

# Appendix A

## Assessment Assumptions

## Appendix A

# Key Assumptions to be Applied in the Assessment of Renewable Energy Resource

### Introduction

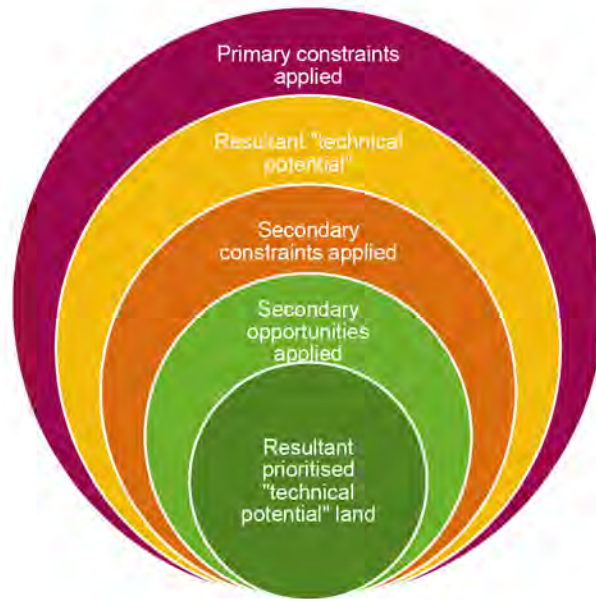
**A.1** This note sets out the key assumptions that were used within the assessments of technical potential for wind and ground mounted solar. The assumptions used within the assessment of technical potential for roof mounted solar are included in **Chapter 2**.

### Overview

**A.2** To identify land with the opportunity to deliver wind and ground mounted solar developments, primary constraints to these technologies were mapped to identify the remaining unconstrained land within Herefordshire. This unconstrained land represents the technical potential for wind and ground mounted solar. This “technical potential” could be used to define areas of potential suitability for wind within the Local Plan in accordance with footnote 54 of the NPPT (Please note, footnotes 54 does not cover solar).

**A.3** Following this, secondary constraints and opportunities were overlaid to identify land within the areas of technical potential that have greater or lower potential suitability for development (see **Figure A.1**). These secondary constraints and opportunities could be presented on the online webmap to enable planners, renewable developers, community groups and members of the public to begin the process of identifying the most suitable sites for development.

Figure A.1: Method overview



## Emission Factors

**A.4** To determine the potential CO<sub>2</sub> savings from the identified potential renewable resources, the identified potential electricity/heating output was multiplied by the emissions factors of the fuels the renewable energy generation would replace. In the case of the technologies being assessed, it assumed that electricity from the national grid will be replaced by the energy they produce. The emissions factors for grid electricity at present is 0.183kgCO<sub>2</sub>e/kWh<sup>1</sup>.

## Wind Resource Assessment Parameters: Primary Constraints

**A.5** The potential wind development resource within Herefordshire was assessed using a Geographic Information Systems (GIS) approach. This involved mapping a variety of technical and environmental parameters to identify parts of the county which are constrained with respect to wind development at various scales. The remaining land was then identified as having 'technical potential' (subject to further site-specific assessment at application stage). The parameters of the GIS tool are set out in **Table A.1**.

**A.6** The maximum theoretical wind generation capacity of the areas of technical potential was estimated using:

- Standardised turbine densities and assumed turbine maximum generation capacities (the latter expressed in Megawatts (MW));
- One or more assumed capacity factors based on historic data broken down at least to regional level (using data from the Department for Business, Energy and Industrial Strategy (BEIS) relating to Feed in Tariff (FiT) installations)<sup>2</sup>; and
- The assumption that, where land has technical potential for multiple turbine scales, the largest scale will be developed in preference to smaller scales.

<sup>1</sup> National Grid (2023) Future Energy Scenarios: FES 2023 Data workbook – Key Stats: Annual average carbon intensity of electricity (five year forecast from 2022)

<sup>2</sup> An energy generator's 'capacity factor' can be defined as the actual energy yield produced over a period of time expressed as a proportion of the energy yield that would have been produced if the generator had operated at its full generation capacity continuously over the same period.

Table A.1: Assumptions used in the assessment of technical potential for onshore wind – Constraints

Parameter	Assumption	Data Source	Justification and Notes
Wind Turbine Size	<p>Five turbine sizes were considered:</p> <ul style="list-style-type: none"> <li>■ Very large (150-220m tip height)</li> <li>■ Large (100-150m tip height)</li> <li>■ Medium (60-100m tip height)</li> <li>■ Small (25-60m tip height)</li> <li>■ Very small (&lt;25m tip height)</li> </ul> <p>Assessment was based on notional turbine sizes, approximately intermediate within each class size i.e.:</p> <ul style="list-style-type: none"> <li>■ Very large: 185m tip height, 4MW capacity</li> <li>■ Large: 125m tip height, 2.5MW capacity</li> <li>■ Medium: 80m tip height, 0.5MW capacity</li> <li>■ Small: 45m tip height, 0.05MW capacity</li> </ul>	<ul style="list-style-type: none"> <li>■ LUC</li> <li>■ Research into turbine manufacturers</li> <li>■ BEIS renewable energy planning database and other databases containing information on wind turbine applications</li> </ul>	<p>There are no standard categories for wind turbine sizes. The categories chosen are based on consideration of current and historically 'typical' turbine models at various different scales. The approach is intended to be flexible in the light of uncertainty regarding future financial support for renewable energy.</p> <p>A review of wind turbine applications across the UK showed tip heights ranging from less than 20m up to around 220m, with larger turbine models in demand from developers following the reduction in financial support from Government<sup>3</sup>.</p> <p>Due to the structure of the financial support system in the past, smaller turbines (those in the medium to small categories) have tended to be deployed as 1-2 turbine developments.</p> <p>As this is a strategic scale study, notional turbine sizes, approximately intermediate within each class size, were used to represent each scale of turbine within this assessment.</p> <p>No map-based assessment of 'very small' turbines was undertaken. The type of buffers applied to constraints for the assessment of other turbine size categories in many cases do not reasonably apply to very small turbines. Equally, mapping a strategic county-wide 'resource' for very small turbines (which are generally developed individually in association with particular farm or other buildings) is not particularly meaningful. Instead, it is recommended that policy references the entire plan area as suitable for very small wind in principle (subject to site-specific assessment).</p>
Wind Speed	Exclude:	<ul style="list-style-type: none"> <li>■ Global Wind Atlas/Vortex</li> <li>■ Industry practice</li> </ul>	<p>Wind speed requirements change with turbine scale and model. Some turbine manufacturers produce models which may operate at lower wind speeds and the configuration of certain turbine models can be altered to improve yield in lower wind speed environments.</p>

<sup>3</sup> LUC review in July 2023

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Parameter	Assumption	Data Source	Justification and Notes
	<ul style="list-style-type: none"> <li>All areas with mean annual average wind speed &lt;5m/s at 50m above ground level (agl).</li> </ul>		<p>Future changes in government policy and turbine technology could allow developments to be deliverable at lower wind speeds than are currently viable. A 5m/s threshold was applied to take account of such changes.</p>
Roads	<p>Exclude:</p> <ul style="list-style-type: none"> <li>Roads (excl. restricted access tracks) with a buffer of the height of the turbine (to blade tip height) +10%.</li> </ul>	<ul style="list-style-type: none"> <li>Ordnance Survey OpenRoads</li> </ul>	<p>These buffers were applied as a safety consideration. The buffer distance is based on standard safety distances used by wind turbine developers and the DECC Renewable and Low-carbon Energy Capacity Methodology<sup>4</sup>.</p> <p>Restricted access tracks were excluded from consideration as these predominantly comprise of forestry and other tracks which could be more easily diverted than standards roads.</p>
Railways	<p>Exclude:</p> <ul style="list-style-type: none"> <li>Railways with a buffer of the height of the turbine (to blade tip height) +10%.</li> </ul>	<ul style="list-style-type: none"> <li>Ordnance Survey VectorMap District</li> </ul>	<p>This buffer was applied as a safety consideration, based on the same principles as used for roads.</p>
Electricity Lines	<p>Exclude:</p> <ul style="list-style-type: none"> <li>Major transmission lines (132kV minimum) with a buffer of the height of the turbine (to blade tip height) +10%.</li> </ul>	<ul style="list-style-type: none"> <li>Ordnance Survey OpenMap</li> <li>National Grid</li> </ul>	<p>This buffer was applied as a safety consideration. It is derived from guidance by the Energy Networks Association (Engineering Recommendation L44) and National Grid (Technical Advice Note 287).</p> <p>It is noted that this guidance also states that a buffer of 3x the rotor diameter should be applied to account for turbine wake downwind of a turbine impacting the weathering of electricity lines. However, this also states that this impact is variable depending on factors including turbine positioning. This would require site-level study and consultation with the relevant DNO. As such, this buffer distance was not applied as a constraint.</p> <p>Further study would be required to consider transmission lines operated by the local DNO Western Power Distribution.</p>

<sup>4</sup> DECC (2010) Renewable and Low-carbon Energy Capacity Methodology

Parameter	Assumption	Data Source	Justification and Notes
Gas Pipelines	Exclude: <ul style="list-style-type: none"> <li>Gas pipelines with a 1.5x hub height buffer.</li> </ul>	<ul style="list-style-type: none"> <li>National Grid</li> </ul>	<p>This buffer was applied as a safety consideration. It is derived from guidance by the United Kingdom Onshore Pipeline Operators' Association (UKOPA/GP/013 Edition 1).</p> <p>It is noted that only National Grid open data was available for use within this study. Further site-specific study would be required to consider any other buried pipelines not contained within this dataset.</p>
Airports and Airfields	Exclude: <ul style="list-style-type: none"> <li>Operational airports and airfields.</li> </ul>	<ul style="list-style-type: none"> <li>Ordnance Survey OpenMap Local Functional Site layer with the theme 'Air Transport'</li> </ul>	<p>OS VectorMap Local Functional Site data with the theme Air Transport was used in the assessment.</p> <p>It is noted that land within consultation zones surrounding airports and airfields may also be unsuitable for wind turbine development, and further consultation between potential developers and airport and airfields is required to determine if there is any impact from a proposed development.</p>
Noise	Exclude: <ul style="list-style-type: none"> <li>Sensitive<sup>5</sup> and non-sensitive receptor<sup>6</sup> buffer zones based on turbine size: <ul style="list-style-type: none"> <li>Very large scale: 500m for residential/other sensitive receptors, 250m for non-residential.</li> <li>Large scale: 480m for residential/other sensitive receptors, 230m for non-residential.</li> <li>Medium scale: 400m for residential/other sensitive receptors, 180m for non-residential.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>OS Addressbase</li> <li>OS OpenMap</li> </ul>	<p>Wind turbines generate sound during their operation, and their noise impacts upon nearby properties must be limited to appropriate levels, defined in particular by the 'ETSU' Guidance – The Assessment and Rating of Noise from Wind Farms (1995) (as supplemented by the Institute of Acoustics). The relationship between turbine size and the separation distance from properties at which acceptable noise levels will be achieved is in practice quite complex and variable. However, the present assessment has applied specialist acoustic advice to define minimum distances below which it is generally unlikely that the required noise levels under ETSU-R-97 will be achievable.</p> <p>The buffer for a noise level of 35dB LA90 for small-medium turbines and 38dB LA90 for large-very large turbines was used as the minimum limit applied to sensitive receptors in a typical rural location.</p>

<sup>5</sup> Sensitive receptors include residential properties, schools, hospitals and care homes. These were identified via the LLPG data.

<sup>6</sup> Non-relevant addresses that have no applicable noise receptors were excluded, identified via the LLPG data, including: ancillary buildings, car parking, garages, non-buildings.

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Parameter	Assumption	Data Source	Justification and Notes
	<ul style="list-style-type: none"> <li>– Small scale: 180m for residential/other sensitive receptors, 80m for non-residential.</li> </ul> <p>For properties outside (but close to) the authority boundary, indicative buffers were applied to the available property/buildings data from OS VectorMap. As this data does not distinguish commercial and residential properties, and it was not possible to verify uses by other means, non-residential buffers were used throughout.</p>		<p>The approach taken necessarily involves applying various assumptions, including:</p> <ul style="list-style-type: none"> <li>■ An assumed single turbine development in all cases (rather than multiple turbines); and</li> <li>■ The assumption that no properties will be 'financially involved' in the wind development or are located in an existing noisier area (financial involvement and existing elevated baseline noise levels may allow higher noise levels to be accepted in individual cases).</li> </ul> <p>The limitations associated with such assumptions are considered preferable to avoiding the use of noise-related separation distances for the assessment, bearing in mind that noise is a key factor that influences the acceptable siting of turbines in practice. The assessment defines the minimum distances below which adherence to the Industry standard (ETSU-R-97) noise guidance would not be possible and it should not be inferred that the proposed distances represent acceptance of any given proposal within the areas of identified suitable potential as site based noise monitoring and assessments would still be required.</p> <p>Note: Within the County, where address points did not overlay OS OpenMap buildings data, points were buffered 5m to estimate building footprint. Where OS OpenMap buildings did not overlay address point data, these buildings were assumed to be of non-sensitive use<sup>7</sup>. Moreover, due to lack of sufficient data, buildings outside of the County were assumed to be of non-sensitive use. This was to ensure that land was not unnecessarily ruled as being constrained to wind development, as a result of non-sensitive buildings being mistakenly assessed as being sensitive. It is noted further site specific study would be required to determine the necessary buffer distance between specific buildings and proposed turbines.</p>
Buildings	<p>Exclude:</p> <ul style="list-style-type: none"> <li>■ Buildings with a buffer of the height of the turbine (to blade tip height) +10%.</li> </ul>	<ul style="list-style-type: none"> <li>■ OS Addressbase</li> <li>■ OS OpenMap</li> </ul>	<p>National Planning Practice Guidance notes that the topple distance +10% is a safe separation distance between turbines and buildings.</p>

<sup>7</sup> Where OS buildings overlaid non-relevant addresses (see footnote 6) these were excluded from consideration.

Parameter	Assumption	Data Source	Justification and Notes
			The same building and Addressbase datasets used in the consideration of noise was used to determine the location of buildings for this parameter.
Future Developments, Safeguarded Land and Employment Sites	Exclude: <ul style="list-style-type: none"> <li>■ Site allocations from Herefordshire's Plan: <ul style="list-style-type: none"> <li>– Committed Sites;</li> <li>– Proposed housing site; and</li> <li>– Safeguarded Employment Sites.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>■ Herefordshire Council</li> </ul>	Generally unsuitable for wind turbine development, unless allocations contain relatively large undeveloped portions. Identification of suitable land for wind within specific allocation boundaries would require a separate site-specific study. In addition, it is assumed that opportunities for renewables within such sites will already be considered as part of their design.
Country Parks	Exclude: <ul style="list-style-type: none"> <li>■ Country Parks.</li> </ul>	<ul style="list-style-type: none"> <li>■ Natural England</li> </ul>	The only Country Park designated within Herefordshire is Queenswood Country Park. Herefordshire Council advised that wind development within this would not be acceptable. As such this was treated as a constraint to wind development.
Existing Renewable Energy Developments	Exclude: <ul style="list-style-type: none"> <li>■ Land boundaries of consented and operational renewable energy installations.</li> </ul>	<ul style="list-style-type: none"> <li>■ Herefordshire Council</li> <li>■ BEIS</li> <li>■ Aerial imagery</li> <li>■ LUC windfarm database</li> </ul>	<p>The quarterly BEIS Renewable Energy Planning Database, Herefordshire Council data and the LUC internal windfarm database was used to determine the locations of operational and consented renewable energy installations. To approximate the site boundary, land was excluded based on Herefordshire Council boundary data in combination with assessment of surrounding recent aerial imagery. For existing wind developments, it was assumed these were of notional medium scale tip height and occupied a 5 x 3 rotor diameter oval spacing<sup>8</sup>, with the major axis of the oval oriented towards the prevailing wind direction, taken to be south-west (see turbine spacing below).</p> <p>Existing roof-mounted solar PV developments and advanced conversion technologies are building-integrated and therefore were excluded via the consideration of existing built development as a constraint.</p>

<sup>8</sup> To mitigate impacts on the productivity of wind turbines located close to one another caused by wind turbulence, it is standard practice for developers to maintain an oval of separation between turbines that is equal to 5 times the turbine rotor diameter (the cross sectional dimension of the circle swept by the rotating blades) on the long axis, and 3 times the rotor diameter on the short axis.



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			<p>Additionally, existing landfill gas developments were not considered a constraint to wind developments, as there is potential that turbines could be incorporated onto such existing sites.</p> <p>Existing battery developments were not included as, due to their small scale, their exact location within a site was difficult to identify. Moreover, there is potential for battery and turbine developments to also be co-located.</p>
Terrain	<p>Exclude:</p> <ul style="list-style-type: none"> <li>■ Slopes greater than 15%.</li> </ul>	<ul style="list-style-type: none"> <li>■ EA Lidar DTM</li> </ul>	<p>This is a development/operational constraint. Developers have indicated that this is the maximum slope they would generally consider feasible for development. Although it is theoretically possible to develop on areas exceeding 15% slopes, turbine manufacturers are considered unlikely to allow turbine component delivery to sites where this is exceeded.</p>
Water Environment	<p>Exclude:</p> <ul style="list-style-type: none"> <li>■ Watercourses and waterbodies with a 50m buffer;</li> </ul>	<ul style="list-style-type: none"> <li>■ Ordnance Survey VectorMap Local</li> </ul>	<p>A 50m buffer was applied around all rivers and waterbodies to take account of good practice such as that relating to pollution control during construction.</p> <p>OS Survey OpenMap Local surface water area data includes waterways of approximately a minimum of 2m width. OpenMap Local surface water line data is line data, and so a 1m buffer was applied to approximate a footprint of smaller waterways.</p>
Woodland	<p>Exclude:</p> <ul style="list-style-type: none"> <li>■ Ancient Woodland Inventory with a 50m buffer; and</li> <li>■ Woodland as shown on the National Forest Inventory with a 50m buffer including: <ul style="list-style-type: none"> <li>– Assumed woodland;</li> <li>– Broadleaved;</li> <li>– Conifer;</li> <li>– Coppice;</li> <li>– Coppice with standards;</li> <li>– Low density;</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>■ Forestry Commission</li> <li>■ Natural England</li> </ul>	<p>All areas of woodland were excluded with a +50m buffer to reduce risk of impact on bats.</p> <p>A 50m clearance distance of turbine blades from tree canopies and other habitat features is standard practice and endorsed by Natural England guidance set out in 'TIN051'. A 50m horizontal buffer from turbine masts is a reasonable proxy clearance for the purposes of a strategic study, bearing in mind unknowns concerning tree height and turbine dimensions. In addition, a 50m buffer cannot be applied to all linear habitat features and individual trees due to a lack of data for a study of this scale. Further site specific study would therefore be required to accurately define buffer distances between turbines and adjacent woodland.</p> <p>The following National Forestry Inventory categories of woodland were considered non-permanent or non-woodland and therefore not excluded as wind turbine development may be suitable in these locations:</p> <ul style="list-style-type: none"> <li>■ Cloud/shadow;</li> </ul>

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Parameter	Assumption	Data Source	Justification and Notes
	<ul style="list-style-type: none"> <li>– Mixed mainly broadleaved;</li> <li>– Mixed mainly conifer; and</li> <li>– Young trees.</li> </ul>		<ul style="list-style-type: none"> <li>■ Failed;</li> <li>■ Felled;</li> <li>■ Group prep;</li> <li>■ Shrub;</li> <li>■ Uncertain; and</li> <li>■ Windblown.</li> </ul>
Orchards	Exclude: <ul style="list-style-type: none"> <li>■ Orchard as shown in the Priority Habitat Inventory.</li> </ul>	<ul style="list-style-type: none"> <li>■ Natural England</li> </ul>	A 50m clearance distance of turbine blades from tree canopies and other habitat features is standard practice and endorsed by Natural England guidance set out in 'TIN051'. A 50m horizontal buffer from turbine masts is a reasonable proxy clearance for the purposes of a strategic study bearing in mind unknowns concerning tree height and turbine dimensions. In addition, 50m buffer cannot be applied to all linear habitat features and individual trees due to a lack of data for a study of this scale. Further site specific study would therefore be required to accurately define buffer distances between turbines and adjacent orchards.
Geological Designations	Exclude: <ul style="list-style-type: none"> <li>■ Locally Important Geological Sites.</li> </ul>	<ul style="list-style-type: none"> <li>■ Herefordshire Council/University of Worcester</li> </ul>	As protected by: <ul style="list-style-type: none"> <li>■ Town and Country Planning Act 1990</li> <li>■ Herefordshire Local Plan Core Strategy 2011-2031</li> </ul>
Biodiversity (International Designations)	Exclude international designations <sup>9</sup> : <ul style="list-style-type: none"> <li>■ Special Areas of Conservation (SAC).</li> </ul>	<ul style="list-style-type: none"> <li>■ Natural England</li> </ul>	As protected by: <ul style="list-style-type: none"> <li>■ Conservation of Habitats and Species Regulations 2017 (as amended)</li> </ul>
Biodiversity (National Designations)	Exclude national designations: <ul style="list-style-type: none"> <li>■ Sites of Special Scientific Interest; and</li> </ul>	<ul style="list-style-type: none"> <li>■ Natural England</li> </ul>	As protected by: <ul style="list-style-type: none"> <li>■ Wildlife and Countryside Act 1981</li> </ul>

<sup>9</sup> There are no Special Protection Areas (SPA), potential SPAs, potential SACs, Ramsar site or proposed Ramsar sites within the county.

Parameter	Assumption	Data Source	Justification and Notes
	<ul style="list-style-type: none"> <li>National Nature Reserves.</li> </ul>		<ul style="list-style-type: none"> <li>Conservation of Habitats and Species Regulations 2017 (as amended)</li> </ul>
Biodiversity (Regional and Local Designations)	<p>Exclude other designations<sup>10</sup>:</p> <ul style="list-style-type: none"> <li>Local Nature Reserves;</li> <li>Local Wildlife Sites; and</li> <li>Wildlife Trust Reserves.</li> </ul>	<ul style="list-style-type: none"> <li>Natural England</li> <li>Herefordshire Council</li> <li>Herefordshire Biodiversity Record Centre</li> <li>Herefordshire Wildlife Trust</li> </ul>	<p>Generally, would not be suitable for renewables development based on law/policy/guidance including:</p> <ul style="list-style-type: none"> <li>NPPF</li> <li>Natural Environment and Rural Communities Act 2006</li> <li>Herefordshire Local Plan Core Strategy 2011-2031</li> </ul> <p>It is noted that further site-specific study would be required to consider non-designated features.</p>
Cultural Heritage	<p>Exclude<sup>11</sup>:</p> <ul style="list-style-type: none"> <li>Registered Parks and Gardens;</li> <li>Scheduled Monuments;</li> <li>Listed Buildings;</li> <li>Conservation Areas; and</li> <li>Locally Listed buildings.</li> </ul>	<ul style="list-style-type: none"> <li>Historic England</li> <li>Herefordshire Council</li> </ul>	<p>As protected by:</p> <ul style="list-style-type: none"> <li>NPPF</li> <li>The Convention Concerning the Protection of the World Cultural and Natural Heritage</li> <li>National Heritage Act 1983</li> <li>Ancient Monuments and Archaeological Areas Act of 1979</li> <li>Planning (Listed Buildings and Conservation Areas) Act 1990</li> <li>Herefordshire Local Plan</li> </ul> <p>It is noted that further site specific study would be required to determine if any unexpected archaeological remains or undesignated but nationally significant features are present that would require consideration, as well as the setting of historic features.</p>

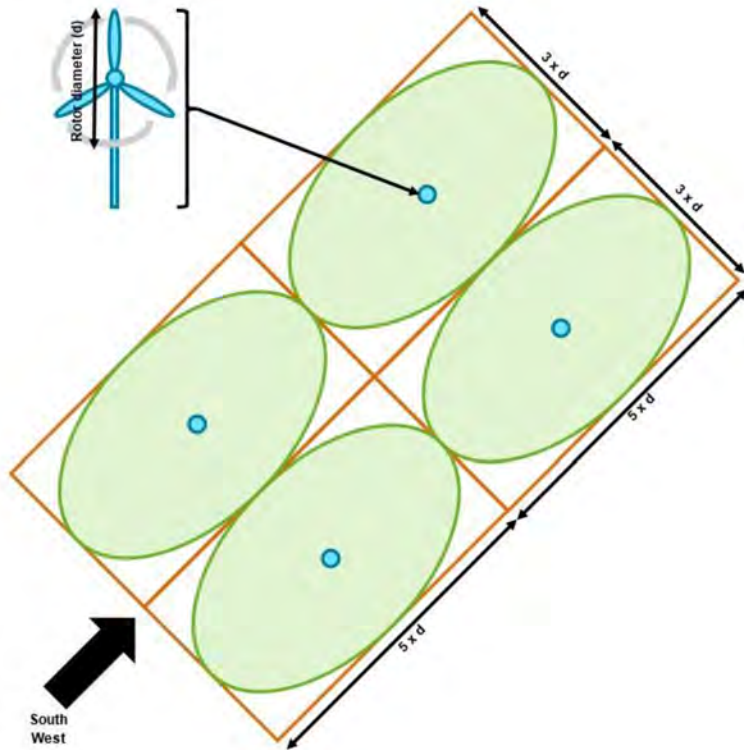
<sup>10</sup> There are no RSPB Reserves within the county

<sup>11</sup> There are no World Heritage Sites or Registered Battlefields within the county.

Parameter	Assumption	Data Source	Justification and Notes
			Note: Listed building point data was buffered 5m to estimate building footprints where they did not intersect or have the same name as Herefordshire locally listed building polygon data. In addition, listed building line data was buffered 0.5m to approximate the size of designated wall features.
Minimum Development Size	<p>Unconstrained areas of land were excluded if they were below a minimum developable size of 40m width and an area that varied per turbine size:</p> <ul style="list-style-type: none"> <li>■ Very large: 0.8ha</li> <li>■ Large: 0.6ha</li> <li>■ Medium: 0.4ha</li> <li>■ Small: 0.2ha</li> </ul>	<ul style="list-style-type: none"> <li>■ N/A</li> </ul>	<p>The minimum development size was based on developer knowledge of recent wind turbine developments, and accounts for the estimated land take requirements for a single turbine base, the adjacent laydown area and other immediate infrastructure requirements adjacent to the turbine itself.</p> <p>However, further site specific study would be required in order to determine the land take requirements of individual turbines depending on factors such as their model and location.</p>
Turbine Spacing	<p>The following standardised turbine densities were considered when determining the overall potential for turbine development across Herefordshire:</p> <ul style="list-style-type: none"> <li>■ Very large: 4 per km<sup>2</sup> (assuming a rotor diameter of 130m)</li> <li>■ Large: 8 per km<sup>2</sup> (assuming a rotor diameter of 90m)</li> <li>■ Medium: 22 per km<sup>2</sup> (assuming a rotor diameter of 55m)</li> <li>■ Small: 167 per km<sup>2</sup> (assuming a rotor diameter of 20m)</li> </ul>	<ul style="list-style-type: none"> <li>■ N/A</li> </ul>	<p>The calculation of potential wind capacity involved applying an assumption concerning development density. In practice, turbines are spaced within developments based on varying multiples of the rotor diameter length. Although turbine separation distances vary, a 5 x 3 rotor diameter oval spacing<sup>12</sup>, with the major axis of the oval oriented towards the prevailing wind direction, taken to be south-west as the 'default' assumption in the UK, was considered a reasonable general assumption at the present time in this respect. In practice, site-specific factors such as prevailing wind direction and turbulence are taken into account by developers, in discussion with turbine manufacturers.</p> <p>Bearing in mind the strategic nature of the present study, the density calculation did not take into account the site shape, and a standardised rectangular grid density based on a 5 x 3 rotor diameter was used instead (see image below).</p>

<sup>12</sup> To mitigate impacts on the productivity of wind turbines located close to one another caused by wind turbulence, it is standard practice for developers to maintain an oval of separation between turbines that is equal to 5 times the turbine rotor diameter (the cross sectional dimension of the circle swept by the rotating blades) on the long axis, and 3 times the rotor diameter on the short axis.

Figure A.2: Wind turbine spacing



**A.7** The parameters below have not been used to exclude land for the purposes of this study. This does not mean that these constraints are not present or do not require consideration on a specific site.

**Table A.2: Assumptions to be used for the assessment of technical potential for onshore wind – Constraints considered but not used**

Parameter	Assumption	Data Source	Justification and Notes
Electricity Grid	No land excluded on this basis.	<ul style="list-style-type: none"> <li>Western Power Distribution</li> </ul>	<p>As grid capacity is so variable with little certainty in advance of where there could be capacity for additional electricity generation to be connected, no land was excluded on this basis for the technical assessment. Further consultation would be required with WPD to determine the feasibility to connect specific sites to the electricity grid.</p> <p>Moreover, for larger wind turbine schemes, developers commonly deliver substations and additional grid infrastructure as required to support the additional generation capacity requirements of the development, limiting concerns regarding connecting to constrained parts of the existing grid.</p>
NATS Safeguarding Areas	<p>Guidance includes reference to the following safeguarding areas:</p> <ul style="list-style-type: none"> <li>30km for aerodromes with a surveillance radar facility;</li> <li>17km for non-radar equipped aerodromes with a runway of 1,100m or more, or 5km for those with a shorter runway;</li> <li>4km for non-radar equipped unlicensed aerodrome with a runway of more than 800m or 3km with a shorter runway;</li> <li>10km for the air-ground-air communication stations and navigation aids; and</li> <li>15 nautical miles (nm) for secondary surveillance radar.</li> </ul>	<ul style="list-style-type: none"> <li>NATS</li> </ul>	<p>Further consultation between potential developers and NATS is required to determine if there is any impact from a proposed development.</p> <p>NATS safeguarding areas were therefore not excluded.</p>

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Parameter	Assumption	Data Source	Justification and Notes
	These are indicative of potential constraints to wind development but cannot be used to definitely exclude land as unsuitable.		
Shadow Flicker	No land excluded on this basis.	■ N/A	Wind turbines may in some circumstances cause 'shadow flicker' within nearby properties. However, shadow flicker effects can be readily mitigated and so shadow flicker was not considered as a constraint for the purposes of this study.
Residential Amenity	No land excluded on this basis.	■ N/A	It is noted that it may be inappropriate to develop wind turbines in proximity to residential properties, due to impacts upon residential amenity. However, due to the potential for micro siting, property aspect and potential for mitigation, it would require further site specific study to determine whether wind turbines would be suitable in proximity to residential properties.  Therefore, this factor would require consideration within a site specific residential and visual amenity assessment.
National Landscapes (formerly Area of Outstanding Natural Beauty – AONB)	No land excluded on this basis.	■ Natural England	The management plans for the Malvern Hills and Wye Valley National Landscapes do not restrict renewable developments within the designations. As such, no land was excluded on this basis.  It is noted that further site-specific landscape sensitivity and visual impact assessment would be required to consider these designations and assess the potential suitability of sites for wind development within or in proximity to the National Landscapes.  As of the 22 <sup>nd</sup> November 2023, Areas of Outstanding National Beauty (AONB) are referred to as 'National Landscapes'. In legal terms they are still defined as AONBs.
MOD Land	No land excluded on this basis.	■ OpenStreetMap	Although some MOD land may be unsuitable for wind turbine development, for example due to interference with aircraft movements, much MOD land may be suitable for wind turbine developments. Further consultation between potential developers and the MOD is required to determine if there is any impact from a proposed wind development.  As such, no land was excluded on this basis.

Parameter	Assumption	Data Source	Justification and Notes
National Park	No land excluded on this basis.	<ul style="list-style-type: none"> <li>Natural England</li> </ul>	There are no National Parks located within the County. As such, no land was excluded on this basis.
Public Rights of Way and Cycle Paths	No land excluded on this basis.	<ul style="list-style-type: none"> <li>Herefordshire Council</li> <li>SusTrans</li> </ul>	Public Rights of Way and cycle paths can be diverted if necessary to ensure they are safely distanced from wind turbines.  Public Rights of Way and cycle paths were therefore not excluded.
Unregistered Parks and Gardens	No land excluded on this basis.	<ul style="list-style-type: none"> <li>Herefordshire Council</li> </ul>	It may not be suitable for wind developments to be located within unregistered parks and gardens. However, this is site dependent and would require further study.  As such, unregistered parks and gardens were not excluded.
Blade Oversail of Biodiversity and Cultural Heritage Designations	No land excluded on this basis.	<ul style="list-style-type: none"> <li>N/A</li> </ul>	Depending on individual designated site characteristics, it may not be suitable for the blades of adjacent wind turbines to oversail the site. However, this is site dependent and would require further study.  As such, a blade oversail buffer was not excluded.

### Ground-Mounted Solar Resource Assessment Parameters: Primary Constraints

**A.8** Herefordshire's technical potential for ground mounted solar PV development was assessed in a similar way to the potential for wind. The key GIS tool parameters are set out in **Table A.3** below.

**A.9** The maximum solar PV capacity of the area of technical potential was estimated using an assumed development density expressed as Megawatts (MW) per hectare; and regional capacity factor<sup>13</sup> (again, derived from historic data broken down to at least regional level).

**A.10** As solar PV is essentially modular, the land with technical potential was not differentiated by project scale.

<sup>13</sup> An energy generator's 'capacity factor' can be defined as the actual energy yield produced over a period of time expressed as a proportion of the energy yield that would have been produced if the generator had operated at its full generation capacity continuously over the same period.



Table A.3: Assumptions used for assessment of the technical potential for commercial/large scale ground-mounted solar – Constraints

Parameter	Assumption	Data Source	Justification and Notes
Development Size Categories	None.	<ul style="list-style-type: none"> <li>N/A</li> </ul>	Solar development is more 'modular' than wind (development size is dictated by the number of panels, which themselves do not differ greatly in size) and constraints are not affected by project scale in the way that they are for wind. Therefore, the identification of available land for ground-mounted solar has not been broken down into discrete project sizes but rather any land technically suitable for development has been identified.
Roads	Exclude: <ul style="list-style-type: none"> <li>Roads.</li> </ul>	<ul style="list-style-type: none"> <li>Ordnance Survey OpenRoads</li> </ul>	<p>Physical features preventing the development of ground-mounted solar PV were excluded. There is no requirement for safety buffers in relation to these with respect to ground-mounted solar PV.</p> <p>Restricted access tracks were excluded from consideration as these predominantly comprise of forestry and other tracks which could be more easily diverted than standards roads.</p> <p>Note: Only line data for roads was available and in order to create a footprint from the road centre, it was assumed that single carriageways are 10m in width, dual carriageways 20m and motorways 30m.</p>
Railways	Exclude: <ul style="list-style-type: none"> <li>Railways.</li> </ul>	<ul style="list-style-type: none"> <li>Ordnance Survey OpenMap</li> </ul>	<p>Physical features preventing the development of ground-mounted solar PV were excluded. There is no requirement for safety buffers in relation to these with respect to ground-mounted solar PV.</p> <p>Note: In order to create a footprint from the railway centrelines data, it was assumed that railways were 15m in width.</p>
Planning/Land Use Other	Exclude: <ul style="list-style-type: none"> <li>Registered Common Land;</li> <li>Open Access Land;</li> <li>Local public green/open space, including: <ul style="list-style-type: none"> <li>Allotments;</li> <li>Amenity green space;</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Natural England</li> <li>Herefordshire Council</li> </ul>	<p>Due to land take requirements, these land uses/types were considered generally to constrain ground-mounted solar development, particularly at larger scales, although in some circumstances they may offer opportunities for smaller scale development collocated with their other facilities. They were excluded from the resource assessment but may be subject to bespoke policies with the Local Plan allowing development to take place in principle subject to defined criteria being satisfied.</p> <p>The open spaces considered within this study were consistent with the open spaces assessed within the 2023 Herefordshire Natural Environment Evidence Update.</p>

Parameter	Assumption	Data Source	Justification and Notes
	<ul style="list-style-type: none"> <li>– Cemeteries and churchyards;</li> <li>– Civic space;</li> <li>– Green chain or corridor;</li> <li>– Incidental greenspace;</li> <li>– Natural and semi natural green space;</li> <li>– Outdoor sports facility;</li> <li>– Provision for children and teenagers; and</li> <li>– Country Parks.</li> </ul>		
Buildings	<p>Exclude:</p> <ul style="list-style-type: none"> <li>■ All buildings with a 10m buffer.</li> </ul>	<ul style="list-style-type: none"> <li>■ OS OpenMap Local data</li> </ul>	Buildings were buffered by 10m to account for shading and impacts on solar output. It is noted that further site specific study considering building heights and orientation in relation to the site would be required to determine the exact buffers required to account for shading.
Future Developments, Safeguarded Land and Employment Sites	<p>Exclude:</p> <ul style="list-style-type: none"> <li>■ Site allocations from Herefordshire's Plan: <ul style="list-style-type: none"> <li>– Committed Sites;</li> <li>– Proposed housing site; and</li> <li>– Safeguarded Employment Sites.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>■ Herefordshire Council</li> </ul>	Generally these will be unsuitable for ground-mounted solar, although there may be some potential for installations on undeveloped land/open space within these areas. Identification of this potential would require a separate, site-specific study. In addition, it is assumed that opportunities for renewables within such sites will already be in development as part of their allocation.
Existing Renewable Energy Developments	<p>Exclude:</p> <ul style="list-style-type: none"> <li>■ Land boundaries of consented and operational renewable energy installations.</li> </ul>	<ul style="list-style-type: none"> <li>■ Herefordshire Council</li> <li>■ BEIS</li> <li>■ Aerial imagery</li> <li>■ LUC windfarm database</li> </ul>	The quarterly BEIS Renewable Energy Planning Database, Herefordshire Council data and the LUC internal windfarm database was used to determine the locations of operational and consented renewable energy installations. To approximate the site boundary, land was excluded based on Herefordshire Council boundary data in combination with assessment of surrounding recent aerial imagery. For existing wind developments, it was assumed these were of notional medium scale tip height and

Parameter	Assumption	Data Source	Justification and Notes
			<p>occupied a 5 x 3 rotor diameter oval spacing<sup>14</sup>, with the major axis of the oval oriented towards the prevailing wind direction, taken to be south-west (see turbine spacing below).</p> <p>Existing roof-mounted solar PV developments and advanced conversion technologies are building-integrated and therefore were excluded via the consideration of existing built development as a constraint.</p> <p>Additionally, existing landfill gas developments were not considered a constraint to solar developments, as there is potential that solar panels could be incorporated onto such existing sites.</p> <p>Existing battery developments were not included as, due to their small scale, their exact location within a site was difficult to identify. Moreover, there is potential for battery and solar developments to also be co-located.</p>
Minerals Sites with a 250m buffer	<p>Exclude:</p> <ul style="list-style-type: none"> <li>All operational minerals sites with a 250m buffer; and</li> <li>Allocated minerals sites with a 250m buffer.</li> </ul>	<ul style="list-style-type: none"> <li>Herefordshire Council</li> </ul>	<p>The IAQM 2016 Guidance on the Assessment of Mineral Dust Impacts for Planning indicates that adverse dust impacts from sand and gravel sites are uncommon beyond 250m and beyond 400m from hard rock quarries measured from the nearest dust generating activities.</p> <p>Only point data was available for mineral sites within the study area. Buffers were applied to these within this study, but further site-specific study would be required to make full consideration of these using site boundary data.</p>
Terrain	<p>Exclude:</p> <ul style="list-style-type: none"> <li>Areas with north-east to north-west aspect and inclinations greater than 7 degrees; and</li> </ul>	<ul style="list-style-type: none"> <li>EA Lidar DTM</li> </ul>	<p>Although it is possible to develop Ground-mounted solar PV installations on slopes facing north-east to north-west, it would generally not be economically viable to do so. However, slopes that are north-east to north-west facing and below 7° are considered potentially suitable<sup>15</sup>, as generation output will not be significantly affected.</p>

<sup>14</sup> To mitigate impacts on the productivity of wind turbines located close to one another caused by wind turbulence, it is standard practice for developers to maintain an oval of separation between turbines that is equal to 5 times the turbine rotor diameter (the cross sectional dimension of the circle swept by the rotating blades) on the long axis, and 3 times the rotor diameter on the short axis.

<sup>15</sup> Based on current standard developer practice.

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Parameter	Assumption	Data Source	Justification and Notes
	<ul style="list-style-type: none"> <li>All areas with inclinations greater than 15 degrees.</li> </ul>		
Agricultural Land Use	<p>Exclude:</p> <ul style="list-style-type: none"> <li>Agricultural land use classifications grades 1.</li> </ul>	<ul style="list-style-type: none"> <li>Natural England</li> </ul>	<p>Agricultural Land Use is a consideration, with grades 1, 2 and 3a land being classed as “the best and more versatile (BMV)” land and having higher value for food production. Further investigation would be required of grade 3 land to determine whether it is grade 3a or b, as available data does not distinguish these. Ground-mounted Solar PV projects, over 50kWp, should ideally utilise previously developed land, brownfield land, contaminated land, industrial land or agricultural land preferably of classification 3b, 4, and 5.</p> <p>However, solar developments can be built on BMV land, if they have been deemed to pass the sequential test, whereby sites on lower grade a non-agricultural land are prioritised over BNM land.</p> <p>Within Herefordshire, the majority of land is grade 2 or 3 agricultural land, and there are existing solar farms present on some of this.</p> <p>As such, only grade 1 (excellent quality) agricultural land was treated as a constraint to solar development, and further site-specific study would be required to determine if sites on lower grade BMV would be suitable based on the sequential text.</p>
Water Environment	<p>Exclude:</p> <ul style="list-style-type: none"> <li>Watercourses and waterbodies with a 50m buffer.</li> </ul>	<ul style="list-style-type: none"> <li>Ordnance Survey VectorMap Local</li> </ul>	<p>A 50m buffer was applied around all rivers and waterbodies to take account of good practice such as that relating to pollution control during construction.</p> <p>OS Survey OpenMap Local surface water area data includes waterways of approximately a minimum of 2m width. OpenMap Local surface water line data is line data, and so a 1m buffer was applied to approximate a footprint of smaller waterways.</p>
Woodland	<p>Exclude:</p> <ul style="list-style-type: none"> <li>Ancient Woodland Inventory with a 20m buffer; and</li> <li>Woodland as shown on the National Forest Inventory with a 20m buffer including: <ul style="list-style-type: none"> <li>Assumed woodland;</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Forestry Commission</li> <li>Natural England</li> </ul>	<p>Forested areas were buffered by 20m to account for shading and impacts on solar output. It is noted that further site specific study considering woodland heights and orientation in relation to the site would be required to determine the exact buffers required to account for shading.</p> <p>The following National Forestry Inventory categories of woodland were considered non-permanent or non-woodland and therefore not excluded as ground mounted solar development may be suitable in these locations:</p>

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Parameter	Assumption	Data Source	Justification and Notes
	<ul style="list-style-type: none"> <li>- Broadleaved;</li> <li>- Conifer;</li> <li>- Coppice;</li> <li>- Coppice with standards;</li> <li>- Failed;</li> <li>- Felled;</li> <li>- Group prep;</li> <li>- Low density;</li> <li>- Mixed mainly broadleaved;</li> <li>- Mixed mainly conifer;</li> <li>- Shrub; and</li> <li>- Young trees.</li> </ul>		<ul style="list-style-type: none"> <li>■ Cloud/shadow;</li> <li>■ Uncertain; and</li> <li>■ Windblown.</li> </ul>
Orchards	<p>Exclude:</p> <ul style="list-style-type: none"> <li>■ Orchard as shown in the Priority Habitat Inventory.</li> </ul>	<ul style="list-style-type: none"> <li>■ Natural England</li> </ul>	<p>Ground-mounted solar panels could not be delivered within orchards due to the presents of trees that would limit ground space and would cause shading and associated impacts on solar output.</p> <p>As orchard trees are typically shorter than those within woodlands, a buffer was not applied to these to account for shading. It is noted however that further site specific study considering orchard heights and orientation in relation to the site would be required to determine the exact buffers required to account for shading.</p>
Geological Designations	<p>Exclude:</p> <ul style="list-style-type: none"> <li>■ Locally Important Geological Sites.</li> </ul>	<ul style="list-style-type: none"> <li>■ Herefordshire Council/University of Worcester</li> </ul>	<p>As protected by:</p> <ul style="list-style-type: none"> <li>■ Town and Country Planning Act 1990</li> <li>■ Local Plan Core Strategy 2011-2031</li> </ul>

Parameter	Assumption	Data Source	Justification and Notes
Biodiversity (International Designations)	Exclude international designations <sup>16</sup> : <ul style="list-style-type: none"> <li>Special Areas of Conservation (SAC).</li> </ul>	<ul style="list-style-type: none"> <li>Natural England</li> </ul>	As protected by: <ul style="list-style-type: none"> <li>Conservation of Habitats and Species Regulations 2017 (as amended)</li> </ul>
Biodiversity (National Designations)	Exclude national designations <sup>17</sup> : <ul style="list-style-type: none"> <li>Sites of Special Scientific Interest; and</li> <li>National Nature Reserves.</li> </ul>	<ul style="list-style-type: none"> <li>Natural England</li> </ul>	As protected by: <ul style="list-style-type: none"> <li>Wildlife and Countryside Act 1981</li> <li>Conservation of Habitats and Species Regulations 2017 (as amended)</li> </ul>
Biodiversity (Regional and Local Designations)	Exclude other designations <sup>18</sup> : <ul style="list-style-type: none"> <li>Local Nature Reserves;</li> <li>Local Wildlife Sites; and</li> <li>Wildlife Trust Reserves.</li> </ul>	<ul style="list-style-type: none"> <li>Natural England</li> <li>Herefordshire Council</li> <li>Herefordshire Biodiversity Record Centre</li> <li>Herefordshire Wildlife Trust</li> </ul>	Generally, would not be suitable for renewables development based on law/policy/guidance including: <ul style="list-style-type: none"> <li>NPPF</li> <li>Natural Environment and Rural Communities Act 2006</li> <li>Herefordshire Local Plan</li> </ul> <p>It is noted that further site-specific study would be required to consider non-designated features.</p>
Cultural Heritage	Exclude <sup>19</sup> : <ul style="list-style-type: none"> <li>Registered Parks and Gardens;</li> <li>Scheduled Monuments;</li> <li>Listed Buildings;</li> <li>Conservation Areas; and</li> <li>Locally Listed buildings.</li> </ul>	<ul style="list-style-type: none"> <li>Historic England</li> <li>Herefordshire Council</li> </ul>	As protected by: <ul style="list-style-type: none"> <li>NPPF</li> <li>The Convention Concerning the Protection of the World Cultural and Natural Heritage</li> <li>National Heritage Act 1983</li> </ul>

<sup>16</sup> There are no Special Protection Areas (SPA), potential SPAs, potential SACs, Ramsar site or propose Ramsar sites within the county.

<sup>17</sup> There are no RSPB Reserves within the county.

<sup>18</sup> There are no RSPB Reserves within the county.

<sup>19</sup> There are no World Heritage Sites or Registered Battlefields within the county.

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Parameter	Assumption	Data Source	Justification and Notes
			<ul style="list-style-type: none"> <li>■ Ancient Monuments and Archaeological Areas Act of 1979</li> <li>■ Planning (Listed Buildings and Conservation Areas) Act 1990</li> <li>■ Herefordshire Local Plan</li> </ul> <p>It is noted that further site specific study would be required to determine if any unexpected archaeological remains or undesignated but nationally significant features are present that would require consideration, as well as the setting of historic features.</p> <p>Note: Listed building point data was buffered 5m to estimate building footprints where they did not intersect or have the same name as Herefordshire locally listed building polygon data. In addition, listed building line data was buffered 0.5m to approximate the size of designated wall features.</p>
Minimum Development Size	Unconstrained areas of land were excluded if they were below a minimum developable size of 0.6ha.	■ N/A	A minimum development size of 0.6ha was set in agreement with Herefordshire Council.
Development Density	1.2 hectares per MW.	■ N/A	<p>The Draft National Policy Statement for Renewable Energy Infrastructure (EN-3) states that, along with associated infrastructure, generally a solar farm requires between 2 to 4 acres for each MW of output. This equates to 0.8-1.6ha per MW. For this study, the average of 1.2ha per MW was used.</p> <p>It is noted that on sites where solar farms are co-located with wind turbines, the value of MW per ha may increase as infrastructure may be able to be shared between the technologies.</p>

**A.11** The parameters below have not been used for the purposes of this study. This does not mean that these constraints are not present or do not require consideration on a specific site.

Table A.4: Assumptions used for the assessment of technical potential for commercial/large scale ground-mounted solar – Constraints considered but not used

Parameter	Assumption	Data Source	Justification and Notes
Solar Irradiance	No land excluded on this basis.	<ul style="list-style-type: none"> <li>Global Solar Atlas</li> </ul>	<p>Using modern solar panel technology, the vast majority of land within England is deemed suitable for solar panel development in terms of solar irradiance. Any land unsuitable due to slope and aspect which limit the total hours of direct daily sunlight within a location, were excluded from consideration as based on the above constraints table.</p> <p>Therefore, no land was excluded from this assessment based on this, and solar irradiance levels they were mapped for information only to indicate where the more productive sites may be located.</p>
Electricity Grid	No land excluded on this basis.	<ul style="list-style-type: none"> <li>Western Power Distribution</li> </ul>	<p>Grid connection is a key consideration for solar developments, as additional grid connections costs, such as long cable distances and additional substation requirements, can significantly hinder the economic viability of this technology.</p> <p>However, as grid capacity is so variable with little certainty in advance of where there could be capacity for additional electricity generation to be connected, no land was excluded on this basis for the technical assessment. Further consultation would be required with WPD to determine the feasibility to connect specific sites to the electricity grid.</p>
Gas Pipelines	No land excluded on this basis.	<ul style="list-style-type: none"> <li>National Grid</li> </ul>	<p>Although the presence of buried pipelines could impact the suitability of overlaying above-ground solar panels, mitigation and panel layout design can be applied to limit impacts. Further site-specific study would be required to consider this parameter.</p> <p>As such, no land was excluded on this basis.</p>
Electricity Lines	No land excluded on this basis.	<ul style="list-style-type: none"> <li>Ordnance Survey OpenMap</li> <li>National Grid</li> </ul>	<p>Although overhead lines have the potential to cause some limited shading of solar panels, and thereby impact on potential PV generation potential, panel layout design and solar tracking systems can limit impacts. Further site-specific study would be required to consider this parameter.</p> <p>As such, no land was excluded on this basis.</p>



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Parameter	Assumption	Data Source	Justification and Notes
Residential Amenity	No land excluded on this basis.	■ N/A	<p>It is noted that it may be inappropriate to develop solar farms in proximity to residential properties, due to impacts upon residential amenity. However, due to the potential for micro siting, property aspect and potential for mitigation, it would require further site specific study to determine whether solar developments would be suitable in proximity to residential properties.</p> <p>This factor could be considered within a future landscape sensitivity assessment. No land was excluded on this basis from the technical assessment.</p>
All Operational Waste Sites	No land excluded on this basis.	■ Herefordshire Council	<p>Waste sites will frequently be quite highly constrained with respect to ground-mounted solar development (e.g. areas of active landfill) but equally may present opportunities in some circumstances, particularly when they are to be decommissioned/restored during a plan period. Waste sites were excluded from the identified ground-mounted solar resource but potentially subject to bespoke policy wording in the local plan.</p> <p>Only point data was available for waste sites within the study area. These could not be considered within the assessment. Therefore, further site-specific study would be required to make consideration of these.</p>
National Landscapes (formerly Area of Outstanding Natural Beauty – AONB)	No land excluded on this basis.	■ Natural England	<p>The management plans for the Malvern Hills and Wye Valley National Landscapes do not restrict renewable developments within the designations. As such, no land was excluded on this basis.</p> <p>It is noted that further site-specific landscape sensitivity and visual impact assessment would be required to consider these designations and assess the potential suitability of sites for wind development within or in proximity to the National Landscapes.</p> <p>As of the 22<sup>nd</sup> November 2023, Areas of Outstanding National Beauty (AONB) are referred to as 'National Landscapes'. In legal terms they are still defined as AONBs.</p>
MOD Land	No land excluded on this basis.	■ OpenStreetMap	<p>Although some MOD land may be unsuitable for solar development due to the land take requirements of the technology, much MOD land may be suitable for solar developments. Further consultation between potential developers and the MOD is required to determine if there is any impact from a proposed development.</p> <p>As such, no land was excluded on this basis.</p>

Parameter	Assumption	Data Source	Justification and Notes
National Park	No land excluded on this basis.	<ul style="list-style-type: none"> <li>Natural England</li> </ul>	There are no National Parks located within the county. As such, no land was excluded on this basis.
Public Rights of Way/Cycle Paths	No land excluded on this basis.	<ul style="list-style-type: none"> <li>Herefordshire Council</li> <li>DEFRA</li> <li>SusTrans</li> </ul>	Public Rights of Way and cycle paths can be diverted if necessary around or safely through ground mounted solar developments, and these impacts are considered as part of the assumed development density. Public Rights of Way and cycle paths were therefore not excluded.
Unregistered Parks and Gardens	No land excluded on this basis.	<ul style="list-style-type: none"> <li>Herefordshire Council</li> </ul>	It may not be suitable for wind developments to be located within unregistered parks and gardens. However, this is site dependent and would require further study. As such, unregistered parks and gardens were not excluded.
Airports and Airfields	No land excluded on this basis.	<ul style="list-style-type: none"> <li>Ordnance Survey VectorMap Local Functional Site layer with the theme 'Air Transport'</li> <li>Aerial imagery</li> </ul>	Glint and glare caused by solar panels is a consideration for aviation safety. However, this is site dependent and scheme design can enable solar developments to be situated within airports and airfields themselves. As such, only the airport and airfield buildings and hardstanding should be treated as constraints to solar development. Although airport buildings were treated as constraints to solar development, considered under "Buildings", no spatial data was available to map runways and in-use airport hardstanding. Therefore, further site-specific study would be required to consider these.

## Wind and Ground-Mounted Solar Resource Assessment Parameters – Secondary Constraints and Opportunities

**A.12** Following the assessment of technical potential (which only considered primary constraints) all unconstrained land was reviewed to take account of secondary constraints and opportunities – i.e. to show which areas may have greater potential for development.

**A.13** In the analysis of secondary constraints, areas were evaluated based on their proximity to features that might influence their developability. For example, an arbitrary radius of 1km was applied around the National Landscapes (formerly AONBs) to take account of potential issues

relating to the setting of the National Landscape. This buffer is arbitrary and further site-based assessments would be needed to verify if this buffer is appropriate in reality. For the purpose of a strategic assessment however, this was deemed to be a proportional and pragmatic approach. The buffers applied vary for the features considered, as set out in **Table A.5** to **Table A.8**.

**A.14** As Herefordshire is located adjacent to the Welsh border and these arbitrary radiuses surrounding constraints and opportunities could extend beyond the County, both English and Welsh datasets were considered.

**A.15** The results of the secondary constraints and opportunities analysis are to be presented on the online webmap. Supporting policy text within the Local Plan could then be added to direct people to use this webmap as a tool to begin site searching. However, further site based feasibility studies, beyond the scope of this study, would be required to determine the actual suitability of locations for wind and ground mounted solar development.

### Wind Resource Secondary Constraints and Opportunities

Table A.5: Wind resource assessment secondary constraints

Parameter	Secondary Constraints	Data Source	Justification and Notes
National Landscapes (formerly Area of Outstanding Natural Beauty – AONB)	Land that is: <ul style="list-style-type: none"> <li>■ Located within or within 1km of a National Landscape.</li> </ul>	<ul style="list-style-type: none"> <li>■ Natural England</li> <li>■ Natural Resources Wales</li> </ul>	<p>Planning permission may be more difficult to obtain for sites within or close to the designation.</p> <p>As of the 22<sup>nd</sup> November 2023, Areas of Outstanding National Beauty (AONB) are referred to as 'National Landscapes'. In legal terms they are still defined as AONBs.</p>
Geological Designations	Land located within 1km of: <ul style="list-style-type: none"> <li>■ Locally Important Geological Sites.</li> </ul>	<ul style="list-style-type: none"> <li>■ Herefordshire Council/University of Worcester</li> </ul>	<p>As protected by:</p> <ul style="list-style-type: none"> <li>■ Town and Country Planning Act 1990</li> <li>■ Herefordshire Local Plan Core Strategy 2011-2031</li> </ul> <p>Wind development may be appropriate in close proximity to some designations, however planning permission may be more difficult to obtain for sites close to such designations.</p>
Biodiversity (International designations)	Land located within 1km of international designations <sup>20</sup> : <ul style="list-style-type: none"> <li>■ Special Areas of Conservation.</li> </ul>	<ul style="list-style-type: none"> <li>■ Natural England</li> <li>■ Natural Resources Wales</li> </ul>	<p>As protected by:</p> <ul style="list-style-type: none"> <li>■ Conservation of Habitats and Species Regulations 2017 (as amended)</li> </ul> <p>Wind development may be appropriate in close proximity to some designations, however planning permission may be more difficult to obtain for sites close to such designations.</p>

<sup>20</sup> There are no Special Protection Areas (SPA), potential SPAs, potential SACs, Ramsar site or proposed Ramsar sites within 1km of the county

Parameter	Secondary Constraints	Data Source	Justification and Notes
Biodiversity (National designations)	Land located within 1km of national designations: <ul style="list-style-type: none"> <li>Sites of Special Scientific Interest; and</li> <li>National Nature Reserves.</li> </ul>	<ul style="list-style-type: none"> <li>Natural England</li> <li>Natural Resources Wales</li> </ul>	<p>As protected by:</p> <ul style="list-style-type: none"> <li>Wildlife and Countryside Act 1981</li> <li>Conservation of Habitats and Species Regulations 2017 (as amended)</li> </ul> <p>Wind development may be appropriate in close proximity to some designations, however planning permission may be more difficult to obtain for sites close to such designations.</p>
Biodiversity (Regional and local designations)	Land located within 1km of regional and local designations <sup>21</sup> : <ul style="list-style-type: none"> <li>Local Nature Reserves;</li> <li>Local Wildlife Sites; and</li> <li>Wildlife Trust Reserves.</li> </ul>	<ul style="list-style-type: none"> <li>Natural England</li> <li>Herefordshire Council</li> </ul>	<p>As protected by:</p> <ul style="list-style-type: none"> <li>National Planning Policy Framework</li> <li>Natural Environment and Rural Communities Act 2006</li> </ul> <p>Wind development may be appropriate in close proximity to some designations, however planning permission may be more difficult to obtain for sites close to such designations.</p>
Cultural Heritage	Land that is within 1km of <sup>22</sup> : <ul style="list-style-type: none"> <li>Registered parks and gardens;</li> <li>Scheduled monuments;</li> <li>Listed buildings;</li> <li>Conservation Areas; and</li> <li>Locally Listed buildings.</li> </ul> <p>Land that is:</p>	<ul style="list-style-type: none"> <li>Historic England</li> <li>Cadw</li> <li>Welsh Government</li> <li>Herefordshire Council</li> </ul>	<p>As protected by:</p> <ul style="list-style-type: none"> <li>National Planning Policy Framework</li> <li>Planning Policy Wales</li> <li>The Convention Concerning the Protection of the World Cultural and Natural Heritage</li> <li>National Heritage Act 1983</li> <li>Ancient Monuments and Archaeological Areas Act of 1979</li> <li>Planning (Listed Buildings and Conservation Areas) Act 1990</li> </ul>

<sup>21</sup> There are no RSPB Reserves within the county

<sup>22</sup> There are no World Heritage Sites or Registered Battlefields within 1km of the county.

Parameter	Secondary Constraints	Data Source	Justification and Notes
	<ul style="list-style-type: none"> <li>Located within or within 1km of a Registered Historic Landscape.</li> </ul>		<p>Wind development may be appropriate in close proximity to some designations, however planning permission may be more difficult to obtain for sites close to such designations.</p> <p>It is noted that further site specific study would be required to determine if any unexpected archaeological remains or undesignated but nationally significant features are present that would require consideration, as well as the setting of historic features.</p> <p>Note: Listed building point data was buffered 5m to estimate building footprints where they did not intersect or have the same name as Herefordshire locally listed building polygon data. In addition, listed building line data was buffered 0.5m to approximate the size of designated wall features.</p>
Flood Zones	<p>Land that is:</p> <ul style="list-style-type: none"> <li>Located within Flood Zone 3.</li> </ul>	<ul style="list-style-type: none"> <li>Environment Agency</li> </ul>	<p>Wind development will not necessarily be infeasible within areas of greater flood risk, however the delivery of ground-mounted solar development in such locations may be more complex and costly.</p>
Agricultural Land Use	<p>Land that is:</p> <ul style="list-style-type: none"> <li>Is located within agricultural land use classifications grades 1 and 2.</li> </ul>	<ul style="list-style-type: none"> <li>Natural England</li> </ul>	<p>Agricultural Land Use is a consideration, with grades 1, 2 and 3a land being classed as “the best and more versatile (BMV)” land and having higher value for food production. Further investigation would be required of grade 3 land to determine whether it is grade 3a or b, as available data does not distinguish these, and grade 3a land would additionally need to be considered as part of a development siting.</p> <p>Wind energy developments have a lesser land take than ground-mounted solar, and agricultural practices can still be undertaken at wind farms. However, the turbines and infrastructure such as access tracks may limit the productivity of a site and as such may wind developments may be less deliverable on higher grade agricultural land.</p>
Noise	<p>Land within:</p>	<ul style="list-style-type: none"> <li>OS Addressbase</li> <li>OS OpenMap Local Buildings layer</li> </ul>	<p>As noted above, wind turbines generate sound during their operation, and their noise impacts upon nearby properties must be limited to appropriate levels.</p> <p>To indicate which area of land within the identified potentially “technical” suitable land, may be more difficult to develop in terms of noise, the same acoustic advice was used as per the technical assessment. However, the following assumptions were applied:</p>

Parameter	Secondary Constraints	Data Source	Justification and Notes
	<ul style="list-style-type: none"> <li>■ Sensitive<sup>23</sup> and non-sensitive receptor<sup>24</sup> buffer zones based on turbine size:               <ul style="list-style-type: none"> <li>— Very large scale: 800m for residential/other sensitive receptors, 500m for non-residential.</li> <li>— Large scale: 750m for residential/other sensitive receptors, 480m for non-residential.</li> <li>— Medium scale: 600m for residential/other sensitive receptors, 400m for non-residential.</li> <li>— Small scale: 300m for residential/other sensitive receptors, 180m for non-residential.</li> </ul> </li> </ul>		<ul style="list-style-type: none"> <li>■ Multiple turbine developments in all cases (assumed three turbines in a line generating noise); and</li> <li>■ The assumption that no properties will be 'financially involved' in the wind development or are located in an existing noisier area (financial involvement and existing elevated baseline noise levels may allow higher noise levels to be accepted in individual cases, and were considered as part of the technical assessment above).</li> </ul> <p>Note: Within the Authority, where address points did not overlay OS OpenMap buildings data, points were buffered 5m to estimate building footprint. Where OS OpenMap buildings did not overlay address point data, these buildings were assumed to be of non-sensitive use<sup>25</sup>. Moreover, due to lack of sufficient data, buildings outside of the authority were assumed to be of non-sensitive use. This was to ensure that land was not unnecessarily ruled out as being constrained to wind development, as a result of non-sensitive buildings being mistakenly assessed as being sensitive. It is noted further site specific study would be required to determine the necessary buffer distance between specific buildings and proposed turbines.</p>
Planning/Land Use Other	<p>Exclude:</p> <ul style="list-style-type: none"> <li>■ Registered Common Land;</li> <li>■ Open Access Land; and</li> <li>■ Local public green/open space, including:               <ul style="list-style-type: none"> <li>— Allotments;</li> <li>— Amenity green space;</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>■ Natural England</li> <li>■ Herefordshire Council</li> </ul>	<p>Wind energy developments have a lesser land take than ground-mounted solar. However, the turbines and infrastructure such as access tracks may limit the usability of such recreational land uses and as such may wind developments may be less deliverable on them.</p> <p>The open spaces considered within this study were consistent with the open spaces assessed within the 2023 Herefordshire Natural Environment Evidence Update.</p>

<sup>23</sup> Sensitive receptors include residential properties, schools, hospitals and care homes. These were identified via the LLPG data.

<sup>24</sup> Non-relevant addresses that have no applicable noise receptors were excluded, identified via the LLPG data, including ancillary buildings, car parking, garages, non-buildings.

<sup>25</sup> Where OS buildings overlaid non-relevant addresses (see footnote 24) these were excluded from consideration.

Parameter	Secondary Constraints	Data Source	Justification and Notes
	<ul style="list-style-type: none"> <li>– Cemeteries and churchyards;</li> <li>– Civic space;</li> <li>– Green chain or corridor;</li> <li>– Incidental greenspace;</li> <li>– Natural and semi natural green space;</li> <li>– Outdoor sports facility;</li> <li>– Provision for children and teenagers; and</li> <li>– Country Parks.</li> </ul>		

Table A.6: Wind resource assessment secondary opportunities

Parameter	Secondary Opportunities	Data Source	Justification and Notes
Roads	<p>Land that:</p> <ul style="list-style-type: none"> <li>■ Is located within 500m of a main road (A Road) or motorway junction.</li> </ul>	<ul style="list-style-type: none"> <li>■ OS OpenRoads</li> </ul>	Wind sites are likely to be more deliverable if located in closer proximity to existing road networks suitable for HGVs.
Brownfield Land	<p>Land that:</p> <ul style="list-style-type: none"> <li>■ Is located within brownfield land.</li> </ul>	<ul style="list-style-type: none"> <li>■ Herefordshire Council</li> </ul>	Developments that re-use previously developed land are more likely to be considered more favourably when being considered for planning permission.
Electricity Grid	<p>Land that:</p> <ul style="list-style-type: none"> <li>■ Is located within 1km of a substation.</li> </ul>	<ul style="list-style-type: none"> <li>■ National Grid</li> </ul>	<p>Small scale (but not private wire) wind sites, such as community wind developments, are likely to be more deliverable and less costly to develop if located closer to existing electricity infrastructure. Further study of sites, landownership and costs would be required to determine the actual distance from a substation that could be viable to connect to.</p> <p>Further study would be required to make consideration of transmission lines operated by the local DNO Western Power Distribution.</p>

Parameter	Secondary Opportunities	Data Source	Justification and Notes
Existing Industrial Sites	Land that: <ul style="list-style-type: none"> <li>Is located within 500m of industrial sites.</li> </ul>	<ul style="list-style-type: none"> <li>Herefordshire Council</li> </ul>	Land in proximity to industrial sites may be more attractive to developers to deliver private wire connections to the industrial sites.
Existing Renewable Energy Developments	Land that: <ul style="list-style-type: none"> <li>Is located within 1km of an existing or consented renewable development.</li> </ul>	<ul style="list-style-type: none"> <li>Herefordshire Council</li> <li>BEIS</li> <li>Aerial imagery</li> <li>LUC windfarm database</li> </ul>	Co-locating developments may make developments more deliverable, such as through reduced construction costs, use of shared infrastructure, and increased continuity of supply to compensate for intermittencies in generation.  In addition, the colocation of ground-mounted solar panels at wind developments can increase the generation efficiency of the site in comparison to the land take required.
Identified Areas of Potential for Solar Development	Land that: <ul style="list-style-type: none"> <li>Is located in areas identified as having “technical potential” for solar.</li> </ul>	<ul style="list-style-type: none"> <li>LUC</li> </ul>	Co-locating developments may make developments more deliverable, such as through reduced construction costs, use of shared infrastructure, and increased continuity of supply to compensate for intermittencies in generation.
Wind Speed	Land that: <ul style="list-style-type: none"> <li>Is located within areas of higher wind speeds.</li> </ul>	<ul style="list-style-type: none"> <li>Global Wind Atlas</li> </ul>	Locations with higher wind speeds are likely to have a greater generation potential and therefore are more likely to be financially viable and deliverable.

### Ground-Mounted Solar Resource Secondary Constraints and Opportunities

Table A.7: Ground-mounted solar resource assessment secondary constraints

Parameter	Secondary Constraints	Data Source	Justification and Notes
National Landscapes (formerly Area of Outstanding Natural Beauty – AONB)	Land that is: <ul style="list-style-type: none"> <li>Located within or within 1km of a National Landscape.</li> </ul>	<ul style="list-style-type: none"> <li>Natural England</li> <li>Natural Resources Wales</li> </ul>	Planning permission may be more difficult to obtain for sites within or close to the designation.  As of the 22 <sup>nd</sup> November 2023, Areas of Outstanding National Beauty (AONB) are referred to as 'National Landscapes'. In legal terms they are still defined as AONBs.



Parameter	Secondary Constraints	Data Source	Justification and Notes
Geological Designations	Land located within 1km of: <ul style="list-style-type: none"> <li>Locally Important Geological Sites.</li> </ul>	<ul style="list-style-type: none"> <li>Herefordshire Council/University of Worcester</li> </ul>	<p>As protected by:</p> <ul style="list-style-type: none"> <li>Town and Country Planning Act 1990</li> <li>Herefordshire Local Plan Core Strategy 2011-2031</li> </ul> <p>Ground-mounted solar development may be appropriate in close proximity to some designations, however planning permission may be more difficult to obtain for sites close to such designations.</p>
Biodiversity (International designations)	Land located within 1km of international designations <sup>26</sup> : <ul style="list-style-type: none"> <li>Special Areas of Conservation.</li> </ul>	<ul style="list-style-type: none"> <li>Natural England</li> <li>Natural Resources Wales</li> </ul>	<p>As protected by:</p> <ul style="list-style-type: none"> <li>Conservation of Habitats and Species Regulations 2017 (as amended)</li> </ul> <p>Ground-mounted solar development may be appropriate in close proximity to some designations, however planning permission may be more difficult to obtain for sites close to such designations.</p>
Biodiversity (National designations)	Land located within 1km of national designations: <ul style="list-style-type: none"> <li>Sites of Special Scientific Interest; and</li> <li>National Nature Reserves.</li> </ul>	<ul style="list-style-type: none"> <li>Natural England</li> <li>Natural Resources Wales</li> </ul>	<p>As protected by:</p> <ul style="list-style-type: none"> <li>Wildlife and Countryside Act 1981</li> <li>Conservation of Habitats and Species Regulations 2017 (as amended)</li> </ul> <p>Ground-mounted solar development may be appropriate in close proximity to some designations, however planning permission may be more difficult to obtain for sites close to such designations.</p>
Biodiversity (Regional and local designations)	Land located within 1km of regional and local designations <sup>27</sup> : <ul style="list-style-type: none"> <li>Local Nature Reserves;</li> </ul>	<ul style="list-style-type: none"> <li>Natural England</li> <li>Herefordshire Council</li> </ul>	<p>As protected by:</p> <ul style="list-style-type: none"> <li>National Planning Policy Framework</li> <li>Natural Environment and Rural Communities Act 2006</li> </ul>

<sup>26</sup> There are no Special Protection Areas (SPA), potential SPAs, potential SACs, Ramsar site or proposed Ramsar sites within 1km of the county.

<sup>27</sup> There are no RSPB Reserves within the county.

Parameter	Secondary Constraints	Data Source	Justification and Notes
	<ul style="list-style-type: none"> <li>Local Wildlife Sites; and</li> <li>Wildlife Trust Reserves.</li> </ul>		Ground-mounted solar development may be appropriate in close proximity to some designations, however planning permission may be more difficult to obtain for sites close to such designations.
Cultural Heritage	<p>Land that is within 1km of<sup>28</sup>:</p> <ul style="list-style-type: none"> <li>Registered parks and gardens;</li> <li>Scheduled monuments;</li> <li>Listed buildings;</li> <li>Conservation Areas; and</li> <li>Locally Listed buildings.</li> </ul> <p>Land that is:</p> <ul style="list-style-type: none"> <li>Located within or within 1km of a Registered Historic Landscape.</li> </ul>	<ul style="list-style-type: none"> <li>Historic England</li> <li>Cadw</li> <li>Welsh Government</li> <li>Herefordshire Council</li> </ul>	<p>As protected by:</p> <ul style="list-style-type: none"> <li>National Planning Policy Framework</li> <li>Planning Policy Wales</li> <li>The Convention Concerning the Protection of the World Cultural and Natural Heritage</li> <li>National Heritage Act 1983</li> <li>Ancient Monuments and Archaeological Areas Act of 1979</li> <li>Planning (Listed Buildings and Conservation Areas) Act 1990</li> </ul> <p>Ground-mounted solar development may be appropriate in close proximity to some designations, however planning permission may be more difficult to obtain for sites close to such designations.</p> <p>It is noted that further site specific study would be required to determine if any unexpected archaeological remains or undesignated but nationally significant features are present that would require consideration, as well as the setting of historic features.</p>
Flood Zones	<p>Land that is:</p> <ul style="list-style-type: none"> <li>Located within Flood Zone 3.</li> </ul>	<ul style="list-style-type: none"> <li>Environment Agency</li> </ul>	Ground-mounted solar development will not necessarily be infeasible within areas of greater flood risk, however the delivery of ground-mounted solar development in such locations may be more complex and costly.
Agricultural Land Use	<p>Land that is:</p>	<ul style="list-style-type: none"> <li>Natural England</li> </ul>	Agricultural Land Use is a consideration, with grades 1, 2 and 3a land being classed as “the best and more versatile (BMV)” land and having higher value for food

<sup>28</sup> There are no World Heritage Sites or Registered Battlefields within 1km of the county.

Parameter	Secondary Constraints	Data Source	Justification and Notes
	<ul style="list-style-type: none"> <li>■ Located within agricultural land use classification grade 2.</li> </ul>		production. Grade 1 land is considered as a primary constraint to solar development. Further investigation would be required of grade 3 land to determine whether it is grade 3a or 3b, as available data does not distinguish these, and grade 3a land would additionally need to be considered as part of a development siting.

Table A.8: Ground-mounted solar resource assessment secondary opportunities

Parameter	Secondary opportunities	Data Source	Justification and Notes
Electricity Grid	Land that: <ul style="list-style-type: none"> <li>■ Is located within 1km of a substation.</li> </ul>	<ul style="list-style-type: none"> <li>■ National Grid</li> </ul>	Ground-mounted solar sites are likely to be more deliverable and less costly to develop if located closer to existing electricity infrastructure. Further study of sites, landownership and costs would be required to determine the actual distance from a substation that could be viable to connect to.  Further study would be required to make consideration of transmission lines operated by the local DNO Western Power Distribution.
Brownfield Land	Land that: <ul style="list-style-type: none"> <li>■ Is located within brownfield land.</li> </ul>	<ul style="list-style-type: none"> <li>■ Herefordshire Council</li> </ul>	Developments that re-use previously developed land are more likely to be considered more favourably when being considered for planning permission.
Existing Industrial Sites	Land that: <ul style="list-style-type: none"> <li>■ Is located within 500m of industrial sites.</li> </ul>	<ul style="list-style-type: none"> <li>■ Herefordshire Council</li> </ul>	Land in proximity to industrial sites may be more attractive to developers to deliver private wire connections to the industrial sites.
Existing Renewable Energy Developments	Land that: <ul style="list-style-type: none"> <li>■ Is located within 1km of an existing or consented renewable development.</li> </ul>	<ul style="list-style-type: none"> <li>■ Herefordshire Council</li> <li>■ BEIS</li> <li>■ Aerial imagery</li> <li>■ LUC windfarm database</li> </ul>	Co-locating developments may make developments more deliverable, such as through reduced construction costs, use of shared infrastructure, and increased continuity of supply to compensate for intermittencies in generation.  In addition, the colocation of ground-mounted solar panels at wind developments can increase the generation efficiency of the site in comparison to the land take required.

Parameter	Secondary opportunities	Data Source	Justification and Notes
Identified Areas of Potential for Wind Development	Land that: <ul style="list-style-type: none"> <li>Is located in areas identified as having "technical potential" for wind.</li> </ul>	<ul style="list-style-type: none"> <li>LUC</li> </ul>	<p>Co-locating developments may make developments more deliverable, such as through reduced construction costs, use of shared infrastructure, and increased continuity of supply to compensate for intermittencies in generation.</p> <p>In addition, the colocation of ground-mounted solar panels at wind developments can increase the generation efficiency of the site in comparison to the land take required.</p>
Solar Irradiance	Land that: <ul style="list-style-type: none"> <li>Is located within areas of higher solar irradiance values.</li> </ul>	<ul style="list-style-type: none"> <li>Global Solar Atlas</li> </ul>	<p>Using modern solar panel technology, the vast majority of land within England is deemed suitable for solar panel development in terms of solar irradiance. However, locations with higher solar irradiance are likely to have a greater generation potential and therefore are likely to be more financially viable and deliverable.</p>