Landscape Sensitivity to Renewable Energy in Harborough District

July 2016

1 Introduction

Renewable energy is recognised as an important contributor to the national power generation mix. The National Planning Policy framework (NPPF) suggests that renewable energy should be able to be accommodated in the countryside.

NPPF, however, also recognises the importance of landscape and heritage assets. Renewable energy developments are often in the open countryside and the requirements for the development need to be balanced against any harm to, for instance, local heritage assets or a locally important landscape.

This study assesses the ability of different landscape character areas to absorb the impact of renewable energy installations. There is understandably a focus on wind turbines, as turbines are tall and have a significant visual impact. The study will help to identify the appropriate scale of turbines for different parts of the district. However, solar field installations and biomass plant can also have impacts. This study also considers these. Harborough District has a very small hydro-power resource, so this is not assessed.

2 National Planning Policy

The National Planning Policy Framework (NPPF) recognises that all communities should contribute to power generation from low carbon energy technologies. It expects local planning authorities to plan positively for additional renewables and low carbon energy. Policies are expected to be developed to maximise renewable energy, whilst still ensuring that adverse impacts are addressed satisfactorily.

NPPF states that local planning authorities should "approve the application [unless material considerations indicate otherwise] if its impacts are (or can be made) acceptable. Once suitable areas for renewable and low carbon energy have been identified in plans, local planning authorities should also expect subsequent applications for commercial scale projects outside these areas to demonstrate that the proposed location meets the criteria used in identifying suitable areas."

NPPF is also supportive of community led renewable projects. Further guidance on renewable energy is available in one of the supporting Guidance Notes and can be found at http://planningguidance.planningportal.gov.uk/blog/guidance/renewable-and-low-carbon-energy/.

On 18th June, a Ministerial Statement was issued, which states that when considering applications for wind energy development (of one or more turbines) local planning authorities should only grant planning permission if:

- the development site is in an area identified as suitable for wind energy development in a Local or Neighbourhood Plan; and

- following consultation, it can be demonstrated that the planning impacts identified by affected local communities have been fully addressed and therefore the proposal has their backing.

This new guidance has now been adopted in the National Planning Guidance on Renewable energy.
http://planningguidance.planningportal.gov.uk/blog/guidance/renewable-and-low-carbon-energy/particular-planning-considerations-for-hydropower-active-solar-technology-solar-farms-and-wind-turbines/#paragraph_033

3 Renewable Energy Development

Renewable energy is defined as energy that is derived from natural flows on the earth that are naturally replenished. It includes:

- Wind
- Solar
- Biomass
- Hydro
- Heat from the ground

These developments need to be sited where there is a suitable resource, unlike more traditional generation, where fuel is brought in to a site. Renewable energy developers will, as part of their search for a site, consider the size of the resource and the constraints of the site. All renewable energy developments do need to have good access to the electricity network, and this maybe a key constraint in site selection. Other constraints will be access, national landscape designations and, in the case of wind, radar operations and airports. Once these constraints are considered renewable energy developers often have a limited number of appropriate sites.

In Harborough District wind, solar and biomass are the main renewable technologies that will be considered in this report. There is an insignificant hydropower resource and heat from the ground would be part of a building system, so has no specific impact in itself.

3.1 Wind

Wind power relies on tall structures, to capture the higher wind speeds aloft. The higher the wind speed, the more energy is captured by the rotating blades and turned into electricity. Wind turbines vary from small scale (up to 15m high) to very large machines of 100 to 150m height. The power generated also varies from perhaps 25kW/h, which would provide power for a farm, to over 2MW/h, which could provide power for around 1000 homes. Turbines can be deployed singly, for example on a farm, or in clusters or groups. Larger groups are known as wind farms.

Harborough District has a number of small scale single turbines on farms and has two larger windfarms: Low Spinney – four 2MW machines of 92.5m height; and Swinford – eleven 2MW machines.

For the purposes of this study wind turbines are classified as:

- Small – up to 30m high
- Medium – over 30m and up to 65m thigh
- Large – over 65m and up to 125m high

The effect of single turbines, small groups of up to 3 turbines and wind farms of more than 3 turbines are considered in the assessment of sensitivity.

A study of wind turbine opportunities, completed in 2011 for the East Midlands Councils, identifies areas where there is a technical wind resource, using the methodology agreed by the Department of Energy and Climate Change (DECC)[1] There are a number of sites across the district with potential, as shown in Figure 1. The technical assessment does not include a landscape sensitivity assessment. However, the area marked as purple in Figure 1 indicates that there is high bird sensitivity in that area.

[1] "Low Carbon Energy Opportunities and Heat Mapping for Local Planning Areas Across the East Midlands: Final Report"; Landuse Consultants, 2011

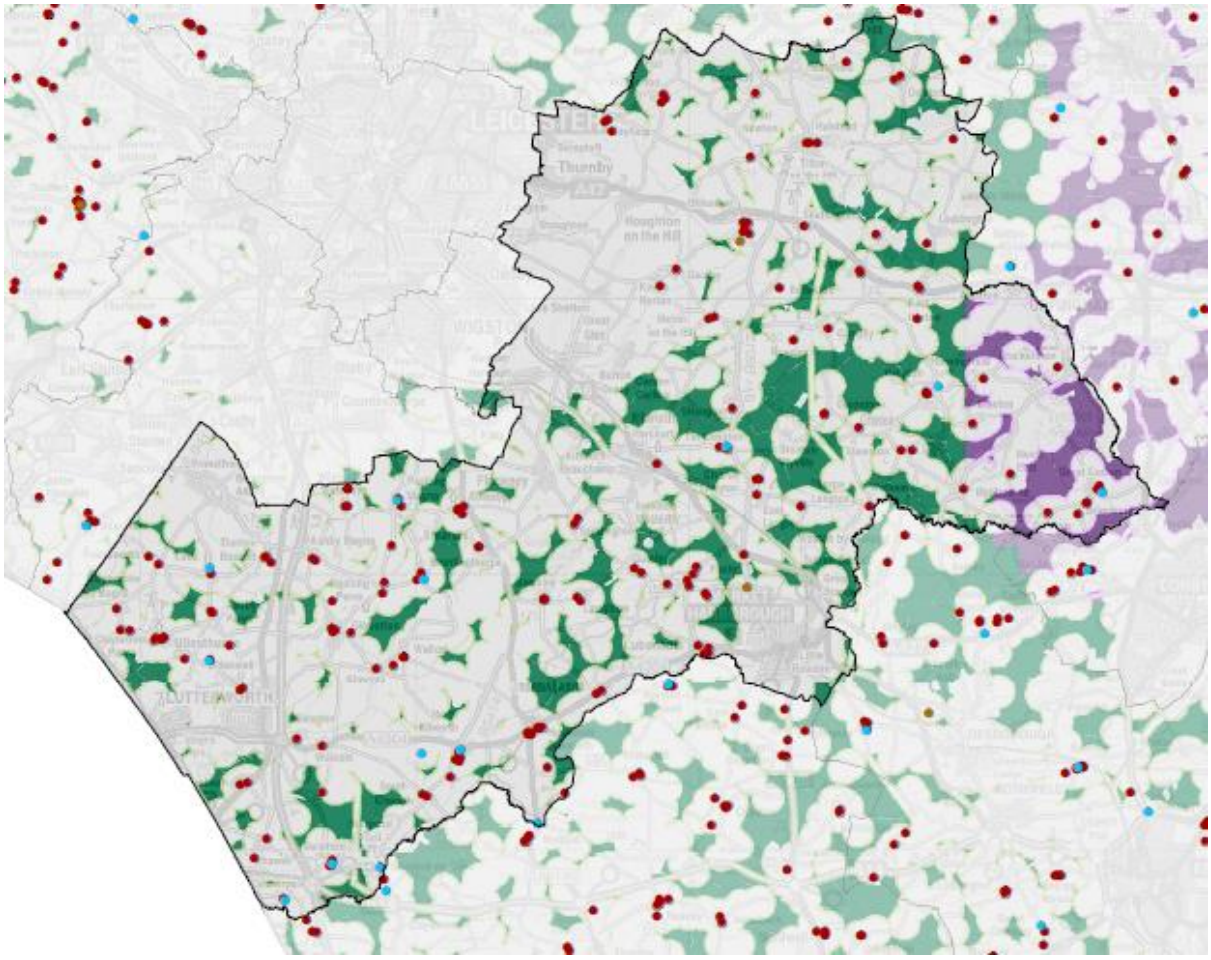

Figure 1: Wind Turbine Technical Resource

3.2 Solar

Solar energy is captured by panels made of semi-conductor material. Sunlight landing on the panel, frees electrons causing an electric current. Solar panels (often referred to as photovoltaic or PV panels) can be placed almost anywhere. Smaller developments are well suited to being positioned on roofs, but there is a trend toward developing very large scale installations, which can generate 10s of MW. These installations are generally sited in a field and are in the form of a large number of inclined panels, generally facing south.

There are various solar installations on roofs, including large rural farm buildings in the district and some field based systems have been granted planning permission and are operational.

3.3 Biomass

Wood, slurry and food waste are all forms of biomass that can be used to generate electricity and heat. On the whole these developments will be in buildings and have more freedom on where they are sited. The main feature with landscape impact would be a tall chimney. Biomass power generation can lead to issues around

movement of trucks or smells. There are some small biomass developments in the district.

4 Harborough District Landscape Character

A landscape study[2] has been completed that identifies five main landscape characters, following the Natural England designations. These are:

- Welland Valley
- High Leicestershire
- Upper Soar
- Laughton Hills
- Lutterworth Lowlands

[2] Harborough District Landscape Character Assessment; Atkins; 2007

4.1 Welland Valley

This is a broad open landscape to the South East of the District, defined mainly by the River Welland.

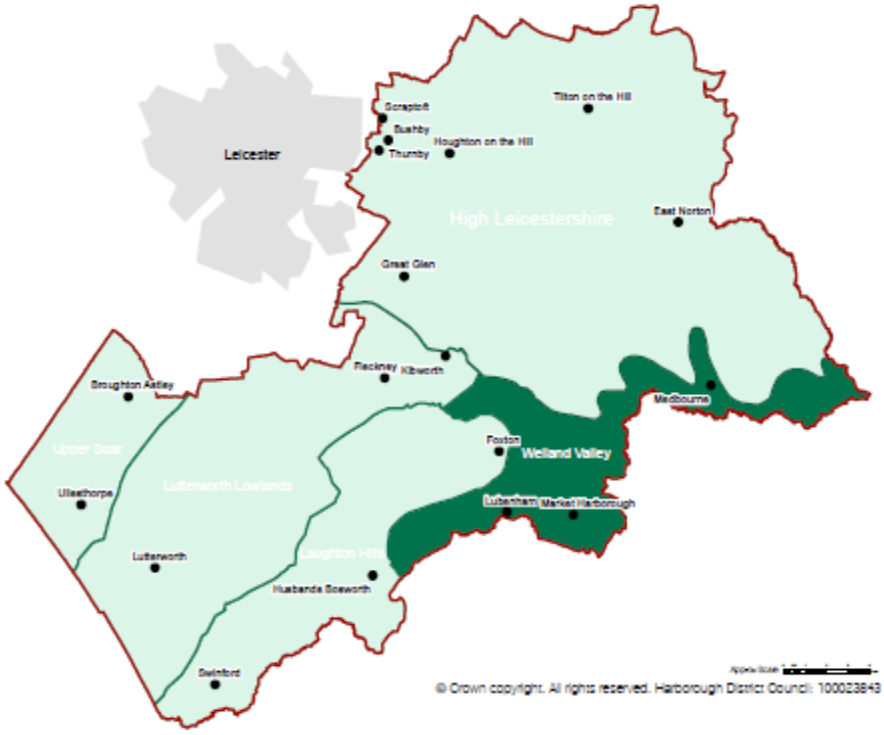

Figure 2 Welland Valley Landscape Area

The key characteristics are:

- Gently meandering river in wide and shallow valley
- Little tree cover
- Pasture on the floodplains
- Arable farming on the valley sides
- Market Harborough, operating as a traditional market town, is the dominant urban influence

4.2 High Leicestershire

This is a highly rural landscape, with complex topography, to the North East of the District.

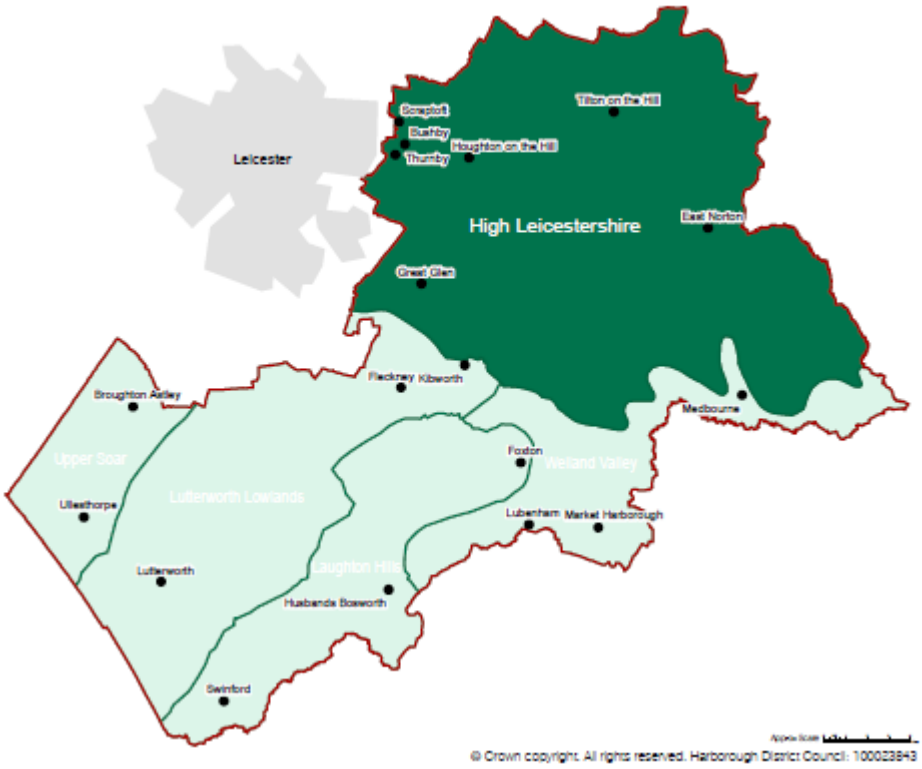

Figure 4: High Leicestershire Landscape Area

The key characteristics are:

- Steep undulating hills
- High concentration of woodland
- Parkland areas with narrow gated roads
- Rural area with a mix of arable farming on lowlands and pasture on hillsides
- Scattering of traditional villages and hamlets through the area
- Encroachment of Leicester to the west of the area

4.3 Upper Soar

This is an area to the far West of the District, and is part of a wider landscape that stretches beyond the district boundary. It is an open landscape with few features and affected by human scale development outside of the area.

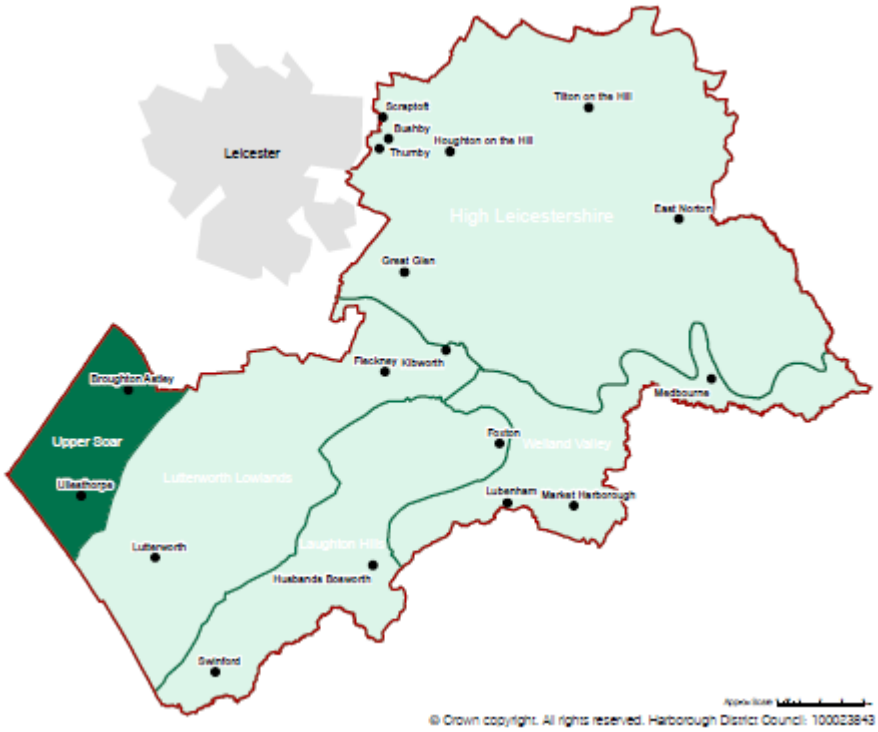

Figure 5: Upper Soar Landscape Area

The key characteristics are:

- Large wide river basin with high ridges
- Forms a small part of larger character area
- Lack of woodland
- Predominantly pasture
- Visible influences from outside character areas
- Urban influence apparent in particular around Broughton Astley

4.4 Laughton Hills

These are found in the South West of the district and are a very rural area with little development.

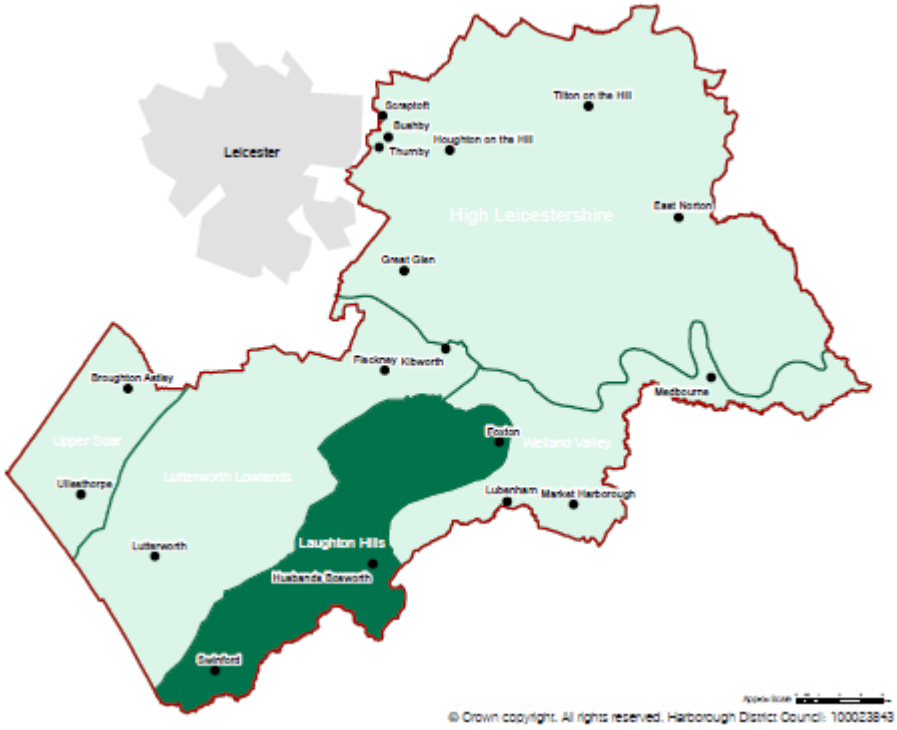

Figure 3: Laughton Hills Landscape Area

The key characteristics are:

- Distinct ridgeline of rolling hills with steep sides
- Predominantly rural character with areas of woodland
- Arable farming predominantly on the flatter areas to the south
- Pasture on the hillier areas to the north
- Scattering of small attractive villages and hamlets

4.5 Lutterworth Lowlands

This is an area of open landscape, in the South and centre of the district with a significant influence from human activity.

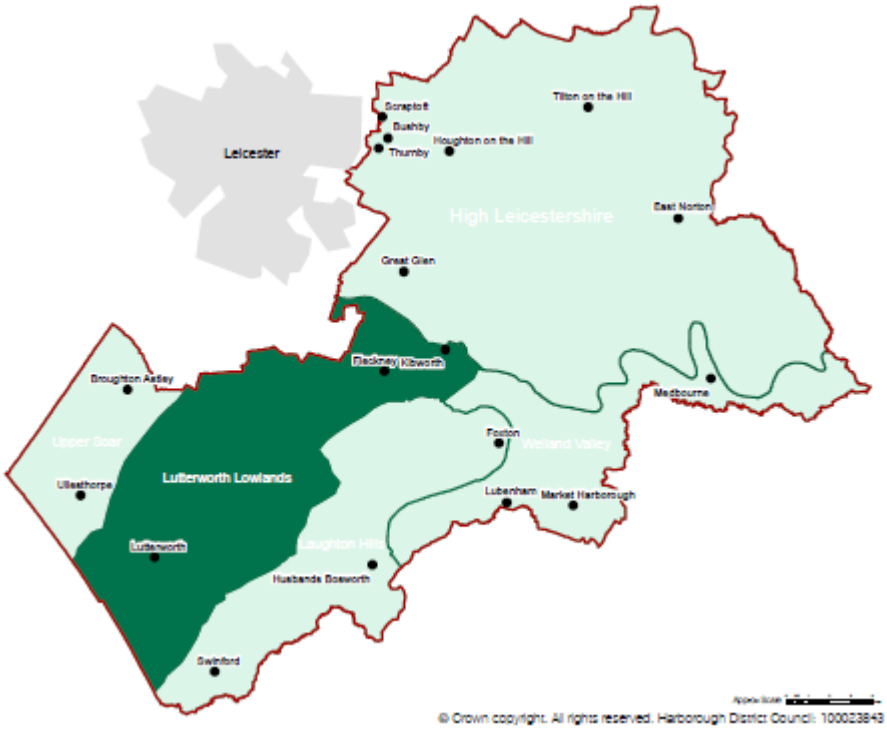

Figure 6: Lutterworth Lowlands Landscape Area

The key characteristics are:

- Open and relatively flat, to gently rolling area
- Lack of large woodland areas
- Farming is predominantly grazing
- Scattering of small villages with larger settlements of Kibworth and Fleckney to the north and Lutterworth to the south
- Includes Bruntingthorpe Airfield
- The M1 and the A426 run through the area
- Contains Magna Park Distribution Park to the west of Lutterworth

5 The Sensitivity of Landscape to Renewable Energy Installations

The ability of landscape to accommodate renewable developments depends upon a number of features

- Landform and scale – relatively flat landscapes are less sensitive than rugged or complex topographies
- Land cover pattern and presence of human scale features – large scale uniform ground cover is less sensitive than areas with small fields, tree cover and small hamlets and farm buildings. Large human influence, such as industrial buildings reduce the sensitivity of the landscape
- Skylines – a large scale relatively flat landscape is less sensitive than a landscape with prominent skylines.
- Perceptual qualities – a busy landscape with lots of human activity is less sensitive than a remote or tranquil landscape, with little activity
- Scenic qualities – a less attractive landscape is less sensitive than a pleasing scene.
- Intervisibility – Landscape with wide vistas and links with other landscapes are more sensitive than more contained landscapes with weak visual connections to neighbouring areas.
- Size of the installation - smaller developments are more easily accommodated than commercial scale developments.

The sensitivity of each landscape type is described and summarised in Table 1. The capacity of the landscape areas to accommodate different renewable technologies is summarised in Table 2. The broad conclusions are as follows.

5.1 Welland Valley

The Welland valley character area has a broad open landscape, with larger fields and comparatively little tree cover. There is also the urban influence of Market Harborough. This means that the landform and scale is less sensitive to renewable development. The relative flatness also leads to few views and there are few features on the skyline. However, it is for the most part deeply rural and has pleasant agricultural scenery, which is not suited to large scale industrial type installations. It could however, accommodate medium scale developments.

Individual or small groups (up to 3) large turbines could be accommodated by the landscape if sited properly. However much of the area is identified as having high bird sensitivity in a regional study of wind turbine opportunities area. See figure 1. Similarly larger scale solar would be possible in well shielded sites. Biomass power stations would be able to be accommodated but would be best sited near other buildings. Transport may well be an issue on the smaller roads

5.2 High Leicestershire

High Leicestershire is a deeply rural part of the district. It is characterised by complex topography, with distinct features and steep hill sides. There are few human elements in the landscape, with only small village and isolated farms. It is also a tranquil area with many varied and attractive views. This area is very sensitive to any renewable development and there are limited opportunities for small scale developments.

In general the landscape is too sensitive to accommodate turbines above 30m and even smaller turbines would need to be very carefully sited. Only single, small turbines could be accommodated in carefully selected locations. Similarly field based solar would only be possible if the scale was small and the development was well sited and shielded. Biomass operations may be possible if located near other farm buildings, but transport would be likely to cause issues.

5.3 Upper Soar

The upper Soar landscape area is characterised by a open landscape across the river valley. The fields tend to be larger with little woodland and some dominant urban features in places. There are comparatively few distinctive features and although a rural area there are significant urban and industrial influences in some areas. This includes the M1 motorway, A5 and large scale developments at Magna Park. There are many areas where larger scale renewable developments could be accommodated.

The landscape has the capacity to absorb larger scale renewable development. There may be sites where a wind farm of more than 4 turbines could be accommodated and well sited solar field developments are also possible. Biomass development could be located sensitively with other buildings and well sited for transport links. However, there may some issues with cumulative impact as there are a number of developments outside the district boundary.

5.4 Laughton Hills

The Laughton Hills are an attractive rolling landscape, characterised by many small farms and wooded area. It is rural and tranquil and has many distinctive features, including a prominent ridgeline, which leads to many fine views. There is little human influence in this area, with small farms and villages. This area is very sensitive to large scale renewable development. It has little capacity to accommodate renewables.

Small scale single turbines of less than 30m height may be suitable in some locations. Similarly smaller scale field solar systems may be accommodated in carefully sited locations if well designed. Smaller scale biomass generation

may be possible if associated with farm buildings however, transport may be an issue.

5.5 Lutterworth Lowlands

The Lutterworth Lowlands are characterised by an open landscape with larger fields and many larger scale human features, including the market town of Lutterworth. It is a pleasant rural landscape, but there are significant urban and industrial influences. There a few distinctive features and few views. The landscape has the capacity to accommodate renewable developments. Indeed the two developed wind farms in the district are sited in this landscape area.

The landscape could accommodate a larger scale development with groups of more than four turbines over 100m. However, there may be issues with cumulative impact, with the existing wind developments along the M1. Larger scale solar developments could also be accommodated, but would still need to be carefully sited and well designed. There are opportunities for large biomass developments close to other industrial sites, or linked with farms.

Table 1: Overview of the Sensitivity of Harborough District Landscape Types

Sensitivity criteria	Harborough District Landscape	Welland Valley	High Leicestershire	Upper Soar	Laughton Hills	Lutterworth Lowlands
Landform and Scale		Broad open landscape with meandering river	Complex landform with distinct features, steep hillsides	Open landscape across river valley	Rolling landscape	Open landscape
Landcover pattern and human features		Larger fields with little woodland	Small hamlets and farms scattered in a landscape of varied small fields and woods	Larger fields, less woodland, some dominant urban features including M1 and Industrial units	Many small farms and wooded areas	Larger size fields and many larger scale human features, including M1, A5 and industrial areas
Skylines		Few features	Many distinctive features	Few distinctive Features	Distinctive features and prominent ridgeline	Few distinctive features on skyline
Perceptual Qualities		Tranquil rural area, but with some urban influences near Market Harborough	Tranquil - highly rural	Rural, but with significant urban, industrial and human influences	Tranquil and rural	Rural but with significant urban, industrial and human influences
Scenic Qualities		Pleasant agricultural landscape	Highly attractive landscape, with varied views	Pleasant agricultural landscape with some areas of urban influence	Attractive farming area, with small scattered villages	Pleasant agricultural landscape, with some areas of significant urban influence
Intervisibility		Few views	Many views across to neighbouring areas	Few views	Prominent ridgeline gives important views	Few views

Table 2: Capacity to accommodate renewable energy developments

Technology	Landscape area	Welland Valley	High Leicestershire	Upper Soar	Laughton Hills	Lutterworth Lowlands
Wind		Lower sensitivity to wind developments. However, large wind developments might be difficult to accommodate in very rural landscape.	High sensitivity to all scales of wind turbine. Single, small turbines (below 30m) may be able to be accommodated in areas with human features, e.g. pylons.	Lower sensitivity to wind developments of all sizes. However, the presence of two large scale wind farms may lead to cumulative impact issues.	High sensitivity to wind developments. Individual smaller (below 30m) turbines may be able to be accommodated in areas with human features, e.g. pylons.	Lower sensitivity to wind developments of all sizes. However, the presence of two large scale wind farms may lead to cumulative impact issues.
Solar		Lower sensitivity to solar field systems, if well screened. Low sensitivity to building mounted schemes.	Very high sensitivity to field based large solar systems. Panels on roofs, or smaller well screened field systems may be possible.	Lower sensitivity to all scales of solar developments. However, impacts may be significant in some more rural areas if not adequately screened.	High sensitivity to larger field solar installations. Panels on roofs and well designed , well screened smaller field systems may be possible to accommodated.	Lower sensitivity to all scales of solar developments. However, impacts may be significant in some more rural areas if not adequately screened.
Biomass		Low sensitivity to biomass, if traffic issues can be resolved.	Larger systems would lead to significant traffic impact, small local systems should be able to be accommodated.	Lower sensitivity, but highways issues may be a concern.	Traffic issues could be a concern.	Lower sensitivity, but highways issues may affect the development.

Recommendations

- High Leicestershire and Laughton Hill landscape areas are generally unsuitable for renewable energy installations. Some small schemes (wind turbines below 30m and small field solar) maybe able to be accommodated in some sites subject to strict criteria
- Welland landscape area maybe able to accommodate some medium developments, but bird sensitivity and tranquillity should be considered. A group of up to 3 large turbines may be able to be accommodated in limited number of locations and subject to other criteria. Similarly solar field systems could be accommodated if well design and screened.
- Lutterworth Lowlands and Upper Soar landscape areas have capacity to accommodate more commercial scale renewable developments, including turbine groupings of more than four and with heights up to 125m. Large scale field PV systems and commercial biomass sites. Any development would need to be subject to specific criteria to ensure that mitigation was possible.

These recommendations should now be used to inform the Local Plan policy approach.

References

Harborough District Landscape Character Assessment; 2007; Atkins

Low Carbon Energy Opportunities and Heat Mapping for Local Planning Areas Across the East Midlands: Final Report; 2011; Landuse Consultants, Centre for Sustainable Energy and SQW Consultants.