

Consultation on Draft  
Guidance Document

**Designing for  
Renewable Energy  
in Wales**

## About us

Since 1978, Solar Energy UK has worked to promote the benefits of solar energy and to make its adoption easy and profitable for domestic and commercial users. A not-for-profit association, we are funded entirely by our membership, which includes installers, manufacturers, distributors, large-scale developers, investors, and law firms.

Our mission is to empower the UK solar transformation. We are catalysing our members to pave the way for 70GW of solar energy capacity by 2035. We represent solar heat, solar power and energy storage, with a proven track record of securing breakthroughs for all three.

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- Would you like this response to remain confidential? No
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## Introduction

We welcome the second opportunity to feed into the development of the Design Commission for Wales' Renewable Energy Guidance. If Wales is to deliver 100% of its energy needs through renewable technologies by 2035, solar will undoubtedly need to play a core role.

Solar is a versatile technology and able to be deployed at both rooftop and ground mount scale. The industry is committed to the delivery of well-designed and well managed solar farms that not only play a significant role in the delivery of clean energy but tackling wider challenges such as climate change and biodiversity loss.

We thank you for taking our response into consideration.

### **1. Does the draft guide include the key design considerations for large-scale wind and solar energy developments?**

We welcome the language used within the consultation outlining the key design considerations (landscape and visual impact, natural capital and considerations to community engagement and local support) for large-scale solar farms. We are pleased that our feedback from the previous iteration of this consultation has been included and the guidance has separated design considerations for onshore wind and solar. As a result, the guidance is clearer and more accessible.

With regards to site selection and the text in chapter 6.3, we agree that land type is a key characteristic when selecting suitable sites and that when selecting a site, developers should look to utilise previously developed land for example brownfield sites, contaminated land, or land of lower agricultural quality (grades 3b,4,5).

However, due to the size of solar farms, identifying land which does not have any land classified as Best and Most Versatile (BMV) is a significant challenge especially when balancing competing design objectives e.g. shading, screening, community impact, construction access and grid connection. Moreover, in some instances, BMV land may be only in small parcels or be inaccessible but be suitable as part solar site package. We therefore, would suggest that this is recognised more clearly in the guidance.

Land type should be considered on a case-by-case basis and weighed against the ability of a proposed development to provide mitigation and enhancement; for example, a development on BMV cropland may have greater potential to deliver biodiversity net gain or more suitable for continued sheep grazing.

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The guidance should clearly state that land type should not be a predominating factor in determining the suitability of the site location and all design considerations should be reviewed on an equal footing otherwise this could threaten both existing and emerging Welsh Government targets for renewable energy.

The consultation outlines the potential for solar farms to deliver multifunctional land use (providing clean green energy, improving biodiversity and supporting the continuation of some agricultural practises e.g. sheep grazing) which we strongly commend. As mentioned in Chapter 6.7, well-managed and well-designed solar farms have the potential to support biodiversity and make significant contributions to addressing biodiversity loss.

In May 2023, Solar Energy UK published a report outlining the ecological trends found across 37 solar sites in the UK. The report highlights the positive relationships between solar farms and mammals, birds, botany and invertebrates. <sup>1</sup>

As an example, the proposed Penpergwn Solar Farm, a 32MW farm outside of Abergavenny was approved in February 2022 and includes a mix of grade 2, 3a and 3b land. The land has been used to graze sheep and has been designed to continue doing so whilst also producing energy for 8,093 homes annually. The plan also includes a community orchard, proposed wildflower meadows throughout the site linking to existing footpaths, new tree belts to screen views, hedgerow planting, reinforcing existing hedgerows to promote species diversity and green corridor, bee banks, badger gates, dormice nests, reptile hibernacula and invertebrate hotels will be constructed. <sup>2</sup>

The consultation fails to recognise the potential opportunities to co-locate solar and onshore wind farms. Wind and solar are complementary for example, seasonally, wind reaches peak production in the winter and solar reaches peak production in the summer. Daily when pressure is higher the wind speed reduces but there are sunnier periods and when pressure drops, wind picks up while it becomes cloudier. Co-locating technologies increase the total energy production of the land, maximises the capacity factor of the grid connection and allows for the sharing of substations.

Additionally, many solar farm developers are now seeking to co-locate grid-scale battery storage systems with their projects. This helps to alleviate periods of lower solar generation by storing energy produced at peak times, for later use. We would welcome further consideration of co-location in the design of both onshore wind and solar, highlighting opportunities and challenges.

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<sup>1</sup> Solar Habitat: A Look into ecological trends on solar farms in the UK • Solar Energy UK

<sup>2</sup> Penpergwm Solar Farm | Renewable Connections

The text within chapter 4.8 considers the option to increase the lifespan of wind farms by repowering projects. This means replacing the old turbines with more efficient models to increase generation capacity. We ask that the Design Commission for Wales, expands this guidance to include repowering solar farms. As it stands, chapter 4 only refers to wind farms despite the rest of the chapter referencing both solar and wind technologies.

We would recommend that greater clarity is provided on whether the same rules apply for repowering solar projects, as they do wind. For Wales to meet its targets repowering, of solar and wind, will be crucial and so the presumption should be that development for repowering will be supported. This point should be made explicit in the guidance to support LAs in the assessment of projects.<sup>6</sup>

Chapter 4.2.3 raises the potential impact of the construction and decommissioning of solar and wind farms. We acknowledge that there could be some disruption during the construction and decommissioning phases of a solar farm's lifecycle however, these are short-term, the nature of solar farm construction is that it is quick and easy to install and decommission

During the operational phase, the land on solar farms is largely undisturbed by people, creating habitats for wildlife to flourish. In spring 2022, SEUK released a Natural Capital Best Practice guidance to promote well-designed and managed solar farms that enhance opportunities to increase biodiversity and enhance natural capital at all stages of a solar farm's lifecycle. We would encourage the Design Commission for Wales to review the document in full.<sup>3</sup>

We are concerned with the final sentence of section 4.3 which says "With both types of facility, the challenge is to devise a design that is a positive response to the landscape setting." This sentence is unclear in its meaning and is not additive in improving understanding of how policy should be interpreted. As it risks increasing ambiguity and subjectivity in assessment, we recommend that it is removed.

## **2. Does the draft guide reflect the most significant changes in large-scale renewable energy in relation to design and placemaking since the previous guidance document by the Design Commission for Wales was last updated in 2014?**

No comment

### 3. Does the draft guide reflect the main technology changes the wind and solar industries may expect to deploy in the near future (i.e. 5-10 years)?

Solar is an innovative and rapidly changing technology. As the technology matures, the efficiency of solar panels and other system components continue to improve<sup>4</sup>. For ground mounted solar this means that less space will be required. Our market intelligence suggests that within Wales there is 6.7GW of ground mounted solar in the planning pipeline. On the assumption that solar farms need 3 acres of land to produce 1MW, this means that if all the pipeline was built, solar would need an estimated 20,100 acres of land, just 0.004% of land in Wales.

Further, the design of solar mounting systems is also evolving from traditional fixed tilt systems to single axis trackers. Single axis trackers allow more light to reach the ground than fixed tilt systems as the cell moves from point to point throughout the day, following the sun for optimised generation capacity and during the middle of the day when the panels are flatter they are closer to the ground so not as visible.

Additionally, the use of bi-facial panels which generate power by exposing both sides of the solar cell to sunlight, has also grown in popularity. Alongside maximising total energy generation, bi-facial panels also increase the distribution of light which helps with vegetation growth.<sup>5</sup>

An emerging area of interest in the UK is Agri-Photovoltaics (PV). Agri-Photovoltaics demonstrates that solar energy technologies, agriculture, and environmental stewardship can go hand-in-hand. Combining solar with agriculture enables the expansion of PV generation whilst promoting food production and security. Agri-PV systems have the potential to generate higher crop yields, reduce water usage, and provide clean renewable electricity all on the same site, thereby significantly increasing land use efficiency<sup>6</sup>. We expect that in the next decade, the UK will follow the successes seen in Japan, Spain, and Germany.

Lastly, we have already seen an increase of co-location of technologies on site, for example onshore wind and solar or solar and batteries together. We expect to see more developers looking towards the co-location of technologies where appropriate.

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<sup>4</sup> <https://www.nrel.gov/pv/cell-efficiency.html>

<sup>5</sup> <https://solarenergyuk.org/wp-content/uploads/2022/05/NCBPG-Solar-Energy-UK-Report-web.pdf>

<sup>6</sup> <https://www.solarpowereurope.org/interests/agrisolar>

#### **4. In your view, is there anything in the draft guidance you would like more advice on?**

As in our answer to question 1, we would like greater focus and clarification on the use of BMV. As before stated, there are reasons that site size, quality of grid connection, screening shading land availability etc. can mean that the inclusion of parts of BMV land is necessary or even beneficial to the project, in terms of site design and making the most of sites that meet the restrictive design considerations as well as for enhancements such as biodiversity and agricultural use. This is seen in the Penpergwn Solar Farm example.<sup>7</sup>

The guidance should clearly state that land type should not be a predominating factor in determining the suitability of the site location. All design considerations should be reviewed on an equal footing, considering the need for renewable generation and the possible enhancements such as biodiversity. The guidance should give a more defined paragraph to the possibility of sites including some BMV.

#### **5. The guide is still in draft and its presentation yet to be fully designed and laid out for publication. Nevertheless, we would like to know if you find the content accessible, easy to read and use?**

We warmly welcome the inclusion of Solar Energy UK's recommendation to provide separate chapters for wind and solar farms. This provides greater clarity and will make the document more accessible for renewable energy developers.

As mentioned in our answer to question 1, some chapters in section 4 are specifically wind focused. We would recommend providing greater clarity on what is applicable to wind/solar.

#### **6. Is there any other guidance or any case studies the guidance should refer to?**

Solar Energy UK in collaboration with Clarkson & Woods, Lancaster University and Wychwood Biodiversity developed a standardised approach to monitoring ecology on solar farms. This promotes the same standard of information to be collected across all solar sites and for data (where agreed) to be amalgamated to create a credible, representative view of the ecological trends on solar farms<sup>8</sup>.

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<sup>7</sup> <https://renewableconnections.co.uk/our-sites/penpergwm-solar-farm/>

<sup>8</sup> <https://solarenergyuk.org/resource/solar-habitat-a-look-into-ecological-trends-on-solar-farms-in-the-uk/>

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In May this year, Solar Energy UK published [Solar Habitat: Ecological trends on solar farms in the UK](#) a report outlining the results from 37 sites across the UK surveyed using the standardised ecological monitoring methodology.

We aim to report annually on ecological trends using the standardised methodology whilst expanding it's use, and the number of sites surveyed and included within the report.

Within the solar habitat report the following case studies can be found:

### **Creating a wildflower meadow within Creacombe solar farm using green hay**

Creacombe solar farm was built in 2019. This 5 MW solar farm was developed by the team behind Eden Renewables, who created a sophisticated biodiversity management plan for the site. Creacombe is now owned by CORE and Yealm Community Energy, whose joint goal is to make it an exemplary site for biodiversity.

Following construction, the entire site was seeded with native fine grasses, which are slow growing and conducive to wildflower spread. Then, five areas were selected for seeding wildflower meadows. In August 2020, Wychwood Biodiversity established 4 of the meadows using Emorsgate's seed mix and for the fifth – the largest of all – used green hay from a local wildflower meadow.

The landowner has a 1 Ha wildflower meadow 2 miles from Creacombe and this was cut, baled and transported to the solar farm within the same morning. Two large round bales were split and spread onto the cultivated ground. The green hay was spread evenly by hand and left in place through the Winter.

The wildflowers established well, with red clover *Trifolium pratense*, yellow rattle *Rhinanthus minor*, birdsfoot trefoil *Lotus corniculatus*, two species of plantain, oxeye daisy *Leucanthemum vulgare* and smooth cat's ear *Hypochaeris radicata* all establishing in year 1. The resulting wildflower meadow is botanically rich and is a valuable foraging habitat for pollinators, small mammals and birds.

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## Encouraging threatened birds at Sawmills solar farm

Sawmills is a 6.6 MW solar farm at Ashcombe, near Dawlish in Devon. The team behind Eden Renewables developed the solar farm in 2015 with an ambitious biodiversity management plan and is now owned and managed by Foresight.

This solar farm falls within the UK range of the ciril bunting *Emberiza cirius*, the UK's rarest resident farmland bird. To enhance the site for this species, hedgerows were managed to increase volume and density and a wild bird seed mix was sown to provide seed through the winter months.

These measures appear to have succeeded, as ciril buntings have been observed on-site in three years during annual breeding bird surveys.

The site has also been successful in attracting other birds of conservation concern, including mistle thrushes *Turdus viscivorus*, song thrushes *Turdus philomelos*, linnets *Linaria cannabina*, skylarks *Alauda arvensis* and yellowhammers *Emberiza citrinella*.

Overall, the bird diversity observed at the site has nearly doubled since the solar farm was built. Survey results from Sawmills demonstrate that with appropriate management, solar farms can benefit threatened species as well as our more common wildlife.

## Downing LLP Biodiversity Study

Downing LLP is a sustainable investment manager who commissioned Clarkson & Woods to undertake a biodiversity assessment of 19 of its ground-mounted solar farm assets in 2022. The study aimed to use the Biodiversity Net Gain (BNG) metric to measure the baseline units on all 19 solar farms, and then to look at options for bespoke ecological enhancements on the sites, with a calculation of the BNG uplift as a result of potentially implementing these.

The study showed that across 19 solar farms, a total of 1,419 habitat units and 237 hedgerow units are currently accommodated within the sites. For each site surveyed, recommendations were set out to improve biodiversity such as changes in grassland management, seeding of wildflower areas, planting of hedgerows/trees and creation of wetland features (where appropriate).

The calculations resulting from these enhancements showed a potential uplift of 505 habitat units and 54 hedgerow units; showing that solar farms offer ideal opportunities for Biodiversity Net Gain.

Some sites offered greater enhancement opportunities than others and depending on the size of the site and the area within the lease agreement. For example, with some of the sites, the boundary hedgerows were outside the lease area and so could not be a focus for improvement. With many solar farms, easy gains could be made by changing the grazing/cutting regime or using fencing to restrict sheep grazing. Other sites offered opportunities for wetland creation within areas outside of the footprint of the array, where soil conditions and topography were appropriate.

We also recommend the below publications from SEUK and other industry stakeholders:

- [Solar Habitat: Ecological trends on solar farms in the UK](#)
- [Natural Capital Best Practice Guidance](#)
- [Natural Capital Value of Solar](#)
- [Standardised Approach to Monitoring Biodiversity](#)
- [BRE National Solar Centre: Community engagement good practice for solar farms](#)
- [Solar Power Europe, Agri PV: How solar enables the clean energy transition in rural areas](#)
- [11 Solar Farm Commitments](#)

We would be very happy to arrange a meeting, or a teach-in to inform staff about the work the industry is doing.

**7. What else would you like to tell us about? Please use this space for any further comment.**

No Comment

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