County Durham Plan

Solar Energy Supplementary Planning Document

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2023 (Consultation Draft)

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1.0 Introduction

1.1 Purpose of this Supplementary Planning Document

Solar energy has an important contribution to make to Durham County Council's target for the county to be net zero carbon by 2045. Enabling local renewable energy generation will support energy security, making energy costs less susceptible to fluctuations in global gas prices.

This Supplementary Planning Document (SPD) provides guidance on key planning issues associated with solar to ensure panels are sited, designed and of a scale which does not harm County Durham's unique landscape character, biodiversity, heritage assets and, protects the best and most versatile agricultural land. Guidance is provided based on three scales of solar development:

- Small scale: solar panels for householders
- Medium scale: solar panels associated with business and community uses (typically generating less than 500KW and on site less than 1ha)
- Large scale: commercial scale solar farms (typically generating up to 50MW and on sites of 1ha or more)

There are two forms of solar technology. Solar photovoltaic (PV) panels include cells which convert sunlight into energy. These are the most common form of solar panel and used from a domestic to a commercial scale. Solar thermal panels use the suns energy to heat water for storage and are more suited to domestic properties. Panels can be fixed onto a roof covering, integrated into a building or free-standing ground mounted. A solar array is a collection of multiple solar panels.

This SPD adds further detail to policies in the County Durham Plan, including Policy 10 (Development in the Countryside), Policy 14 (Best and Most Versatile Agricultural Land and Soil Resources), Policy 27 (Utilities, Telecommunications and Other Broadcast Infrastructure), Policy 29 (Sustainable Design), Policy 33 (Renewable and Low Carbon Energy) and Policy 39 (Landscape).

It will be subject to consultation in accordance with the Council's Statement of Community Involvement. Once adopted it will be a material consideration in determining planning applications for solar development where planning permission is required. Solar farm developments above 50MW are currently determined by the National Infrastructure Directorate of the Planning Inspectorate on behalf of the Secretary of State. The Council are a consultee on applications determined under this process and this SPD will be used to help formulate the Council's response.

1.2 The Climate Emergency

The Council declared a climate emergency in 2019. Using electricity from the national grid accounted for about one fifth (18%) of the total carbon footprint of the county in 2019. The Durham Climate Emergency Response Plan (2022-24) sets a target of being net zero by 2045, when all the energy that is used in the county will be generated from renewable sources.

This aligns with the national response to both the climate emergency and energy crisis. The Government's Energy White Paper (2020)[1] sets plans for a fully decarbonised, reliable, and low-cost power system by 2050, which is likely to be composed of predominantly wind and solar. This will reduce our reliance on gas, which currently sets electricity prices. The Government's Net Zero Strategy (2021)[2] seeks to accelerate deployment of low-cost renewable generation, such as wind and solar through the Contracts for Difference scheme. The British Energy Security Strategy (2022)[3] pledges to achieve net zero targets to increase solar power capacity from 14 gigawatts (GW) to 70GW by 2035. More recently the Growth Plan (2022)[4] reinforces the Government's ambition to move to a system where electricity prices better reflect the UK's low-carbon energy sources, to bring down consumer bills.

1.3 Policy Context

The National Planning Policy Framework (NPPF) encourages local planning authorities to promote renewable energy development and identify appropriate sites for it to support the transition to a low carbon future. It also states community-led initiatives for renewable and low carbon energy should be supported. Planning Practice Guidance (PPG) sets out the factors to be considered when deciding a planning application and says that large scale solar farms should be focussed on previously developed and non-agricultural land, if it is not of high environmental value.

The Overarching National Policy Statement for Energy Policy (EN-1) and National Policy for Renewable Energy Infrastructure (EN-3), both from 2011, are applicable to national infrastructure projects including those onshore projects delivering over 50MW. The Government published revised drafts EN-1 and EN-3 for consultation purposes in 2021. These are still in draft form but give support to renewable and low carbon energy development in appropriate locations, recognising effect on landscape character will need to be considered in decision-making.

The County Durham Plan (CDP) is the Development Plan for Durham, alongside Neighbourhood Plans and the emerging Minerals and Waste Plan. The key development plan policy in relation to solar development is Policy 33 (Renewable and Low Carbon Energy), which states that renewable and low carbon energy development in appropriate locations will be supported. In determining planning applications for such projects significant weight will be given to the achievement of wider social, environmental, and economic benefits. Planning applications will also need to include a satisfactory scheme to restore the site to a quality of at least its original condition once operations have ceased. Policy 29 (Sustainable Design) also requires all development proposals to minimise greenhouse gas emissions, by seeking to achieve zero carbon buildings and providing renewable and low carbon energy generation.

[1] www.gov.uk/government/publications/energy-white-paper-powering-our-net-zero-future
[2] www.gov.uk/government/publications/net-zero-strategy
[3] www.gov.uk/government/publications/british-energy-security-strategy
[4] www.gov.uk/government/publications/the-growth-plan-2022-documents

Whilst Policy 10 (Development in the Countryside) states new development in the countryside will not be permitted unless allowed for by specific policies in the Plan, footnote 54 clarifies relevant policy includes policy on renewables. The policy sets further criteria for assessing applications in the countryside including new development must not give rise to unacceptable harm to the heritage, biodiversity, geodiversity, intrinsic character, beauty or tranquillity of the countryside either individually or cumulatively; result in the merging or coalescence of neighbouring settlements; impact adversely upon the setting, townscape qualities, including important vistas, or form of a settlement which cannot be adequately mitigated or compensated for; be prejudicial to highway, water or railway safety; impact adversely upon residential or general amenity; provide resilience to impacts arising from climate change and maximise the effective use of previously developed (brownfield) land providing it is not of high environmental value.

Other key policies relevant to this SPD include:

- Policy 6 (Development on Unallocated Sites)
- Policy 14 (Best and Most Versatile Agricultural Land and Soil Resources)
- Policy 27 (Utilities, Telecommunications and Other Broadcast Infrastructure)
- Policy 39 (Landscape)
- Policy 41 (Biodiversity and Geodiversity)
- Policy 43 (Protected Species and Nationally and Locally Protected Species)
- Policy 44 (Historic Environment)

2.0 Small scale: householder

Householders may wish to install solar panels on or within the grounds of their property to reduce their carbon footprint and generate energy. The Energy Saving Trust provides a useful guide for householders on things to consider before installing solar panels.

In many cases the installation of solar panels on or within the grounds of a residential buildings is permitted development. Where planning permission is needed, solar panels will be considered to be 'small scale householder development' where they are on or within the grounds of an existing residential building and of a scale proportionate to meeting the needs of the occupier. In other cases, guidance for medium scale solar development will be relevant.

Figure 1: Solar panels on a residential property.

2.1 Permitted Development Rights

The installation of solar panels on a house or block of flats is in many cases 'permitted development' with no need to apply for planning permission. There are, however, important limits and conditions. These are set out in the Town and Country Planning (General Permitted Development) (England) Order 2015 (as amended) and summarised below:

a) Equipment on a building should be sited, so far as is practicable, to minimise the effect on the external appearance of the building and the amenity of the area.
b) When no longer needed equipment should be removed as soon as reasonably practicable.
c) Panels should not be installed above the highest part of the roof (excluding the chimney) and should project no more than 200mm from the roof slope or wall surface.

d) The panels must not be installed on a building that is within the grounds of a listed building or on a site designated as a scheduled monument.
e) If your property is in a conservation area, or in a World Heritage Site, panels must not be fitted to a wall which fronts a highway.

In some cases, standalone solar panels within the ground of a house or block of flats are also permitted development. This is where:

a) It is sited, so far as is practicable, to minimise its effect on the amenity of the area
b) When no longer needed equipment should be removed as soon as reasonably practicable.
c) Only the first standalone solar installation will be permitted development. Further installations will require planning permission.
d) No part of the installation should be higher than 4m.
e) The installation should be at least 5m from the boundary of the property.
f) The size of the array should be no more than 9sq.m or 3m wide by 3m deep.
g) Panels are not to be installed within the boundary of a listed building or a scheduled monument.
h) If your property is in a conservation area, or in a World Heritage Site, no part of the solar installation should be nearer to any highway bounding the house than the part of the house that is nearest to that highway.

Batteries allow energy generated from solar panels to be stored during the day for use on an evening. Batteries are generally installed within the property; in which case they do not require planning permission.

In some conservation areas within County Durham Article 4 Directions have been served that remove householder permitted development rights. This means that certain works that would normally not require planning permission may do so, either in relation to a particular area or a particular type of development. Article 4 Directions are used to control works that could potentially harm the special character and appearance of the conservation area. If the works affect a property within a conservation area it is advised that the applicant contacts the planning department to determine if planning permission is required or not. Alternatively, if you want to be certain that your proposal does not require planning permission, you can apply for a 'Lawful Development Certificate'.

In relation to listed buildings, listed building consent is required for physical alterations to a listed building in any manner which would affect its character as a building of special architectural or historic interest. The requirement applies to all types of works, and to all parts of buildings covered by the listing protection (potentially including buildings or other structures within its curtilage). If the site where the solar panels are to be installed is a Scheduled Monument, any work will require scheduled monument consent from the Secretary of State. This process is managed by Historic England on behalf of the Secretary of State. The protected site of a monument may also include any adjoining land essential for its support and preservation.

Solar development, even when permitted development, must comply with relevant wildlife legislation and regulations, including the Conservation of Species and Habitats Regulations 2017. Therefore, please also refer to guidance in paragraph 2.4.

2.2 Landscape and Townscape

Proposals should contribute positively to an area's character, identity, heritage significance, townscape and landscape features, helping to create and reinforce locally distinctive and sustainable communities. - County Durham Plan Policy 29 (Sustainable Design)

Any proposal should not cause unacceptable harm to the character, quality, or distinctiveness of the landscape, or to important features or views. Proposals will be expected to incorporate appropriate measures to mitigate adverse landscape and visual effects. – County Durham Plan Policy 39 (Landscape) Great weight will be given to conserving the landscaped and scenic beauty of the North Pennines Area of Outstanding Natural Beauty (AONB). Any development in or affecting the AONB will only be permitted where it is not, individually or cumulatively, harmful to its special qualities. - County Durham Plan Policy 38 (North Pennines AONB)

In the first instance solar panels should be designed to accord with permitted development rights. This will avoid the need to apply for planning permission and the associated costs. Where this is not possible, and where the building is not a designated or non-designated heritage asset, the following general design principles apply:

In the case of building-mounted solar panels:

a) Locate, if possible, on outbuildings, extensions, or carports to minimise the impact on the principal building.
b) Avoid designs which appear disproportionate or imbalanced. Technology is advancing and there is an increasing range of solar products which can be integrated into the building fabric, such as PV tiles and solar glass which could be considered.
c) Consider how panels will look in combination. They should be symmetrical and evenly spaced. If possible and practical, roof furniture such as aerials and flues should be moved to allow for this.
d) Select locations that reflect and complement existing features such as windows and roof lights.
e) Where relevant, seek to standardise the style and location of panels with nearby properties, providing these are sympathetic to the character of the area.
f) Choose colour treatments for mounting frames that are non-reflective and recede against the background. Frameless or black-framed panels should be used where frames would detract from the building.
g) Rooftop panels require mounting systems. Lowering the profile of the mounting system will reduce visual impact.

h) Where the appearance of the building is particularly sensitive consider free standing ground mounted panels if space is available.

In the case of free-standing solar panels:

i) Locate close to existing buildings and avoid locations remote from the associated residential property.
j) Choose locations that are naturally well screened in public views by existing buildings, topography, and vegetation.
k) Avoid sites requiring significant ground modelling or site levelling.
l) Chose panels and mounts that are low to the ground and don't project above hedges, fences and walls.
m) Use panels with low potential for glint or glare.
n) Underground services where possible.
o) Use low impact and reversible mountings such as pile driven or ground screw anchors.
p) Avoid the use of security fencing and lighting.

Application Requirements:

Elevations (scale 1:50 or 1:100) and, as applicable, roof plans (scale 1:500 or 1:200) or floor plans (scale 1:50 or 1:100) should be provided which clearly illustrate the design and location of panels. Details should also be provided of the specification of the panels proposed.

2.3 Cultural Heritage

Proposals should sustain the significance of designated and non-designated heritage assets, including any contribution made by their setting. – County Durham Plan policy 44 (Historic Environment)

Durham Context:

County Durham has a wide variety of designated heritage assets which include Durham Castle and Cathedral World Heritage Site (WHS), and at time of writing 3,026 listed buildings, 93 Conservation Areas, 226 Scheduled Monuments, 17 Registered Parks and Gardens and 1 Registered Battlefield. These are all identified on the Local Plan Policies Map and also recorded on the Durham Historic Environment Record. The county also has a significant number and diverse range of non-designated heritage assets.

Detailed Guidance:

The introduction of solar panels on a heritage asset in some circumstances will potentially have harmful impacts. In accordance with the NPPF (Section 16 Conserving and Enhancing the Historic Environment) when considering the impact of a solar development on the significance of a designated heritage asset, great weight will be given to the asset's conservation (and the more important the asset, the greater the weight will be). This is irrespective of whether any potential harm amounts to substantial harm, total loss or less than substantial harm to its significance. Where a proposed development will lead to substantial harm to a designated heritage asset, planning permission will be refused, unless it can be

demonstrated that the substantial harm is necessary to achieve substantial public benefits that outweigh that harm.

When considering applications that directly or indirectly affect non-designated heritage assets, consideration will be given to the scale of any harm or loss and the significance of the heritage asset.

Each heritage asset is unique and as such applicants should seek advice from the Council's Design and Conservation Team at the earliest stage and well in advance of submitting a planning application. The installation of solar panels will need to be justified as part of a 'whole building approach' to improve the energy efficiency of a building. This is to ensure that energy saving measures are appropriate, proportionate, properly designed and integrated, cost effective and that the risks of unintended consequences are reduced. In the first instance the focus should be on improving the energy efficiency of the building with a 'fabric first' approach. An assessment of all renewables should then be undertaken to ensure that solar panels are the right solution for the individual building or site. The Council is producing detailed guidance on the use of renewables on historic buildings as part of a whole life building approach.

Historic England has provided useful guidance on Energy Efficiency and Historic Buildings which sets out the following general principles:

a) The understanding of significance of the asset is critical. Fundamental to achieving high-quality design is a sound understanding of the character and importance of the historic asset involved, whether at the scale of individual buildings and sites or more extensive historic areas and landscapes.
b) To minimise the risk of damage to the building, the means of fixing and the operation of the panels should be agreed in advance, whilst also ensuring that their location does not impede rainwater disposal or hinder maintenance work such as clearing gutters.
c) Carefully plan how panels will be removed at the end of their life so as to avoid damage to the fabric of the building.
d) Minimise visual impact to the setting through location and screening.
e) The roof structure will need to be checked by a competent person to ensure it can withstand the additional load.

Application Requirements:

All applications that could affect heritage assets (designated and non-designated) must be accompanied by a Heritage Statement prepared by a heritage specialist. This needs to assess the significance and setting of the heritage asset and the impact of the proposed changes to it. This will need to identify all the heritage assets affected by the proposal, present an understanding of their heritage significance including any contribution made by setting, and assess the impact of the proposal on the asset's significance.

2.4 Biodiversity and Nature Conservation

Proposals will be expected to minimise impacts on biodiversity and provide net gain for biodiversity. – County Durham Plan Policy 41 (Biodiversity and Geodiversity)

Solar development, even when permitted development, must comply with relevant wildlife legislation and regulations, including the Conservation of Species and Habitats Regulations 2017. As such, any potential negative impacts, will still have to be addressed in all cases. The homeowner is responsible for ensuring that the development complies with all relevant legislation and regulations. It is advisable to engage the services of a consultant ecologist to determine if there is a risk of protected species being present.

In the case of roof mounted panels potential impacts include damage or disturbance to roosting bats and/or nesting birds.

Stand-alone solar panels within the grounds of a dwelling but not on a building are unlikely to contravene wildlife legislation, but again the onus is on the homeowner to ensure that wildlife legislation is not breached.

The Wildlife and Countryside Act 1981 protects all nesting birds from damage or destruction of an active nest; installation work should be carefully timed not to disturb birds during their nesting seasons from about the end of February to August.
Application Requirements:

An Ecological Risk Assessments or Survey Work may be requested to determine the potential impacts arising from development.

A Bat Risk Assessment might be requested for roof installations, if the property or location meets certain criteria; for example, the property lies within 200m of woodland or roosts are recorded in the vicinity.

2.5 Glint and Glare

It will need to be demonstrated that there will be no unacceptable impact, either individually or cumulatively, on amenity. – County Durham Plan Policy 31 (Amenity and Pollution)

Glint is a momentary flash of bright light typically received by moving receptors or from moving reflectors. Glare is a continuous source of bright light. Solar reflection is sometimes used to refer to both. Glint and glare can be a particular issue if ‘tracking’ panels are proposed as these may cause differential impacts depending on the season and time of day. Applications should fully consider the reflective capacity of all the materials used including panels, frames and supports. Low-reflectivity panels should be used, and panels should be located to avoid glint and glare. Where necessary, appropriate mitigation measures, such as screening, should be employed to ensure that harmful impacts are avoided.

Application Requirements:

A Glint and Glare Assessment may be required where there is potential for impacts on sensitive receptors. For example, where there is potential for solar reflection towards neighbouring properties or other sensitive receptors such as rail, road, and Public Rights of Way (PROW).

3.0 Medium scale: business and community

Businesses and Community groups may wish to install solar panels to reduce their carbon footprint and energy costs. These can be roof mounted or ground mounted. Permitted development rights do not apply in these cases and planning permission will be required.

The Council is supportive of community-led initiatives, particularly those seeking to alleviate fuel poverty.

Figure 2: Solar panels on the rooftop of the Louisa Leisure Centre in Stanley

3.1 Use of Land

To protect the best and most versatile agricultural land for food production. - County Durham Plan Policy 14 (Best and Most Versatile Agricultural Land and Soil Resources).

On unallocated sites make as much use as possible of previously developed (brownfield) land. – County Durham Plan Policy 6 (Development on Unallocated Sites)

Durham Context:

Agricultural Land is classified as Grade 1 to 5, with 1 to 3a being the best and most versatile agricultural land. Apart from urban areas and the North Pennines AONB, the county is predominantly classified as Grade 3 as identified on Natural England's Agricultural Land classification map for the region.

Detailed Guidance:

In the first instance solar development should be directed to previously developed land, which is not in agricultural use and has a low environmental value, followed by agricultural land of Grades 3b, 4 or 5. The best quality land (Grade 1, 2 and 3a) should be used for agricultural purposes and policy would not normally support solar development in this location.

If the site is Grade 3 an Agricultural Land Classification Statement will be needed to assess whether the land is of Grade 3a or b. The survey will need to be carried out by suitably qualified independent practitioners in accordance with up-to-date industry best practice.

Solar farms can help generate an income to support the continued viability of a farm business. It is also possible for solar farms to continue to support low intensity agricultural use. It should be demonstrated how the design of the solar farm promotes a purposeful relationship with the management of the land for agricultural purposes. Where the proposal is for ground mounted panels on an existing farm, information will be required on the viability of this farm to continue to function (as an agricultural unit) with the development in situ. Proposals should allow for continued agricultural use where applicable and/or encourage biodiversity improvements around arrays. Low intensity grazing can be a low cost means of managing grassland as well as increasing its conservation value. Sheep are the usual choice for solar farms, being small enough to pass beneath the rows of panels. There are examples of solar panels combined with cattle grazing, but in these cases the height of panels needs to be substantial. There is also growing research and examples of 'agrivoltaic arrays' where crops are grown between or beneath solar panels. This requires careful consideration of the crops, location and climate.

In all cases any loss of agricultural land should be on a temporary basis after which sites should be restored to agricultural use in accordance with section 0.

Application Requirements:

In the case of non-agricultural land, no further information is required in this regard. In all other cases an Agricultural Land Classification Statement will be required setting out the agricultural land classification. This should also address:

a) Analysis of the cumulative impact of the proposed development and other permitted large-scale solar developments on the supply of agricultural land within the same classification across the county.
b) Justification that the development needs to be located on the site and not on land of a lesser agricultural classification within the county.
c) If the proposed development site makes up part of an existing farm, provide information on the viability of this farm to continue to function (as an agricultural unit) with the development in situ.

3.2 Landscape and Townscape

Proposals should contribute positively to an area's character, identity, heritage significance, townscape and landscape features, helping to create

and reinforce locally distinctive and sustainable communities. - County Durham Plan Policy 29 (Sustainable Design)

Any proposal should not cause unacceptable harm to the character, quality, or distinctiveness of the landscape, or to important features or views. Proposals will be expected to incorporate appropriate measures to mitigate adverse landscape and visual effects. – County Durham Plan Policy 39 (Landscape) Great weight will be given to conserving the landscape and scenic beauty of the North Pennines Area of Outstanding Natural Beauty (AONB). Any development should be designed and managed to the highest environmental standards and have regard to the conservation priorities and desired outcomes of the North Pennines AONB Management Plan and to the guidance given in the North Pennines AONB Planning Guidelines, the North Pennines AONB Building Design Guide and the North Pennines AONB Moorland Tracks and Access Roads Planning Guidance Note as material considerations. - County Durham Plan Policy 38 (North Pennines AONB)

Durham Context:

The Durham Landscape is one of enormous contrast and diversity. It includes nationally important landscapes including the North Pennines Area of High Landscape Value (AONB) and registered historic parks and gardens. It also includes locally important landscapes identified as Areas of Higher Landscape Value (AHLV) in the CDP and locally listed Historic Parks, Gardens and Designated Landscapes. All of these and other local landscapes vary in their sensitivity to solar developments. Further information on the landscape of the county can be found on the Durham Landscape website.

- The County Durham Landscape Character Assessment (2008) provides detailed information about the character of the county's landscape from the strategic to the local level.
- The County Durham Landscape Strategy (2008) is the Council's adopted strategy for the landscape. It analyses the issues affecting the landscape and sets out objectives and priorities for conservation and improvement specific to each character area. One overarching objective for new energy development is that it respects the character of the local landscape and built environment.
- The County Durham Landscape Guidelines cover a range of topics including trees, woodlands and forestry, hedges and grasslands and provide development and land management guidelines for individual landscape types.
- The County Durham Landscape Value Assessment (2019) provides information on the valued attributes of local landscapes.

Detailed Guidance:

Development proposals should be informed by an understanding of the character and sensitivities of the local landscape. In many cases solar panels developed to support local business or community facilities will be in urban situations where they may not be out of keeping with the general character of the built-up area. In the countryside solar panels are a novel form of development that can detract from its rural character by introducing tracts of man-made structures, particularly where they

are visually prominent. The landscape of countryside on the edge of towns may share some of that sensitivity, particularly in smaller rural gaps between settlements where solar development can lead to a degree of visual coalescence. Medium scale developments can nevertheless often be accommodated without substantial harm provided that they are sensitively located and well designed.

Location

a) Choose locations that are naturally well screened in public views by existing buildings, topography and vegetation.
b) Locate solar arrays close to existing buildings, farmsteads and settlement edges to avoid a sprawling pattern of development.
c) Avoid elevated or sloping sites that are difficult to screen and sites that require significant ground modelling or levelling.
d) Avoid locations where development would erode smaller gaps between settlements.
e) Avoid sensitive locations such as historic parks and gardens and features of historical interest such as old rigg and furrow, strip lynchets and other earthworks.
f) Choose sites that fit into, and interlock with, existing field and woodland patterns.
g) Ensure the area of development is in scale with the landscape in which it lies: be guided by the scale of other features such as field patterns and woodlands.
h) Avoid close proximity to PROW where panels can dominate the experience of users.

Layout and design

i) Fit the scheme into the existing landscape framework, preserving landscape features such as hedges, walls and tree lines. A pre-development Tree Survey should be undertaken where necessary to inform design.
j) Keep the layout compact and reflect the pattern of fields and woodlands in the area.
k) Run arrays along rather than across the contours on sloping sites.
l) Fit arrays comfortably into existing fields, avoiding long, ragged or staggered edges.
m) Minimise earthworks: avoid the use of screening mounds that can add to the development's impact.
n) Allow sufficient space around existing hedges, trees and woodland edges to avoid shading, facilitate management and enhance their ecological value.
o) Use existing access points and field tracks where possible.

Panels and ancillary elements

p) Select panels and supports to be as low as possible to keep them in scale with local field boundaries.
q) Use panels with low potential for glint or glare.

r) Use low impact and reversible mountings such as pile driven or ground screw anchors.
s) Minimise the development of new access tracks and areas of hard surfacing: use reinforced grass or other green solutions: use agricultural or 4WD vehicles to service the facilities.
t) Bury cables wherever possible (avoiding damage to trees, hedges, or archaeology) to minimise their impact.
u) House co-located batteries and inverters in existing buildings where possible. Where new structures are needed design them to reflect the local vernacular and locate close to existing buildings or other features.
v) Avoid the use of security fencing, lighting and pole-mounted CCTV. Use visually light fencing where it is unavoidable. Set perimeter fences back from hedge boundaries to reduce their visibility from outside the site. Where lighting is necessary provide to the minimum required and design to prevent overspill and glare.

Mitigation

w) Where there are trees or hedges on or close to the site commission an Arboricultural Impact Assessment (AIA) and Arboricultural Method Statement (AMS) to ensure that they are adequately protected through the development phase.
x) In rural situations manage the land within the site by grazing to avoid it becoming overgrown: long grass, mulches and bare ground or dead vegetation created by chemical weed control can make the site incongruous in the context of managed farmland.
y) Consider the effects of the development in key views. Manage existing landscape features and establish new features to help screen and assimilate it into the landscape.
z) Ensure that screening features are in keeping with the local landscape (hedges, walls, tree lines, woodlands). Use species that are native to or characteristic of the locality.
aa) Allow hedges to grow to a taller managed height: this can achieve screening more rapidly than new planting.
bb) Take opportunities to restore existing, relict or lost landscape features to leave a beneficial legacy in the long term.
cc) Have a Management Plan in place that captures landscape and visual objectives alongside other factors such as biodiversity.

Application Requirements:

In rural situations a Landscape and Visual Impact Assessment (LVIA) may be required. The need for this or otherwise should be established with the Planning Officer at an early stage in the process. If an LVIA is required, it should:

a) Follow guidance provided in the Landscape Institute and Institute of Environmental Management and Assessment's 'Guidelines for Landscape and Visual Impact Assessment'.
b) Be carried out by a suitably qualified Landscape Architect.
c) Have its scope and content agreed with the Council's Landscape Officer.

Where there are trees or hedges on or close to the site a Tree Survey, Arboricultural Impact Assessment (AIA) and Arboricultural Method Statement (AMS) will be required. This should be:

a) Carried out in accordance with BS5837.
b) Undertaken by a suitably qualified arboriculturist.

These studies should be commissioned at an early stage to inform the location, design and management of the development.

3.3 Biodiversity and Nature Conservation

Proposals will be expected to minimise impacts on biodiversity by retaining and enhancing existing biodiversity assets and features and providing net gain for biodiversity. Where significant harm cannot be avoided, or appropriately mitigated, or as a last resort compensated for, development will not be permitted. – County Durham Plan Policy 41 (Biodiversity and Geodiversity)

Development that has the potential to have an effect on internationally designated sites, either individually or in combination with other plans or projects, will need to be screened in the first instance to determine whether significant effects on the site are likely and, if so, will be subject to an Appropriate Assessment. Development will be refused where it cannot be ascertained, following Appropriate Assessment, that there would be no adverse effects on the integrity of the site, unless the proposal is able to pass the further statutory tests of 'no alternatives' and 'imperative reasons of overriding public interest' as set out in Regulation 64 of the Conservation of Habitats and Species Regulations 2017. – County Durham Plan Policy 42 (Internationally Designated Sites)

All development proposals in, or which are likely to adversely impact upon (either individually or in combination with other developments), any of the following national designations (where not a component of an internationally designated site): Sites of Special Scientific Interest or National Nature Reserves, will only be permitted where the benefits of development in that location clearly outweigh the impacts on the interest features on the site and any wider impacts on the network of sites. All development proposals in, or which are likely to adversely impact upon, any of the following local designations: Local Sites (Geology and Wildlife) and Local Nature Reserves (LNRs) will only be permitted when it can be demonstrated that the benefits of development in that location outweigh the impacts on the local nature conservation interest or scientific interest on the site and any wider impacts on the network of sites. – County Durham Plan Policy 43 (Protected Species and Nationally and Locally Protected Sites)

Durham Context:

County Durham supports a diverse range of biodiversity, including species and habitats of international and national importance. It includes large areas of

internationally important habitats such as magnesian limestone and holds populations of declining species such as water vole and red squirrels. The priority habitat and species lists produced by the Durham Biodiversity Partnership are still valid and now held by the North East England Nature Partnership
Habitats or features with a special value for biodiversity are often protected under international, national and local legislation. Sites protected by international or national legislation found in the county include Special Areas of Conservation (SAC), Special Protection Areas (SPA), Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR) and Local Nature Reserves (LNR). Interactive maps of their boundaries can be accessed on the Multi Agency Geographic Information for the Countryside (MAGIC) website. A further tier of sites protected through the planning system are known as Local Sites. Local Wildlife Sites are mapped on the Durham policies map.

Although not yet produced, the emerging Local Nature Recovery Strategy (LNRS) will be a key reference point for proposed development. LNRS are strategic plans that will help drive action and investment to help nature and wider nature-based environmental benefits. They will consist of:

- A Statement of Biodiversity Priorities: priorities for biodiversity outcomes, and the actions that need to be undertaken to achieve these outcomes.
- A Local Habitat Map: existing distribution of habitats and areas already important for biodiversity, overlaid by locations considered suitable for delivering the outcomes and actions.

All development in County Durham will need to be mindful of the LNRS and should aim to deliver against its priorities were appropriate.

Detailed Guidance:

The nature of impacts on ecology will depend on the ecological characteristics and features of the site and sensitivity to proposed changes. Solar arrays could have implications for habitat loss, fragmentation and modification and for displacement of species. However, solar arrays also have the potential to deliver significant environmental gains through creating and enhancing habitats.

Design should be informed and influenced by ecological assessments. The use of a consultant ecologist from the earliest stages of the design process will ensure that adverse impacts are mitigated, and biodiversity enhancements are maximised. Roof mounted solar panels have the potential to impact on roosting bats and breeding birds, the applicant should be aware of the legislation surrounding bats and birds and ideally select locations where impacts can be avoided.

There are potential impacts arising from the installation of solar arrays on a range of ecological receptors, although research on the impacts of solar arrays is in its infancy, developers should be aware of these and aim to mitigate impacts through site selection and design where appropriate.

Research indicates that ground nesting species such as skylark could be displaced from solar farms[5] and Birdlife Europe[6] suggests that there could be negative impacts on species such as lapwing and skylark with reduced opportunities for foraging and breeding. The effects of solar farms on birds are likely to be species specific and care will be needed when assessing impacts and designing mitigation or compensation.

There is some evidence that mayflies, stoneflies, small fly species, and tabanid flies are attracted away from water, by the horizontally polarised light produced by the panels, to lay eggs on panels, reducing their survival chances[7]. Most solar arrays in in the UK use grid-formed panels with anti-reflective films, so the reflection of polarised light is substantially reduced. Using non-polarising white cell borders on the panels will further reduce attractiveness to insects.

Other potential impacts include severance of ecological connectivity due to positioning of road infrastructure. There may also be direct impacts on habitats through construction and security lighting which may impact foraging and commuting bats, especially on vegetated boundaries.

Natural England recommend the avoidance of solar developments in or near to areas of high ecological value or designated sites. For all proposals, the mitigation hierarchy should be applied where everything is done to first avoid impacts and then minimise impacts on biodiversity, and only as a last resort compensate for losses that cannot be avoided.

The mitigation hierarchy begins with site selection; intensively managed agricultural land is likely to be of least ecological value and have a greater potential to deliver biodiversity net gains, although the best and most versatile agricultural land should be avoided as set out in section 3.1. Ecologically important sites, including SPA (and their associated functionally linked land), SAC, SSSI, NNR and LNR and Local Wildlife Sites should generally be avoided. Sites important for protected or priority species should also be avoided where possible.

Where impacts still exist after avoidance, and minimisation and restoration measures have been taken, the final option is to offset or compensate the losses elsewhere. The mitigation hierarchy applies to both species and habitats.

An example of applying the mitigation hierarchy would be the approach to breeding birds, for example ground nesting species such as Skylark or Curlew. If breeding birds are identified on site, then avoiding installing solar panels on those areas used by breeding birds, being aware of species requirements such as sightlines. If this is not possible then designing adequate areas outside the footprint of the array that are suitable and managed for birds would be the next stage in the hierarchy. Where on-site options are not available then an off-site location would be required for

[5] Montag H, Parker G & Clarkson T. (2016). The effects of solar farms on local biodiversity. A comparative study. Clarkson and Woods & Wychwood Biodiversity.

[6] BirdLife Europe (2011) Meeting Europe's Renewable Energy Targets in Harmony with Nature – Summary Report (eds. Scrase I. and Gove B.). The RSPB, Sandy, UK

[7] Horvath et al (2010). Reducing the Maladaptive Attractiveness of Solar Panels to Polarotactic Insects. Conservation Biology, Vol. 24, No. 6.

compensation works; the area and management that would need to be secured would be dependent on the species and numbers of birds involved.
Various options exist to enhance the biodiversity value of a proposed development, and although interventions to enhance biodiversity will be site specific and informed by ecological survey work, the following general guidance may assist in designing ecological enhancements into ground mounted solar developments.

a) Creation or enhancement of grassland habitats around the boundary of the site and/or under the solar arrays is a key mechanism for delivering biodiversity net gains on most sites. The greatest biodiversity value will be gained from providing a variety of grassland habitats within the development. The creation of species rich grasslands with a high floristic diversity could be complemented with areas of tussock grassland which would provide opportunities for nesting bumblebees and small mammals.
b) Further variety can be incorporated through the inclusion of wild bird seed mixes and pollen and nectar strips.
c) Provision of a diverse range of habitats should always be considered and the inclusion of woodland and wetland habitats should not be discounted within solar farms.
d) Although the provision of woodland might be counter-intuitive given the shading implications; opportunities to incorporate woodland and scrub habitats especially on northern boundaries should be considered as a mechanism to introduce variety into the scheme.
e) Low lying corners of fields can be utilised to create wetland features such as scrapes, ponds or wet grasslands.
f) Boundary features should be created or enhanced through gap filling of existing hedgerows and the planting of new hedgerows to join up with existing features, not only to provide a range of habitats but also to create ecological connectivity. Priority should be given to boundary features that contribute to ecological networks in the wider landscape. Field margins and hedgerows are the main type of boundary feature that should be considered, ditches can also enhance connectivity especially when associated with a margin or buffer strip.
g) Security fencing may act to prohibit animal migration and a gap between the base of the fence and the ground may be required to enable movement of badgers and other wildlife across the landscape.
h) The inclusion artificial features such as nest boxes for a range of bird species or bat boxes and bug hotels can be incorporated in the scheme to encourage the greatest diversity of wildlife.

Biodiversity enhancements should be informed by the physical attributes of the site, existing habitats, the surrounding landscape and the results of species surveys and consultation with the local record centre. The nature of habitats delivered on site should be informed by the potential to enhance populations of local BAP or UK Priority Species.

Further guidance on biodiversity delivery within solar farms is available from the BRE National Solar Centre, Solar Energy UK and Renewable Energies Agency.

Application Requirements:

A Preliminary Ecological Assessment (PEA) and Baseline Habitat Plan will be required in all cases. The PEA will provide information on the habitats on site, present the results of data searches and using this information will recommend any further surveys required to understand the value of the site and the potential impacts arising from development.

Depending on the location and nature of the proposals further surveys may include breeding and / or wintering bird surveys, bat transect surveys, bat surveys of specific structures or trees. Otter and water vole surveys of riparian habitats might be required and evidence or data indicating the presence of other species e.g., badgers, could necessitate survey for those identified species. The Environmental Records Information Centre (ERIC) for the North East of England should be consulted as part of the ecological assessment. Specialist groups may also need to be contacted depending on the nature of the site and the data held by ERIC. Applicant should be aware that since species are active at different times of the year, some ecology surveys may only be suitable within specific months of the year. Sufficient lead in times need to be incorporated into the project to allow for species and habitat surveys to be completed at an appropriate time of year.

A Biodiversity Net Gain Assessment (BNG) should be provided using the appropriate Defra Metric which provides a quantified net gain assessment. This should be considered alongside a qualitative assessment. For example, a BNG Assessment will not capture where a development severs ecological connectivity or impacts a locally rare habitat. Priority species and important species assemblages are not accounted for within the metric and specific compensation might be required for any identified important ecological receptors.

A Biodiversity Management and Monitoring Plan (BMMP) is required at application stage. This document should provide sufficient information to determine that the habitat creation and long-term management is deliverable for both on-site habitats and any off-site habitats created or enhanced. The plan should include appropriate monitoring regimes and review periods. The delivery of the BMMP will be secured through appropriate legal agreements.

A plan will be required that clearly shows habitat types or linear features being retained, enhanced, and created, and the area or length of each habitat type or linear feature; it must be colour-coded so that each habitat type is easily identifiable. Other proposed biodiversity enhancements (including for priority species) and protected species mitigation areas should also be shown on this plan e.g., bird and bat boxes. This information can be placed within the site layout plan, illustrative masterplan, green infrastructure plan or landscape plans. The information on the plan must align with the information held within the Defra metric.

3.4 Cultural Heritage

Proposals should sustain the significance of designated and non-designated heritage assets, including any contribution made by their setting. - County Durham Plan Policy 44 (Historic Environment).

Development that would result in harm to the Outstanding Universal Value of the World Heritage Site or its setting will not be permitted other than in wholly exceptional circumstances. - County Durham Plan Policy 45 (Durham Castle and Cathedral World Heritage Site)

Durham Context:

County Durham has a wide variety of designated heritage assets which include Durham Castle and Cathedral World Heritage Site, and at time of writing 3,026 listed buildings, 93 Conservation Areas, 226 Scheduled Monuments, 17 Registered Parks and Gardens, and 1 Registered Battlefield. These are all identified on the Local Plan Policies Map and also recorded on the Durham Historic Environment Record. The county also has a significant number and diverse range of non-designated heritage assets.

Detailed Guidance:

Heritage assets could be affected by a solar development, either by direct physical change or by a change in the assets setting and therefore altering people's experience of it. In accordance with the NPPF when considering the impact of a solar development on the significance of a designated heritage asset, great weight will be given to the asset's conservation (and the more important the asset, the greater the weight will be). This is irrespective of whether any potential harm amounts to substantial harm, total loss or less than substantial harm to its significance. Where a proposed development will lead to substantial harm to a designated heritage asset, planning permission will be refused, unless it can be demonstrated that the substantial harm is necessary to achieve substantial public benefits that outweigh that harm. When considering applications that directly or indirectly affect non-designated heritage assets, consideration will be given to the scale of any harm or loss and the significance of the heritage asset.

A detailed Heritage Impact Assessment should be undertaken to guide the site selection and the design process. This should identify all heritage assets located within, immediately adjacent or in the wider setting of the site. The search area for the survey should be agreed with the Design and Conservation Team as part of the development management process. The assessment should identify the extent and contribution of the setting, define the impacts of development and where appropriate identify potential mitigation or enhancement measures.

Development must seek to protect the outstanding universal value (OUV) of the WHS through conservation of the components that contribute to its OUV, including the visual drama of the Cathedral and Castle on the peninsula. The setting of the WHS, as set out in the WHS Management Plan, is formed in part by an 'inner bowl' contained by nearby ridges and spurs incised by the meandering River Wear, and a more diffuse 'outer bowl' contained by more distant high ground including the limestone escarpment to the east and south, and higher spurs and ridges to the west. Commercial scale solar development within the setting of the WHS can detract from the visual quality of its setting, and the experience of the WHS, including views towards and from the WHS and on this basis is likely to be strongly resisted.

Solar development has potential to impact on archaeology through ground disturbance from ground levelling, trenching, foundations, and fencing. The design and layout of development should be informed by consultation with the Historic Environment Record (HER) maintained by the Council. Where relevant, archaeological desk-based assessments and geophysical survey reports will be required. Such assessments should demonstrate the use of appropriately qualified professional expertise. Identified archaeology can be protected from impacts, either by exclusion or protection from ground impacts. Where development proposals seek to offset damage to archaeological sites by recording them prior to development, the Council will require intrusive field evaluation to inform their decision making.

Application Requirements:

All applications that could affect heritage assets (designated and non-designated) must be accompanied by a Heritage Statement (inclusive of Impact Assessment) prepared by a heritage specialist. The Statement should demonstrate an understanding of the asset's significance, identify the extent and contribution of setting, define the impacts of development and where appropriate suggest mitigation or enhancement measures.

For greenfield sites of 1ha or more or where proposals are likely to affect sites of known importance or sites of significant archaeological potential, background research followed up by archaeological investigation will be required prior to their determination. Recording in an appropriate form for inclusion in the HER and mitigating as necessary.

An assessment to evaluate the impact on a historic landscape may also be required, to define historic boundaries, ponds, hedgerows, historic and ancient woodland, and other landscape features which contribute to the significance of a historic landscape.

3.5 Glint and Glare

It will need to be demonstrated that there will be no unacceptable impact, either individually or cumulatively, on amenity. – County Durham Plan Policy 31 (Amenity and Pollution).

Within safeguarding areas, it must be demonstrated proposals would not prejudice the safety of air traffic or air traffic services and would not have an unacceptable adverse impact upon the operation of the Peterlee Drop Zone unless the benefits of the proposed development clearly outweigh the resulting harm. – County Durham Plan Policy 28 (Safeguarded Areas)

Durham Context:

Durham contains several 'receptors' which could be sensitive to the impact of glint and glare. These include within the county Fishburn Airfield, Shotton Airfield and Peterlee Parachute Drop Zone which are subject to a Safeguarding Area. The Durham Tees Valley and Newcastle International Airports Safeguarding Area also encompasses part of the county. Safeguarding zones are identified on the policies map, in addition to Parachute Landing Areas, Overshoots and designated Drop

Zones. Other sensitive receptors include the Rail Network, those living and working here and users of the highways and PROW which intersect the county.
Detailed Guidance:

Glint is a momentary flash of bright light typically received by moving receptors or from moving reflectors. Glare is a continuous source of bright light typically received by static receptors or from large reflective surfaces. Solar reflection is sometimes used to refer to both. Glint and glare have the potential to impact on sensitive receptors including residents, users of PROW, aircraft, rail, and road. It could cause distraction for pilots or could imitate airfield lighting. Glint and glare can be a particular issue if 'tracking' panels are proposed as these may cause differential impacts depending on the season and time of day.

Panels should be located and designed to avoid glint and glare. It will need to be determined which sensitive receptors are in the surrounding area and the potential for these to be impacted by solar reflections from the development, and the significance of any reflections. Applications should fully consider the reflective capacity of all the materials used including panels, frames and supports. Where necessary, appropriate mitigation measures, such as screening, should be employed to ensure that harmful impacts are avoided.

Where relevant airports and rail operators, the Local Highway Authority and National Highways should be engaged at an early stage. The Health and Safety Executive, Durham Tees Valley Airport, Newcastle International Airport and the Secretary of State for Business Innovation and Skills, acting through the Meteorological Office, will be consulted, as appropriate, on planning applications within officially safeguarded areas and their surrounding defined consultation zones. Development proposals which would prejudice the air safety of airports and airfields will not be permitted within safeguarding zones.

Application Requirements:

A Glint and Glare Assessment will be required prepared by a suitably qualified consultant.

3.6 Residential Amenity

Proposals which will have an unacceptable impact such as through noise and vibration, light pollution, or other sources of pollution, either individually or cumulatively, will not be permitted unless satisfactory mitigation measures can be demonstrated. – County Durham Plan Policy 31 (Amenity and Pollution)

Durham Context:

The county contains areas of tranquillity which are sensitive to light pollution, such as the North Pennines AONB and open countryside. Uses which are sensitive to amenity impacts (referred to as 'sensitive receptors') tend to be in urban areas. These include housing, schools, hospitals, and care homes.

Detailed Guidance:

In the case of solar development impacts from noise, dust and vibrations are predominantly likely to be during construction, although associated transformers and inverters can emit noise when operational. Medium scale solar installations are more likely to be in proximity to sensitive receptors, as they are generally associate with an existing business or community use.

Proposals which have the potential to impact on the general amenity and health of people nearby will need to demonstrate that there will be no unacceptable impact. Any noise emitting equipment should be located away from noise sensitive receptors, and mitigation measures such as acoustic enclosures may be required.

Dust monitoring may be needed where dust generating activities are to be carried out close to sensitive receptors. This is defined as within 100m of the site boundary. The assessment of the impact of dust pollution during construction will need to consider the impact on air quality from emissions of PM10 (Particulate Matter below 10 microns) and PM2.5 (Particulate Matter below 2.5 microns) and the potential for visible dust emissions to give rise to unacceptable amenity impacts or to a statutory nuisance to neighbouring sensitive receptors. Measures will need to be put in place to prevent mud and other materials migrating onto the highway.

Where lighting is required, it will need to be demonstrated that the lighting proposed is the minimum necessary for functional or security purposes. Particular attention will be paid to areas where tranquillity and dark skies are valued and may also be sensitive to light pollution, such as the North Pennines AONB and open countryside.

Application Requirements:

A Noise Assessment will be required and should cover the construction, operation, and decommissioning phases of the proposal to identify any potential impacts and necessary mitigation measures.

A Construction Management Plan will be required for all major developments with existing sensitive receptors within 100m of the site boundary. It should include measures to control and monitor emission of dust and dirt, noise, and vibration.

A Lighting Assessment will be required for developments which would involve the provision of significant external lighting (e.g., floodlights or security lighting) that may have an adverse impact on residential amenity, the character of the open countryside or a heritage asset.

3.7 Recreational Amenity and Public Rights of Way

Development will be expected to maintain and protect, and where appropriate improve, the county's green infrastructure network. Development proposals should incorporate appropriate Green Infrastructure that is integrated into the wider network, which maintains and improves biodiversity, landscape character, increases opportunities for healthy living and contributes to healthy ecosystems and climate change objectives. All Public Rights of Way impacted

upon by a proposal will remain usable during and post construction. – Durham County Plan Policy 26 (Green Infrastructure)

Durham Context

The county benefits from a Green Infrastructure network which fulfils several important functions including recreation and sport. As well as public open space, the network includes wildlife sites, river corridors, coastlines, mountains, moorland, woodland and agricultural land and is integral to the health and quality of life of sustainable communities. It contains an extensive network of trails and paths which connect the county's many towns and villages. Public Rights of Way (PROW) can be categorised as: public footpath (walkers only), public bridleway (walker, horse riders and cyclists only), restricted byway (walker, horse riders, cyclists and non-motor vehicles) and public byway (walkers, horse riders, cyclists and all other vehicles). All recorded PROW are mapped on the Definitive Public Rights of Way map. Details of current applications to record additional bridleways on the map can be found on the PROW webpage. PROW are one element of the wider access network, which also includes railway paths, permissive paths, promoted routes and cycle routes.

Detailed Guidance:

The Council has produced a Strategic Green Infrastructure Framework which sets out the principles and recommendations for Green Infrastructure in the county, and the conservation and enhancement of the existing network. This should help inform the location and design of any proposals.

The access network, including PROW, is to retain its recreational amenity and character and be integrated as part of the proposal. In the first instance applicants should identify all recorded and proposed PROW within and in the vicinity of the site. Where there are potential impacts on these from the development early engagement with the Access and Rights of Way Team will be needed.

The area to be retained will be dependent on the character of the PROW. For example, footpaths might only be 1.8m wide, whilst bridleways can be much wider. Additional planting may be needed to provide screening and protect users. In such cases, a long-term maintenance strategy and appropriate buffer will be required to ensure any planting does not encroach onto the PROW. Proposals are encouraged to consider how they can enhance the existing PROW and wider accessibility network. Measures should also be put in place to protect users during construction. In exceptional circumstances a diversion may be agreed by the Access and Rights of Way Team. In these cases, it must be demonstrated the new route is of at least equivalent quality, direct, convenient, and attractive and must not have a detrimental impact on environmental or heritage assets. It should also be noted, whilst the Access and Rights of Way Team might accept an application to divert a PROW, any such proposal would still have to be subject to a statutory consultation process with the potential for objections and determination at Public Inquiry, entirely separate to the planning process.

Application Requirements:

Any impacts on PROW should be addressed in the Design and Access Statement. The Construction Management Plan will need to address how users will be protected during construction.

3.8 Flooding and Drainage

The development, including the access, will be safe, without increasing or exacerbating flood risk elsewhere, any residual risk can be safely managed and where possible will reduce flood risk overall. There should be no net increase in surface water runoff for the lifetime of the development. Where greenfield sites are to be developed, the runoff rates must not exceed and where possible should reduce the existing greenfield runoff. – County Durham Plan Policy 35 (Water Management)

Durham Context:

In County Durham flood risk is mainly fluvial, from rivers and watercourses, although we are seeing increasing events of surface and ground water flooding due to climate change and development pressure. River flooding within the county is primarily due to the overtopping of the River Wear and its tributaries in towns and villages along its length. The county also has a coastal frontage which extends from Seaham in the north to Crimdon Park in the south. There are also several water storage reservoirs in the county. Whilst localised surface water flooding is more common in developed areas, incidents have occurred in rural areas. The Environment Agency provides a map of flood zones.

Detailed Guidance:

It will need to be demonstrated that the solar development will be safe from all forms of flooding for its lifetime, taking climate change into account. All solar development (solar farms and infrastructure for electricity generation) is defined as essential infrastructure in the NPPF. Where proposed in flood zone 2 and 3 the sequential test will need to be passed. It will need to be demonstrated that it is not possible to locate the solar development in areas of lower flood risk. In flood zone 3 the exceptions test will also need to be passed. It will need to be demonstrated that the proposal will deliver wider sustainability benefits to the community and be safe for its lifetime, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall. In addition, in flood zone 3 solar development must be constructed to remain operational and safe in times of flood, and in zone 3b also result in no net loss of floodplain storage and not impede water flows.

Solar development has the potential to impact on surface water flow through construction impacts and to solar arrays concentrating surface water flow from rainfall. As a result, a greater volume of surface water could potentially enter watercourses, or flow to adjacent areas at a greater rate than would otherwise occur in greenfield conditions.

The site's soils and their permeability will be a major consideration, as siting on impermeable clay soils will lead to runoff channel forming, erosion and potential silting of watercourses and possible flooding. To counter ground compaction from

construction machinery, sub soiling by chisel plough should be carried out to break up any natural hard sub soils or construction compacted ground beneath the surface. There should be a soil management plan in place to ensure that the soil is kept in a good condition both during and after construction, as well as for decommissioning. Panels should be sited along the contour of land, wherever possible, so that the water flow between rows is dispersed evenly beneath them. Localised Sustainable Drainage Systems (SuDS) should be utilised to control runoff. This could include:

a) Bunds, filter drains or other measures to interrupt flows of water between structures, disperse water flows over the surface and promote infiltration into the soils.
b) Wide grassed filter strips at the downstream side of the panels, with grass at a long length to interrupt water flows and to promote infiltration.
c) Gravel filled filter drains or swales to help infiltrate run-off (where ground conditions allow).

Arrangements must be put in place for the whole life management and maintenance of SuDS.

The permeability of material used for the access tracks should be taken into consideration. Access roads should take account of the infiltration capacity of the soil. Where feasible, permeable materials should be used, or the road should be positively drained. Drainage from access roads may require attenuation control to the outflow before discharging to an identified location (e.g., a watercourse) or soakaway (where ground conditions allow).
Application Requirements:

A Flood Risk Assessment (FRA) and Surface Water Drainage Strategy is required where sites are:

- within Flood Zone 2 or 3; or
- of 1ha or more and in Flood Zone 1.

The FRA should review all existing flood risks and identify any necessary mitigation measures during the construction, operational and decommissioning phases. The lifetime of the development should be made explicit to ensure that mitigation measures use the appropriate climate change allowance for storage calculations for attenuation features.

The following information shall be included within the Surface Water Drainage Strategy:

a) Assessment of the existing soil and sub soils and their permeability.
b) A review of the existing surface water drainage mechanisms.
c) Assessment of the impact from the run-off and how this will be controlled.
d) Details, plans, sections and calculations where necessary to demonstrate that there will be no increase in flood risk, and total discharge from the site will be equivalent to QBAR Rate for all events up to and including the 1 in 100 + 40% climate change factor for the lifetime of the development.

e) Details of the future site management plan including an inspection and maintenance plan for the areas around and beneath the structures.
f) Details and sections of any new access roads identifying how these will be drained.
g) A construction management plan providing details of how the site and any temporary and permanent access roads will be drained during the installation and decommissioning. This assessment should review how the site drainage characteristics will be temporarily changed following removal of any crops, stubble or grasslands.
h) Identify any existing watercourses which may require crossing to form temporary or permanent access tracks and include details of any localised culverting and assessments to demonstrate that the culverts will be able to accept the flow from the 1 in 100+ 40% Climate Change storm event with an agreed freeboard. Note that where any works affecting a watercourse even of a temporary nature are involved, then an Ordinary watercourse Consent approval will be required from Durham County Council Drainage and Coastal Protection Section.

3.9 Site Restoration

Developments will need to include a satisfactory scheme to restore the site to a quality of at least its original condition once operations have ceased. – County Durham Plan Policy 33 (Renewable and Low Carbon Energy)

Detailed Guidance:

Applications need to include outline proposals for the timely restoration of the land to its previous use at the end of the operational life of the solar panels, which is generally between 25 and 40 years. Restoration means that all development, including ancillary infrastructure, footings and access tracks should be removed from the site and any soils and vegetation restored, to ensure the land is as a minimum returned to the condition it was in before the development. Any landscape or biodiversity enhancements delivered through the development should be retained. Restoration should be completed as soon as practicably possible. This will be secured by bond, legal agreement, or condition.

Application Requirements:

A plan for decommissioning and restoration which could form part of the LVIA.

4.0 Large scale: commercial solar farms

A solar farm is a large-scale photovoltaic power system which is connected to the national grid. These are generally commercial enterprises although there are some examples of community ownership models. For operational reasons solar farms need to be in proximity to a substation with capacity. Northern Power Grid generation availability heat map provides an indication of substation capacity, although this is very much a snapshot in time. Whilst appreciating this is a key constraint on where solar farms can be located, this SPD sets out key planning considerations to help direct solar farms to the most appropriate locations.

Figure 3: Morrison Busty Solar Farm

4.1 Use of Land

Please refer to guidance in paragraph 3.1.

4.2 Landscape and Townscape

Proposals should contribute positively to an area's character, identity, heritage significance, townscape and landscape features, helping to create and reinforce locally distinctive and sustainable communities. - County Durham Plan Policy 29 (Sustainable Design)

Any proposal should not cause unacceptable harm to the character, quality, or distinctiveness of the landscape, or to important features or views. Proposals will be expected to incorporate appropriate measures to mitigate adverse landscape and visual effects. – County Durham Plan Policy 39 (Landscape) Great weight will be given to conserving the landscape and scenic beauty of the North Pennines Area of Outstanding Natural Beauty (AONB). Major development will only be permitted in the AONB in exceptional circumstances and where it can be demonstrated to be in the public interest, in accordance with national policy. - County Durham Plan Policy 38 (North Pennines AONB)
Durham Context

The Durham Landscape is one of enormous contrast and diversity. It includes nationally important landscapes including the North Pennines Area of High Landscape Value (AONB) and registered historic parks and gardens. It also includes locally important landscapes identified as Areas of higher Landscape Value (AHLV) in the CDP and locally listed Historic Parks, Gardens and Designed Landscapes. All of these and other local landscapes vary in their sensitivity to solar developments. Further information on the landscape of the county can be found on the Durham Landscape website.

- The County Durham Landscape Character Assessment (2008) provides detailed information about the character of the county's landscape from the strategic to the local level.
- The County Durham Landscape Strategy (2008) is the Council's adopted strategy for the landscape. It analyses the issues affecting the landscape and sets out objectives and priorities for conservation and improvement specific to each character area. One overarching objective for new energy development is that it respects the character of the local landscape and built environment.
- The County Durham Landscape Guidelines cover a range of topics including trees, woodlands and forestry, hedges and grasslands and provide development and land management guidelines for individual landscape types.
- The County Durham Landscape Value Assessment (2019) provides information on the valued attributes of local landscapes.

Detailed Guidance:

Development proposals should be informed by an understanding of the character and sensitivities of the local landscape. Large scale solar farms are generally developed in the countryside where solar panels are a novel form of development that can detract from its rural character by introducing large tracts of man-made structures, particularly where they are visually prominent. The landscape of the countryside on the edge of towns shares that sensitivity, particularly in smaller rural gaps between settlements where solar development can lead to a degree of visual coalescence.

Large scale development can be difficult to accommodate in rural landscapes without locally significant effects on landscape character. While some impacts of that kind might need to be accommodated as part of the transformation of our energy supply infrastructure, they can be reduced by ensuring that sites are sensitively located and well designed.

Location

a) Choose locations in landscapes that have a lower sensitivity to solar development (see Table 1).
b) Choose locations that are naturally well screened in public views by existing topography and vegetation or are capable of being screened with new planting within a relatively short timescale.
c) Avoid elevated or sloping sites that are difficult to screen.
d) Avoid locations where development would erode small or important gaps between settlements.

e) Avoid sensitive locations such as historic parks and gardens and features of historical interest such as old field systems, rigg and furrow, strip lynchets and other earthworks.
f) Avoid sites with well-developed and well-used public rights of way networks where panels can dominate the user's experience of the countryside.
g) Avoid sites that figure in important views or the settings of sensitive heritage assets.
h) Consider how the scheme fits with other operational and consented schemes to minimise cumulative impacts.

Table 1: landscape sensitivity

Lower sensitivity	**Higher sensitivity**
Flat, gently rolling or gently undulating terrain	Elevated sloping ground, strongly rolling or strongly undulating terrain, valley sides, sites overlooked from higher ground
Enclosed landscapes	Open landscapes
Landscapes experienced in shallow or interrupted views	Landscape experienced in deep or panoramic views
Complex and varied landcover; marked seasonal changes in landcover	Simple or consistent landcover; modest seasonal changes in landcover
Large scale patterns of enclosure	Small scale patterns of enclosure
Low historical interest: modern, fragmented or amalgamated field systems. Previously developed land	High historical interest: old or intact field systems, rigg and furrow and strip lynchets. Historic parks and designed landscapes.
Landscapes with little recreational access	Landscapes with high levels of recreational access
Landscapes that form the setting of few heritage assets	Landscapes that form the setting of many, or particularly sensitive, heritage assets
Landscapes that don't feature in important views	Landscapes that feature prominently in important views
Landscapes with high levels of urban or industrial development and infrastructure	Undeveloped landscapes with a strong sense of remoteness or naturalness
Low scenic quality. Many detractive elements	High scenic value. Few detractive elements

Layout and design

i) Fit the scheme into the existing landscape framework, preserving landscape features such as hedges, walls, woodlands and tree lines, watercourses and wetlands.
j) Avoid sensitive features such as old rigg and furrow and strip lynchets.
k) Keep the layout compact or interlock with existing field and woodland patterns.
l) Avoid detached or scattered parcels unless it meets specific design objectives such as reducing visual effects.

m) Run arrays along rather than across the contours on sloping sites.
n) Fit arrays comfortably into existing fields, avoiding long, ragged or staggered edges.
o) Allow sufficient space around existing hedges, trees and woodland edges to avoid shading, facilitate management and enhance their ecological value.
p) Use existing access points and field tracks where possible.
q) Where the site is to be managed by grazing consider this in the layout having regard to the supervision and movement of livestock.

Panels and ancillary elements

r) Select panels and supports to be as low as possible to keep them in scale with local field boundaries.
s) Use panels with low potential for glint or glare.
t) Use low impact and reversible mountings such as pile driven or ground screw anchors.
u) Minimise the development of new access tracks and areas of hard surfacing: use reinforced grass or other green solutions: use agricultural or 4WD vehicles to service the facilities.
v) Avoid urban detailing at the site access: kerbs, signage etc.
w) Bury cables wherever possible (avoiding damage to trees, hedges, or archaeology) to minimise their impact.
x) House co-located batteries and inverters in existing buildings where possible. Where new structures are needed design them to reflect the local vernacular and locate close to existing buildings or other features.
y) For larger battery storage arrays choose well screened locations and use visually recessive colours for battery modules.
z) Avoid the use of security fencing where possible. Use visually light fencing where it is necessary. Set perimeter fences back from hedge boundaries to reduce their visibility from outside the site.
aa) Avoid the use of security lighting where possible. Where it is necessary provide to the minimum required and design to prevent overspill and glare.
bb) Avoid the use of pole-mounted CCTV where possible.

Mitigation

cc) Where there are trees or hedges within or around the site commission an Arboricultural Impact Assessment (AIA) and Arboricultural Method Statement (AMS) to ensure that they are adequately protected through the development phase.
dd) Consider the effects on the development in key views. Manage existing landscape features and establish new features to help screen and assimilate it into the landscape.
ee) Ensure that screening features are in keeping with the local landscape (hedges, walls, tree lines, woodlands). Use species that are native to or characteristic of the locality.
ff) Allow hedges to grow to a taller managed height: this can achieve screening more rapidly than new planting and avoid them being obscured by development in wider views.

gg) Take opportunities to restore existing, relict or lost landscape features to leave a beneficial legacy in the long term.
hh) Manage the site through a conservation grazing regime to maximise biodiversity.
ii) Have a Management Plan in place for the lifetime of the development that captures landscape and visual objectives alongside other factors such as biodiversity.

Application Requirements:

For large scale development a Landscape and Visual Impact Assessment (LVIA) will be required. This should be carried out in accordance with the Guidelines for Landscape and Visual Impact Assessment produced by the Landscape Institute and the Institute of Environmental Management and Assessment (3rd Edition 2013) and undertaken by a suitably qualified person.

The LVIA should have regard to the following documents, electronic copies of which can be obtained from the Landscape and Arboriculture section:

- County Durham Landscape Character Assessment (2008)
- County Durham Landscape Strategy (2008)
- County Durham Landscape Guidelines
- County Durham Landscape Value Assessment (2019)

And where appropriate:

- County Durham Plan Local Landscape Designations Review (2019)
- The North Pennines AONB Planning Guidelines and Building Design Guidelines.

The study area for the LVIA and the location of representative and/or important viewpoints used in the study should be agreed with the Council's Landscape Officer. Photographs and visualisations included as part of the analysis of views should conform to the standards set out in Visual Representation of Development Proposals (Landscape Institute Technical Guidance note 06/19).

Where there are trees or hedges on or close to the site a Tree Survey, Arboricultural Impact Assessment (AIA) and Arboricultural Method Statement (AMS) will be required. These should be carried out in accordance with BS5837: 2012 and undertaken by a suitably qualified arboriculturist.

The LVIA and Arboricultural studies should be commissioned at an early stage to inform the location, design and management of the development.

4.3 Biodiversity and Nature Conservation

Please refer to guidance in paragraph 3.3.

4.4 Cultural Heritage

Please refer to guidance in paragraph 3.4.

4.5 Glint and Glare

Please refer to guidance in paragraph 3.5.

4.6 Residential Amenity

Please refer to guidance in paragraph 3.6.

4.7 Public Rights of Way

Please refer to guidance in paragraph 3.7.

4.8 Flooding and Drainage

Please refer to guidance in paragraph 3.8.

4.9 Site Restoration

Please refer to guidance in paragraph 3.9.

4.10 Green Belt

Green Belt has an important function in preventing urban sprawl by keeping land permanently open. The NPPF states substantial weight should be given to any harm to the Green Belt. Elements of many renewable energy projects will comprise inappropriate development in the Green Belt and very special circumstances will need to be demonstrated. Very special circumstances will not exist unless it is evidenced the potential harm to the Green Belt is clearly outweighed by other considerations. – NPPF (Section 13 Protecting Green Belt land), County Durham Plan Policy 20 (Green Belt)

Durham Context:

Land designated as Green Belt in the county covers an area of 8,726 hectares. This equates to just under 4% of land in the county. The extent of the Green Belt is shown on the policies map. It can be broken down into three areas. The Durham City Green Belt which surrounds the City of Durham, which broadly aligns with an Area of High Landscape Value. The original purpose of this Green Belt was to preserve the setting of Durham as a historic town. The North Durham extension to the Tyne and Wear Green Belt which comprises two parts, the North East Durham Green Belt located to the north of Seaham and the North Durham Green Belt located to the north of Chester-le-Street. The original purpose of the North Durham extension was to check the unrestricted sprawl of large built-up areas within Tyne and Wear.

Detailed Guidance:

Given that only 4% of land in County Durham comprises Green Belt it is considered there is sufficient land outside of the Green Belt which could accommodate solar

farm developments. Whilst in principle very special circumstances could be put forward, it is unlikely that such circumstances would out weight the harm to the Green Belt. It would need to be robustly demonstrated the solar farm could not be located elsewhere in the county due to locational requirements.

Application Requirements:

Evidence of very special circumstances, which would outweigh the harm to the Green Belt, including evidence the solar farm could not be accommodated on land in the county outside of the Green Belt.

4.11 Access and Traffic

Proposals should ensure that any vehicular traffic generated, following the implementation of sustainable transport measures, can be safely accommodated on the local and strategic highway network and does not cause an unacceptable increase in congestion or air pollution, or detriment to road safety. – County Durham Plan Policy 21 (Delivering Sustainable Transport)

Detailed Guidance:

In the case of solar farms most transport impacts will be during construction, with limited maintenance vehicle visits during operation. It may be necessary to improve access routes into the site. In this scenario the Local Highway Authority and National Highways should be engaged at an early stage.

Application Requirements:

Where appropriate a Transport Assessment or Transport Statement, and Travel Plan will be required. The Construction Management Plan will need to address impacts of construction traffic.

4.12 Contamination and Soil

Where on previously developed land any existing despoiled, degraded, derelict, contaminated or unstable land issues should be satisfactorily addressed by appropriate mitigation measures prior to construction. – County Durham Plan Policy 32 (Despoiled, Degraded, Derelict, Contaminated and Unstable Land)

All development proposals relating to previously undeveloped land must demonstrate that soil resources will be managed and conserved in a viable condition and used sustainably in line with accepted best practice. - County Durham Plan Policy 14 (Best and Most Versatile Agricultural Land and Soil Resource)

Durham Context:

Large parts of County Durham have been identified by the Coal Authority as 'Development High Risk Areas' and 'Development Low Risk Areas' due to the known occurrence of coal mining legacy issues and related hazards. Contaminated land in the county can arise from several sources typically associated with some types of industrial and manufacturing uses such as gas, coke, chemical and steel works. While contamination is more likely to arise in former industrial areas, it can also occur in other locations, including in the countryside. There is also despoiled land, which is primarily where mineral resources have been removed.

Detailed Guidance:

It is essential that the developer undertakes investigations and risk assessments and any necessary remedial measures to ensure that any despoiled, degraded, derelict, contaminated and unstable land issues are satisfactorily addressed.

The Coal Authority does not as standard require a Coal Mining Risk Assessment for solar arrays as ground disturbance is generally minimal. However, where works require the installation of cabling or other infrastructure a risk assessment may be required. In such cases the Coal Authority will be consulted.

Soil is a fundamental and finite resource that fulfils many important functions and ecosystem services. Where soil stripping is required, topsoil and subsoil should be stripped, stored, and replaced separately to minimise soil damage and to provide optimal conditions for site restoration. Bringing alien soil material onto the development site should be avoided.

Application Requirements:

A Land Contamination Assessment will be required for development on brownfield land where contamination could be an issue due to the previous use of the site (or adjacent land) and for new development within 250 metres of current or former landfill sites.

A Coal Mining Risk Assessment will be required within Coal Mining High Risk Areas where works will involve significant ground works (i.e., beyond surface scraping and installation of loose materials.)

A Soil Resource Management Strategy will be required for any development on a site of 1ha or more on previously undeveloped land. To include the methodology for soil stripping, storage, and replacement.

4.13 Associated Infrastructure

Proposals will be permitted for new or extensions to existing energy generation where it can be demonstrated that the scheme will not cause significant adverse impacts or that its benefits outweigh any adverse negative effects. – County Durham Plan Policy 27 (Utilities, Telecommunications and Other Broadcast Infrastructure)

In addition to solar panels, solar developments include supporting infrastructure including inverters which convert energy from the panel from direct current (DC) into useable alternating current (AC), batteries to store the electricity and cabling. Commercial solar farms need to be in proximity to a substation with capacity on the National Grid. Although rare, a solar farm proposal could include a new substation and associated cabling.

Where a new substation is proposed, operators will be required to provide evidence that they have explored the possibility of alternative existing substations, and this was not possible due to technical and operational constraints. This is of particular importance where the site falls within an area of sensitivity.

Batteries can help to maximise the efficiency of an installation by allowing energy to be stored. Battery storage should be considered as part of all solar developments. Batteries and inverters should be co-located in existing buildings where possible, particularly where these are in the local vernacular and located near the site. New battery and inverter buildings should match the local vernacular, be carefully sited, and should generally avoid high or exposed locations. Existing and locally occurring vegetation should be used to screen new buildings. Batteries and inverters should be located away from noise sensitive development.

Cabling should be buried underground to minimise their impact on landscape character and visual amenity. They should avoid areas of ecological or archaeological sensitivity, damage to trees or hedges. Connection to the grid may cause an accumulation of overhead wiring, if this occurs in sensitive areas, the cumulative impact will need to be assessed.
Application Requirements:

Design and Access Statements should clearly set out where invertors and batteries will be located and how they will be designed. The nature and extent of cabling should be shown on the site plan.

A Noise Impact Assessment may be required where batteries or inverters would be in proximity to noise sensitive uses.

5.0 Planning process

5.1 Pre-Application Advice

Pre-Application advice is strongly encouraged for medium and large-scale solar developments. This will avoid abortive work by helping to identify if a proposal is likely to be acceptable. Advice will be provided on the supporting studies required and the level of detail they should contain based on the sensitivity of the site, the nature of the proposal and its potential effects.

Pre-Application enquiries can be submitted online via the Council's planning advice and enquiries webpage.

5.2 Community Engagement and Benefit

The Council will expect developers to engage with the community prior to submission of a solar farm application. Through this process an applicant will be able to explore areas of concern, options for mitigation and potential benefits that their proposal could provide to the local area. Community benefits associated with renewable energy schemes can help to give a community a sense of ownership and address their concerns over development. Applicants are also encouraged to outline the benefits of their proposal within their planning application. In determining planning applications for such projects and in accordance with CDP Policy 33 significant weight will be given to the achievement of wider social, environmental and economic benefits. Benefits could include employment and skills and local energy generation.

For community benefits to be secured through planning obligations (s106) via a legal agreement they must be directly related to the development; necessary to make the development acceptable in planning terms; and fairly and reasonably related in scale and kind to the proposal. It should be noted community funds or investments (e.g., Community Benefits Trust, local share issue, community ownership) typically cannot be considered as part of the decision-making process on planning applications. They are a matter for discussion between the developer and the community. Proposals for renewable energy development should be developed through local community engagement and, where appropriate, deliver local community benefits. The provision of community funds and other community investment typically do not meet the criteria set out for planning obligations, and as such cannot be considered as part of the decision making process on planning applications.

The Council's Statement of Community Involvement provides further guidance on appropriate consultation methods and how the results of community consultation should be used.

In the case of the installation of small and medium size solar developments, it is advisable to engage with neighbouring occupiers before submitting a planning application.

5.3 Environmental Impact Assessment

Certain solar developments require Environmental Impact Assessment (EIA) under Regulations which implement the EU's Environmental Impact Assessment Directive. Solar farm developments are not specifically listed in the Town and Country Planning (Environmental Impact Assessment) Regulations 2017. However, Schedule 2 of the Regulations specify that any industrial energy installation producing electricity, steam, and hot water, which exceeds 0.5ha could potentially be EIA development. Requests for EIA Screening and Scoping can be made via planning@durham.gov.uk.

5.4 Submitting a Planning Application

A Planning Performance Agreement (PPA) is an agreement between a developer and the local planning authority setting out who will do what and by when. In the case of solar farms, a PPA is encouraged and will facilitate better engagement between parties.

The Council's validation checklist sets out validation requirements for planning applications. In the case of solar farm developments, engagement is encouraged prior to submission and will avoid delays in the application being validated.