic viability of the resource. Therefore, for the majority of RLCE types, the EOS does not include landscape value or sensitivity as a constraint to the areas of energy opportunity identified. The exception to this is commercial scale wind, where landscape sensitivity is a key factor in the economic viability of the energy potential. As such, landscape sensitivity[19], nationally designated landscapes, and to some extent the potential for cumulative effects, are used to constrain the potential of the resource. To achieve this, the EOS adopts the wind energy specific, landscape sensitivity assessment produced as part of the AEAT Study (also known as the SREATS Study)[20]. The AEAT assessment of sensitivity was undertaken at a very broad scale and was based on the 24 National Character Areas (NCA) within the Yorkshire and Humber Region, sixteen of which lie in North Yorkshire and York. Each of these National Character Areas was given a sensitivity 'score' of High, Medium or Low to either small, medium or large wind development [21] (n.b. small, medium and large categories are based on the number of turbines, not the height to tip of each turbine).

Based on the above, the EOS identifies potential energy opportunity for commercial scale wind energy based on:

- The technical accessibility of the resource i.e. the performance of the generating equipment, which is defined by the scale, design and output potential of the turbines. The study assumed a standard turbine size of 2.5MW, with rotor diameter of 100m, hub height of 85m and tip height of 135m;

- The physical accessibility of the resource i.e. wind speed, proximity to existing, potentially conflicting land uses such as buildings, aerodromes, MoD land, transport infrastructure, lakes and rivers; and

- The planning and regulatory viability of the resource i.e. areas where commercial scale wind is unlikely to be permitted due to concerns over their impact on sensitive landscapes. The study assumed zero deployment of commercial scale wind in:
    - Areas assessed as being of high landscape sensitivity to wind in AEAT study;
    - Nationally designated Landscapes (National Parks and AONBs or land within 2km of the designated area);
    - Areas identified as Heritage Coast; and
    - Areas within 50m of National Trails.

A landscape capacity study for wind energy has been produced for the South Pennines sub-region[22] which identifies the capacity of the landscape in relation to wind energy development. This detailed assessment was also used to inform the EOP for commercial wind within the South Pennines part of the Yorkshire and Humber region. No study of this type has been produced for North Yorkshire and York so it was not possible to include detailed landscape capacity judgements for the sub-region in the EOS.

In addition to landscape related constraints for commercial wind, it should also be noted that additional constraints were applied in relation to areas designated nationally and internationally for nature conservation value, areas with

[18] See page 97 of http://www.yourclimate.org/system/files/documents/LC%2526REC%20Y%2526H%202011%20-%20Final%20Report.pdf
[19] As defined in the AEAT Study: Planning for Renewable Energy Targets in Yorkshire and Humber (Dec 2004)
[20] Planning for Renewable Energy Targets in Yorkshire and Humber, 2004 http://www.gos.gov.uk/497763/docs/199734/199731/247395/290895
[21] Planning for Renewable Energy Targets in Yorkshire and Humber, 2004 – see page 23 onwards http://www.lgyh.gov.uk/dnlds/Planning%20for%20Renewable%20Energy%20Targets%20Vol%203.pdf
[22] Landscape Capacity Study for Wind Energy Developments in the South Pennines, (Julie Martin Associates) 2010

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sensitivity to birds, areas of deep peat, ancient woodland and sites of historic interest. In fact, although landscape sensitivity is not generally considered, a number of the areas of energy opportunity identified in the EOS do take account of high level nature conservation and or historic/cultural constraints. For example, National Nature Reserves, RAMSAR, SAC, SPA, SSSI, Ancient Woodland, Local Nature Reserves, Scheduled Monuments, Registered Battlefields and World Heritage Sites are excluded from the assessment of suitable land area potentially available for growing biomass energy crops.

Full details of the data and assumptions used to produce the EOPs for each RLCE development type can be found in Appendix A of the EOS report[23].

3.4.1.2 Summary of Limitations of the Study in Relation to Landscape Sensitivity

- Areas of opportunity for all types of RLCE are primarily based on technical, physical, and economic opportunities and constraints, and/or areas of energy opportunity identified in other energy studies.

- With the exception of commercial scale wind (and to some extent hydro) areas of opportunity for all types of RLCE do not include any consideration of landscape specific constraints.

- For hydro energy, the EOS uses recent information produced by the Environment Agency (EA), which identifies a number of potential hydro sites, many of which have not been assessed in terms of landscape sensitivity. It is worth noting that the EA study[24] does include consideration of high level ecological constraints relating to marine as part of the identification of sites.

- It is also important to note that those hydro sites identified in the EOS are limited to 'low head' schemes, over 10KW generation potential, so do not include potential energy opportunities associated with smaller scale schemes or medium or, 'high head' hydro opportunities.

- The assessment of energy opportunity for Biomass does not include any judgements in relation to the location and/or siting of a new biomass processing facility of any scale. Rather, it relates to the energy opportunity and available resource for the production of energy crops within the sub-region. Landscape character and sensitivity were not considered as part of the assessment of energy opportunity, though it is noted that these should be considered on a site by site basis as part of the planning process.

- In production of the Energy Opportunity Plans, only the opportunity areas identified for commercial scale wind take account of Landscape Sensitivity.

- The landscape sensitivity judgements used to inform the commercial scale wind element of the Energy Opportunity Study were taken directly from the AEAT study. The AEAT sensitivity judgements are based on high level landscape characterisation at a national level, undertaken by the Countryside Commission in 1998. It should be noted that the AEAT study was produced before the national character assessment was updated by the then Countryside Agency (now Natural England) in 2005, so is not based on the most up to date information.

[23] See table 37 on page 28 of Appendix A7 in Low Carbon and Renewable Energy Capacity in Yorkshire and Humber (Aecom), March 2011 http://www.yourclimate.org/system/files/documents/LC%2526REC%20Y%2526H%202011%20-%20Final%20Report.pdf

[24] Mapping Hydropower Opportunities and Sensitivities in England and Wales, Technical Report (Environment Agency), February 2010

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- It is not clear from the AEAT landscape sensitivity study what assumptions have been made in relation to the scale (height) of wind turbines assessed. Judgements made in relation to the sensitivity of 'small', 'medium' and 'large' wind farms are related to the number of turbines, not the height of turbines. Turbine height should be a key consideration in determining the sensitivity and capacity of a landscape to wind development. It is not clear to what extent the AEAT study therefore supports the assumptions made in the EOS which identifies energy opportunities for turbines of 135m height to tip.

- Neither the AEAT study nor as a consequence, the EOS consider views or visual effects of wind energy development and as such no landscape capacity judgements can be drawn from the findings of either report without further study.

- In general terms, Energy Opportunities Plans provide an overview of a limited range of potentially feasible technologies and systems within the sub-region, they do not replace the need for site specific feasibility studies.

- Information regarding existing and proposed RLCE installations/facilities within the region was correct when the report was published (May 2011), but will become out of date over time.

- The primary purpose of the EOS was to identify the overall potential for RLCE within the sub-region, not the geographical or landscape capacity for specific RLCE types in specific locations. Although the study considers the spatial opportunities for some technologies (most notably commercial scale wind power), for the majority of technologies the assessment has not been carried out using spatial constraints mapping, but is based instead, for example, on the availability of feedstock at a local authority level.

FUNCTION (IN RELATION TO THE AIMS OF THIS FRAMEWORK)

The Energy Opportunities Study (EOS) provides a strategic, high level guide to the amount (capacity) of RLCE energy potential within North Yorkshire and York, as part of a regional level study based primarily on technical, physical and economic constraints and opportunities. With the exception of commercial scale wind, the study includes no consideration of landscape value or sensitivity. Its primary function is to guide the formulation of targets for specific types of RLCE within the region.

In terms of land use planning and the identification of potentially suitable sites for RLCE development, the EOS has some, albeit limited, practical application as it does identify areas of technical, physical and economic capacity, at strategic level, for commercial scale wind, district heating and hydro RLCE development.

It also identifies the areas of least constraint (in landscape sensitivity terms) for commercial scale wind, but does not provide a definitive guide to where commercial scale wind may or may not be acceptable in landscape terms. It does not provide any judgement in relation to the number of turbines or size of turbines which might be acceptable in any given landscape; so is not a substitute for a detailed, landscape capacity assessment.

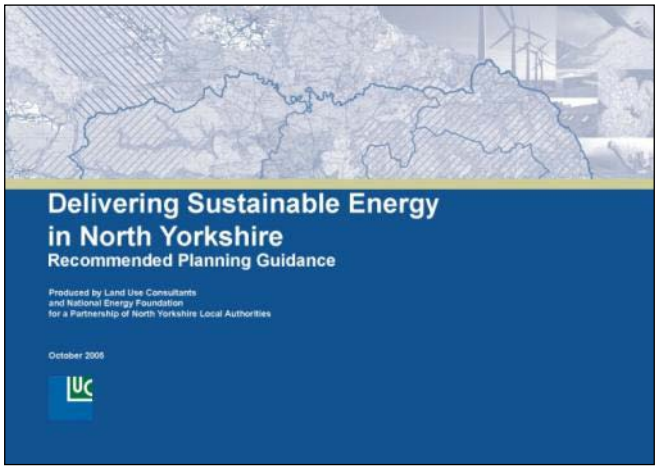
The application of the EOS for land use planning is limited by the strategic level of the study and the nature of the assumptions made in identifying geographical opportunities. These assumptions and limitations should be taken into consideration when using the study for policy development and land use planning purposes.

Capabilities on project:
Environment

KR2: The Sensitivity Study

Delivering Sustainable Energy in North Yorkshire: Recommended Planning Guidance (LUC and NEF), October 2005)

3.4.1.3 Key Features



The Sensitivity Study identifies landscape sensitivity to a range of RLCE development within the North Yorkshire sub-region. The RLCE types assessed were limited to wind, a large biomass plant, and 40 pre-determined small scale hydroelectric schemes (as identified in AEAT 2002 and 2004). Figures 5.2, 5.3 and 5.4[25] illustrate the sensitivity of the landscape to Wind, Biomass and Hydro schemes in the sub-region.

The sensitivity assessment uses national landscape typologies (equivalent to national scale landscape character types) as a basis for the sensitivity assessment. These landscape typologies (or types) were originally identified to inform the characterisation of National Character Areas (formerly referred to as 'Countryside Character Areas' and 'Joint Character Areas') by the Countryside Agency. The landscape of North Yorkshire and York is divided into 23 National Landscape Typologies.

As part of the Sensitivity Study, the 23 National Landscape Typologies were sub-divided (using desk based analysis only) into 50 units where landscape character and sensitivity were found to be the same. This provided landscape characterisation at a county scale, which was deemed most appropriate for the purposes of the study. As such the Sensitivity Study provides a more detailed assessment of landscape sensitivity than the AEAT 2004 study, and also provides a landscape sensitivity assessment in relation to biomass and predefined hydro schemes in addition to commercial scale wind, within the 50 landscape character units.

Descriptions of each of the 50 landscape character typology units together with an assessment of sensitivity to wind and biomass schemes are located in Appendix 4 of the Sensitivity Study; and hydro sites in Appendix 5. These assessments of sensitivity should be used as the primary source of information when considering wind, biomass and hydro development.

The assumed scale of wind, biomass and hydro development was a key consideration in undertaking the Sensitivity Study and full details of the assumptions made can be found on pages 56-59[26] of the main report. In summary, the following key assumptions were made in relation to the scale of the RLCE development types assessed:

Wind:

- Turbine height of 100m to tip, and of 2-2.5MW;
- Small scale development (1-5 turbines), Medium scale development (6-25 turbines) and Large scale development (more than 25 turbines)

[25] Delivering Sustainable Energy in North Yorkshire: Recommended Planning Guidance - Figures
http://www.northyorks.gov.uk/CHttpHandler.ashx?id=1045&p=0
[26] Delivering Sustainable energy in North Yorkshire Recommended Planning Guidance, LUC and NEF, October 2005

- Where sensitivity to even small scale development was identified as being high, an additional assessment of sensitivity to turbines of 50m to tip height was also considered to account for the potential for 'domestic scale' energy generation.

Biomass:
- A single, 1MW biomass plant;
- One to three modern agricultural style sheds of approximately 30mx 10m x 6m, with a chimney stack height of 25m.

Hydro:
- Medium scale, run of river hydro scheme up to 1MW, with turbines housed in structures approximately 1.5m x 2m x 1.5m in size (though smaller schemes of 1.5m maximum dimension were also considered where appropriate.

3.4.1.4 Summary of Limitations of the Study in Relation to Landscape Sensitivity

- The assessments made in the Sensitivity Study are intended to identify those areas most vulnerable or 'sensitive' to wind, biomass and hydro energy development. It does not take account of landscape value or make judgements in relation to landscape capacity, so does not draw out opportunities for specific development types i.e. the number of turbines of a particular height in a particular area. The study does not present a pro-active approach to guiding development to less sensitive or vulnerable areas (see definitions of landscape sensitivity and capacity for clarification).

- The assessment of landscape sensitivity to biomass is restricted to a single 1MW biomass facility (buildings and chimney), and does not include any assessment of the sensitivity of the landscape to smaller scale installations. In addition, no scale assumptions were made regarding the extent, planting pattern or height of biomass crops, or the size of hardstanding yards or storage areas, though general guidance on these issues is considered in section 6.26-6.30 of the report and in the assessment of each of the 50 landscape units in Appendix 4 of the report.

- The Sensitivity Study considers 40 potential hydro sites. These sites were those used in the AEAT 2004 study, which were initially identified by the University of Salford study 'Small Scale Hydroelectric Generation Potential in the UK' from 1989. The Environment Agency has since undertaken a national level assessment of the potential for small scale hydro sites in 2010[27] which has identified a number of additional sites (see description of KR1 above for associated assumptions). This more recent data was used as the basis of KR1, the Energy Opportunities Study. Although the assessment of sensitivity for the 40 sites identified is still valid there are a number of additional, potentially viable sites which have been identified without reference to landscape sensitivity.

- Although the assessment of sensitivity to hydro includes consideration of ancillary structures, the main aspect in terms of assumptions of scale for a typical development was based on the size of the turbine housing.

[27] Opportunity and Environmental Sensitivity Mapping for Hydropower in England and Wales, ENTEC (on behalf of the Environmental Agency), 2010

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- The assessment of landscape sensitivity to wind is based on scale criteria set out in 'Key Features' above. The assumed height to tip for turbines of 100m contrasts with that made in KR1: The Energy Opportunities Study, which used 135m height to tip for commercial scale wind turbines.

FUNCTION (IN RELATION TO THE AIMS OF THIS FRAMEWORK)

The Sensitivity Study can be used to inform both policy development and decision making in relation to wind, biomass and hydroelectric schemes in the sub-region.

The assessments of landscape sensitivity provided in this study should be used as the primary source of information when considering wind, biomass and hydro, as the judgements made are specific to these types of RLCE development. Accordingly, where there are discrepancies between sensitivity assessments provided in the key reference documents, the assessment of sensitivity in KR2: The Sensitivity Study should be the primary source of information.

Appendices 4 and 5 of the report contain the detailed landscape sensitivity judgements for each of the 50 landscape units identified in the study. This information can be used to develop policy which seeks to identify the areas of least landscape constraint for wind energy development (at differing scales) and for a 1MW biomass plant. Due to the limitations of the hydro study (outlined above) it may not always be as appropriate to use the Sensitivity Study for this purpose, as it only considers 40 pre-identified sites.

In combination with other factors, as set out in the appraisal methodology, the Sensitivity Study can also be used to inform and influence decision making related to specific development proposals, through practical application of the landscape sensitivity assessments provided for each landscape unit. The Sensitivity Study provides guidance on design and typical landscape issues that need to be considered in relation to specific RLCE development types.

The information available can be used to help identify the level of information required to support a particular planning application, to provide pre-planning advice and consultation responses to applicants in relation to landscape constraints and opportunities within a certain area, respond to screening opinions and/or scoping reports for EIA, inform a local assessment as part of the IPC process, or to identify gaps in information submitted.

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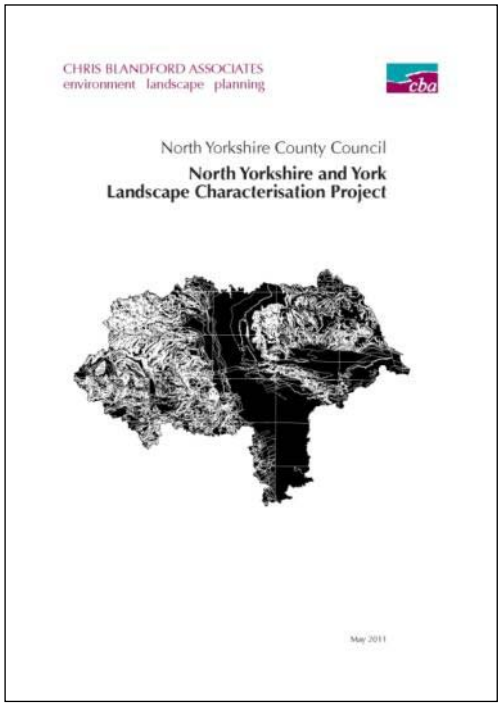
KR3: The Character Study

(North Yorkshire and York Landscape Characterisation Project (CBA), May 2011)

3.4.1.5 Key Features



The Character Study is the most up to date assessment of landscape character within the sub-region. It identifies Landscape Character Types (LCT) at a sub-regional scale and makes judgements in relation to sensitivity of each LCT to development or land use change of any kind, including, but not specific to RLCE.

The study is intended to provide a strategic level assessment at a sub-regional level which will complement existing and future landscape character assessments undertaken at a local level. It does not replace the need for local level assessment, or the role of local assessments in policy development or decision making. Although not yet formally adopted at a local level, it is intended that the study will provide a strategic framework for landscape character within the sub-region, and could form a Supplementary Planning Document (SPD) to LDFs.

The Landscape Character Types identified are illustrated on Figure 3.1 of the North Yorkshire and York Landscape Characterisation Project report. Figure 3.3 shows how the LCTs that have been identified 'fit' within the framework of National Character Areas. Descriptions for each LCT are included in the body of the report and in summary, the following information is provided for each LCT:

- **Characterisation** (the process of assessment of which factors/features/attributes combine to create a sense of place)
    - Key Characteristics;
    - Description;
    - Definitive Attributes;
- **Evaluation** (to determine forces for change and sensitivity of landscape to change)
    - Forces for Change;
    - Sensitivity to Change Issues; which, uniquely for the sub-region, provides sensitivity judgements in relation to:
        - Visual Sensitivity;
        - Ecological Sensitivity; and
        - Landscape Sensitivity
- **Guidance** (for managing landscape change, to aid the process of managing landscape change by highlighting needs and opportunities to inform planning and land management decisions)

LCTs are identified within broader, Primary Landscape Units (PLU) as illustrated on Figure 3.2 of the report, which have been identified according to the underlying geological influence on the landscape, against which no sensitivity judgements are made.

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3.4.1.6 Summary of Limitations of the Study in Relation to Landscape Sensitivity

- The evaluation of landscape, visual and ecological sensitivity is not specific to RLCE development nor to any other type of development or land use change. Rather, it is an assessment of the sensitivity of landscape character *per se* and consequently the evaluation of landscape and visual sensitivity in the study should not be used as a definitive constraint to a particular development or development type.

- Due to the nature of the landscape sensitivity assessments made (i.e. not specific to a particular type of development e.g. wind turbines) the sensitivity judgements made in KR3 should be used a secondary source of information where development specific studies (such as that provided in KR2) are available.

- The evaluation of ecological sensitivity is based on a judgement made in relation to the importance of characteristic and/or designated habitats within an LCT, at a landscape scale. It is not a substitute for detailed ecological survey or assessment of potential effects on ecology at a site level but provides strategic guidance to the sensitivity of biodiversity as a resource within each LCT identified.

FUNCTION (IN RELATION TO THE AIMS OF THIS FRAMEWORK)

The Character Study could be used to support (and directly relate to) potential LDF policies if and where they deal specifically with protection or enhancement of landscape character and RLCE development. Where applicable, it could be used in combination with existing local level landscape character assessments for this purpose, with the added advantage that it will provide a consistent, county wide resource against which proposals could be assessed. This may be of particular assistance or relevance where RLCE development has the potential to significantly affect landscape character, or give rise to cumulative effects over a broad area of landscape (such as commercial scale wind) and which would often require co-ordination between multiple authorities.

The study could be used in combination with local level character assessments to identify key issues related to the sensitivity of landscape character, relative to a specific RLCE development proposal. The Character Study will help to identify constraints and opportunities associated with a particular landscape or site and this information can be used to influence and/or review specific RLCE development proposals to determine the level of information required from an applicant in support of their proposal.

The Character Study will be of particular value to decision makers where:

a) There is a need to minimise the potentially detrimental landscape or visual effects of development through appropriate mitigation such as siting and design;

b) There are opportunities for landscape enhancement as part of the proposals; and

c) Proposals are required to compensate for the loss of landscape elements, characteristics or features.

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3.4.2 Key Concepts

In addition to the key references, it is important to define the key concepts of landscape character, landscape sensitivity and landscape capacity, and the interrelationship and differences between them. Rather than attempt to redefine these concepts again, it seems sensible to refer to existing definitions within the key reference documents and recognised industry guidance.

3.4.2.1 Landscape Character

The most up to date guidance on the landscape characterisation process is Landscape Character Assessment, Guidance for England and Scotland, produced by Scottish Natural Heritage and Countryside Commission in 2002[28]. The guidance provides a useful explanation of the difference between landscape character types (LCT) and landscape character areas (LCA) as follows:

***"Landscape Character Types**:*

These are distinct types of landscape that are relatively homogeneous in character. They are generic in nature in that they may occur in different areas in different parts of the country, but wherever they occur they share broadly similar combinations of geology, topography, drainage patterns, vegetation and historical land use and settlement pattern. For example, chalk river valleys or rocky moorlands are recognisable and distinct landscape character types.

***Landscape Character Areas**:*

By comparison, these are single unique areas and are the discrete geographical areas of a particular landscape type. So, taking the chalk river example, the Itchen Valley, the Test Valley and the Avon Valley (all chalk rivers) would be separate landscape character areas of the chalk river valley landscape character type. Each has its own individual character and identity, even though it shares the same generic characteristics with other areas of the same chalk river valley type. This distinction is reflected in the naming of types and areas: landscape character types have generic names such as moorland plateau and river valley, but landscape character areas take on the names of specific places. Looking at a Scottish example, in Dumfries and Galloway the narrow wooded valley landscape character type can be found. Within the area there are several individual landscape character areas of this type, each distinct and unique, such as the Esk Valley, the Urr Water, the Water of Kan, the Big Water of Fleet and the River Cree character units.

Landscape character areas and types rarely conform to administrative boundaries."

The guidance also describes the relationship between different scales of landscape character assessment, from national level assessments (such as that produced by Natural England) to local level assessments (such as those produced by LPAs in NY&Y). It states that:

"Landscape Character Assessment can be applied at a number of different scales from the national or indeed European level to the parish level. Ideally assessments at different scales should fit together as a nested series or a

[28] Landscape Character Assessment, Guidance for England and Scotland, (Scottish Natural Heritage and Countryside Commission), 2002 http://www.snh.org.uk/wwo/sharinggoodpractice/CCI/cci/guidance/Main/Content.htm

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hierarchy of landscape character types and/or areas so that assessment at each level adds more detail to the one above. The analogy of Russian Dolls is often used to describe this hierarchical relationship, but the idea of a camera zooming in, from a distant broad view, to a detailed small-scale portrait, also makes the point."[29]

The three main levels at which Landscape Character Assessment are carried out are National and Regional scale, Local Authority scale and Local (or site specific) scale.

Figure 2.3 on page 12 of the guidance illustrates the relationship between different levels of character assessment. The illustration is reproduced here in Figure 3 (below) for ease of reference.

[29] Landscape Character Assessment, Guidance for England and Scotland, (Scottish Natural Heritage and Countryside Commission), 2002 http://www.snh.org.uk/wwo/sharinggoodpractice/CCI/cci/guidance/Main/Content.htm

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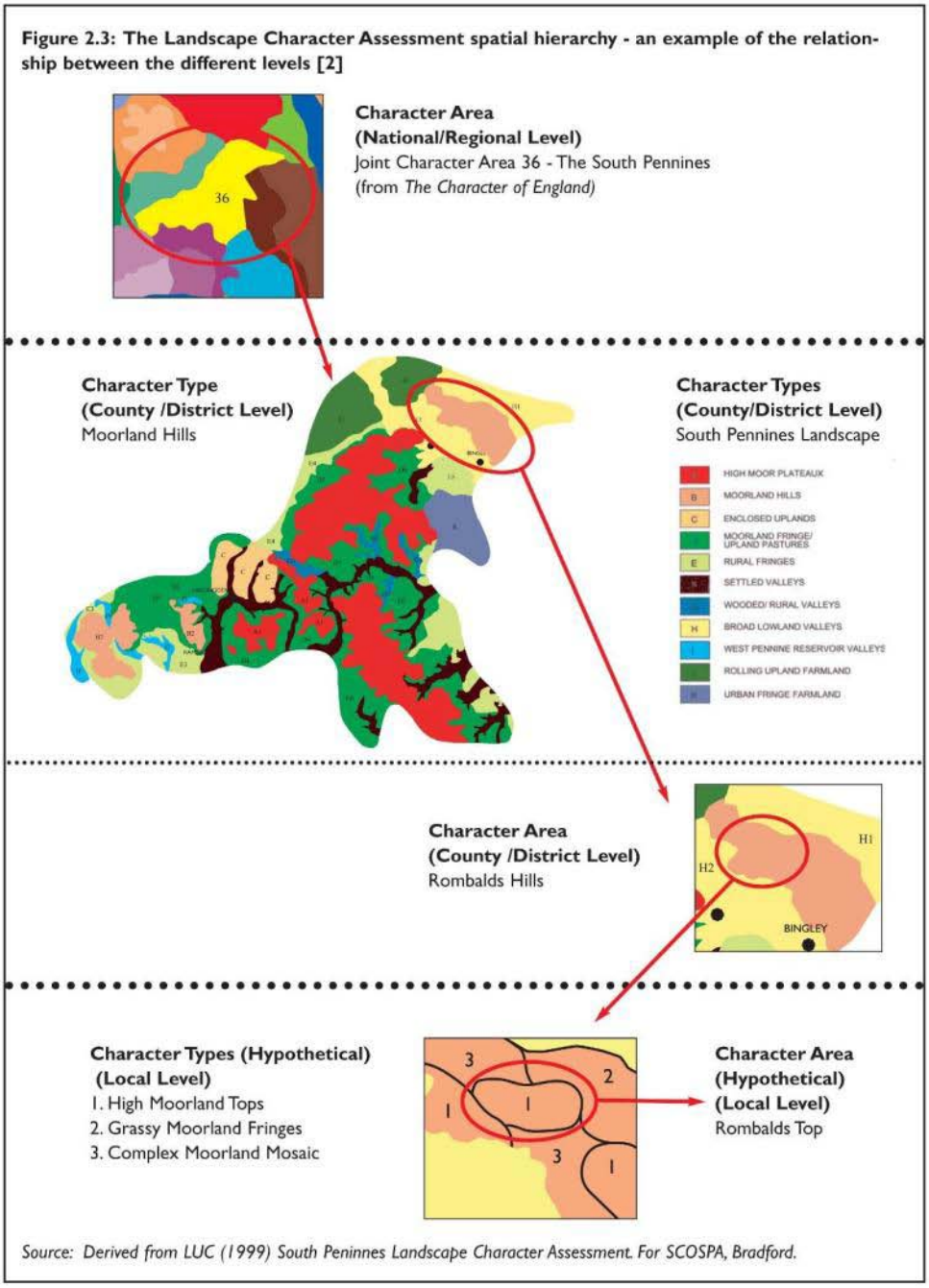

Figure 3: The Landscape Character Assessment Spatial Hierarchy – an example of the relationship between the different levels (Extract taken from Landscape Character Assessment, Guidance for England and Scotland, produced by Scottish Natural Heritage and Countryside Commission in 2002, originally produced by LUC (1999) South Pennines Landscape Character Assessment for SCOSPA, Bradford).

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3.4.2.2 Landscape Capacity and Sensitivity

Scottish Natural Heritage has produced the most comprehensive guidance on the subject, including Topic Paper 6 (with the then Countryside Agency) and the Landscape Sensitivity and Capacity Toolkit (as listed in section 2.6 of this report). The latter includes a number of examples from sensitivity and capacity studies produced in relation to commercial scale wind and urban extensions, for which this type of study is often commissioned. One of the examples cited is from the Landscape Capacity Study for Wind Turbine Development in East Lothian (May 2005) by Anderson and Grant, who define the three concepts succinctly as follows:

Landscape Character

"Landscape relates not only to the physical attributes of the land but also to the experience of the receptor. Landscape character is made up of physical characteristics of land such as landform, woodland pattern etc (which exist whether anyone sees them or not) plus a range of perceptual and value based responses to that landscape."

Landscape Sensitivity

"Sensitivity relates to landscape character and how vulnerable this is to change. In this study, change relates to wind energy development and any findings on landscape sensitivity are restricted to this. Landscapes may have different sensitivities to other forms of change or development. Landscapes which are highly sensitive are at risk of having their key characteristics fundamentally altered by development and change may result in a different landscape character. Sensitivity is assessed by considering the physical characteristics and the perceptual characteristics of landscapes."

Landscape Capacity

"This relates to how far a landscape can absorb or accommodate development without a fundamental change in character. Landscape character and sensitivity are part of this, but capacity can also include visibility assessment and any values (in the form of designations) relating to that landscape and whether change was acceptable. Therefore a landscape which has high sensitivity in terms of potential effects on its character would not necessarily have a low capacity and vice versa as there are other factors which need to evaluated."

KR2, the Sensitivity Study produced for NY&Y by LUC, describes the difference between a landscape sensitivity study and a landscape capacity study as follows:

"*5.12. Considerable care must be taken to clearly define what is meant by the terms 'sensitivity' and 'capacity', and to clarify the differences between a sensitivity study and a capacity study.*

5.13. Sensitivity studies focus on drawing out the inherent sensitivities of the study area to any 'development', e.g. renewables, highlighting those areas most vulnerable or 'sensitive' to changes in character. In contrast, capacity studies take this sensitivity information, and judgements about landscape value, and draw out the potential opportunities for a specific development type under consideration, e.g. wind farms of 30 turbines of 95m tip height. As a result, sensitivity studies tend to present information on avoiding key sensitive or vulnerable areas, whereas capacity studies present a more proactive approach to guiding developments to less sensitive or vulnerable areas.

5.14. For this study it was considered more appropriate to carry out a sensitivity study to highlight those areas of North Yorkshire that may be particularly sensitive to different types of renewable energy developments, and to

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provide guidance as to the constraints and opportunities for development within each landscape character area considered.

5.15. The overall landscape sensitivity of a character area to development is a function of landscape character sensitivity and visual sensitivity of the landscape.

5.16. Landscape sensitivity is defined in this study as:

Landscape Sensitivity is the degree to which a particular landscape character type or area is vulnerable to change with potentially adverse effects on its character.

5.17. Visual sensitivity is defined in this study as:

Visual Sensitivity is the degree to which a particular view or visual experience is vulnerable to change with potentially adverse effects on its character.

5.18. A capacity study is typically a more detailed and concentrated study, considering a specific form of development, e.g. residential housing or 95m turbines. The judgement of capacity requires consideration of not only landscape character and visual characteristics, but also landscape value to help inform the more complex judgements of capacity. Landscape value can be taken from the designation status of the landscape, e.g. National Park, AONB, and ideally considers stakeholder consensus on landscape values, including cultural and heritage values."

It is important to note that no landscape capacity assessments have been undertaken specific to RLCE within the study area and consequently no specific judgements can be made in relation to RLCE development based on the landscape capacity of the study area without further assessment being undertaken.

3.4.2.3 Landscape and Visual Impacts

Landscape and visual impact assessment (LVIA) is the process of assessing the effects of a particular development on both landscape character and visual amenity. Guidance from Scottish Natural Heritage's EIA handbook describes the meaning of both landscape and visual impacts and identifies the differences between the two processes as follows:

"Landscape and visual impacts are related but separate, different concepts.

***Landscape Impacts** are on the fabric, character and quality of the landscape. They are concerned with:*

- *Landscape components*
- *Landscape character – regional and local distinctiveness*
- *Special interests e.g. designations, conservation sites, cultural associations.*

***Visual Impacts** are the effects on people of the changes in available views through intrusion or obstruction and whether important opportunities to enjoy views may be improved or reduced.*

Landscape and visual impacts do not necessarily coincide. Landscape impacts can occur in the absence of visual impacts, for instance 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.

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Similarly, some developments, such as a new communications mast in an industrial area, may have significant visual impacts, but insignificant landscape impacts. However, such cases are very much the exception, and for most developments both landscape and visual impacts will need to be assessed."[30]

3.5 Signposting to Existing Guidance

3.5.1 Landscape Specific Guidance

There are a number of guidance documents that have been produced specific to landscape character assessment, landscape sensitivity, landscape capacity and landscape and visual impact assessment. The following provides a list of current guidance at the time of this report; the GLVIA is currently under review and it is understood that it will be updated in 2012.

- **Guidelines on Landscape and Visual Impact Assessment** (GLVIA) Second Edition, Landscape Institute and Institute of Environmental Management and Assessment, 2002 (Not available online)
- **Landscape Character Assessment: Guidance for England and Scotland,** Countryside Agency and Scottish Natural Heritage (SNH) produced by the University of Sheffield and Land Use Consultants, 2002 (http://www.naturalengland.org.uk/Images/lcaguidance_tcm6-7460.pdf)
- **A Handbook on Environmental Impact Assessment: Guidance for Competent Authorities, Consultees and Others Involved in the Environmental Impact Assessment Process In Scotland**, SNH, 2009 (http://www.snh.org.uk/pdfs/publications/heritagemanagement/EIA.pdf)
- **Topic Paper 6: Techniques and Criteria for Judging Capacity and Sensitivity**, SNH and Countryside Agency (http://www.snh.org.uk/wwo/sharinggoodpractice/CCI/cci/guidance/Topic/topic.htm#topic6)
- **A Guide to Commissioning a Landscape and Sensitivity Study (Toolkit)**, SNH, (http://www.snh.gov.uk/docs/B858929.pdf)

3.5.2 RLCE Specific Guidance in Relation to Landscape

A list of useful guidance for each RLCE development type is included as part of tool T2 of the Appraisal Methodology, in Appendix A of this report. The following lists provide a summary of some of the guidance currently available. The list of documentation is provided as potential sources of further information; the status of specific guidance should be verified with the author/publisher before use.

3.5.2.1 Wind

Scottish Natural Heritage has produced the most comprehensive guidance specific to wind development in relation to landscape and biodiversity. The following documents may be of assistance in identifying potential landscape and visual effects of wind farms:

[30] A Handbook on Environmental Impact Assessment: Guidance for Competent Authorities, Consultees and Others Involved in the Environmental Impact Assessment Process In Scotland, SNH, 2009 (http://www.snh.org.uk/pdfs/publications/heritagemanagement/EIA.pdf)

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- **Cumulative Effect of Wind farms**: DRAFT Version 3 for Consultation, SNH (November 2009) http://www.snh.org.uk/pdfs/strategy/renewables/A307913.pdf

- **Guidance on Siting and Designing Wind Farms in the Landscape**, SNH (2009). http://www.snh.gov.uk/docs/A337202.pdf

- **Natural Heritage Assessment of Small Scale Wind Energy Projects which do not Require Formal Environmental Impact Assessment**, SNH (2008) http://www.snh.gov.uk/docs/C206956.pdf

- **Siting and Designing Single and Groups of Small Turbines in the Landscape**, SNH (March 2011) http://www.snh.gov.uk/docs/A516125.pdf

- **Visual Representation of Windfarms Good Practice Guidance**, SNH (March 2006) http://www.snh.org.uk/pdfs/publications/heritagemanagement/Visual%20Representation%20of%20windfarms%20-%20excerpt.pdf

- **University of Newcastle (2002) Visual Assessment of Windfarms Best Practice**. Scottish Natural Heritage Commissioned Report F01AA303A http://www.snh.gov.uk/docs/A305437.pdf

- **Survey Methods For Use In Assessing The Impacts Of Onshore Windfarms On Bird Communities**, SNH, (November 2005, revised December 2010) http://www.snh.gov.uk/docs/C278917.pdf

For an example of a landscape capacity study for wind energy development, see that produced for the South Pennines (Landscape Capacity Study for Wind Energy Developments in the South Pennines, Julie Martin Associates (January 2010)). The study provides useful information on landscape sensitivity and capacity in relation to wind energy development. It also includes guidance on how to assess the impact of wind development on landscape character (Table 11) and details of the type of information which should accompany a planning application within a landscape and visual impact assessment (LVIA) (Table 12)[31]. This has been used to inform production of Appraisal Methodology Tool T7, located in Appendix A.

[31] http://www.rochdale.gov.uk/PDF/2010-04-14_LDF_Land_Cap_Study_Wind_Energy_Dev_South_Pennines_Jan_2010.pdf

3.5.2.2 Other RLCE Types

The following guidance has been produced in relation to assessment of other RLCE development types:

Hydro

- **Guidelines on the Environmental Impacts of Windfarms and Small Scale Hydroelectric Schemes**, SNH, (2002) http://www.snh.org.uk/pdfs/publications/heritagemanagement/Guidelines%20Windfarms%20Hydroelectric%20Schemes.pdf

- **Hydroelectric Schemes and the Natural Heritage**, Version 1, SNH (December 2010) http://www.snh.gov.uk/docs/C278964.pdf

- Demars, B. O. L. and Britton, A. (2011). **Assessing the impacts of small scale hydroelectric schemes on rare bryophytes and lichens**. Scottish Natural Heritage and Macaulay Land Use Institute Funded Report. Scottish Natural Heritage Commissioned Report No.421 http://www.snh.org.uk/pdfs/publications/commissioned_reports/421.pdf

Micro Renewables

- **Guidance Note : Micro Renewables and the Natural Heritage**, SNH, (October 2009) http://www.snh.gov.uk/docs/A301202.pdf

General

- **Bioenergy and the Natural Heritage**, SNH (2009) http://www.snh.gov.uk/docs/C192626.pdf

- **Renewable Energy and the Natural Heritage**, SNH, (2010) http://www.snh.gov.uk/docs/C272217.pdf

3.5.3 Other Relevant Guidance

The following guidance, although not specific to landscape character per se, might also be useful when dealing with RLCE in relation to the historic landscape (or historic features within the landscape) and biodiversity/nature conservation.

English Heritage

- **Wind Energy and the Historic Environment**, English Heritage (2005) http://www.english-heritage.org.uk/publications/wind-energy-and-the-historic-environment/

- **Biomass Energy and the Historic Environment**, English Heritage (2006) http://www.english-heritage.org.uk/publications/biomass-energy-historic-environment/

- **Small-scale solar thermal energy and traditional buildings**, English Heritage (2008) http://www.english-heritage.org.uk/publications/small-scale-solar-thermal-energy-and-traditional-buildings/

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- **Micro wind generation and traditional buildings**, English Heritage (2010) http://www.english-heritage.org.uk/publications/micro-wind-generation-and-traditional-buildings/

- **Microgeneration in the Historic Environment**, English Heritage (2010) http://www.english-heritage.org.uk/publications/microgeneration-in-the-historic-environment/

- **Small scale solar electric (photovoltaics) energy and traditional buildings**, English Heritage (2010) http://www.english-heritage.org.uk/publications/small-scale-solar-electric-photovoltaics-energy/

- **Energy crops and the historic environment**, English Heritage (2001) http://www.english-heritage.org.uk/publications/energy-crops-and-the-historic-environment/

- **The Setting of Heritage Assets**, English Heritage (2011) http://www.english-heritage.org.uk/publications/setting-heritage-assets/

Natural England

- **Wind farm development and nature conservation. A guidance document for nature conservation organisations and developers when consulting over wind farm proposals in England**, English Nature, RSPB, WWF-UK, BWEA (2001) http://naturalengland.etraderstores.com/NaturalEnglandShop/WF1

- **Making space for renewable energy: assessing on-shore wind energy development**, Natural England (2010) http://naturalengland.etraderstores.com/NaturalEnglandShop/NE254

- **The Natural England website**, also provides general guidance on nature conservation in relation to planning and specific standing advice relating to protected species: http://www.naturalengland.org.uk/ourwork/planningtransportlocalgov/spatialplanning/standingadvice/default.aspx

3.6 Appraisal Methodology Tools

The following tools are referenced in the appraisal methodology and are located in Appendix A of this report:

T1 Landscape Sensitivity to Commercial Scale Wind, Overlaid with Energy Opportunity Mapping for Commercial Scale Wind (based on GIS Mapping from KR2 and KR1 respectively)

The purpose of this mapping is to provide a quick reference for the previously identified energy opportunity and landscape sensitivity to commercial scale wind developments, which are illustrated on a single figure. It combines GIS data from the following sources:

- Figure 5.2 in KR2 showing landscape sensitivity to commercial scale wind (based on tip height of 100m). Landscape sensitivity is mapped in relation to landscape units identified as part of the study (summarised in the description of KR2 above); and

- The Energy Opportunity Plan for North Yorkshire and York from KR1 (illustrated on Figure 56 of the main report), which illustrates the area of practically viable resource for commercial scale wind (assuming a turbine tip height of 135m), based on technical and physical availability and planning and regulatory criteria (summarised in the description of KR1 above).

T2 List of Typical Landscape Effects of RLCE Development Types

T2 is intended to assist in the identification of potential landscape effects of RLCE development types and, subsequently help to identify the level of information required to support a development proposal/planning application.

The types of RLCE considered within this framework are aligned with those identified in the regional capacity study undertaken by Aecom and published in March/April 2011, namely:

- District Heating and Combined Heat and Power (CHP)
- Commercial Scale Wind Energy
- Hydro Energy (small scale, low head)
- Biomass (including use in co-firing and energy generation from dedicated energy crops, managed woodland, industrial wood waste and agricultural arising, or straw)
- Energy from Waste (EfW) (including energy generation from slurry, food and drinks waste, poultry litter, municipal solid waste, commercial and industrial waste arisings, landfill gas production and sewerage gas production)
- Microgeneration (including small scale wind energy, solar, heat pumps, small scale biomass boilers)

The definition of scale in relation to wind energy may be helpful in differentiating between what constitutes a large/medium or commercial scale wind farm, a medium/small or community scale wind farm, and a domestic, micro/ small scale wind energy installation. Both SNH guidance and a recent landscape capacity study for Dumfries and Galloway (Dumfries and Galloway Wind Farm Landscape Capacity Study. Carol Anderson Alison Grant Landscape Architects. January 2011), provide useful definitions in relation to scale of wind development which, in combination with a knowledge of current and real life built examples, have been used to define typical scales of different kinds of wind development. The definitions in Table 1 are taken from this guidance and provide reasonable assumptions in relation to wind development typologies.

Capabilities on project:
Environment

Table 1: Suggested Typologies for Wind Development by Scale (Height) of Turbines

Typology	Height (to tip)	Scale
Micro	Up to 12m	Single turbine or wall/roof mounted turbine.
Small (Domestic Scale, 1.5-15kw))	12-20m	Single turbines or small groups of between 1 and 5 turbines. (Gigha community Wind Farm is a typical example and has 3 second hand turbines of 43.5m in height)
Small/Medium (Community Scale, 15kw-500kw)	20-50m	
Medium (Small Commercial Scale)	50-80m	Single turbines/groups of up to 10 turbines.
Large (Commercial Scale 1.5MW-2.5MW)	80-150m	Generally over 10 turbines but with single turbines also considered in this height range

Each of the RLCE development types under consideration has potential to affect the landscape resource in different ways and at different scales. Equally, each development type may require different types and/or scales of mitigation, relative to the potential effects.

T2 provides a summary of the typical, potential effects of RLCE development in relation to landscape and also provides a guide to what a typical installation might comprise. The information in the table is based on guidance in the companion guide to PPS 22[32] and professional experience, and has been adapted and developed from research undertaken on behalf of the Welsh Assembly Government, published in July 2010[33]. For each RLCE development type the following information is provided:

- A description of the technology under consideration including an indication of the scale, size, massing, appearance of each type of installation;
- A description of typical infrastructure associated with each type of development (where applicable) e.g. connection to the grid, maintenance access roads;
- A list of typical landscape effects associated with both of the above;
- An indication of the scale at which the development could affect the landscape (with reference to guidance in T4);
- A guide to the type of mitigation that should be considered as part of the design process; and
- A list of references for further information on each RLCE type and or technical guidance.

Typical effects identified include:

- **Direct** landscape effects, which might occur where proposed development would have a physical effect on a specific landscape element or feature e.g. the removal of existing woodland, a watercourse or a change to existing field pattern;

[32] http://www.communities.gov.uk/publications/planningandbuilding/planningrenewable
[33] Planning Implications of Renewable and Low Carbon Energy , Research Report to the Welsh Assembly Government, July 2010 http://wales.gov.uk/topics/planning/planningresearch/publishedresearch/planningimplications/?lang=en

- **Indirect**, or perceived landscape effects, which might occur due to a change to the character of an area of landscape or over a wider area, e.g. a perceived change in the scale of the landscape, through introduction of inappropriately large development, or an increase in the sense of enclosure or urbanisation within a rural area;

- **Visual** effects, which might occur if a particular development causes a change in a particular view; and

- **Cumulative** effects, which might occur where there is an accumulated or combined effect of more than one scheme in a particular view or landscape character area.

Indirect effects are dependent upon the perception of the landscape; perception is affected by the value assigned to particular landscapes by a variety of stakeholders. The Landscape Character Assessment Guidance for England and Scotland identifies the following criteria or reasons why stakeholders may attach value or importance to different landscapes:

- landscape quality (the condition and intactness of a landscape and its features);
- scenic quality (visual appeal);
- rarity (the presence of rare landscape types or features);
- conservation interests (the presence of features of particular wildlife, earth science, archaeological, historical or cultural interest);
- wildness (the presence of wild or relatively wild character in the landscape);
- associations (with particular people, artists, writers or events in history);
- tranquillity (reflecting perceived links to nature and natural features and relative lack of detractors such as built development, traffic and noise); and
- recreational opportunities (for enjoyment of the landscape).

T3 Guidance on Assessing of the Typical Scale of Effects of RLCE Development

The scale at which the development could affect the landscape is likely to influence the level of assessment required to be undertaken for each development type and therefore the level of information required to be submitted in order to properly consider and determine a planning application. The purpose of T3 is to assist in the decision making process by providing guidance on the typical scale of landscape effects associated with RLCE development.

The guidance provided in T3 is based on SNH guidance for assessment of wind farms and the experience of AECOM's UK landscape teams in undertaking landscape assessment for a range of development types. It is intended as a guide based on typical development types, and does not provide an absolute evidence base. If there is any doubt or ambiguity in assessing scale of effects, then additional information should be sought from an applicant to help to define the scale of the landscape effects.

It should be noted that the guidance provided is primarily related to the scale at which schemes typically give rise to significant landscape effects, not the extent or scale of significant visual effects. It is very difficult to provide guidance on typical effects in relation to visual impact, as the magnitude and significance of visual effect depend so heavily on the context of a site or study area. Visibility is not the same as visual effect and although a development may be visible over a long distance, it may not necessarily have any significant effect on views.

An assessment of the typical scale of effects for each RLCE type is provided in T2, based on the guidance provided in T3.

Capabilities on project:
Environment

T4 Guidance on Cross Boundary Effects on Multiple Landscape Character Areas or Types

Guidance on cross boundary effects has been prepared specifically at the request of the steering group. Again, this guidance should be used to help to determine both the predicted scale of effects and the level of information required to fulfil the requirements of a planning application.

T5 Landscape Character and Sensitivity Mapping (Based on information and GIS Mapping from KR3)

The purpose of this mapping is to provide a quick reference guide to the landscape sensitivity and character context of the study area.

T5 includes GIS mapping of landscape, visual and ecological sensitivity based on the analysis undertaken as part of the landscape characterisation of NY&Y, as reported in KR3. This mapping has been produced to illustrate sensitivity of each landscape character type (LCT) to change of any type (not specific to RLCE or development – see guidance on limitations of KR3). The sensitivity mapping should be used in conjunction with the descriptions of each LCT (as presented in KR3) to determine the landscape character and sensitivity context of a particular area. The sensitivity mapping comprises the following figures:

- NY &Y Landscape Character Assessment Landscape Sensitivity
- NY &Y Landscape Character Assessment Visual Sensitivity
- NY &Y Landscape Character Assessment Ecological Sensitivity

T5 also includes mapping to illustrate the location and extent of landscape character areas, types, units and typologies within the sub-region, including:

- National Character Areas (as identified by Natural England);
- Primary Landscape Units and Landscape Character Types (as identified in KR3); and
- Landscape Typologies used by Land Use Consultants to identify areas of sensitivity to wind, biomass and hydro development (as identified in KR2).

This mapping data has been overlaid to illustrate the relationship between the various landscape units identified for the sub-region at a strategic level. This helps to illustrate areas that coincide and areas of inconsistency between the baseline mapping used as a basis for each of the studies, in terms of the location and extent of landscape units.

T6 Map of Existing RLCE Installations in NY&Y and Surrounding Areas

The purpose of this mapping is to provide a definitive guide to existing and proposed RLCE development within the sub-region and beyond to assist with the identification of potential cumulative effects. Existing schemes are defined as those that are currently in operation or that have planning consent; proposed schemes are those that are in the planning system. This information and mapping may be particularly useful in relation to appraisal of large scale RLCE developments such as commercial scale wind and biomass power plants, where cumulative effects can be significant.

The current mapping is based on GIS information gathered as part of the evidence base for KR1: The Energy Opportunities Study and is current as of March 2011. It is intended that this information be collated and illustrated in combination with similar data from surrounding regions including Lancashire, Cumbria and County Durham, if and where this information is available. It will be the responsibility of the authorities within the sub-region to obtain and

maintain the GIS data upon which this tool is based. The tool will only remain useful if the information can be updated in a reasonably regular basis. As such the steering group may wish to discuss the potential for resourcing and co-ordinating this type of mapping in the medium to long term.

In discussion with the steering group, it was suggested that it may also be possible to add locations for schemes which have been refused planning consent, though at the time of this report, the information was not yet available in GIS format.

T7 Checklist of Typical Information to be Provided in a Planning Application

The purpose of the checklist is to provide a guide to the level and type of information required to assess RLCE schemes according to type and the typical scale of potential effects. This tool could also be used in combination with existing SPD such as the existing NY&Y guidance on validation requirements.

Capabilities on project:
Environment

4

4 Case Studies

Housing development with solar panels, Castleton

4.1 Introduction

This section provides worked examples of the Landscape Sensitivity Framework Pro Forma, to illustrate the practical application of the Appraisal Methodologies provided in Figures 1 and 2 in Section 3 of this Framework. The worked examples are based on three case study areas and a range of different RLCE types as suggested by the steering group. The three case studies are:

- Commercial scale wind development in the **Vale of Mowbray**;
- Biomass power plant in the **Humberhead Levels**; and
- Hydroelectric power plant in the **North York Moors National Park**.

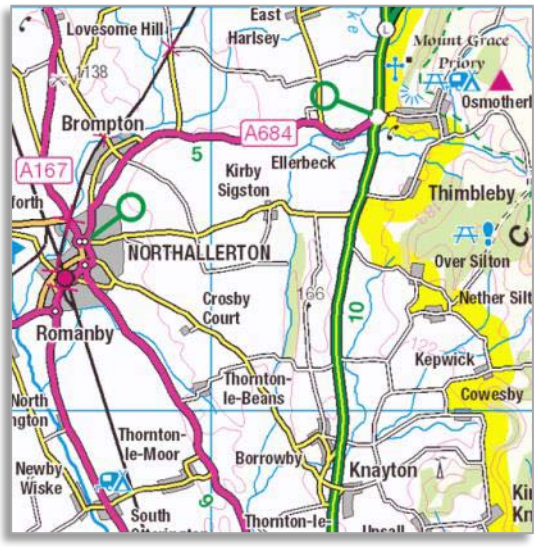
The development proposals described in each case study represent a potential scenario and are not meant to be representative of actual development proposals. Any similarity between existing development proposals and those described here is entirely unintentional. That said, each scenario is intended to represent a potentially viable and realistic development proposal in each of the geographic areas identified.

Each case study comprises a single worked example of the Pro Forma with the exception of the North York Moors, where the steering group has requested that an alternative approach is devised to focus on the use of their local level Landscape Character Assessment. This alternate approach could be equally applied to other areas within North Yorkshire and York, where a more local and detailed level of appraisal could be appropriate. Due to the more localised focus of the alternative Pro Forma, its use is likely to be more appropriate to development management decision making than strategic policy development.

The case studies are set out in sections 4.1.1 – 4.1.3 below.

Capabilities on project:
Environment

4.1.1 Vale of Mowbray



Vale of Mowbray, N Buchan

Landscape Sensitivity Framework - Pro Forma

To be used with reference to the appraisal methodology and associated Key References (KR) and Tools (T) as set out in Managing Landscape Change: Renewable & Low Carbon Energy Developments – a Sensitivity Framework for North Yorkshire and York.

APPLICATION REFERENCE (If relevant)**:** N/A

PROVIDE SUMMARY DESCRIPTION OF DEVELOPMENT PROPOSAL UNDER CONSIDERATION OR PURPOSE OF REVIEW:

10-12MW Wind Farm comprising: four wind turbines (130m to tip) and associated infrastructure including transformers and crane pads; new and upgraded access tracks; substation and control building; a temporary site compound; and, a meteorological mast.

Purpose of Review: To respond to EIA scoping request.

1. WHERE IS THE SITE UNDER CONSIDERATION?
(Identify location using OS mapping, Aerial Photography)**:**

4km south of Northallerton

2. WHICH LANDSCAPE CHARACTER AREA / UNIT/ TYPE IS THE SITE IN?
(Identify from mapping and LCT descriptions in **KR3/T5**)**:**

National Character Area:	County Primary Landscape Unit:	County Landscape Character Type:
Vale of Mowbray	Farmed Lowland Valley Landscape	Settled Vale Farmland (LCT 25)

3. HAS THE RELEVANT ENERGY OPPORTUNITY BEEN IDENTIFIED FOR THIS RLCE TYPE?
(Identify using information provided in **KR1/T1**)**:**

(Yes) No

4. WHICH LANDSCAPE TYPOLOGY UNIT IS THE SITE IN?
(Identify from mapping and area descriptions in **KR2**)**:**

RCA 1 – Intermediate, Clayland, Ancient Woods

5. WHAT IS THE LANDSCAPE SENSITIVITY TO CHANGE OF THE TYPE PROPOSED?
(Only complete if a Wind, Biomass, or Hydro Proposal. Identify from mapping and area descriptions in **KR2 /T1**)**:**

Low Med- Low Medium (Med-High) High

Note: Landscape sensitivity defined in KR2 to a 'Small Wind Farm' (1-5 turbines)

6. WHAT IS THE SENSITIVITY OF THE COUNTY LANDSCAPE CHARACTER TYPE TO CHANGE?
(Identify using mapping and LCT descriptions in **KR3/T5**)**:**

Landscape Sensitivity:	Low	(Moderate)	High
Visual Sensitivity:	Low	(Moderate)	High
Ecological Sensitivity:	(Low)	Moderate	High

7. SCALE OF THE POTENTIAL EFFECT/S FOR RLCE TYPE
(Identify using criteria outlined in **T3/T4** and/or using descriptions of typical effects in **T2**)**:**

What is the Scale of Any Potential Effects? **T3/T2**

Site Small Medium (Large)

Is There Potential for 'Cross Boundary' Effects? **T4**

(Yes) No

8. IDENTIFY POTENTIAL EFFECTS OF RLCE PROPOSED AND APPRAISE AGAINST LANDSCAPE CHARACTER

Identify potential effects of RLCE type proposed using **T2** as a guide. List those effects that are relevant to the scheme/site under consideration under Description of Potential Effects in the Matrix below. Appraise whether the potential effects identified are likely to cause a change to the definitive attributes associated with the LCT, as identified in the LCT descriptions in section 5.0 of North Yorkshire and York, Landscape Characterisation Project **(KR3)**.

In addition, with reference to the 'tools' and references identified in red, appraise whether the potential effects are likely to have: cumulative effects; visual effects; effects on designated landscapes or features; and/or effects on landscape value i.e. less physical characteristics related to the perception of character of an area of landscape e.g. sense of tranquillity or remoteness, sense of enclosure, sense of place, cultural associations, perceived scale of the landscape.

Definitive Attributes of LCT (As identified in **KR3**)	**Description of Potential Effects** **T2**	**Potential for Cumulative Effects: Y/N?** **T6**	**Potential for Visual Effects: Y/N?**	**Potential for Effects on Perception of Character or Landscape Value: Y/N?** **KR3**	**Potential for Effects on Designated Landscape Area or Feature: Y/N?** **MAGIC, LDF**
Topography and Drainage	**Direct:** No direct impacts, as no significant excavation or earth mounding/movement likely to be proposed. **Indirect:** No indirect impacts, as no effect on perception of wider topographic setting.	Yes. There is one existing Wind Farm in the same LCT, 4km north east of Northallerton (Bullamoor). There is also a proposed windfarm south of Ripon and an existing wind farm south of Midddles-borough.	Yes. Due to the height of the turbine there is potential for visual effects in views from a variety of receptors including those within nearby settlements, farmsteads and dwellings and the recreational footpath network including a national trail. There is also potential for views	Yes Though there are vertical elements of an industrial character (Pylons) within the area, the scale of the development is such that there is potential for effects on perception of landscape character. The proposed development will be visible over a wide area and the addition of tall structures could affect the sense of	Yes Setting and views from and of the NYM National Park. Setting of Listed Buildings and Scheduled Monuments Conservation Area in Northallerton.
Land Cover	**Direct:** Localised impact on landcover as small amount of agricultural land removed to make way for foundations of new access track and structures. Impact limited to built footprint of development which is small. **Indirect:** No indirect impacts, as scale of change is small and effects will be localised.				
Enclosure and Field Pattern	**Direct:** No direct impacts as existing field boundaries on site will not be affected. **Indirect:** Potential to affect the perception of enclosure within the wider landscape setting; the installation of large scale structures will change the sense of scale and sense of enclosure.				
Settlement Pattern	**Direct:** No direct impacts as site is located within agricultural land, outside of existing settlements. **Indirect:** Potential indirect impact on settlement pattern due to the scale and appearance of the turbine which will contrast with				

	local settlement pattern of dispersed houses and farmsteads.		from elevated ground in the N York Moors to the east.	tranquillity within a remote and isolated rural landscape.	
Visible Historic Features	**Direct:** No direct impacts as the development site does not contain any visible Historic Features **Indirect:** Due to scale and potential prominence of turbines, potential for impact in views from historic features which could affect their historic setting, and wider historic landscape character.				

9. SUGGESTED LANDSCAPE MITIGATION MEASURES
(With reference to **T2 and KR3**)

- Potential for landscape enhancement at a local level including reinstatement of former hedgerows.
- Potential to use of local building materials for smaller structures including ancillary buildings and access track, which could be designed to reflect existing settlement pattern.
- Ensure best practice in siting and design of wind farm (ref SNH designing wind farms in the landscape). Site & design wind farm layout to minimise potential impacts on perception of character, and in key views from and of National Park, and from national trail and settlements.
- Use appropriate colour coating for tower, nacelle and turbine blades.
- Minimise extent of disturbance to ground and ensure good practice during construction (i.e. minimising working area, prompt reinstatement etc).
- Complete landscape restoration works at the end of the construction period. Ensure full site restoration upon decommissioning.

10. SUMMARY OF APPRAISAL AND OF ANY RECOMMENDATIONS
(Include details of the type and level of information required to accompany a planning application based on guidance in **T7** or whether additional information is required to determine application.)

Recommendations for Scope of EIA:

- Landscape and Visual Impact assessment
- Cumulative Impact assessment
- Sequential assessment along National Trail
- Residential amenity survey

Additional guidance on information required to determine extent of landscape and visual effects:

- Zone of Theoretical Visibility to identify potential visibility and extent of cross boundary effects on landscape character.
- Assessment of cumulative effects in views and upon landscape character.
- Photomontage and wire line representations from key viewpoints (to be agreed) along with conceptual design layout options to illustrate design process.
- Judgements relating to landscape sensitivity and capacity of receiving landscape
- Detailed design statement

Guidance Notes from Discussion with Steering Group:
Views both towards and from within the National Park should be considered. This is important as the National Park has an important influence on the landscape character of areas outside of it, which relate to it as part of its context. The park provides a distinct setting and 'sense of place' which is often a defining characteristic of an adjacent landscape.

Typical Image of Large Scale Wind Turbine

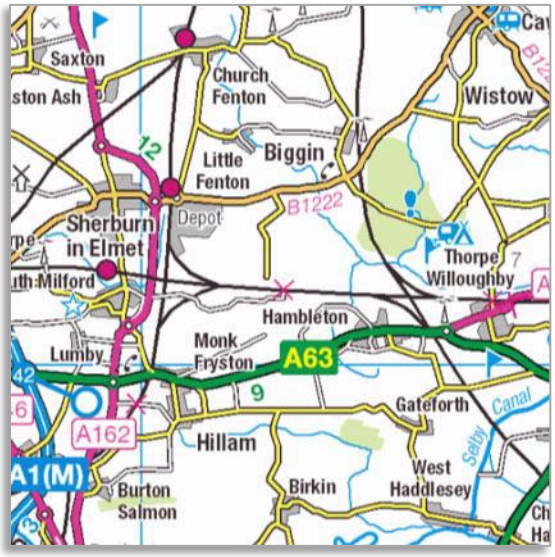
(Aecom)

Knabbs Ridge Wind Farm by G X Megson

Lyndhurst Wind Farm, Nottingham (Online Image)

Capabilities on project:
Environment

4.1.2 The Humberhead Levels



Humberhead Levels, Sherburn-in-Elmet (Google Streetview)

Landscape Sensitivity Framework - Pro Forma

To be used with reference to the appraisal methodology and associated Key References (KR) and Tools (T) as set out in Managing Landscape Change: Renewable & Low Carbon Energy Developments – a Sensitivity Framework for North Yorkshire and York.

APPLICATION REFERENCE (If relevant)**:** N/A

PROVIDE SUMMARY DESCRIPTION OF DEVELOPMENT PROPOSAL UNDER CONSIDERATION AND/OR PURPOSE OF REVIEW:

1.5MW biomass power plant on green field site at edge of Sherburn-in-Elmet: comprising large scale industrial building with associated out buildings, storage facilities, car parking, loading yard and 20m high chimney stack.

Purpose of Review: To provide pre-application advice and guidance on level of information required to support a detailed planning application.

1. WHERE IS THE SITE UNDER CONSIDERATION?
(Identify location using OS mapping, Aerial Photography)**:**

In industrial area on eastern edge of Sherburn-in-Elmet

2. WHICH LANDSCAPE CHARACTER AREA / UNIT/ TYPE IS THE SITE IN?
(Identify from mapping and LCT descriptions in **KR3/T5**)**:**

National Character Area:	County Primary Landscape Unit:	County Landscape Character Type:
Humberhead Levels	Farmed Lowland Valley Landscape	Levels Farmland (LCT 23)

3. HAS THE RELEVANT ENERGY OPPORTUNITY BEEN IDENTIFIED FOR THIS RLCE TYPE?
(Identify using information provided in **KR1/T1**)**:**

(Yes) No

4. WHICH LANDSCAPE TYPOLOGY UNIT IS THE SITE IN?
(Identify from mapping and area descriptions in **KR2**)**:**

LCN 4

5. WHAT IS THE LANDSCAPE SENSITIVITY TO CHANGE OF THE TYPE PROPOSED?
(Only complete if a Wind, Biomass, or pre-identified Hydro Proposal (see KR2). Identify from mapping and area descriptions in **KR2 /T1**)**:**

(Low) Med- Low Medium Med-High High

6. WHAT IS THE SENSITIVITY OF THE COUNTY LANDSCAPE CHARACTER TYPE TO CHANGE?
(Identify using mapping and LCT descriptions in **KR3/T5**)**:**

Landscape Sensitivity:	Low	(Moderate)	High
Visual Sensitivity:	Low	Moderate	(High)
Ecological Sensitivity:	(Low)	Moderate	High

7. SCALE OF THE POTENTIAL EFFECT/S FOR RLCE TYPE
(Identify using criteria outlined in **T3/T4** and/or using descriptions of typical effects in **T2**)**:**

What is the Scale of Any Potential Effects? **T3/T2**

Site Small (Medium) Large

Is There Potential for 'Cross Boundary' Effects? **T4**

(Yes) No Nb: Flat, open Landscape affords strong intervisibility between LCTs

8. IDENTIFY POTENTIAL EFFECTS OF RLCE PROPOSED AND APPRAISE AGAINST LANDSCAPE CHARACTER

Identify potential effects of RLCE type proposed using **T2** as a guide. List those effects that are relevant to the scheme/site under consideration under Description of Potential Effects in the Matrix below. Appraise whether the potential effects identified are likely to cause a change to the definitive attributes associated with the LCT, as identified in the LCT descriptions in section 5.0 of North Yorkshire and York, Landscape Characterisation Project **(KR3)**.

In addition, with reference to the 'tools' and references identified in red, appraise whether the potential effects are likely to have: cumulative effects; visual effects; effects on designated landscapes or features; and/or effects on landscape value i.e. less physical characteristics related to the perception of character of an area of landscape e.g. sense of tranquillity or remoteness, sense of enclosure, sense of place, cultural associations, perceived scale of the landscape.

Definitive Attributes of LCT (As identified in **KR3**)	**Description of Potential Effects** **T2**	**Potential for Cumulative Effects: Y/N?** **T6**	**Potential for Visual Effects: Y/N?**	**Potential for Effects on Perception of Character or Landscape Value: Y/N?** **KR3**	**Potential for Effects on Designated Landscape Area or Feature: Y/N?** **MAGIC**
Topography and Drainage	**Direct:** Limited direct impacts, due to flat topography of area and lack of substantial earth movement as part of proposals. Potential effect on watercourse/dykes at local level. **Indirect:** No indirect impacts, as no effect on perception of wider topographic setting.	Yes The proposed development will be seen in combination with existing industrial site where numerous employment land uses are also proposed.	Yes Potential for visual effects due to the open, flat landscape context and scale of new development which includes a tall chimney stack and plume. Any lighting or fencing could increase the visual effects.	Yes Although limited due to location in proximity to existing industrial area. Potential to extend urbanising effect to wider setting as a result of the large scale industrial development, chimney and plume. Any lighting or fencing could increase the effects on the landscape character.	No No designated sites within the context of the site. To be confirmed by applicant.
Land Cover	**Direct:** Localised impact on landcover as agricultural land will be replaced by industrial development. Potential effects on existing site trees. **Indirect:** Potential effect on local landscape setting if existing site trees affected.				
Enclosure and Field Pattern	**Direct:** Potential loss of existing trees to site boundaries could reduce sense of enclosure locally. **Indirect:** The installation of a large scale industrial element could affect the sense of scale and enclosure.				
Settlement Pattern	**Direct:** No direct impacts as site is located within/adjacent to an industrial setting. **Indirect:** Potential indirect impact on settlement pattern depending upon the scale and form of development. Effects limited by industrial setting.				
Visible Historic	**Direct:** Potential to affect dyke which is a visible Historic Feature in close				

Features	proximity. **Indirect:** Unlikely to affect wider historic landscape character due to location within established industrial area.				

9. SUGGESTED LANDSCAPE MITIGATION MEASURES
With reference to **T2**

- **Advise retention of existing mature site vegetation as far as possible to provide screening –** important to retain the well vegetated character of site to help integrate the industrial style proposals into the more rural landscape setting.
- **Advise use of appropriate colour treatment of plant and chimney stack –** to reduce visual prominence of the structure and relate to existing built and rural settings.
- **Ensure careful site layout design and siting of plant –** to reduce visual effects on neighbouring properties in Sherburn-in-Elmet and in views of town from rural landscape to north and west. Important to ensure scale and massing of main building relates to existing industrial and agricultural buildings in the vicinity.
- Consideration given to **protection of existing visible historic features** including existing drains and dykes.

10. SUMMARY OF APPRAISAL AND OF ANY RECOMMENDATIONS
Include details of the type and level of information required to accompany a planning application based on guidance in **T7** or whether additional information is required to determine application.

The following information is requested as part of a planning application:

- Landscape and Visual Impact Assessment including effects on townscape if appropriate (irrespective of whether development requires EIA)
- Zone of Theoretical Visibility of building and chimney stack
- Appraisals of effects of the plume
- Visualisation (photomontage and or wirelines) from agreed viewpoint locations
- Details of Landscape Mitigation and/or detailed landscape design information e.g. planting plan, cross sections, site layout, landscape masterplan
- Architectural elevations
- Site Photography
- Landscape Management Plan
- Tree Survey to BS5837:2005 Trees in Relation to Construction, including tree protection measures and statement of method of working

Guidance Notes from Discussion with Steering Group:

1. The typical development under consideration here has been deliberately located in proximity to existing industrial land uses, within an area of un-remarkable or perhaps degraded landscape, as this is the most likely location for such a proposal. However, it is important to note that by locating an industrial development of this type within a landscape of lower scenic value does not mean that there the development will not have a detrimental effect on the character of the Humberhead Levels landscape. In fact, mitigation is as important within a landscape of this type as it is else ware. More importantly, development in this scenario may provide a good opportunity for landscape reinstatement and enhancement (e.g. reinstatement of former or degraded field boundary hedgerows or creation of woodland if characteristic) as part of the proposals. Both the county and District level Landscape Character Assessments can provide guidance on specific recommendations for landscape enhancement which could form part of a consultation response.

2. Screen planting is particularly effective mitigation within a flat landscape.

Typical Images of Biomass Power Plant

Eccleshall Biomass Power Plant - 2.6MW (Online Image) http://talbottspower.co.uk/

Thetford Biomass Power Station - 38.5MW (Online Image) http://www1e.btwebworld.com/fibrowatt/UK-Thetford/index.html

Capabilities on project:
Environment

4.1.3 The North York Moors

NYMNPA / photograph of the river Esk, near Egton Bridge by Chris Ceasar

Landscape Sensitivity Framework - Pro Forma

To be used with reference to the appraisal methodology and associated Key References (KR) and Tools (T) as set out in Managing Landscape Change: Renewable & Low Carbon Energy Developments – a Sensitivity Framework for North Yorkshire and York.

APPLICATION REFERENCE (If relevant)**:** N/A

PROVIDE SUMMARY DESCRIPTION OF DEVELOPMENT PROPOSAL UNDER CONSIDERATION OR PURPOSE OF REVIEW:

50-1000KW Low Head, Hydroelectric Plant: comprising turbine housing (circa 3m x 5m x 3.5m high), possibility of a new fish pass, maintenance access and parking, connection to the grid, intake, impoundment, pipeline and tail race.

Purpose of Review: Consultation response to outline design proposals.

1. WHERE IS THE SITE UNDER CONSIDERATION?
(Identify location using OS mapping, Aerial Photography)**:**

At existing 'barrier' on River Esk, north of Grosmont, in Eskdale.

2. WHICH LANDSCAPE CHARACTER AREA / UNIT/ TYPE IS THE SITE IN?
(Identify from mapping and LCT descriptions in **KR3/T5**)**:**

National Character Area:	County Primary Landscape Unit:	County Landscape Character Type:
North Yorkshire Moors and Cleveland Hills	Upland Fringe and Valley Landscapes	Broad Valleys

3. HAS THE RELEVANT ENERGY OPPORTUNITY BEEN IDENTIFIED FOR THIS RLCE TYPE?
(Identify using information provided in **KR1/T1**)**:** Identified as a 'win-win' site in Environment Agency's Mapping Hydropower Opportunities in England and Wales.

(Yes) No

4. WHICH LANDSCAPE TYPOLOGY UNIT IS THE SITE IN?
(Identify from mapping and area descriptions in **KR2**)**:**

VCA 2

5. WHAT IS THE LANDSCAPE SENSITIVITY TO CHANGE OF THE TYPE PROPOSED?
(Only complete if a Wind, Biomass, or pre-identified Hydro Proposal (see KR2). Identify from mapping and area descriptions in **KR2 /T1**)**:**

Low Med- Low Medium Med-High High

Landscape sensitivity not assessed in KR2.

6. WHAT IS THE SENSITIVITY OF THE COUNTY LANDSCAPE CHARACTER TYPE TO CHANGE?
(Identify using mapping and LCT descriptions in **KR3/T5**)**:**

Landscape Sensitivity:	Low	(Moderate)	High
Visual Sensitivity:	Low	(Moderate)	High
Ecological Sensitivity:	Low	(Moderate)	High

7. SCALE OF THE POTENTIAL EFFECT/S FOR RLCE TYPE
(Identify using criteria outlined in **T3/T4** and/or using descriptions of typical effects in **T2**)**:**

What is the Scale of Any Potential Effects? **T3/T2**

Site (Small) Medium Large

Is There Potential for 'Cross Boundary' Effects? **T4**

Yes (No)

8. IDENTIFY POTENTIAL EFFECTS OF RLCE PROPOSED AND APPRAISE AGAINST LANDSCAPE CHARACTER

Identify potential effects of RLCE type proposed using **T2** as a guide. List those effects that are relevant to the scheme/site under consideration under Description of Potential Effects in the Matrix below. Appraise whether the potential effects identified are likely to cause a change to the definitive attributes associated with the LCT, as identified in the LCT descriptions in section 5.0 of North Yorkshire and York, Landscape Characterisation Project **(KR3)**.

In addition, with reference to the 'tools' and references identified in red, appraise whether the potential effects are likely to have: cumulative effects; visual effects; effects on designated landscapes or features; and/or effects on landscape value i.e. less physical characteristics related to the perception of character of an area of landscape e.g. sense of tranquillity or remoteness, sense of enclosure, sense of place, cultural associations, perceived scale of the landscape.

Definitive Attributes of LCT (As identified in **KR3**)	**Description of Potential Effects** **T2**	**Potential for Cumulative Effects: Y/N?** **T6**	**Potential for Visual Effects: Y/N?**	**Potential for Effects on Perception of Character or Landscape Value: Y/N?** **KR3**	**Potential for Effects on Designated Landscape Area or Feature: Y/N?** **MAGIC & LDF**
Topography and Drainage	Potential for small scale, localised direct effect on topography due to installation of pipeline and foundation for structures. Potential for affects on character of River Esk.	No No other hydroelectric schemes are proposed in vicinity.	Yes Potential for visual effects from addition of man-made structures on views of otherwise rural and unspoilt, riverside setting.	Yes Due to potential effects on sense of tranquillity and through perception of urbanisation within primarily rural setting.	Yes Within North York Moors National Park. Setting of numerous Listed Buildings in vicinity and in Grosmont. Protected woodland and trees.
Land Cover	Potential for reduction in woodland cover, arable field, grassland areas, due to need for turbine housing, access track and pipe. Though small in scale, the loss of these characteristic features could affect perception of character within wider landscape setting.				
Enclosure and Field Pattern	Potential effects on woodland could affect physical enclosure of landscape.				
Settlement Pattern	Potential to adversely affect settlement pattern if turbine house is not sensitively designed and located. Potential for imaginative re-use of existing buildings/structures and/or existing stone on site.				
Visible Historic Features	Potential for affects on character of River Esk including existing weir/barrier within river as a result of new structures and fish pass. Potential for positive effect if existing, disused structures can be brought back into use,				

9. SUGGESTED LANDSCAPE MITIGATION MEASURES
With reference to **T2**

- Agree full restoration proposals and construction method statement
- On-site monitoring during construction and restoration stages by landscape architect or landscape clerk of works
- Reduce impact of all built elements, including pipeline, air valves, pipe bridges, fish passes, etc by careful siting and design, making use of recessive colours and materials. Fish passes are often require and should 'fit' with local character.
- Siting of turbine houses where they will be least obtrusive and where they will be hidden by the contours of the land or blend into natural and existing man made features.
- Design turbine housing with local building material and traditions, and incorporate appropriate screen planting.
- Reduce impact of construction corridor, compounds and borrow pits by careful siting, ensure full restoration of working areas
- Bring existing disused buildings back into use, by re-use of existing buildings, structures and waterway barriers where possible, such as former water mills to house equipment
- Incorporate screen planting (of appropriate species) to improve landscape fit of turbine house and other built elements
- Retain existing vegetation to provide screening wherever possible.
- Consider undergrounding of elements of installation if/where technically possible.

10. SUMMARY OF APPRAISAL AND OF ANY RECOMMENDATIONS
Include details of the type and level of information required to accompany a planning application based on guidance in **T7** or whether additional information is required to determine application.

Refer to North York Moors National Park Authority, Renewable Energy Supplementary Planning Document (April 2010)
Refer to North York Moors Landscape Character Assessment

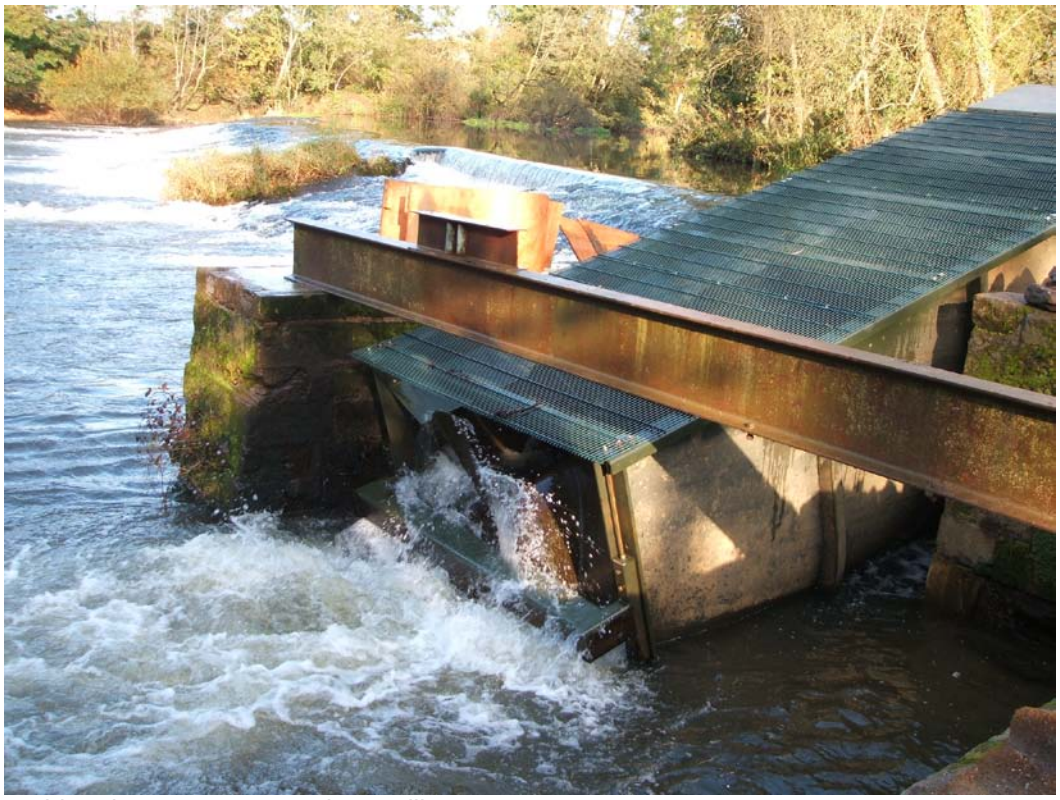
The following information is requested as part of a planning application:

- Appraisal of effects on Landscape Character and key views (Typically provided in a Design and Access Statement)
- Visualisation (photomontage and or wirelines) from agreed viewpoint locations
- Details of Landscape Mitigation and/or detailed landscape design information e.g. planting plan, cross sections, site layout, landscape masterplan
- Architectural elevations/design drawings/pipeline location
- Site Photography
- Landscape Management Plan
- Restoration proposals and construction method statement
- BS Tree Survey and tree protection measures

Guidance Notes from Discussion with Steering Group:
There are a number of sources of useful information relating to the design and siting of hydro schemes. The most relevant in this landscape context might be that produced by the Yorkshire Dales National Park and English Heritage (see section 3.5 of the framework for links and further details).

Images of Typical Small Scale Hydro Installation

Archimedes screw and turbine house of stone construction, Appleton



Archimedes screw at Howsham Mill

Turbine house for a 100kW hydro plant. Taken from Planning for Renewable Energy: A Companion Guide to PPS22 (OPDM), 2004

Example of metal clad turbine house, N Buchan.

Landscape Sensitivity Framework - Pro Forma

ALTERNATE PRO-FORMA FOR USING LOCAL CHARACTER ASSESSMENTS

To be used with reference to the appraisal methodology and associated Key References (KR) and Tools (T) as set out in Managing Landscape Change: Renewable & Low Carbon Energy Developments – a Sensitivity Framework for North Yorkshire and York.

APPLICATION REFERENCE (If relevant)**:** N/A

PROVIDE SUMMARY DESCRIPTION OF DEVELOPMENT PROPOSAL UNDER CONSIDERATION OR PURPOSE OF REVIEW:

50-1500KW Low Head, Hydroelectric Plant: comprising turbine housing (circa 3m x 5m x 3.5m high), possibility of a new fish pass, maintenance access and parking, connection to the grid, pipeline.

Purpose of Review: Consultation response to outline design proposals.

1. WHERE IS THE SITE UNDER CONSIDERATION?
(Identify location using OS mapping, Aerial Photography)**:**

At existing 'barrier' on River Esk, north of Grosmont, in Eskdale.

2. CONTEXT: WHICH LANDSCAPE CHARACTER AREA / UNIT/ TYPE IS THE SITE IN?
(Identify from mapping and LCT descriptions in **KR3/T5**)**:**

National Character Area:	County Primary Landscape Unit:	County Landscape Character Type:
North Yorkshire Moors and Cleveland Hills	Upland Fringe and Valley Landscapes	Broad Valleys

3. DETAIL: AT A LOCAL LEVEL, WHICH LANDSCAPE CHARACTER AREA IS THE SITE IN?
(Identify from Local Landscape Character Assessment)**:**

Landscape Character Type 8: Central Valley.
Landscape Character Area 8b: Lower Esk Valley

4. WHAT IS THE LANDSCAPE SENSITIVITY TO CHANGE FOR THE CHARACTER AREA?
(Refer to Local Landscape Character Assessment if possible)**:**

No assessment of landscape sensitivity in local LCA. Though significance of development pressure to landscape character for new infrastructure is medium-high, and to development in general is medium.

(If no landscape sensitivity judgements are made, identify strategic level sensitivity using mapping and LCT descriptions in **KR3/T5**)**:**

Landscape Sensitivity:	Low	Moderate	High
Visual Sensitivity:	Low	Moderate	High
Ecological Sensitivity:	Low	Moderate	High

5. SCALE OF THE POTENTIAL EFFECT/S FOR RLCE TYPE
(Identify using criteria outlined in **T3/T4** and/or using descriptions of typical effects in **T2**)**:**

What is the Scale of Any Potential Effects? **T3/T2**

Site | Small | Medium | Large

Is There Potential for 'Cross Boundary' Effects? **T4**

Yes | No

6. IDENTIFY POTENTIAL EFFECTS OF RLCE PROPOSED AND APPRAISE AGAINST LANDSCAPE CHARACTER

Identify potential effects of RLCE type proposed using **T2** as a guide. List those effects that are relevant to the scheme/site under consideration under Description of Potential Effects in the Matrix below. Appraise whether the potential effects identified are likely to cause a change to the key characteristics of the local Landscape Character Assessment.

In addition, with reference to the 'tools' and references identified in red, appraise whether the potential effects are likely to have: cumulative effects; visual effects; effects on designated landscapes or features; and/or effects on landscape value i.e. less physical characteristics related to the perception of character of an area of landscape e.g. sense of tranquillity or remoteness, sense of enclosure, sense of place, cultural associations, perceived scale of the landscape.

Key Characteristics of Local Landscape Character Area (Summarise where relevant to study area from local Landscape Character Assessment - LIST BELOW)	**Description of Potential Effects** **T2**	**Potential for Cumulative Effects: Y/N?** **T6**	**Potential for Visual Effects: Y/N?**	**Potential for Effects on Perception of Character or Landscape Value: Y/N?** **KR3**	**Potential for Effects on Designated Landscape Area or Feature: Y/N?** **MAGIC & LDF**
Broad valley and complex topography. Steep and undulating valley sides.	**[As illustrated in standard pro-forma examples]**				
Meandering form of River Esk with dramatic waterfalls.					
Landcover is complex mix of farmland/ pasture and woodland with areas of scrub and grassland.					
Blocks of woodland and linear woodland along watercourses.					
Historic features include stone bridges and North Yorkshire					

Steam Railway					
The Victorian railway architecture exerts a strong influence on settlement character at Grosmont.					
Scattered farms of medium to large size are sited on the mid and upper valley sides.					

7. SUGGESTED LANDSCAPE MITIGATION MEASURES
With reference to **T2**

[As illustrated in standard pro-forma examples]

8. SUMMARY OF APPRAISAL AND OF ANY RECOMMENDATIONS
Include details of the type and level of information required to accompany a planning application based on guidance in **T7** or whether additional information is required to determine application

[As illustrated in standard pro-forma examples]

Guidance Notes from Discussion with Steering Group:
The use of a local level assessment may be of a more appropriate for the appraisal of smaller scale development proposals i.e. micro generation than the county level study provided in KR3. This pro-forma is provided to facilitate appraisal of development proposals using local level landscape character assessments, though it is advised that reference should also be made to KR3 as a secondary source of information. Local level landscape character assessment may also be used to appraise larger scale proposals in combination with an appraisal using the standard pro-forma and KR3.

Some local level landscape character assessments include an assessment of landscape sensitivity to development at a local level as part of the study. Where available, the local level assessment of landscape sensitivity may be used at section 4 above. However if using the local level landscape character assessment for this purpose the following should also be considered:

1. It is important to use the appropriate level of assessment for the task being undertaken. For example, it the purpose of an appraisal were for policy development at a district or sub-regional level, then it may not be appropriate to use a local level assessment of landscape sensitivity. However, if it were for development management purposes, when considering a specific development proposal, then it may be appropriate to use the local level study where KR2 is not relevant;
2. It is also important to ascertain whether judgements made in the local level assessment are a direct substitute for the assessment of landscape sensitivity made in KR2. For example, the local landscape assessment for the North York Moors makes reference to the 'significance of development pressure to landscape character' rather than an explicit judgement about landscape sensitivity. It is not clear how the 'scores' have been arrived at from the method provided, and the criteria and implications for the 'scores' given are not defined. This may be important as an assessment of the 'significance of

development pressure to landscape character' could be construed slightly differently to sensitivity. It may be appropriate to seek clarification where similar issues arise.

3. The assessment of landscape sensitivity in KR2 has been made specific to certain RLCE development types (namely: wind, biomass, hydro). The local assessment is more general in its scope (rightly so), so does not consistently and comprehensively deal with landscape sensitivity in relation to specific RLCE development types.

The above is not to say that the judgements made in the local level assessment are not useful or relevant in appraising the sensitivity of the landscape to specific RLCE development - they are, but it is important to understand the differences between the methods used to appraise sensitivity in the local level study and KR2.

Appendices

Appendix A: Appraisal Methodology Tools

T1 Landscape Sensitivity to Commercial Scale Wind, Overlaid with Energy Opportunity Mapping for Commercial Scale Wind (Based on GIS Mapping from KR2 and KR1 respectively)

T2 List of Typical Landscape Effects of RLCE Development Types

T3 Guidance on Assessing of the Typical Scale of Effects of RLCE Development

T4 Guidance on Cross Boundary Effects on Multiple Landscape Character Areas or Types

T5 Landscape Character and Sensitivity Mapping (Based on information and GIS Mapping from KR3)

T5.1 - Wind & Landscape Sensitivity

T5.2 - Wind & Visual Sensitivity

T5.3 - Wind & Ecological Sensitivity

T5.4 - Relationship between County Primary Landscape Units (PLU) and County Landscape Character Types (LCT)

T5.5 - Relationship between County LCT and National Character Typologies (NCT)

T6 Map of Existing RLCE Installations in NY&Y and Surrounding Areas

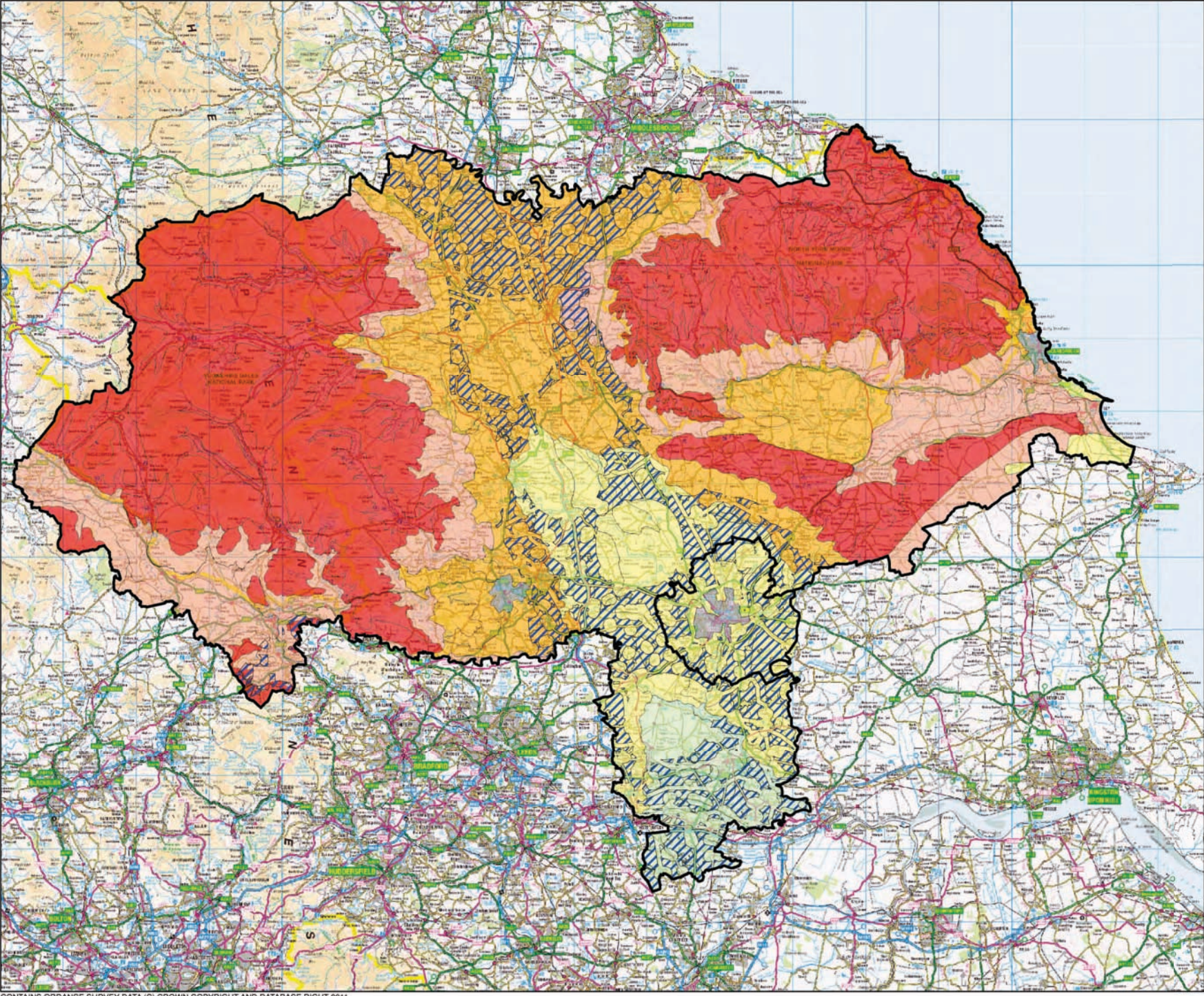
T7 Checklist of Typical Information to be Provided in a Planning Application

Capabilities on project:
Environment

T1

Landscape Sensitivity to Commercial Scale Wind, Overlaid with Energy Opportunity Mapping for Commercial Scale Wind

(Based on GIS Mapping from KR2 and KR1 respectively)



Key

T1

- Study Area

Energy Opportunity (Note 2)

- Practically Viable Wind Resource Area

Landscape Sensitivity to Commercial Scale Wind (Note 1)

- Urban
- Low
- Medium - Low
- Medium
- Medium - High
- High

Notes:

1. Landscape Sensitivity to Wind taken from 2005 LUC Study
2. Energy Opportunity Areas taken from AECOM RLCE Study 2011

CLIENT: North Yorkshire and York

PROJECT: Managing Landscape Change: RLCE Developments - A Sensitivity Framework for NY & Y

FIGURE: Tool T1 Landscape Sensitivity and Energy Opportunity for Commercial Scale Wind

SCALE:	DATE:	GIS:
NTS	Nov 11	CS

AECOM
Lynnfield House, Church Street
Altrincham
WA14 4DZ
Tel: +44 (0) 161 927 8200
Fax: +44 (0) 161 927 8499
www.aecom.com

Capabilities on project:
Environment

T2 List of Typical Landscape Effects of RLCE Development Types

T2 – Typical Landscape Effects of RLCE Development

The following information is based on information provided in the companion guide to PPS 22 and professional experience. It has been adapted and developed from research undertaken on behalf of the Welsh Assembly Government (Planning Implications of Renewable and Low Carbon Energy, Research Report to the Welsh Assembly Government, July 2010) which also provides additional details of other environmental effects, including biodiversity per RCE development type.

The following tables set out typical landscape effects, mitigation and sources of information for each of the RLCE development types considered as part of this framework, namely:

- Commercial scale wind energy
- District heating and Combined Heat and Power (CHP)
- Hydro energy (small scale, low head)
- Biomass (including use in co-firing and energy generation from dedicated energy crops, managed woodland, industrial wood waste and agricultural arising, or straw)
- Energy from Waste (EfW) (including energy generation from slurry, food and drinks waste, poultry litter, municipal solid waste, commercial and industrial waste arisings, landfill gas production and sewage gas production)
- Microgeneration (including small scale wind energy, solar, heat pumps, small scale biomass boilers)

The guidance provided on the typical scale of potential effects is based on the guidance provided in appraisal methodology T3.

RLCE TYPE:	**Description of Typical Installation:**	
COMMERCIAL SCALE WIND	Large scale wind turbines can range from approximately 80m -150m+ to tip; Medium scale turbines 50m-80m to tip; Small scale turbines from 20m-50m to tip. Wind energy developments are unique, in relation to other tall structures, in that they introduce an obvious source of movement into the landscape. They can be deployed singly, in small clusters (2-5 turbines), or in larger groups as wind farms (typically 5 or more turbines). The infrastructure required for large and medium a scale wind turbine developments includes road access to the site, on-site tracks, turbine foundations, temporary crane hardstanding areas, one or more anemometer masts, temporary construction compound, borrow pits, electrical cabling and an electrical sub-station/control building. Connection from the sub-station to the electricity distribution network (i.e. the grid) will also be required. The turbines can have a life of up to 25 years but will require daily/weekly maintenance checks. Small scale installations are likely to come forward as part of a community wind scheme and the associated infrastructure will be smaller as a result.	
Potential Effects on Landscape Resource	**Potential Mitigation Measures**	**Sources of Further Information**
Direct landscape impacts on the site - for example loss of landscape features or change in the character of the site resulting from ground disturbances, construction activity, lighting and presence of new features including access tracks, turbines, substation and cabling Indirect impacts on the landscape character of the surrounding area – for example change in the character of adjacent landscapes as a result of the change in outlook from those landscapes, e.g. a change in the perception of scale or sense of enclosure. Direct & indirect impacts on Special interests e.g. designations, conservation sites, cultural associations. Direct impacts on views– for example change to views from settlements and viewpoints as a result of the introduction of tall moving structures and construction activities into views. Cumulative impacts of one wind energy development in combination with other existing or proposed wind energy developments on landscape character and views (including combined visibility from a single viewpoint and sequential effects on routes Visual impacts on the setting of features of historic interest (e.g. scheduled ancient monuments, listed buildings, conservation areas and historic landscapes)	Minimise extent of disturbance to ground. Ensure good practice during construction (i.e. minimising working area, prompt reinstatement etc). (Ref SNH upland track construction) Complete landscape restoration works at the end of the construction period. Ensure full site restoration upon decommissioning. Ensure best practice in siting and design of wind farm (ref SNH designing wind farms in the landscape). Site & design wind farm layout to minimise impacts. Incorporate off-site screen planting in key locations. Use appropriate colour coating for tower, nacelle and turbine blades.	Section 6 of **KR2** of this framework: Delivering Sustainable Energy in North Yorkshire: Recommended Planning Guidance (LUC and NEF), October 2005 Countryside Agency and Scottish Natural Heritage's Landscape Character Assessment Guidance (2002). Scottish Natural Heritage's Cumulative Effect of Wind farms: DRAFT Version 3 for Consultation (November 2009) Landscape Institute's Guidelines for Landscape and Visual Impact Assessment (2002). Scottish Natural Heritage's guidance on Siting and Designing Wind Farms in the Landscape (2009). SNH's Natural Heritage assessment of small scale wind energy projects which do not require formal Environmental Impact Assessment (EIA) (2008)
Scale of Typical Effect:	**Large - Medium**	

RLCE TYPE:	Description of Typical Installation:	
SINGLE WIND TURBINE (2.5kw and above – see micro wind for lower energy generating schemes)	Although there are no rigid categories relating to the scale of wind turbines, installations tend to fall within four size bands: micro, small, medium and large. These can range from 5 Watt battery charging models to multi-megawatt commercial scale turbines. This example looks at the deployment of single, stand-alone small, medium and large scale turbines, rather than clusters of multiple turbines. The impacts and proposed mitigation measures outlined below are similar to those set out for wind farms, albeit they are likely to be significantly reduced. The extent to which the impacts will occur will vary depending on the size and location of the turbines proposed. The infrastructure required for a large and medium scale wind turbine development includes road access to the site, on-site track(s) (may be required depending on scale), the turbine foundation, a temporary crane hardstanding area, electrical cabling and an electrical sub-station/control building. Connection from the sub-station to the electricity distribution network (i.e. the grid) will also be required.	
Potential Effects on Landscape Resource	**Potential Mitigation Measures**	**Sources of Further Information**
Direct landscape impacts on the site - for example loss of landscape features or change in the character of the site resulting from ground disturbances, construction activity, lighting and presence of new features including access tracks, the turbine, substation and cabling. Indirect impacts on the landscape character of the surrounding area – for example change in the character of adjacent landscapes as a result of the change in outlook from those landscapes, e.g. a change in the perception of scale or sense of enclosure Direct impacts on views– for example change to views from settlements and viewpoints as a result of the introduction of a tall moving structure and construction activities into views. Cumulative impacts in combination with other existing or proposed wind energy developments on landscape character and views (including combined visibility from a single viewpoint and sequential effects on routes). Visual impacts on the setting of features of historic interest (e.g. scheduled ancient monuments, listed buildings, conservation areas and historic landscapes).	Ensure good practice during construction (i.e. tidy site etc). Undertake landscape restoration works at the end of the construction period. Ensure site restoration upon decommissioning. Ensure careful siting of turbine. Minimise extent of disturbance to ground. Incorporate off-site screen planting in key locations. Use appropriate colour coating for tower, nacelle and turbine blades. Undertake landscape restoration works at the end of the construction period. Locate turbine to minimise impacts.	Section 6 of **KR2** of this framework: Delivering Sustainable Energy in North Yorkshire: Recommended Planning Guidance (LUC and NEF), October 2005 Countryside Agency and Scottish Natural Heritage's Landscape Character Assessment Guidance (2002). Scottish Natural Heritage's Cumulative Effect of Wind farms: DRAFT Version 3 for Consultation (November 2009) Landscape Institute's Guidelines for Landscape and Visual Impact Assessment (2002). SNH Siting and Designing Single and Groups of Small Turbines in the Landscape (March 2011) SNH's Natural Heritage assessment of small scale wind energy projects which do not require formal Environmental Impact Assessment (EIA) (2008) Scottish Natural Heritage's guidance on Siting and Designing Wind Farms in the Landscape (2009).
Scale of Typical Effect:	**Large - Medium**	

RLCE TYPE:	Description of Typical Installation:	
DISTRICT HEATING AND CHP	District heating describes the infrastructure for delivering heat and hot water to multiple buildings from a central heat source. The infrastructure requires an energy centre of some description from which to deliver heat; this can be a purpose built, dedicated energy plant (e.g. biomass boiler or CHP plant) or can utilise waste heat from existing processes such as power generation or waste incineration. For the purposes of this study, district heating typically comprises a series of insulated underground pipes with a series of heat exchangers within receptor buildings. Landscape effects associated with purpose built energy centres (CHP) are dealt with else ware in this document (i.e. Biomass or EfW).	
Potential Effects on Landscape Resource	**Potential Mitigation Measures**	**Sources of Further Information**
Temporary impact during construction of underground pipe network. Direct loss of existing landscape features (i.e. hedgerows) to make way for pipe.	Avoidance of impacts through careful routing and/or replacement planting as required to replace that lost.	
Scale of Typical Effect:	**Site**	

RLCE TYPE:	Description of Typical Installation:	
SMALL SCALE HYDRO	A small scale hydro-power system is below 1MW. The main component of a hydro system is a source of water that will provide a relatively constant supply. Other components include a pipeline (often referred to as a penstock) to connect the water source to the turbine, a turbine, generator and a 'tailrace' returning the water to the watercourse. The infrastructure required for small scale hydro-power systems includes a building housing the turbine, generator and ancillary equipment (the 'turbine house') a connection to the electricity distribution network (i.e. the grid) or the user's premises, a pipeline, often known as a penstock, to connect the intake to the turbine and a short open 'headrace' channel may be required between the intake and the pipeline. Although the majority of small scale hydro schemes are likely to be smaller than average within North Yorkshire and York, the effects described below are still applicable for all small scale hydro schemes.	
Potential Effects on Landscape Resource	**Potential Mitigation Measures**	**Sources of Further Information**
Landscape impacts – for example the impact of dams, weirs, intakes, leats, turbine houses and associated power lines on the character of the landscape. Visual impact – for example the visual appearance of dams, weirs, intakes, leats, turbine houses and associated power lines and changes in the visual appearance of waterfalls affected by water abstraction Visual impacts on the setting of heritage features (e.g. scheduled ancient monuments, listed buildings, conservation areas and historic landscapes) Opportunities for the restoration of dilapidated historic buildings (e.g. disused water mills). Cumulative effect of multiple hydro scheme along one water body, or within one or multiple character areas.	Incorporate screen planting (of an appropriate species) to conceal turbine house. Design built elements to be as small as possible. Ensure colour and materials of built elements are in keeping with local landscape features. Re-use existing buildings, structures and waterway barriers where possible/practical, such as former water mills to house equipment and siting of facilities at existing weir, dams, leats etc. Bury pipeline, or use black coloured piping, and restore pipeline route after construction. Fish passes are often require and should 'fit' with local character. Siting of turbine houses where they will be least obtrusive and where they will be hidden by the contours of the land or blend into natural and existing man made features. Design turbine housing with local building material and traditions, and incorporate appropriate screen planting. Bring existing disused buildings back into use. Retention of existing mature site vegetation to provide instant green context/screen.	Delivering Sustainable Energy in North Yorkshire: Recommended Planning Guidance (LUC and NEF), October 2005 Guidelines on the Environmental Impacts of Windfarms and Small Scale Hydroelectric Schemes, SNH, (2002) Hydroelectric Schemes and the Natural Heritage, Version 1, SNH (December 2010) Yorkshire Dales National Park Authority's Small-Scale Hydro Feasibility Study (2009) Environment Agency's Good Practice Guidelines Annex to the Environment Agency Hydropower Handbook (2009) Demars, B. O. L. and Britton, A. (2011). Assessing the impacts of small scale hydroelectric schemes on rare bryophytes and lichens. Scottish Natural Heritage and Macaulay Land Use Institute Funded Report. Scottish Natural Heritage Commissioned Report No.421 Yorkshire Dales SPD: A Guide to Energy Production in the Yorkshire Dales National Park for developers and householders
Scale of Typical Effect:	**Medium - Small**	

RLCE TYPE:	**Description of Typical Installation:**	
BIOMASS CHP	Combined Heat and Power (CHP) plant. The primary product of these is the generation of electricity, but the excess heat is used productively, for instance as industrial process heat or in a district heating scheme. The typical size range for CHP is 5 to 30 MW thermal total energy output. In the case of a small heat plant for a school, the boiler house could typically be some 4m by 3m, with a fuel bunker of similar proportions. The bunker may be semi-underground with a lockable steel lid. The chimney will be 3 to 10m high, depending on plant design and surrounding buildings. Sufficient space to safely manoeuvre a large lorry or tractor and trailer will also be required.	
Potential Effects on Landscape Resource	**Potential Mitigation Measures**	**Sources of Further Information**
Direct landscape impacts on the site - for example loss of landscape features or change in the character of the site resulting from construction activity or the presence of an industrial building. Indirect impacts on the landscape character of the surrounding area – for example change in the character of adjacent landscapes as a result of the change in outlook from those landscapes e.g. greater sense of urbanisation. Direct impacts on views– for example change to views from settlements and viewpoints as a result of the introduction of an industrial structure with chimney stack Visual impacts on the setting of features of historic interest (e.g. scheduled ancient monuments, listed buildings, conservation areas, world heritage sites; and registered landscapes, parks and gardens of special historic interest)	Minimise extent of disturbance to ground. Ensure good practice during construction (i.e. tidy site etc). Undertake landscape restoration works at the end of the construction period. Ensure careful site layout design and siting of plant. Incorporate off-site screen planting in key locations. Appropriate colour treatment of plant. Sensitive siting, high quality design and layout of plant to minimise impacts on cultural heritage landscapes or features (if applicable). Retention of existing mature site vegetation to provide instant green context/screen.	Countryside Agency and Scottish Natural Heritage's Landscape Character Assessment Guidance (2002) . Landscape Institute's Guidelines for Landscape and Visual Impact Assessment (2002).
Scale of Typical Effect:	**Site**	

RLCE TYPE:	Description of Typical Installation:	
BIOMASS POWER STATION (and co-firing)	Large scale biomass plants are designed primarily for the production of electricity and are generally in the range 10 to 40MW. Excess heat from the process is not utilised. In the case of a larger electricity generating plant, a medium sized industrial building of two-storey height would be required, with a slender chimney of 25 or more metres in height. Typically, a 1.5MW plant producing electricity using gasification technology will require a site area of some 0.5 hectares and a 40MW plant may require 5 hectares. The infrastructure required for a large scale biomass plant includes a 'dutch barn' scale building for on-site storage and sorting of fuel, ancillary plant such as an electricity substation, additional buildings for offices and workshops and an extensive area for lorry manoeuvring. If co-firing with an existing power station, then the conversion to co-firing is unlikely to cause any physical change.	
Potential Effects on Landscape Resource	**Potential Mitigation Measures**	**Sources of Further Information**
Direct landscape impacts on the site - for example loss of landscape features or change in the character of the site resulting from construction activity or the presence of an industrial building. Indirect impacts on the landscape character of the surrounding area – for example change in the character of adjacent landscapes as a result of the change in outlook from those landscapes Direct impacts on views– for example change to views from settlements and viewpoints as a result of the introduction of an industrial structure with chimney stack, with associated 'plume' in certain weather conditions which could increase visual prominence of the facility. Visual impacts on the setting of features of historic interest (e.g. scheduled ancient monuments, listed buildings, conservation areas, world heritage sites; and registered landscapes, parks and gardens of special historic interest). Impact of growing biomass crops such as short rotation coppice, miscanthus etc. though planning consent not necessarily required. If co-firing, it is assumed that effects limited to production of energy crops only, as power plant already in place. Energy crops would not necessarily come from the locality.	Ensure good practice during construction (i.e. tidy site etc). Undertake landscape restoration works at the end of the construction period. Ensure careful site layout design and siting of plant. Minimise extent of disturbance to ground. Incorporate off-site screen planting in key locations. Appropriate colour treatment of plant and chimney stack. Sensitive siting, high quality design and layout of plant to minimise impacts on cultural heritage landscapes or features (if applicable). Retention of existing mature site vegetation to provide instant green context/screen. There are numerous mitigation measures linked to the growing of biomass crops (eg minimising use of fertilisers, creation of buffer etc) which are outlined in sources of further information under 'Energy crops'.	Delivering Sustainable Energy in North Yorkshire: Recommended Planning Guidance (LUC and NEF), October 2005 Countryside Agency and Scottish Natural Heritage's Landscape Character Assessment Guidance (2002) . Landscape Institute's Guidelines for Landscape and Visual Impact Assessment (2002). Energy Crops: Wildlife and Countryside Link (2007) Bioenergy: Environmental Impact and Best Practice. Forestry Commission, (2002), Establishment and Management of Short Rotation Coppice. Forestry Commission, (2003a), England Forestry Forum: Biodiversity Working Group Final Report Forestry Commission, (2003b), Forests and water guidelines. Forestry Commission, (2006), The Environmental Impacts of Woodfuel. British Biogen, (1996), Short Rotation Coppice for Energy Production. Good Practice Guidelines British Biogen, (1999), Wood Fuel from Forestry and Arboriculture: the development of a sustainable energy production industry - Good Practice Guidelines.
Scale of Typical Effect:	**Large**	

RLCE TYPE:	Description of Typical Installation:	
ANAEROBIC DIGESTION	Anaerobic digestion is used widely in the agricultural sector in the form of small on-farm digesters producing biogas to heat farmhouses and other farm buildings. AD is most likely to be part of an integrated farm waste management system in which the feedstocks and products all play a part. However larger scale centralised anaerobic digesters (CADs) , using feedstocks imported from a number of sources also exist. CADs are more suited to areas allocated for business use and traditional commercial/industrial urban areas, and are compatible with more intensive Class B1/B2 uses. Please note the following table summarises the impacts that are predominately related to large scale CAD plants. Small scale AD schemes can often be incorporated within existing agricultural buildings. AD is also used as part of the sewerage gas and landfill gas applications, and tanks and equipment are typically around 15m in height. The infrastructure required for anaerobic digestion plant includes road access to the site (which is free from restrictions for HGVs) and sufficient storage within the layout of the plant to contain the digestate and liquor products prior to distribution.	
Potential Effects on Landscape Resource	**Potential Mitigation Measures**	**Sources of Further Information**
Landscape impacts on the site (e.g. Impact of storage tanks, ground disturbances and lighting on the landscape character of the site itself.) Impacts on landscape character of surrounding area Visual impact from key viewpoints/ settlements of industrial buildings and storage tanks. Cumulative landscape impact (of more than one AD plant) on landscape character types Visual impacts on the setting of heritage features (e.g. scheduled ancient monuments, listed buildings, conservation areas, world heritage sites; and registered landscapes, parks and gardens of special historic interest)	Minimise extent of disturbance to ground. Ensure good practice during construction (i.e. tidy site etc). Undertake landscape restoration works at the end of the construction period. Ensure careful site layout design and siting of plant (i.e. digesters can be partially buried to minimise visual impacts- which also has insulation benefits). Incorporate screening measures to minimise potential adverse impact. Incorporate off-site screen planting in key locations. Appropriate colour treatment of plant. Ensure careful site layout design and siting of plant. Undertake landscape restoration works at the end of the construction period. **Note**: Visual impact will depend upon the scale of the plant. Small on-site plants are unlikely to cause significant intrusion, especially if new buildings are located within or adjacent to existing agricultural or light industrial units.	Countryside Agency and Scottish Natural Heritage's Landscape Character Assessment Guidance (2002) Landscape Institute's Guidelines for Landscape and Visual Impact Assessment (2002).
Scale of Typical Effect:	**Medium - Small**	

RLCE TYPE:	Description of Typical Installation:	
ENERGY FROM WASTE: THERMAL PROCESSES (MUNICIAL SOLID WASTE/ COMMERCIAL AND INDUSTRIAL WASTE)	Energy from Waste plants vary in size from small installations (serving factories for example) to large-scale municipal solid waste (MSW) plants. New projects therefore might either be accommodated within existing or converted buildings, or may require large new sites. According to PPS 22, a typical, new, large scale waste combustion plant, with an output of 10-35MW, includes an industrial building of between 30-45m high, with a chimney stack of up to 80m tall, on a site of 2-3Ha in area. A typical waste-fuelled combined heat and power process will involve some or all of the following: • waste reception and storage; • waste processing, material sorting and recovery; • the combustion, pyrolysis or gasification reactor itself; • generation of heat and power using steam turbines, gas engines or gas turbines; • handling, storage and disposal of ash and liquid effluents such as boiler water and surface water. In many cases, Energy from Waste developments are likely to be proposed in industrial areas, where they will be broadly in keeping with the existing buildings. Even so, the developments can be prominent features, and therefore local authorities will wish to encourage a high standard of design and landscaping in order to minimise their visual impact. Chimney stack heights vary according to pollution control to ensure safe dispersal.	
Potential Effects on Landscape Resource	**Potential Mitigation Measures**	**Sources of Further Information**
Direct landscape impacts on the site - for example loss of landscape features or change in the character of the site resulting from construction activity or the presence of an industrial building. Indirect impacts on the landscape character of the surrounding area – for example change in the character of adjacent landscapes as a result of the change in outlook from those landscapes. Direct impacts on views– for example change to views from settlements and viewpoints as a result of the introduction of an industrial structure with chimney stack and associated plume. Visual impacts on the setting of features of historic interest (e.g. scheduled ancient monuments, listed buildings, conservation areas, world heritage sites; and registered landscapes, parks and gardens of special historic interest). Visual impact from key viewpoints/ settlements of industrial buildings Visual impacts on the setting of heritage features (e.g. scheduled ancient monuments, listed buildings, conservation areas, world heritage sites; and registered landscapes, parks and gardens of special historic interest)	Minimise extent of disturbance to ground. Ensure good practice during construction (i.e. tidy site etc). Undertake landscape restoration works at the end of the construction period. Ensure careful site layout design and siting of plant to least sensitive areas where possible/practical. Incorporate off-site screen planting in key locations. Appropriate colour treatment of plant and chimney stack. Sensitive siting, high quality design and layout of plant to minimise impacts on cultural heritage landscapes or features (if applicable). Retention of existing mature site vegetation to provide instant green context/screen.	Countryside Agency and Scottish Natural Heritage's Landscape Character Assessment Guidance (2002) Landscape Institute's Guidelines for Landscape and Visual Impact Assessment (2002).
Scale of Typical Effect:	**Medium**	

RLCE TYPE:	Description of Typical Installation:	
ENERGY FROM WASTE: HEAT RECOVERY	Waste heat is heat produced by machines, electrical equipment, and/or industrial processes which is regarded as a by-product. Heat recovery technology usually consists of some form of heat exchanger or heat pump. Larger sources of waste heat, such as those from power stations or oil refineries can be used to supply district heating systems serving nearby homes and businesses. Smaller scale installations comprise heat exchangers/pumps and will have an appearance similar to air-conditioning units and may be internal or external to a building. Heat recovery from larger scale industrial processes or power stations will involve substantial infrastructure such as complex pipe work (above and below ground), boiler and cooling vessels, flues and water treatment equipment – although much of this is likely to be integrated with existing equipment producing the source heat.	
Potential Effects on Landscape Resource	**Potential Mitigation Measures**	**Sources of Further Information**
Visual impact from small scale systems. Direct Impact on landscape from large scale systems.	Sensitive siting and design of pump equipment and associated housing, locating in least visible locations and using materials characteristic of the area. Maximise use of existing buildings and previously developed land, minimising need for additional land take or additional impact on landscape. Retain and enhance existing screening (e.g. planting) as appropriate.	Small Sites: The Siting and Design of Micro-generation systems for historic area and landscapes: DRAFT, CADW CLG, PPS 22: Planning for Renewable Energy, Companion Guide Larger Sites: Countryside Agency and Scottish Natural Heritage's Landscape Character Assessment Guidance (2002). Landscape Institute's Guidelines for Landscape and Visual Impact Assessment (2002).
Scale of Typical Effect:	**Site**	

RLCE TYPE:	Description of Typical Installation:	
MICRO: WIND (Less than 2.5kw)	Micro scale turbines can be installed with a free-standing mast or building-mounted, and are most commonly deployed as single machines supplying energy to specific buildings or developments. Turbines range from 5W battery charging models up to around 2.5 kW rooftop devices which provide a proportion of a building's electricity demand. Vertical axis machines are more common at the micro scale, with some turbines designed to perform more efficiently at the lower, more turbulent wind speeds typically found in built-up areas. Micro turbines must be sited in a reasonably exposed location and work best at a height where there are no obstructions from buildings, trees or other features that would cause turbulence. The mast of a free standing turbine micro turbine will require reinforced concrete foundations and a cable connecting it to the building/development to which it is supplying power. Cables are usually buried in the ground. A wall-mounted turbine will be fastened to a bracket on the wall. No grid connection is likely to be required.	
Potential Effects on Landscape Resource	**Potential Mitigation Measures**	**Sources of Further Information**
Direct impact on landscape character or townscape character. Direct visual impact on the character of a building, rural landscape (at a localised level), or site of historical value. Indirect visual impacts on the setting of heritage features (e.g. listed buildings, conservation areas, historic landscape). Cumulative impacts in combination with other existing or proposed micro wind energy developments on landscape/tonwscape character and views.	Position turbines sympathetically to surrounding built forms, as far as possible. Choose sympathetic paint and finishes for tower/mast, nacelle and turbine blades. Use screening (e.g. planting) to minimise unsympathetic views where appropriate. Avoid detrimental impact on a designated building/site or conservation area. Wall mounted micro turbines should be installed on unobtrusive areas of a roof or walls if possible. Consult relevant heritage stakeholder (local authority, NE) Sensitive siting and high quality design where appropriate.	The Siting and Design of Micro-Generation Systems for Historic Buildings, Areas and Landscapes (CADW). WAG's Technical Advice Note 8: Planning for Renewable Energy (2005). BWEA web pages on 'Small Wind Sysytems': http://www.bwea.com/small/index.html Renewable Energy and your Historic Building: Installing Micro-generation Systems (2010) Cadw.
Scale of Typical Effect:	**Small - Site**	

RLCE TYPE:	Description of Typical Installation:	
MICRO: SOLAR PV	Photovoltaic (PV) systems commonly comprise of a number of semi conductor cells which are interconnected and encapsulated to form a solar panel. Solar panels are typically 0.5 to 1m2 and have a peak output of 70 to 160 watts. A typical array on a domestic dwelling would have an area of 9 -18m2. The infrastructure required for PV systems includes a low support structure used to fit the PV panels on the roof. The connections between individual PV panels are made either in the support structure or inside the roof void. In some cases, PV panels are mounted on free standing support structures on the ground. Larger applications such as solar farms are not included here as it is unlikely for a scheme of this type to come forward within the study area, due to both geographic/technical limitations and the recent review of feed in tariffs.	
Potential Effects on Landscape Resource	**Potential Mitigation Measures**	**Sources of Further Information**
Visual impacts of solar panel on roof tops. Visual Impacts of ground mounted panels. Visual impacts on the setting of historic features (e.g. listed buildings, conservation areas and historic landscapes).	Design (including colour and appearance) and siting of panels to minimise visual impacts. Design (including colour and appearance) and siting of panels to minimise visual impacts on character and appearance of heritage features. If possible, solar panels should be installed on unobtrusive areas of a roof, such as the inner slopes of a roof valley, or where a flat roof is obscured by a parapet. Care should be taken to make sure that the panels are not shaded for long periods of the day, as they will not function when overshadowed.	Various local authorities around the UK have drafted guidance on solar panels including the New Forest, Hull, Hertsmere etc. The siting and design of micro-generation systems for historic area and landscapes: DRAFT, CADW CLG, PPS 22: Planning for Renewable Energy, Companion Guide
Scale of Typical Effect:	**Small - Site**	

RLCE TYPE:	Description of Typical Installation:	
MICRO: SOLAR HEATING	The main component in a solar water heating system is the collector, which comes in two main types: flat plate collectors and evacuated tube collectors. In both types, radiation from the sun is collected by an absorber and is transferred as heat to a fluid, which may be either water or a special fluid employed to convey the energy to the domestic system using a heat exchanger. The infrastructure required for a solar water heating system includes connecting pipe work, which is normally run from the back of the collector directly through to the roof void. Some systems use photovoltaics (PV) to provide power for the system pump. In such a case, a separate PV module would be mounted adjacent to the solar hot water collector.	
Potential Effects on Landscape Resource	**Potential Mitigation Measures**	**Sources of Further Information**
Visual impacts of solar panel on roof tops. Visual impacts on the setting of historic features (e.g. listed buildings, conservation areas and historic landscapes)	Design (including colour and appearance) and siting of collectors to minimise visual impacts. The solar collectors do not have to be located together and so can be separated to minimise visual impacts. Design (including colour and appearance) and siting of panels to minimise visual impacts on character and appearance of heritage features. If possible, solar panels should be installed on unobtrusive areas of a roof, such as the inner slopes of a roof valley, or where a flat roof is obscured by a parapet. Care should be taken to make sure that the panels are not shaded for long periods of the day, as their efficiency will be significantly reduced.	Various local authorities around the UK have drafted guidance on solar panels including the New Forest, Hull, Hertsmere etc. The siting and design of micro-generation systems for historic area and landscapes: DRAFT, CADW CLG, PPS 22: Planning for Renewable Energy, Companion Guide
Scale of Typical Effect:	**Small - Site**	

RLCE TYPE:	Description of Typical Installation:	
MICRO: HEAT PUMPS	Heat pumps systems capture the environmental solar heat energy stored in the ground. Applications include space heating, water heating, heat recovery, space cooling and dehumidification in both the residential and commercial building sectors. An air source heat pump (ASHP) system consists of an evaporator coil, which absorbs heat from the outside air, a compressor pump and a heat exchanger. The coil and compressor pump are positioned outside the building and can visually resemble an air conditioning unit. The two main types of ASHP systems are air-to-water systems, which use heat to warm water, and air-to-air systems, which produce warm air that is circulated by fans to heat a building. A ground source heat pump (GSHP) system consists of a ground loop, which is comprised of lengths of pipe buried in the ground through either a borehole or a horizontal trench, a heat pump and a heat distribution system (e.g. radiators or an under-floor heating system). The ground loop feeds into the heat pump, which is located within the building. A water source heat pump (WSHP) system consists of a loop, which is submerged in water, a heat pump and a heat distribution system (e.g. radiators or an under-floor heating system). The loop feeds into the heat pump, which is located within the building.	
Potential Effects on Landscape Resource	**Potential Mitigation Measures**	**Sources of Further Information**
Ground source heat pumps only - Temporary impact during construction of underground pipe network and direct loss of existing landscape features (i.e. hedgerows) to make way for pipe. Due to the probably scale of the installation the effects are likely to be small scale and highly localised. Visual impacts on character of surrounding area. Visual impacts on the setting of historic features (e.g. listed buildings, conservation areas and historic landscapes)	Avoidance of impacts through careful routing and/or replacement planting as required to replace that lost. Design (including colour and appearance) and siting of outdoor pump unit to minimise visual impacts. Design (including colour and appearance) and siting of panels to minimise visual impacts on character and appearance of heritage features.	The Siting and Design of Micro-generation systems for historic area and landscapes: DRAFT, CADW CLG, PPS 22: Planning for Renewable Energy, Companion Guide
Scale of Typical Effect:	**Site**	

RLCE TYPE:	Description of Typical Installation:	
MICRO: WOOD BURNING STOVES AND BIOMASS BOILERS	There are two main ways of using wood to heat domestic and small-scale commercial buildings: a standalone stove burning logs or pellets to heat a single room (some can also be fitted with a back boiler to provide water heating as well) and a boiler burning pellets, logs or chips connected to a central heating and hot water system. The infrastructure required for wood fuelled heating includes a large dry area close to the boiler to store wood and a vent which is specifically designed for wood fuel appliances, with sufficient air movement for proper operation of the stove. An existing household chimney can be fitted with a lined flue.	
Potential Effects on Landscape Resource	**Potential Mitigation Measures**	**Sources of Further Information**
Visual impacts (e.g. impact of a flue fitted through roof if existing chimney can't be retrofitted) Visual impacts on the setting of heritage features (e.g. listed buildings, conservation areas and historic landscapes)	Design (including colour and appearance) and siting of flue to minimise visual impacts Design (including colour and appearance) and siting of flue to minimise visual impacts. Potential design measures may include positioning new flues away from principal elevations, making use of existing chimneys where possible, or reducing the visual impact by painting flues with a heat-resistant dark coloured paint with a matt finish.	The Siting and Design of Micro-generation systems for historic area and landscapes: DRAFT, CADW CLG, PPS 22: Planning for Renewable Energy, Companion Guide
Scale of Typical Effect:	**Site**	

Capabilities on project:
Environment

T3 Guidance on Assessing of the Typical Scale of Effects of RLCE Development

T3

Scale of Potential Effects

The scale at which the development could affect the landscape will affect the level of assessment required to be undertaken for each development type. The assumptions and guidance within this framework is based on the following criteria, which can also be used as a general guide in appraising development proposals for RLCE:

- **Large**: Effects over an expansive area due to the scale and potential prominence of the development type, or potential to affect visual amenity or landscape character at a sub-regional level and/or numerous character areas (typically giving rise to numerous, potentially significant effects over 5km radius of a site)

- **Medium** – Effects over a wide area or potential to affect the character of the landscape at a district level (typically, the majority of significant landscape effects would not extend beyond 5km radius from a site)

- **Small** – At a localised level e.g. the site and its immediate setting (typically the majority of potential landscape effects would not extend beyond a 2km radius from a site)

- **Site** – Effects within the curtilage of an existing property or the immediate environs only

The criteria outlined above are provided for guidance purposes only. The guidance is not intended to provide a definitive guide to the scale of effects for all schemes. It is not a substitute for deliberation about the scale of potential effects on a scheme by scheme and site by site basis.

Capabilities on project:
Environment

T4 Guidance on Cross Boundary Effects on Multiple Landscape Character Areas or Types

T4

Cross Boundary Effects on Multiple Landscape Character Areas or Types

While a development of any kind will almost certainly have some effect on the character of the landscape character area/type within which it is located, it may or may not necessarily have an effect on the landscape character over a wider area, or another/multiple other Landscape character areas/types, i.e. a cross-boundary effect.

The concept of cross boundary effects in relation to landscape character is heavily linked with the concept of intervisibility. To a large extent, the extent of intervisibility between one character area and another determines the level and to some extent scale of potential cross-boundary effects.

There are a number of factors specific to each proposed development which need to be considered to determine whether it is likely to have a cross boundary effect. These could include:

- The scale, height, massing of the development;
- The physical topography of the landscape within which a development is located;
- The physical topography of the wider landscape setting of the area within which a development is located
- The level and sense of enclosure within which a development is located (determined, for example, by the amount of significant vegetation (mature woodland, intact or multiple hedgerows or field boundaries) within a rural landscape, or the scale and or density of built form in an urban landscape.

There are two sources of information which could be used to help to determine the potential for cross boundary effects.

1. **Information in a Landscape Character Assessment for the Area**

A landscape character assessment may include details of the importance of intervisibility within a specific character area. The proximity of the area to a more mountainous area (for example) might be a key attribute or characteristic of an LCA or LCT. This attribute may be identified as helping to create a unique sense of place.

For example, in the County Landscape Characterisation project the relationship of LCT 21, Narrow Chalk Valley, to Chalk Wolds and Chalk Foothills is a key consideration in relation to visual sensitivity.

2. **A Zone of Theoretical Visibility (ZTV)**

A ZTV can be used to determine the extent to which a particular development may be visible. In that regard, it will provide a guide to the extent of intervisibility between a given landscape character area (or type) and a particular development.

The amount of intervisibility between a development and a character area will help to determine the scale of a potential effect on that character area.

A Note About Seascape

No seascape assessment has been undertaken for the study area so it is not possible to determine cross boundary effects off off-shore development on the terrestrial landscape.

Guidance produced by both Scottish Natural Herritage (SNH) and the Countryside Council for Wales (CCW) provides information on the likely levels of intervisibility between terrestrial

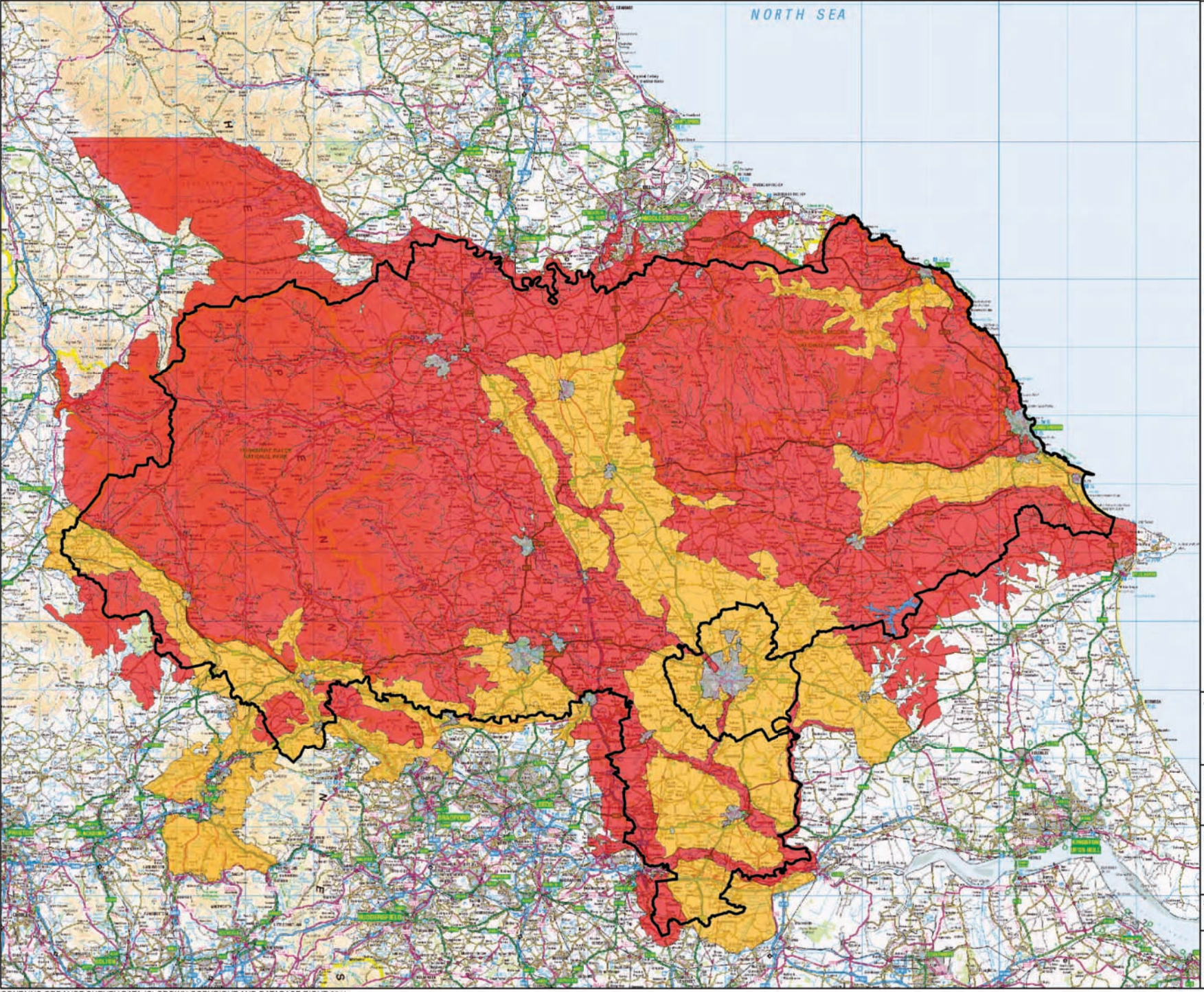
landscape and the marine environment, related particularly at the potential effects of off-shore wind turbines on terrestrial character. It is possible to undertake visibility analysis for off-shore wind with reference to the methodologies in the following document:

Scott, K.E., Anderson, C., Dunsford, H., Benson, J.F. and MacFarlane, R. (2005).
An assessment of the sensitivity and capacity of the Scottish seascape in relation to offshore windfarms. Scottish Natural Heritage Commissioned Report No.103 (ROAME No. F03AA06)

Capabilities on project:
Environment

T5 Landscape Character and Sensitivity Mapping

(Based on information and GIS Mapping from KR3)



T5.1

Key

Study Area

Landscape Sensitvity (Note 1)

- Urban
- Low
- Moderate - Low
- Moderate
- Moderate - High
- High
- Unclassified

Notes:

1. Landscape Sensitivity Interpreted from Descriptions of Landscape Character Types within NY & Y Landscape Characterisation Project 2011

CLIENT:
North Yorkshire and York

PROJECT:
Managing Landscape Change: RLCE Developments - A Sensitivity Framework for NY & Y

FIGURE:
Tool T5.1
NY & Y Landscape Character Assessment: Landscape Sensitivity

SCALE:	DATE:	GIS:
NTS	Nov 11	CS

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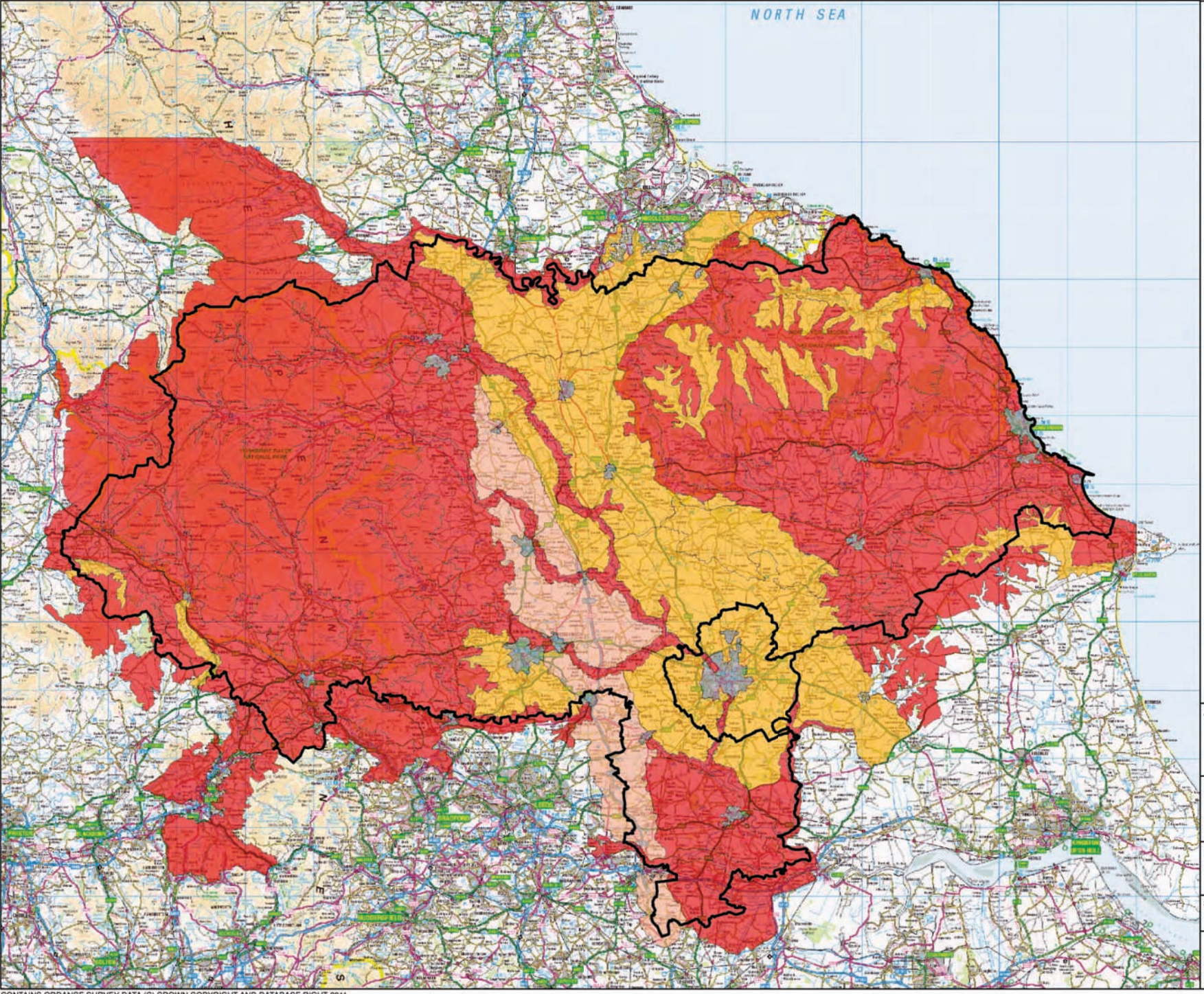

T5.2

Key

Study Area

Visual Sensitvity (Note 1)

- Urban
- Low
- Moderate - Low
- Moderate
- Moderate - High
- High

Notes:

1. Visual Sensitivity Interpreted from Descriptions of Landscape Character Types within NY & Y Landscape Characterisation Project 2011

CLIENT: North Yorkshire and York

PROJECT: Managing Landscape Change: RLCE Developments - A Sensitivity Framework for NY & Y

FIGURE: Tool T5.2 NY & Y Landscape Character Assessment: Visual Sensitivity

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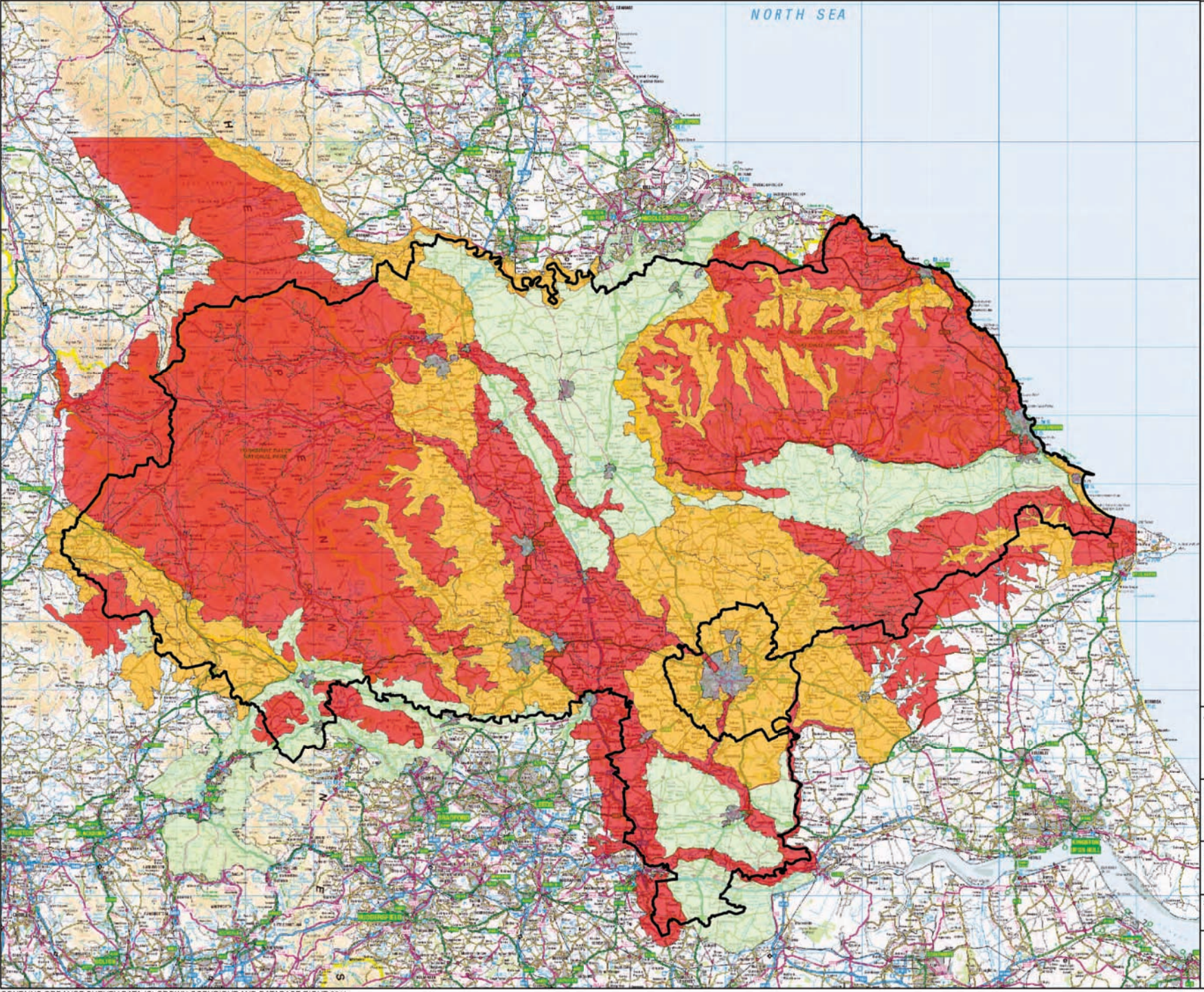

T5.3

Key

Study Area

Ecological Sensitvity (Note 1)

- Urban
- Low
- Moderate - Low
- Moderate
- Moderate - High
- High

Notes:

1. Ecological Sensitivity Interpreted from descriptions within NY & Y Landscape Characterisation Project 2011

CLIENT:
North Yorkshire and York

PROJECT:
Managing Landscape Change: RLCE Developments - A Sensitivity Framework for NY & Y

FIGURE:
Tool T5.3
NY & Y Landscape Character Assessment: Ecological Sensitivity

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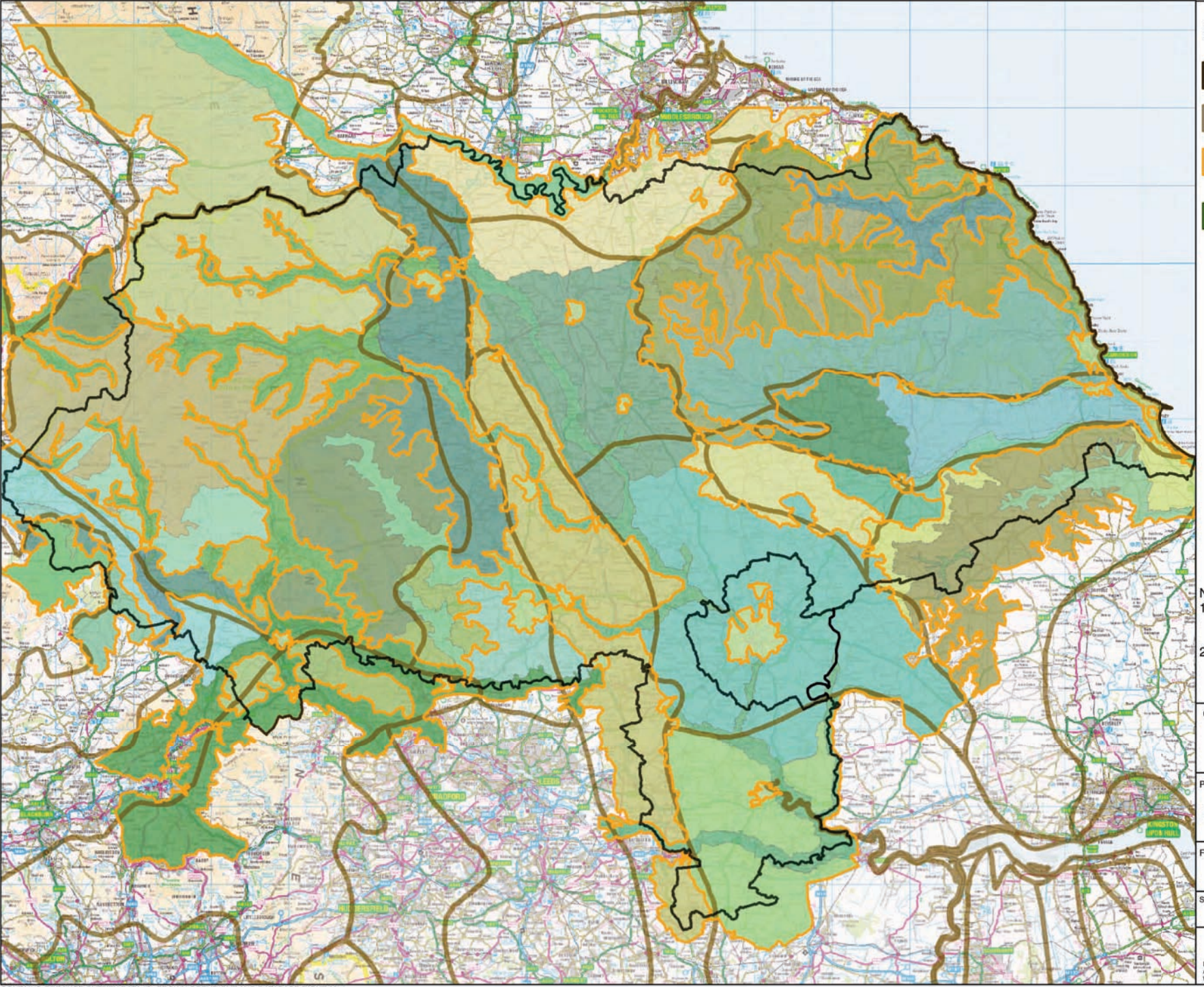

T5.4

Key

- Study Area
- National Character Areas
- County Primary Landscape Units (CPLU)
- Block Fill — County Landscape Character Types (CLCT)

Note:
1. National Character Areas taken from National England's National Character Areas Map (2005).
2. CPLU and CLCT Interpreted from descriptions within NY&Y Landscape Characterisation Project 2011

CLIENT:
North Yorkshire and York

PROJECT:
Managing Landscape Change: RLCE Developments - A Sensitivity Framework for NY & Y

FIGURE: Tool T5.4
Relationship of NCAs, CPLU & CLCT

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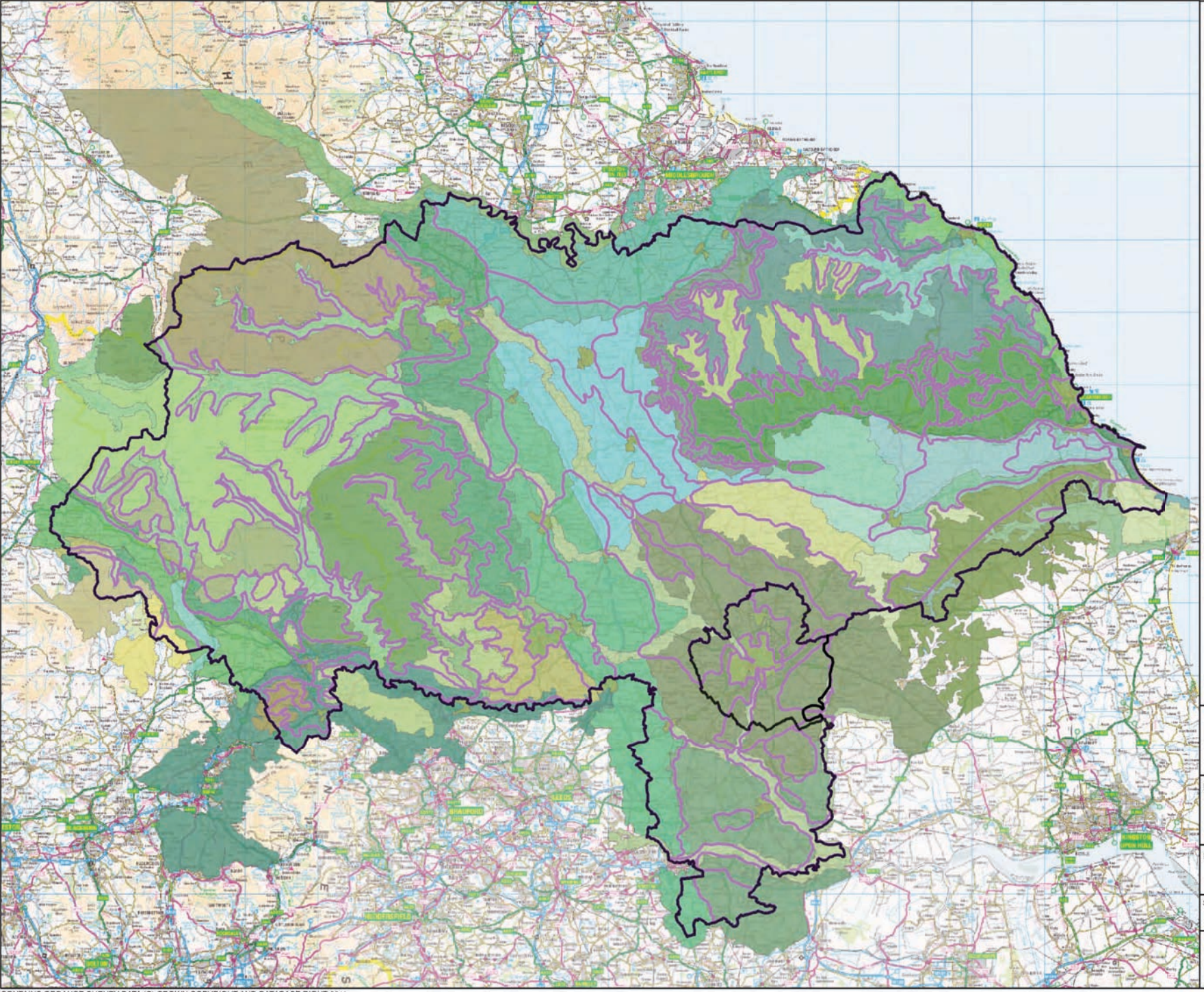

T5.5

Key

- Study Area
- Block Fill — County Landscape Character Types (CLCT)
- National Landscape Typologies (NCT)

Notes:
1. CLCT Interpreted from descriptions within NY & Y Landscape Characterisation Project 2011.
2. National Landscape Typologies Interpreted from descriptions within 2005 LUC Study as Identified by Natural England.

CLIENT:
North Yorkshire and York

PROJECT:
Managing Landscape Change: RLCE Developments - A Sensitivity Framework for NY & Y

FIGURE:
Tool T5.5
Relationship of CLCT & NCT

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NTS	Nov 11	CS

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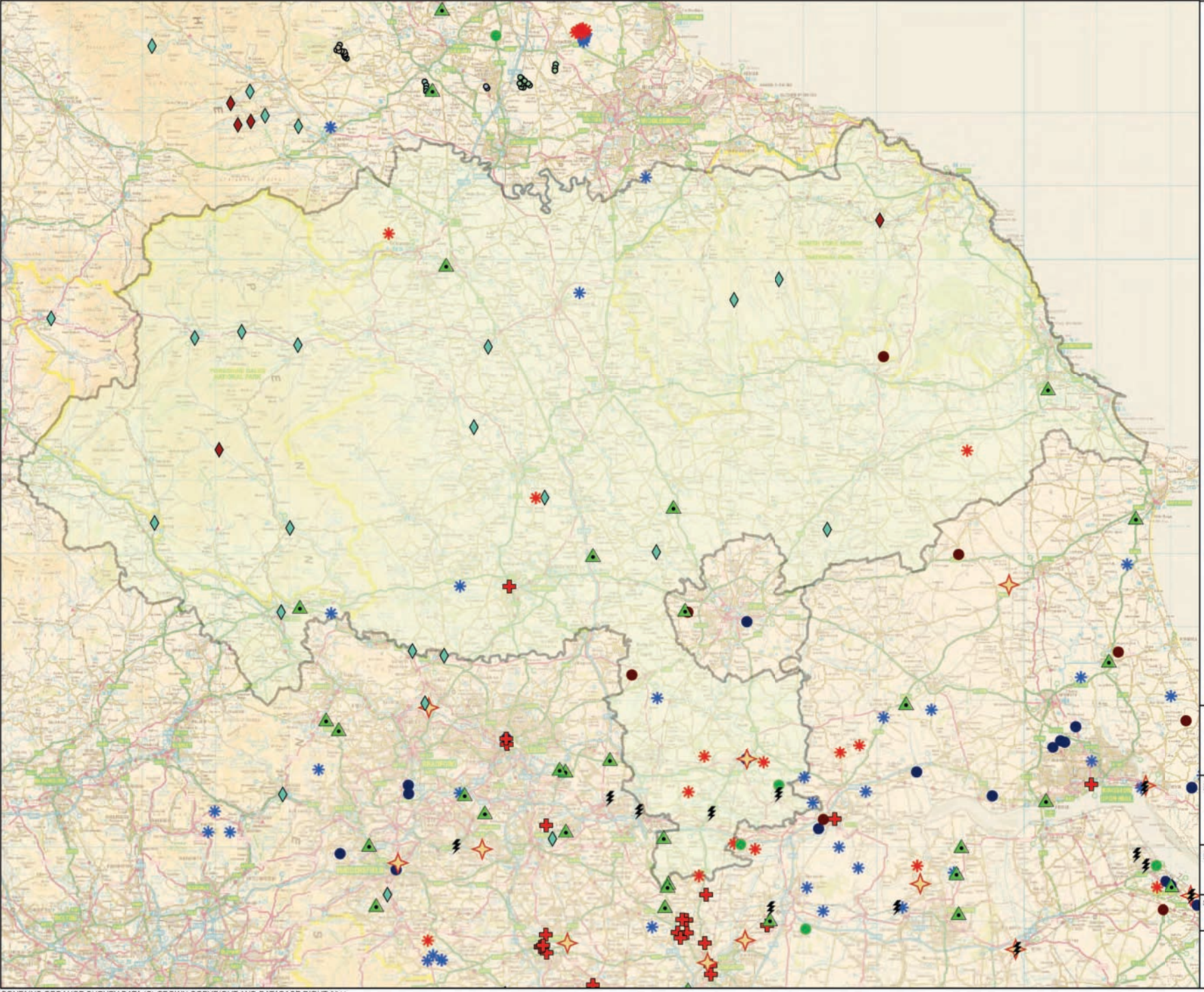
Capabilities on project:
Environment

T6 Map of Existing RLCE Installations in NY&Y and Surrounding Areas



Key

T6

- Study Area
- Current Wind Farm
- Proposed Wind Farm
- Current Hydro Power
- Proposed Hydro Power
- Current Energy from Waste
- Current Heating Network
- Current Biomass Energy
- Proposed Biomass Energy
- Current Energy from Landfill
- Current Fossil Fuel Power Stations
- Current CHP

This plan is intended to provide a guide to existing RLCE development in NY & Y and surrounding Counties.

This information displayed is accurate up to the date shown below:
NY & Y - March '11
County Durham - TBC
County Cumbria - TBC
County Lancashire - TBC

CLIENT:
North Yorkshire and York

PROJECT:
Managing Landscape Change: RLCE Developments - A Sensitivity Framework for NY & Y

FIGURE:
Tool T6
Existing RLCE Installations (Major Installations)

SCALE:	DATE:	GIS:
NTS	Nov 11	CS

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Capabilities on project:
Environment

T7 Checklist of Typical Information to be Provided in a Planning Application

T7 – Checklist of Typical Information Required as Part of Planning Application

Key:

- Essential – Very likely to be necessary to support an application (Potential validation requirement)
- Preferable – Likely to be helpful in support of an application (At discretion of LPA on scheme/site basis)
- Optional – Unlikely to be required to support and application (Provided at discretion of application)

	Scale of Potential Effect /RLCE Development Type As defined in tool T4			
Suggested Submission Requirements	**Large**	**Medium**	**Small**	**Site**
	Commercial Scale Wind	Wind; Biomass Power Station; EfW; Hydro; Sewage/Landfill AD;	Micro Wind; Hydro; Biomass CHP; Agricultural AD	Micro Generation; District Heating
Landscape and Visual Impact Assessment (LVIA) to appropriate methodology and agreed scope.	🔴	🔴	🟠	🟢
Landscape sensitivity and capacity assessment or judgements as part of submission	🔴	🟠	🟢	🟢
Cumulative Impact Assessment	🔴	🔴	🟠	🟢
Digitally produced Zone of Theoretical Visibility (ZTV) or Zone of Visual Influence (ZVI)	🔴	🔴	🟠	🟢
Photomontage, Block Montage or Wireline representations	🔴	🟠	🟠	🟢
Detailed design drawings including elevations to assess visual impact	🔴	🔴	🟠	🟠
Appraisal of effects on Landscape Character (Typically provided in a Design and Access Statement - If LVIA not required)	N/A	N/A	🔴	🟠
Assessment of key views (Typically provided in a Design and Access Statement - If LVIA not required)	N/A	N/A	🔴	🟠
Details of Landscape Mitigation and/or detailed landscape design information e.g. planting plan, cross sections, site layout, landscape masterplan	🔴	🔴	🟠	🟢
Landscape Management Plan (To ensure successful establishment of planted mitigation where it is key to the development of scheme)	🔴	🔴	🟠	🟢
Site Photography	🔴	🔴	🟠	🟢

Appendix 1 of SNH Handbook on EIA, 2009 (3rd Edition) contains useful information on what a landscape and visual impact assessment (LVIA) should contain and how to assess the quality of a submission. Box 1 below is an extract from the EIA Handbook and provides an example of useful tests to apply to Environmental Statements in respect of Landscape and Visual Impact Assessments. Box 2, is an extract from the Landscape Capacity Study of Wind Energy in the South Pennines, Julie Martin Associates (2010) which provides guidance on the types of presentation materials required to

assess landscape and visual impact. Although written specifically for assessment of wind development, the principles remain the same for other types of development.

Box 1: Extract from SNH EIA Handbook (2009)

Appendix 1 Box 4

- Does the Environmental Statement contain fair/accurate/appropriate illustrations?
- Is there a Map showing relevant Zones of Theoretical Visibility (ZTV) and is it clear what they relate to and how they were compiled?
- Are there before and after illustrations such as artist's impressions, sketches, photomontage or computer aided montages or overlays?
- Are viewpoints fair and typical and comprehensive of relevant views?
- Are maps diagrams and illustrations clear and is the text clear and unambiguous?
- Are options or alternatives adequately considered?
- Are mitigation measures adequately described and are their effects assessed?
- Are residual effects clearly identified and if so could they be further reduced at reasonable cost?

Box 2: Extract from Julie Martin Associates Landscape Capacity Study of Wind Energy In the South Pennines (2010)

Table 13: Checklist of Presentation Material for Wind Energy LVIA

Conceptual design options
Computer-generated wireline images to show conceptual design options that were considered. Images accompanied by map(s) to show the turbine layouts that are illustrated and the viewpoint location, viewing direction, included field of view and appropriate viewing distance for the wirelines.

Site layout
Site layout plan showing position of turbines, access and internal tracks, compounds, substation and all ancillary elements in the context of the physical landscape fabric, including contours, type and condition of landcover, boundaries and trees, existing access points, utilities and important environmental features. Scale 1:25,000 or greater.

Turbines and other elements
Scaled elevations showing technical detail of turbines, transformers, substation and ancillary elements, with key dimensions. Typical photographs of turbines proposed.

Landscape character
Map showing site location and LCTs and LCAs within the study area on a colour 1:50,000 OS base (this may be reduced as long as it is legible). Map should indicate concentric distance bands from the outer turbines of the site including those distance bands used in writeup (ie 2, 5, 15 and 30km). Viewpoint locations should also be shown.

Landscape designations and values
Map showing site location and location of valued landscape features within the study area on a 1:50,000 OS base (as before), including as a minimum all the 'landscape values' information detailed in *Table 8* of this guidance. Concentric distance bands as above. Viewpoint locations.

Zones of theoretical visibility
Maps of theoretical visibility to hub height and to blade tip height on a 1:50,000 OS base (as before), with transparent colouring to indicate the number of hubs or blade tips that may be visible at a given point. Maps should cover the whole study area with enlargements at 1:25,000 or 1:50,000 to show visibility up to 5km in more detail. Concentric distance bands as above. Viewpoint locations.

Visualisations
Computer-generated wireline images and (where possible) colour photomontages for the selected viewpoint locations. These should be based on photographs taken with a 50mm lens on a 35mm film format (or digital equivalent), reproduced at a size that, when seen at a normal reading distance of around 50cm, will appear similar to what would be seen in the field. The horizontal field of view should be similar to that of the human eye (around 50 degrees). Each visualisation should be accompanied by a photograph of the view as existing and by details of distance to nearest turbine, viewpoint grid reference and height AOD, viewing direction, included field of view and appropriate viewing distance.

Cumulative impacts
Location map (with individual turbine locations) for all operational, consented and application sites for commercial wind energy development within 30km. Presented on a 1:50,000 OS base (as before) with concentric distance bands. Overlain by transparent ZTVs of different sites in different colours, so that areas of cumulative visibility can be seen. Location of cumulative viewpoints. 180 or 360 degree computer-generated wireline images for these viewpoints, annotated with site name, status (operational, consented, application), and distance to nearest turbine.

Box 3 is also an extract from the Landscape Capacity Study of Wind Energy in the South Pennines, Julie Martin Associates (2010). It provides guidance on good practice requirements for landscape and visual impact LVIA). Although written specifically for assessment of wind development, the principles are similar for other large/medium scale RLCE development. The guidance should be applied at an appropriate level dependant upon the scale and complexity of proposals and in relation to the potential for significant landscape and visual effects.

Box 3: Extract from Julie Martin Associates Landscape Capacity Study of Wind Energy In the South Pennines (2010)

Table 12 Good Practice Requirements for Landscape and Visual Impact Assessment

Description of alternatives

- Describe the alternative sites considered and their landscape constraints and opportunities.
- Indicate why the final choice of site was made and why it was considered suitable in terms of potential landscape and visual impacts.
- Drawing on the design statement, describe the alternative conceptual design options considered, giving the reasons for choosing turbine numbers, height and the particular site, layout and design.
- Explain why the preferred solution represents the optimum landscape fit.
- Computer-generated wireline images may be helpful in illustrating this section of the EIA.

Project description

- Describe the project at each phase in its life cycle in sufficient detail to allow the assessment of landscape and visual effects.
- Include the location and dimensions or extent of all plant and structures, and describe the nature, scale and duration of project activities during construction, operation, and decommissioning.
- Construction phase information should include site access and haulage routes and construction details; turning circles and visibility splays; removal and protection of existing features; any cut and fill and drainage requirements; borrow pits and disposal areas; temporary lay down areas and crane hard standings; construction compound and materials storage; turbine foundations; temporary anemometer masts; site cable runs; and site reinstatement.
- Operational phase information should include details of number and type of turbines (including form, materials, colour etc); operational wind speeds and blade rotation speed; transformers; substation and control building; signage, lighting and fencing; landscape mitigation measures such as planting; grid connection; servicing and land management arrangements.
- Decommissioning phase information should include arrangements for removal of turbines and ancillary structures; proposals for restoration; and future land management.

Baseline assessment – landscape resources

- Agree with the local planning authority the size of the study area. For turbines of medium or large commercial height this should generally extend to a 30km radius around the site; for small turbines a 20km radius may be acceptable.
- Compile mapping and descriptions of the existing landscape within the study area, examining the broad landscape context (15-30km), landscape setting (5-15km), local landscape setting (2-5km) and immediate landscape setting (up to 2km).
- Cover landscape character, landscape values and landscape sensitivity throughout the study area, drawing on the relevant landscape character assessment reports, information on special landscape values (such as descriptions of landscape, natural and cultural heritage designations); and the landscape sensitivity and capacity assessment sheets.
- Describe how landscape character affects the sensitivity to wind energy development of the landscapes within the study area and define their level of sensitivity.
- In relation to valued landscape characteristics and features, explain the reasons why the characteristic or feature is important and its level of importance (ie national, regional, local).
- Describe the landscape of the site itself, including landform, landcover, features of natural and cultural heritage interest and access. Include details of the landscape fabric ie vegetation, trees, hedges and other boundary features and their condition.
- Confirm and expand this information through field survey.

Baseline assessment – visual resources

- Prepare mapping to show the area over which wind turbines may be seen (commonly referred to as the zone of theoretical visibility (ZTV).
- Review the ZTV and consider the site's contribution to visual amenity within the distance bands indicated above. Consider in the field the degree to which buildings, trees and vegetation may reduce or contain visibility.
- Use the ZTV and field work to help identify viewpoints to be covered in the assessment through the preparation of wireline images and photomontages. These viewpoints should be discussed and agreed with the local planning authority and other stakeholders at the scoping stage.

- The number of viewpoints required will vary but 15-25 viewpoints are likely to be necessary for most commercial wind farms, particularly in areas of high landscape sensitivity.
- Include views referred to in the sensitivity and capacity assessment, eg views from settlements; transport corridors; tourist and walking routes; specific receptors such as historic parks; and also locations where cumulative impacts will occur with other wind energy developments.
- Give priority to views from distances of less than 5km but also include some middle and longer range views.
- Include a range of receptors (viewer groups) and classify these in terms of their sensitivity. In general, those engaged in tourism and recreation eg walkers have higher amenity expectations and are more sensitive, while groups such as passing motorists and local workers have lower amenity expectations and are less sensitive.

Description of impacts

- This section should systematically identify and describe the likely effects of the proposal; indicate the mitigation measures developed; estimate the magnitude of the changes that will occur; and consider whether they will be beneficial or adverse. It should cover impacts at construction, operational and decommissioning phases.
- Impacts should be separately assessed under headings of landscape fabric, landscape character, landscape values and visual amenity and for each of the distance bands described above.
- For *landscape fabric*, the scale of impacts such as physical damage or loss and proposed mitigation should be given wherever possible, eg length of hedge lost, length of replacement hedging proposed.
- For *landscape character*, the assessment should briefly describe the changes that will occur to the character of each of the LCAs where wind turbines are visible (using the LCT and LCA frameworks provided in this report). It should consider how the wind farm will affect perceptions of character (eg landscape scale, patterns, focal points, skylines and settings etc) and how widespread and prominent the changes will be.
- For *landscape values*, the assessment should describe any changes in landscape quality, scenic quality, wildness, tranquility, natural and cultural heritage features, cultural associations and amenity and recreation that will occur due to the development (given its distance and visibility).
- For *visual amenity*, the extent of visibility should be described by reference to ZTV mapping. Changes in views from the selected viewpoints should be assessed by reference to the wireline images and photomontages.
- Commentary and assessment should also be provided on impacts on residential properties within 2km; impacts on views from Historic Parks and Gardens and Conservation Areas within 5km; and impacts on views from the principal routes in the area (including the main road routes, tourist routes, National Trails and other long distance paths where appropriate).

Cumulative impacts

- Where there are any other operational, consented or application stage sites within a 30km radius of the site, cumulative impacts should also be assessed (recognising that there are varying degrees of certainty associated with these different types of site).
- Prepare cumulative ZTV(s) for a radius of at least 30km around the proposed development (the local planning authority may request that this be extended in some cases, for example where a highly sensitive landscape lies midway between two wind farm sites).
- Analyse the pattern of combined effects and identify key viewpoints within areas of overlap between the ZTVs of different developments, including some short and middle range views. Again, these viewpoints should be selected in consultation with the local planning authority and other stakeholders. Prepare cumulative wireline images for each of these viewpoints.
- Assess cumulative impacts under the same headings as site-specific impacts. Pay particular attention to issues such as:
  - the combined effect of different site accesses on the landscape fabric of a single hillside or valley;
  - how developments relate to one other and to the underlying landscape in terms of scale and capacity;
  - the extent to which the setting of valued landscapes or features may be eroded by cumulative impacts;
  - the combined visual effects of more than one wind farm on particular tourist routes or long distance walks when seen together or sequentially.
- In assessing the magnitude of cumulative impacts it may be helpful to consider the extent of overlap between the ZTVs of different developments, and the extent to which the proposed development extends the horizontal field of view occupied by wind turbines.

Assessment of impact significance

- Finally the *significance* of impacts should be assessed by reference to the *sensitivity* of the landscape or viewer and the *magnitude* of the change that is expected to occur. Significance should be classified, for example on five or seven levels from negligible to major. Good practice is to do this by means of a matrix that sets out the combinations of sensitivity and magnitude that give rise to specific significance levels.
- The assessment of significance should be informed by the relevant sensitivity and capacity assessment sheets, and should focus on the potentially significant impacts of the project, that is those that will affect decision-making.

Appendix B: Appraisal Methodology Pro-Forma

1. Landscape Sensitivity Framework - Pro Forma
2. Landscape Sensitivity Framework - Pro Forma (Alternative Pro-Forma For Using Local Character Assessments)

Landscape Sensitivity Framework - Pro Forma

To be used with reference to the appraisal methodology and associated Key References (KR) and Tools (T) as set out in Managing Landscape Change: Renewable & Low Carbon Energy Developments – a Sensitivity Framework for North Yorkshire and York.

APPLICATION REFERENCE (If relevant)**:**

PROVIDE SUMMARY DESCRIPTION OF DEVELOPMENT PROPOSAL UNDER CONSIDERATION OR PURPOSE OF REVIEW:

1. WHERE IS THE SITE UNDER CONSIDERATION?
(Identify location using OS mapping, Aerial Photography)**:**

2. WHICH LANDSCAPE CHARACTER AREA / UNIT/ TYPE IS THE SITE IN?
(Identify from mapping and LCT descriptions in **KR3/T5**)**:**

National Character Area:	County Primary Landscape Unit:	County Landscape Character Type:

3. HAS THE RELEVANT ENERGY OPPORTUNITY BEEN IDENTIFIED FOR THIS RLCE TYPE?
(Identify using information provided in **KR1/T1**)**:**

Yes No

4. WHICH LANDSCAPE TYPOLOGY UNIT IS THE SITE IN?
(Identify from mapping and area descriptions in **KR2**)**:**

5. WHAT IS THE LANDSCAPE SENSITIVITY TO CHANGE OF THE TYPE PROPOSED?
(Only complete if a Wind, Biomass, or pre-identified Hydro Proposal (see KR2). Identify from mapping and area descriptions in **KR2 /T1**)**:**

Low Med- Low Medium Med-High High

6. WHAT IS THE SENSITIVITY OF THE COUNTY LANDSCAPE CHARACTER TYPE TO CHANGE?
(Identify using mapping and LCT descriptions in **KR3/T5**)**:**

Landscape Sensitivity:	Low	Moderate	High
Visual Sensitivity:	Low	Moderate	High
Ecological Sensitivity:	Low	Moderate	High

7. SCALE OF THE POTENTIAL EFFECT/S FOR RLCE TYPE
(Identify using criteria outlined in **T3/T4** and/or using descriptions of typical effects in **T2**)**:**

What is the Scale of Any Potential Effects? **T3/T2**

Site Small Medium Large

Is There Potential for 'Cross Boundary' Effects? **T4**

Yes No

8. IDENTIFY POTENTIAL EFFECTS OF RLCE PROPOSED AND APPRAISE AGAINST LANDSCAPE CHARACTER

Identify potential effects of RLCE type proposed using **T2** as a guide. List those effects that are relevant to the scheme/site under consideration under Description of Potential Effects in the Matrix below. Appraise whether the potential effects identified are likely to cause a change to the definitive attributes associated with the LCT, as identified in the LCT descriptions in section 5.0 of North Yorkshire and York, Landscape Characterisation Project **(KR3)**.

In addition, with reference to the 'tools' and references identified in red, appraise whether the potential effects are likely to have: cumulative effects; visual effects; effects on designated landscapes or features; and/or effects on landscape value i.e. less physical characteristics related to the perception of character of an area of landscape e.g. sense of tranquillity or remoteness, sense of enclosure, sense of place, cultural associations, perceived scale of the landscape.

Definitive Attributes of LCT (As identified in **KR3**)	**Description of Potential Effects** **T2**	**Potential for Cumulative Effects: Y/N?** **T6**	**Potential for Visual Effects: Y/N?**	**Potential for Effects on Perception of Character or Landscape Value: Y/N?** **KR3**	**Potential for Effects on Designated Landscape Area or Feature: Y/N?** **MAGIC**
Topography and Drainage					
Land Cover					
Enclosure and Field Pattern					
Settlement Pattern					
Visible Historic Features					

9. SUGGESTED LANDSCAPE MITIGATION MEASURES

With reference to **T2**

10. SUMMARY OF APPRAISAL AND OF ANY RECOMMENDATIONS

Include details of the type and level of information required to accompany a planning application based on guidance in **T7** or whether additional information is required to determine application.

Landscape Sensitivity Framework - Pro Forma

ALTERNATIVE PRO-FORMA FOR USING LOCAL CHARACTER ASSESSMENTS

(For use where KR2 is not (or less) relevant and/or for small scale development)

To be used with reference to the appraisal methodology and associated Key References (KR) and Tools (T) as set out in Managing Landscape Change: Renewable & Low Carbon Energy Developments – a Sensitivity Framework for North Yorkshire and York. **Can be used as a substitute for, or in addition to, the standard pro-forma (see appendix B).**

APPLICATION REFERENCE (If relevant)**:**

PROVIDE SUMMARY DESCRIPTION OF DEVELOPMENT PROPOSAL UNDER CONSIDERATION OR PURPOSE OF REVIEW:

1. WHERE IS THE SITE UNDER CONSIDERATION?
(Identify location using OS mapping, Aerial Photography)**:**

2. CONTEXT: WHICH LANDSCAPE CHARACTER AREA / UNIT/ TYPE IS THE SITE IN?
(Identify from mapping and LCT descriptions in **KR3/T5**)**:**

National Character Area:	County Primary Landscape Unit:	County Landscape Character Type:

3. DETAIL: AT A LOCAL LEVEL, WHICH LANDSCAPE CHARACTER AREA IS THE SITE IN?
(Identify from Local Landscape Character Assessment)**:**

4. WHAT IS THE LANDSCAPE SENSITIVITY TO CHANGE FOR THE CHARACTER AREA?
(Refer to Local Landscape Character Assessment if possible)**:**

Low Med- Low Medium Med-High High

(If no landscape sensitivity judgements are made, identify strategic level sensitivity using mapping and LCT descriptions in **KR3/T5**)**:**

Landscape Sensitivity:	Low	Moderate	High
Visual Sensitivity:	Low	Moderate	High
Ecological Sensitivity:	Low	Moderate	High

5. SCALE OF THE POTENTIAL EFFECT/S FOR RLCE TYPE
(Identify using criteria outlined in **T3/T4** and/or using descriptions of typical effects in **T2**)**:**

What is the Scale of Any Potential Effects? **T3/T2**

Site Small Medium Large

Is There Potential for 'Cross Boundary' Effects? **T4**

Yes No

6. IDENTIFY POTENTIAL EFFECTS OF RLCE PROPOSED AND APPRAISE AGAINST LANDSCAPE CHARACTER

Identify potential effects of RLCE type proposed using **T2** as a guide. List those effects that are relevant to the scheme/site under consideration under Description of Potential Effects in the Matrix below. Appraise whether the potential effects identified are likely to cause a change to the key characteristics of the local Landscape Character Assessment.

In addition, with reference to the 'tools' and references identified in red, appraise whether the potential effects are likely to have: cumulative effects; visual effects; effects on designated landscapes or features; and/or effects on landscape value i.e. less physical characteristics related to the perception of character of an area of landscape e.g. sense of tranquillity or remoteness, sense of enclosure, sense of place, cultural associations, perceived scale of the landscape.

For small scale development proposals, it may also be necessary to consider effects at a more detailed level than the local landscape character assessment i.e. site specific effects, such as: relationship to surrounding buildings/structures, trees/vegetation, location of roads/footpaths, amount of human intrusion and effects in long distance views.

Key Characteristics of Local Landscape Character Area (As identified in local Landscape Character Assessment – LIST BELOW)	**Description of Potential Effects** **T2**	**Potential for Cumulative Effects: Y/N?** **T6**	**Potential for Visual Effects: Y/N?**	**Potential for Effects on Perception of Character or Landscape Value: Y/N?** **KR3**	**Potential for Effects on Designated Landscape Area or Feature: Y/N?** **MAGIC**

7. SUGGESTED LANDSCAPE MITIGATION MEASURES

With reference to **T2**

8. SUMMARY OF APPRAISAL AND OF ANY RECOMMENDATIONS

Include details of the type and level of information required to accompany a planning application based on guidance in **T7** or whether additional information is required to determine application