Renewable Energy And Low Carbon Energy Assessment And Strategy For West Oxfordshire

October 2016

A New Fetter Place
8-10 New Fetter Lane
London EC4A 1AZ
United Kingdom
T +44 (0) 20 7467 1470
F +44 (0) 20 7467 1471
W www.lda-design.co.uk

LDA Design Consulting Ltd
Registered No: 09312403
17 Minster Precincts, Peterborough PE1 1XX

LDĀ DESIGN

Renewable Energy And Low Carbon Energy Assessment And Strategy For West Oxfordshire

LDĀ DESIGN

Renewable Energy And Low Carbon Energy Assessment And Strategy For West Oxfordshire

Contents

5282 West Oxfordshire Ren

Renewable Energy And Low Carbon Energy Assessment And Strategy For West Oxfordshire

Version:	1.5
Version date:	20/10/2016
Comment	Final

This document has been prepared and checked in accordance with ISO 9001:2008.

Renewable Energy And Low Carbon Energy Assessment And Strategy For West Oxfordshire

Executive Summary

This report sets out the potential for further renewable and low carbon energy development in West Oxfordshire and recommends a renewable and low carbon energy strategy and revised planning policy for the district. Recommendations for wind power and solar farms are informed by an assessment of the district's landscape capacity for wind power and solar farms (attached as an appendix). Finally, the report includes planning guidance for each technology that has potential for deployment in the district for use by the planning authority, developers, community energy groups and neighbourhood planning.

In West Oxfordshire, four large scale renewable energy generating facilities are operational at the time of writing – three solar farms and an anaerobic digestion facility. In addition, there has been a strong uptake of renewable heating installations such as biomass boilers in West Oxfordshire.

The UK remains committed to meeting at least 15% of its energy demand from renewable and low carbon sources by 2020 and to an 80% cut in greenhouse gas emissions by 2050 (Climate Change Act 2008). The National Planning Policy Framework (the NPPF) requires local authorities to support the delivery of renewable and low carbon energy and associated infrastructure, and to help increase the use and supply of renewable and low carbon energy.

There is potential to develop further renewable and low carbon technologies in West Oxfordshire. However this needs to be balanced with West Oxfordshire District Council's vision to meet the needs of the district's communities without significant change to the intrinsic character of the District, and the aims of maintaining an attractive and biodiversity rich environment and protecting the distinctive qualities of the district's towns and villages.

Wind Power

Whilst wind speeds across West Oxfordshire are likely to be sufficient for wind power, there are no commercial-scale wind turbines installed in the district. Large scale wind in particular is constrained by residential properties and the dispersed nature of settlements in the district, and aviation safeguarding areas which cover the district in its entirety. Whilst these provide significant constraints to wind power, a combination of appropriate site selection, design mitigation and, where necessary and financially viable, contributions towards radar improvements, can potentially make siting of wind turbines acceptable.

This report (Figures 8 to 10) identifies potentially suitable areas for wind using a landscape-based approach in accordance with the Written Ministerial Statement (HCWS42) – "Local Planning". Parts of the district are also covered by the Cotswolds AONB and heritage designations. However, even on these sites which benefit from high level protection, national planning policy does not act as a ban on wind power development. It is therefore concluded that presenting areas of the district as categorically unsuitable is not supported by planning policy.

Taking into account the constraints in place within the district, the potential for large scale and medium scale wind power is very limited and limited, respectively. However, the potential for small scale wind power is significant.

Renewable Energy And Low Carbon Energy Assessment And Strategy For West Oxfordshire

Solar Farms

Very few hard constraints exist for solar farms, and those that are considered to be so, such as public rights of way, woodlands and rivers, cover a small portion of the district. Whilst sites on best and most versatile agricultural land are likely to be heavily constrained by the Written Ministerial Statement (HCWS488) – "Solar energy: protecting the local and global environment", it will be for applicants to undertake surveys to confirm the classification of agricultural land on a site by site basis. Notwithstanding agricultural land classification, the landscape capacity assessment concluded that most of the district is 'more suitable' for solar farms (Figure 12). As such, in general terms, there is significant potential for further solar farm development in the district subject to careful consideration of individual development proposals.

Run-Of-River Hydropower

Analysis of West Oxfordshire's rivers by the Environment Agency indicates that the hydro resource in West Oxfordshire is relatively significant. Several sites are potentially technically viable, however detailed assessment of site ecology and hydro resource will be required to identify a given site is suitable. The potential for run-of-river hydropower i.e. schemes where water is taken directly from the river, passed through a turbine and returned back to the watercourse is therefore significant, albeit providing a relatively small amount of renewable energy generation capacity relative to wind and solar.

Small-Scale Renewable Heat Installations

It is expected that small-scale renewable heat installations such as biomass boilers will continue to be installed in the district as 15-30% of households are not connected to the gas network[1]. Whilst many installations will be outside the control of the planning system and unlikely to have spatial planning implications, supporting renewable heat installations and woodland management schemes could help stimulate a local supply chain for woodfuel with resulting benefits to the rural economy and woodland ecology.

District heating requires sufficient heat demand in order to be viable and, given the low density of housing in the area, retrofitting district heating networks is unlikely to be viable in the district. Opportunities may exist for district heating on large demand sites when existing heating systems are replaced or suitable new development is built but the overall potential in the existing building stock appears limited. An example of district heating in an area of low housing density is provided along with lessons learned.

Battery Energy Storage Facilities

Rapid reductions in costs and a growing recognition of the role of battery storage in reducing energy costs to consumers, maintaining a secure and resilient power system, and facilitating deployment of renewables is leading to increased deployment of battery storage facilities. Most facilities that are being planned and built at present are relatively small scale and can

[1] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/267375/off_gas_grid.pdf

be sited in a wider range of locations. The potential for deployment of battery storage is therefore significant in West Oxfordshire.

Community Energy

Community energy can provide more affordable and secure energy and increase local support for renewable energy. Given that successful community energy projects have come forward in the area, West Oxfordshire District Council should consider significant policy support for this model of renewable energy development.

Recommended Strategy

The NPPF requires local planning authorities to have a positive strategy to promote energy from renewable and low carbon sources. Based on our analysis of the potential for renewable and low carbon energy in the district, we recommend a strategy to West Oxfordshire District Council in section 4.9 of this report. In summary, the Council should:

- Focus the energy strategy on maximising the deployment of renewable generation facilities, especially small to medium wind power, solar farms, hydropower and battery energy storage, whilst avoiding significant adverse impact to the intrinsic character of the District, maintaining an attractive and biodiversity rich environment and protecting the distinctive qualities of the district's towns and villages. We recommend that guidance attached to this assessment together with the landscape capacity study and the suitability maps for wind power and solar farms should be used to achieve this balance.
- Encourage applicants through planning policy and our guidance to locate new developments of wind power and solar farms in 'more suitable' areas. Where applicants deem it necessary to target 'less suitable' areas, we recommend that West Oxfordshire District Council requires clear and robust justification to be provided by the applicant.
- Maintain policy support for small scale renewable heat installations such as biomass boiler and proposals that include woodland management schemes should be supported.
- Provide policy support for developments that are genuinely led by or meet the needs of local communities when considering the merits of renewable energy developments.
- Provide the information contained in this study to communities in order to support their assessment of the likely opportunities.
- Work with developers to ensure that opportunities for higher standards than existing Building Regulations are explored.

Emerging Policy Review

Section 4.10 suggests amendments to Policy EH4 in the emerging West Oxfordshire Local Plan 2031 in light of the findings of this report.

Renewable Energy And Low Carbon Energy Assessment And Strategy For West Oxfordshire

1.0 Introduction

The National Planning Policy Framework (2012) requires local authorities to support the delivery of renewable and low carbon energy and associated infrastructure and to help increase the use and supply of renewable and low carbon energy.

Specifcally, the NPPF states that Local Planning Authorities (LPA) should:

- "*Have a positive strategy to promote energy from renewable and low carbon sources.*
- *Design their policies to maximise renewable and low carbon energy development while ensuring that adverse impacts are addressed satisfactorily, including cumulative landscape and visual impacts.*
- *Consider identifying suitable areas for renewable and low carbon energy sources, and supporting infrastructure, where this would help secure the development of such sources.*
- *Support community-led initiatives for renewable and low carbon energy, including developments outside such areas being taken forward through neighbourhood planning.*
- *Identify opportunities where development can draw its energy supply from decentralised, renewable or low carbon energy supply systems and for co-locating potential heat customers and suppliers.*"

West Oxfordshire District Council's (WODC) existing evidence on renewable energy was published in 2009 in the form of a renewable energy and sustainable construction study. The study[2] (known as the CAG Study) was a joint commission with Cherwell District Council and was intended to provide an evidence-based understanding of the local feasibility and potential for decentralised, renewable and low carbon technologies; local targets and local requirements for sustainable construction.

As part of the local plan examination process in 2015, WODC stated that the identification of potentially suitable areas for wind energy would be further assessed by the Council through an early review of the Local Plan. In light of the suspension of the examination and the Inspector's recommendations contained in his preliminary findings, the Council is no longer proposing to undertake an early review and will instead seek to address all necessary amendments to the plan through proposed modifications, to be published for consultation later in the year. This will include the identification of potentially suitable areas for wind energy, if appropriate.

This Renewable Energy And Low Carbon Energy Assessment And Strategy For West Oxfordshire aims to inform the emerging Local Plan by providing:

- An assessment of current levels of renewable and low carbon energy deployment in West Oxfordshire (Section 2).

[2] Cherwell District Council and West Oxfordshire District Council Renewable energy and sustainable construction study. A report by CAG Consultants in association with Impetus Consulting, Adrian Smith and Dotted Eyes. September 2009.

Renewable Energy And Low Carbon Energy Assessment And Strategy For West Oxfordshire

- An assessment of renewable and low carbon energy potential in West Oxfordshire (Section 3).
- A renewable and low carbon energy strategy for West Oxfordshire including a review of emerging planning policy (Section 4).
- Planning guidance on renewable and low carbon energy technologies expected to come forward in West Oxfordshire (Section 5).

2.0 Current Levels of Renewable and Low Carbon Energy Deployment

2.1. Current Deployment

Recent trends in renewable energy installations for West Oxfordshire have been reviewed using published data sources, corroborated with information held by the Council:

- The Department for Energy and Climate Change (DECC) (now part of the Department for Business, Energy & Industrial Strategy) renewable energy planning database.
- Ofgem's FiT installation database.
- The DECC's statistics on renewable heat installations.
- Discussion with the LPA.

Table 1 and Figure 2 present the existing renewable energy installations above 20 kilowatt (kW)[3] capacity in West Oxfordshire, as well as those granted planning permission but not yet built. The information is from DECC's Renewable Energy Planning Database.

Table 1 Existing renewable and low carbon energy installations (>20kW) in West Oxfordshire

Name	Technology	Capacity	Status
Eynsham Solar Farm	Solar farm	13.2 MW	Operational
Kencot Hill Solar Farm	Solar farm	37 MW	Operational
Westerfield Farm	Solar farm	12.5 MW	Operational
Sustainable Charlbury Community Solar	Solar farm	4.3 MW	Consented
Cassington	Anaerobic Digestion	2.1 MW	Operational

Solar photovoltaic (PV) farms: Three solar farms are operational in West Oxfordshire, with a combined installed capacity of 62.7 megawatt (MW). A community-led solar project has been consented and is awaiting construction.

Wind power: The planning database indicates that historically no applications have been submitted for large commercial-scale (>1MW) wind farms.

Energy from Waste: An Anaerobic Digestion plant at Cassington manages food waste from domestic collections. Waste policy is determined at the county level and is the responsibility of Oxfordshire County Council.

[3] Smaller solar PV and other projects may not require planning permission. This means that they do not appear in the planning database and that the Permitted Development Orders define the circumstances where development is permitted, rather than local planning policy.

Renewable Energy And Low Carbon Energy Assessment And Strategy For West Oxfordshire

The planning database covers a wide range of other renewable and low carbon energy technologies (>20kW capacity), including biomass, hydropower applications since 2001. No applications for these technologies have been made in West Oxfordshire.

The figure below compares the total renewable and low carbon generating capacity (>20kW) in West Oxfordshire with other rural district, borough and unitary authorities in England. This is an indicator of relative contribution toward the country's decarbonisation objectives, though this comparison doesn't take into account land area or resources. West Oxfordshire's 62.7MW is less than 38 other authorities and is much smaller than Cornwall, which has the largest total capacity at 535MW. However, West Oxfordshire has an above average total installed capacity in comparison to mostly rural districts.

Figure 1 Total operational renewable energy capacity in West Oxfordshire (blue column) compared to other comparable local authority areas. Note that all districts with less than 20MW installed are excluded.

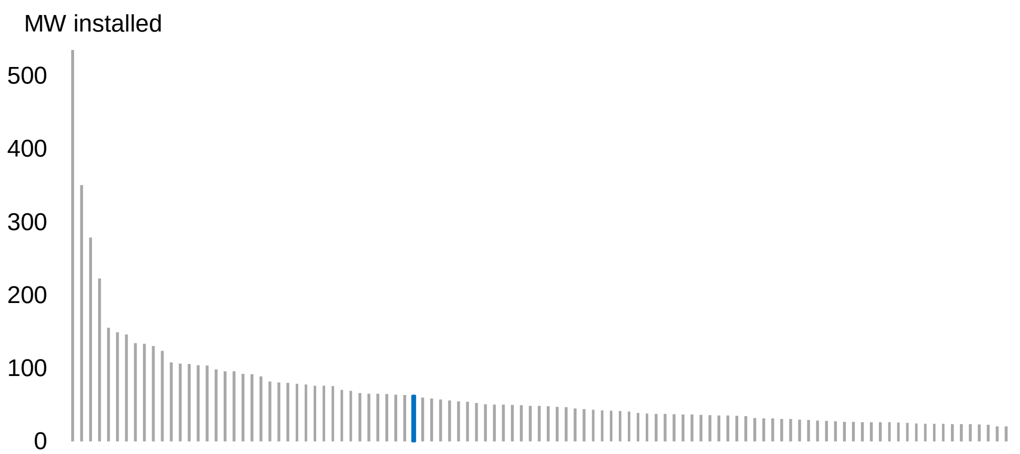
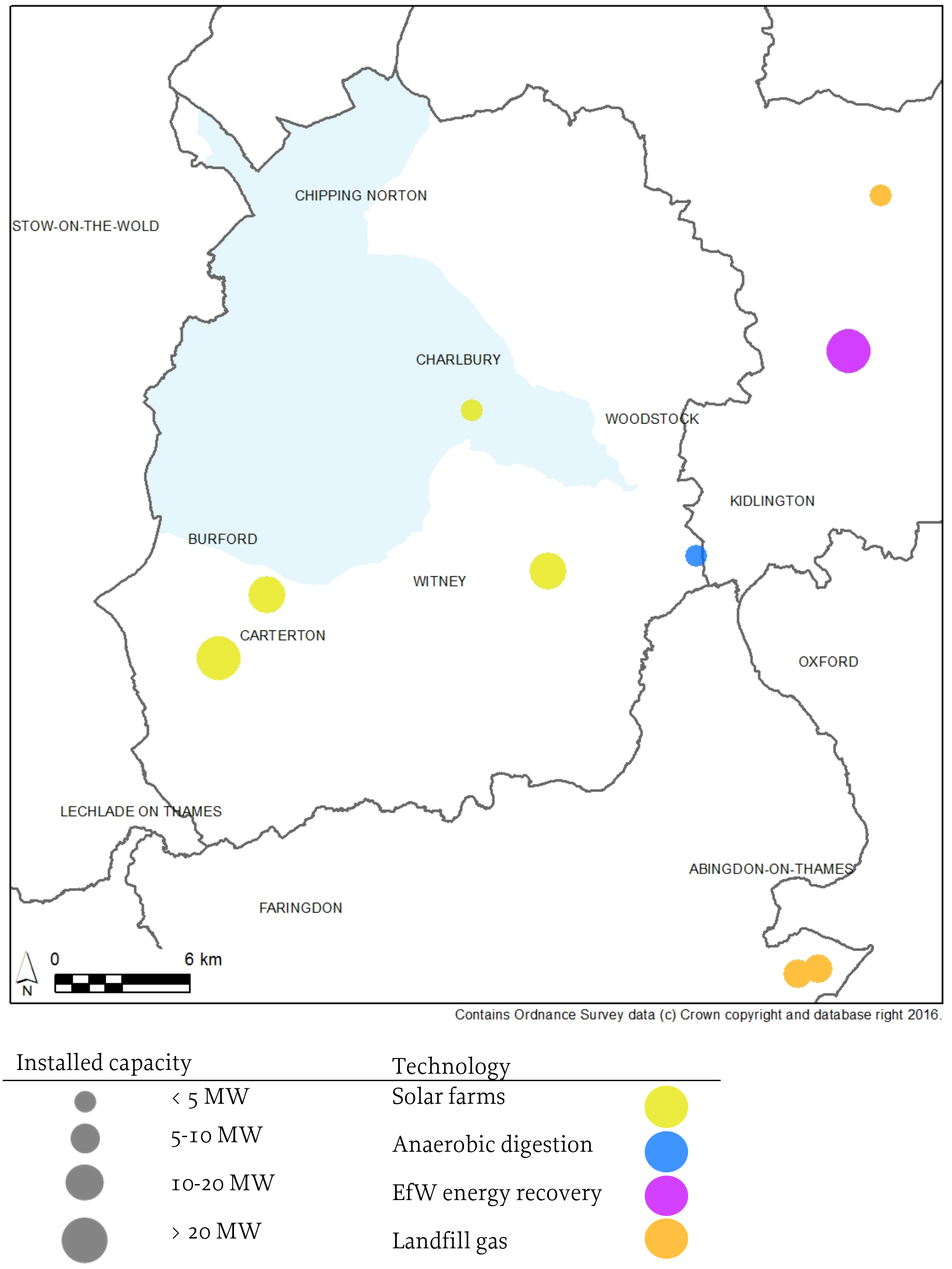


Figure 2 shows that large renewable and low carbon energy schemes in West Oxfordshire are spread across the south and centre of the District, with commercial solar farms located in the countryside around Carterton and Witney, the community solar farm project at Charlbury located within the Cotswolds AONB and the anaerobic digestion plant located at Cassington.

Renewable Energy And Low Carbon Energy Assessment And Strategy For West Oxfordshire

Figure 2 Map of existing large renewable and low carbon energy installations in West Oxfordshire. The Cotswolds Area of Outstanding Natural Beauty is shown in blue.



2.2. Current Incentives

2.2.1. Small Renewable Installations supported by the Feed-In Tariff

The Feed-in Tariff (FIT) offers a payment per unit of electricity generated from renewable energy technologies. Solar PV, anaerobic digestion, wind, and hydropower up to 5MW capacity are eligible. It is the principal financial mechanism supporting smaller renewable energy generators (below 20kW) which are not included in the figure above.

Since the incentive was introduced in April 2010 it has led to tremendous growth in small and medium scale renewable energy capacity and has led to more than 750,000 installations. Whilst the majority are rooftop solar PV arrays, almost 7,000 wind turbines have been installed nationwide with support from the FIT.

Ofgem's recent quarterly Feed-in Tariff Installation Report (data to end June 2016) gives information about the installations in West Oxfordshire:

- Domestic solar PV: Almost 2,600 systems installed, most of which are less than 4kW with a total capacity of 8.1MW. Domestic solar PV is installed across the whole of West Oxfordshire, both rural and urban, with concentrations in towns including Eynsham, Carterton and Witney.
- Commercial, industrial and communal PV: 52 systems installed, which tend to be larger with a total capacity of 2MW.
- Two small hydro power systems are operating with a total capacity of around 25kW.
- A single 6kW small wind turbine and a 1kW micro CHP system are also operating in West Oxfordshire.

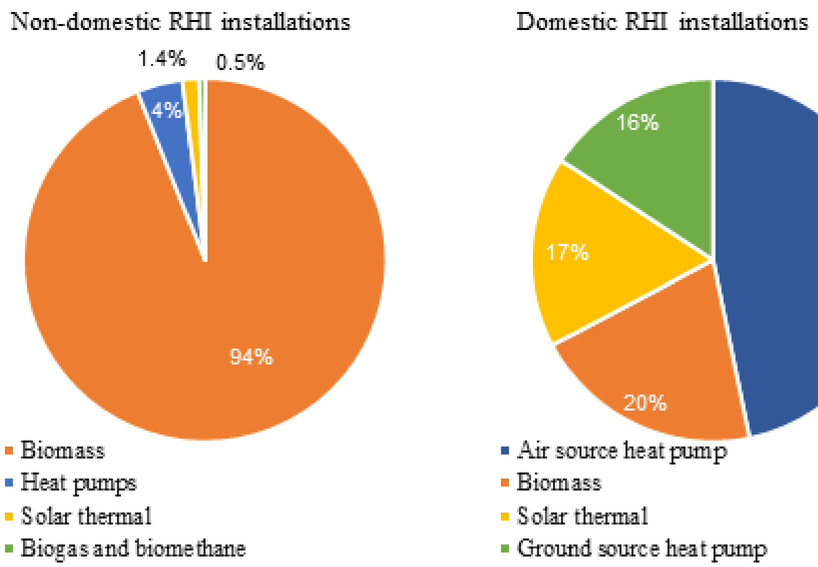
2.2.2. Small Renewable Heat Installations supported by the Renewable Heat Incentive

The Renewable Heat Incentive (RHI) is similar to the FiT and offers a payment per unit of heat generated in order to encourage a switch to renewable heating. A range of technologies including solid biomass, biogas, solar thermal and heat pumps are eligible. The non-domestic RHI was introduced in November 2011 for installations in commercial, industrial and agricultural sectors. The domestic RHI which supports renewable heating for households has been available since April 2014.

DECC's monthly statistics for the RHI from July 2016 provides information on uptake in West Oxfordshire. 391 domestic renewable heating systems have been installed since April 2014, which is 43% of all RHI installations in Oxfordshire. A further 40 non-domestic systems are operating with a combined installed capacity of 5.6MW, over a quarter of all installations in Oxfordshire. This suggests that West Oxfordshire is already experiencing higher uptake than its neighbouring authorities. This suggests that low carbon heating systems are well suited to the district.

While more detailed information about the technology and size of these installations is not available at local authority level, national data indicates that more than 90% of non-domestic installations are biomass boilers (primarily with a capacity <200kWth) and almost half of domestic systems are air source heat pumps, with ground source heat pumps, biomass boilers and solar thermal panels also present in signifcant proportions (Figure 3).

Figure 3 Renewable heat installations by technology type. National data from DECC's monthly RHI statistics.



2.2.3. Large Renewable Installations, Contracts For Difference

Large renewable and low carbon energy projects will be supported by the Contracts for Difference (CfD) mechanism. A 'contract for difference' provides a guaranteed minimum price for the electricity generated and sold. This minimum 'strike price' is set through competitive auctions, with the lowest priced bids winning a CfD contract.

The subsidy is variable and makes up the difference between the market price and the pre-agreed strike price. If the market price exceeds the strike price, the generator is required to pay back the difference, protecting consumers from over-payment. Overall CfD aims to provide incentives more efficiently, while also giving investors greater certainty in the return on investment.

The first CfD auction round was in February 2015 with the second round initially scheduled for 2016. This is now delayed until early 2017 and onshore wind and solar farms are expected to be excluded from this auction. At the time of writing, any new onshore wind and solar farm capacity would need to rely on the market prices in order to fund development.

3.0 Renewable and Low Carbon Energy Potential

3.1. Introduction

The existing renewable and low carbon energy capacity study for West Oxfordshire was published in 2009[1]. It covered a range of technologies, including micro-renewables, CHP/district heating and large wind, with some information on energy from waste.

This assessment revisits the analysis and provides updated conclusions in light of advances in technology, new planning policy and guidelines, and current approaches to developing renewable energy. It also extends to solar farms and battery storage, which were not included in the 2009 study but have become an important renewable energy technology across England.

This assessment of potential renewable and low carbon energy potential includes:

- Wind power.
- Solar farms.
- Hydropower.
- Renewable and low carbon heating.
- Energy from waste.
- Battery energy storage.

Since the 2009 study, DECC has published guidance[4] which establishes a common basis for renewable energy capacity assessments. Our approach builds on this methodology to identify potential locations for new renewable and low carbon installations. It has been adapted to take account of new information including revised planning policy and guidance[5] and insights from appeals and local plan examinations, particularly in the wind power and solar farm sectors.

This assessment of the potential for renewable and low carbon installations within the district takes into account the following:

- The renewable energy resource: for example, areas of high average wind speed.
- Hard constraints: exclusion areas around physical constraints, such as railways and other constraints where renewable energy development is likely to be incompatible with an existing use.
- Landscape, historic and natural environment: Renewable and low carbon energy installations need to be sensitively located within the landscape and the historic and natural environment.

[4] Renewable and Low-carbon Energy Capacity Methodology for the English Regions. January 2010.
[5] Online Planning Practice Guidance on Renewable and Low Carbon Energy; Written Ministerial Statement (HCWS488) – Solar energy: protecting the local and global environment made on 25 March 2015; Written Ministerial Statement (HCWS42) – Local planning made on 18 June 2015.

3.2. Wind Power

3.2.1. Introduction

Wind power is the most widespread renewable energy technology and is the largest source of clean energy in the UK. In 2015, wind generated around 11% of annual electricity demand; over half of that was supplied from onshore wind turbines. According to Renewable UK, that is equivalent to the annual needs of around 8.25 million homes; more than 30% of UK households[6].

Commercial-scale wind turbines are a mature and proven technology. They are currently regarded as the lowest cost source of renewable electricity and as such represent the most cost-effective way to reduce emissions from the electricity supply. Their greater height and long blades, relative to smaller turbines, allow them to capture more energy from the faster moving air higher above the ground.

Commercial turbines typically have a generating capacity of 1.5 to 3MW, with hub heights above 70m and a full height to the blade tips of up to 150m. By European standards, commercial turbines typically deployed in the UK are relatively small; hub heights of more than 100m and turbines of 150-200m are becoming the norm in mainland Europe. This demand from the European market means that larger turbines tend to be less expensive per MW and are benefitting from more technical improvements in terms of efficiency, noise reduction and maintainability. There can be benefits therefore in considering larger turbines where they can be accommodated.

There are a number of smaller free-standing wind turbine models available, with generating capacity starting at 6kW. Smaller turbines are suited to producing electricity to meet the needs of rural homes, farms as well as commercial and industrial businesses. The smaller tower and shorter blades means that they can be less visually intrusive and may be located nearer to homes and built up areas.

3.2.2. Existing Wind Power Installations

There are no commercial-scale wind turbines installed in West Oxfordshire. A small 6kW wind turbine is operational.

The majority of the UK's onshore wind turbines are installed in regions with strong winds and low population density. DECC statistics from 2014[7] indicate that more than half of onshore wind farms are in Scotland, Wales and Northern Ireland. Of England's regions, Yorkshire and the Humber, the East of England and South West together account for almost two thirds of sites. The South East, including Oxfordshire account for just 3% or 1.1GW of installed wind capacity.

[6] http://www.renewableuk.com/en/news/press-releases.cfm/05-01-2016-new-records-set-in-best-ever-year-for-british-wind-energy-generation#sthash.pJm9aFIO.dpuf

[7] DECC, Renewable electricity in Scotland, Wales, Northern Ireland and the regions of England in 2014.

Renewable Energy And Low Carbon Energy Assessment And Strategy For West Oxfordshire

In Oxfordshire, one wind farm is operational. The West Mill Community project at the site of a disused RAF airfield near the village of Watchfield has five 1.3 MW wind turbines (total capacity of 6.5 MW).

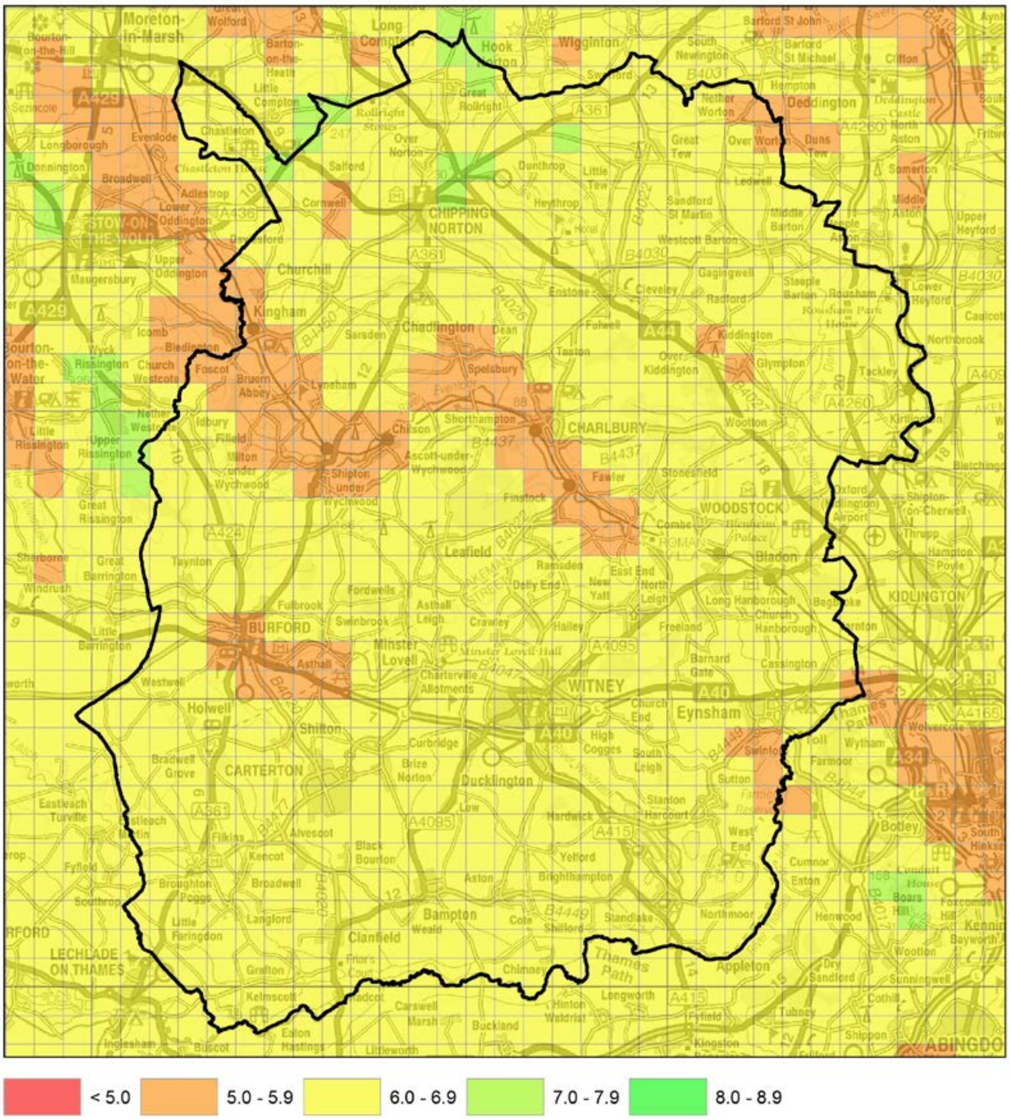
3.2.3. Wind Resource

The Met Office provides estimated average annual wind speed data at a 1 km^2 resolution which is used as an initial indicator of where wind turbines could be suitable and is shown in Figure 4. It is important to note that this data does not take into account local landscape, topography and obstructions such as trees.

DECC suggests that only areas with average annual wind speeds above a minimum threshold of 5.0m/s at 45m above ground level (agl) should be considered. Higher wind speeds would increase the likely productivity of the turbines and will be more attractive to developers. Areas with lower estimated average wind speeds at 1km^2 resolution could have locations which have higher local winds and, with careful micro-siting and the selection of wind turbine models suited to low wind sites, could also prove viable. Figure 4 indicates that wind speeds across West Oxfordshire are likely to be sufficient for wind power.

Renewable Energy And Low Carbon Energy Assessment And Strategy For West Oxfordshire

Figure 4 Estimated average wind speeds across West Oxfordshire (m/s)



3.2.4. **'Hard' Constraints**

The proximity of the proposed turbines to physical infrastructure and the transport network are important safety considerations. Suggested minimum safe distances are:

- Principal transport network – The Highway Agency provides guidance on the siting of wind turbines close to trunk roads in its Spatial Planning Advice Note SP12/09. The minimum safe distance to motorways, A and B roads and railways is the turbine's 'topple distance' (based on tip height) plus a 50m margin.

Renewable Energy And Low Carbon Energy Assessment And Strategy For West Oxfordshire

- Major overhead transmission lines – The minimum safe distance is the tip height of the turbine plus 50 meters, according to DECC guidance.
- Woodland or inland waters are considered hard constraints as it is assumed that wind turbines are unlikely to be erected within those areas.

Wind turbines produce some noise and could cause a nuisance to homes nearby. The impact can be managed by maintaining a minimum distance of 600m, according to DECC guidance, between large turbines and residential buildings. A minimum distance of 400m should be maintained between small turbines and built up areas.

Figures 5 and 6 show that large scale wind[8] in particular is constrained by the presence of residential properties because of the dispersed nature of settlements in the district. This conclusion must however be treated with some caution because wind turbines are frequently approved closer than 600 metres to residential properties, often in cases where residential properties are occupied by the landowner or farmer promoting the development. Noise and nuisance impacts are however likely to be an important constraint to development of wind turbines within the district.

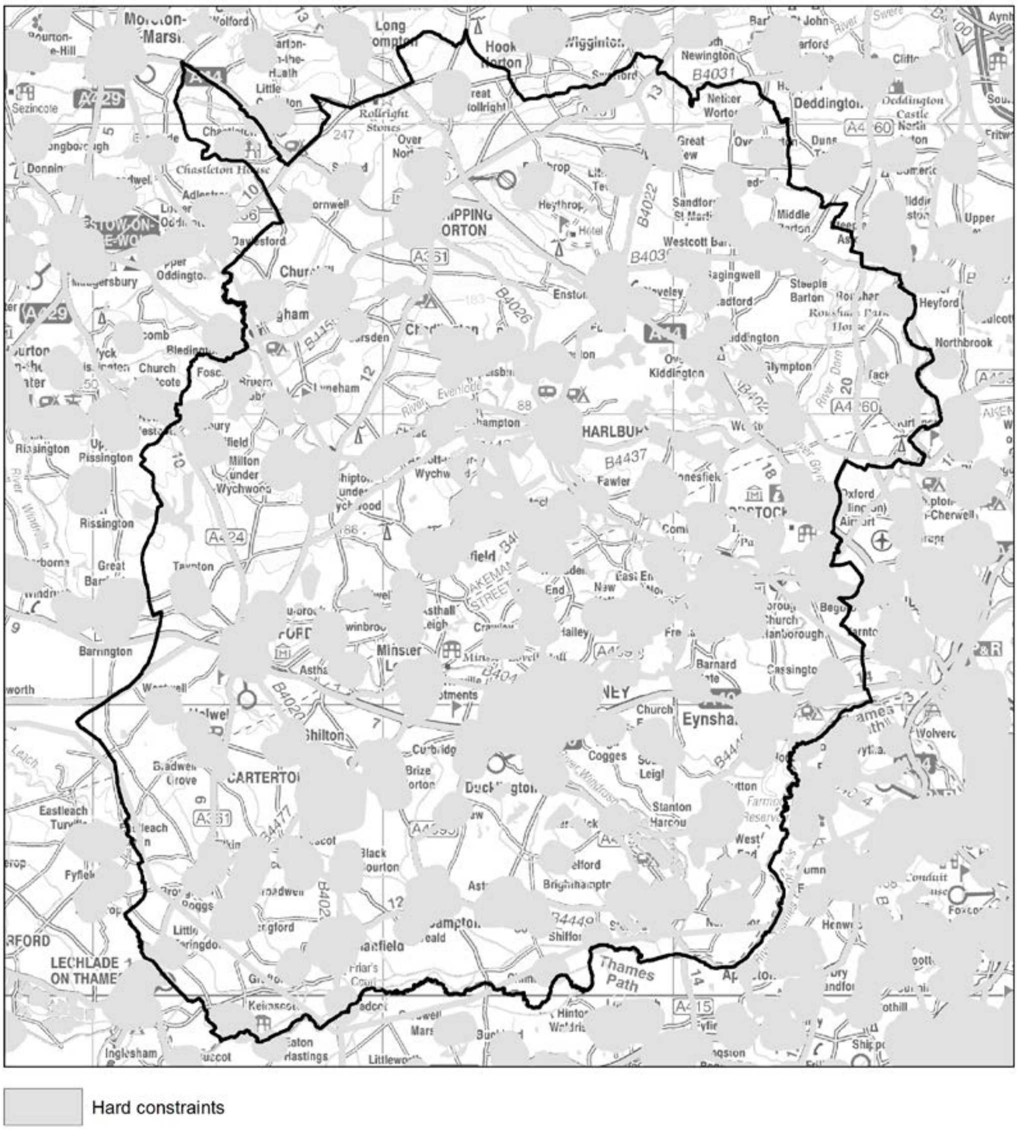
[8] Figures 5 and 6 (hard constraints) assume large wind turbines have a tip height of 135m and rotor diameter of 100m and small wind turbines have a tip height of 45m and rotor diameter of 25m.

Renewable Energy And Low Carbon Energy Assessment And Strategy For West Oxfordshire

Figure 5 Large Scale Wind – Constrained areas (in grey) comprise areas within 600m of residential buildings, minimum safe distances to motorways, A and B roads and railways, minimum safe distances to major overhead transmission lines and areas of woodland and inland waters.

Renewable Energy And Low Carbon Energy Assessment And Strategy For West Oxfordshire

Figure 6 Small Scale Wind – Constrained areas (in grey) comprise areas within 400m of residential buildings, minimum safe distances to motorways, A and B roads and railways, minimum safe distances to major overhead transmission lines and areas of woodland and inland waters



3.2.5. **Aviation Constraints**

Commercial-scale wind turbines can conflict with aviation. As well as presenting obstacles to low flying aircraft, turbines can interfere with radar and communication signals. Their spinning blades can 'clutter' radar screens which can create 'holes' in coverage, potentially masking signals. As a result, National Air Traffic Services (NATS), airports, airfields and aerodromes are important consultees during the wind planning process.

Renewable Energy And Low Carbon Energy Assessment And Strategy For West Oxfordshire

The Civil Aviation Authority provides guidance on wind turbines, which includes pre-planning advice for LPAs when assessing the viability of wind turbine developments. NATS also provide additional guidance on restrictions to wind turbine locations around radar, communication and navigation sites. The guidance includes the following safeguarding areas:

- 30km for aerodromes with a surveillance radar facility.
- 17km for non-radar equipped aerodromes with a runway of 1,100 m or more, or 5km for those with a shorter runway.
- 4km for non-radar equipped unlicensed aerodrome with a runway of more than 800m or 3km with a shorter runway.
- 10km for the air-ground-air communication stations and navigation aids.
- 15 nautical miles (nm) for secondary surveillance radar.

In addition, NATS provides Geographical Information Systems (GIS) maps[9] which help determine whether a turbine might interfere with its radar. The maps show where turbines would be within line-of-sight of at least one NATS radar. It doesn't represent an exclusion zone but means that further detailed assessment would need to be carried out by the applicant.

These areas are presented in Figure 7 and denote where consultation should take place. They do not necessarily mean that no turbines can be erected but they do indicate that they would be either 'undesirable' or 'undesirable but possible', indicative of a substantial constraint.

RAF Brize Norton is the largest station in the RAF and is home of the country's air transport and air-to-air refuelling fleets. It is located in West Oxfordshire and would be an important consideration in any proposed wind turbine development in the district.

London Oxford Airport at Kidlington is one of the fastest growing airports in Europe[10]. The airport intends to install a new surveillance radar system to manage increasing traffic at the airport and at RAF Brize Norton. As a result, the safeguarding zone around the airport has been increased to 30km.

In addition to these major aviation constraints are Enstone aerodrome, a private airfield with a 4km safeguarding buffer, and RAF Little Rissington, which is in Cotswold District but its safeguarding area (5km buffer) extends into parts of West Oxfordshire.

It is relevant to note that in 2010, Partnerships for Renewables, a wind energy developer, was seeking to install a single commercial-scale wind turbine at Cutteslowe Park, North Oxford. Early consultations with RAF Brize Norton indicated that it could have interfered with its radar stations and the project was abandoned.

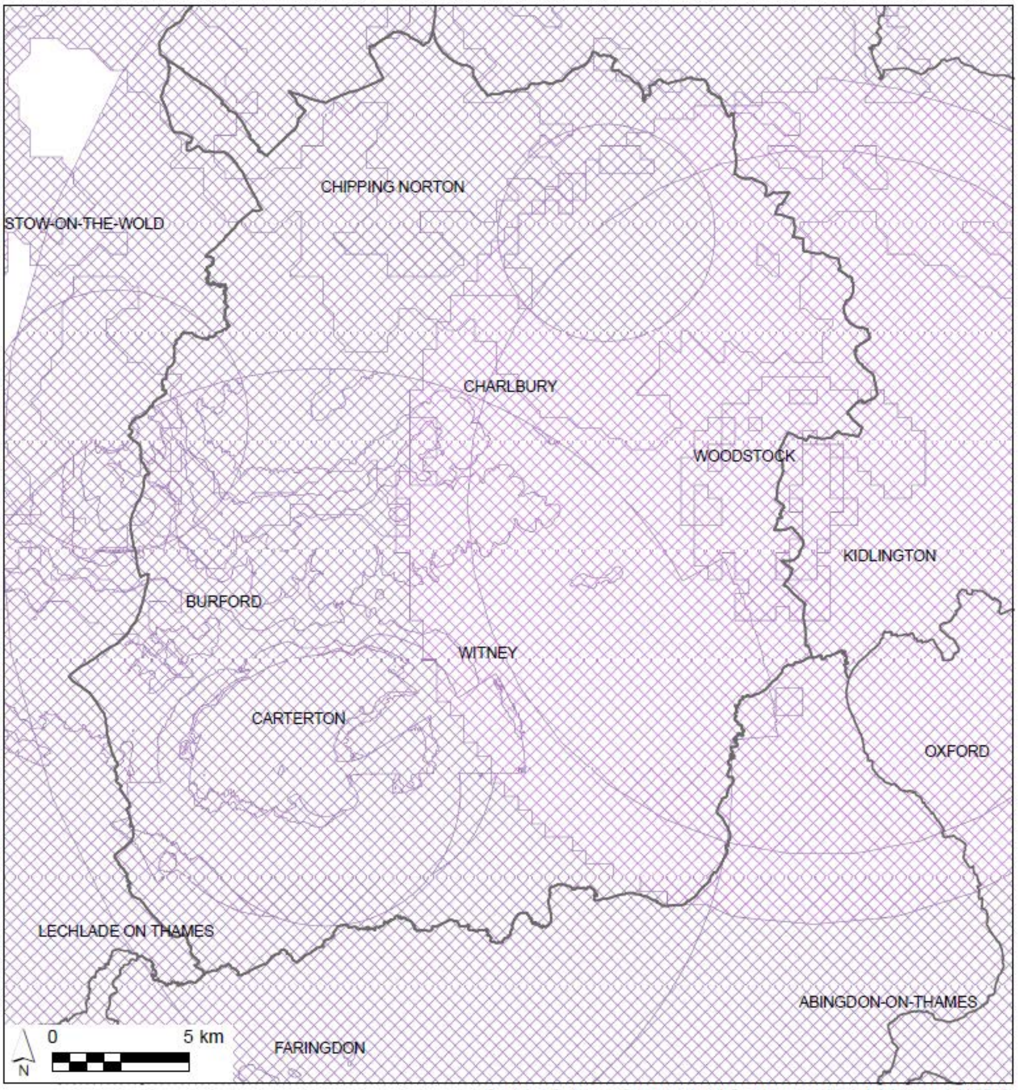
Aviation constraints do not however prohibit development in all circumstances. A combination of appropriate site selection, design mitigation and, where necessary and

[9] http://www.nats.aero/services/information/wind-farms/self-assessment-maps/
[10] https://www.ainonline.com/aviation-news/business-aviation/2016-05-20/oxford

Renewable Energy And Low Carbon Energy Assessment And Strategy For West Oxfordshire

financially viable, contributions towards radar improvements can make siting of wind turbines acceptable.

Figure 7 Aviation constraints in West Oxfordshire (shown as purple hatched)



Contains Ordnance Survey data (c) Crown copyright and database right 2016.

3.2.6. Suitable Areas for Wind Power

Areas of the district that are not subject to 'hard' constraints are not necessarily automatically suitable for wind power. The district's landscape, natural and cultural assets are rightly prized and are key considerations in renewable energy planning. Not only is the location of renewable energy in relation to these assets important, but the scale, design and micro-siting of any proposed scheme.

Renewable Energy And Low Carbon Energy Assessment And Strategy For West Oxfordshire

Deciding whether a location is suitable for renewable and low carbon energy projects involves careful judgement based on its individual merits, including their landscape and visual impact, sensitivity to context and compliance with relevant planning policy and guidance. This will be critical to assessing whether or not areas are suitable in planning terms and also a development's acceptability to local communities.

These are key planning considerations, but they cannot be effectively identified at the scale of this study through the use of strict buffers and exclusions zones alone. To identify which are more likely to be suitable, a landscape based approach has been applied.

The methodological approach to this assessment can be summarised into the following stages (which are described in detail in the Appendix):

- Identification of the various wind power typologies that have an important spatial component and thus have the potential to influence the landscape on a district scale.
- Identification of the landscape baseline.
- Definition of key terminology used within the assessment.
- Assessment of the susceptibility of different landscapes to the technology and an assessment of landscape value.
- An assessment of whether landscapes are more or less suitable for development based on the judgements of susceptibility and value.

Based on the extensive experience built up nationally and current industry trends, the following wind energy development typologies are considered:

Table 2 Wind energy development typologies

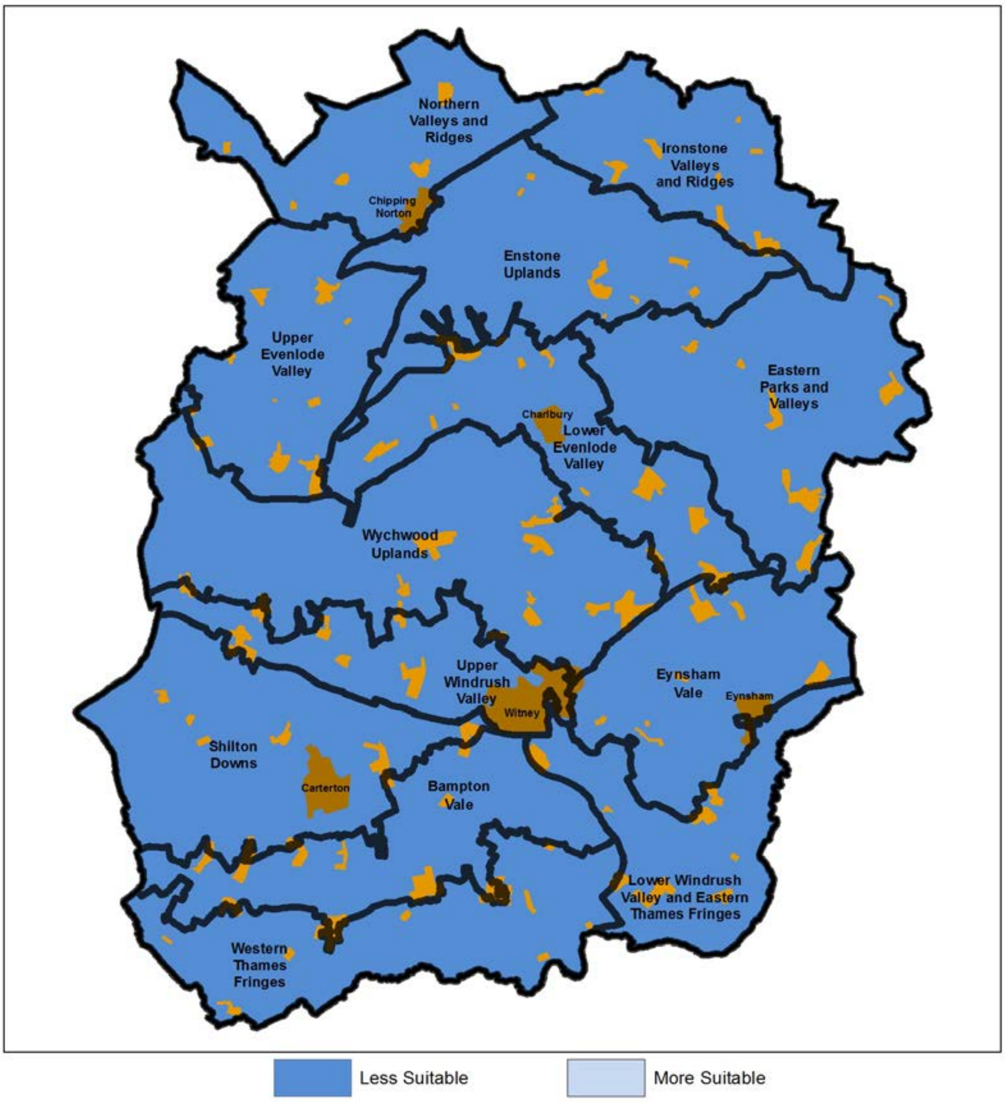
Development Typology	Turbine Size (tip height)	Cluster Size
Small Turbines	Up to 50m	Often deployed as a single or pair of turbines and occasionally in groups of three
Medium Turbines	50m – 90m	Often deployed as a single or pair of turbines and occasionally in groups of three
Large Turbines	Over 90m	Occasionally deployed as single turbines although more typically seen in larger groupings

An assessment of whether landscapes are more or less suitable for wind power development are provided in the Appendix, based on the judgements of susceptibility and value. Importantly, the Appendix also includes guidance on the scope of development which may be suitable for each area.

Figures 8 to 10 present areas that are more suitable for wind power and areas that are less suitable for wind power using a landscape based approach.

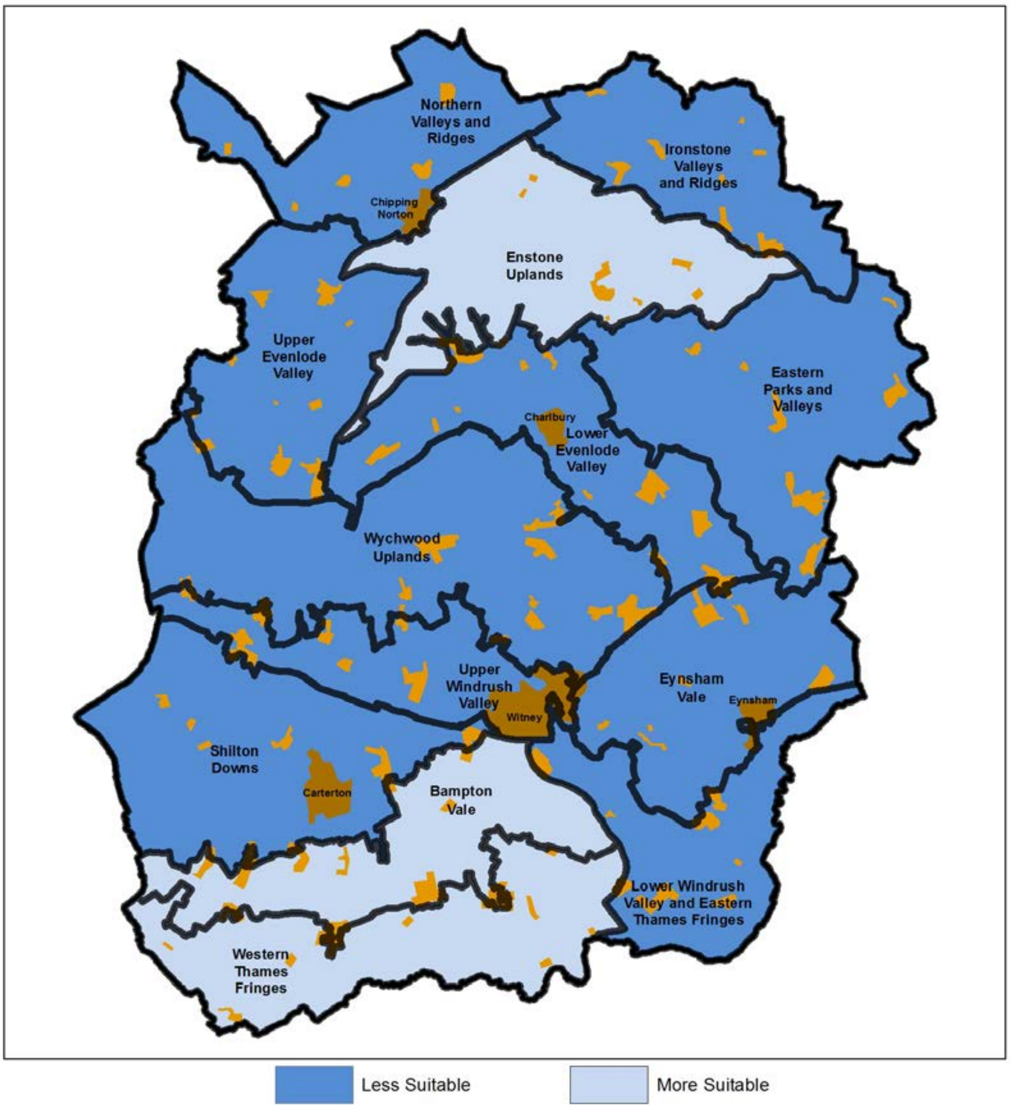
Renewable Energy And Low Carbon Energy Assessment And Strategy For West Oxfordshire

Figure 8 Suitability of West Oxfordshire for Large Scale Wind Power (landscape based approach).



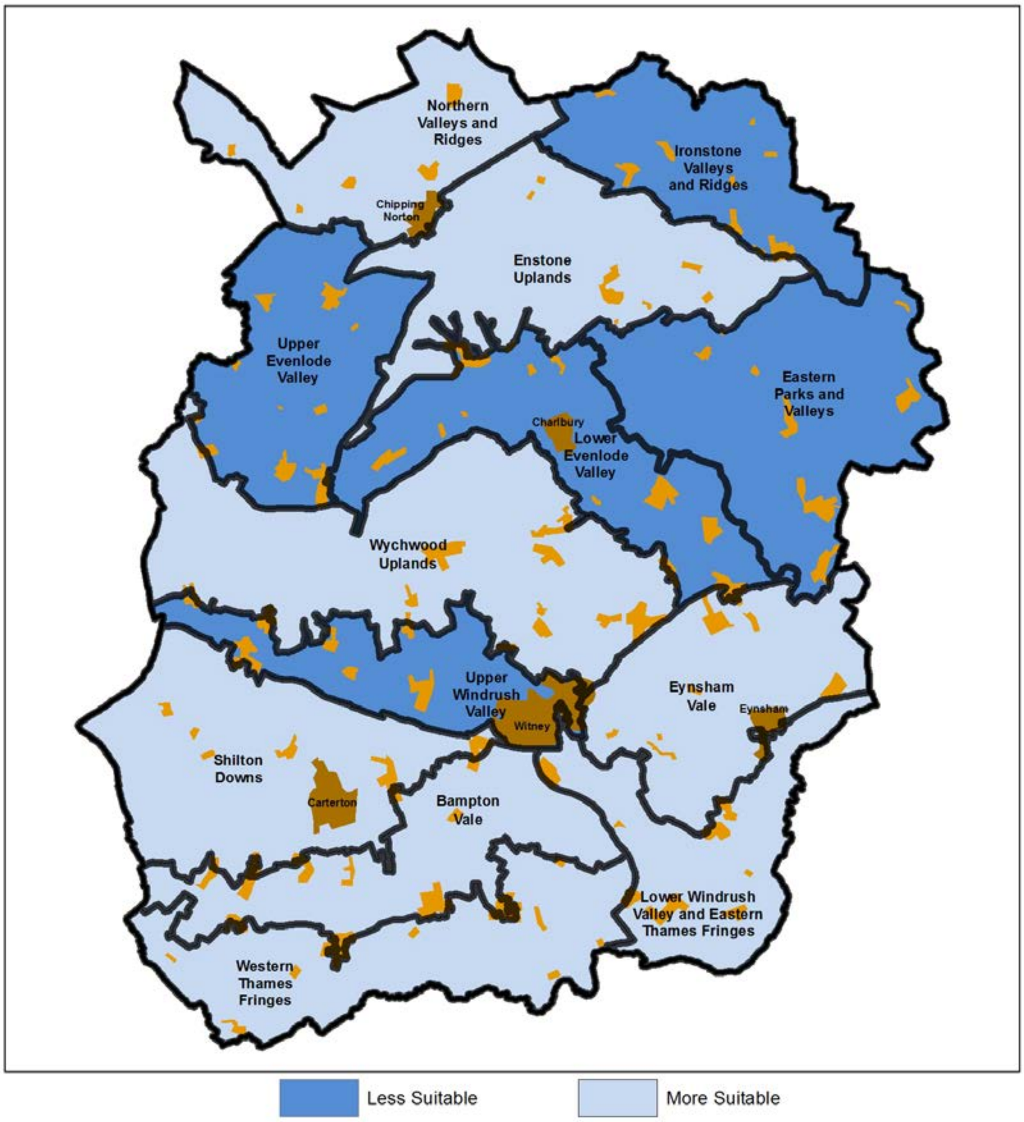
Renewable Energy And Low Carbon Energy Assessment And Strategy For West Oxfordshire

Figure 9 Suitability of West Oxfordshire for Medium Scale Wind Power (landscape based approach)



Renewable Energy And Low Carbon Energy Assessment And Strategy For West Oxfordshire

Figure 10 Suitability of West Oxfordshire for Small Scale Wind Power (landscape based approach)



3.3. Solar Farms

3.3.1. Introduction

Solar farms are ground or water-mounted installations of solar photovoltaic (PV) panels. Solar farms have become more common in recent years due to improving technology, falling costs, availability of financial subsidy and in general the lower likelihood of severe landscape and visual impacts. UK-wide, there is currently more installed solar capacity than onshore wind. Solar farms are typically large, constructed on hectares of agricultural land and generate multiple megawatts of electricity at peak output.

3.3.2. Existing Solar Farm Installations

Solar farms with a combined installed capacity of 67MW are operating or consented in West Oxfordshire which suggests that it is an attractive area for solar developers and means that more applications should be expected in the future, regardless of whether or not subsidies exist.

3.3.3. Solar Resource

Levels of solar irradiance vary gradually across England with sunny southern regions favoured, but the difference across West Oxfordshire is small. The aspect, orientation and slope of the land, as well as shading, can have a greater influence on overall energy production. While it is important for developers to take account of the available solar resource, it is not a critical issue in deciding where solar farms may be appropriate within the district.

3.3.4. 'Hard' Constraints

Solar farms have been built alongside airports, motorways, railway lines, and roads, and within woodland clearings and on standing water bodies, such as lakes. As such, very few truly hard constraints exist for solar. Exclusion buffers around nearby infrastructure are therefore of very little value.

Hard constraints are limited to existing developed areas as demolition costs are likely to render a scheme financially unviable. Developers will also normally avoid encroaching on to public rights of way due to the risks and delays involved in applying to divert or extinguish them.

3.3.5. Best and Most Versatile Land

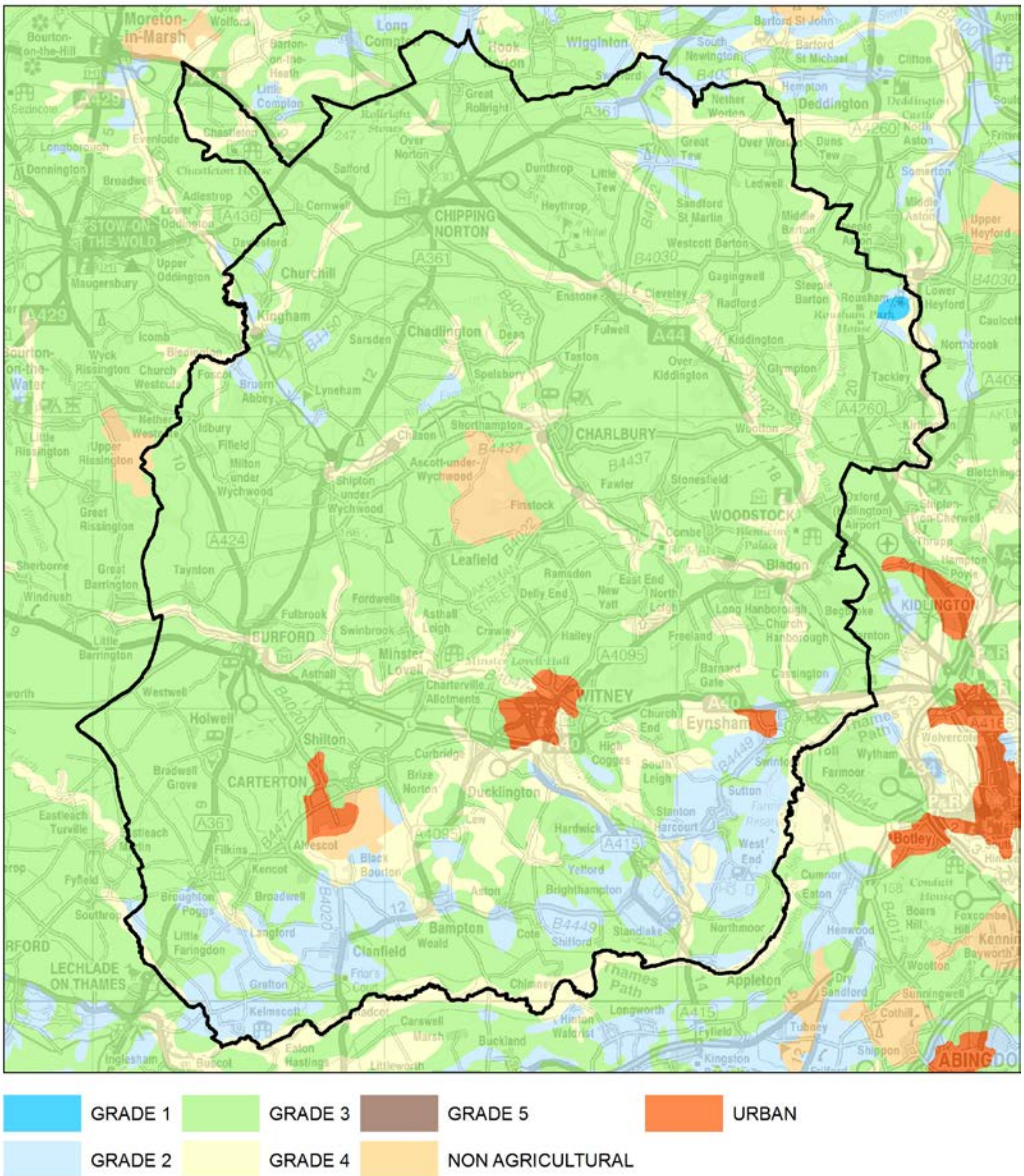
The NPPF states that local planning authorities should "*take into account the economic and other benefits of the best and most versatile agricultural land and where significant development of agricultural land is demonstrated to be necessary, local planning authorities should seek to use areas of poorer quality land in preference to that of a higher quality*", which is defined as land in grades 1, 2 and 3a of the Agricultural Land Classification.

The Written Ministerial Statement Solar energy: protecting the local and global environment (HCWS488) states that any proposal for a solar farm involving the best and most versatile agricultural land would need to be justified by the most compelling evidence.

The DEFRA agricultural land classification data, which only provides a broad indication of the classification, grade indicates that West Oxfordshire is comprised primarily of grade 3 land, with some small areas of higher quality grade 2 (Figure 11). The national classification map does not normally differentiate between 3a and 3b land, but the difference is important since the latter is not "best and most versatile". Therefore, without an on site-specific Agricultural Land Classification (ALC) it is not possible to anticipate with any certainty the extent to which best and most versatile land is a constraint. For the purposes of this assessment, it is assumed that Grade 3 land does not present a constraint to solar farm development, subject to a site-specific ALC being carried out.

Renewable Energy And Low Carbon Energy Assessment And Strategy For West Oxfordshire

Figure 11 Agricultural land classification in West Oxfordshire (DEFRA)



3.3.6. **Suitable Areas for Solar Farms**

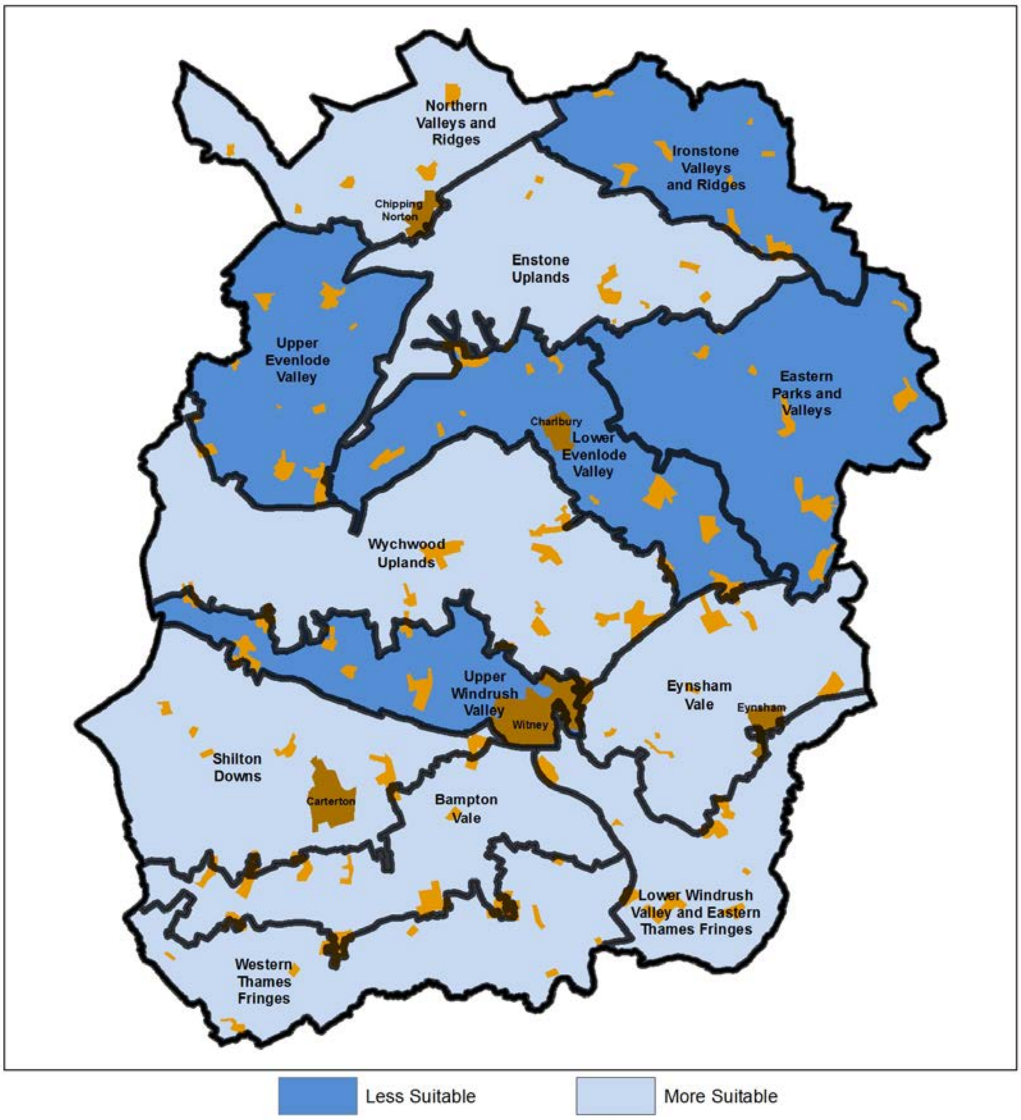
Very few hard constraints exist in relation to solar farms and the low lying profile of solar farms means that screening can be effective, with existing hedges and trees potentially able to mitigate most or all of the visual impact. On a site-specific level there are many other considerations which need be addressed which the guidance covers (Section 5). The relationship between solar farms and heritage assets and their settings and the natural environment is a particularly important consideration and carries significant weight in planning decisions.

DECC's methodology for assessing renewable capacity (2010) does not provide an approach for assessing solar farms. Therefore, this assessment uses the same landscape character-based methodology used in this assessment for wind power to identify more suitable and less suitable areas for solar farms. The assessment does not make particular distinction between size of solar farms as landscape effects on the district scale are likely to be similar. However, guidance on size and any particular constraints with respect to solar farms are discussed in the Appendix.

Figure 12 presents areas that are more and less suitable for solar farms.

Renewable Energy And Low Carbon Energy Assessment And Strategy For West Oxfordshire

Figure 12 Suitability of West Oxfordshire for Solar Farms (landscape based approach)



3.4. Hydropower

3.4.1. Introduction

The River Thames flows through West Oxfordshire's lowland river valleys. Together with the Windrush, Evenlode, Cherwell and their many tributaries, the district's watercourses could provide opportunities for small-scale run of river turbines.

Given the geography of the district, only run-of-river hydropower is likely to be practical. In run-of-river schemes, the water is taken directly from the river, passed through a turbine which generates renewable electricity and returned back to the watercourse. Other types of hydropower plant, such as impoundment dams and pumped systems, are more common in mountainous regions where water falls from greater heights. Run-of-river systems are designed to ensure that the river maintains its normal flow above minimum levels; protecting the river's ecological functions. Run-of-river hydro schemes do not impound the river so it is unlikely to have any role in flood management measures listed in the The Flood and Water Management Act 2010.

Hydropower schemes normally have a limited visual impact on the landscape because only the powerhouse, intake and possibly the penstock (a pipe which directs water into the turbine house) are visible. Both the turbine house and intake are relatively small structures and can be designed sympathetically with the local environment. In addition, new infrastructure can often be constructed around existing river infrastructure such as weirs and former mills, of which there are many in West Oxfordshire.

3.4.2. Existing Hydropower Installations

Two small run of river schemes in West Oxfordshire are operating with the support of the Feed-in Tariff incentive, each with capacity of less than 20kW.

Outside the District, a 49kW community-led hydro project began operating in 2015 at Osney Lock[11] in Oxford. A number of additional small hydro projects have been considered or are being planned across Oxfordshire, including a community project in Abingdon that was granted planning permission in 2013[12]. The Abingdon project and a number of other potential schemes are on hold because they are not currently considered financially viable.

3.4.3. Hydropower Resource

The Environment Agency published maps in 2009 showing where there might be opportunities for small-scale hydropower across the UK, taking into account both generating capacity and potential environmental sensitivity based upon modelled fish population data and Special Areas of Conservation (SAC)[13]. While the maps are indicative only, they provide an initial assessment of the hydro resource as well as the constraints and opportunities.

Opportunities are typically where existing barriers along the watercourse, such as weirs, could be refurbished to include a hydro turbine. This would limit any additional impact on the surroundings or the river's ecology.

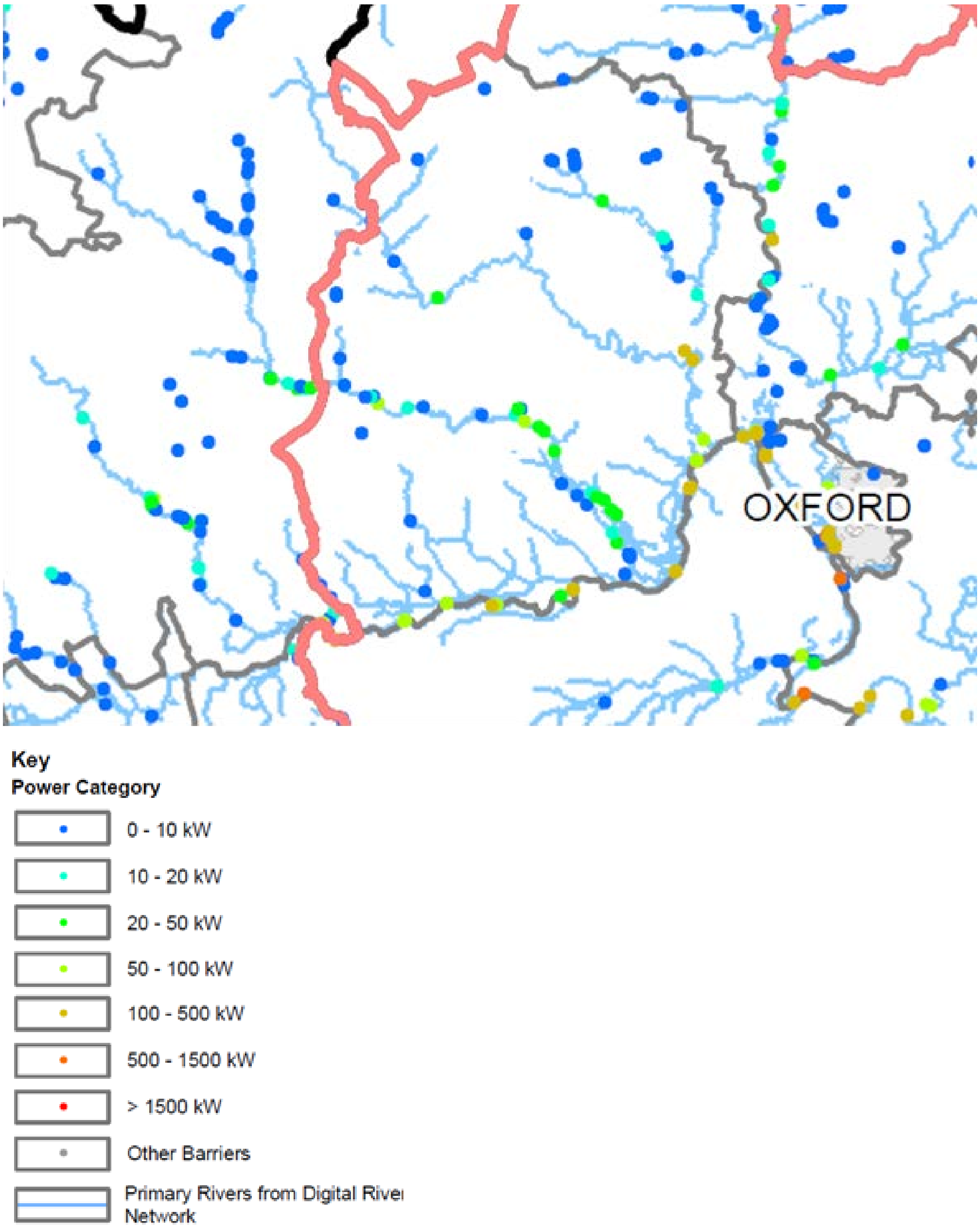
In West Oxfordshire, the maps identified several sites which are able generate sufficient power. Figure 13 indicates the majority are small 0-50kW opportunities, however there are a small number that could potentially support up to 500kW of generating capacity.

[11] http://www.osneylockhydro.co.uk/

[12] https://www.osep.org.uk/social-enterprise/abingdon-hydro-cic

[13] Mapping Hydropower Opportunities in England and Wales. Environment Agency. 2009. See also Mapping Hydropower Opportunities and Sensitivities in England and Wales, Technical Report, Final Report, February 2010.

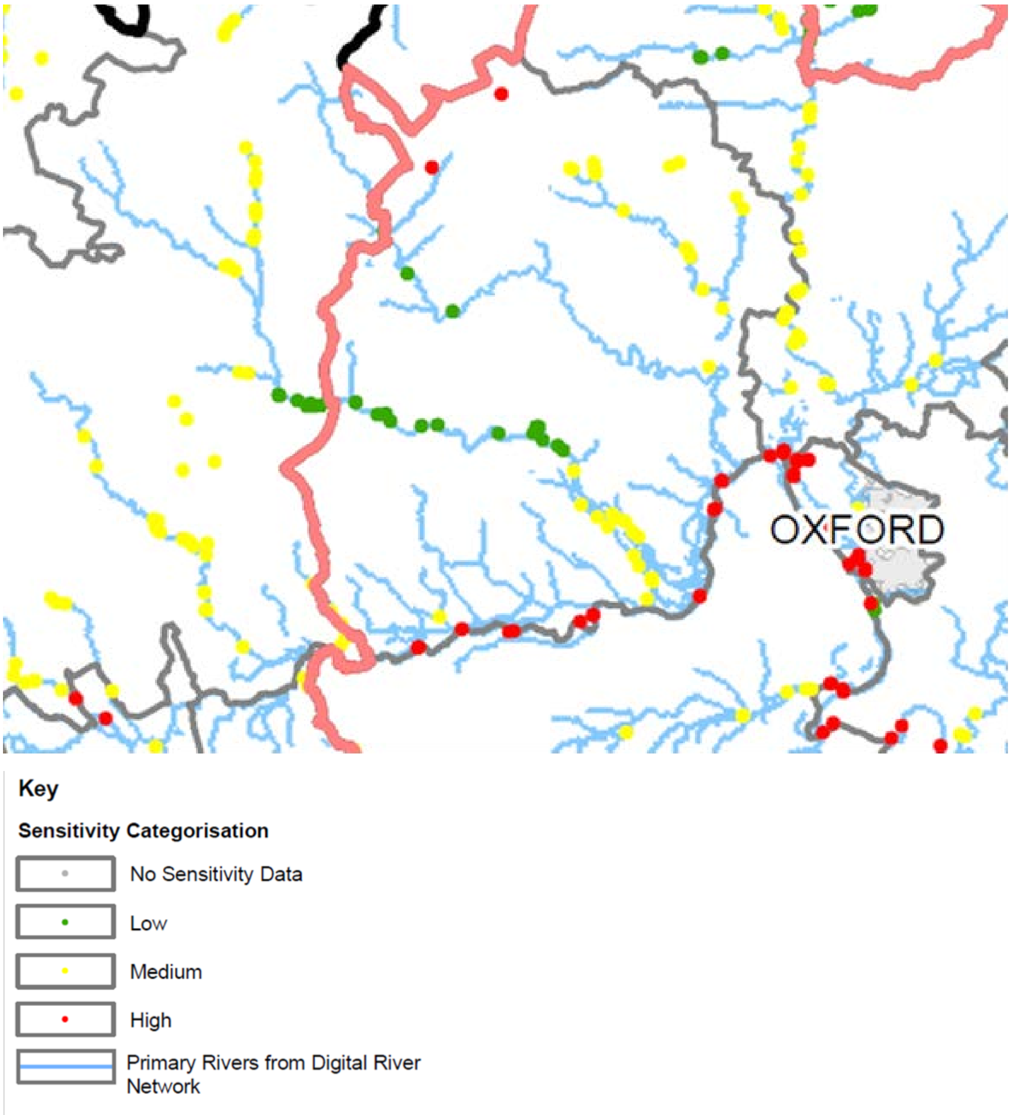
Figure 13 Maximum Power Potential, from EA, 2009, Mapping Hydropower Opportunities in England and Wales (Note that the red line in the figure is a regional boundary line and is not relevant to the analysis).



3.4.4. Ecological Constraints and Opportunities for Hydropower

Based on the Environment Agency study, the potential at the majority of these sites is likely to be limited due to their environmental sensitivity. Figure 14 indicates that most sites along the River Thames are considered highly sensitive. The least constrained opportunities are along the Windrush and Evenlode at sites with potential power capacities below 50kW. It should be noted however that the study was a coarse national overview based on modelled data. Detailed assessment by applicants on a site by site basis may conclude that sites are more suitable than indicated by the study.

Figure 14 Environmental Sensitivity, from EA, 2009, Mapping Hydropower Opportunities in England and Wales (Note that the red line in the figure is a regional boundary line and is not relevant to the analysis).



3.5. Renewable and Low Carbon Heat

3.5.1. Introduction

Renewable and low carbon heat can be generated by a range of technologies including biomass boilers, heat pumps, solar thermal and gas-fired combined heat and power (CHP), serving single homes or businesses through to communal heating systems providing heat to whole neighbourhoods with district heating.

District heating is distribution of heat from a central energy centre, which contains the heating system, through a network of insulated pipes to homes and businesses. The large size of the heating system means that the plant can be more efficient.

District heat networks can also make use of the waste heat from industrial processes or thermal power stations and can be used to provide space heating, hot water and heat for use in industrial processes. It can also be used to supply cooling if there is sufficient demand.

Permitted development rights allow many building integrated renewable and low carbon heating technologies to be installed without planning permission. However local authorities can play a strategic role in ensuring that adequate supplies of biomass fuels are available to those who want to install biomass heating technology. Local authorities and community groups can also help create demand for locally sourced woodfuel, which can contribute to the rural economy and improve biodiversity by bringing woodland back into active management.

3.5.2. Existing Renewable and Low Carbon Heating Installations

RHI installations statistics indicate that there has been stronger uptake of renewable heating in West Oxfordshire than other parts of Oxfordshire, with hundreds of residential installations and over 5MW of non-domestic capacity. Renewable heating is most attractive to households without a connection to the gas network. In West Oxfordshire 15-30% of households are not connected[14] and this may, in part, be driving uptake. There are no large dedicated power stations in West Oxfordshire and no district heating networks.

It is likely that small scale renewable heat installations will continue to be installed in West Oxfordshire to supply renewable heat to households and non-domestic uses.

3.5.3. Demand for Heat in Existing Towns and Villages

DECC's National Heat Map[15] presents estimated heat demand from buildings across England. It helps to identify where district heating might be possible and provides supporting evidence when prioritising the most promising opportunities. It is expressly designed to support local authorities in developing local energy policy.

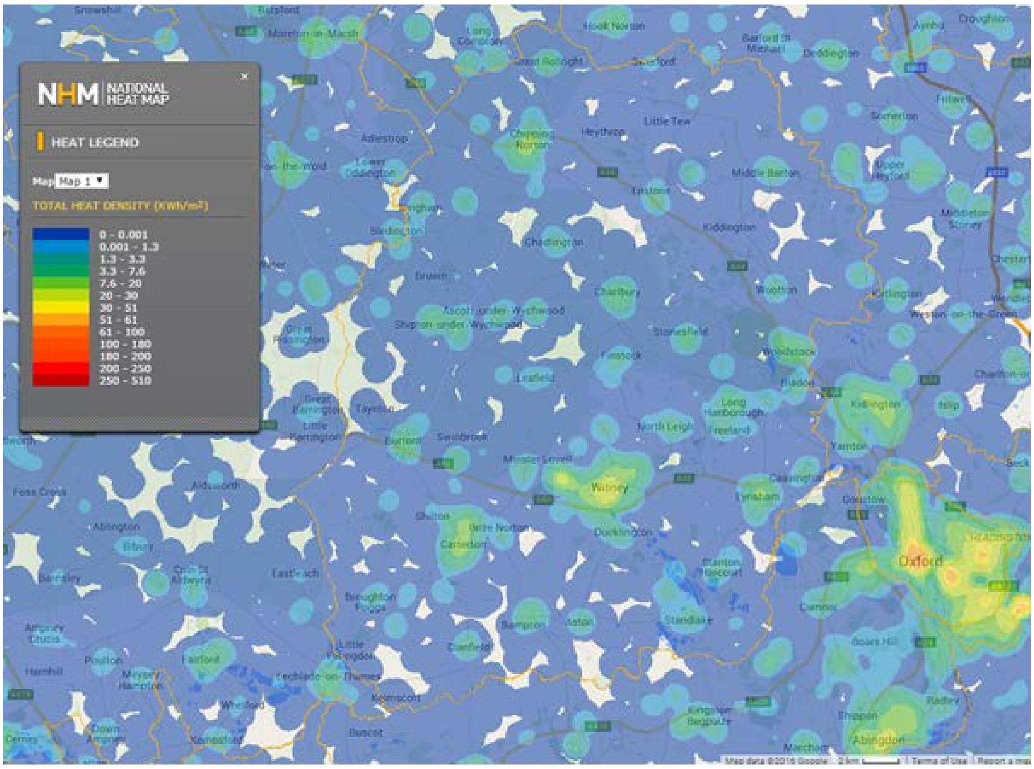
[14] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/267375/off_gas_grid.pdf
[15] http://tools.decc.gov.uk/nationalheatmap/#

Renewable Energy And Low Carbon Energy Assessment And Strategy For West Oxfordshire

The National Heat Map is built on industry standard benchmark energy demand data for residential, commercial and industrial buildings combined with metered heat data from public buildings (based on Display Energy Certificates).

The 'Total Heat Density' shown in Figure 15 is an estimate of heat demand density in kWh/m^2 from all building types present. Each colour band represents a range of heat demand density values, with yellow and red areas indicative of a higher demand for heat, and therefore greater potential for new district heating networks. The highest density of heat demand is West Oxfordshire is in Witney. A closer assessment indicates that heat density is highest in the town centre, as would be expected, due to the concentration of commercial, public and industrial buildings.

Figure 15 National Heat Map of West Oxfordshire (The Department of Energy and Climate Change)



3.5.4. District Heating Constraints

A high density of heat demand is a key factor in determining whether or not a district heating is viable. Based on metrics defined in a previous area-based district heating assessment[16], a heat density of at least $30kWh/m^2$ would indicate that a heating network

[16] GLA Decentralised energy capacity study (2011). Available at: http://www.london.gov.uk/sites/default/files/de_study_phase1.pdf

might be technically feasible in an existing neighbourhood, with a density above 50kWh/m^2 indicating a potentially promising opportunity.

The highest demand density is in an area of approximately one square mile in the centre of Witney, which includes the largest non-domestic heat consumers. The housing in central Witney is low density, characterised by semi-detached houses, short terraces and small units of flats. Due to the cost of retrofitting individual dwellings into a network, it is unlikely that it would be viable to connect them to any district heating scheme that might be developed. Residential connections have therefore been excluded from the analysis.

Table 3 below includes the estimated heat demand density in the centre of Witney from the key building types.

Table 3 Heat demand density estimates in central Witney from the National Heat Map.

Building Type	**Heat Density kWh/m^2**
Commercial	8.7
Public	5.9
Industrial	6.5
Total	**21**

The heat demand density of Witney does not meet the minimum threshold for an early stage district heating opportunity assessment. This is consistent with practical experience of district heating networks in the UK, which tend to be in city centres or based around high density residential blocks which already share communal heating systems.

In many cases, a catalyst is needed to develop a new district heating network. The replacement of aging heating systems in a large demand site, such as a hospital or leisure centre, or a new development that creates a substantial increase in heat demand density. While these opportunities may arise in West Oxfordshire in future, and should be supported where they do, the overall potential in the existing building stock appears limited.

3.5.5. District Heating in New Strategic Development Sites

New developments are required to meet high standards of energy conservation. Typically, these are met with insulation and air tight construction methods, but renewable and low carbon energy technology can also be used. Where higher standards are expected though planning policy or because of developer goals then energy technologies, including district heating, become essential.

The cost of installing district heating infrastructure in new developments is generally cheaper than in existing towns because it can be designed in and installed during construction. Density of development is a key consideration in reducing the cost of infrastructure. District heating might be a favoured solution in blocks of flats or where homes can be served alongside commercial businesses or other large heat consumers like hospitals and leisure centres.

Renewable Energy And Low Carbon Energy Assessment And Strategy For West Oxfordshire

WODC is in the process of identifying appropriate strategic development sites and the information needed to assess the feasibility of district heating was not available at the time of writing. It has therefore not been possible to undertake an assessment of the potential for district heating. The following case study of the Monkerton district heating scheme, with the networks serving a strategic development site is particularly relevant to West Oxfordshire because of the similarities with its own strategic sites. The main lessons of the scheme are presented for WODC below.

3.5.6. Monkerton District Heating Network Case Study

Exeter is a growing city and has delivered new housing through a number of strategic development sites outside the city. The high environmental standards of these developments and the challenges overcome in order to achieve them provide valuable lessons for other local authorities.

The Monkerton urban extension of 2,900 homes includes commercial floor space and scientific facilities. *The Monkerton Story*[17] includes more detail about the approach and the challenges overcome by the Council. It also includes helpful excerpts from the agreement with E.On to build and operate the network, other important agreements and contact details of the officers involved.

Building on positive experiences district heating at the Cranbrook development site on the outskirts of Exeter, the City Council decided that it should support further efforts to reduce carbon emissions. A comprehensive approach to low carbon development was put in place through the Core Strategy, with a set of specific policies included to deliver this goal.

A decentralised energy policy expected developers of sites with ten or more dwellings, or with a floor space of at least 1,000 m^2, to either install a site-wide district heating network or connect to an existing network nearby. The strong policy wording means that developers would need to prove that a network was not viable in order to pursue another approach. The alternative strategy would still be expected to deliver equivalent carbon savings to the district heating option.

The Monkerton area, comprising a 170 ha site which already included a business park and the Met Office HQ, was included in the Core Strategy as a strategic development site. In 2009 the Council prepared a masterplan with an accompanying 'Energy Framework', a forward looking site-wide energy strategy. A communal district heating system was recommended as the most cost effective site-wide approach to meeting the government's proposed energy efficiency and zero carbon homes policies, which would apply to later phases of the development.

E.On developed a plan to install a network to serve the whole Monkerton development, with heat provided by a central gas combined heat and power (CHP) plant. The scheme would be built, operated and funded by E.On in exchange for the long term revenue stream from heat sales. The additional funding needed would be raised through a fixed connection fee of £3,950 paid by the developers for each property connected to it. Devon County Council

[17] The Monkerton Story by John Rigby, Chair Low Carbon Task Force. Available at: http://www.exeterandeastdevon.gov.uk/monkerton-district-heating/.

agreed to lease E.On a site for the central CHP. Exeter City Council did not contribute funds and no grant funding was used.

To deliver the development with a district heating network, an agreement was reached by the project partners and a special purpose vehicle was created to take charge of delivery. The Monkerton Heat Company (MHC) was created to own the network. MHC was owned by each of the developers and Exeter City Council. As each developer site was completed they would exit the MHC leaving the City Council as the sole owner of the completed network scheme. This required that the Council take on the long term liabilities as well as the assets but ensured that the partners were held to their obligations and met agreed performance standards.

The Code for Sustainable Homes and government's zero carbon homes policy were important drivers of higher construction standards and the energy strategy at Monkerton. District heating can be one of the most cost effective means of delivering the low carbon building standards that were expected to come into force. However, the zero carbon homes policies have since been rescinded (see below) and local authority powers to demand higher standards have been curtailed. There was a risk that developer's concerns about viability could lead to demands for a lower carbon reduction target and the abandonment of the district heating network. The Council's robust planning policy framework and other levers available to it helped to keep the plan on track and the network is now operational. However Exeter's experiences suggest a district heating network would be harder to deliver today, with current government policy.

The Council learned some important lessons through the process. A strong and supportive planning policy can provide an important basis for coordinating the long-term development and growth of district heating networks. Their willingness to enter into contracts and make long term commitments to the project helped ensure that the initial goals and ambition was maintained throughout the planning, development and construction phases. They took a proactive approach to delivery and worked in partnership with the private sector. The network faced challenges and enforcement measures contained in the planning consents were seen as critical in holding partners to their commitments.

3.5.7. Biomass Supply

The Biomass Suppliers List is a list of RHI eligible woodfuels and biomass suppliers managed by DECC. It helps RHI participants ensure that their fuel meets sustainability criteria and has been used to identify approved suppliers in and around West Oxfordshire.

Figure 16 includes five registered suppliers within West Oxfordshire, providing sustainable pellets and woodchips. These are located at Chipping Norton, Witney and Carterton. Over two dozen more suppliers are within driving distance in surrounding districts at Farringdon, Abingdon, Bourton-on-the-Water and Banbury among others.

Figure 16 Location of biomass suppliers around West Oxfordshire from the Biomass Suppliers List

Supply is increasing with a new biomass depot recently opened in Carterton. It is part of a national network of sites giving access to a biomass supply chain. Commercial biomass suppliers are operating in West Oxfordshire to serve current demand and, based on communications with local suppliers, appear able to respond to future growth in demand from residential and commercial customers.

Oxfordshire has a large number of woodlands some of which are managed by estates. Bringing woodland into active management could provide woodfuel, grow the rural economy, as well as providing a richer and more varied habitat for wildlife. Local woodlands could be used as an alternative source of wood fuel if there was sufficient demand and bringing them into active management could be shown to be economically viable.

3.6. Energy from Waste

3.6.1. Introduction

Our historic reliance on landfill to manage our waste is being replaced with a suite of more environmentally-friendly options. Today, waste management policy is guided by the waste hierarchy, which sets the order of preference, starting with waste prevention, reuse and recycling. What can't be recycled (the residual waste) could either go to energy recovery or as a last resort, landfill. Recovering energy from waste is prioritised over sending it to landfill because efficient conversion technologies can produce usable energy that, with the right waste, is a low carbon energy source.

3.6.2. Existing Energy from Waste Sites

West Oxfordshire works with all Oxfordshire councils to coordinate waste management infrastructure across the County through the Joint Municipal Waste Management Strategy.

Oxfordshire County Council is the waste planning authority and submitted its new Minerals and Waste Local Plan in 2015. It sets out the existing waste infrastructure and projections for increases in waste management capacity in future.

There is currently 44MW of operational energy from waste (EfW) capacity in Oxfordshire. A 2.1MW anaerobic digestion (AD) plant at Cassington is the destination for food waste collections and is the only waste facility within West Oxfordshire. A second AD plant is under construction near Wallingford. Ardley EfW is the largest energy from waste scheme in the area with 24MW of capacity and is designed to take all of Oxfordshire's residual solid waste. 6MW of Advanced Conversion Technology EfW has been consented at Finmere Quarry, but has not yet constructed. As a result of these recent investments, Oxfordshire sends little untreated municipal waste to landfill.

3.6.3. Additional Energy from Waste Capacity Needs

The Core Strategy of Oxfordshire's Minerals and Waste Local Plan indicates there is sufficient waste management capacity for municipal solid waste and organic food waste collections. In the medium term there is a projected need for additional commercial and industrial recycling capacity – an additional 138,000 tonnes per annum (tpa) from 2021 to 316,000 tpa by 2031 – that can help divert waste away from landfill across Oxfordshire.

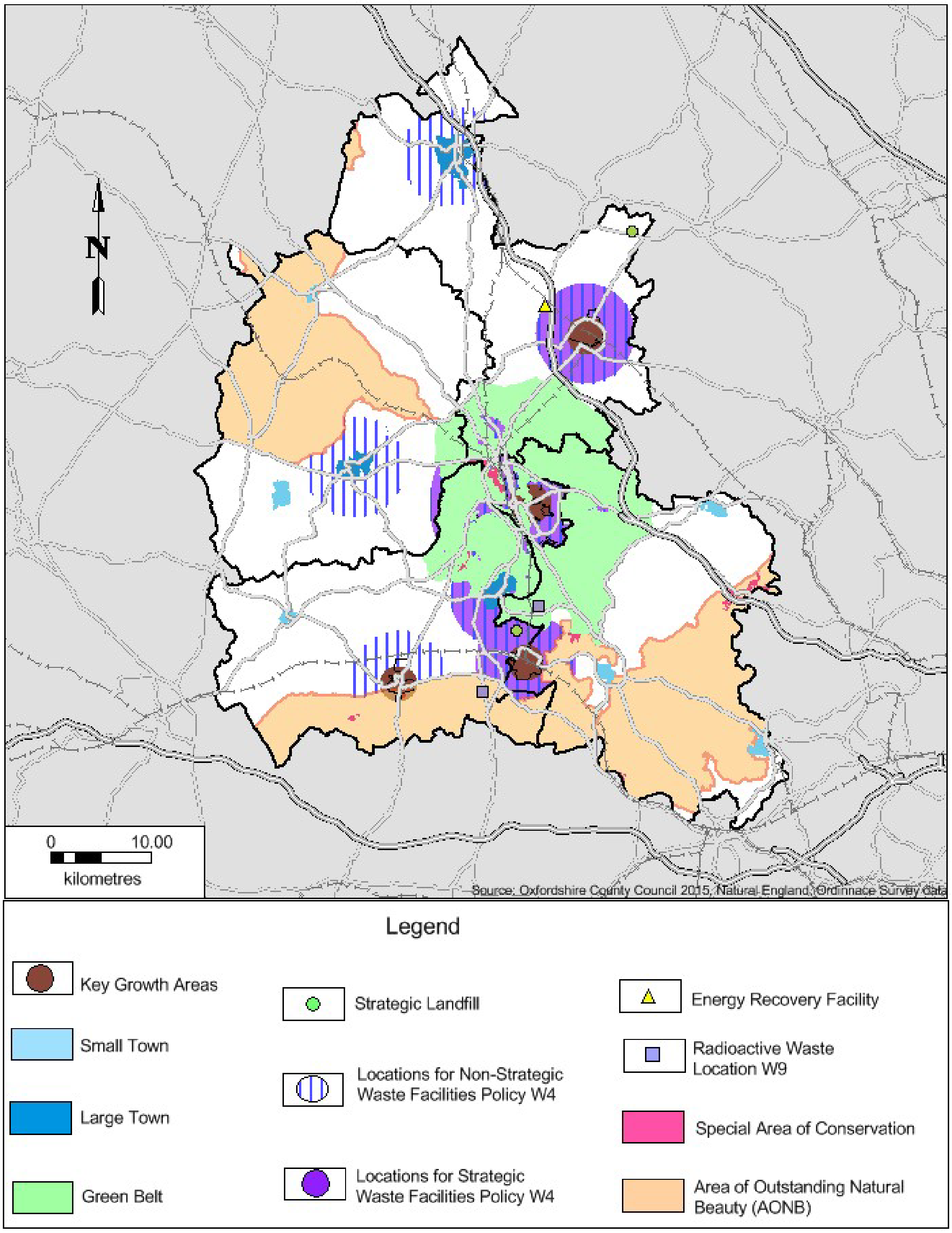
In order to meet the Oxfordshire waste management targets, the need is for recycling rather than recovery. While additional energy from waste capacity could be used to meet targets, recycling capacity would be prioritised as it is higher up the waste management hierarchy.

Policy W4 in the submitted Core Strategy indicates that non-strategic waste management facilities (those with Recycling/Treatment/Recovery Facilities with 20-50,000 tpa throughput) should normally be located in or close to large towns, including Witney. Larger strategic waste sites (more than 50,000 tpa throughput) are not considered suitable in West Oxfordshire.

Renewable Energy And Low Carbon Energy Assessment And Strategy For West Oxfordshire

The broad area around Witney that may be appropriate is highlighted on the Waste Key Diagram in Figure 17.

Figure 17 Key Waste Diagram from the Core Strategy of Oxfordshire's Minerals and Waste Local Plan



Renewable Energy And Low Carbon Energy Assessment And Strategy For West Oxfordshire

It is possible that new EfW proposals could come forward in West Oxfordshire to meet the need for additional waste capacity in line with waste policy in future.

Criteria for assessing the suitability of any new sites is contained within policies W5 and C1 to C11 of the Waste Local Plan. These seek to give priority to locations which are:

- Already in waste management or industrial use.
- Previously developed, derelict or underused.
- Part of an active mineral working or landfill site.
- Existing agricultural buildings and their curtilages.
- Waste water treatment works.

More details about the suitability criteria can be found in the Waste Local Plan documents.

3.7. New Developments

The construction of new buildings offers an opportunity to integrate low emissions technology into their design. Paragraph 95 of the National Planning Policy Framework (NPPF)[18] states that local planning authorities should:

- Plan for new development in locations and ways which reduce greenhouse gas emissions.
- Actively support energy efficiency improvements to existing buildings.
- When setting any local requirement for a building's sustainability, do so in a way consistent with the Government's zero carbon buildings policy and adopt nationally described standards.

National standards for energy use in buildings are described by Part L of the Building Regulations. The current 2013 standards represent a 6% improvement over the previous 2010 standards. The standards can normally be met through energy efficiency and do not require renewable or low carbon energy systems to be installed.

In relation to new building, the government has announced that they do not intend to proceed with the zero carbon policy or allowable solutions but will be reviewing energy efficiency standards in the future. In its recent review of housing standards, the government decided not to include a nationally described standard for energy as part of the review..

Permitted development rights allow many small-scale and building integrated renewable and low carbon technologies to be installed without planning permission. While they can be important and widespread sources of distributed energy generation, the Council has only a strategic role in supporting these technologies.

[18] National Planning Policy Framework (2012). Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/6077/2116950.pdf

3.8. Battery Energy Storage

3.8.1. Introduction

Battery energy storage has been included in this Assessment due to its role in facilitating greater deployment of renewable energy projects, particularly those like wind or solar that have variable output, and to ensure West Oxfordshire is prepared in advance of likely future planning applications.

Battery energy storage facilities provide services to the electricity network by increasing electricity supply or demand on the network when it is useful to the operation of the system. Among the most important services they can provide are:

- Storing energy from renewables to smooth variable supply and enable renewables to meet peak demand.
- Helping energy consumers to manage their energy demand.
- Stabilising voltage and frequency on power networks.

These services are procured by the National Grid and other grid operators in order ensure stable and secure power supplies for UK homes and businesses.

The services they provide are also critical to achieving national and international decarbonisation targets and objectives, and for reducing the need to build new power stations. The National Infrastructure Commission (NIC) estimates[19] that energy storage projects together with interconnections and demand flexibility could save consumers up to £8 billion a year by 2030, help the UK meet its 2050 carbon targets, and secure the UK's energy supply for generations[20]. Energy storage therefore is critical to the modernisation of the electricity network and to enable a move towards a smarter more flexible system.

Rapid reductions in costs and a growing recognition of the role of battery storage in maintaining a secure and resilient power system is leading to increased deployment of battery storage facilities. National Grid's scenarios[21] suggest that up to 7GW of energy storage (excluding pumped storage) could be installed UK-wide by 2030.

3.8.2. Existing Battery Energy Storage Installations

No planning applications for battery energy storage had been received at the time of writing. Since most facilities will require planning consent, it is likely that battery deployment is low at present.

[19] Smart Power: A National Infrastructure Commission Report, 2016
[20] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/505218/IC_Energy_Report_web.pdf
[21] National Grid Future Energy Scenarios, 2016

3.8.3. **Battery Energy Storage Opportunities**

While there are a number of energy storage technologies available, lithium based battery systems are showing the potential for a rapid increase in installed capacity due to significant year-on-year cost reductions. Each technology will have different attributes but they information below relates to lithium-ion. These are likely to be installed:

- On sites near to electricity distribution infrastructure and substations.
- On industrial and other sites that include large consumers of electricity.
- Alongside existing renewable installations, including wind and solar farms and on sites where planning permission for wind and solar has been refused but an agreed grid connection is still available.

While batteries can be installed in buildings, manufacturers tend to install batteries within standard sized shipping containers which are 40ft long x 8ft wide x 8ft 6in high. Depending on the capacity of the overall system, this could be two containers together or a larger array of 20 containers or more. As a guide, a battery storage facility including around two to four shipping containers with associated plant, a substation building and a perimeter security fence will typically occupy an acre site (around 0.5 hectares).

The installations do not create emission other than a degree of noise from cooling units and are relatively small scale. As such, sustainable locations for energy storage are likely to be found in both urban and countryside locations near to grid connections. It is possible that West Oxfordshire will receive applications for battery storage in the near future.

The following section of the report summarises the potential and key considerations for each technology type and sets out a proposed strategy for WODC.

Renewable Energy And Low Carbon Energy Assessment And Strategy For West Oxfordshire

4.0 Renewable and Low Carbon Energy Strategy

At the UN Framework Convention on Climate Change in Paris in 2015, world leaders agreed to avoid the worst impacts of climate change by holding the rise in global temperatures to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C. The agreement was subsequently signed by 174 countries in New York on 22nd April 2016, making it legally binding.

The European Union (EU) already had its own commitments in place before the Paris agreement. The EU Directive 2009/28/EC published in 2009 sets out a binding requirement on the UK to provide 15% of its energy from renewables by 2020. The Directive has been transposed into UK law and so will remain in legally binding regardless of the UK leaving the EU, unless specifically repealed by the government.

The Climate Change Act 2008 places a legal duty on the Secretary of State to reduce greenhouse gas emissions by 80% over 1990 levels by 2050 and to adapt to the impacts of climate change. The fifth carbon budget under the Act came into law on 19th July 2016, committing the UK to reducing emissions by 57% against 1990 levels by 2032.

National planning policy within the NPPF requires local planning authorities to use their planning functions to help meet the UK's national and international obligations. The NPPF states that planning plays a key role in helping shape places to secure radical reductions in greenhouse gas emissions, minimising vulnerability and providing resilience to the impacts of climate change, and supporting the delivery of renewable and low carbon energy and associated infrastructure. The NPPF requires local planning authorities to have a positive strategy to promote energy from renewable and low carbon sources and to design policies to maximise renewable and low carbon energy development while ensuring that adverse impacts are addressed satisfactorily, including cumulative landscape and visual impacts.

Supporting decentralised, renewable and low carbon energy schemes is an important component of meeting carbon reduction targets and they are capable of delivering significant carbon savings over a short period of time.

In West Oxfordshire, four large scale renewable energy generating facilities are operational at the time of writing – three solar farms and an anaerobic digestion facility. Whilst this is a relatively small number, they represent a significant increase in renewable energy generating capacity in the district, providing 64.8 MW. Commercial and domestic solar PV together have provided around 10MW and non-domestic renewable heat systems have provided 5.6MW, with small amounts of additional capacity provided by biomass, hydropower and CHP. There is also the potential for an additional 4.3MW to be provided by a community-led solar farms, which is consented at Charlbury but not operational.

The following section sets out a proposed strategy for each technology by drawing together current planning policy and guidance and the potential for each technology identified in section 3.

Renewable Energy And Low Carbon Energy Assessment And Strategy For West Oxfordshire

4.1. Wind Power

4.1.1. Introduction to Technology

Wind power is currently the lowest cost source of renewable electricity and the most widespread renewable energy technology and largest source of clean energy in the UK. Furthermore, large commercial-scale wind turbines are a mature and proven technology.

Small turbines with a tip height of up to 50m are often deployed as a single or pair of turbines and occasionally in groups of three. Medium turbines (50m – 90m) are often deployed as a single or pair of turbines and occasionally in groups of three. Large turbines (over 90m) are occasionally deployed as single turbines although more typically seen in larger groupings.

4.1.2. Summary of Analysis

Whilst wind speeds across West Oxfordshire are likely to be sufficient for wind power, there are no commercial-scale wind turbines installed in West Oxfordshire.

Large scale wind in particular is constrained by the presence of residential properties and the dispersed nature of settlements in the district. Given the number of airports and airfields across and near to the district, aviation safeguarding areas cover the district in its entirety.

Whilst these provide significant constraints to wind power, especially medium and large scale wind turbines, a combination of appropriate site selection, design mitigation and, where necessary and financially viable, contributions towards radar improvements, can make siting of wind turbines acceptable.

The House of Commons: Written Statement on Local Planning in 2015 stated that:

"*When determining planning applications for wind energy development involving one or more wind 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 report (see Figures 8 to 10) identifies potentially suitable areas for wind in accordance with the Written Statement. Parts of the site are also covered by the Cotswolds AONB and heritage designations. However, even on these sites which benefit from high level protection, national planning policy does not act as a ban on such development. It is therefore concluded that presenting areas of the district as categorically unsuitable is not supported by planning policy.

Based on the landscape character analysis, which assesses the susceptibility and value of landscape character areas in the district, no parts of the district are 'more suitable' for large scale wind power and given the additional constraints already mentioned, there is likely to be a very limited potential for large scale wind power in the district.

Hard constraint areas for small and medium scale wind power are less extensive in the district. There may be some scope for these technologies subject to overcoming aviation constraints. The landscape character analysis concludes that most of the district is 'less suitable' for medium scale turbines, with Enstone Uplands, Bampton Vale and Western Thames Fringes being the only 'more suitable' areas (Figure 9). The landscape character analysis concluded that most of the district is 'more suitable' to small scale wind power (Figure 10). Limited opportunities exist for medium scale wind and significant opportunities for small scale wind in West Oxfordshire.

4.2. Solar Farms

4.2.1. Introduction to Technology

Solar farms are ground or water-mounted installations of solar PV panels. Solar farms have become more common in recent years due to improving technology, falling costs, availability of financial subsidy and in general the lower likelihood of landscape and visual impacts. UK-wide there is currently more installed solar capacity than onshore wind. Solar farms are typically large, constructed on hectares of agricultural land and generate multiple megawatts of electricity at peak output. Solar farms with a combined installed capacity of 67MW are operating or consented in West Oxfordshire which suggests that it is an attractive area for solar developers.

4.2.2. Summary of Analysis

Very few hard constraints exist for solar farms and those that are considered to be so, such as public rights of way, woodland and rivers, cover a small portion of the district. Whilst sites on best and versatile agricultural land are likely to be heavily constrained by the Written Ministerial Statement "Solar energy: protecting the local and global environment", it will be for applicants to undertake site-specific surveys to confirm whether the district's large areas of undifferentiated grade 3 land are subgrade 3a (best and most versatile) or 3b (lower quality land). Notwithstanding agricultural land classification, the landscape character assessment concluded that most of the district is 'more suitable' for solar farms (Figure 12). As such, there is significant potential for further solar farm development in the district.

4.3. Hydropower

4.3.1. Introduction to Technology

The River Thames flows through West Oxfordshire's lowland river valleys. Together with the Windrush, Evenlode, Cherwell and their many tributaries, the district's watercourses could provide opportunities for small-scale run of river turbines.

In run-of-river schemes, the water is taken directly from the river, passed through a turbine which generates renewable electricity before being returned back to the watercourse. Run-of-river systems are designed to ensure that the river maintains its normal flow above minimum levels; protecting the river's ecological functions. When the river level drops during dry periods the turbine is stopped automatically.

Hydropower schemes normally have a limited visual impact on the landscape once operational because only the turbine house, intake and possibly the penstock (which directs water into the turbine) are visible. Both the powerhouse and intake are relatively small structures and can be designed sympathetically with the local environment. In addition, in the case run-of-river hydropower, new infrastructure can be constructed around existing river infrastructure such as weirs and former mills, of which there are many in West Oxfordshire.

4.3.2. Summary of Analysis

Analysis of West Oxfordshire's rivers by the Environment Agency indicates that the hydro resource in West Oxfordshire is relatively significant. Several sites are potentially technically viable however detailed assessment of site ecology and hydro resource will be required to identify a given site is suitable. The potential for run-of-river hydropower installations is therefore significant, albeit providing a relatively small amount of renewable energy generation capacity relative to wind and solar.

4.4. Renewable and Low Carbon Heat

4.4.1. Introduction to Technology

Renewable and low carbon heat can be generated by a range of technologies - including biomass boilers, heat pumps, solar thermal and gas-fired combined heat and power (CHP) - serving single homes or businesses through to communal heating systems providing heat to whole neighbourhoods with district heating.

Permitted development rights allow many building integrated heating technologies to be installed without planning permission. However local authorities can play a strategic role in ensuring that adequate supplies of biomass fuels are available and supporting renewable and low carbon heat installations which require planning permission and those in new development.

4.4.2. Summary of Analysis

It is expected that small-scale renewable heat installations will continue to be installed in the district due to the large number of households that are not connected to the gas network. Whilst many installations will be outside the control of the planning system and unlikely to have spatial planning implications, supporting renewable heat installations and woodland management schemes can help stimulate a local supply chain for woodfuel with resulting benefits to the rural economy and woodland ecology.

District heating requires sufficient heat demand in order to be viable and given the low density of housing in the area, retrofitting district heating networks is unlikely to be viable in the district. Opportunities may exist for district heating on large demand sites when existing heating systems are replaced or suitable new development is built but the overall potential in the existing building stock appears limited.

West Oxfordshire are in the process of identifying appropriate strategic development sites however the information needed to assess the feasibility of district heating is not available. As discussed in the case study in section 3.5.6, a strong and supportive planning policy can provide an important basis for coordinating the long-term development and growth of district heating networks.

4.5. Energy from Waste

4.5.1. Introduction to Technology

Waste management policy is guided by the waste hierarchy, which sets the order of preference, starting with waste prevention, reuse and recycling. What can't be recycled (the residual waste) could either go to energy recovery or as a last resort, landfill. Recovering energy from waste is prioritised over sending it to landfill because efficient conversion technologies can produce usable energy that, with the right waste, is a low carbon energy source.

4.5.2. Summary of Analysis

A number of recent investments in energy from waste in Oxfordshire means there is currently sufficient waste management capacity in the district which limits the available supply of waste for additional plant.

In the medium term, an additional need for a recycling, treatment or recovery facility has been identified in the Oxfordshire Minerals and Waste local plan. However recycling installations rather than energy from waste plant would be the priority as recycling is higher up the hierarchy. As such, the potential for new energy from waste facilities is very limited at present.

4.6. Battery Energy Storage

4.6.1. Introduction to Technology

Battery energy storage facilities comprise one or more containers with ancillary plant usually located within a fenced compound. Battery facilities allow operators to buy electricity when it is cheap or available, and supply it later when it is needed. Storage can help reduce the impact of peak demand and the need for new power stations, while soaking up excess supply from power stations at other times of day. It also eases constraints on the electricity grid, reducing the need for grid reinforcements, and allow greater deployment and more efficient operation of variable generators such as wind turbines and solar panels.

There are a number of ways electricity can be stored within batteries. At the time of writing, many facilities use lithium-ion batteries. However many other types of battery exist and are being explored for future deployment.

4.6.2. Summary of Analysis

Rapid reductions in costs and a growing recognition of the role of battery storage in maintaining a secure and resilient power system is leading to increased deployment of battery storage facilities. Most facilities that are being planned and built at present are relatively small scale, that can be sited in a wider range of locations. Proximity to a grid connection with capacity for new generators rather than environmental sensitivity is likely to be the biggest constraint on development. The potential for deployment of battery storage is therefore significant. The potential role of storage in facilitating new economic activity also makes it an important technology, for example, aggregating multiple smaller domestic, commercial or community energy generation projects in order to access additional revenue streams, thereby adding value to projects.

4.7. Potential for Community Energy

Involving communities in energy development is an important part of maintaining the high public approval rating of many technologies and of fostering support for renewable energy projects in general.

There are already some examples in West Oxfordshire and Oxfordshire of the community playing a significant role in bringing new renewable energy projects to the planning stage and in some cases to delivery.

Community energy has the potential to deliver significant long term benefits to local communities, including reduced energy bills and increased energy sustainability and security. Community energy can also help foster greater support and acceptance of renewable energy development. This is particularly beneficial in areas such as West Oxfordshire where the natural environment is highly valued and renewable projects may not normally be supported by the community.

Given that community energy projects have existed in the area and the potential benefits of community energy, WODC should consider significant policy support for this model of renewable energy development. This could take the form of strategic policies that define what type of project will meet the definition of community energy and therefore receive policy support and the guidance attached to this report which sets out what communities need to consider when developing proposals. WODC could also encourage communities to consider developing a community energy plan to underpin the neighbourhood plan.

When defining the type of project that will meet the definition of community energy, WODC will need to consider a number of models exist ranging from full community ownership and control to ones where ownership is shared between the community and another party (usually the developer or operator).

If the community has full ownership and control, usually through some form of community energy enterprise, such as a cooperative, they will benefit from revenue generated and potentially discounted energy prices. Shared ownership could include:

- Split ownership – different parts of the renewable energy project are owned by the community and developer.
- Joint venture – the community partners with a developer to develop projects together.
- Equity shares – the community invests in a project in return for equity.
- Post-construction community buy out – the community purchases the project once it has been built and commissioned.

In general, projects where there is no community ownership but local benefits flow from the developer to the community either through payments or 'payments in kind' are not considered to be community energy.

4.8. Future Deployment Potential

Table 4 Potential for further deployment of renewable and low carbon energy developments

Technology	Potential
Wind Power - Large scale - Medium scale - Small scale	 Very limited Limited Significant
Solar Farms	Significant
Hydropower	Significant
Renewable and Low Carbon Heat (district heating)	Very limited
Energy from Waste	Very limited
Battery Energy Storage	Significant

4.9. Recommended Strategy

The UK remains committed to meeting at least 15% of its energy demand from renewable and low carbon sources by 2020 and to an 80% cut in greenhouse gas emissions by 2050 (Climate Change Act 2008).

There is potential to develop further renewable and low carbon technologies in West Oxfordshire and as such, we recommend the district includes a policy in the local plan to maximise the development of such technologies in the district. This needs to be balanced with WODC's vision[22] to meet the needs of the district's communities without significant change to the intrinsic character of the District, and the aims of maintaining an attractive and biodiversity rich environment and protecting the distinctive qualities of the district's towns and villages.

The overall strategy of the emerging local plan is that all development will be expected to give explicit consideration to the efficient, prudent use and management of natural resources including the use of sustainable construction, minimisation of waste and recycling of waste. **We recommend that WODC works with developers to ensure that opportunities for higher standards than existing Building Regulations are explored.** In some cases, it may also be possible for WODC or third party energy developers to facilitate higher levels of renewable and low carbon energy generation in new development.

[22] West Oxfordshire Pre-Submission Local Plan 2011-2031

Renewable Energy And Low Carbon Energy Assessment And Strategy For West Oxfordshire

Supporting decentralised, renewable and low carbon energy generation schemes is an important component of meeting carbon reduction targets. In the short term at least, WODC is capable of delivering greater carbon savings through new renewable energy infrastructure than will be achievable through the development of new low carbon buildings. **Our recommendation is to focus the energy strategy on maximising the deployment of renewable generation facilities, including battery energy storage, whilst avoiding significant adverse impact to the intrinsic character of the District, maintaining an attractive and biodiversity rich environment and protecting the distinctive qualities of the district's towns and villages. We recommend that guidance attached to this assessment together with the suitability maps for wind power and solar farms should be used to achieve this balance.**

With 15-30% of the district's households not connected to the gas network, it is likely that small scale renewable heat installations such as biomass boilers, will continue to be installed into households in West Oxfordshire. Our analysis found that additional demand could be met by commercial biomass suppliers in the district. However local woodlands could be used as a sustainable source of wood fuel if there was sufficient demand and bringing them into active management could be shown to be economically attractive. The benefits of stimulating a local biomass supply chain would be positive for the rural economy and ecology. For these reasons we recommend that **WODC maintains policy support for small scale renewable heat installations such as biomass boiler and proposals that include woodland management schemes should be supported.**

Our analysis found that environmental constraints on large-scale wind and technical constraints on district heating and energy from waste mean that to achieve significant levels of renewable energy generation, **the focus will need to be on small to medium wind power, solar farms and hydropower. We also recommend that equal support is given to energy storage** given that it will facilitate the development of renewable energy technology across the wider electricity distribution network.

Renewable and low carbon technologies occur at a wide range of scales with different characteristics affecting the relative impacts upon amenity and the natural and historic environments. We recognise that given the rich natural and historic environment of West Oxfordshire, the effect on landscape, visual, heritage and biodiversity are important considerations.

The assessment of wind energy proposals will involve consideration of the Written Ministerial Statement (WMS) "Local Planning", which states that local planning authorities should only grant planning permission if, 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.

In developing an appropriate response to the WMS in the proposed strategy, our Landscape Character Assessment has been used as the basis for identifying areas that are 'more suitable' and 'less suitable' for wind and solar power. As both areas are suitable, all proposals will comply with the first bullet in the WMS. However developers will also need to demonstrate compliance with the second bullet that "*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.*"

We recommend that applicants are encouraged through planning policy and our guidance to locate new developments in 'more suitable' areas. Where applicants deem it necessary to target 'less suitable' areas, we recommend that WODC requires clear justification to be provided.

The WMS does not change the statutory status of the development plan as the starting point for decision making. Therefore, it is important to note that all proposals for wind power will require an assessment on its own merits to ensure that impacts on amenity and the natural and historic environments are acceptable, including cumulative impacts. We recommend that Landscape and Visual Impact Assessments submitted with applications for wind power and solar farm development are assessed with regard to the guidance in the appended Landscape Character Assessment.

Cumulative impacts of existing operational, consented and proposed developments will need to be assessed by applicants, and suitable mitigation measures proposed, to minimise impacts on biodiversity and landscape character and quality. **WODC should ensure through planning policy that applicants demonstrate that cumulative effects do not become a significant or defining characteristic of the wider landscape, including across administrative boundaries and different landscape character types. Special attention and protection should be given to the landscape and biodiversity of the Lower Windrush Valley Project, the Windrush in Witney Project Area and the Wychwood Project Area**.

In accordance with the NPPF, great weight should be given to conserving landscape and scenic beauty in the Cotswolds AONB, which have the highest status of protection in relation to landscape and scenic beauty. **Planning permission should be refused for major developments[23] in the Cotswolds AONB except in exceptional circumstances and where it can be demonstrated they are in the public interest.** Consideration of such applications should include an assessment of:

- The need for the development, including in terms of any national considerations, and the impact of permitting it, or refusing it, upon the local economy.
- The cost of, and scope for, developing elsewhere outside the designated area, or meeting the need for it in some other way.
- Any detrimental effect on the environment, the landscape and recreational opportunities, and the extent to which that could be moderated.

Where possible, environmental mitigation should contribute to the enhancement of Conservation Target Areas (defined by Wild Oxfordshire) and Nature Improvement Areas. WODC should discuss with applicants how this will be achieved on a particular development with reference to guidance included in section 5.0. WODC

[23] Development carried out on a site having an area of one hectare or more (as defined in Article 2 of the Development Management Procedure Order 2015)

should also consider whether strategic objectives can be delivered where multiple applications are received.

Elements of many renewable energy schemes in the green belt will comprise of inappropriate development. In such circumstances, and as directed by policy, harm due to inappropriateness and harm to the openness and purposes of the green belt will be assessed. **For development proposals in the green belt, WODC will need to ask Applicants to demonstrate very special circumstances, which may include improvements to the green belt that are facilitated by the development, such as enhancements to access, landscapes, visual amenity, biodiversity or improving damaged and derelict land.**

WODC should seek to work with communities to explore opportunities to build upon existing successes in community-led renewable energy. Community energy has the potential to deliver significant long term benefits to local communities including reduced energy bills and increased energy sustainability and security. Community energy can also help foster greater support and acceptance of renewable energy development. This is particularly beneficial in areas such as West Oxfordshire where the natural environment is highly valued and renewable projects may not normally be supported by the community.

We recommend that developments that are genuinely led by or meet the needs of local communities receive particular policy support when considering the merits of renewable energy developments. WODC should provide support to communities where possible, including through the neighbourhood planning process. WODC should provide the information contained in this study to communities in order to support their assessment of the likely opportunities. In order for renewable energy development proposals to be considered community-led energy schemes they must be able to demonstrate that they are genuinely led by, or meet the needs of, local communities. **WODC should require applicants to submit a written agreement between the planning applicant and a community energy enterprise demonstrating that the benefits of all or part of the project will flow to the community for the lifetime of the project.** This approach is supported by the Community Energy Strategy[24] and the Shared Ownership framework[25] both of which are supported by the Government.

4.10. Emerging Policy Review

This section reviews the emerging policy on renewable energy in light of the findings of this report.

The emerging West Oxfordshire Local Plan 2031 includes the following policy on Decentralised and renewable or low carbon energy development. Policy EH4 states:

"*In principle, renewable and low-carbon energy developments, especially small scale community-led initiatives for wind schemes, solar clubs and the use of biomass will be supported.*

[24] Community Energy Strategy: Full Report. DECC. 2014
[25] Government response to the Shared Ownership Taskforce. February 2015.

Renewable Energy And Low Carbon Energy Assessment And Strategy For West Oxfordshire

Renewable or low-carbon energy development should be located and designed to minimise any adverse impacts, with particular regard to conserving the District's high valued landscape and historic environment. In assessing proposals, the following local issues will need to be considered and satisfactorily addressed:

- *impacts on landscape, biodiversity, historic environment, residential amenity, aviation activities, highway safety and fuel/energy security, including their cumulative and visual impacts;*
- *opportunities for environmental enhancement;*
- *potential benefits to host communities (including job creation and income generation).*

The use of decentralised energy systems, including Combined Heat and Power (CHP) and District Heating (DH), especially woody biomass fuelled, will be encouraged in all developments.

An energy assessment or strategy which assesses viability for decentralised energy systems, including consideration of the use of local wood fuel biomass and other renewable energy initiatives will be required for:

- *proposals on strategic development areas (SDAs)*
- *all residential developments in off-gas areas for 50 dwellings or more.*
- *all non-domestic developments above 1000m² floorspace."*

Reflecting the potential for each technology and the planning strategy, we would suggest updating the policy as follows:

Policy EH4 - Decentralised and renewable or low carbon energy development

In principle, renewable and low-carbon energy developments, especially small-scale wind power, run-of-river hydropower and the use of biomass will be supported. Battery energy storage developments that aid the deployment of renewable and low carbon development across the wider electricity network will generally also be supported.

Renewable or low-carbon energy development should be located and designed to minimise any adverse impacts, with particular regard to conserving the District's high valued landscape and historic environment. In assessing proposals, the following local issues will need to be considered and satisfactorily addressed:

- impacts on landscape, biodiversity, historic environment, residential amenity, aviation activities, highway safety and fuel/energy security, including their cumulative and visual impacts. Applicants for solar farms and wind power will be encouraged to locate new developments in 'more suitable' areas as shown in the suitability maps. Where applicants deem it necessary to develop 'less suitable' areas, clear justification will need to be provided. Applicants must demonstrate that cumulative effects do not become a significant or defining characteristic of the wider landscape, including across administrative boundaries and different landscape character types;

Renewable Energy And Low Carbon Energy Assessment And Strategy For West Oxfordshire

- opportunities for environmental enhancement. Environmental enhancements, in addition to those required to mitigate and compensate any, will be sought, especially where they will contribute to Conservation Target Areas and Nature Improvement Areas;
- potential benefits to host communities (including job creation and income generation).

Applicants for wind energy development involving one or more wind turbines must also demonstrate that the planning impacts identified by affected local communities have been fully addressed. Any proposals for a solar farm involving best and most versatile agricultural land would need to be justified by the most compelling evidence which demonstrates why poorer quality land has not been used in preference to best and most versatile agricultural land. Developments that are led by or meet the needs of local communities will receive particular support when considering the merits of renewable energy developments. Applicants should submit a written agreement between the applicant and a community energy enterprise demonstrating that the benefits of all or part of the project will flow to the community for the lifetime of the project.

The use of decentralised energy systems, including Combined Heat and Power (CHP) and District Heating (DH), especially woody biomass fuelled, will be encouraged in all developments.

An energy assessment or strategy which assesses viability for decentralised energy systems, including consideration of the use of local wood fuel biomass and other renewable energy initiatives will be required for:

- proposals on strategic development areas (SDAs)
- all residential development for 100 dwellings or more
- all residential developments in off-gas areas for 50 dwellings or more.
- all non-domestic developments above 1000m^2 floorspace

Detailed guidance on renewable and low carbon energy technologies in West Oxfordshire, which includes information on submission requirements, national policy considerations and good practice, is published in a West Oxfordshire Renewable and Low Carbon Energy Guidance and Landscape Capacity Study.

5.0 Renewable and Low Carbon Energy Guidance

Section 3 of this report set out the broad potential for future deployment of renewable and low carbon technologies and in the case of solar farms and wind power, identification of more and less suitable areas for wind power and solar farms.

Section 4 sets out a proposed strategy for West Oxfordshire for the future.

Acceptability on a site by site basis will depend on the assessment of the benefits and impacts of development on a site specific considerations

The following tables set out the likely submission requirements, policy responses and issues for each technology. It also describes good practice for applicants and development managers.

Battery Energy Storage Facilities	
Key issues for the technology	Applicants will generally seek sites as close as possible to existing substations and roads, thereby avoiding the need to provide extensive grid connection cabling or access roads. Battery facilities can be located on urban and rural sites (including previously developed land) and vary substantially in scale from a single shipping-type container with ancillary plant to 10 or more containers. Battery facilities comprise one of more containers with ancillary air conditioning units, transformers, a harmonic filter, an auxiliary transformer and an onsite substation, all housed on an area of hardstanding, accessed from a public road and enclosed within a compound by appropriate fencing and CCTV cameras. Typically, each container is around 13m x 2.4m and 3m high, fitted out with racks of battery modules and battery management systems as well as internal electrical cabling and a fire suppression system. Each container will have an external heating, ventilation, and air conditioning handling unit for the climate control system and will normally sit on concrete pad foundations. Specifications of the components, including dimensions will vary depending on the supplier. A cable, usually underground, will connect the battery facility to an off-site electricity substation. There are a number of ways electricity can be stored within batteries. At the time of writing, the favoured technology is typically lithium ion batteries. However many other types of battery exist and are either being used now or explored for future deployment. <u>Fire/pollution risk</u> Some batteries contain substances that are classified hazardous. However, the battery housing is usually hermetically sealed (airtight) and therefore there is very low risk of substances being released into the environment. Lithium ion batteries contain some substances that present a fire risk in the event of a catastrophic failure. The risk is mitigated by mechanical and software based safety systems that prevent any unsafe operation, and each energy storage system is climate controlled by a dedicated heating, ventilation and air conditioning (HVAC) system to ensure the batteries stay within their operating temperature. Typically, each lithium ion based unit is also installed with it's own fire suppression system and monitoring systems to identify and warn of potential safety issues and protection. Monitoring and fire suppression systems can ensure that faults do not cause danger to life or property.

	Hazardous Substances Consents and other regulatory regimes exist to manage health and safety. Developers will need to apply for Hazardous Substances Consent if hazardous substances are stored or used at or above specified controlled quantities. Whether or not a project comes under the hazardous substances consent regime, other operational health, safety and environmental regulatory regimes apply, including: • Control of Major Accident Hazards Regulations (COMAH) 2015. For the construction of a new establishment where the quantities of dangerous substances are equal to or in excess of relevant COMAH thresholds, developers must notify the Health and Safety Executive 3 to 6 months before construction begins. • A DSEAR (dangerous substances and explosive atmospheres regulations) may be needed. • COSHH (control of substances hazardous to health regulations) risk assessments will be needed.
Site selection	Battery facilities do not emit pollution and can be developed on concrete pad foundations which result in very limited, if any, permanent impact on the ground. Furthermore, depending on the scale of the facility, they can be adjusted to suit the site. As such, Battery facilities are potentially acceptable in a range of contexts.
Site design	The components of battery facilities are generally of standard specification and are bought ready assembled. It may however be possible to house the plant and containers within a larger storage building, although in many cases this will not be necessary. Typically, good design can be achieved though appropriate layout and siting with landscaping where necessary. Any surveys or assessments undertaken, along with pre-application discussions with the Council, stakeholders and the community, should be treated as an integral part of the design process. Surveys should be undertaken early to ensure that the design and layout can take full account of the outcomes. Pre-application consultation with the local community can make a valuable addition to the acceptability of the proposed development. The most appropriate type of consultation will depend on the scheme – it might be as simple and talking with immediate neighbours, through to a series of public events. Applicants should discuss options with the LPA.
Green belt	Battery facilities are inappropriate development in the green belt and as such very special circumstances will need to be demonstrated by developers. Inevitably some loss of openness will occur depending on the scale, height and density of the facility. Very special circumstances will need to show that the harm to openness and by virtue of the inappropriate development is outweighed by other considerations. This may include the wider benefits of the development.

The following assessments <u>may be required</u> subject to the size of the facility, pre-application discussion and specific site constraints		
Landscape and visual impact assessment	Submission detail	A landscape and visual impact assessment (LVIA) is unlikely to be necessary unless the facility is large-scale or located in a sensitive area. A landscape mitigation strategy or plan may be necessary if soft or hard landscaping works are involved. A detailed landscape mitigation plan can normally be a requirement of a planning condition. The plan should cover all development phases: • Pre-construction (e.g. carrying out further surveys, establishing protected areas, carrying out early mitigation works). • During construction (e.g. carrying out agreed mitigation measures) • Post construction/completion/operational phases (e.g. ongoing maintenance/management and monitoring). The plan should include the following details where necessary: • A planting schedule and specification for the planting, establishment and ongoing management of watercourses, woodlands/copses, individual trees, areas of scrub, hedgerows and biodiversity features. • A plan showing trees to be retained. • Any ongoing farmland management including grazing. • Monitoring of the site's landscape and biodiversity.
	Primary policy and guidance	NPPF Planning Practice Guidance for Natural Environment, June 2014 Planning Practice Guidance for Renewable and Low Carbon Energy, June 2015 Guidelines for Landscape and Visual Impact Assessment (3rd Edition), Landscape Institute and Institute of Environmental Management & Assessment, 2013. Local policy and guidance.

	Good practice in development and decision-making	The following general points should be considered: • Facilities should be carefully sited and should avoid visually prominent locations. • Generally, proposals should fall within existing field boundaries (where present) to minimise potential impact. • Low height of containers and supporting infrastructure means many sites can be readily screened by vegetation. • Any landscape planting should use locally native species. • Any access works, buildings, plant and hard surfacing and fencing should be kept to the minimum. • On-site cables should be buried underground unless it would cause damage to trees or there is contaminated land.
Heritage and archaeology	Submission detail	In line with paragraph 128 of The National Planning Policy Framework, all proposals should be as a minimum informed by a consultation with the Historic Environment Record (HER) where heritage assets may be affected. For many areas, these can be located online using http://www.heritagegateway.org.uk/gateway/advanced_search.aspx (see the 'resources' tab). For above ground assets, the degree of harm to the asset's significance should be assessed including the effect on the setting of the asset. Where a site on which development is proposed includes or has the potential to include heritage assets with archaeological interest, an appropriate desk-based assessment may be appropriate. Field evaluation may be necessary, however the low ground impact of the battery facility and the likely significance of the asset (if known) should be taken into account. It is often sufficient to include a geophysical survey and analysis as part of the application.

		Field evaluations should be carried out in consultation with the LPA and Oxfordshire County Council historic environment officer who will be able to provide a brief for the required expert assessment or evaluation work. The flexible and relatively un-intrusive nature of battery facilities means that it is often acceptable to require any field evaluations via a planning condition.
	Primary policy and guidance	NPPF Planning Practice Guidance Paragraph: 013 Reference ID: 18a-013-20140306 Local policy and guidance. GPA2 - Managing Significance in Decision-Taking in the Historic Environment GPA3 - Setting and Views
	Good practice in development and decision-making	Historic England has published two good practice notes (referred to above).
Ecology	Submission detail	A phase 1 habitat survey, including desk review of data and a site visit should be submitted with the application if there is potential for protected species or designated sites to be affected. Where this concludes that protected habitats or species may be present then appropriate phase 2 surveys should also be undertaken. These will normally need to have been completed and appropriate mitigation measures agreed prior to determining the application. Some surveys can be undertaken via planning condition but these should be agreed in advance. Note that most surveys must be undertaken at specific times of year (https://www.gov.uk/guidance/protected-species-how-to-review-planning-applications). A planning condition may require preparation of an ecology management plan, including the implementation of any mitigation measures. The types of details that may be required are included above under 'Landscape and visual impact assessment'.
	Primary policy and guidance	NPPF Planning Practice Guidance: • Paragraph: 013, Reference ID: 5-013-20150327 • Paragraph: 007 Reference ID: 8-007-20140306

		Other international, EU and UK legislation also applies. Biodiversity – Code of practice for planning and development BS42020 (and any subsequent update) Local policy and guidance.
Flood risk and drainage	Submission detail	For sites greater than 1ha, or in Flood Zones 2 and 3, a flood risk assessment will be required alongside the submission. This will normally include a draft drainage strategy. Some sites will require a sequential test and exceptions test as part of the planning submission. Details of when these are required is included in policy and guidance. It may be necessary to require a detailed drainage strategy via a condition.
	Primary policy and guidance	NPPF Planning Practice Guidance: • Paragraph: 030 Reference ID: 7-030-20140306 Local policy and guidance.
	Good practice in development and decision-making	• Battery facilities should be directed to lower flood risk sites in accordance with the Sequential Test. • Where there is sufficient flood risk and the Sequential Test is passed, water-sensitive components should be raised above predicted flood levels and fencing should be designed to minimise impediment to potential flood flows. • For high risk sites a flood maintenance plan should also be put in place to ensure a process is mapped out for the clearance and removal of any debris following flood events. Furthermore, a flood alarm should be installed at site, which alerts engineers in the event of a flood at site. • Where possible permeable surfaces and SuDS should be incorporated into the development.
	Challenges in interpreting and applying policy and guidance	The Flood Zone and Flood Risk Tables in Planning Practice Guidance identify which forms of development are compatible with which Flood Zones. However, they do not specify which flood risk vulnerability battery facilities fall into.

Traffic and access	Submission detail	Given that the batteries arrive in large pre-assembled containerised units, the number of trips during constriction stage is usually limited. As such, a construction traffic management plan (CTMP) is unlikely to be necessary. On sites with difficult access routes, details of traffic volumes and routing may be required.
	Primary policy and guidance	NPPF Planning Practice Guidance: • Paragraph: 013 Reference ID: 42-013-20140306 Local policy and guidance.
Noise	Submission detail	Noise emissions occur through the operation of cooling equipment which operates during the day and night. Where the facility is located in close proximity to noise sensitive receptors, a noise assessment will be required. The level of detail required will depend on the number of properties that are likely to be affected and the specific details of the proposed development.
	Primary policy and guidance	NPPF Planning Practice Guidance: • Paragraph: 001 Reference ID: 30-001-20140306 • Local policy and guidance.

Hydropower – run of river schemes	
Key issues for the technology	Run of river schemes extract water from a watercourse using a weir and have no facility for water storage. The water is directed through a turbine (or water wheel) and returned to the watercourse. The technology usually comprises: Intake – usually a pre-existing or proposed weir across a watercourse built to direct water towards the turbines. In order to collect silt being carried downstream a settlement tank or silt trap may be required next to the weir. Penstock – the pipeline connecting the intake to the turbine. Turbine house – a building containing the turbine, generator and ancillary plant. Tail race – the channel which returns water from the turbine to the watercourse. Grid connection – electrical connection between the turbine house and the electricity network. Developers should seek sites with sufficient hydro resource but also take into consideration constraints and opportunities. Opportunities are typically where existing barriers along the watercourse, such as weirs, could be refurbished to include a hydro turbine, however new weirs may also be proposed. The construction and operation of a run of river hydropower has the potential to impact both the watercourse and land beside the watercourse. As such, ecological impact should be carefully considered at the site selection and initial design stages. The requirement for a sufficient head of water tends to direct hydropower proposals to traditional water mill sites and/or sites in rural countryside which may have heritage and landscape sensitivities. Sensitive design will therefore be required, taking into consideration heritage assets and landscape character and views. Any alteration to a river can also increase flood risk up and down stream and therefore a Flood Risk Assessment will be required and early consultation with the Environment Agency is recommended. Whilst planning permission is required, applicants will also be applying for a number of separate licences and permits from the Environment Agency. The Environment Agency will only give permission for these if it can be shown in the scheme's design that harm to the environment and other water users will be prevented by ensuring: • It won't prevent the achievement of Water Framework Directive objectives, e.g. it won't damage the ecological status of water or prevent the improvement of its status - find the objectives for your local area.

	• It won't affect protected and designated sites or species in unacceptable ways, eg it won't damage habitats that are important for protected species of fish. • It will maintain or improve fish passage. • It won't affect people's access to the water, for example anglers. • It won't have negative impacts on local communities, eg it must not increase the risk of flooding. Whilst applications for the above licences and permits are required by a separate regulatory regime, such applications may provide information which is relevant to planning. More guidance is found at https://www.gov.uk/guidance/new-hydropower-scheme-apply-to-build-one.
Site selection	In selecting sites, developers should consider the following: • The size of the hydro resource. • The likely effect on protected species and designated wildlife sites. • Key views from important viewpoints, settlements and scenic routes. • Any impact on the Cotswolds AONB including its setting and local landscape designations. • Where older buildings or structures exist, the potential effect on their significance either through direct harm or harm to setting and the opportunities to restore and/or bring back into use heritage assets. • Existing public rights of way and health and safety of public right of way users. • Access for construction and maintenance vehicles.
Site design	The environmental surveys, along with pre-application discussions with the Council, stakeholders and the community, should be treated as an integral part of the design process. Surveys should be undertaken early to ensure that the design and layout can take full account of the outcomes. Pre-application consultation with the local community can make a valuable addition to the acceptability of the proposed development. The most appropriate type of consultation will depend on the scheme – it might be as simple and talking with immediate neighbours, through to a series of public events. Applicants should discuss options with the LPA.
Green belt	Hydropower schemes are inappropriate development in the green belt and as such very special circumstances will need to be demonstrated by developers. Some loss of openness may occur depending on the scale of the weir and associated buildings. However, only the turbine house, intake and possibly the penstock may be visible above ground

	and may result in a relatively small impact on the openness and purposes of the green belt compared to other technologies. Very special circumstances will need to show that any harm to openness and by virtue of the inappropriate development is outweighed by other considerations. This may include the wider benefits of the development including enhancements to the green belt.

Submission requirements for most run of river hydropower projects (subject to pre-application discussion and specific site constraints)		
Landscape and visual impact assessment	Submission detail	A detailed landscape and visual impact assessment (LVIA) may not be necessary for small-scale run of river hydropower scheme and those with very limited visibility in the wider area. In other cases, and for proposals located with the Cotswolds AONB, an LVIA is more likely to be required with the level of detail proportionate to the scale and potential effects on landscape and visual receptors. Photomontages or other visual representations may be required to accompany the application. Careful consideration should be given to design and landscaping especially where development is visible from viewpoints, public rights of way, historic buildings and settlements. A detailed Landscape Mitigation Plan will normally be required unless the site is small scale and limited, in which case it will normally be a requirement of a planning condition. A Landscape Mitigation Plan is a site layout plan which clearly includes a set of mitigation measures. Consideration could also be given to measures which protect and enhance both biodiversity and the landscape and maintain visual amenity. The plan should cover all development phases: • Pre-construction (e.g. carrying out further surveys, establishing protected areas, carrying out early mitigation works). • During construction (e.g. carrying out agreed mitigation measures) • Post construction/completion/operational phases (e.g. ongoing maintenance/management and monitoring). The plan should include the following details where necessary: • A planting schedule and specification for the planting, establishment and ongoing management of watercourses, woodlands/copses, individual trees, areas of scrub, hedgerows and biodiversity features. • A plan showing trees to be retained. • Monitoring of the site's landscape and biodiversity.

		The plan should aim to enhance management of landscape features and habitats as part of a development. This might include contributing to wider landscape scale targets and projects in the Cotswolds AONB Management Plans and Nature Improvement Areas. Cumulative impacts should be considered where there is a potential for hydropower installations to be seen from public viewpoints in combination or in succession when travelling through the landscape. Cumulative assessment In judging what is included in the cumulative assessment, operational and consented developments are typically treated as being part of the landscape and visual baseline. i.e. it is assumed that consented schemes will be built except for occasional exceptions where there is good reason to assume that they will not be constructed. A cumulative assessment should examine the same groups of landscape and visual receptors as the assessment for the main scheme, though different viewpoints may be used in order to better represent the likely range of effects arising from the combination of schemes. As stated above, the effects on users of routes through the area, from which developments may be sequentially visible as one passes through the landscape should also considered, if appropriate. The assessment should be informed by cumulative Zone of Theoretical Visibility (ZTV) study as necessary, showing the extent of visual effects of the schemes in different colours to illustrate where visibility of more than one development is likely to arise. Cumulative wireframes or photomontages may also be prepared where judged necessary to inform the assessment. In relation to cumulative landscape and visual cumulative assessment, it is important to note the following: • Combined cumulative effects may be the same as for the application scheme, or greater (where the influence of multiple schemes would increase effects, or where schemes in planning other than the application scheme would have the predominant effects).

		• Incremental cumulative effects may be the same as for the application scheme, or reduced (where the influence of other schemes in planning would be such that were they consented and considered to be part of the baseline, the incremental change arising from the addition of the application scheme would be less). • Subject to the distance and degree of intervening landform, vegetation and structures there may be no cumulative effects.
	Primary policy and guidance	NPPF Planning Practice Guidance for Natural Environment, June 2014 Planning Practice Guidance for Renewable and Low Carbon Energy, June 2015 Guidelines for Landscape and Visual Impact Assessment (3rd Edition), Landscape Institute and Institute of Environmental Management & Assessment, 2013. Local policy and guidance.
	Good practice in development and decision-making	Where LVIA and photomontages are required they should inform the design process. The following general points should be considered when assessing run-of-river hydropower: • Minimise impacts on key views from important viewpoints, popular tourist and scenic routes and settlements. • Avoid landscapes that are difficult to restore such as semi-natural habitats. • Minimise built elements and where possible, design buildings to be sympathetic with the character and appearance of the local landscape and any existing buildings. • If security perimeters are required, the use and height of security fencing should be minimised and should reflect local vernacular. Preferably, existing features such as hedgerows and walls should be used where possible. • Security lighting should be minimised and should use passive infra-red (PIR) technology. Glare, light pollution and impacts on biodiversity, in particular bats (see ecology section) should be minimised.

		- Where pole mounted CCTV facilities are required, their location, design and colour should be carefully considered to minimise visual and landscape impact. In exposed landscapes such structures should be avoided. - Disturbed ground or ground works should be restored as part of the design.
Heritage and archaeology	Submission detail	In line with paragraph 128 of The National Planning Policy Framework, all proposals should be as a minimum informed by a consultation with the Historic Environment Record (HER) where heritage assets may be affected. For many areas, these can be located online using http://www.heritagegateway.org.uk/gateway/advanced_search.aspx (see the 'resources' tab). For above ground assets, the degree of harm to the asset's significance should be assessed including the effect on the setting of the asset. Where a site on which development is proposed includes or has the potential to include heritage assets with archaeological interest, an appropriate desk-based assessment may be appropriate. Field evaluations should be carried out in consultation with the LPA and Oxfordshire County Council historic environment officer who will be able to provide a brief for the required expert assessment or evaluation work.
	Primary policy and guidance	NPPF Planning Practice Guidance Paragraph: 013 Reference ID: 18a-013-20140306 Local policy and guidance. GPA2 - Managing Significance in Decision-Taking in the Historic Environment GPA3 - Setting and Views
	Good practice in development and decision-making	- Proposals within or adjacent to the World Heritage Site at Blenheim Palace should be designed to avoid harm to the values of the site. - Structures proposed in association with historic buildings should be designed sensitively. Taking into account the significance of the heritage asset, as much as possible of the existing building should be retained.

		• Particular care should be taken to protect historic buildings or structures during construction stages.
Ecology	Submission detail	Given the significant ecological value of many watercourses and Water Framework Directive requirements, a phase 1 habitat survey will be necessary followed by surveys for fish and any other protected species. Where the proposed development incorporates existing older structures or buildings a bat or owl survey may be required. These will normally need to have been completed and appropriate mitigation measures agreed prior to determining the application. Some surveys can be undertaken via planning condition but these should be agreed in advance. Note that most surveys must be undertaken at specific times of year (https://www.gov.uk/guidance/protected-species-how-to-review-planning-applications). Mitigation measures will need to be identified prior to planning permission being granted. A planning condition may require preparation of an ecology management plan, including the implementation of any monitoring measures. The types of details that may be required are included above under 'Landscape and visual impact assessment'.
	Primary policy and guidance	NPPF Planning Practice Guidance: • Paragraph: 013, Reference ID: 5-013-20150327 • Paragraph: 007 Reference ID: 8-007-20140306 Other international, EU and UK legislation also applies. Biodiversity – Code of practice for planning and development BS42020 (and any subsequent update) Local policy and guidance. New hydropower scheme: apply to build one https://www.gov.uk/guidance/new-hydropower-scheme-apply-to-build-one
	Good practice in development and decision-making	• Enhancement of ecological habitats should be provided where practicable. This should include within land adjacent to the watercourse around engineered features.

		- The development should be designed to benefit the fish population. For example, by oxygenating water and improving passage through the watercourse. - Any weirs should be constructed to allow safe passage of fish and other freshwater fauna, and protection from turbines. - Developers should undertake early liaison with the Environment Agency and any fishing groups.
Flood risk and drainage	Submission detail	Any alteration to the flow of a river can cause potential flooding issues especially during extreme weather events. As such, a Flood Risk Assessment will be required as part of a planning application. The primary aim of the assessment is likely to be the effect on up and downstream flooding. Hydopower is likely to be classified "Essential Infrastructure" given the requirement for such infrastructure to be located on and adjacent to watercourses. In flood zones 3a and 3b, the Exceptions Test must be passed. For the Exception Test to be passed: - It must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk, informed by a Strategic Flood Risk Assessment where one has been prepared; and - A site-specific flood risk assessment must demonstrate that the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall. In Flood Zone 3a essential infrastructure should be designed and constructed to remain operational and safe in times of flood. In Flood Zone 3b (functional floodplain) essential infrastructure that has to be there and has passed the Exception Test should be designed and constructed to: - Remain operational and safe for users in times of flood; - Result in no net loss of floodplain storage; - Not impede water flows and not increase flood risk elsewhere.

	Primary policy and guidance	NPPF Planning Practice Guidance: • Paragraph: 030 Reference ID: 7-030-20140306 Local policy and guidance.
	Good practice in development and decision-making	• Where flood risk is likely to be increased, mitigation should be identified (including potentially relocating the proposal) to remove the risk. • In order to prevent increased runoff into watercourses, access tracks should be permeable and localised Sustainable Drainage Systems (SuDS) used to control any runoff. SuDS should also be installed to control runoff from impermeable surfaces.
Traffic and access	Submission detail	The construction of hydropower schemes may attract a significant number of HGV trips. In these cases, it may be necessary for the applicant to submit a construction traffic management plan (CTMP). For many projects, this should be submitted alongside the application and its implementation included as a planning condition.
	Primary policy and guidance	NPPF Planning Practice Guidance: • Paragraph: 013 Reference ID: 42-013-20140306 Local policy and guidance.
	Good practice in development and decision-making	• Construction movements should be kept to a minimum, particularly where the road network and site access require trips along minor roads. The schedule and routing will need to be defined and agreed with the planning authority. • The developer may be required to demonstrate that the local highway network is able to accommodate the type and number of vehicles likely to be required to install, construct and maintain a hydropower facility.
Noise	Submission detail	Noise is produced by the turbine or the sound of water flowing or cascading over weirs and/or water wheels. A noise assessment should be submitted to support any application close to noise sensitive receptors (for example homes). The level of detail required will depend on the number of properties that are likely to be affected and the specific details of the proposed development.

	Primary policy and guidance	NPPF Planning Practice Guidance: • Paragraph: 001 Reference ID: 30-001-20140306 • Local policy and guidance.
	Good practice in development and decision-making	• The turbine should be located within a turbine housing which should be capable of reducing and controlling the noise emissions to acceptable levels. • Noise assessments must include detailed predictions of likely noise levels at receptors as compared to the prevailing background noise level, at typical operating levels.

Solar Farms	
Key issues for the technology	Available electricity grid connection. Generally need to be in open countryside due to size. Subsidies – • Reductions in the value of subsidies have typically come into effect at the end of each financial year (beginning of April). This has led to many solar farms being constructed during the winter, which poses construction challenges. • Most subsidies have now been removed and so unless there is a change in Government policy, the majority of new solar farms are likely to be developed without subsidies. The margins for developers are therefore likely to be significantly lower than previously.
Site selection	Solar farms are often non-polluting, reversible developments and that have minimal environment impact if sited and designed carefully. Furthermore, the scale, height and layout of solar farms can be adjusted to suit the site, making solar farms a development type that can be acceptable in a range of contexts. As confirmed by the landscape character assessment within this report, a large area of the district is assessed as more suitable for solar farms. Taking into account visual impact, an ideal site for a solar farm would be a relatively flat site which is well screened by hedgerows and is not crossed by public rights of way. However, the need to site solar farms close enough to a suitable point on the electricity grid means that development is likely to come forward on sites with varying degrees of visibility. Sites on best and most versatile (BMV) agricultural land are likely to be heavily constrained by the Written Ministerial Statement "Solar energy: protecting the local and global environment" (HCWS488) which requires compelling evidence to be provided to justify the use of BMV land as opposed to lower quality (grade 3b and below) land. Both grid connection and agricultural land classification are therefore the greatest factors in site selection. Applications for solar farms tend to come forward on land which is not designated and Applicants will generally avoid designated wildlife sites and heritage assets and their curtilages (not including setting). Solar farms can however be successfully accommodated within the settings of heritage assets and designated landscapes depending on the reason for the designation and the harm caused by the solar farm.

Site design	The cultural and environmental surveys, along with pre-application discussions with the Council, stakeholders and the community, should be treated as an integral part of the design process. Surveys should be undertaken early to ensure that the design and layout can take full account of the outcomes. Pre-application consultation with the local community can make a valuable addition to the acceptability of the proposed development. The most appropriate type of consultation will depend on the scheme – it might be as simple and talking with immediate neighbours, through to a series of public events. Applicants should discuss options with the LPA. Further guidance can be found in the BRE National Solar Centre guidance: Planning guidance for the development of large scale ground mounted solar PV systems www.bre.co.uk/filelibrary/pdf/other_pdfs/KN5524_Planning_Guidance_reduced.pdf
Green belt	Solar farms are inappropriate development in the green belt and as such very special circumstances will need to be demonstrated by developers. Inevitably some loss of openness will occur depending on the scale, height and density of the arrays but the low height of the arrays and the retention of open rows in between the arrays moderates the impact as compared to built development. Very special circumstances will need to show that the harm to openness and by virtue of the inappropriate development is outweighed by the benefits of development. This may include the wider benefits of the development including enhancements to the green belt.

Submission requirements for most solar farm projects (subject to pre-application discussion and specific site constraints)		
Landscape and visual impact assessment	Submission detail	A landscape and visual impact assessment (LVIA) will almost certainly be required for solar farms. Photomontages or other visual representations may be required to accompany the application. A landscape mitigation strategy may be necessary, but a detailed Landscape Mitigation Plan can normally be a requirement of a planning condition. A Landscape and Ecological Mitigation Plan or a Landscape Mitigation Plan is a site layout plan which clearly includes a set of landscape and biodiversity mitigation measures. In accordance with Planning Practice Guidance for solar farms, space should also be provided for measures which protect and enhance both biodiversity and the landscape and maintain visual amenity. The plan should cover all development phases: • Pre-construction (e.g. carrying out further surveys, establishing protected areas, carrying out early mitigation works). • During construction (e.g. carrying out agreed mitigation measures) • Post construction/completion/operational phases (e.g. ongoing maintenance/management and monitoring). • The plan should include the following details where necessary: • A planting schedule and specification for the planting, establishment and ongoing management of watercourses, woodlands/copses, individual trees, areas of scrub, hedgerows and biodiversity features. • A plan showing trees to be retained. • Any ongoing farmland management including grazing. • Monitoring of the site’s landscape and biodiversity. •

		The plan should aim to enhance management of landscape features and habitats as part of a development. This might include contributing to wider landscape scale targets and projects in the Cotswolds AONB Management Plans and Nature Improvement Areas. Whilst the potential for cumulative effects is reduced in comparison to wind farms, it is important to consider cumulative impacts where there is a potential for solar farms to be seen from public viewpoints in combination or in succession when travelling through the landscape. <u>Cumulative assessment</u> In judging what is included in the cumulative assessment, operational and consented developments are typically treated as being part of the landscape and visual baseline. i.e. it is assumed that consented schemes will be built except for occasional exceptions where there is good reason to assume that they will not be constructed. A cumulative assessment should examine the same groups of landscape and visual receptors as the assessment for the main scheme, though different viewpoints may be used in order to better represent the likely range of effects arising from the combination of schemes. As stated above, the effects on users of routes through the area, from which developments may be sequentially visible as one passes through the landscape should also considered, if appropriate. The assessment should be informed by cumulative Zone of Theoretical Visibility (ZTV) study as necessary, showing the extent of visual effects of the schemes in different colours to illustrate where visibility of more than one development is likely to arise. Cumulative wireframes or photomontages may also be prepared where judged necessary to inform the assessment. In relation to cumulative landscape and visual cumulative assessment, it is important to note the following: • Combined cumulative effects may be the same as for the application scheme, or greater (where the influence of multiple schemes would increase effects, or where schemes in planning other than the application scheme would have the predominant effects).

		• Incremental cumulative effects may be the same as for the application scheme, or reduced (where the influence of other schemes in planning would be such that were they consented and considered to be part of the baseline, the incremental change arising from the addition of the application scheme would be less). • Subject to the distance and degree of intervening landform, vegetation and structures there may be no cumulative effects. The way in which the cumulative assessment should be described and presented is varies depending on the number and nature of scenarios which may arise. This variation is needed in order to convey to the reader the key points of each assessment. For example, the three different cumulative combinations that may arise for an assessment in which there are two existing undetermined applications each can be assessed individually. A situation in which there are 10 applications cannot reasonably be assessed in this way and the developments may need to be grouped for analysis.
	Primary policy and guidance	NPPF Planning Practice Guidance for Natural Environment, June 2014 Planning Practice Guidance for Renewable and Low Carbon Energy, June 2015 Guidelines for Landscape and Visual Impact Assessment (3rd Edition), Landscape Institute and Institute of Environmental Management & Assessment, 2013. Local policy and guidance.
	Good practice in development and decision-making	Good siting and design of solar farms is critical. The LVIA and photomontages should inform the design process. The following general points should be considered when assessing solar farms: • The underlying landscape fabric may should not be altered by the proposals and landscape effects should be acceptable, with or without mitigation measures, or reversible. • Generally proposals should fall within existing field boundaries to minimise potential impact and follow the land's contours.

		• Although potentially extending over large areas, solar farms may be considered similar in scale to more familiar rural development, such as polytunnels or glass houses. • Low height of panels and supporting infrastructure means many sites can be readily screened by vegetation. The introduction of dense vegetation should be avoided where uncharacteristic. The landscape character assessment should inform which, if any, mitigations measures are likely to be suitable. • Opportunities to enhance existing landscape features, such as hedgerows, should be considered. Where multiple schemes are being proposed, the Applicant request potential contributions towards strategic green infrastructure. Ancillary elements such as fencing, substations, inverters, lighting, hard surfaces, cables may have an impact. Any access works, buildings, plant and hard surfacing and fencing should be kept to the minimum necessary to allow the solar farm to operate safely and securely. Fencing should be deer stock fencing, limited to 2 metres in height and set back from any boundary hedging to minimise visibility. On-site cables should be buried underground unless it would cause damage to existing hedges, archaeology or there is contaminated land. Buildings and ancillary plant should be carefully sited and should avoid high or exposed locations.
Heritage and archaeology	Submission detail	In line with paragraph 128 of The National Planning Policy Framework, all proposals should be as a minimum informed by a consultation with the Historic Environment Record (HER) where heritage assets may be affected. For many areas, these can be located online using http://www.heritagegateway.org.uk/gateway/advanced_search.aspx (see the 'resources' tab). For above ground assets, the degree of harm to the asset's significance should be assessed including the effect on the setting of the asset. Where a site on which development is proposed includes or has the potential to include heritage assets with archaeological interest, an appropriate desk-based assessment may be appropriate.

		Field evaluation may be necessary, however the low ground impact of the solar arrays and the likely significance of the asset (if known) should be taken into account. It is often sufficient to include a geophysical survey and analysis as part of the application. Field evaluations should be carried out in consultation with the LPA and Oxfordshire County Council historic environment officer who will be able to provide a brief for the required expert assessment or evaluation work. The flexible and relatively un-intrusive nature of solar farms means that it is often acceptable to require any field evaluations via a planning condition.
	Primary policy and guidance	NPPF Planning Practice Guidance Paragraph: 013 Reference ID: 18a-013-20140306 Local policy and guidance. GPA2 - Managing Significance in Decision-Taking in the Historic Environment GPA3 - Setting and Views
	Good practice in development and decision-making	Solar PV developments may affect heritage assets (sites, monuments, buildings and landscape) both above and below ground. Above ground impacts may include the effects of applications on the setting of Listed Buildings if the setting is registered as part of the listing and Scheduled Monuments as well as on the Historic Landscape Character. Heritage is an important constraint in the siting of solar farms. Early advice from an historic environment specialist should be used by prospective applicants to determine the suitability of sites. Applications should take account of the results of historic environment assessments in their design, for instance through the sensitive planning of installations. Below ground impacts may include direct impacts on archaeological deposits through ground disturbance associated with trenching, foundations, fencing, temporary haul routes etc. Equally finds may be protected by a solar PV farm as the site is removed from regular ploughing. Installation of arrays on to the ground using non-penetrative methods such as concrete ballast or 'shoes' and/or installation of cabling on the surface 'trays' may mitigate impact.

		Any opportunities to introduce better management of affected assets, or to improve the settings of designated sites, should be identified. Historic England has published two good practice notes (referred to above).
Ecology	Submission detail	A phase 1 habitat survey, including desk review of data and a site visit should normally be submitted with the application. Where this concludes that protected habitats or species may be present then appropriate phase 2 surveys should also be undertaken. These will normally need to have been completed and appropriate mitigation measures agreed prior to determining the application. Some surveys can be undertaken via planning condition but these should be agreed in advance. Note that most surveys must be undertaken at specific times of year (https://www.gov.uk/guidance/protected-species-how-to-review-planning-applications). A planning condition may require preparation of an ecology management plan, including the implementation of any mitigation measures. The types of details that may be required are included above under 'Landscape and visual impact assessment'.
	Primary policy and guidance	NPPF Planning Practice Guidance: • Paragraph: 013, Reference ID: 5-013-20150327 • Paragraph: 007 Reference ID: 8-007-20140306 Other international, EU and UK legislation also applies. Biodiversity – Code of practice for planning and development BS42020 (and any subsequent update) Local policy and guidance.
	Good practice in development and decision-making	Solar farms have significant potential for ecological benefit: • There is minimal disturbance to the land and a lot of "spare" space around and under the arrays.

		• Taking land out of intensive agriculture allows it to rest, rejuvenate and, with appropriate management, increase its biodiversity. • Management plans can prioritise the protection, enhancement or creation of habitat. A number of common mitigation requirements are set out below: Construction – Solar arrays are normally attached to the ground using narrow piles which are driven directly into the ground without foundations. Where such fauna are present, pile driving may affect badgers and protected bird species. Impacts will need to be informed by surveys however a development-free buffer area around badger sett entrances is likely to be necessary. Fencing – appropriate buffers should be left between fencing and hedges and trees. The size and extent will depend on the canopy and root zone. The fencing should allow badgers, reptiles and other fauna access into the site (whilst retaining grazing sheep). A variety of solutions including gates and gaps below fences are available. Opportunities should be sought to use development to achieve wider ecological benefits, particularly within the Conservation Target Areas for Oxfordshire. Where applications for multiple developments are received then there may be potential for combining contributions to deliver more strategic benefits. This will be discussed with the applicant. Many of the ecological mitigation measures are also likely to have landscape and visual benefits, so it may be appropriate to request a joint management plan. Further guidance: • BRE (2014) Biodiversity Guidance for Solar Developments. Eds GE Parker and L Greene

Agricultural land	Submission detail	Policy and guidance directs applicants away from "best and most versatile" (BMV) land – grades 1, 2 and 3a. However, for solar farms it also encourages applicants to use roofs and non-agricultural land. An agricultural land classification (ALC) survey should be submitted with the application, where land grade is not clear on published maps. A sequential test may also be required for proposals on BMV land, accompanied by "compelling evidence" of the need to use such land. Development managers may request that the applicant confirms whether alternative non-agricultural land is available. In such cases, it is the LPA's responsibility to propose these sites and for the applicant to demonstrate their suitability or otherwise.
	Primary policy and guidance	NPPF Planning Practice Guidance, Paragraph: 013, Reference ID: 5-013-20150327 Written Ministerial Statement (WMS) "Solar energy: protecting the local and global environment", 25th March 2015 Local policy and guidance.
	Good practice in development and decision-making	Applicants should seek to avoid using BMV land where possible and in accordance with the NPPF, solar farm development should be directed towards previously developed/brownfield sites. Where development is located on agricultural land it should be temporary, capable of removal and reversible. Interpretation of guidance and the WMS at appeal by Planning Inspectors has varied but the emerging consensus in recent decisions is as follows: • Where is it not clear that a site is not BMV, a site specific ALC survey should be requested. • If the ALC shows the site to be BMV, or substantially BMV, then a sequential assessment will need to be carried out by the applicant to demonstrate "compelling evidence".

		• If the ALC shows the site to be of lower grade (3b, 4 or 5) then this should normally be sufficient to comply with policy and guidance. Applicants should seek to retain some form of agricultural use alongside the solar farm. Typically, this will be the grazing of livestock. Where appropriate, conditions should be applied requiring the site to be returned to its previous use at the end of the project's life. However, it might be appropriate to retain any environmental or cultural enhancements. This should be discussed with the applicant. It is important to note that the use of agricultural land is not necessarily a negative thing. Most solar farms are temporary development, albeit for 20-plus years, and a well managed solar farm will give time for intensively farmed land to rejuvenate. If the solar farm is within an existing farm unit, Applicants will be encouraged to submit a farm/estate management plan. This should show how the viability of the farm will be protected and or increased with the solar farm in situ.
	Challenges in interpreting and applying policy and guidance	Conflict with other uses for previously developed land, especially housing. In areas of previously-developed land within settlements or urban areas, most other use classes are likely to attract higher values, meaning solar will normally struggle to compete for previously developed sites. There is little guidance from government, appeal decisions or case law on what should be included in a sequential test, nor what constitutes "compelling evidence", therefore it will be helpful to all parties to agree a methodology in writing before proceeding. It is unlikely to be reasonable to require an applicant to undertake site specific ALC surveys for "alternative" sites, since this would be impractical and extremely costly.
Flood risk and drainage	Submission detail	For sites greater than 1ha, or in Flood Zones 2 and 3, a flood risk assessment will be required alongside the submission. This will normally include a draft drainage strategy.

		Some sites will require a sequential test and exceptions test as part of the planning submission. Details of when these are required is included in policy and guidance. It may be necessary to require a detailed drainage strategy via a condition. Unless Applicants demonstrate that it is inappropriate, Sustainable Drainage Systems should be integrated into the site design, maximising their habitat value and ensuring their long term maintenance.
	Primary policy and guidance	NPPF Planning Practice Guidance: • Paragraph: 030 Reference ID: 7-030-20140306 Local policy and guidance.
	Good practice in development and decision-making	The extent of many solar farms (a 50MW site may cover around 100 hectares) means that it is not uncommon for areas of flood zone 2 and 3 (higher risk) to exist alongside otherwise low risk sites. In these instances, layouts should locate sensitive equipment (e.g. inverters and substations) in low risk parts of the site and panels should be set at a height above the assessed flood level. Rainfall will simply run down the incline of the panel and drain naturally into the ground, with little or no impact on runoff. On particularly steep slopes, some intensification of runoff may occur and this will need to be addressed within the drainage strategy. Access tracks and other surfaces should be permeable and localised sustainable drainage, such as swales and infiltration trenches, should be used to control any run-off where recommended by the drainage strategy of local flood authority. Given the temporary nature of solar PV farms, sites should be configured or selected to avoid the need to impact on existing drainage systems and watercourses. Where culverting for access is unavoidable, it should be demonstrated that no reasonable alternatives exist. Wherever possible the drainage strategy should endeavour to also achieve ecological benefits, e.g. the creation of wetland scrapes. This should be discussed with the applicant.

	Challenges in interpreting and applying policy and guidance	The Flood Zone and Flood Risk Tables in Planning Practice Guidance identify which forms of development are compatible with which Flood Zones. However, they do not specify which flood risk vulnerability solar farms fall into. The Environment Agency has generally classified solar farms as "less vulnerable".
Traffic and access	Submission detail	Almost all traffic impacts occur during construction and decommissioning. It will normally therefore be necessary for the applicant to submit a construction traffic management plan (CTMP). For many projects, this should be submitted alongside the application and its implementation included as a planning condition. On sites with suitable pre-existing access it may be acceptable to provide minimal detail on traffic volumes, nature and routing, leaving the CTMP to a planning condition. This should be agreed during the pre-application process.
	Primary policy and guidance	NPPF Planning Practice Guidance: • Paragraph: 013 Reference ID: 42-013-20140306 Local policy and guidance.
	Good practice in development and decision-making	Early consideration should be given by the applicant to the likely route of construction vehicles and the volume. Traffic movements are generally relatively low, often averaging only one or two lorries a day. However, construction periods are normally very short and deliveries concentrated within this period, meaning that daily lorry movements can be significantly higher. While it is unlikely to be possible to specify exact daily movements, consideration should be given to this in discussions with applicants. Engaging with communities on this matter is also strongly recommended. Access tracks and compound areas within the site should normally be capable of being removed once they are no longer required. Annual subsidy reductions in April has led to many solar farms being constructed during the winter, which means there is often a greater chance of mud finding its way onto the highway from vehicles. The CTMP should address how this issue will be avoided.

Other possible submission requirements for solar farms		
Noise and amenity		The panels and their associated infrastructure produce no localised air, odour or dust pollution to air, land or water. During their operation. The only potential loss of amenity would occur if the solar panels are so dominant as to be overbearing or noise levels in operation we deemed to be unacceptable. These matters should be considered by applicants in the design and layout of proposals, including proximity to properties. In some cases, a residential amenity assessment may be necessary, but this is very rare. Noise emissions from solar farm developments are normally relatively low impact and, where they do arise, they are generally straightforward to address through appropriate design and equipment selection. The inverters and transformers are typically the only items of equipment that generate significant noise emissions, through the operation of cooling fans in warm weather. Other associated infrastructure, including the PV panels and substations, generally do not. Inverters and transformers tend to be housed in small buildings or housings, which reduces the level of noise, and will only normally generate noise during sunlight hours (for obvious reasons). Potential noise issues can generally be mitigated through careful siting and design.
Glint and glare		Glint may be produced as a direct reflection of the sun in the surface of the solar PV panel. It may be a source of viewer distraction. Glare is a continuous source of brightness, relative to diffused lighting. This is not a direct reflection of the sun, but rather a reflection of the bright sky around the sun. Glare is significantly less intense than glint.

		Solar PV panels are designed to absorb, not reflect, irradiation. However, the sensitivities associated with glint and glare, and the landscape/visual impact and the potential impact on aircraft safety, should be a consideration. In some instances, it may be necessary to seek a glint and glare assessment as part of a planning application, e.g. if there are unobstructed properties in close proximity, or if the site is located close to an airport. Note, that there are many examples of solar PV panels being installed within and near to airports, but early discussion with the operator is advisable. The effects on visual receptors can also be considered as part of the LVIA. The potential for solar PV panels, frames and supports to have a combined reflective quality should be assessed. This assessment needs to consider the likely reflective capacity of all of the materials used in the construction of the solar PV farm.

<table>
<tr><th colspan="2">Wind Farms</th></tr>
<tr><td>Key issues for the technology</td><td>Available electricity grid connection.
The need for wind turbines to capture the wind resource means the preferred locations are often in open or elevated areas.

The Written Ministerial Statement on Local Planning (House of Commons: Written Statement (HCWS42)) made by the then Secretary of State for Communities and Local Government on 18 Jun 2015 is a material consideration. The Statement makes clear that “When considering applications for wind energy development, 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.”

Whether the proposal has the backing of the affected local community is a planning judgement for the local planning authority.”

The Written Ministerial Statement made reference to communities having the final say on wind turbine applications, which has been interpreted by some communities as meaning that they can veto them. At the time of writing, this has not been the interpretation made by the Secretary of State for Communities and Local Government or the Planning Inspectorate. Planning Practice Guidance (Paragraph: 033, Reference ID: 5-033-150618) provides advice on interpreting the Statement.

Local community engagement in site design and/or site selection will help Applicants understand and address the planning impact identified by affected local communities.

The following are key issues which should be addressed:

Landscape and visual impacts (including any cumulative impacts).
Noise impacts and any impacts due to shadow flicker and reflection.
Safety in relation to buildings, power lines, strategic road network, air traffic, Ministry of Defence operations and radar installations.
</td></tr>
</table>

	• Impact on ecology. • Impact on heritage. The Council will use planning conditions to ensure that redundant turbines are removed when no longer in use and land is restored to an appropriate use.
Site selection	In most instances, wind turbines require an annual average wind speed of at least 6 metres per second to be viable, but this may not be the case for all sites. Wind speed may be affected by topography, tall buildings or trees, or existing wind turbines in the area. A temporary installation of an anemometer may be required to monitor wind speed at a prospective site. This may require temporary planning permission, typically for a period of around 12 months. Appendix A contains guidance based on an assessment of the sensitivity of the landscape to wind power development. It should be consulted at an early stage to inform site selection. Consideration should be given to: landform and topography, views and screening, historic landscape, previously developed land, site access and residential impact. Safety may be an issue in certain circumstances, but risks can often be mitigated through appropriate siting and consultation with affected bodies. Fall over distance plus 10% is often used as a safe separation distance to buildings. National Grid, and/or the relevant Distribution Network Operators will be able to advise on the required standards for wind turbines being separated from existing overhead power lines. Air traffic and safety – Due to the number of aviation and military sites in and around West Oxfordshire, consultation and safeguarding areas cover the entire district. Applicants should be advised to consult the Civil Aviation Authority, Ministry of Defence (MOD) and the National Air Traffic Services (NATS) at an early stage of the site identification process. There is a 15 km consultation zone and 30km or 32km advisory zone around every civilian air traffic radar, although objections can be raised to developments that lie beyond the 32km advisory zone. In addition, there is a c.15km statutory safeguarding consultation zone around Ministry of Defence aerodromes within which wind turbine proposals would be assessed for physical obstruction. In addition to air traffic radar, wind turbines may affect other radar installations such as weather radar operated by the Meteorological Office and electromagnetic transmissions (e.g. radio, television and phone signals). Specialist organisations responsible for the operation of electromagnetic links typically require 100m clearance either side of a

	line of sight link from the swept area of turbine blades. OFCOM acts as a central point of contact for identifying specific consultees relevant to a site. Developers considering sites in the Cotswolds AONB should be aware of the statutory duty under the Countryside and Rights of Way Act 2000 for authorities to have regard to the purpose of conserving and enhancing the natural beauty of the AONB and the NPPF's requirement to give great weight to conserving the AONB's landscape and scenic beauty.
Site design	The cultural and environmental surveys, along with pre-application discussions with the Council, stakeholders and the community, should be treated as an integral part of the design process. Surveys should be undertaken early to ensure that the design and layout can take full account of the outcomes. To minimise the impact of the development, amendments to scale, layout, turbine design, design of ancillary structure and plant, and land management and landscaping may be possible. Where developments require submission of a Design and Access Statement, Applicants should explain how the design has evolved in response to the context of the development. This may also be beneficial (but not required) where development falls bellow the threshold for Design and Access Statements. Unlike other renewable energy technologies, pre-application consultation with the local community is a statutory requirement for wind applications and could be used to demonstrate the acceptability of the development to the Council against the Written Ministerial Statement on Local Planning (HCWS42). The most appropriate type of consultation will depend on the scheme. It might be as simple and talking with immediate neighbours, through to a series of public events. Applicants should discuss options with the LPA.
Green belt	Wind turbines are inappropriate development in the green belt and as such very special circumstances (which may include benefits arising from the development and/or a lack of better alternative locations) will need to be demonstrated by Applicants. Some loss of openness and impact on the purposes of the green belt may occur depending on the scale, height and location of the turbines.

Submission requirements for most wind turbine and wind farm projects (subject to pre-application discussion and specific site constraints)		
Landscape and visual impact assessment	Submission detail	A landscape and visual impact assessment (LVIA) will be required for most wind turbine developments. Photomontages or other visual representations will almost certainly be required to accompany the application. A landscape mitigation strategy may be necessary (usually in relation to control buildings rather than the turbines), but this can normally be a requirement of a planning condition.
	Primary policy and guidance	NPPF. Overarching National Policy Statement for Energy (EN-1). Overarching National Policy Statement for Renewable Energy (EN-3). Planning Practice Guidance for Natural Environment, June 2014 Planning Practice Guidance for Renewable and Low Carbon Energy, June 2015, Guidelines for Landscape and Visual Impact Assessment (3rd Edition), Landscape Institute and Institute of Environmental Management & Assessment, 2013. Siting and Designing Wind Farms in the Landscape (Version 2), Scottish Natural Heritage, May 2014. Siting and Design of Small Scale Wind Turbines of between 15 and 50 metres in height, Scottish Natural Heritage, March 2012. Assessing the Cumulative Impact of Onshore Wind Energy Developments, Scottish Natural Heritage, March 2012. Visual Representation of Wind Farms (Version 2.1), Scottish Natural Heritage, December 2014. LI Advice Note 01/11 Photography and photomontage in landscape and visual impact assessment, Landscape Institute, March 2011. Local policy and guidance.
	Good practice in development and decision-making	The siting and design of wind turbines is a key consideration and should be informed by the LVIA process. Generally: • Larger turbines are more easily accommodated in larger scale landscapes. • Due to their size and preferred locations in open or elevated areas, that typically have the greatest wind speeds, turbines are potentially visible over wide areas.

		They may also compete with existing landmarks within the landscape or influence the apparent scale of surrounding landforms. • Where turbines may influence a designated landscape the LVIA should assess the effects and address the specific reasons for designation. • Turbines have an uncompromisingly modern appearance and so effects may be particularly notable in landscapes that are perceived as natural or of particularly high scenic quality. • Wind energy development has a relatively small footprint and limited impact on landscape fabric. Care should be taken to ensure any loss of landscape fabric is minimised and where possible restored post construction or mitigated through landscape enhancement elsewhere. • Visualisations supporting applications should be proportionate to the scale of development proposed and follow current industry guidance (see Primary Policy and Guidance). • Where turbines are proposed in close proximity to residential properties a Residential Visual Amenity Assessment may be required (see Other possible submission requirements below)
	Cumulative impacts	It is important to consider how the scheme fits with other operational and consented schemes to minimise cumulative impacts. Cumulative impacts can be defined as the additional changes caused by a proposed development in conjunction with other similar developments, or as the combined effect of a set of developments taken together. The cumulative impact of a 'wind energy development' on landscape and visual amenity are the product of: • The distance between the individual wind turbines. • The distance over which they are visible. • The overall character of the landscape and its sensitivity to windfarms. • The siting and design of the wind turbines and. • The way in which the landscape is experienced. (for more information: Scottish Natural Heritage (2012) Assessing the Cumulative Impact of Onshore Wind Energy Developments

		Planning Practice Guidance Paragraph: 022, Reference ID: 5-022-20140306 and Paragraph: 023, Reference ID: 5-023-20140306) The following should be considered when identifying a site and refining the design: • If wind turbines already exist in a particular LCA, or part of, new proposals should follow a similar pattern, e.g. on hill tops. • Achieving design continuity with existing development within a LCA, consideration should be given to the relationship between the height, design, proportions and rotation speed of the proposed and existing developments. • Ensure multiple developments do not obscure distinctive landforms and are in scale with ridges and hills. • The potential for visual clutter with other turbines and structures should be considered, as well as the siting of multiple developments in relation to important focal points within the landscape. • Individual developments should generally appear visually separate unless specifically designed to create the appearance of a single combined wind farm. (For more information: Cornwall Renewable Energy Informal Planning Advice. March 2016)
Heritage and archaeology	Submission detail	In line with paragraph 128 of The National Planning Policy Framework, all proposals should be as a minimum informed by a consultation with the Historic Environment Record (HER) where heritage assets may be affected. For many areas, these can be located online using http://www.heritagegateway.org.uk/gateway/advanced_search.aspx (see the 'resources' tab). For above ground assets, the degree of harm to the asset's significance should be assessed including the effect of the setting of the asset. Where a site on which development is proposed includes or has the potential to include heritage assets with archaeological interest, an appropriate desk-based assessment may be appropriate. Field evaluation may be necessary and the likely significance of the asset (if known) should be taken into account.

		Field evaluations should be carried out in consultation with the LPA or historic environment officer who will be able to provide a brief for the required expert assessment or evaluation work.
	Primary policy and guidance	Section 66 of the Planning (Listed Buildings and Conservation Areas) Act 1990 places a statutory duty on local planning authorities to have “special regard to the desirability of preserving” listed buildings and their settings. NPPF. Planning Practice Guidance Paragraph: 019, Reference ID: 5-019-20140306 Local policy and guidance.
	Good practice in development and decision-making	The application of Section 66 requires the setting of designated heritage assets be appropriately assessed. Considerable importance and weight is applied to the preservation of the setting of listed buildings. Assessments should focus on the significance of the site and its setting, whether development proposals will harm the historic environment, and to what degree. The presence of designated assets and their settings, even in close proximity, to a wind turbine or wind farm does not necessarily represent an unacceptable impact. This should be assessed but some types of asset, particularly those with a strong presence in the landscape, are especially vulnerable. Heritage asset setting assessments are distinct from those undertaken as part of the LVIA because they depend on specialist consideration of the specific significance of each heritage asset. Where a Zone of Theoretical Visibility has been produced, this should inform the heritage setting assessment. Photomontages can also be a useful part of the assessment. Further guidance is provided by Historic England including two good practice notes. GPA2 - Managing Significance in Decision-Taking in the Historic Environment and GPA3 - Setting and Views.

Ecology	Submission detail	A phase 1 habitat survey, including desk review of data and a site visit should normally be submitted with the application. For wind turbines, the potential for impacts on birds and bats should be given particular consideration. Where it is concluded that protected habitats or species may be present and affected by the wind turbine(s) then appropriate phase 2 surveys should also be undertaken. These will normally need to have been completed and appropriate mitigation measures agreed prior to determining the application. Some surveys can be undertaken via planning condition but these should be agreed with the Council in advance. Note that most surveys must be undertaken at specific times of year. A planning condition may require preparation of an ecology management plan, including the implementation of any mitigation measures.
	Primary policy and guidance	NPPF Planning Practice Guidance: • Paragraph: 018 Reference ID: 5-018-20140306 Other international, EU and UK legislation also applies. Local policy and guidance.
	Good practice in development and decision-making	Land use around wind turbines should be managed to prevent the habitat from attracting species sensitive to collision with wind turbines. If replacement habitat is required, it should be a safe distance from the wind turbines rather than underneath them. Habitat creation or enhancement should be provided except where it will increase the risk of collision between bird or bat species and the turbines. The planning application should show that the distance between turbines and streams, hedgerows or other linear landscape features will mitigate the potential impact on species navigation and movement.
Construction/traffic	Submission detail	A Construction Traffic Management Plan will be required to demonstrate that the local highway network and site access is able to accommodate the type and number of construction vehicle movements and that there is no unnecessary local traffic disruption. The Construction Traffic Management Plan should also ensure that the entrance and access onto the public highway are designed and constructed to provide safe access and egress to the site. If construction of the wind turbines requires abnormal loads to be moved to the site, consideration should be given to this in the traffic management plan. Oxfordshire County Council Highways can advise on such matters at the pre-application stage.

	Primary policy and guidance	NPPF Planning Practice Guidance: • Paragraph: 018 Reference ID: 5-018-20140306 Other international, EU and UK legislation also applies. Local policy and guidance.
	Good practice in development and decision-making	Damage to narrow lanes, hedges, trees, historic bridges and gateposts as a result of road widening should be avoided. The Construction Traffic Management Plan should provide assurances that any features lost or damaged will be repaired or replaced. Construction vehicle routes should avoid sensitive areas such as residential access roads. The length of new tracks and existing routes should be minimised. If it is necessary to create a new access into a field, widen an existing field entrance, or create permanent access or maintenance tracks, consideration must be given to local character. In rural areas, kerbing, visibility splays, hard surfacing and lighting should be designed to minimise vegetation removal and avoid urbanisation. New tracks should follow contours, avoid steep or wet ground and follow the hedge boundaries without causing damage to tree growth through compaction. Where possible, tracks should be removed or re-vegetated and any hedges removed to widen accesses replanted with suitable locally native species. If hedges are permanently removed, Applicants should look for opportunities to plant new hedges along historic lines to compensate for losses. Where significant numbers of trips are required, the following measures may be required: • Avoidance of HGV arrivals during local peak/school traffic periods. • Temporary traffic management systems for site access. • Temporary speed limits to reduce potential of traffic accidents.
Noise	Submission detail	All wind turbines produce sound when rotating, which usually comes from two sources: 1. Aerodynamic noise generated by the movement of the blades through the air; and

		1. Mechanical noise from the generator and any associated gearbox. Applicants must submit a noise report as part of wind power applications where noise sensitive premises may be affected. This must be undertaken by a qualified acoustician and assess the noise produced by the turbine, both on its own and cumulatively with any other turbines in the area, and whether it will have an adverse effect on the amenity of nearby noise sensitive premises. Such premises may include schools, offices and tourist businesses which require relative tranquillity, such as campsites & caravan sites as well as residential properties. The effect not only depends on proximity but wind speed, wind direction and background noise levels. Planning Practice Guidance (Paragraph: 015 Reference ID: 5-015-20140306) states that "'*The assessment and rating of noise from wind farms' (ETSU-R-97) should be used by local planning authorities when assessing and rating noise from wind energy developments*."
	Primary policy and guidance	NPPF Planning Practice Guidance, Paragraph: 013, Reference ID: 5-013-20150327 Written Ministerial Statement (WMS) "Solar energy: protecting the local and global environment", 25th March 2015 Local policy and guidance.
	Good practice in development and decision-making	Good practice guidance has been prepared by the Institute of Acoustics. The then Department of Energy and Climate Change accepted that it represents current industry good practice and endorses it as a supplement to ETSU-R-97.
Shadow flicker and reflected light	Submission detail	In the UK., only properties within 130 degrees either side of north relative to the turbines can be affected by shadow flicker and the effect is generally limited to within 10 rotor diameters of a wind turbine. However, problems caused by shadow flicker are rare. Where proposals for wind turbines could give rise to shadow flicker, applicants should provide an analysis which quantifies the impact. If necessary, individual turbines can be controlled through the use of conditions to avoid shadow flicker at a specific property or group of properties on sunny days. Turbines can also cause flashes of reflected light, which can be visible for some distance. It is possible to ameliorate the flashing but it is not possible to eliminate it.

	Primary policy and guidance	NPPF Planning Practice Guidance: • Paragraph: 020 Reference ID: 5-020-20140306
Flood Risk and Drainage	Submission detail	In accordance with national policy within the NPPF, a site-specific Flood Risk Assessment will be required for all wind power developments occupying an area of more than 1 ha in Flood Zone 1 and developments of any size within Flood Zones 2 or 3 or in an area within Flood Zone 1 which has critical drainage problems (as notified to the local planning authority by the Environment Agency (EA)). Wind turbines are classed as 'essential infrastructure' and are therefore compatible with EA Flood Zones 1 and 2 (see PPG Paragraph: 067 Reference ID: 7-067-20140306). In Flood Zone 3, the Exception Test set out in paragraph 102 of the NPPF should be demonstrated to be passed. In addition, in Flood Zone 3a, FRAs should show that the wind power development is designed and constructed to remain operational and safe in times of flood. In Flood Zone 3b (functional floodplain) essential infrastructure that has to be there and has passed the Exception Test, and water-compatible uses, should be designed and constructed to: • Remain operational and safe for users in times of flood; • Result in no net loss of floodplain storage; • Not impede water flows and not increase flood risk elsewhere. In summary wind power developments in Flood Zone 3 will need to show that it will provide wider sustainability benefits to the community that outweigh flood risk, and that it will be safe for its lifetime, without increasing flood risk elsewhere and where possible reduce flood risk overall. FRAs should also address surface water flood risk and minimise the impact of the proposed wind turbines and ancillary infrastructure on the natural drainage characteristics of the site, in order to prevent an increased risk of flooding. In areas at risk of flooding, development should only be considered appropriate if priority has been given to the use of sustainable drainage systems. For major developments, Sustainable Drainage Systems should be considered unless demonstrated by the Applicant to be inappropriate.

	Primary policy and guidance	NPPF Planning Practice Guidance: • Paragraph: 067 Reference ID: 7-067-20140306 • Paragraph: 068 Reference ID: 7-068-20140306 Local policy and guidance.
	Good practice in development and decision-making	A water interest survey may need to be undertaken to identify all boreholes, springs, wells and any surface water features and identify any future mitigation measures. The impact on the water cycle should be considered when stripping, storing and replacing soils.

Other possible submission requirements for wind turbines and wind farms		
Residential Visual Amenity Assessment		It is widely accepted that in planning no individual has the right to a particular view, however, there may be a point when, by virtue of the proximity, size and scale of a development, a residential property would be rendered so unattractive a place to live that planning permission should be refused. Where proposed turbines are in close proximity to residential properties or of a size such that there is the potential for them to have an overwhelming or oppressive effect on properties then a Residential Visual Amenity Assessment should be provided. This is often produced alongside, although as a separate exercise, to an LVIA.

LDĀ DESIGN

Appendix

West Oxfordshire Renewables Study

Landscape Capacity
August 2016

A New Fetter Place
8-10 New Fetter Lane
London EC4A 1AZ
United Kingdom
T +44 (0) 20 7467 1470
F +44 (0) 20 7467 1471
W www.lda-design.co.uk

LDA Design Consulting Ltd
Registered No: 09312403
17 Minster Precincts, Peterborough PE1 1XX

August 2016
West Oxfordshire Renewables Study

Contents

LDĀ DESIGN

5282_Landscape Capacity

August 2016

West Oxfordshire Renewables Study

Version: 1.0

Version date: 04 August 2016

Comment

This document has been prepared and checked in accordance with ISO 9001:2008.

1.0 Introduction

1.1. Overview

An Approach to Landscape Character Assessment (Natural England, 2014) defines landscape character as:

"a distinct and recognisable pattern of elements, or characteristics, in the landscape that make one landscape different from another, rather than better or worse."

The introduction of any development into a landscape adds a new feature which can affect the 'sense of place' in its near vicinity. This may in turn result in long term change to the wider landscape character of an area, either as a result of the development on its own or cumulatively with other developments. It is specifically noted within An Approach to Landscape Character Assessment (Natural England, 2014) that:

"Our landscapes have evolved over time and they will continue to evolve – change is a constant but outcomes vary. The management of change is essential to ensure that we achieve sustainable outcomes – social, environmental and economic. Decision makers need to understand the baseline and the implications of their decisions for that baseline."

A number of best practice guidance documents have been published that deal with the issue of landscape sensitivity within the context of the assessment of landscape character, landscape and visual impacts and landscape capacity (see References). The most specific of these is 'Topic Paper 6: Techniques and criteria for judging capacity and sensitivity', produced by the former Countryside Agency/SNH in 2004. Together these guidance documents set out a variety of techniques, definitions and criteria for assessing landscape sensitivity and, although they contain some common threads and principles, it is clear that this is not an 'exact science' and that there is no single advocated method or consistent application within current practice.

The approach adopted for this assessment has been informed by the available guidance but has been tailored specifically for the purposes of this study. It is underpinned by the following principles:

- All landscapes matter and in planning for development the primary aim should be to protect the District's most important landscape assets;
- Some form of development may potentially be accommodated within any landscape provided it can be demonstrated that it would not have unacceptable impact on valued landscape assets;
- The assessment process should be simple and easy to follow by all, avoiding complex scoring systems and overly technical language; and
- It should encourage a responsive and properly considered approach to designing and assessing development proposals.

1.2. Summary of Methodology

The methodological approach to this assessment can be summarised into the following stages which are discussed in more detail in subsequent sections:

- Identification of technologies and their various typologies that have an important spatial component and thus have the potential to influence the landscape on a District scale
- Identification of the landscape baseline
- Definition of key terminology used within the assessment
- Assessment of the susceptibility of different landscapes to the identified technologies and an assessment of landscape value
- An assessment of whether landscapes are more or less suitable for renewables development based on the judgements of susceptibility and value

1.3. Technologies and Typologies

This study considers a wide range of renewable energy technologies however most are likely to be deployed in small numbers (e.g. energy from waste) or are relatively small scale and unobtrusive in the wider landscape (e.g. anaerobic digestion); they may also be subject to particular infrastructural or location constraints (e.g. run of river hydro). As such they are unlikely to result in notable landscape change on a district wide scale.

There is however likely to be increased pressure for solar and wind energy proposals to be deployed. These technologies, by their nature, have a greater potential to cause landscape change on a wider scale i.e. wind turbines are tall and are potentially visible over wide areas and solar arrays cover large areas. It is therefore important to assess the sensitivity of the landscape on a district scale in order to understand and manage the changes that may result from the deployment of these technologies.

Wind energy developments vary hugely in both the size of the turbines and the number of turbines which they comprise, ranging from domestic or farm scale single 15m high turbines up to utility scale developments of tens of turbines of 125m height or more. Both the height of turbines and their number will have a bearing on whether or not a proposal can be accommodated within a particular landscape. Based on extensive experience and current industry trends the following wind energy development typologies are considered:

Development Typology	Turbine Size	Cluster Size
Small Turbines	Up to 50m	Often deployed as a single or pair of turbines and occasionally in groups of three
Medium Turbines	50m – 90m	Often deployed as a single or pair of turbines and occasionally in groups of three
Large Turbines	Over 90m	Occasionally deployed as single turbines although more typically seen in larger groupings

It should be noted that although small and medium typologies are typically seen in small groupings proposals for larger clusters may come forward. In this case guidance provided in this assessment on both turbine height and cluster size within the host landscape should be reviewed.

Solar farms comprise rows of solar panels of around 3m in height set on open ground, usually agricultural fields although brown field sites and even floating schemes on reservoirs have been developed. They typically occupy areas from around 1 hectare up to several which in the context of the West Oxfordshire landscape could be considered as occupying one field up to several. The assessment does not make particular distinction between size of solar farms as within their typical range landscape effects on the district scale are likely to be similar. Where appropriate, guidance on size and any particular constraints with respect to solar farms are discussed in the assessment.

Roof mounted solar is not considered in the assessment.

1.4. Landscape Baseline

A landscape character baseline for West Oxfordshire District is provided by the West Oxfordshire Landscape Assessment (1998); although this document is relatively old it remains broadly relevant across the district. The Cotswolds AONB Landscape Character Assessment (2002) provides a slightly more recent baseline for those areas within the AONB and is supplemented by the new Cotswolds AONB Landscape Strategy and Guidelines (June 2016). In order to maintain a consistent approach across the district the 1998 study is considered to be the most appropriate baseline reference for this assessment although reference will be made to the AONB studies where appropriate.

The West Oxfordshire Landscape Assessment divides the district into 13 local character areas (LCA's) which are defined as *"tracts of landscape which may be quite diverse in character but have some unifying or consistent elements which are related to their physical form or geographical location"*. Recognising that even within these areas there may be variation in character five landscape character types (LCT's) are defined which span LCA boundaries and are further divided in 24 sub-types.

In line with the brief to provide spatial guidance on the siting of renewables this assessment is based on the geographically coherent LCA's and draws on the key characteristics and development sensitivities of the underlying LCT's.

1.5. Assessment Terminology

The assessment of sensitivity of landscapes is reached by combining judgements of their susceptibility to the type of change anticipated or proposed development and the value attached to the landscape in question. The susceptibility of landscape character areas is judged based on both the attributes of the receiving environment and the characteristics of the proposed development. It indicates the ability of a landscape to accommodate the proposed development *"without undue consequences for the maintenance of the baseline situation" (GLVIA, 3rd version, para 5.40)*. It is rated on the following scale:

- High – undue consequences are likely to arise from the proposed development.
- Medium – undue consequences may arise from the proposed development.
- Low - undue consequences are unlikely to arise from the proposed development.

Where intermediate ratings are given e.g. 'High-Medium' this indicates an effect that is both less than High and more than Medium, rather than one which varies across the range.

The key characteristics of the landscape character types are considered, along with scale, openness, topography; the absence of, or presence, nature and patterns of development, settlement, land cover, the contribution of heritage assets and historic landscape elements and patterns, and land uses in forming the character. The condition of the receiving landscape, i.e. the intactness of the existing character will also be relevant in determining susceptibility. To maintain clarity and consistency through the assessment the susceptibility of landscape types, for which key characteristics are defined in the West Oxfordshire Landscape Assessment, will be considered against the following criteria:

Landform and scale		
Flat or gently sloping and simple landform without dramatic changes in topography is more likely to accommodate wind turbine development than more complex landforms with particularly distinctive elements. Likewise, larger scale landscapes are better able to accommodate tall turbine structures which may appear out of scale in more intimate landscapes. Landform and scale are usually less susceptible to solar farm development as they have no notable vertical component.		
Typical example of susceptibility judgement		
High – intimate, small scale landscapes or those with dramatic and distinctive topography.	**Medium** – rolling or undulating medium scale landscapes with some localised variation (e.g. incised valleys, isolated hills).	**Low** – open and extensive landscapes, typically flat, with little or no distinctive topography.

Land Cover Pattern		
Simple landscapes with consistent land cover and pattern with few human scale features are generally less susceptible to the simple structural forms introduced with turbine development. Where there is a more diverse mosaic of land uses, such as trees or woodland and buildings which act as scale comparators, susceptibility is likely to be increased. This is a less clear distinction with solar farm development and very much depends on local context. For example, there may be areas where the converse is true and the introduction of extensive areas of solar panels may clash with the homogeneity of simple land cover (e.g. arable farming) but may more easily be accommodated within a more complex mosaic where they are incorporated as one of may varying land uses.		
Typical example of susceptibility judgement		
High – landscapes with a rich mosaic of land cover and human scale features to act as scale comparators.	**Medium** – landscapes comprising medium scale fields of regular or sub regular shape with some variation in land cover. Occasional human scale features such as small woodlands and buildings.	**Low** – open landscapes with consistent land cover and few human scale features.

Key Views and Skylines		
The overall visibility of turbines within a landscape depends on their height and any screening offered by the surrounding landform and land cover. Elevated landscapes, those with prominent skylines or those with important visual links with adjoining landscapes are of higher susceptibility whilst those with limited inward or outward views and few landmark features will be of lower susceptibility. Although solar farms are unlikely to be widely visible across landscapes particularly visually prominent locations, such as ridgelines and escarpment slopes, would be of higher susceptibility.		
Typical example of susceptibility judgement		
High – landscapes with prominent ridgelines lacking existing built development that form an important backdrop to surrounding landscapes.	**Medium** – landscapes with some notable although not particularly distinctive ridgelines, perhaps already influenced by mast or pylon development. They may have some visual relationship with adjoining landscape types but do not form an import part of their setting.	**Low** – enclosed landscapes with limited views in or out and no distinctive skylines.

Scenic and Perceptual Qualities		
Areas of high scenic and perceptual quality are likely to be more susceptible to renewables development than those of low scenic quality. These may be the result of pleasing combinations of landform, land cover and visual relationships or well managed areas in pristine condition resulting in a particularly strong sense of place. The modern structures associated with wind and solar development may be seen as intrusive in areas that are perceived to be tranquil, natural, deeply rural or where historic character is notable. Lower susceptibility would generally be associated with areas where there is already modern development or intensive land use.		
Typical example of susceptibility judgement		
High – quietly rural landscapes with very limited evidence of modern development and high scenic quality.	**Medium** – generally attractive landscapes with some modern influences such as large scale commercial farming or busy roads.	**Low** – degraded landscapes or areas dominated by modern development and human activity such as mineral extraction or industrial use.

It should be noted that these criteria are not necessarily evenly weighted in terms of the overall susceptibility of a landscape and their relative importance will vary across different landscape types.

The character assessment identifies a number of types that can be considered functional landscapes and include: Sport landscapes, Airfields and MoD site and Minerals and landfill sites. In these areas renewables development is unlikely to be compatible with the land use that defines the landscape type. As such, landscape effects are unlikely to have any bearing on whether development occurs here and so susceptibility in these areas is not assessed; for the purpose of the wider assessment these areas are considered neutral in landscape terms.

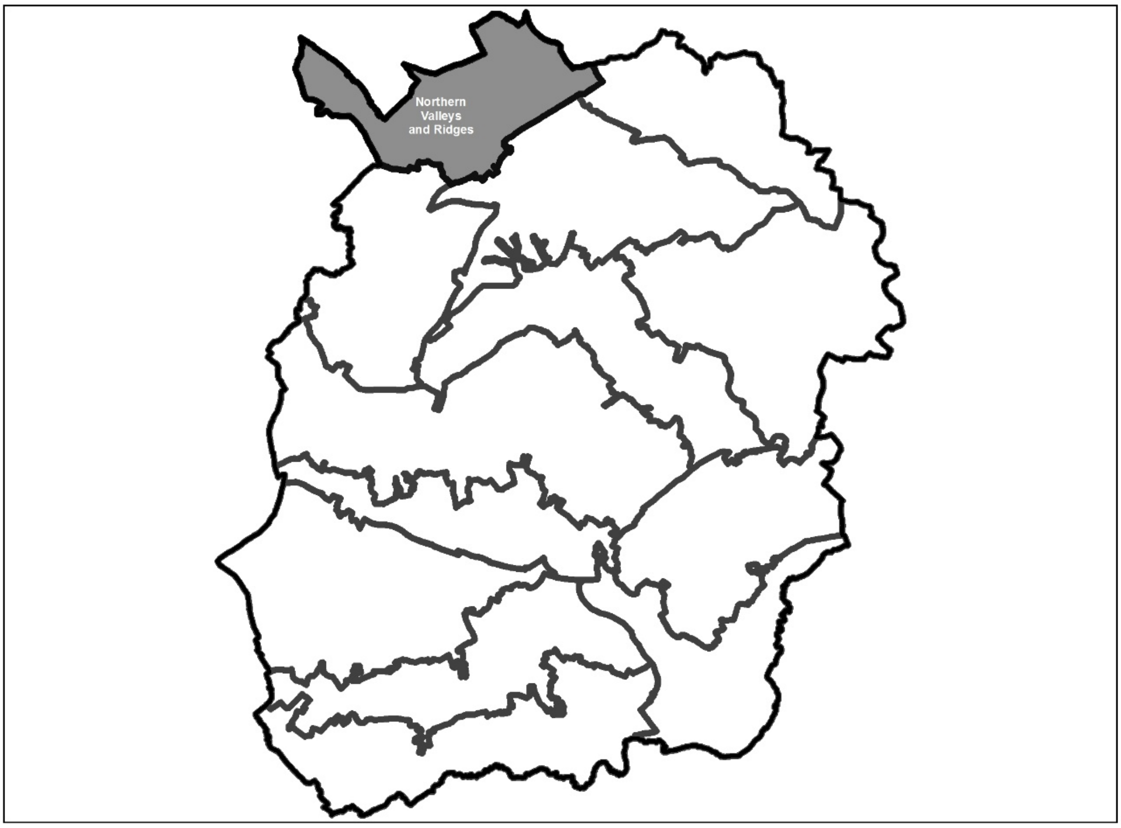
Susceptibility of the 13 landscape character areas identified in the West Oxfordshire Landscape Assessment is deduced from the assessment of the underlying landscape types. This is combined with the judgement of landscape value of the character area in order to arrive at an assessment of sensitivity. Landscape value is *"the relative value that is attached to different landscapes by society" (GLVIA, 3rd version, page 157).* It is rated on the following scale:

- National/International – Designated landscapes which are nationally or internationally designated for their landscape value – including National Parks, Areas of Outstanding Natural Beauty, World Heritage sites; Heritage Coast and National Scenic Areas.
- Local/District – Locally or regionally designated landscapes (e.g. Area of High Landscape Value, Regional Scenic Areas); also areas which local evidence (such as tourism guides, landscape character assessments or other documentary information) indicates as being more valued than the surrounding area.
- Community – 'everyday' landscape which is appreciated by the local community but has little or no wider recognition of its value.
- Limited – despoiled or degraded landscape with little or no evidence of being valued by the community.

A relative assessment of landscape sensitivity to both wind and solar development for each character area is arrived at through a combination of the judgements of susceptibility and landscape value. This is then expressed in terms of the area being more able to accommodate renewables development or less able to accommodate renewables development of the given typologies.

2.0 Landscape Character Areas

2.1. Northern Valleys and Ridges



2.1.1. Summary Description

"A topographically diverse area of complex geology to the north of Chipping Norton, where folding and faulting have created a distinctive, 'corrugated' landscape of valleys and ridges. Landform has influenced land use, with a typical pattern of smaller-scale fields on steeper slopes and valley bottoms and larger-scale fields, mostly under arable, on gentler, upper slopes. The area is characterised by a generally strong landscape structure of thick hedgerows, hedgerow trees and scattered belts of woodland."

"The distinctive character of this area is defined by its visual and physical diversity. The complex network of valleys and ridges and the intricate patchwork of fields, hedges and woodland combine to create great visual diversity and a rich pattern of landscape that is difficult to break down into individual components."

2.1.2. Susceptibility

The table below summarises the susceptibility of the underlying landscape character sub-types that are found within the character area, for further detail refer to Appendix 1.

Landscape Sub-type	Renewable Technology	Susceptibility		
		Low	Medium	High
Valley Floor Farmland	Wind			
	Solar			
Open Valleys and Ridges	Wind			
	Solar			
Semi-enclosed Valleys and Ridges	Wind			
	Solar			
Open Limestone Wolds	Wind			
	Solar			
Semi-enclosed Limestone Wolds (large-scale)	Wind			
	Solar			
Semi-enclosed Clay Wolds (smaller-scale)	Wind			
	Solar			
Parkland	Wind			
	Solar			

Summary

The great diversity of land cover and use, complex topography and variety of scale of within this character area give it a high scenic value and point to increased susceptibility to both turbine and solar farm development.

Overall Susceptibility	Wind			
	Solar			

2.1.3. Landscape Value

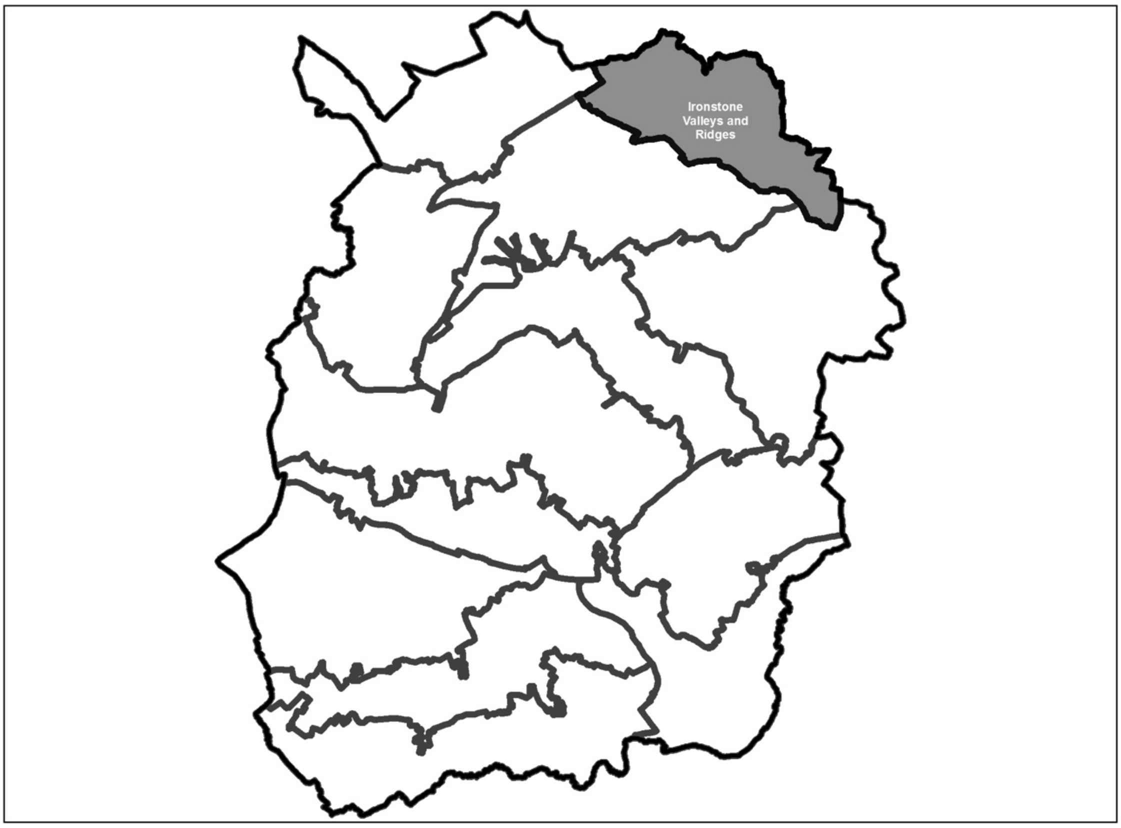
The majority of this character area falls within the Cotswolds AONB which is indicative of the nationally important value placed on this landscape. The character area also contains a number of conservation areas and two registered parks and gardens at Chastleton House and Cornwell Manor which are contributors to the historic character and value of the landscape and also provide visitor attractions, all of which contribute to an elevated landscape value.

2.1.4. **Guidance and Capacity**

There may be some very limited scope for turbine development to be accommodated within this character area and slightly greater potential solar farm development although suitable locations are likely to be limited. Any development should avoid the most open areas with potentially high intervisibility and should not detract from the highly susceptible Parkland landscapes or their settings. It is unlikely that the character area would be able to accommodate numerous wind turbines or solar farm schemes as the cumulative effect would rapidly result in unacceptable modern intrusion into a traditionally picturesque, rural landscape.

Development Typology	**Suitability for Development**	
	More Suitable	**Less Suitable**
Small Turbines		
Medium Turbines		
Large Turbines		
Solar		

2.2. Ironstone Valleys and Ridges



2.2.1. Summary Description

"This area shares the topographic complexity and patchwork landscape pattern of the Northern Valleys and Ridges area but is distinguished from it by the presence of iron rich clay soils and the use of Ironstone as a building material, lending a distinctive red colour to soils and warm orange to buildings. Parklands and estate villages (e.g. at Great Tew, Sandford St Martin and Steeple Barton) are also characteristic of this area and contribute to its well-treed character."

"Like the Northern Valleys and Ridges, the character of this area is defined by its overall diversity, with the complex landform and the intricate patchwork of fields, hedges and woodland combining to create a rich pattern of landscape. The ironstone geology and well-treed character are particularly distinctive and unifying elements in the landscape."

2.2.2. **Susceptibility**

The table below summarises the susceptibility of the underlying landscape character sub-types that are found within the character area, for further detail refer to Appendix 1.

Landscape Sub-type	Renewable Technology	Susceptibility		
		Low	Medium	High
Minor Valley	Wind			
	Solar			
Valley Floor Farmland	Wind			
	Solar			
Open Valleys and Ridges	Wind			
	Solar			
Semi-enclosed Valleys and Ridges	Wind			
	Solar			
Open Limestone Wolds	Wind			
	Solar			
Semi-enclosed Limestone Wolds (large-scale)	Wind			
	Solar			
Parkland	Wind			
	Solar			
Estate Farmland	Wind			
	Solar			

Summary

As with the Northern Valleys and Ridges LCA the great diversity of land cover and use, complex topography and variety of scale of within this character area give it a high scenic value and point to increased susceptibility to both turbine and solar farm development.

Overall Susceptibility	Wind			
	Solar			

2.2.3. **Landscape Value**

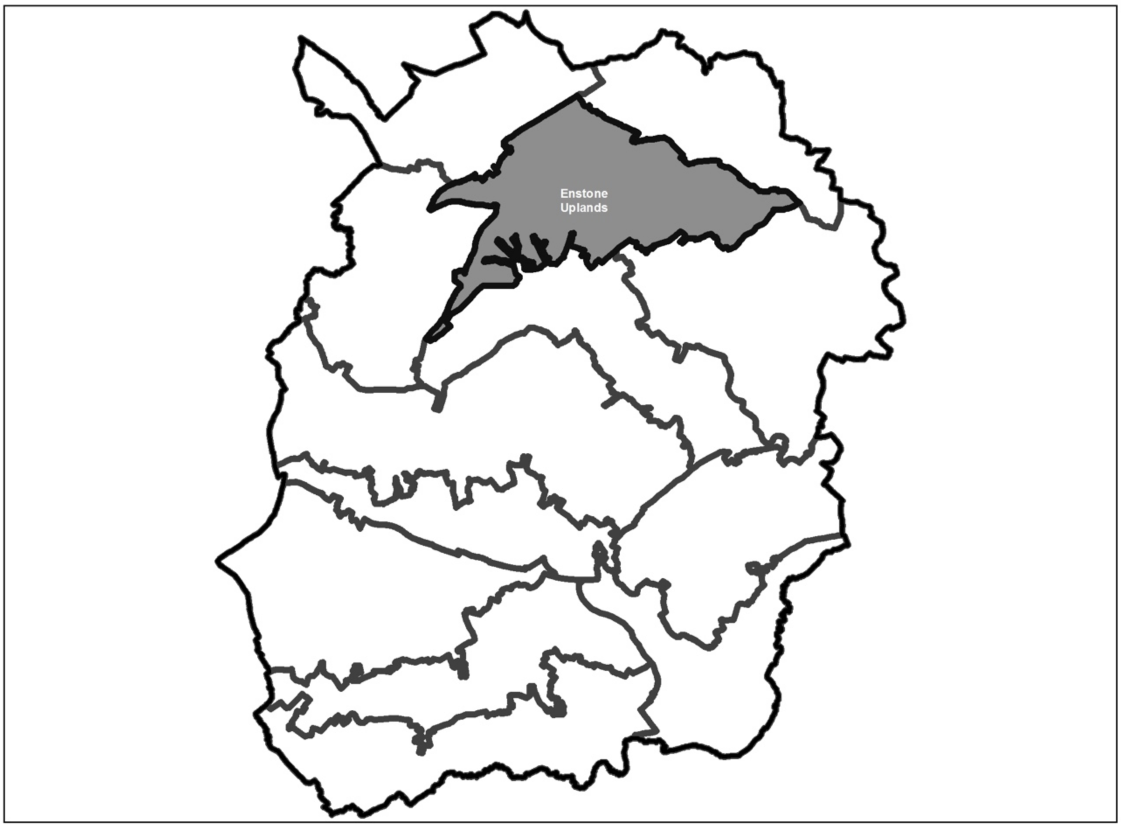
Although this character area does not fall within the Cotswolds AONB there is a higher proportion of registered parks and gardens and conservation areas resulting in slightly greater historic character than in the similar Northern Valleys and Ridges LCA. This, along with the presence of ecological designations, perhaps even greater landscape diversity and high scenic quality are indicative that the landscape value of the area is on a par with the Northern Valleys and Ridges despite the lack of a formal designation.

2.2.4. Guidance and Capacity

There is very limited scope for turbines to be accommodated within this character area due to the potential adverse impacts on an area of particularly high scenic quality. Small turbines located in the less susceptible Limestone Wolds landscapes might potentially be incorporated without undue consequences although proximity to the particularly susceptible Parkland and Estate Farmland types may be a limiting factor. Solar farms would be subject to the same sensitivities although where they can be sufficiently screened by vegetation may be acceptable. In either case It is unlikely that the character area would be able to accommodate numerous developments without notable detriment.

Development Typology	**Suitability for Development**	
	More Suitable	**Less Suitable**
Small Turbines		
Medium Turbines		
Large Turbines		
Solar		

2.3. Enstone Uplands



2.3.1. Summary Description

"This area occupies a high limestone plateau, dissected by the River Glyme but otherwise characterised by rolling landform with a distinctively elevated and open character. Intensive arable farming predominates, with large-scale fields bounded by dry-stone walls and hedges. Thin, dry calcareous soils over limestone result in a generally sparse vegetation cover (apart from woodland associated with Heythrop House and Park) and characteristic species (e.g. ash, hazel and field maple)."

"The overall character of this area is dominated by its limestone geology, forming the typically large-scale, open and elevated landscape of the limestone wolds. However, there is a sharp contrast between this and the heavily wooded and enclosed parkland and estate character around Heythrop House which dominates the northern part of the plateau and the minor river valleys."

2.3.2. Susceptibility

The table below summarises the susceptibility of the underlying landscape character sub-types that are found within the character area, for further detail refer to Appendix 1.

Landscape Sub-type	Renewable Technology	Susceptibility		
		Low	Medium	High
Minor Valley	Wind			
	Solar			
Open Limestone Wolds	Wind			
	Solar			
Semi-enclosed Limestone Wolds (large-scale)	Wind			
	Solar			
Parkland	Wind			
	Solar			
Estate Farmland	Wind			
	Solar			
Sport Landscapes	Wind			
	Solar			
Airfields and MoD Land	Wind			
	Solar			

Summary

Although some of the character area comprises landscape types of higher susceptibility the majority of the area is occupied by the Limestone Wolds types that are generally less susceptible. Functional landscape types also occupy a notable proportion of the character area although in the case of renewables development these are considered neutral.

Overall Susceptibility	Wind			
	Solar			

2.3.3. Landscape Value

A small proportion of this character area is within the Cotswolds AONB although this corresponds with the least susceptible Open Limestone Wolds character type. Heythrop Park is a registered landscape, now a hotel and country club, which occupies a relatively large portion to the central north of the character area. It contributes to historic character although is distinctively different to the character of the wider area and does not notably increase the value of the character area as a whole. Although these two areas are of particular value the character area overall has no particular features that raise the value beyond local or regional importance.

2.3.4. Guidance and Capacity

There is scope for both some turbine and solar form development to be accommodated within this character area and most readily within the larger scale Limestone Wolds types. Potential adverse effects are more likely to occur in close proximity to Heythrop Park or within the AONB and these areas are therefore considered least favourable. The large scale of the landscape and intensive land use means it may be suitable for not just the smallest turbines and if potential cumulative effects are considered carefully there may be scope for several developments to be accommodated.

Development Typology	Suitability for Development	
	More Suitable	Less Suitable
Small Turbines		
Medium Turbines		
Large Turbines		
Solar		

2.4. Eastern Parks and Valleys

2.4.1. Summary Description

"This is an area of rolling limestone landscape which is heavily dissected by the valleys of the Glyme, Dorn and Cherwell and distinguished by a particular concentration of formal parks, designed landscapes and estate farmland (Blenheim, Ditchley, Glympton, Kiddington, Rousham, etc). The parks have extensive areas of woodland and the landscape generally has a well-managed character typical of large estates."

"The parkland and estate landscapes are the dominant feature of this area, creating a large-scale mosaic of woodland and farmland within which are set the mansions and formal elements of the designed parkland landscape."

2.4.2. **Susceptibility**

The table below summarises the susceptibility of the underlying landscape character sub-types that are found within the character area, for further detail refer to Appendix 1.

Landscape Sub-type	Renewable Technology	Susceptibility		
		Low	Medium	High
Minor Valley	Wind			
	Solar			
Valley Floor Farmland	Wind			
	Solar			
Semi-enclosed Valley-side Farmland	Wind			
	Solar			
Open Limestone Wolds	Wind			
	Solar			
Semi-enclosed Limestone Wolds (large-scale)	Wind			
	Solar			
Parkland	Wind			
	Solar			
Estate Farmland	Wind			
	Solar			

Summary

The character area has a relatively high proportion of the most susceptible landscape types distributed throughout. Due to proximity, even development outside these types has the potential to encroach resulting in an overall elevated susceptibility.

Overall Susceptibility	Wind			
	Solar			

2.4.3. **Landscape Value**

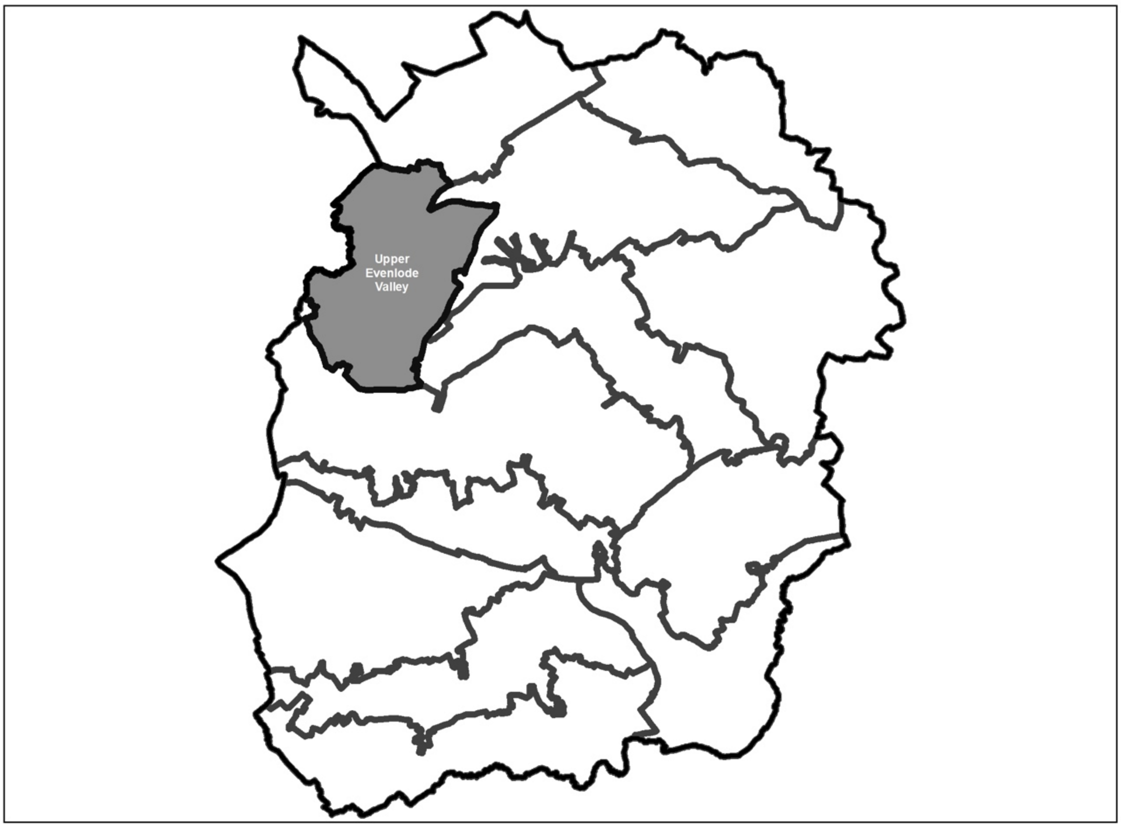
Blenheim Palace and the surrounding landscape are designated as a World Heritage Site occupying a section of the southern part of the character area. Associated estate farmland and the registered landscape at Ditchley Park occupy a further large swathe along the western edge of the character area. These, along with further registered landscapes and conservation areas are indicative that this is a landscape of the highest value stemming from the international value of the Blenheim Estate.

2.4.4. **Guidance and Capacity**

Potential to accommodate both solar farms and turbines is very limited within this character area due to the large potential for adverse effects on a highly valued and particularly scenic landscape. If developments are proposed then smaller schemes located in the Limestone Wolds character type and away from the highly susceptible Valleys and Parkland types are likely to result in the lowest potential for adverse effects.

Development Typology	Suitability for Development	
	More Suitable	Less Suitable
Small Turbines		
Medium Turbines		
Large Turbines		
Solar		

2.5. Upper Evenlode Valley



2.5.1. Summary Description

"A distinctive area of rolling clayland which forms a broad, shallow basin around the upper reaches of the River Evenlode. The area is characterised by heavy clay soils and a strong landscape structure of thick hedgerows and frequent hedgerow trees, in marked contrast with the limestone areas to the south and east Despite this, the large-scale field pattern, gentle topography and limited areas of woodland (apart from those at Bruern Abbey) give the area a general open, expansive character."

"The parkland and estate landscapes are the dominant feature of this area, creating a large-scale mosaic of woodland and farmland within which are set the mansions and formal elements of the designed parkland landscape."

2.5.2. **Susceptibility**

The table below summarises the susceptibility of the underlying landscape character sub-types that are found within the character area, for further detail refer to Appendix 1.

Landscape Sub-type	**Renewable Technology**	**Susceptibility**		
		Low	**Medium**	**High**
Valley Floor Farmland	Wind			
	Solar			
Open Valley-side Farmland	Wind			
	Solar			
Semi-enclosed Valley-side Farmland	Wind			
	Solar			
Open Clay Wolds	Wind			
	Solar			
Semi-enclosed Clay Wolds (large-scale)	Wind			
	Solar			
Semi-enclosed Clay Wolds (smaller-scale)	Wind			
	Solar			
Parkland	Wind			
	Solar			
Estate Farmland	Wind			
	Solar			
Sport Landscapes	Wind			
	Solar			

Summary

This character area has a mix of landscape types of both higher and lower susceptibility in roughly equal proportions. Occupying a relatively small area however, any development is likely to be in quite close proximity to more susceptible areas and as a result the susceptibility across the area as a whole is increased.

Overall Susceptibility	Wind			
	Solar			

2.5.3. **Landscape Value**

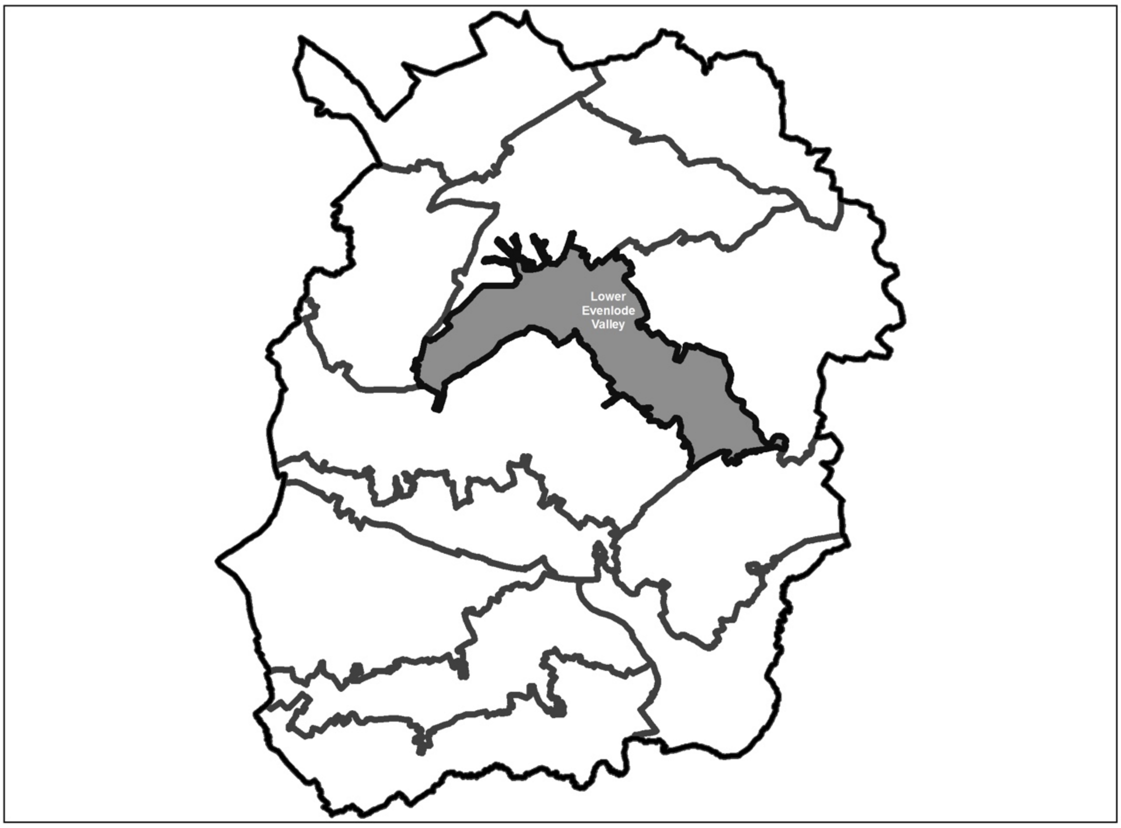
The entire character area is located within the Cotswolds AONB which is an indication of the national value attached to this landscape. There are also designated areas including SSSI's, conservation areas and the registered landscape at Sarsden House that are indicative of increased heritage and ecological value.

2.5.4. **Guidance and Capacity**

Turbine development is likely to conflict with the objectives of the AONB and is therefore unlikely to be accommodated within this character area although there is some limited potential for solar development within the less susceptible Clay Wolds landscape types. These correspond to the Pastoral Lowland Vale type identified in the Cotswolds AONB Landscape Character Assessment. The AONB Landscape Strategy and Guidelines provides guidance in relation to solar farms in this type which include landscape enhancement, appropriate screening and avoiding the removal of existing landscape features such as hedges, walls or ridge and furrow.

Development Typology	Suitability for Development	
	More Suitable	Less Suitable
Small Turbines		
Medium Turbines		
Large Turbines		
Solar		

2.6. Upper Evenlode Valley



2.6.1. Summary Description

"Unlike its upper section (Area 5), the Lower Evenlode Valley forms a distinct landform unit which, although it varies in width between Shipton-under-Wychwood and Bladon, creates a sense of enclosure and a particular sense of place. The valley floor has a distinctively pastoral, intimate and riparian character with a dose visual relationship with its enclosing valley sides, along which lie a string of valley-side settlements."

"The landform of the Lower Evenlode Valley defines its overall character, providing visual endosure, shelter and a coherent valley character which contrasts markedly with the open, rolling limestone hills above."

2.6.2. Susceptibility

The table below summarises the susceptibility of the underlying landscape character sub-types that are found within the character area, for further detail refer to Appendix 1.

Landscape Sub-type	Renewable Technology	Susceptibility		
		Low	Medium	High
Minor Valley	Wind			
	Solar			
Valley Floor Farmland	Wind			
	Solar			
Open Valley-side Farmland	Wind			
	Solar			
Semi-enclosed Valley-side Farmland	Wind			
	Solar			
Open Limestone Wolds	Wind			
	Solar			
Semi-enclosed Limestone Wolds (large-scale)	Wind			
	Solar			
Parkland	Wind			
	Solar			
Quarries and Landfill Sites	Wind			
	Solar			

Summary

The particularly strong sense of place and enclosed, intimate character that is consistent across the various character types within this character area results in the overall susceptibility being elevated to the higher end of those types found within.

Overall Susceptibility	Wind			
	Solar			

2.6.3. Landscape Value

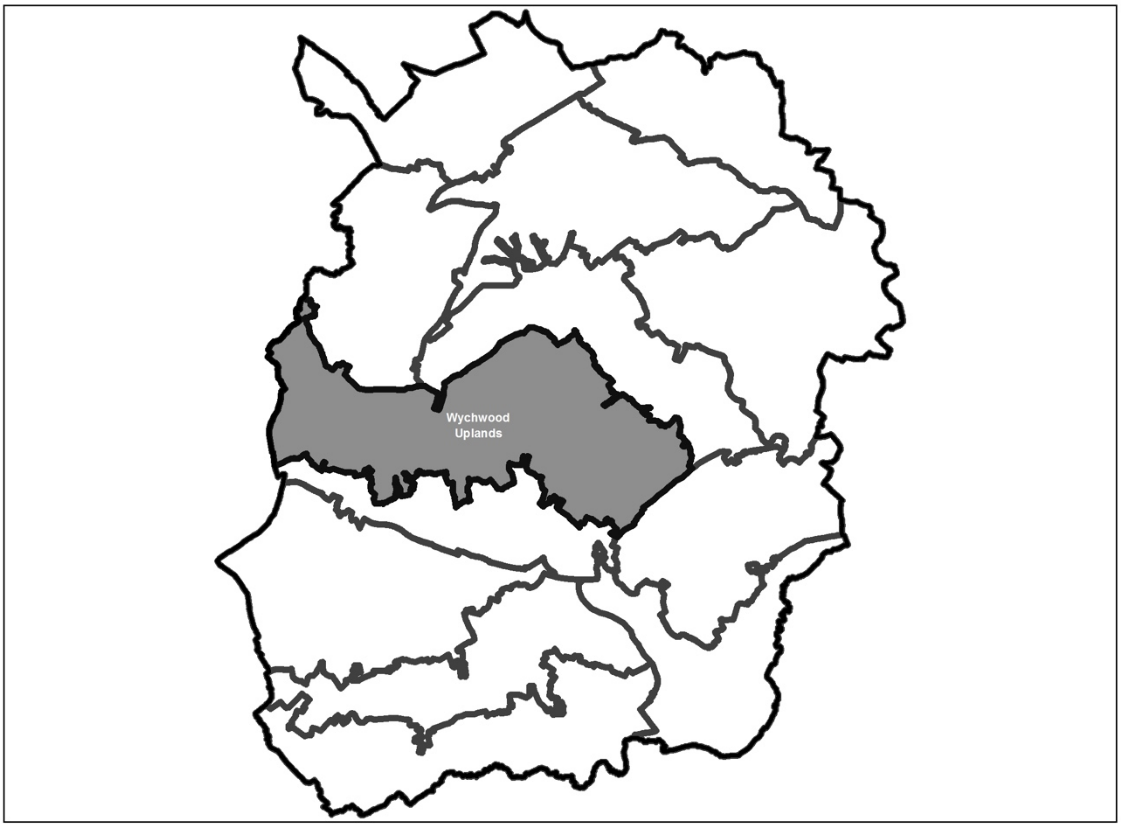
As with the Upper Evenlode Valley character area this is located entirely within the Cotswolds AONB which is an indication of the national value attached to the landscape here. There are also designated areas including SAM's, SSSI's and conservation areas that are indicative of increased heritage and ecological value.

2.6.4. Guidance and Capacity

The strong sense of place and scenic quality resulting from the strong coherence across the various character types that make up this area mean the potential for adverse effects occurring is relatively high for any form of renewables development within the character area. Where proposals do come forward there would be less potential for adverse effects for those located in the Limestone Wolds types although these areas are limited within the type and adjacent to the highly sensitive Parkland landscapes associated with the Blenheim World Heritage Site in the adjacent character area.

Development Typology	**Suitability for Development**	
	More Suitable	**Less Suitable**
Small Turbines		
Medium Turbines		
Large Turbines		
Solar		

2.7. Wychwood Uplands



2.7.1. Summary Description

"An area of smoothly rolling limestone uplands bounded by the valleys of the Evenlode and Windrush. Although lower in elevation, it supports the typical large-scale arable farmland of the Enstone Uplands but is distinguished by the presence of the extensive woodlands of Cornbury Park, remnants of the former Wychwood Forest which covered much of this area until as recently as the nineteenth century."

"The overall character of this area is dominated by its limestone geology, forming the typically large-scale, open and elevated landscape of the limestone wolds. However, there is a sharp contrast between this and the heavily wooded and enclosed parkland and estate character around Cornbury Park which dominates the north-eastern part of the plateau and the more mixed pattern of landscape which occurs immediately to the south of this."

2.7.2. Susceptibility

The table below summarises the susceptibility of the underlying landscape character sub-types that are found within the character area, for further detail refer to Appendix 1.

Landscape Sub-type	Renewable Technology	Susceptibility		
		Low	Medium	High
Open Limestone Wolds	Wind			
	Solar			
Semi-enclosed Limestone Wolds (large-scale)	Wind			
	Solar			
Semi-enclosed Limestone Wolds (smaller-scale)	Wind			
	Solar			
Parkland	Wind			
	Solar			
Estate Farmland	Wind			
	Solar			

Summary

Although there are some relatively small areas of more susceptible landscape types within this character area the vast majority comprises Limestone Wolds character types which are typically of lower susceptibility.

Overall Susceptibility	Wind			
	Solar			

2.7.3. Landscape Value

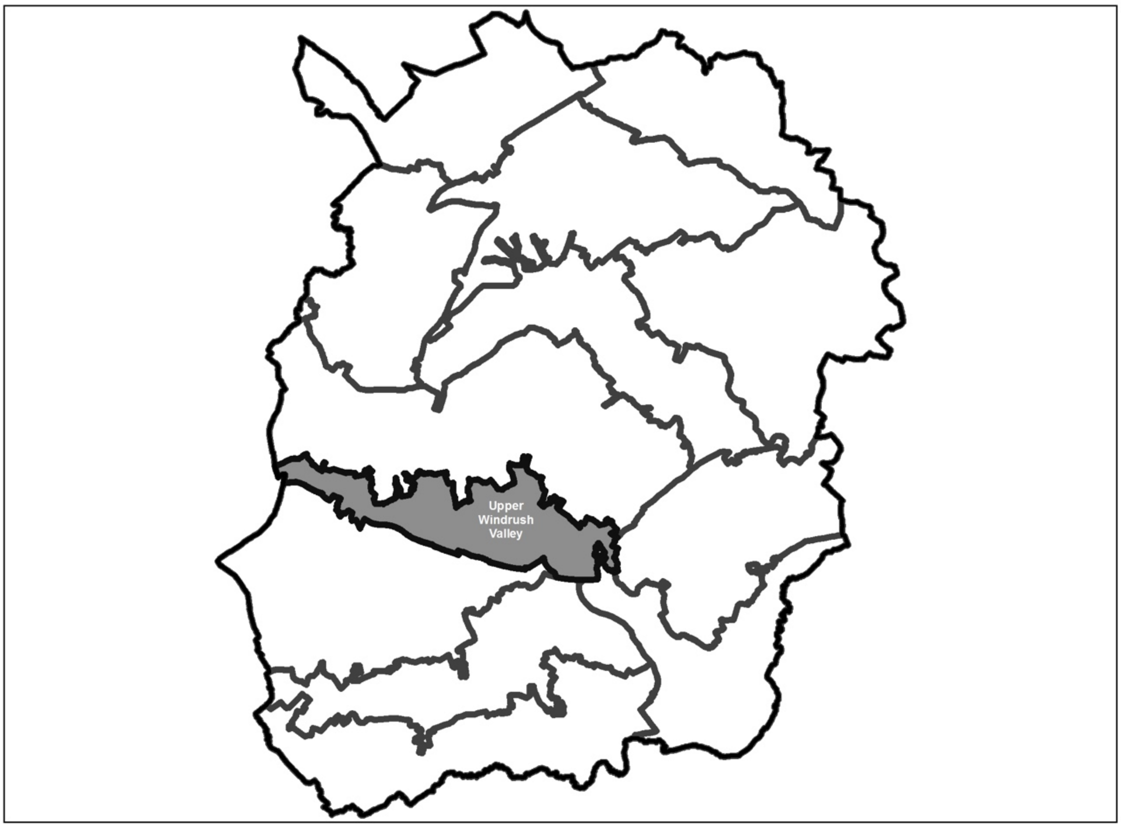
Around two thirds of this character area is located within the Cotswolds AONB which is an indication of the national value attached to this landscape. There are also other designated areas including SAM's, SSSI's, a National Nature Reserve, the designated landscape of Cornbury Park and conservation areas that are indicative of increased heritage and ecological value.

2.7.4. Guidance and Capacity

The landscape types within this area tend towards the lower end of susceptibility to potential renewables development although the value attached to the landscape is generally high and as a result potentially suitable sites for solar or wind development are more limited than they may otherwise be. Areas to the southeast of the character area are likely to be most suitable as they avoid the more highly valued AONB landscape. This area is primarily made up of the Semi-enclosed Limestone Wolds (smaller-scale) landscape type within which solar farms and small turbines are likely to be the most appropriate typologies. There is limited capacity for this small part of the character area to accommodate multiple developments before cumulative effects lead to an unacceptable degree of change.

Development Typology	**Suitability for Development**	
	More Suitable	**Less Suitable**
Small Turbines		
Medium Turbines		
Large Turbines		
Solar		

2.8. Upper Windrush Valley



2.8.1. Summary Description

"The River Windrush flows through a deep valley which dissects the limestone of the Cotswold dip slope and forms a highly distinctive landform feature, with a distinctively intimate and pastoral character. The valley is punctuated at its western end by Burford and at its eastern end by Witney, which occupies an island of Combrash limestone within the valley floor and forms the junction with the more open Vale to the south."

"The landform of the Windrush Valley defines its overall character, providing visual enclosure, shelter and a coherent valley character which contrasts markedly with the open, rolling limestone hills above."

2.8.2. Susceptibility

The table below summarises the susceptibility of the underlying landscape character sub-types that are found within the character area, for further detail refer to Appendix 1.

Landscape Sub-type	Renewable Technology	Susceptibility		
		Low	Medium	High
Minor Valley	Wind			
	Solar			
Open Valley-side Farmland	Wind			
	Solar			
Semi-enclosed Valley-side Farmland	Wind			
	Solar			
Open Limestone Wolds	Wind			
	Solar			
Semi-enclosed Limestone Wolds (large-scale)	Wind			
	Solar			
Semi-enclosed Limestone Wolds (smaller-scale)	Wind			
	Solar			
Estate Farmland	Wind			
	Solar			
Rural Fringe Land	Wind			
	Solar			
Sport Landscapes	Wind			
	Solar			

Summary

The coherence of the overall valley landform that contains the various character types within this character area and the intimate character this creates results in the overall susceptibility being elevated to the higher end of those types found within.

Overall Susceptibility	Wind			
	Solar			

2.8.3. Landscape Value

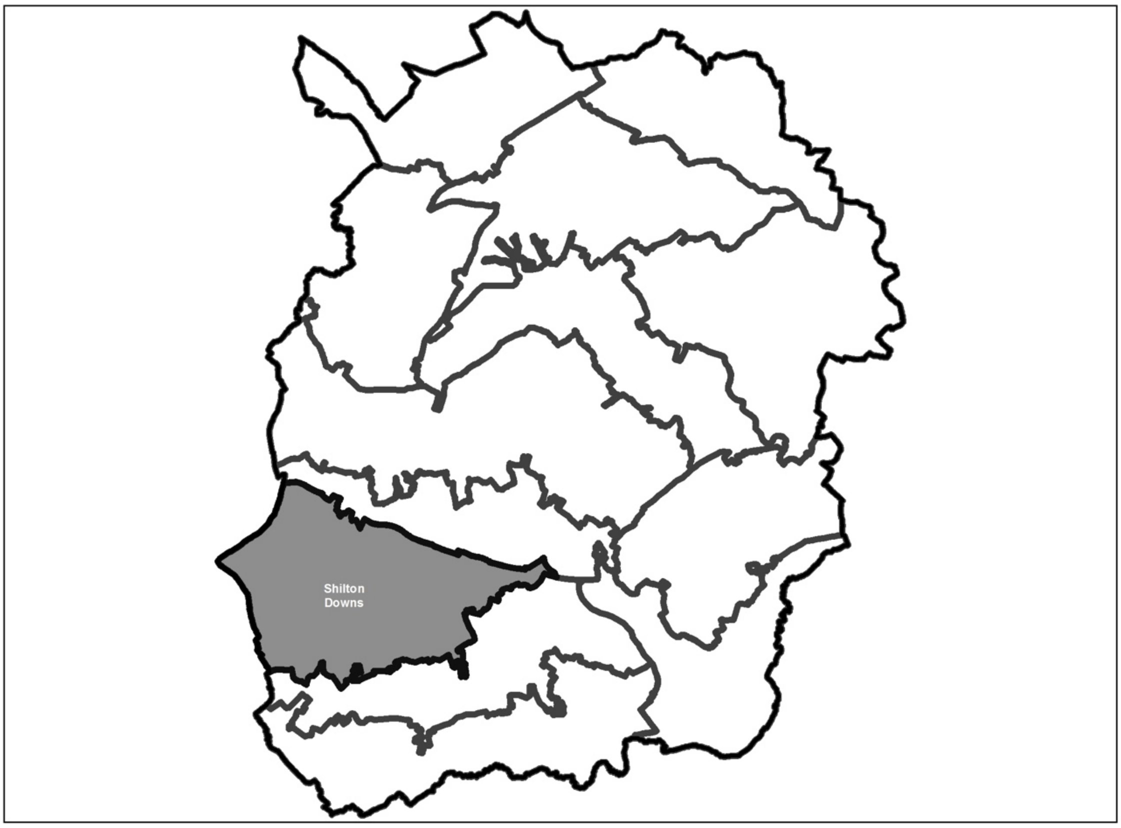
Around half of this character area is located within the Cotswolds AONB which is an indication of the national value here. There are also numerous heritage and ecological designations within the area indicative of historic and ecological value and some areas of accessible open space around Eynsham which are of local value.

2.8.4. **Guidance and Capacity**

Turbines are likely to be seen as a particularly intrusive feature into this landscape as their scale would be at odds with the general small scale and intimate character of this valley landscape. Solar farm development may be slightly more readily accommodated on the upper valley slopes although these locations are likely to be highly visible so siting and potential for screening should be carefully considered.

Development Typology	**Suitability for Development**	
	More Suitable	**Less Suitable**
Small Turbines		
Medium Turbines		
Large Turbines		
Solar		

2.9. Shilton Downs



2.9.1. Summary Description

"An area of limestone landscape which forms the divide between the low-lying clay vale to the south and the Windrush Valley and limestone uplands to the north. A line of settlements lie along its southern boundary, occupying the spring line between the limestone and clay (eg. Filkins, Kencott, Broadwell, Alvescot and Carterton). The area has a typically large-scale field pattern bounded by dry-stone walls with the sparse and characteristic vegetation cover typical of the other limestone areas, apart from extensive woodlands around the Cotswold Wildlife Park and estate farmland to the west."

"The overall character of this area is dominated by its limestone geology, forming the typically large-scale, open landscape of the limestone wolds. However, there are contrasts between this and the heavily wooded and enclosed estate character around the Cotswold Wildlife Park"

2.9.2. **Susceptibility**

The table below summarises the susceptibility of the underlying landscape character sub-types that are found within the character area, for further detail refer to Appendix 1.

Landscape Sub-type	Renewable Technology	Susceptibility		
		Low	Medium	High
Minor Valley	Wind			
	Solar			
Open Limestone Wolds	Wind			
	Solar			
Semi-enclosed Limestone Wolds (large-scale)	Wind			
	Solar			
Semi-enclosed Limestone Wolds (smaller-scale)	Wind			
	Solar			
Parkland	Wind			
	Solar			
Estate Farmland	Wind			
	Solar			
Rural Fringe Land	Wind			
	Solar			
Sport Landscapes	Wind			
	Solar			
Airfields and MoD Land	Wind			
	Solar			

Summary

This character area has a mix of both higher and lower susceptibility landscape types although the majority comprises the less susceptible Limestone Wolds types. Functional landscape types, primarily the Brize Norton RAF station, also occupy a notable proportion of the character area although in the case of renewables development these are considered neutral.

Overall Susceptibility	Wind			
	Solar			

2.9.3. **Landscape Value**

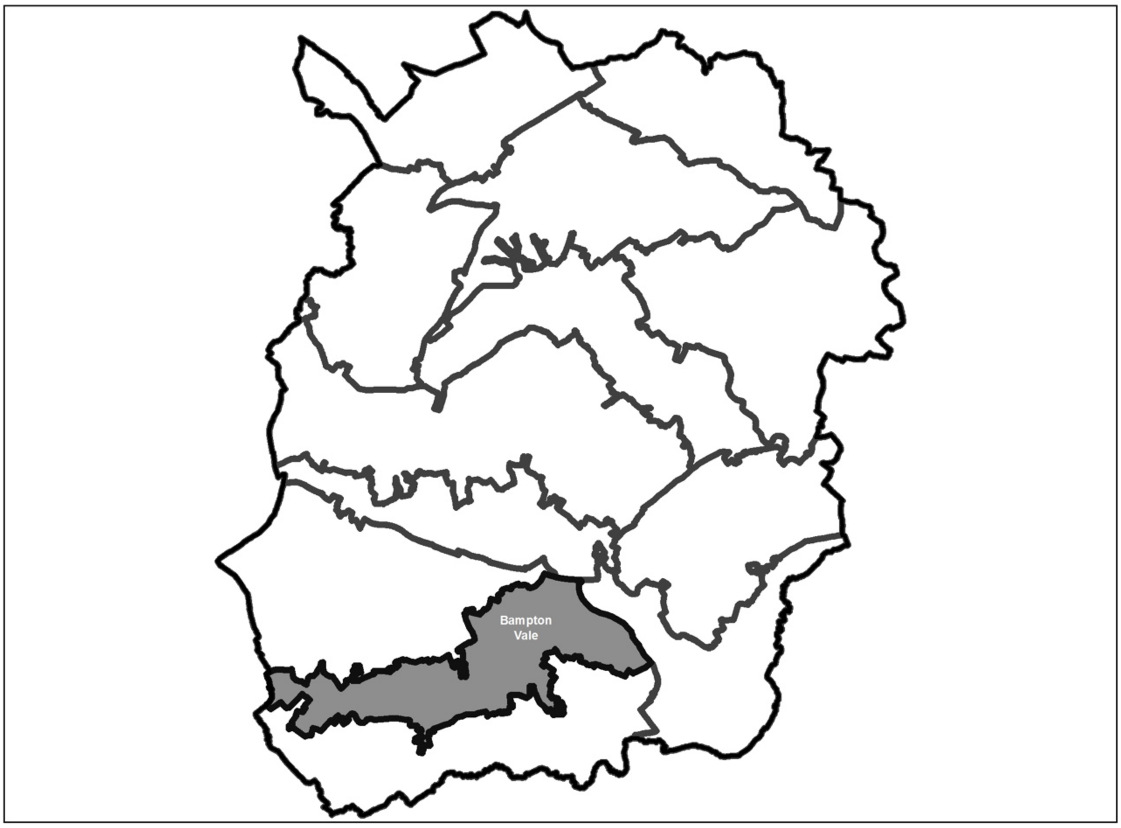
The Cotswold Wildlife Park is located within this character area which is a popular regional visitor attraction. There are also designated Local Geological Sites associated with some of the valley landforms and there is accessible open space around Carterton however there are no features that suggest the area is considered more than an everyday locally valued landscape.

2.9.4. **Guidance and Capacity**

The large scale landscape of typically simple land cover pattern may be able to accommodate both wind turbine and solar farm development within the less susceptible Limestone Wolds character types. To the north and west of the character area these are in fairly close proximity to both the AONB and more susceptible landscape types so careful consideration of siting and potential mitigation is required. Small turbines and solar farms are likely to be the most suitable typologies although there may be some limited scope for larger turbines. The former airfield to the west of Carterton is a slightly degraded and relatively remote area which may be particularly suitable, especially where landscape enhancement forms part of a proposal. A number of developments may potentially be accommodated within this landscape before cumulative effects become unacceptable.

Development Typology	**Suitability for Development**	
	More Suitable	**Less Suitable**
Small Turbines		
Medium Turbines		
Large Turbines		
Solar		

2.10. Bampton Vale



2.10.1. Summary Description

"This area of distinctively low-lying but gently rolling clay vale landscape lies between the edge of the limestone to the north and the very flat, expansive floodplain landscape which borders the River Thames to the south. The underlying clay geology is reflected in the soils and character of the vegetation (e.g. oak is the dominant tree species). Landscape pattern is characterised by large fields with a reasonably strong structure of hedgerows and trees, although pockets of more open, intensive arable cultivation occupy higher, drier and more productive land overlying localised areas of river gravels."

"The overall character of this area is defined by its low-lying and gentle relief and the patchwork of large, regularly shaped fields and comparatively strong structure of hedgerows and trees."

2.10.2. **Susceptibility**

The table below summarises the susceptibility of the underlying landscape character sub-types that are found within the character area, for further detail refer to Appendix 1.

Landscape Sub-type	Renewable Technology	Susceptibility		
		Low	**Medium**	**High**
Floodplain Pasture	Wind			
	Solar			
Open Flat Vale Farmland	Wind			
	Solar			
Semi-enclosed Flat Vale Farmland	Wind			
	Solar			
Open Rolling Vale Farmland	Wind			
	Solar			
Semi-enclosed Rolling Vale Farmland	Wind			
	Solar			
Parkland	Wind			
	Solar			
Estate Farmland	Wind			
	Solar			

Summary

This character area is dominated by the less susceptible Clay Wolds landscape types and although there are some of the more susceptible Parkland types present these form a very minor extent of the overall area.

Overall Susceptibility	Wind			
	Solar			

2.10.3. **Landscape Value**

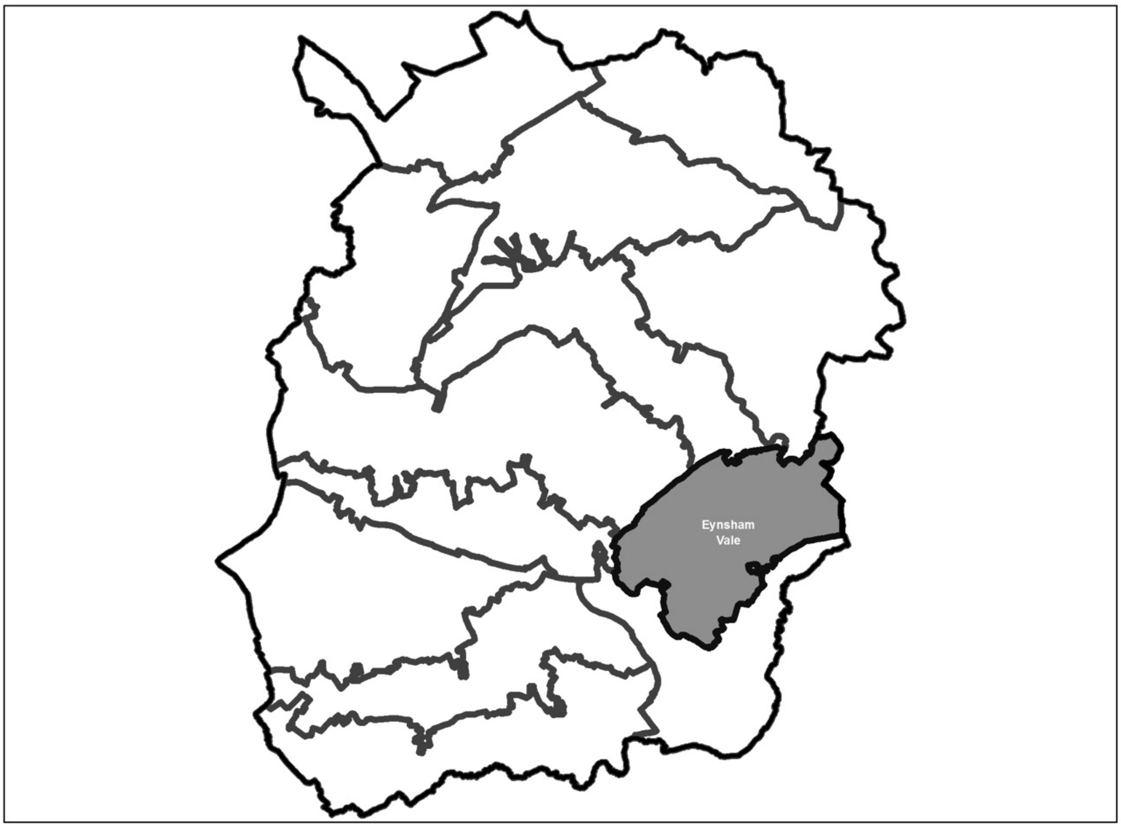
This is a typical everyday, locally valued landscape. Whilst there are a number of SAM's and conservation areas within that contribute to historic landscape value there are no particular features that would lead to an overall elevated landscape value.

2.10.4. **Guidance and Capacity**

The generally lower susceptibility and ordinary value of this large scale landscape mean it may be able to accommodate both wind turbine and solar farm development without notable detriment to its key characteristics. Small to medium scale turbines and solar farms could all potentially be accommodated within the character area with turbine development likely to be a better fit with the Flat Vale types and solar with the Rolling Vale types. A number of developments may potentially be accommodated within this landscape before cumulative effects become unacceptable.

Development Typology	Suitability for Development	
	More Suitable	Less Suitable
Small Turbines		
Medium Turbines		
Large Turbines		
Solar		

2.11. Eynsham Vale



2.11.1. Summary Description

"This area has similarities with Area 10 and forms a low-lying area characterised by large-scale, subtly rolling farmland, with a strong landscape structure. However, it is particularly distinguished by extensive areas of woodland and a well-treed character dominated by the formal parkland and well-managed farmland of Eynsham Park and other large estates."

"Like the Western Vale Fringes, the typical character of this area is defined by its low-lying and gentle relief and the patchwork of large, regularly shaped fields and comparatively strong structure of hedgerows and trees. However, the heavily wooded estate landscape of Eynsham Park is a dominant feature and a number of more subtle variations in local landscape character have also been identified"

2.11.2. Susceptibility

The table below summarises the susceptibility of the underlying landscape character sub-types that are found within the character area, for further detail refer to Appendix 1.

Landscape Sub-type	Renewable Technology	Susceptibility		
		Low	Medium	High
Floodplain Pasture	Wind			
	Solar			
Open Flat Vale Farmland	Wind			
	Solar			
Semi-enclosed Flat Vale Farmland	Wind			
	Solar			
Open Rolling Vale Farmland	Wind			
	Solar			
Semi-enclosed Rolling Vale Farmland	Wind			
	Solar			
Floodplain Wetlands	Wind			
	Solar			
Parkland	Wind			
	Solar			
Estate Farmland	Wind			
	Solar			

Summary

As with Bampton Vale this character area is dominated by the less susceptible Clay Wolds landscape types and although there is a higher degree of enclosure and the more susceptible Parkland types occupy a greater proportion of the overall area resulting in slightly increased susceptibility.

Overall Susceptibility	Wind			
	Solar			

2.11.3. Landscape Value

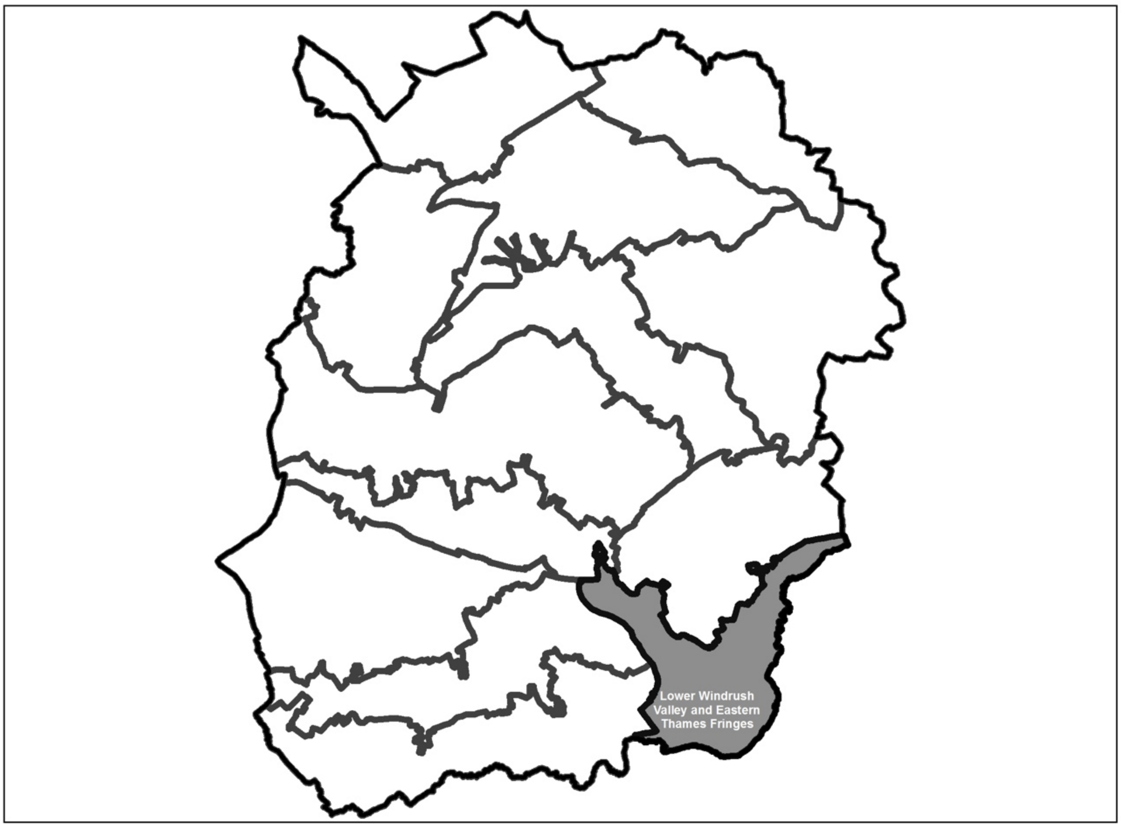
There are a number of heritage designations in this character area including SAM's, conservation areas and the registered landscape at Eynsham Park contribute to historic landscape value. There are also some Local Goeological Sites and areas of accessible open space around Eynsham however there are no particular features that would lead to the landscape being valued above that of an everyday, locally valued landscape.

2.11.4. Guidance and Capacity

There is some scope for renewables development within the less susceptible Clay Wolds landscape types where small turbines and solar farms are likely to be the most appropriate development typologies. There is potential for adverse effects to occur through encroachment on the more susceptible Parkland landscapes at Eynsham Park and to the north east of the character area the close proximity to the Blenheim World Heritage Site could pose a particular constraint. Careful siting and design of schemes within this area are likely to be key to avoiding potentially unacceptable adverse effects and consideration of potential screen planting may be particularly important. The potential for the landscape to accommodate several developments before cumulative effects result in unacceptable change is likely to be limited.

Development Typology	**Suitability for Development**	
	More Suitable	**Less Suitable**
Small Turbines		
Medium Turbines		
Large Turbines		
Solar		

2.12. Lower Windrush Valley and Eastern Thames Fringes



2.12.1. Summary Description

"An area of distinctively flat, low-lying landscape which occupies the 'floodplain' of the River Windrush and the margins of the River Thames to the east and west of their confluence. The area overlies extensive river gravel deposits and its character has been heavily modified by mineral extraction. Large areas of the floodplain are now occupied by gravel pits in various stages of active quarrying, restoration or recolonisation and extensive areas of open water are a distinguishing feature of this area. Where these have recolonised, and in the extensive areas of pasture to the east, the landscape has a typically pastoral, tranquil and remote character."

"The overall character of this area is defined by its low-lying, extremely flat and wetland character"

2.12.2. Susceptibility

The table below summarises the susceptibility of the underlying landscape character sub-types that are found within the character area, for further detail refer to Appendix 1.

Landscape Sub-type	Renewable Technology	Susceptibility		
		Low	Medium	High
Floodplain Pasture	Wind			
	Solar			
Floodplain Wetlands	Wind			
	Solar			
Open Flat Vale Farmland	Wind			
	Solar			
Semi-enclosed Flat Vale Farmland	Wind			
	Solar			
Semi-enclosed Rolling Vale Farmland	Wind			
	Solar			
Quarries and Landfill Sites	Wind			
	Solar			

Summary

This character area is dominated by the Clay Wolds landscape types which frequently exhibit a heavily modified, and in some areas degraded, character resulting from past mineral extraction. Indeed, aside from the Clay Wolds types the only other landscape type represented is Quarries and Landfill Sites which in the case of renewables development are considered neutral. There are some areas of higher susceptibility associated with the floodplain although these are relatively minor in extent.

Overall Susceptibility	Wind			
	Solar			

2.12.3. Landscape Value

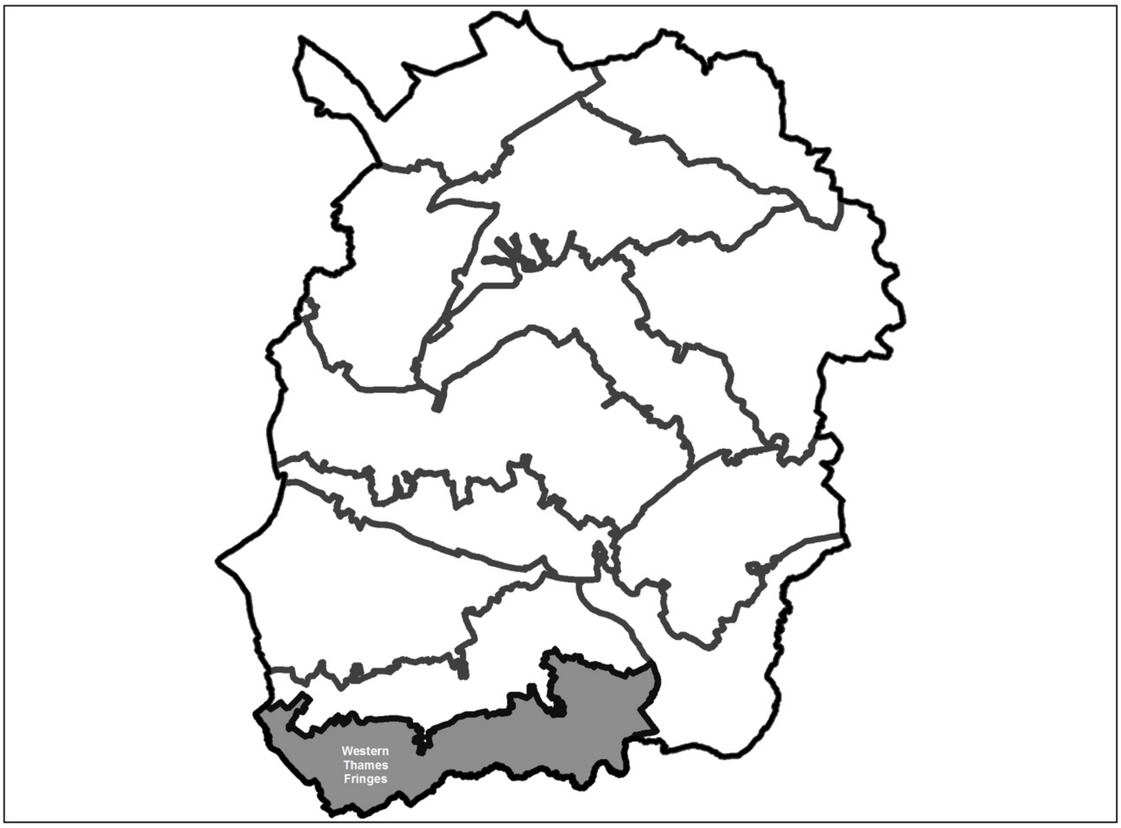
A large part of this character area falls within the Lower Windrush Valley Project which is recognised by policy EH1 of the emerging Local Plan. There are also a number of heritage designations in this character area including fairly extensive areas of prehistoric settlement around Northmoor, other SAM's and conservation areas which contribute to historic landscape value. Some accessible open space exists around Witney to the north west of the area however there are no particular features that would lead to the landscape being valued above that of an everyday, locally valued landscape.

2.12.4. **Guidance and Capacity**

Small turbines and solar farms are likely to be the most readily accommodated typologies within this area that is typically of a small scale than other character areas dominated by the Clay Wolds landscape types. These would be most appropriately sited away from the more susceptible floodplain landscapes although there may be potential for floating solar development on flooded former gravel pits where surrounding vegetation could provide notable screening from the wider landscape. The potential for the landscape to accommodate several developments before cumulative effects result in unacceptable change is likely to be limited due to the relatively small scale of the landscape.

Development Typology	Suitability for Development	
	More Suitable	Less Suitable
Small Turbines		
Medium Turbines		
Large Turbines		
Solar		

2.13. Western Thames Fringes



2.13.1. Summary Description

"Like the Lower Windrush Valley, this area is characterised by the very flat, low-lying landscape of the River Thames floodplain but it remains comparatively free from mineral extraction. However, it has been more affected by land drainage and intensive farming practices and much of the former floodplain pasture is now dominated by arable farmland. Areas underlain by river gravels are particularly intensively farmed and have a very open, expansive character"

"The overall character of this area is defined by its low-lying and extremely flat relief and its remoteness. It typically comprises a patchwork of large, regularly shaped fields and an expansive character."

2.13.2. **Susceptibility**

The table below summarises the susceptibility of the underlying landscape character sub-types that are found within the character area, for further detail refer to Appendix 1.

Landscape Sub-type	Renewable Technology	Susceptibility		
		Low	Medium	High
Floodplain Pasture	Wind			
	Solar			
Floodplain Wetlands	Wind			
	Solar			
Open Flat Vale Farmland	Wind			
	Solar			
Semi-enclosed Flat Vale Farmland	Wind			
	Solar			
Semi-enclosed Rolling Vale Farmland	Wind			
	Solar			

Summary

This character area is completely dominated by the Clay Wolds landscape types with no other types either encroaching or bordering on the area. Whist there are some areas of the more susceptible floodplain landscapes these are very limited and overall the it is the lower susceptibility vale types that comprise the majority of the area.

Overall Susceptibility	Wind			
	Solar			

2.13.3. **Landscape Value**

There are a number of heritage designations in this character area including a relatively high number of SAM's and several conservation areas which contribute to historic landscape value. However, there are no particular features that would lead to the landscape being valued above that of an everyday, locally valued landscape

2.13.4. **Guidance and Capacity**

The generally lower susceptibility and everyday value of this large scale landscape mean it may be able to accommodate both wind turbine and solar farm development without notable detriment to its key characteristics. Small to medium scale turbines and solar farms could all potentially be accommodated within the character area with turbine development likely to be a better fit with the Flat Vale types and solar with the Rolling Vale types. A number of developments may potentially be accommodated within this landscape before cumulative effects become unacceptable.

Development Typology	Suitability for Development	
	More Suitable	Less Suitable
Small Turbines		
Medium Turbines		
Large Turbines		
Solar		

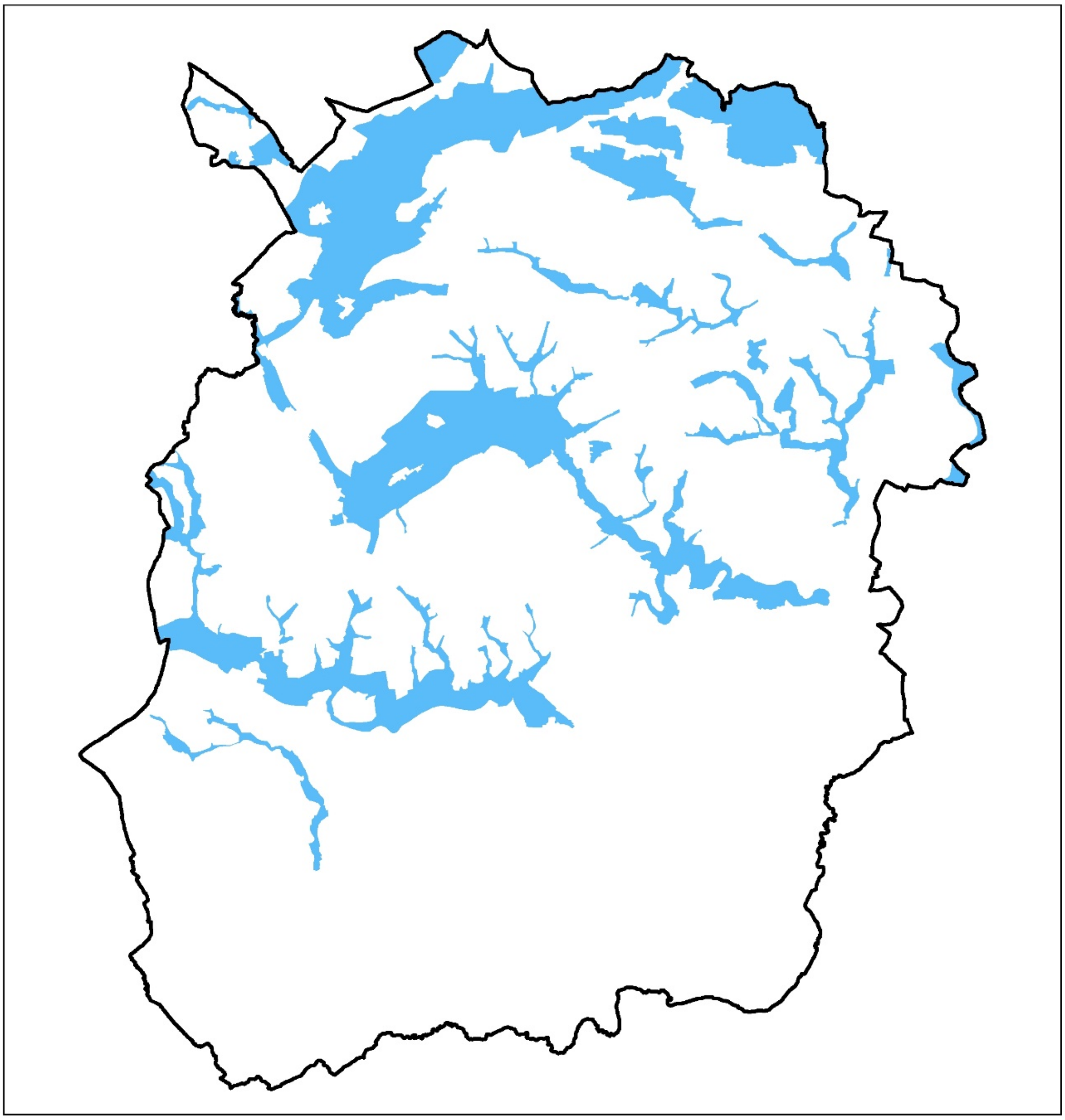
3.0 References

- The Guidelines for Landscape and Visual Impact Assessment, 3rd Edition, Landscape Institute with the Institute of Environmental Management and Assessment, 2013.
- An Approach to Landscape Character Assessment, Natural England, 2014.
- Topic Paper 6: Techniques and criteria for judging capacity and sensitivity, Countryside Agency/SNH 2004.
- Special Report – The State of Environmental Impact Assessment Practice in the UK, Institute of Environmental Management and Assessment, 2011.
- European Landscape Convention, 2000.
- West Oxfordshire Landscape Assessment, Atlantic Consultants on behalf of West Oxfordshire District Council, 1998.

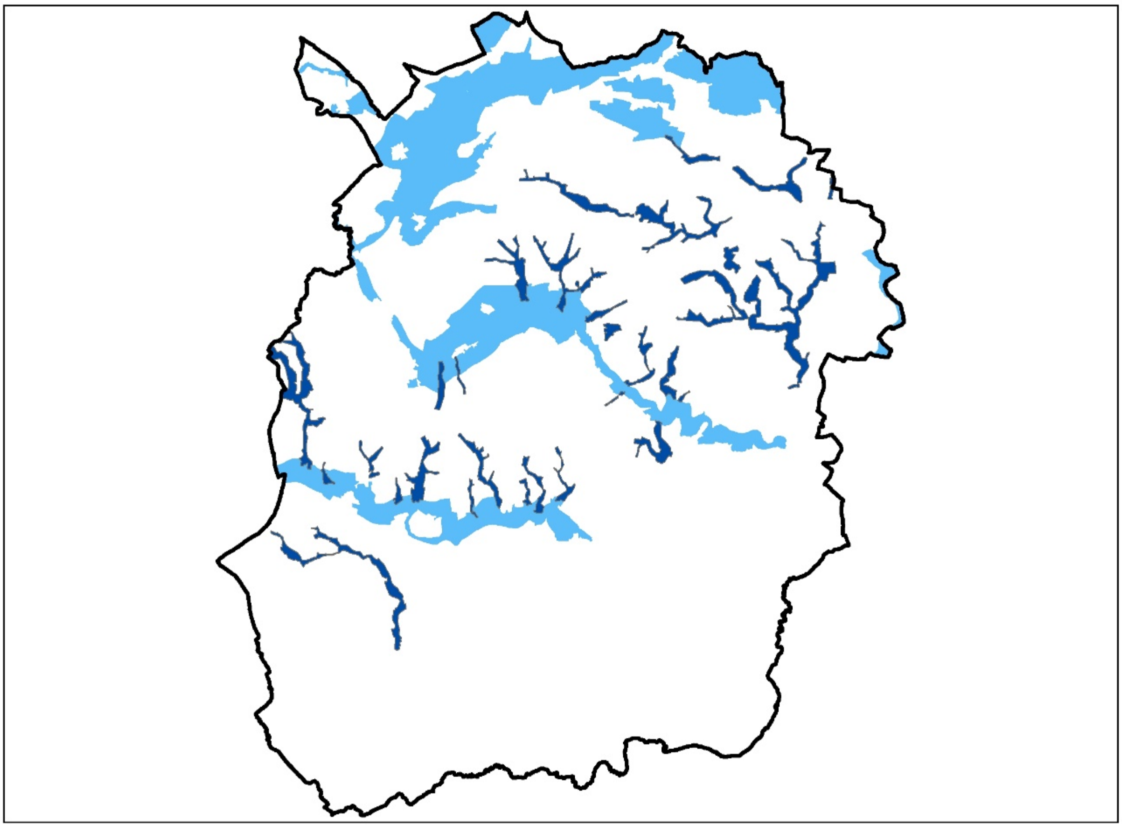
Appendices

Appendix 1. LCT Susceptibility Assessment

1.0 Valley Landscapes



1.1. Minor Valleys



1.1.1. Key Characteristics

- *small-scale tributary valleys which dissect plateaux and valley-sides and connect with major valleys;*
- *pronounced v-shaped profile with steep sides and absence of flat valley floor;*
- *watercourse often inconspicuous or absent (e.g. dry or winterbourne valleys on limestone);*
- *shallower profile at upper end with few trees or hedges and a more open character;*
- *steeper valley profile at lower end of valley, with sides typically occupied by scrub, trees and occasionally woods;*
- *enclosed, intimate character created by valley form and vegetation cover;*
- *moderate to low intervisibility.*

1.1.2. Assessment of Susceptibility

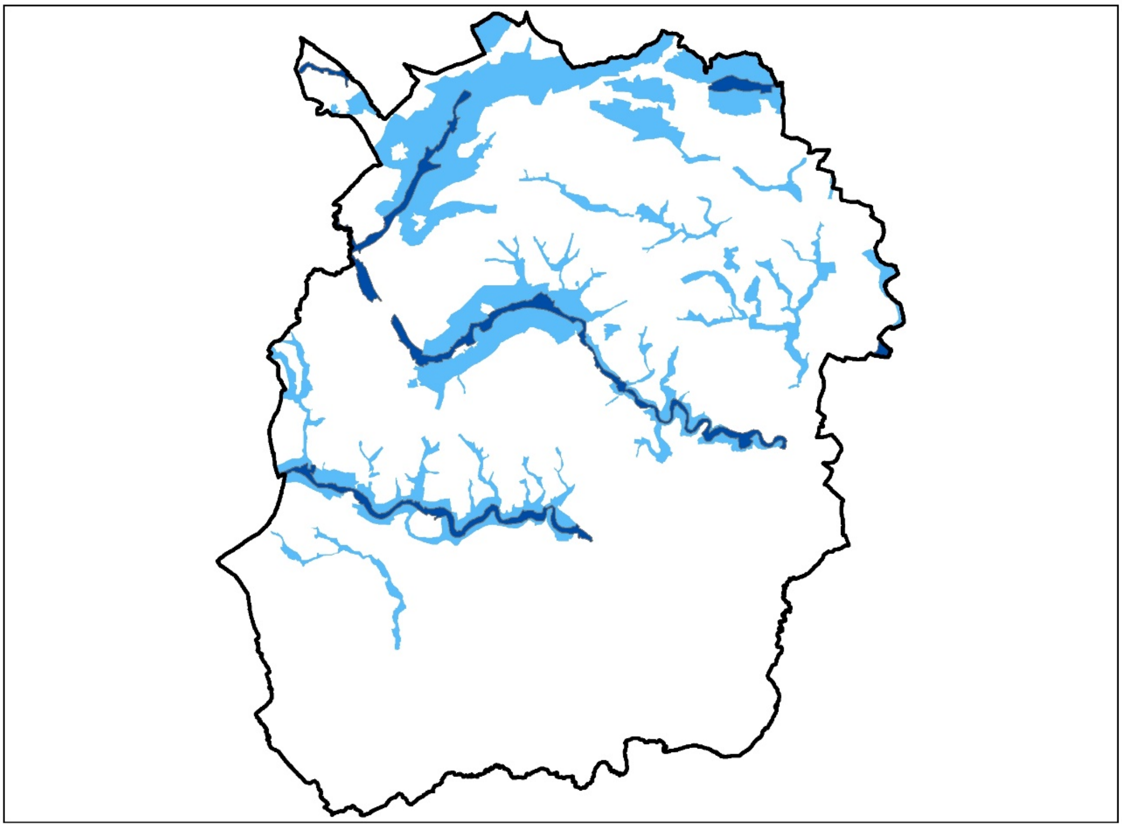
		Susceptibility		
		Low	**Medium**	**High**
Landform and Scale	Small scale valley landform with pronounced V-shape form at lower ends becoming shallower and less distinct at upper ends. Sinuous valleys create complex landforms.			
	Wind			
	Solar			
Land Cover Pattern	Moderately diverse land cover primarily comprising irregular fields of improved pasture and riparian vegetation. Occasionally small areas of woodland are present or arable fields encroach, weakening boundary with adjacent areas. Occasional farm buildings and houses are present which could act as scale comparators.			
	Wind			
	Solar			
Key Views and Skylines	Localised skylines are created by the top of valley sides but often obscured by vegetation; these are most distinctive at the lower end of valleys where landform is steeper and more pronounced. Generally views are constrained both along and out of valleys and intervisibility with other landscapes is minimal.			
	Wind			
	Solar			
Scenic & Perceptual Qualities	The intimate scale, complex topography and generally good condition contributes to overall high scenic quality and creates a strong sense of place. Occasional stands of coniferous trees act as local detractors but overall have limited effect.			
	Wind			
	Solar			

Summary

This is a highly scenic landscape with a strong sense of place that is generally in good condition throughout. Large turbine structures are likely to be at odds with the intimate scale and would dominate the valley around them. Although slightly less susceptible to solar farm development the extensive nature of these may be locally dominating and could potentially be visually prominent on valley sides.

Overall Susceptibility	Wind			
	Solar			

1.2. Valley Floor Farmland



1.2.1. Key Characteristics

- *distinctive flat valley floor;*
- *predominantly permanent pasture but with pockets of cultivated land;*
- *riparian character, with strong pattern of ditches often lined by willow;*
- *prone to winter flooding;*
- *landscape structure provided by lines and groups of mature trees, with willow and alder conspicuous;*
- *intimate, semi-enclosed and pastoral character;*
- *moderate to low intervisibility, with some open views into the valley from above and some filtered longer views along the valley floor.*

1.2.2. Assessment of Susceptibility

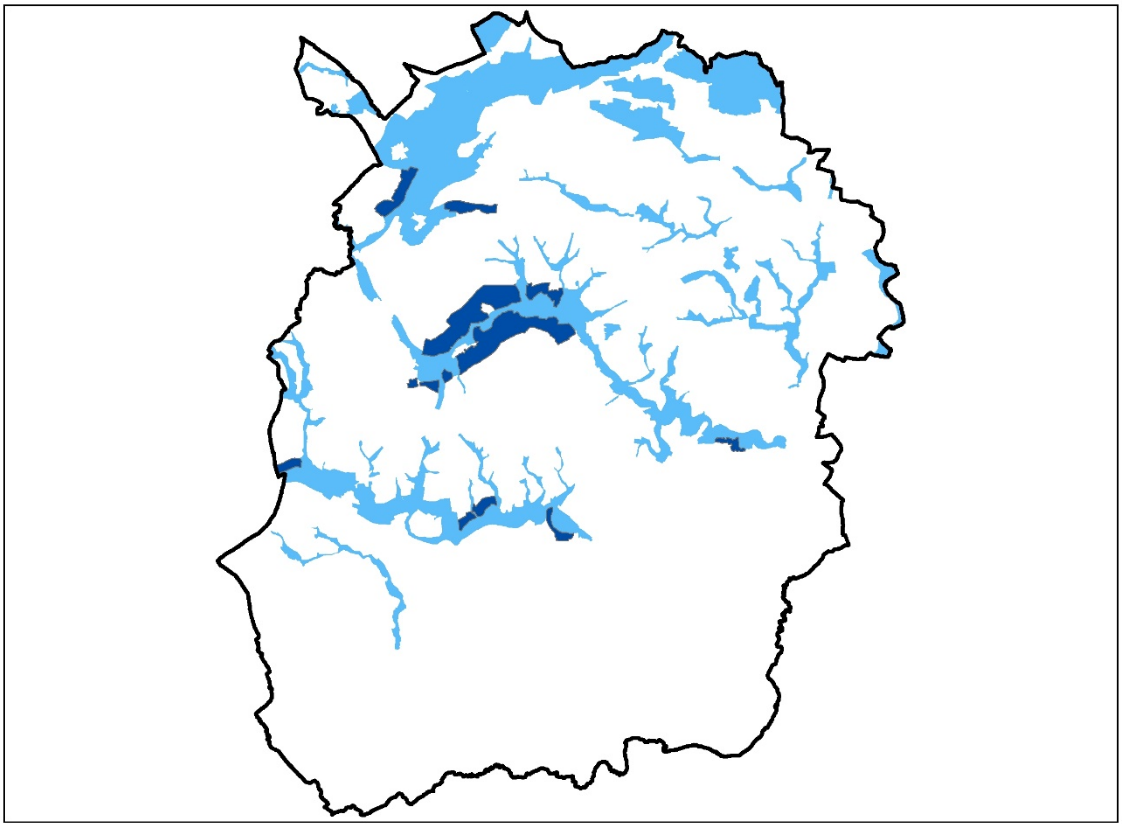
		Susceptibility		
		Low	Medium	High
Landform and Scale	Medium scale, flat valley bottoms albeit framed by landform of the shallow valley sides of adjacent landscape types. Valleys open out in some places creating localised areas of larger scale.			
	Wind			
	Solar			
Land Cover Pattern	Generally simple, sub-regular field patterns predominantly comprising improved pasture with some in arable use. Limited tree cover although riparian vegetation is present along water courses and mature trees define some field boundaries. Where valleys narrow there is often a greater degree of tree cover.			
	Wind			
	Solar			
Key Views and Skylines	Some views along length of valley possible in more open areas. Close visual relationship with valley side landscapes although skylines are not especially prominent and few landmark features present. Valley sides contain this landscape type and now visual relationship with landscapes beyond.			
	Wind			
	Solar			
Scenic & Perceptual Qualities	This landscape type encompasses a range of experiential qualities with some narrower, well vegetated areas feeling quite intimate and more open areas distinctly less so. Generally good condition and attractive.			
	Wind			
	Solar			

Summary

A simple landscape exhibiting some variation of scale and experience and visually contained within the wider valley landscape type. More open areas may be able to accommodate solar development without notable detriment to the overall character. Smaller turbines may also be accommodated within these open areas where the wider valley may limit potential views from beyond.

Overall Susceptibility	Wind			
	Solar			

1.3. Open Valley-side Farmland



1.3.1. Key Characteristics

- *distinctive sloping, and typically convex, valley-side landform;*
- *predominantly large-scale fields under arable cultivation but with occasional pasture;*
- *weak landscape structure and few hedges/trees;*
- *open, visually exposed landscape, prominent in views from within and across valley;*
- *high intervisibility along valley sides.*

1.3.2. Assessment of Susceptibility

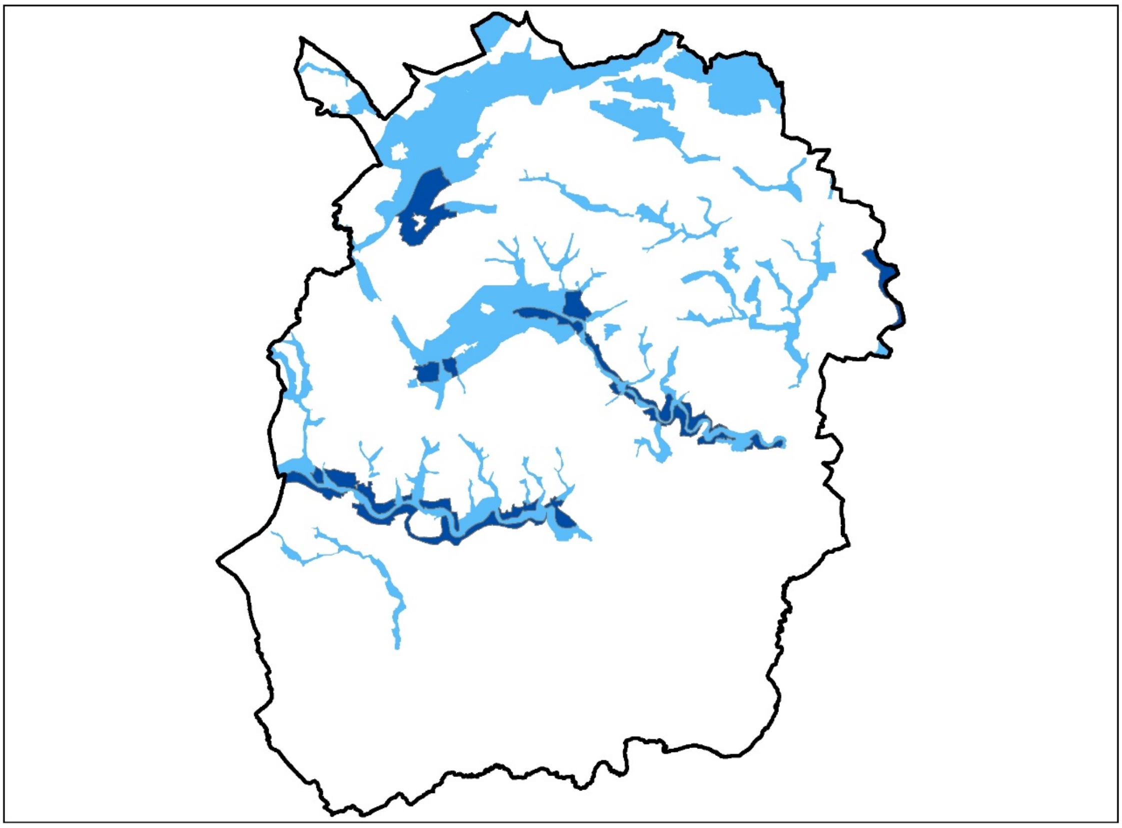
		Susceptibility		
		Low	Medium	High
Landform and Scale	Large scale and gently sloping convex valley sides creating subtly rolling topography running along the length of valleys.			
	Wind			
	Solar			
Land Cover Pattern	Simple land cover with large, regular to sub-regular shaped fields primarily in arable use with occasional grazing pasture. Limited vegetation with field boundaries marked by gappy hedgerows and occasional trees; also some small areas of woodland.			
	Wind			
	Solar			
Key Views and Skylines	Open views across broad, shallow valleys which form skylines and along valley sides. Strong intervisibility with other valley landscape types and from the most elevated areas some intervisibility with other adjacent landscape types.			
	Wind			
	Solar			
Scenic & Perceptual Qualities	Wide open and exposed landscape with some remote qualities although sometimes crossed or bordered by relatively busy A and B-roads which interrupt this. Pleasant views across valleys but extensive arable fields and mixed condition of hedgerows contribute to lower scenic quality.			
	Wind			
	Solar			

Summary

Large scale and open, this landscape type would be able to accommodate some renewable development with limited impact on it's key characteristics. Given the exposed nature any development could potentially be quite widely visible from within other valley landscapes. Wind turbines, particularly on upper slopes, would also likely be widely visible from landscapes beyond.

Overall Susceptibility	Wind			
	Solar			

1.4. Semi-enclosed Valley-side Farmland



1.4.1. Key Characteristics

- *distinctive sloping, and typically convex, valley-side landform;*
- *mixed pattern of land use and strong structure of hedgerows, trees and woodland;*
- *more enclosed character with low intervisibility along the valley sides but prominent in views from within and across the valley*

.

1.4.2. Assessment of Susceptibility

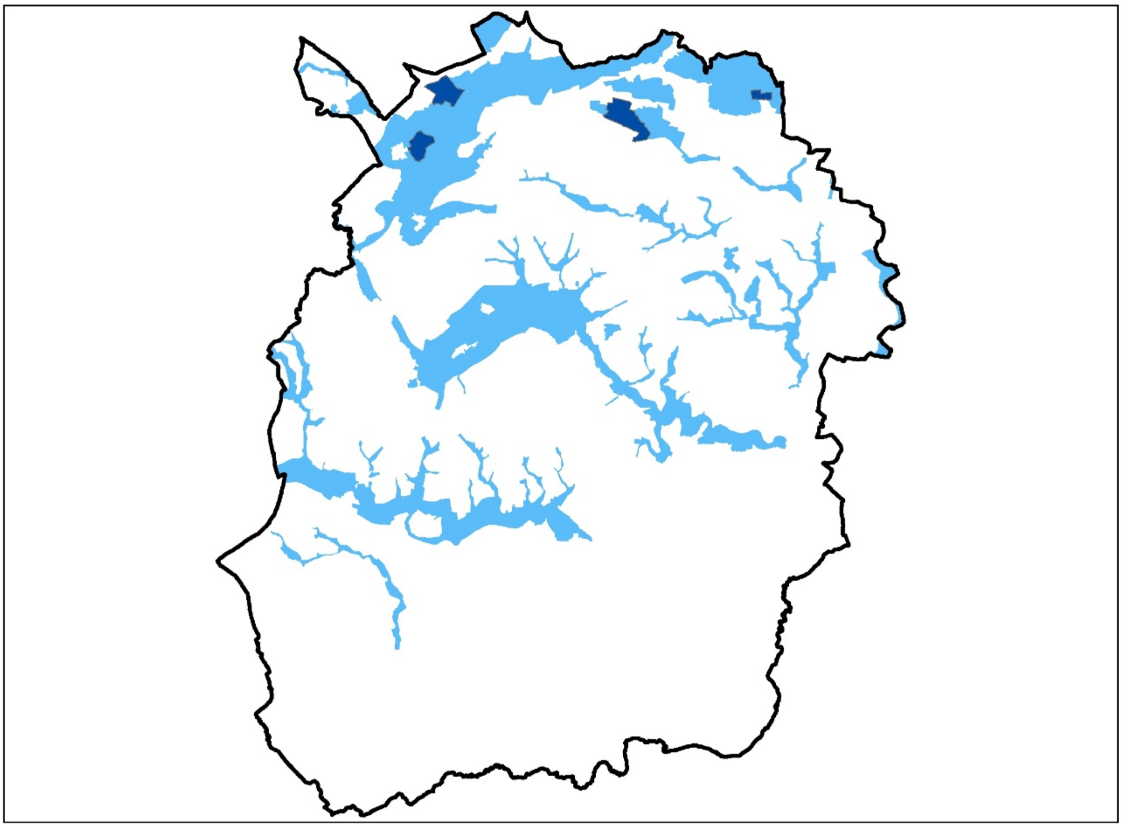
		Susceptibility		
		Low	Medium	High
Landform and Scale	Medium scale and gently sloping convex valley sides creating rolling topography running along the length of valleys. Typically more variation and some areas with steeper slopes than in the Open Valley-side Farmland character type.			
	Wind			
	Solar			
Land Cover Pattern	Moderate to diverse land cover pattern with a mix of arable and grazed fields both regular and irregular across the type. Structure provided by frequent small woodland blocks and mature field boundary vegetation.			
	Wind			
	Solar			
Key Views and Skylines	Some intervisibility with other valley landscapes although vegetation often constrains views. More open views in the area around the village of Churchill where valley sides form notable skyline and village church tower is prominent local landmark.			
	Wind			
	Solar			
Scenic & Perceptual Qualities	A semi-enclosed landscape that feels well managed and settled. Mature trees and hedgerows of good condition contribute to good scenic quality although not particularly notable within the district.			
	Wind			
	Solar			

Summary

The semi-enclosed nature of this landscape is generally more susceptible to renewables development than the related Open Valley-side Farmland type however the increased vegetation cover could provide notable screening for solar development and help limit effects over the wider landscape. Turbines are likely to be more intrusive although single or small turbines may be able to be accommodated in the more open parts of the type provided they do not interrupt key views or skylines.

Overall Susceptibility	Wind			
	Solar			

1.5. Open Valleys and Ridges



1.5.1. Key Characteristics

- *distinctively complex and 'wrinkled' topography of interconnected, steep-sided valleys, spurs and ridges;*
- *underlain by heavily folded and faulted mixed geology at junction of Oolitic Limestone and Lias Clays;*
- *large-scale patchwork of fields, mainly under arable cultivation, typically occupying more gentle valley sides and elevated ground;*
- *regular field boundaries with weak structure of hedgerows and trees;*
- *open, exposed character;*
- *high intervisibility.*

1.5.2. Assessment of Susceptibility

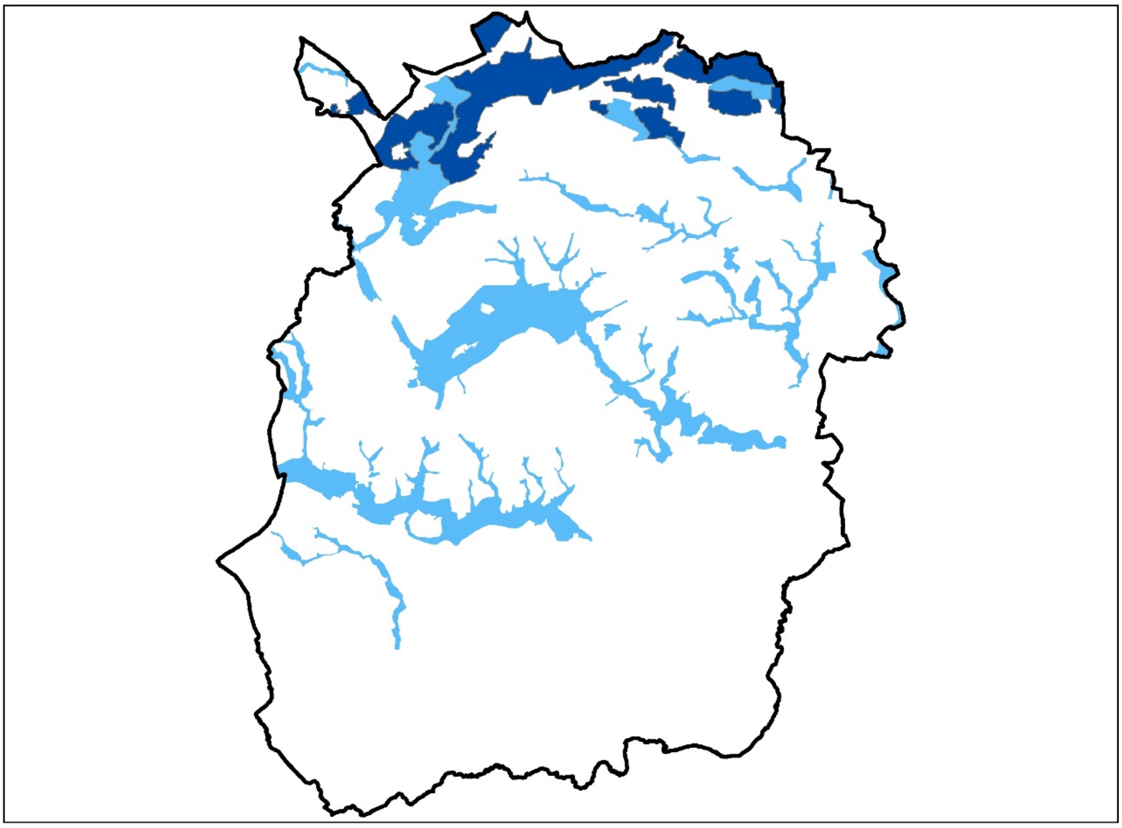
		Susceptibility		
		Low	Medium	High
Landform and Scale	Medium to large scale landscape with complex undulating landform of low rolling hills intersected with more pronounced valleys and slopes.			
	Wind			
	Solar			
Land Cover Pattern	Simple land cover of large scale, predominantly arable fields of regular to sub-regular shape bordered by hedgerows of mixed condition and occasional mature hedgerow trees. Larger shelterbelts, both mature and recently planted, are also present in some areas. Generally, few buildings or other notable infrastructure.			
	Wind			
	Solar			
Key Views and Skylines	Complex topography forms locally distinct skylines although these are indistinct in the wider landscape. Some indivisibility with adjacent character areas and beyond from most elevated areas with views more constrained from valley bottoms.			
	Wind			
	Solar			
Scenic & Perceptual Qualities	Open and exposed except for the area around Little Rollright where recent estate planting and bowl landform to top of valley provide greater structure and result in more intimate character. Landscape condition and scenic quality vary.			
	Wind			
	Solar			

Summary

There is notable variety within this landscape type, in particular in the area around Little Rollright where increased management in recent years has resulted in a degree of landscape change such that the areas is generally less representative of the type. The medium to large scale and simple land cover could potentially accommodate some renewables development although the area around Little Rollright is likely to be more susceptible than elsewhere in the type.

Overall Susceptibility	Wind			
	Solar			

1.6. Semi-enclosed Valleys and Ridges



1.6.1. Key Characteristics

- *distinctively complex and 'wrinkled' topography of interconnected, steep-sided valleys, spurs and ridges;*
- *underlain by heavily folded and faulted mixed geology at junction of Oolitic Limestone, Ironstone and Lias Clays;*
- *mixed pattern of land use with pasture dominating steeper slopes;*
- *diverse field pattern, ranging from medium to large-sized fields with straight boundaries on more gentle slopes, to smaller-scale fields with irregular field boundaries on steeper slopes, valley bottoms and around settlements;*
- *strong landscape structure of hedges, trees and woodland blocks;*
- *an intimate and enclosed patchwork landscape formed by complex landform, mixed land and strong landscape structure;*
- *moderate to low intervisibility.*

1.6.2. **Assessment of Susceptibility**

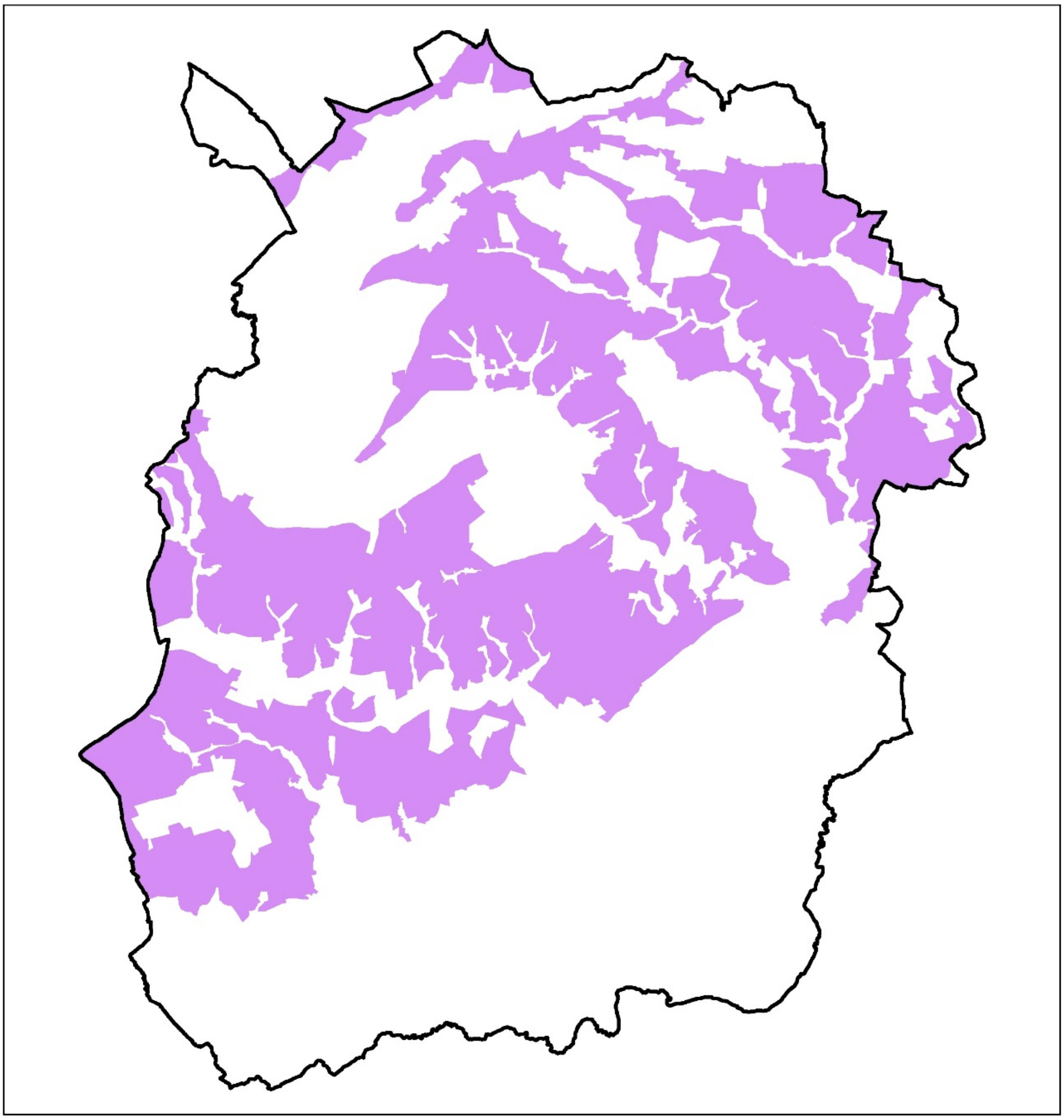
		Susceptibility		
		Low	**Medium**	**High**
Landform and Scale	Extensive area of medium to large scale landscape with complex undulating landform of low rolling hills intersected with more pronounced valleys and slopes.			
	Wind			
	Solar			
Land Cover Pattern	Diverse land cover pattern comprising large, sub-regular arable fields and smaller, more irregularly shaped pasture on steeper slopes. Frequent shelterbelts, small woodlands and hedgerows of mixed condition. The type is crossed by a number of roads, including some busier A-roads, and encompasses a several hamlets, small villages and other dispersed settlement and farms.			
	Wind			
	Solar			
Key Views and Skylines	Within the type complex landform and vegetation provided limited opportunity for views out and largely obscure any distinct skylines however this landscape can be seen as a notable skyline from some more open surrounding landscape types.			
	Wind			
	Solar			
Scenic & Perceptual Qualities	An intimate and varied landscape of generally high scenic quality. Some isolated areas exhibit deteriorated condition although overall impression is of well managed landscape.			
	Wind			
	Solar			

Summary

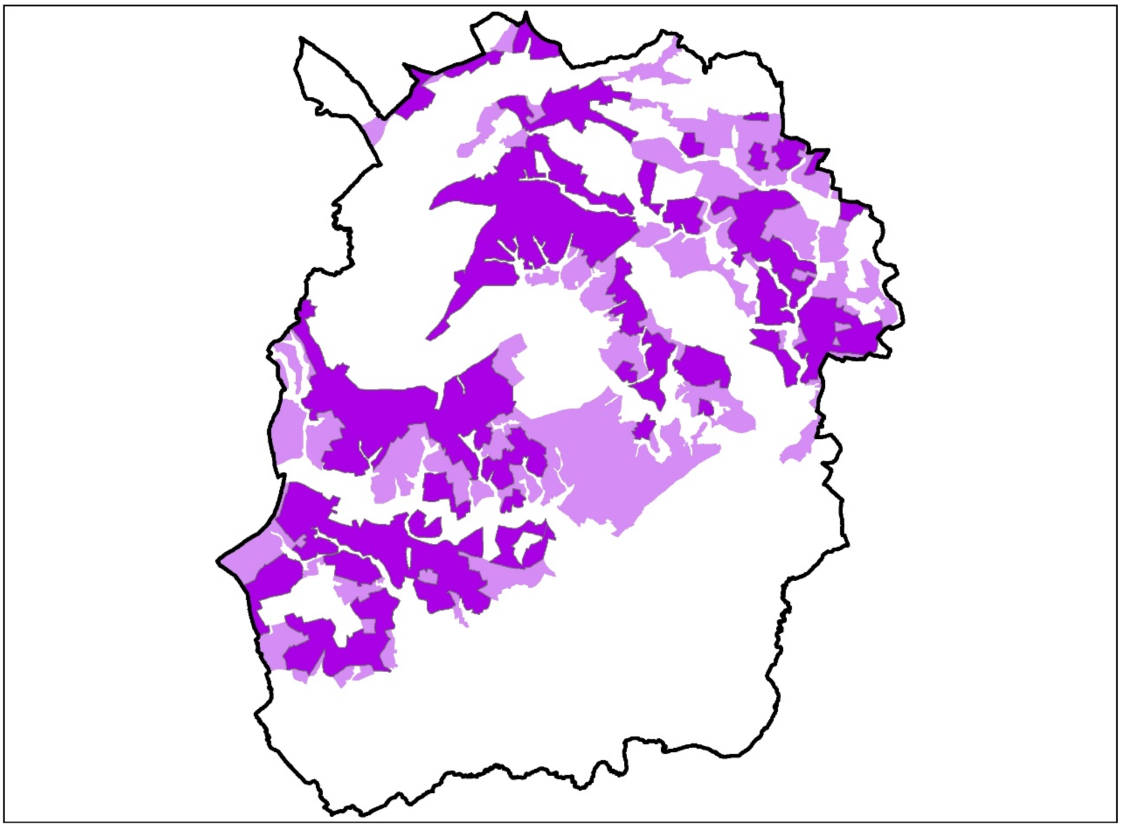
This is an extensive and diverse landscape in generally good condition and of high scenic quality; it is well settled and there are frequent human scale features. Turbines are likely to be intrusive features in most areas although may be able to be accommodated in areas of more open character. Solar development is likely to be more easily accommodated although should avoid more intimate areas and those of highest scenic quality.

Overall Susceptibility	Wind			
	Solar			

2.0 Limestone Wolds Landscapes



2.1. Open Limestone Wolds



2.1.1. Key Characteristics

- *large-scale, smoothly rolling farmland occupying the limestone plateau and dipslope;*
- *typically large or very large fields, with rectilinear pattern of dry-stone walls (typical of later enclosures and often in poor condition) and weak hedgerows, with frequent and very few trees;*
- *productive farmland predominantly under intensive arable cultivation;*
- *thin, well-drained calcareous soils and sparse natural vegetation cover and a somewhat impoverished 'upland' character;*
- *very open and exposed character;*
- *distinctive elevated and expansive character in higher areas, with dominant sky and sweeping views across surrounding areas;*
- *high intervisibility.*

2.1.2. Assessment of Susceptibility

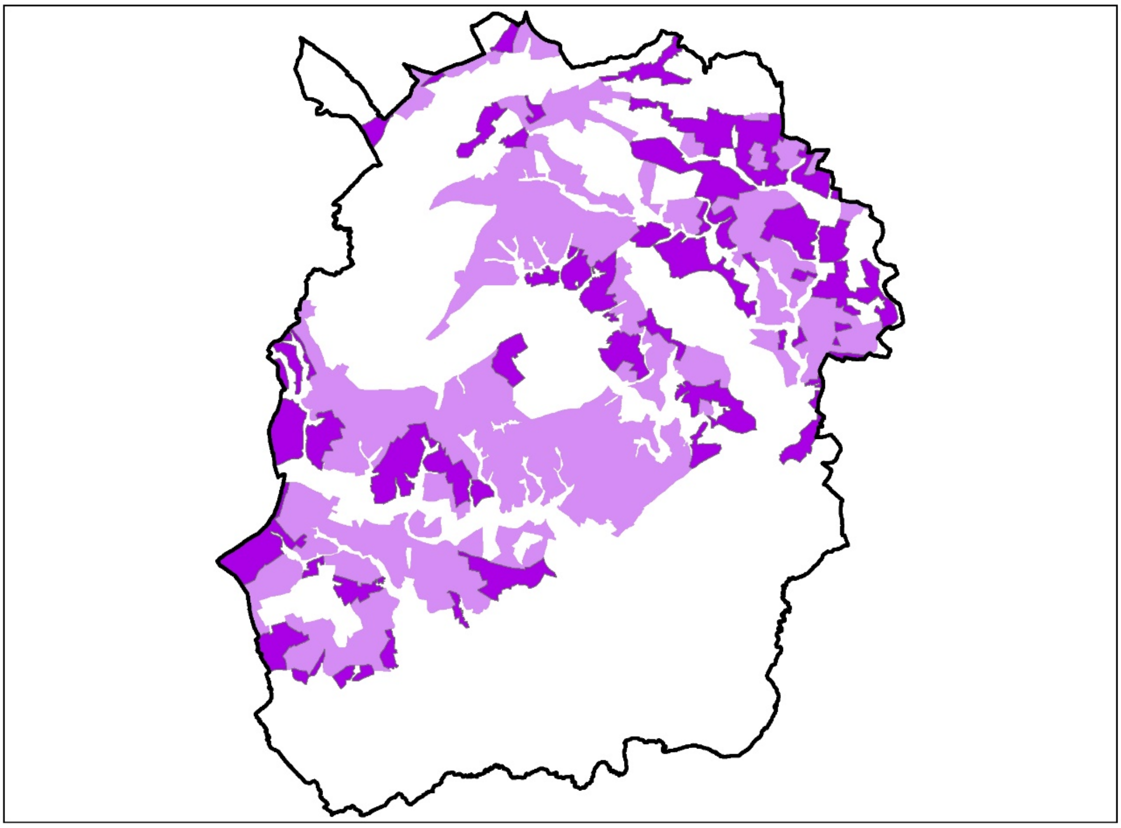
		Susceptibility		
		Low	Medium	High
Landform and Scale	Large scale, open landscape with a simple and gently rolling plateau landform.			
	Wind			
	Solar			
Land Cover Pattern	Simple land cover mainly comprising large scale, regular to sub-regular shaped arable fields. Very occasional shelterbelts and small woodlands with limited tree cover elsewhere. Field boundaries are typically gappy hedgerows or dry stone walls and open in nature. The type is crossed by numerous roads but there is otherwise little built development although a notable exception is Shilton Park which has been built within this landscape type since the time of the character assessment; occasional farm buildings and light industrial buildings are also present.			
	Wind			
	Solar			
Key Views and Skylines	Distinctive skylines are not typical however wide open views across this and surrounding landscapes are possible due to the open nature.			
	Wind			
	Solar			
Scenic & Perceptual Qualities	Open and exposed with a sense of remoteness, poor condition of stone walls and hedgerows gives some areas a forgotten or degraded feel. Expansive and sometimes dramatic skies with an overall moderate scenic quality.			
	Wind			
	Solar			

Summary

The large scale and generally simple form and land cover could potentially accommodate the large structure of turbines without notable detriment to the key characteristics of the landscape type however the high degree of intervisibility would require sensitive siting. Similarly, solar development may be readily accommodated although the open landscape offers little opportunity for screening without the introduction of less characteristic vegetation.

Overall Susceptibility	Wind			
	Solar			

2.2. Semi-enclosed Limestone Wolds (large-scale)



2.2.1. Key Characteristics

- *large-scale, smoothly rolling farmland occupying the limestone plateau and dipslope;*
- *land use dominated by intensive arable cultivation with only occasional pasture;*
- *generally large-scale fields with rectilinear boundaries formed by dry-stone walls and low hawthorn hedges with occasional trees, typical of later enclosures;*
- *some visual containment provided by large blocks and belts of woodland creating a semi-enclosed character;*
- *thin, well-drained calcareous soils and sparse natural vegetation cover and a somewhat impoverished 'upland' character;*
- *ash, hazel, field maple etc. conspicuous in hedgerows*
- *distinctive elevated and expansive character in higher areas, with dominant sky;*
- *moderate intervisibility.*

2.2.2. Assessment of Susceptibility

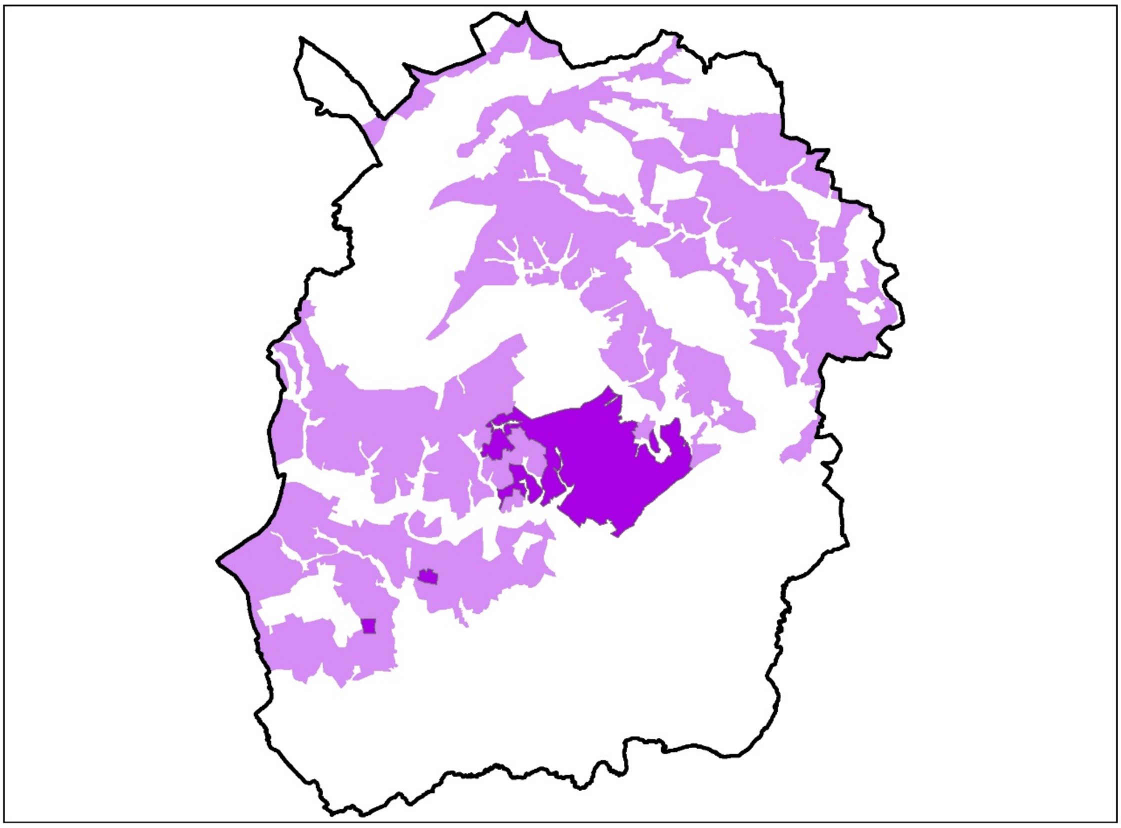
		Susceptibility		
		Low	Medium	High
Landform and Scale	Large scale, open landscape with a simple and gently rolling plateau landform.			
	Wind			
	Solar			
Land Cover Pattern	Simple land cover mainly comprising large scale, sub-regular shaped arable fields interspersed with small woodlands and shelterbelts. Frequent hedgerows and mature hedgerow trees mark field boundaries and enclose minor roads. The type is crossed by numerous roads, including busier A-roads, and encompasses some small settlements.			
	Wind			
	Solar			
Key Views and Skylines	Extent of tree cover provides some containment and limits intervisibility to more elevated and exposed areas. Notable skylines are not characteristic.			
	Wind			
	Solar			
Scenic & Perceptual Qualities	Wide open skies in most elevated areas but generally semi enclosed due to extent of vegetation. Largely well managed and in good condition with few detracting features with moderate to strong scenic quality and sense of place.			
	Wind			
	Solar			

Summary

Likely that solar development could be readily accommodated due to scale and enclosure, and consequent opportunity for screening, although would be a notable modern intrusion in an otherwise strongly rural landscape. Also potential to accommodate turbines although larger types may be particularly intrusive.

Overall Susceptibility	Wind			
	Solar			

2.3. Semi-enclosed Limestone Wolds (smaller-scale)



2.3.1. Key Characteristics

- *gently rolling farmland occupying the elevated limestone plateau and dipslope;*
- *mixed land use and field pattern. with a patchwork of large arable fields and more frequent pasture and smaller-scale fields with irregular, sinuous boundaries;*
- *strong structure of dry-stone walls and hedgerows with frequent mature hedgerow trees, particularly of oak and ash;*
- *ash, oak, hazel, field maple etc. conspicuous in hedgerows;*
- *semi-enclosed character with views contained by hedgerow structure and frequent blocks or belts of woodland;*
- *diverse and pastoral character;*
- *moderate intervisibility.*

2.3.2. Assessment of Susceptibility

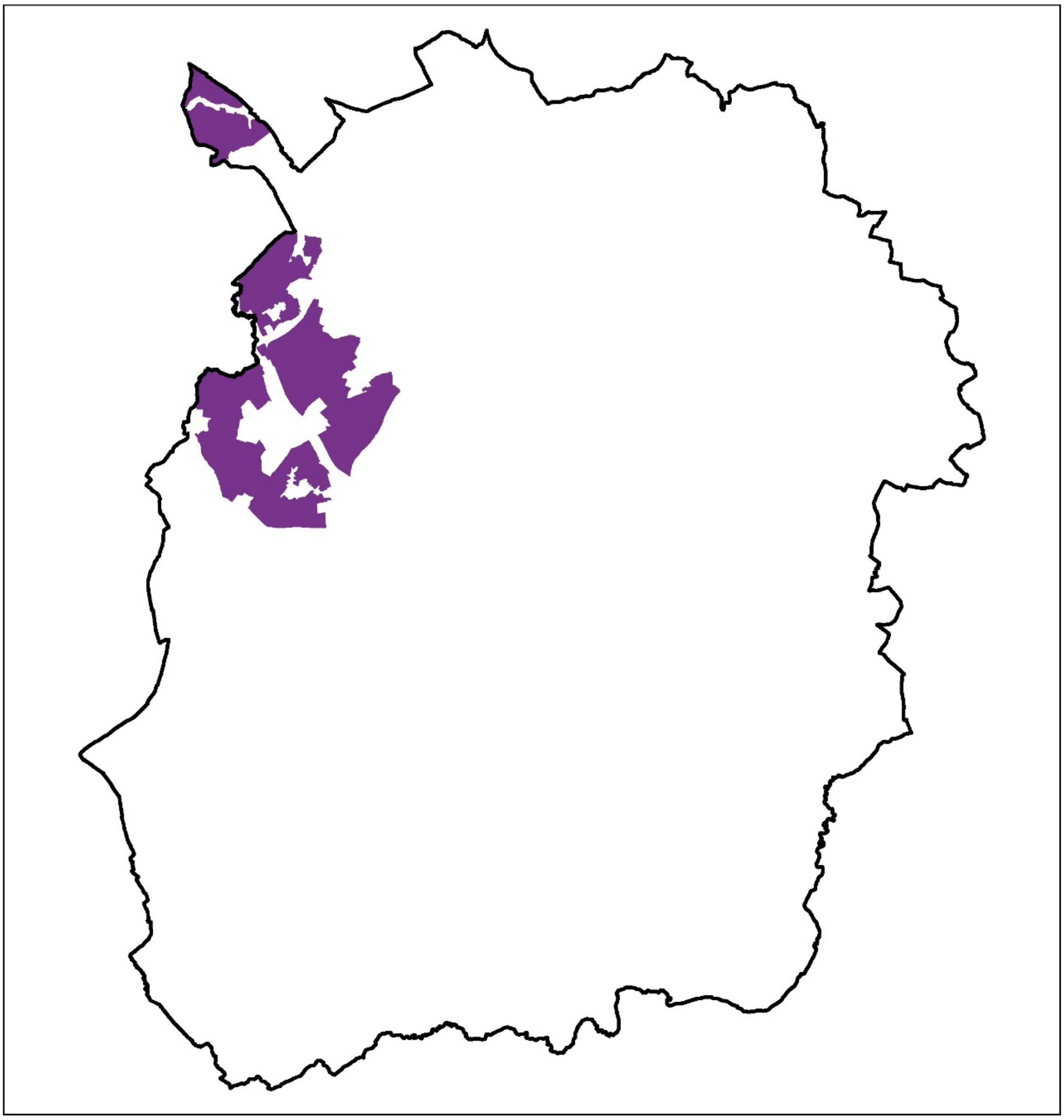
		Susceptibility		
		Low	**Medium**	**High**
Landform and Scale	Medium scale landscape with a simple, flat to gently rolling plateau landform.			
	Wind			
	Solar			
Land Cover Pattern	Diverse field pattern ranging from large regular arable fields to small irregular fields of improved pasture. These are bounded by mature hedgerows with frequent hedgerow trees and there are some small woodlands present. The landscape type is crossed with numerous minor roads and encompasses several small settlements.			
	Wind			
	Solar			
Key Views and Skylines	Extent of tree cover provides some containment and limits intervisibility to more elevated and exposed areas. Notable skylines are not characteristic.			
	Wind			
	Solar			
Scenic & Perceptual Qualities	Generally semi enclosed due to extent of vegetation with some areas having a more intimate feel, particularly where tall hedgerows line roads. Mixed management with some areas of poorer condition and some large farm buildings and light industrial units acting as local detracting elements.			
	Wind			
	Solar			

Summary

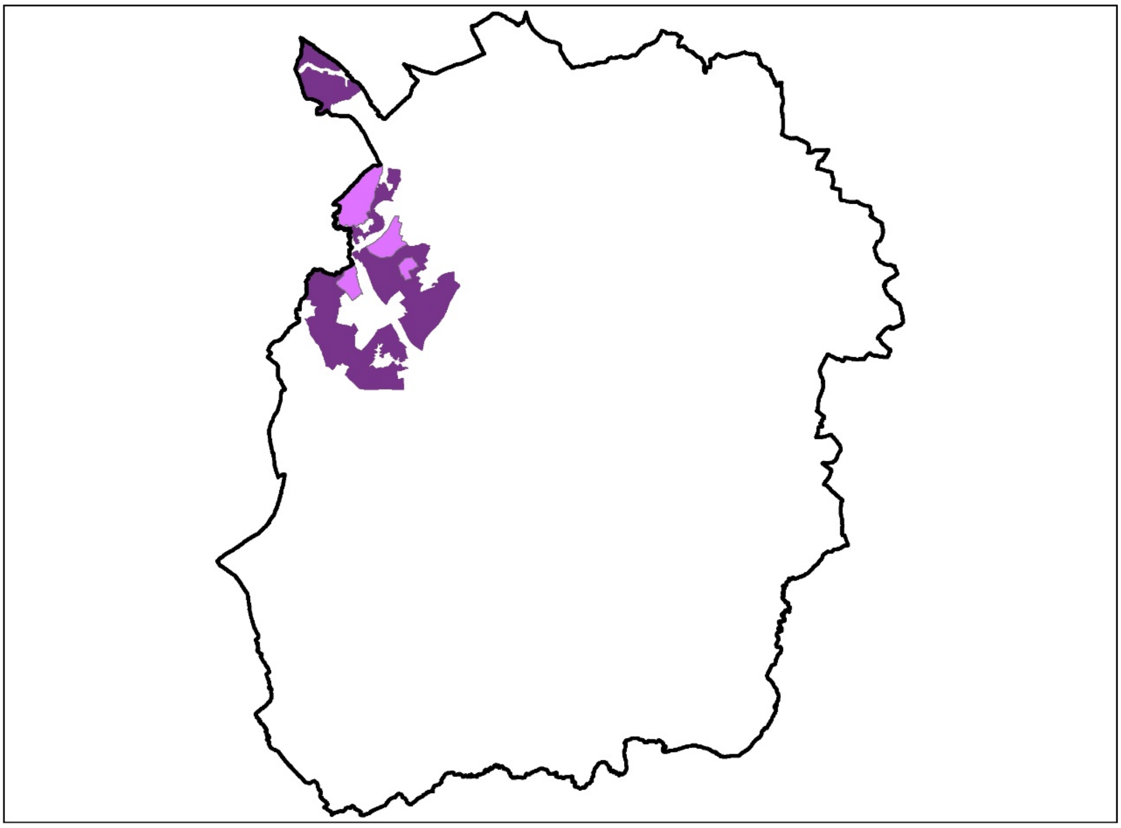
Likely that solar development could be readily accommodated in some areas due to scale and enclosure, and consequent opportunity for screening although more intimate areas are more susceptible. Turbines would be less readily accommodated being generally out of scale with other landscape features and may be particularly dominating where this landscape type abuts the Minor Valleys type.

Overall Susceptibility	Wind			
	Solar			

3.0 Clay Wolds Landscapes



3.1. Open Clay Wolds



3.1.1. Key Characteristics

- *large-scale, softly rolling farmland underlain by Lower Lias Clays and glacial deposits;*
- *typically large fields, with rectilinear pattern of gappy or tightly clipped hedgerows, with few trees;*
- *productive farmland predominantly under intensive arable cultivation;*
- *heavy, gleyed soils;*
- *open character with high intervisibility*

3.1.2. Assessment of Susceptibility

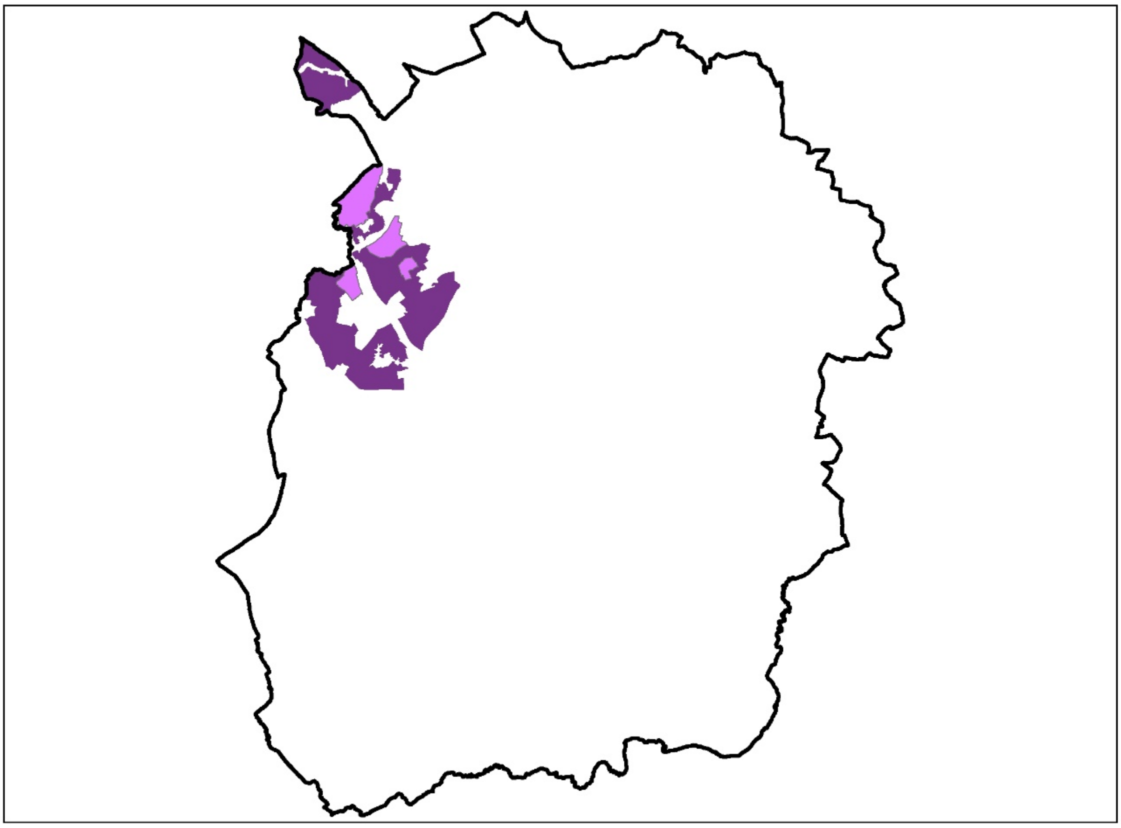
		Susceptibility		
		Low	**Medium**	**High**
Landform and Scale	Gently rolling and large scale with expansive skies, typically more elevated than adjacent landscapes.			
	Wind			
	Solar			
Land Cover Pattern	Simple land cover of predominantly large scale arable fields of regular and sub-regular shape bordered by hedgerows. Some hedgerow trees otherwise very limited tree cover.			
	Wind			
	Solar			
Key Views and Skylines	Wide open views across surrounding landscapes, including those outside the district. Views from some roads passing through the areas more limited due to tall hedgerows.			
	Wind			
	Solar			
Scenic & Perceptual Qualities	Intensively managed and generally good condition. Limited visual diversity within landscape type although views of distant landscapes provide interest, overall moderate scenic quality.			
	Wind			
	Solar			

Summary

The large scale of the landscape and the simple landform and landcover are broadly able to accommodate renewables development however any development is likely to be widely visible within this landscape type and landscapes beyond. Tall hedgerows may offer some opportunity for screening solar development in particular.

Overall Susceptibility	Wind			
	Solar			

3.2. Semi-enclosed Clay Wolds (large-scale)



3.2.1. Key Characteristics

- *large-scale, softly rolling farmland underlain by Lower Lias Clays and glacial deposits;*
- *productive farmland predominantly under intensive arable cultivation;*
- *generally large-scale fields with rectilinear boundaries formed by some walls but mainly by hawthorn hedges, typical of later endosures;*
- *some visual containment provided by blocks and belts of woodland;*
- *oak dominant in hedgerows and woods;*
- *moderate intervisibility.*

3.2.2. Assessment of Susceptibility

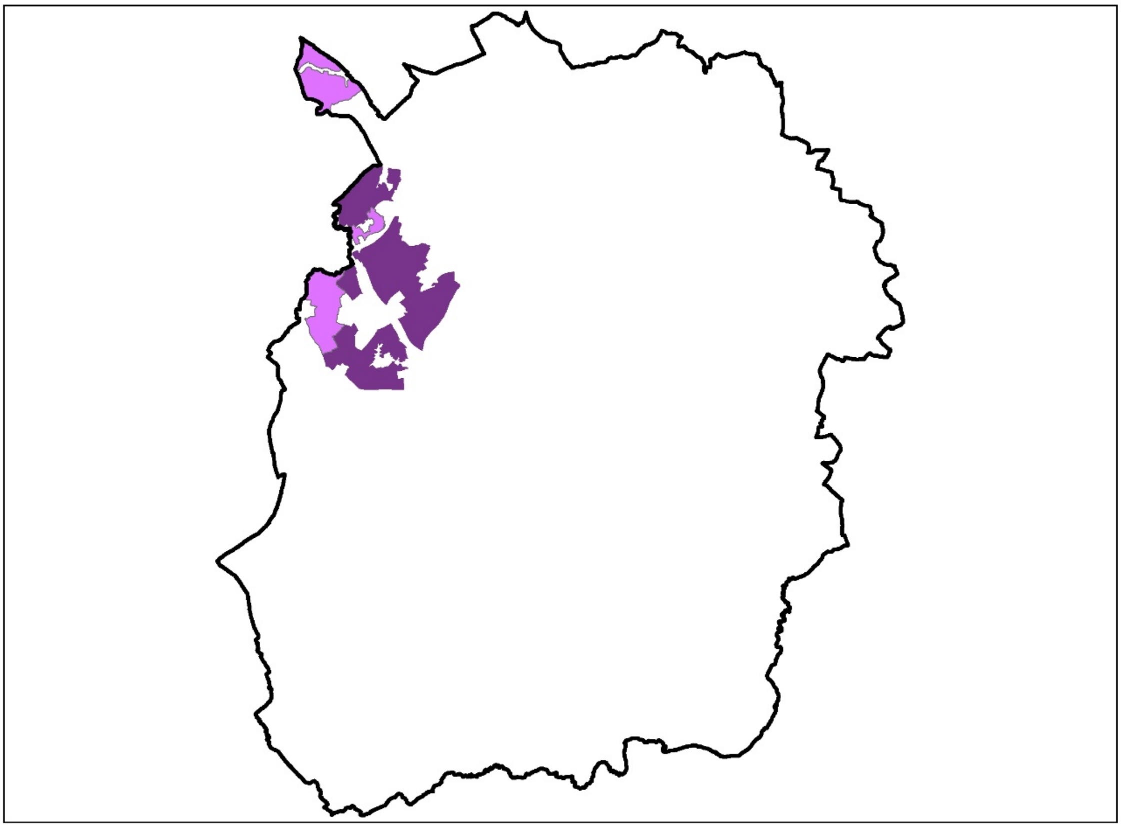
		Susceptibility		
		Low	**Medium**	**High**
Landform and Scale	Large scale and gently rolling elevated landscape.			
	Wind			
	Solar			
Land Cover Pattern	Generally simple land cover of predominantly large scale arable fields of regular and sub-regular shape bordered by hedgerows with frequent hedgerow trees and occasional larger shelterbelts and small woodlands.			
	Wind			
	Solar			
Key Views and Skylines	Some open views across wider landscape possible within the type although notable less open than the Open Clay Wolds landscape type due to increased tree cover. Occasional mobile phone masts visible at elevated locations.			
	Wind			
	Solar			
Scenic & Perceptual Qualities	Relatively exposed landscape with presence of numerous mature hedgerow trees providing visual interest and improving scenic quality. Crossed by numerous roads including some busier A and B routes.			
	Wind			
	Solar			

Summary

The large scale of the landscape and the simple landform and landcover are broadly able to accommodate renewables development however any development could potentially be widely visible. Solar development and smaller turbines are likely to be more readily accommodated in areas of greater enclosure.

Overall Susceptibility	Wind			
	Solar			

3.3. Semi-enclosed Clay Wolds (smaller-scale)



3.3.1. Key Characteristics

- *Softly rolling farmland underlain by Lower Lias Clays and glacial deposits;*
- *mixed land use and field pattern, with a patchwork of large arable fields and more frequent pasture and smaller-scale fields with irregular, sinuous boundaries;*
- *semi-enclosed character with views contained by strong hedgerow structure with frequent mature hedgerow trees and blocks or belts of woodland;*
- *oak dominant in hedgerows and woods;*
- *diverse and pastoral character;*
- *moderate intervisibility*

3.3.2. **Assessment of Susceptibility**

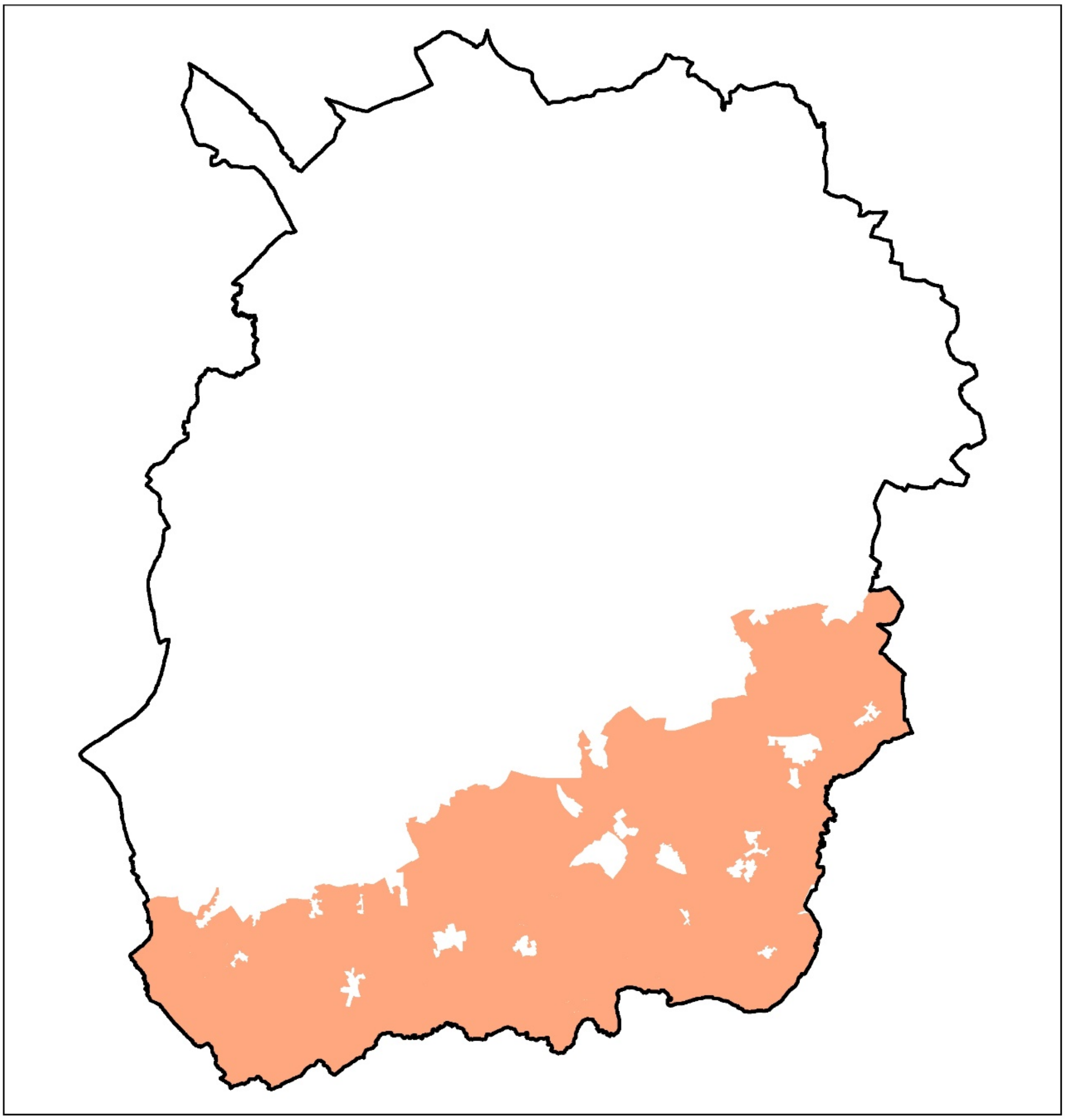
		Susceptibility		
		Low	**Medium**	**High**
Landform and Scale	Gently rolling landform of generally medium to small scale although some areas close to transition with adjacent types are notably larger scale.			
	Wind			
	Solar			
Land Cover Pattern	Mixed land cover mainly comprising larger arable fields, reducing in size and becoming more irregularly shaped in areas adjacent to settlements; occasional use as pasture. Strong structure of hedgerows and mature hedgerow trees although woodlands are rare.			
	Wind			
	Solar			
Key Views and Skylines	Views constrained in smaller scale areas where vegetation is more extensive and opening out in larger scale areas towards the edges of the type.			
	Wind			
	Solar			
Scenic & Perceptual Qualities	Strongly rural character with diversity of land cover provides interest and generally high scenic quality. Enclosure, quiet roads and small settlements lend some areas an intimate feel whilst others more open and expansive.			
	Wind			
	Solar			

Summary

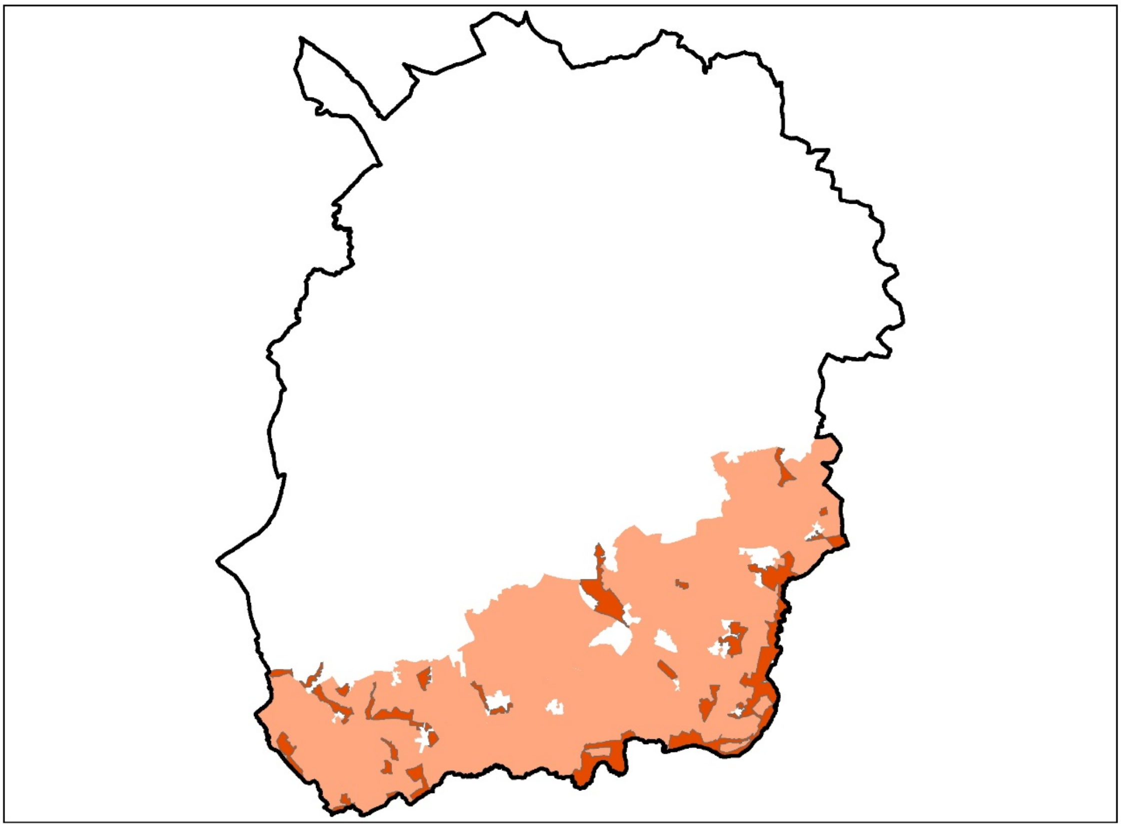
Renewables development in this type is likely to result in notable modern intrusion into an area where the presence modern features is fairly limited. Some development of modest scale may be accommodated, particularly solar, where there is opportunity for vegetation to provide screening. The area around Kingham is likely to be least able to accomodate3 any development.

Overall Susceptibility	Wind			
	Solar			

4.0 Clay Wolds Landscapes



4.1. Floodplain Pasture



4.1.1. Key Characteristics

- *typically located immediately adjacent to rivers and minor watercourses on land prone to flooding, particularly in winter;*
- *distinctively flat, low-lying land (below 70m AOD);*
- *predominantly under permanent pasture with only occasional cultivated land;*
- *riparian character, with strong pattern of ditches often lined by willow;*
- *landscape structure provided by lines and groups of mature trees, with willow and alder conspicuous;*
- *intimate, semi-enclosed and pastoral character;*
- *remote and tranquil with limited intrusion by people or buildings;*
- *moderate to low intervisibility.*

4.1.2. Assessment of Susceptibility

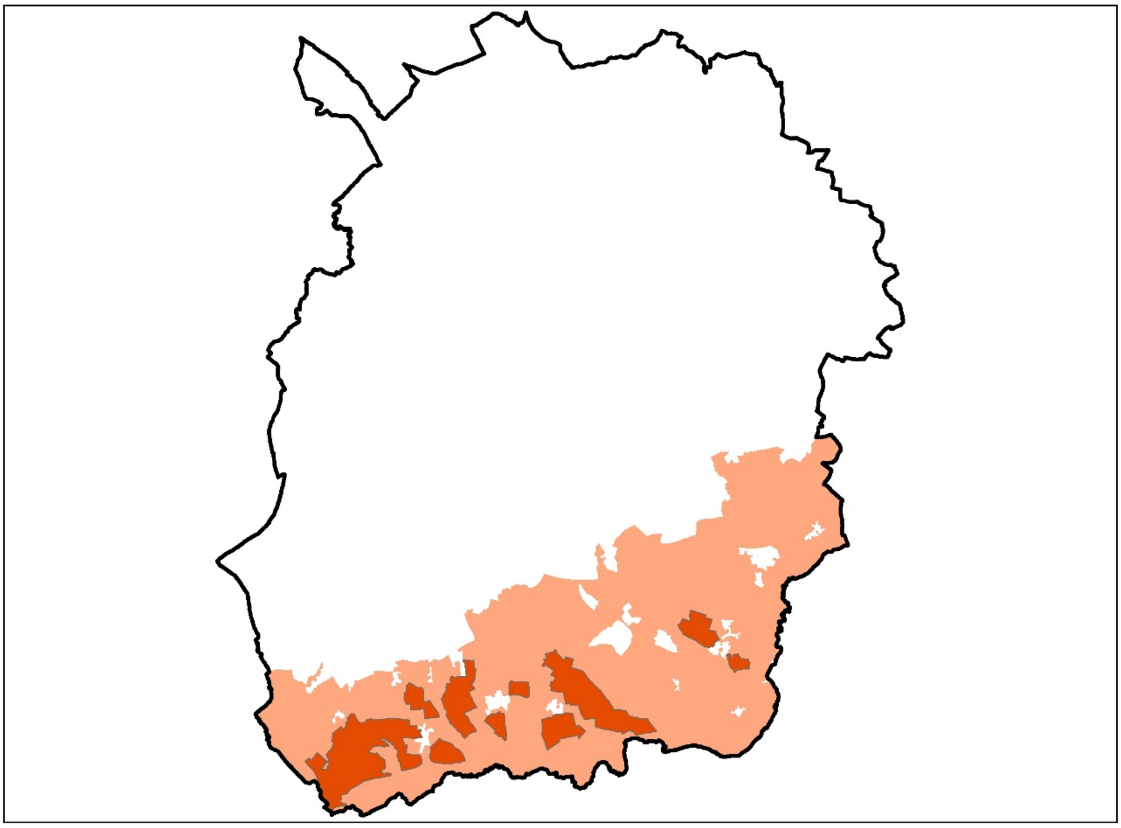
		Susceptibility		
		Low	**Medium**	**High**
Landform and Scale	Flat, low lying floodplain ground typically adjacent to watercourses and of small to medium scale.			
	Wind			
	Solar			
Land Cover Pattern	Ranging from small, irregular fields on settlement fringes to medium size fields of more regular form with a mix of pasture and a smaller degree of arable cultivation. Boundaries defined by a mix of hedgerows and ditches lined with riparian vegetation.			
	Wind			
	Solar			
Key Views and Skylines	Extent of vegetation and low elevation result in fairly confined views from most areas and limited intervisibility with surrounding landscapes. Provides landscape setting to parts of some settlements adjacent to the type.			
	Wind			
	Solar			
Scenic & Perceptual Qualities	This type has an intimate feel, strong sense of place and generally good scenic quality although riparian vegetation can look overgrown and scruffy in some areas.			
	Wind			
	Solar			

Summary

There is limited scope to accommodate renewables development in this type. Some modest solar development may be able to be accommodated without causing undue consequences however wind turbines are likely to be considered overly intrusive in most areas.

Overall Susceptibility	Wind			
	Solar			

4.2. Open Flat Vale Farmland



4.2.1. Key Characteristics

- *drained and cultivated land (arable or reseeded grassland) within the floodplain;*
- *distinctively flat and low-lying;*
- *network of ditches;*
- *weak landscape structure with few trees, low or gappy hedges open ditches and fences;*
- *open, denuded character with high intervisibility;*
- *'two-dimensional', expansive landscape with dominant sky*

4.2.2. **Table 1.1 – Assessment of Susceptibility**

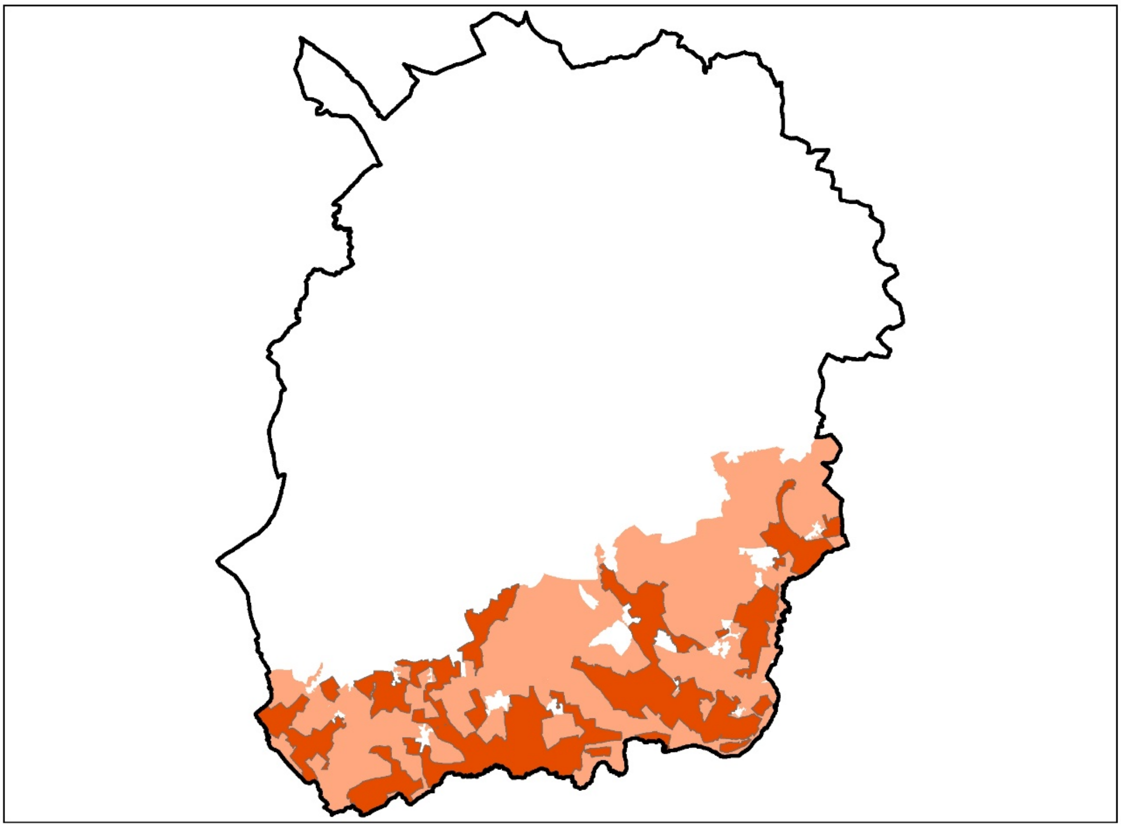
		Susceptibility		
		Low	**Medium**	**High**
Landform and Scale	Large scale and distinctively flat landscape cut through with drainage ditches.			
	Wind			
	Solar			
Land Cover Pattern	Simple land cover of large, primarily arable, fields of regular to sub-regular from. Relatively open boundaries defined by a mix of ditches, fences and gappy hedgerows; tree cover is sparse.			
	Wind			
	Solar			
Key Views and Skylines	Very open and long distance views are possible from this type and there is a high degree of intervisibility with the wider landscape. Skyline typically created by the layering of distant vegetation amongst which occasional church towers and spires are visible			
	Wind			
	Solar			
Scenic & Perceptual Qualities	Expansive landscape of large skies and has a sense of exposure but not remoteness. Some intrusive influences such as pylons are present and there is only a weak sense of place about the landscape type.			
	Wind			
	Solar			

Summary

This is an open landscape without a distinctive structure and of limited scenic quality which is likely to be able to accommodate some renewable energy development without notable detriment to it's key characteristics. Potential development would be most appropriately sited away from other notable intrusions such as pylons in order to avoid landscape clutter.

Overall Susceptibility	Wind			
	Solar			

4.3. Semi-enclosed Flat Vale Farmland



4.3.1. Key Characteristics

- *drained and cultivated land (arable or reseeded grassland) within the floodplain;*
- *distinctively flat and low-lying;*
- *network of ditches;*
- *strong landscape structure of willow-lined ditches, hedgerows and occasional woodland blocks;*
- *semi-enclosed character with moderate to low intervisibility.*

4.3.2. Assessment of Susceptibility

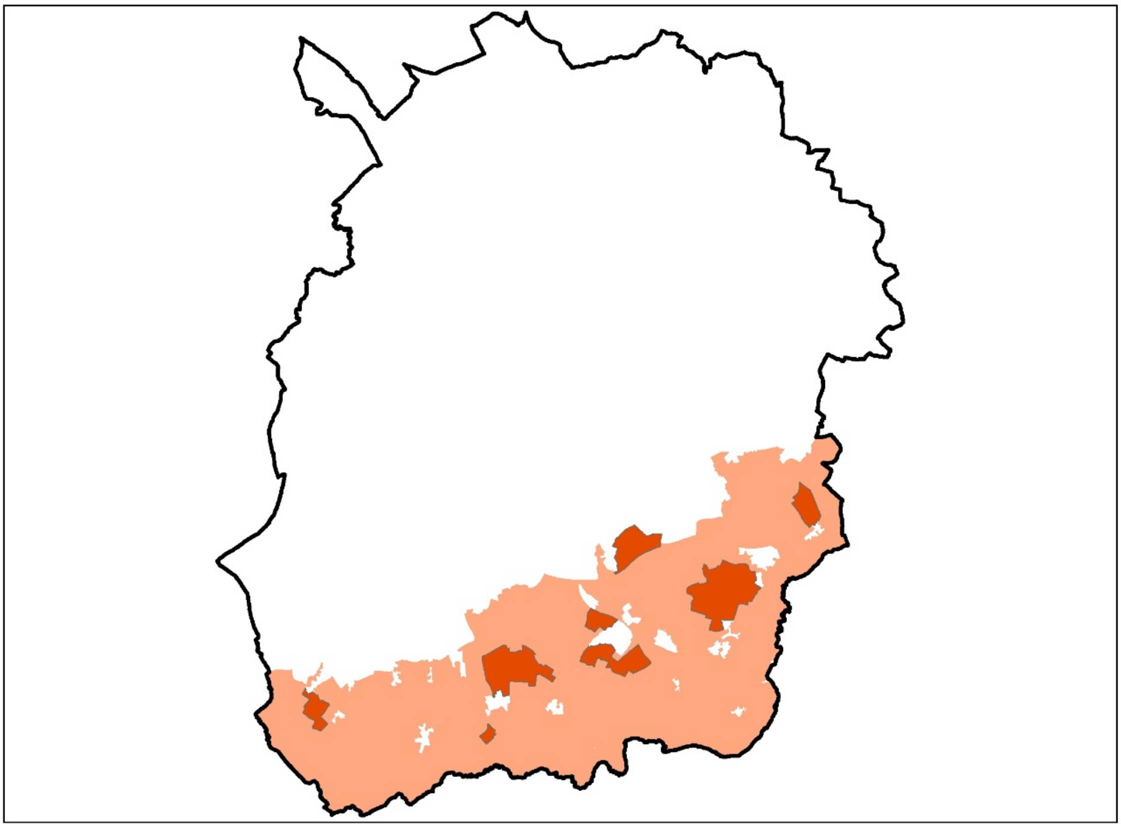
		Susceptibility		
		Low	**Medium**	**High**
Landform and Scale	Large to moderate scale and distinctively flat landscape cut through with drainage ditches and some encroachment from gravel extraction works to the east of Ducklington.			
	Wind			
	Solar			
Land Cover Pattern	Moderately complex land cover comprising arable and grazing land in fields of varying size and shape bounded by hedgerows and ditches lined with riparian vegetation. Very occasional presence of small woodlands and isolated area of gravel pits (both active and flooded).			
	Wind			
	Solar			
Key Views and Skylines	Layering of vegetation constrains views in areas with smaller fields whilst views more open in larger scale areas. Overall moderate to limited intervisibility with other landscape types. Transmission lines can be seen in various parts of this landscape type.			
	Wind			
	Solar			
Scenic & Perceptual Qualities	Scenic quality varies across the type with areas of greater diversity, often close to settlements, of higher quality and areas with notable intrusive elements such as gravel pits or pylons feeling slightly degraded. Generally has a settled feel due to these influences as well as presence of several settlements and busy roads.			
	Wind			
	Solar			

Summary

Larger scale areas within this type would generally be better able to accommodate renewables development however larger turbines are unlikely to be appropriate due to the extent of scale comparators which may emphasise their size. The extent of vegetation is likely to offer notable screening and degraded land associated with gravel extraction may provide opportunity, particularly for solar development.

Overall Susceptibility	Wind			
	Solar			

4.4. Open Rolling Vale Farmland



4.4.1. Key Characteristics

- *low-lying land off floodplain floor (generally above 70m AOD) with a discernible raised landform;*
- *well-drained, productive land underlain by river terrace gravels;*
- *large-scale, cultivated fields (arable predominant) with regular field boundaries;*
- *weak structure of tightly clipped hedges and few hedgerow trees (dry-stone walls absent);*
- *open, denuded character;*
- *high intervisibility;*
- *'two-dimensional', expansive landscape with dominant sky.*

4.4.2. **Assessment of Susceptibility**

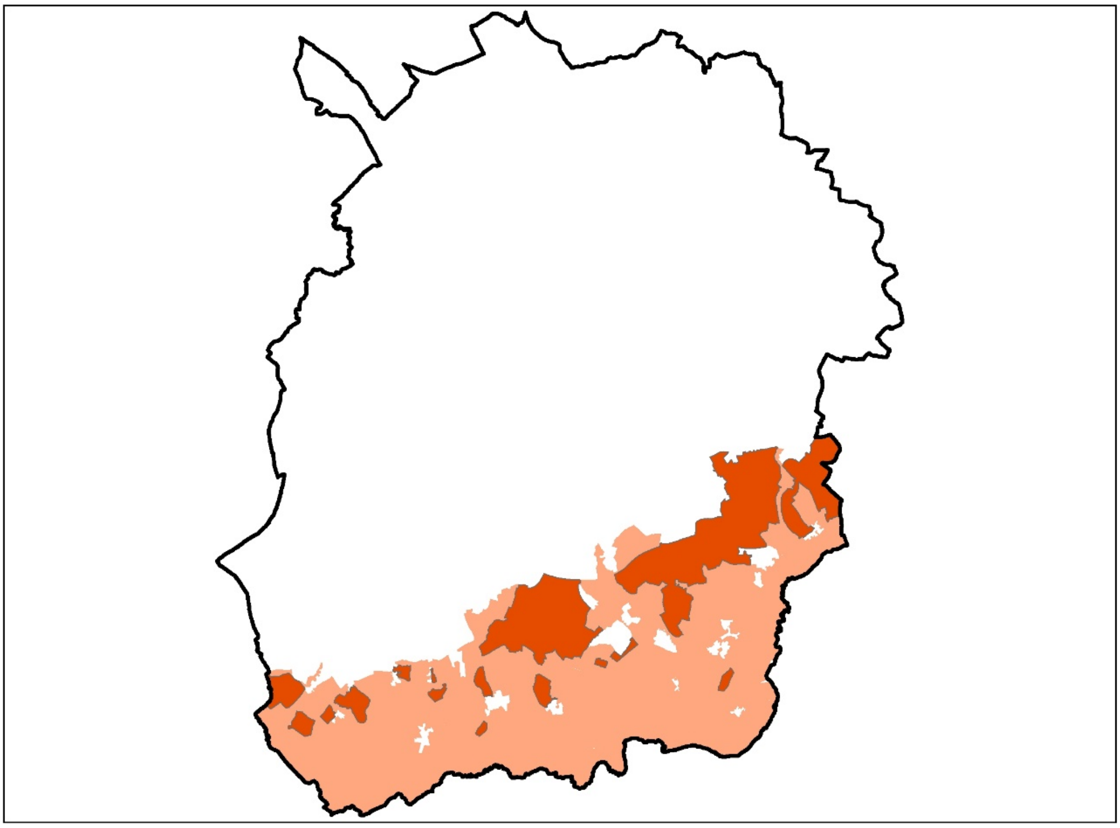
		Susceptibility		
		Low	**Medium**	**High**
Landform and Scale	This large scale landscape is very gently rolling though discernibly different from the adjacent floodplain landscape types. Occasionally cut through by drainage ditches.			
	Wind			
	Solar			
Land Cover Pattern	Simple land cover pattern of large scale arable fields of regular and sub-regular form. These are bordered by well managed hedgerows with occasional hedgerow trees and occasionally by ditches. Larger shelterbelts and woodland are generally absent although do border the type in places.			
	Wind			
	Solar			
Key Views and Skylines	Relatively open view across the type with some more long distance views possible due to increased elevation relative to the adjacent floodplain landscapes.			
	Wind			
	Solar			
Scenic & Perceptual Qualities	Open and expansive with big skies although proximity to settlement and presence of roads and transmission lines gives settled feel. Longer distance views provide interest and generally good condition contributes to moderate scenic quality.			
	Wind			
	Solar			

Summary

The large scale of the landscape type could potentially accommodate both turbine and solar farm development although the open nature and slight elevation relative to adjacent landscapes could result in a high degree of visibility.

Overall Susceptibility	Wind			
	Solar			

4.5. Semi-enclosed Rolling Vale Farmland



4.5.1. Key Characteristics

- *low-lying land 01f floodplain floor (generally above 70m AOD) with a discernible raised landform;*
- *well-drained, productive land underlain by river terrace gravels;*
- *mostly large-scale fields under arable with regular field boundaries but some smaller scale pattern and pasture (especially around settlements);*
- *stronger structure of hedgerows, trees and occasional belts or blocks of woodland;*
- *semi-enclosed character;*
- *moderate intervisibility.*

4.5.2. Assessment of Susceptibility

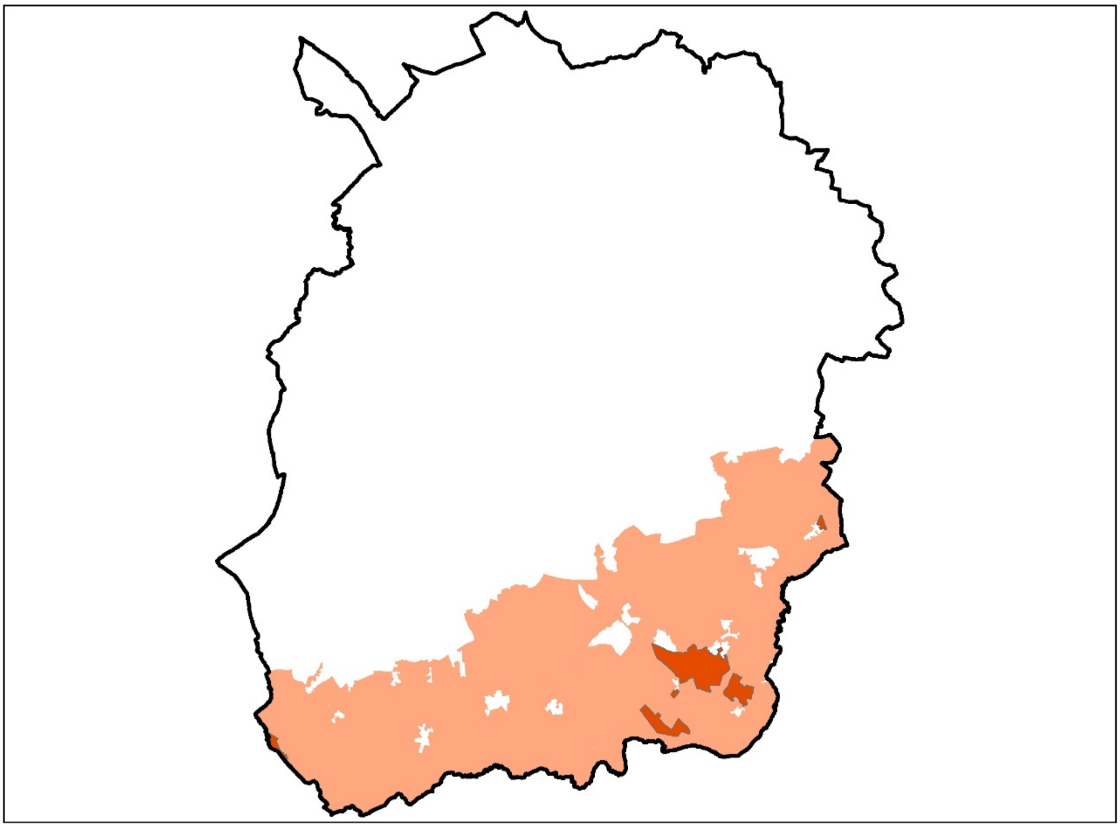
		Susceptibility		
		Low	**Medium**	**High**
Landform and Scale	This large scale landscape is very gently rolling though discernibly different from the adjacent floodplain landscape types. Occasionally cut through by drainage ditches.			
	Wind			
	Solar			
Land Cover Pattern	Simple to moderate land cover pattern of large scale arable fields of regular and sub-regular with some smaller fields used for grazing, generally associated with settlement edges. Fields are defined by hedgerows with hedgerow trees and both woodland and shelterbelts are relatively frequent.			
	Wind			
	Solar			
Key Views and Skylines	Moderate intervisibility with layering of vegetation constraining views in some areas. Church towers and spires can be seen amongst vegetation in places.			
	Wind			
	Solar			
Scenic & Perceptual Qualities	Good condition and variety result in an attractive landscape of moderate to high scenic quality and settled rural feel. Main roads, such as the A40, have a locally disruptive influence but limited effect on the type as a whole.			
	Wind			
	Solar			

Summary

Turbines are likely to be relatively intrusive in this landscape type due to the prevalence of scale comparators although smaller turbine sizes may be able to be accommodated where they don't conflict with key open views or those of landmark spires. Solar development may be more readily accommodated in areas of lower scenic quality.

Overall Susceptibility	Wind			
	Solar			

4.6. Floodplain Wetlands



4.6.1. Key Characteristics

- *areas of open water occupying former gravel pits within floodplain;*
- *associated wet grassland and marsh/fen vegetation communities with a semi-natural character;*
- *distinctively flat, low-lying land (below 70m AOD);*
- *structure and visual enclosure provided by developing scrub and tree cover;*
- *moderate to low intervisibility.*

4.6.2. Assessment of Susceptibility

		Susceptibility		
		Low	**Medium**	**High**
Landform and Scale	This area comprises a small to medium scale flat landscape largely occupied by the open water of flooded former gravel pits.			
	Wind			
	Solar			
Land Cover Pattern	There is moderately complex land cover resulting from the combination of open water surrounded by relatively dense vegetation and wetland.			
	Wind			
	Solar			
Key Views and Skylines	There are open views within this landscape type across the open water although surrounding vegetation restricts intervisibility with other landscape types.			
	Wind			
	Solar			
Scenic & Perceptual Qualities	The human influence on this landscape is apparent although the overriding character is naturalistic. Vegetation provides a strong sense of enclosure that contrasts with the open water creating a moderate to strong sense of place.			
	Wind			
	Solar			

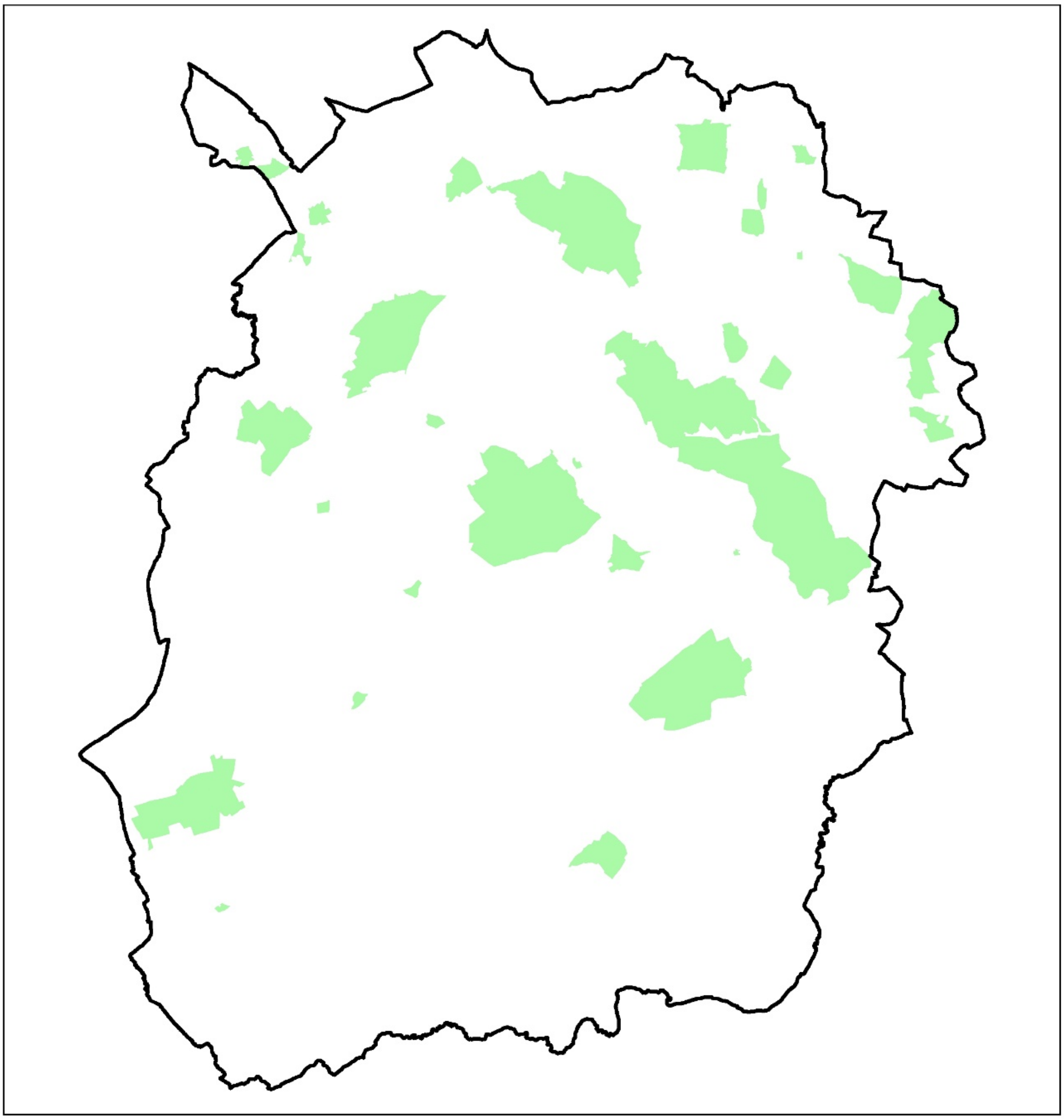
Summary

Although naturalistic in its ‘restored’ state it is readily apparent that this landscape is a product of past gravel extraction. Despite the obvious human influence, turbines are unlikely to be easily accommodated within this landscape type as they would typically be out of scale with their surroundings. Solar development may be more readily accommodated due to the degree of potential screening from existing vegetation.

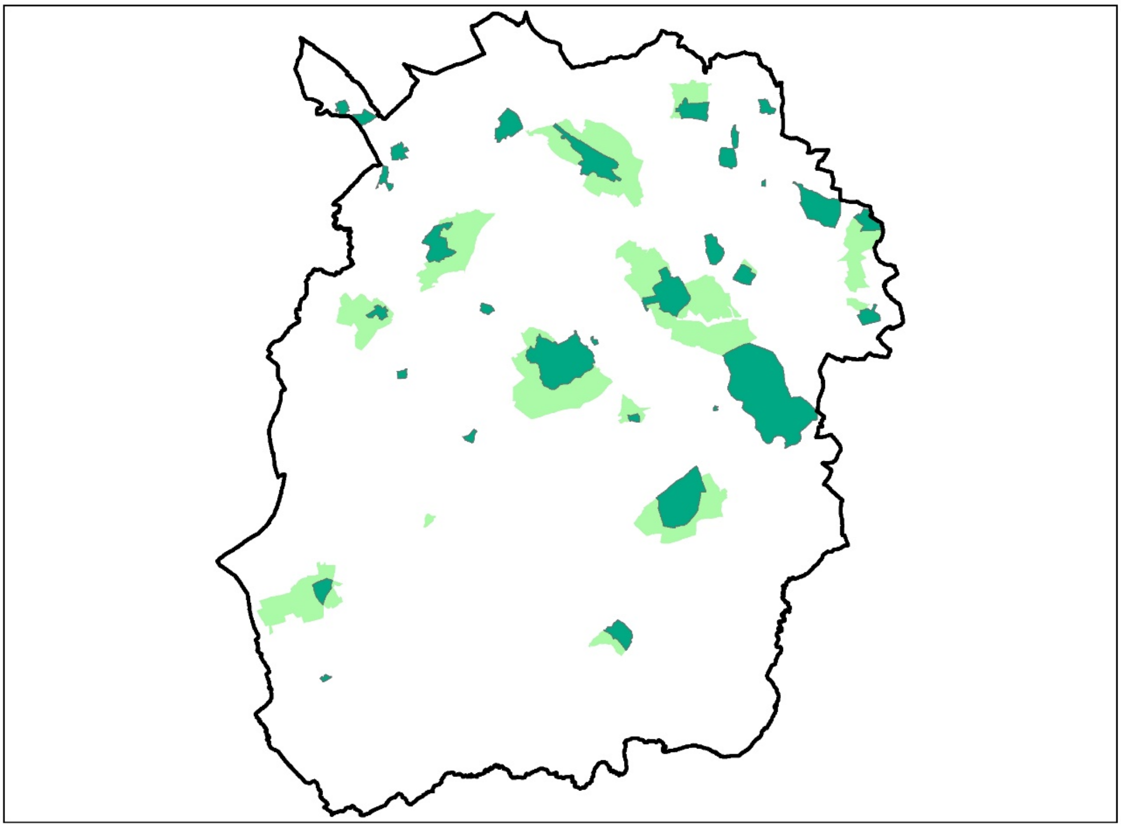
Overall Susceptibility	Wind			
	Solar			

LDĀ DESIGN

5.0 Parkland Landscapes



5.1. Parkland



5.1.1. Key Characteristics

- *formal, designed landscape and grounds surrounding large country houses;*
- *distinctive formal landscape features,*
- *including avenues, free-standing mature trees in pasture, clumps and blocks of woodland, exotic tree species, formal structures and boundary features;*
- *planting and landscape character generally unrelated to surrounding areas;*
- *distinctively rural, picturesque and pastoral character;*
- *mature woodland and tree cover with typically enclosed character;*
- *low intervisibility.*

5.1.2. Assessment of Susceptibility

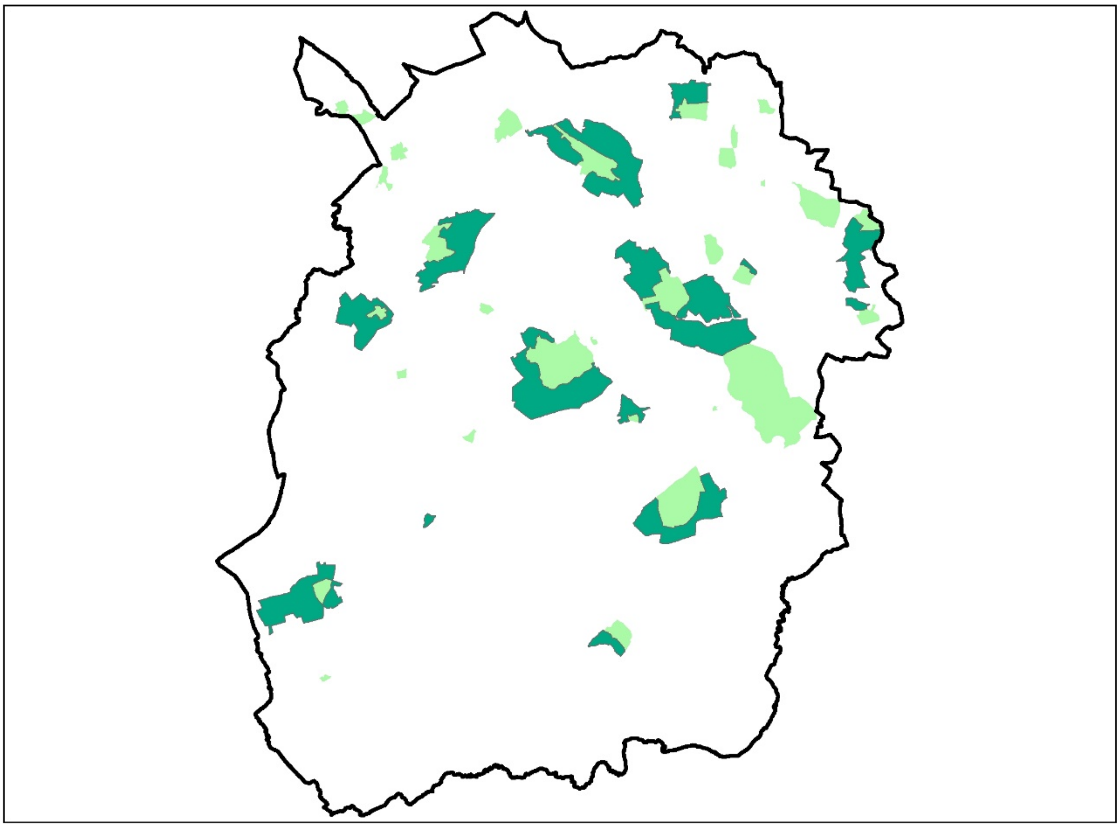
		Susceptibility		
		Low	**Medium**	**High**
Landform and Scale	Generally medium or small scale landscapes of varying topography.			
	Wind			
	Solar			
Land Cover Pattern	These landscapes are designed to a range of aesthetics with a high variety of land cover pattern. Formal gardens and avenues are present along with naturalistic stands of trees and woodlands.			
	Wind			
	Solar			
Key Views and Skylines	Intervisibility is limited due to the extent of tree cover however specifically designed views are characteristic.			
	Wind			
	Solar			
Scenic & Perceptual Qualities	Designed to be distinctively rural, picturesque and of pastoral character these landscapes have very high scenic quality. There is generally a strong sense of enclosure and privacy.			
	Wind			
	Solar			

Summary

Renewables development is very unlikely to be accommodated in designed landscapes without significant adverse effects.

Overall Susceptibility	Wind			
	Solar			

5.2. Estate Farmland



5.2.1. Key Characteristics

- *well managed farmland associated with large country estates, often lying beyond formal parkland boundaries;*
- *distinctively well-treed character, with extensive mature woodland blocks, belts and copses (often managed for game), lines of mature trees (predominantly oak) within hedgerows, along estate boundaries and roads, estate fencing (railings and post and rail) and other estate features or buildings;*
- *large-scale pattern of fields, typically bounded by belts of woodland or lines of mature trees;*
- *land use predominantly arable but with some areas of permanent pasture;*
- *enclosed, secluded and private character;*
- *moderate to low intervisibility.*

5.2.2. Assessment of Susceptibility

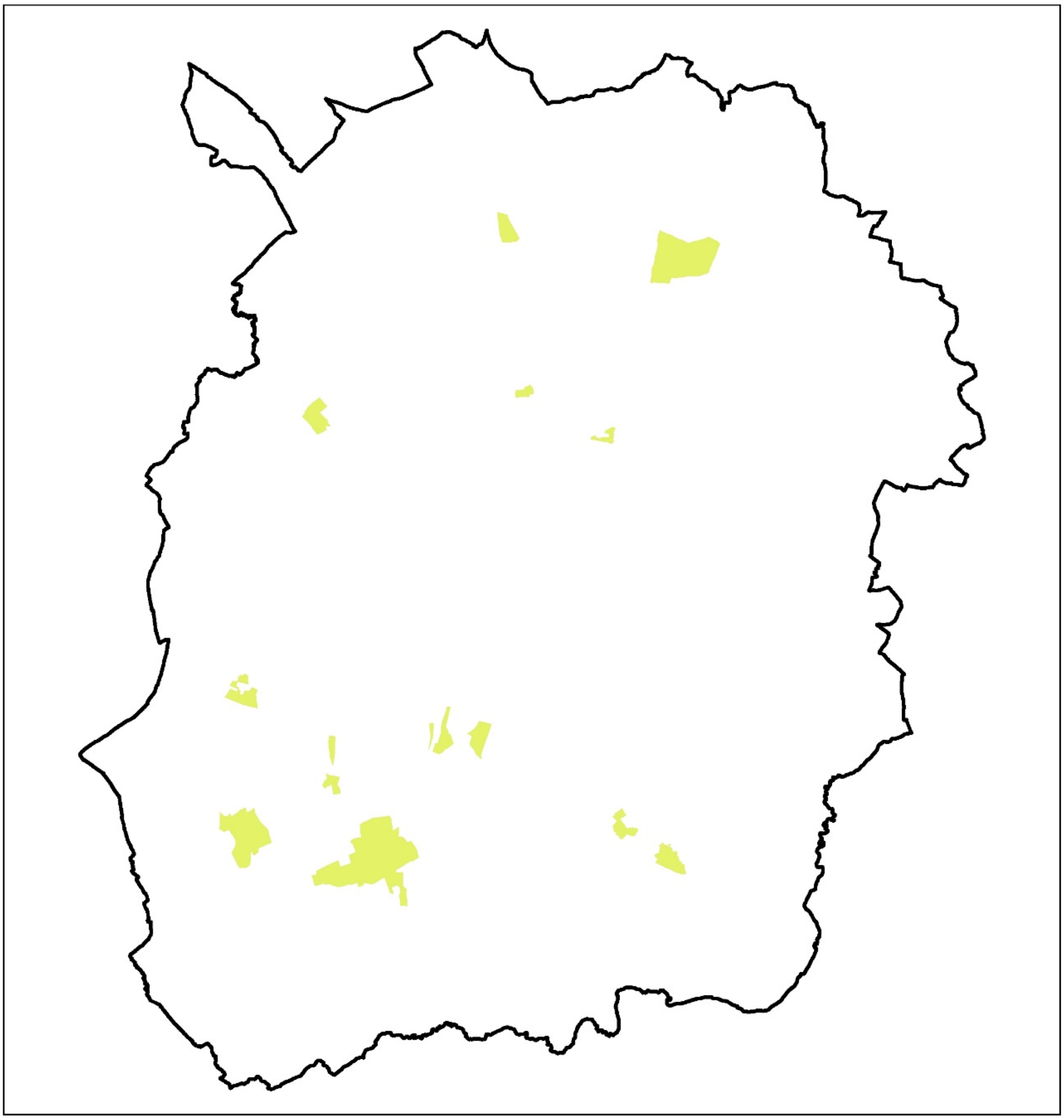
		Susceptibility		
		Low	Medium	High
Landform and Scale	Medium to large scale landscapes of varying topography.			
	Wind			
	Solar			
Land Cover Pattern	Typically medium to large arable fields of regular to sub-regular form with strong boundaries characterised by extensive inclusion of mature trees and woodland blocks. Some areas of improved pasture, generally associated with smaller fields.			
	Wind			
	Solar			
Key Views and Skylines	In some areas there is a visual relationship with the adjacent Parkland landscapes and this landscape type may form part of designed views. Enclosure provided by extensive tree cover limits intervisibility with the wider landscape however.			
	Wind			
	Solar			
Scenic & Perceptual Qualities	Generally in excellent condition due to intensive management and of high scenic quality. There is a very strong sense of place in these typically enclosed and private landscapes.			
	Wind			
	Solar			

Summary

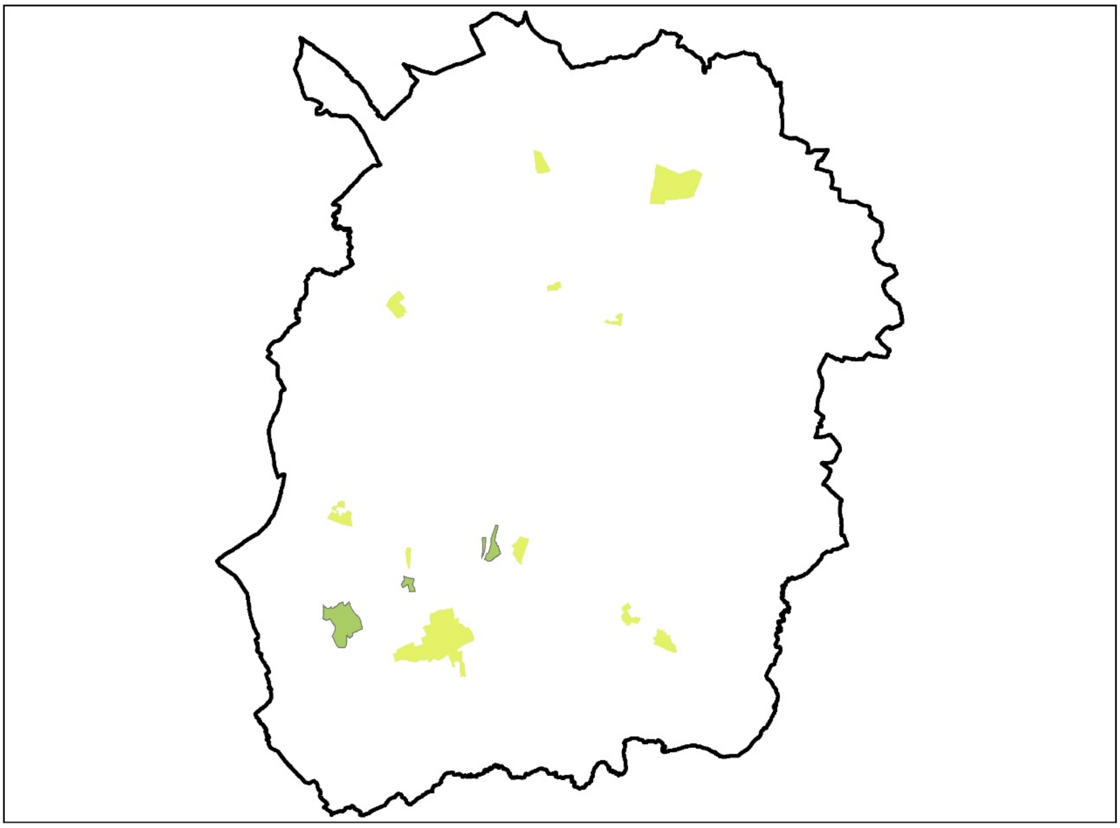
The close association with adjacent designed landscapes and the high scenic quality mean renewables are generally unlikely to be accommodated in this landscape type without undue consequences occurring. There may be some very limited potential to accommodate solar development in less picturesque or well screened areas.

Overall Susceptibility	Wind			
	Solar			

6.0 Sub-rural Landscapes



6.1. Rural Fringe Land



6.1.1. Key Characteristics

- *non-agricultural land with semi-domestic character within a rural context, e.g. horse paddocks, allotments, small-holdings etc.;*
- *small-scale field pattern usually around the fringes of settlements;*
- *somewhat unkempt appearance, rank or weed-infested grassland, poorly managed hedges and boundary fencing, typical assortment of ramshackle sheds, horse jumps, fly-tipping etc.;*
- *other intrusive influences, such as overhead power lines and built form on the edge of settlements;*
- *moderate intervisibility.*

6.1.2. Assessment of Susceptibility

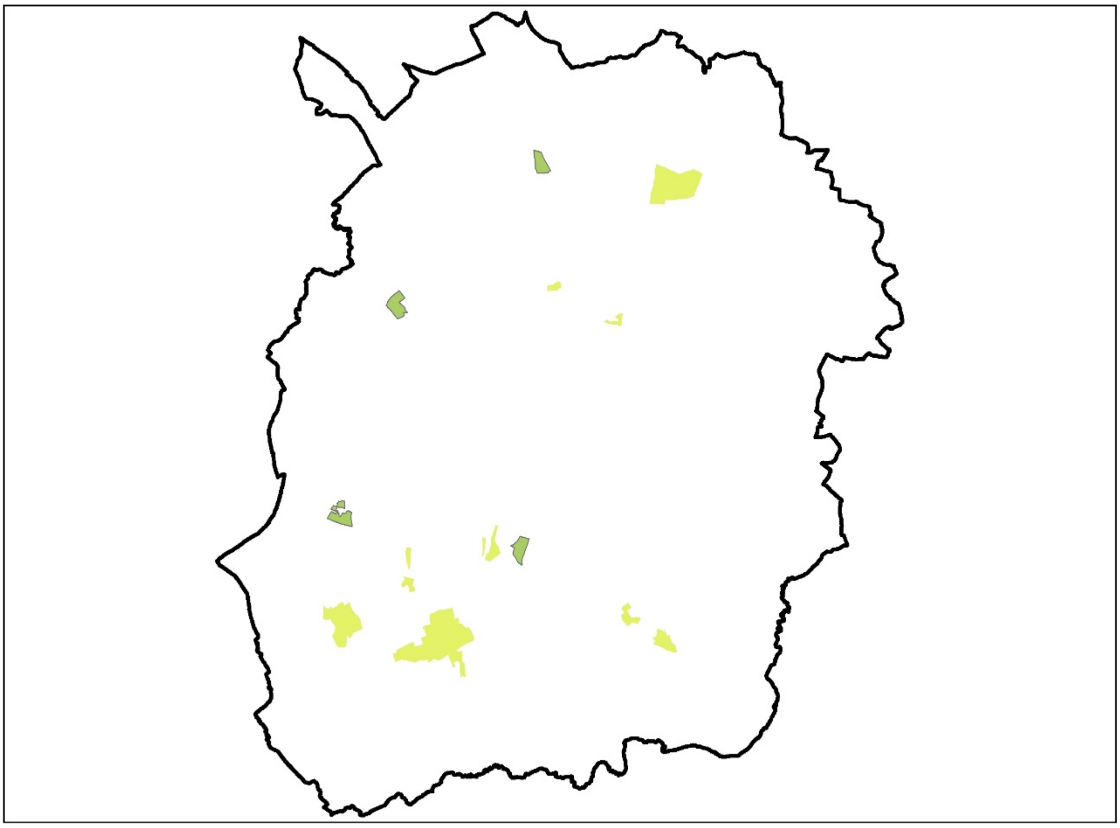
		Susceptibility		
		Low	Medium	High
Landform and Scale	This type is flat to gently rolling with areas most closely associated with settlements being small scale and area comprising the former airfield to the west of Carterton medium to large scale.			
	Wind			
	Solar			
Land Cover Pattern	Areas adjacent to settlements have small fields given over to horse paddocks, allotments and small holdings within a structure of scrappy hedgerows and mature trees. The former airfield west of Carterton comprises much larger fields with a mix of pasture and arable cultivation.			
	Wind			
	Solar			
Key Views and Skylines	Generally quite constrained views due to field boundary vegetation although the former airfield is more open. Settlement edges are notable in views from this landscape type.			
	Wind			
	Solar			
Scenic & Perceptual Qualities	General unkempt appearance and intrusion from settlement and infrastructure such as power lines gives a degraded feel and overall low scenic quality.			
	Wind			
	Solar			

Summary

It is unlikely that the areas of this type located adjacent to settlements would be able to accommodate either solar or turbine developments. There may however be some scope to accommodate either in the larger scale landscape of the former airfield to the west of Carterton which is generally of lower susceptibility.

Overall Susceptibility	Wind			
	Solar			

6.2. Sport Landscapes



6.2.1. Key Characteristics

- *manicured or intensively managed land under amenity use (e.g. golf courses or playing fields);*
- *landform, planting character and features (e.g. lakes, bunkers) often unrelated to landscape context;*
- *open, expansive character, particularly where planting has not yet matured;*
- *moderate to high intervisibility.*

6.2.2. Assessment of Susceptibility

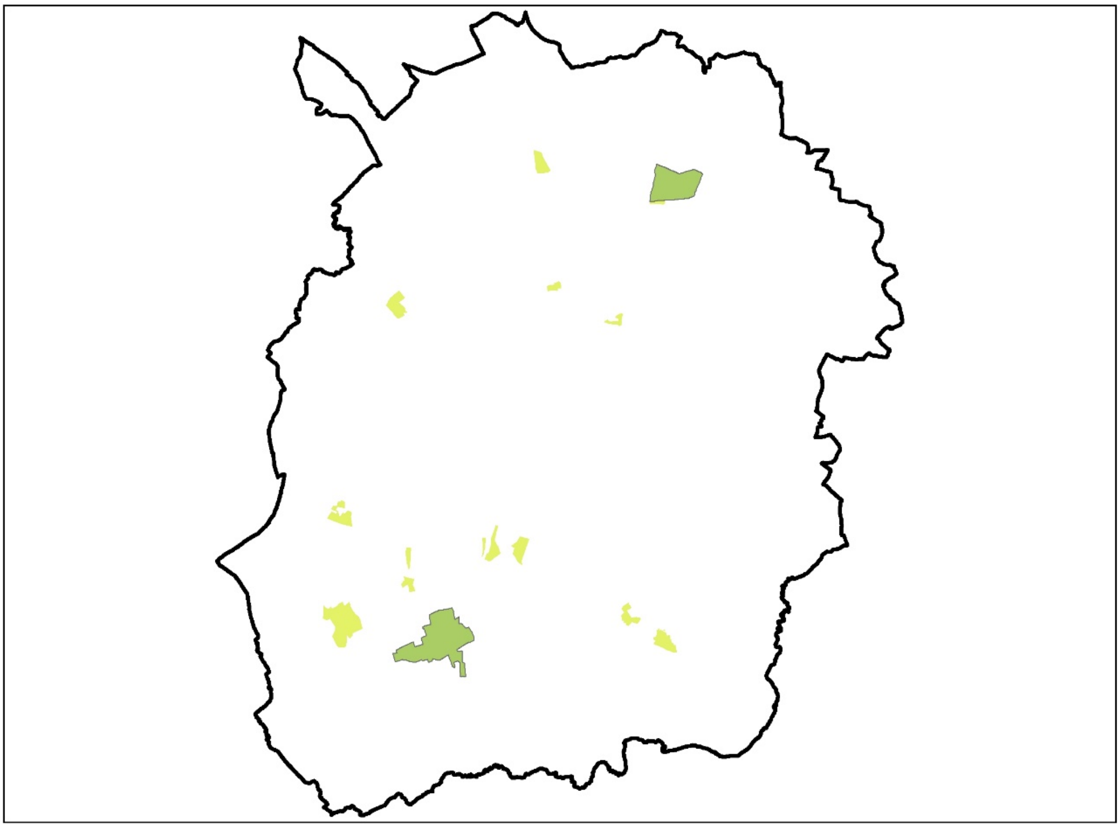
		Susceptibility		
		Low	Medium	High
Landform and Scale	Not assessed.			
	Wind			
	Solar			
Land Cover Pattern	Not assessed.			
	Wind			
	Solar			
Key Views and Skylines	Not assessed.			
	Wind			
	Solar			
Scenic & Perceptual Qualities	Not assessed.			
	Wind			
	Solar			

Summary

As noted in the methodology renewables development is unlikely to be compatible with the existing land use that characterises these areas, therefore susceptibility to potential renewables development has not been assessed.

Overall Susceptibility	Wind			
	Solar			

6.3. Airfields and MOD Sites



6.3.1. Key Characteristics

- *active airfield and MoD sites that typically occupy flat, exposed and prominent locations;*
- *open, expansive and bleak character with very weak landscape structure;*
- *visually prominent buildings and features (e.g. large hangars, sheds, high security fencing, aircraft etc.)*
- *high intervisibility.*

6.3.2. Assessment of Susceptibility

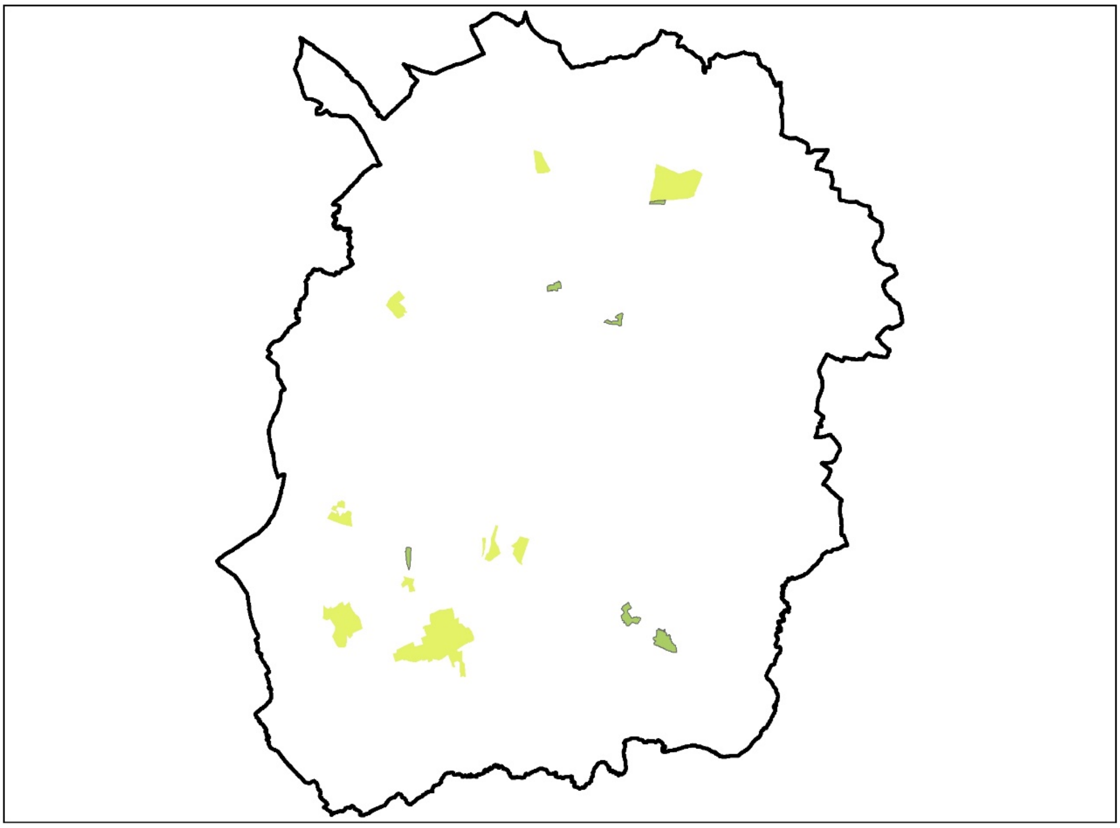
		Susceptibility		
		Low	**Medium**	**High**
Landform and Scale	Not assessed.			
	Wind			
	Solar			
Land Cover Pattern	Not assessed.			
	Wind			
	Solar			
Key Views and Skylines	Not assessed.			
	Wind			
	Solar			
Scenic & Perceptual Qualities	Not assessed.			
	Wind			
	Solar			

Summary

As noted in the methodology renewables development is unlikely to be compatible with existing land use that characterises these areas, therefore susceptibility to potential renewables development has not been assessed.

Overall Susceptibility	Wind			
	Solar			

6.4. Minerals and Landfill Sites



6.4.1. Key Characteristics / Description

- *areas where quarrying or landfill activity has significantly altered local landscape character;*
- *artificial landform created by excavations, tipped material and the construction of screen bunds;*
- *disturbed land typically dominated by bare ground, scrub, rough grassland, weeds and belts of screen planting;*
- *urban character introduced with incongruous styles of fencing and highway treatments, site buildings, machinery etc.;*
- *low intervisibility where mounding and planting have taken effect.*

6.4.2. Assessment of Susceptibility

		Susceptibility		
		Low	Medium	High
Landform and Scale	Not assessed.			
	Wind			
	Solar			
Land Cover Pattern	Not assessed.			
	Wind			
	Solar			
Key Views and Skylines	Not assessed.			
	Wind			
	Solar			
Scenic & Perceptual Qualities	Not assessed.			
	Wind			
	Solar			

Summary

As noted in the methodology renewables development is unlikely to be compatible with existing land use that characterises these areas, therefore susceptibility to potential renewables development has not been assessed.

Overall Susceptibility	Wind			
	Solar			

August 2016

West Oxfordshire Renewables Study