



Solar Farms – Norfolk Wildlife Trust Position Statement

Norfolk Wildlife Trust supports solar farm development when they are at suitable locations, at a scale and to a design appropriate to the local environment. Solar farms can and should contribute to both reducing greenhouse gas emissions and helping nature's recovery.

- **Impact on Wildlife:** It is not appropriate to develop solar farms or their associated infrastructure directly on areas of recognized existing high wildlife value habitat, either within designated nature conservation sites or outside them, or where harm is likely to be caused to populations of vulnerable, threatened or endangered species.
- **Location and Design:** If ground-mounted solar arrays are thoughtfully located and carefully designed, their negative impacts on the natural environment and local landscape character can be avoided. In many circumstances **there is scope for high quality wildlife habitat to be created or enhanced**, but this requires careful design based on robust surveys from the outset, alongside an appropriate management plan.
- **Community Participation:** Our response to the climate and nature crisis is best delivered with community participation. Where developments are outside the local planning process (i.e. a Nationally Significant Infrastructure Project ([NSIP](#))) then additional efforts must be made by developers to engage communities and provide local people with a genuine stake in their success.
- **Strategic land-use framework:** There should be a strategic land use framework, aligned with the Local Nature Recovery Strategy and Local Plans which determines in a structured and strategic way, the best locations for large-scale solar arrays. In line with the NPPF, there should be **a presumption against using high-grade agricultural land for development of solar farms**, in the interests of food security.

Background and Context

The climate and the natural world are in crisis. ^{1 2}

It is critical that global greenhouse gas emissions are reduced rapidly to keep global temperature rise below 2°C and that wildlife-rich natural systems are protected and restored.

¹ WWF (2020) : Living Planet Report 2020 - Bending the curve of biodiversity loss. Almond, R.E.A., et al (eds). Pages 26 to 29.

² State of Nature (2019). Produced by a partnership of more than 70 organisations involved in the recording, researching and conservation of nature in the UK and its Overseas Territories. P. 6

As part of our efforts in the UK, it is vitally important that as much as possible of the energy we use is generated renewably.... that is, it is generated in ways that do not consume finite natural resources faster than the natural world creates them and that do not emit greenhouse gases.

The generation of electricity from solar radiation is one of several renewable energy technologies that are contributing to the UK's intention to achieve net zero greenhouse gas emissions by 2050³. Figures available from EDF in 2015 indicated that over the lifetime of a solar electricity generation installation its total rate of greenhouse gas emissions was typically equivalent to 72g of CO₂ per kilowatt hour (kWh) of electricity generated. This compared very favourably with a gas-fuelled power station, for which the equivalent lifetime figure was 487gCO₂e/kWh.

Key Issues relating to Solar Farms

The development of large-scale ground-mounted solar arrays can cause several problems for wildlife and the natural environment, including direct damage and disturbance to wildlife habitat (caused either by the installation of the solar panels themselves or access tracks, fencing, lighting, cabling and other associated infrastructure). Developers may remove nearby trees and other tall vegetation (such as hedges) during construction for access and cabling, or to prevent shading of the panels. Siting a solar array at a critical location in a landscape may cause or exacerbate the fragmentation of ecologically functioning habitat networks - particularly if fencing prevents the movement of wildlife.

Field margins around solar farms can deliver biodiversity benefits, but there is some evidence that the behaviour of some species, such as bats, is negatively affected by the solar farms themselves⁴. There is some evidence that large unbroken expanses of solar panels can be mistaken as water bodies by aquatic insects (which may attempt unsuccessfully to breed on them), bats (which may attempt to drink from them) and birds (that may collide with them)⁵. Ground nesting birds, such as lapwing, may also be deterred from nesting close to the new structures⁶.

The arrays of solar panels themselves cast shade, which may result in darker, cooler and damper conditions directly under the panels, leading to changed growing conditions for plants and consequent changes in plant communities⁷.

³ UK Government (2019) Climate Change Act 2008 (2050 Target Amendment) Order 2019

⁴ Tinsley et al (2023) Renewable energies and biodiversity: Impact of ground-mounted solar photovoltaic sites on bat activity, *Journal of Applied Ecology* 60:1752–1762

⁵ Natural England (2017). Evidence review of the impact of solar farms on birds, bats and general ecology 2016 (NEER012)

⁶ Natural England (2017). Evidence review of the impact of solar farms on birds, bats and general ecology 2016 (NEER012)

⁷ Vervloesem et al (2022) Effects of Photovoltaic Solar Farms on Microclimate and Vegetation Diversity *Sustainability* 2022, 14, 7493

During operation, the use of herbicides to prevent shading of the panels can reduce plant diversity and abundance, with knock-on consequences for animals - especially invertebrates. Both this and shading caused by the panels themselves may promote bare ground, increasing the risk of soil erosion and associated water and air pollution.

The presence of panels may significantly alter water flows and drainage as they intercept and redirect rainfall, further influencing the surrounding environment.

Several organisations have reviewed the available evidence concerning the environmental impacts of solar energy development^{8,9}. Though the evidence is not abundant, it suggests that if solar arrays are thoughtfully located and carefully designed with adequate spacing, at a suitable height, on arable fields or other land of currently low value for wildlife, there is significant potential for negative impacts to be avoided and for wildlife habitat to be created or enhanced around the solar panels¹⁰.

The Changes we want to see:

Norfolk Wildlife Trust is in favour of solar electricity generation contributing to the UK's future mix of renewable energy capacity. We support its development at suitable locations, at a scale and to a design appropriate to the local environment. **Solar generation developments should contribute to both reducing greenhouse gas emissions and helping nature's recovery.**

We are in favour of installing solar energy generation capacity on buildings, where it can be developed with no additional land-take and negligible negative environmental impact - especially small-scale installations that contribute to a widely distributed electricity supply. There is also potential for installing solar panels on existing large warehouse rooftops, car parks etc. which can provide suitable alternatives.

We expect the installation and operation of solar generation capacity on buildings to **avoid damage and disturbance to birds, bats, their roosts and nests.**

We expect ground-mounted solar arrays to be thoughtfully located, carefully designed and operated based on robust evidence, to avoid negative impacts on the natural environment resulting from construction, maintenance and decommissioning.

In many circumstances there is scope for high quality wildlife habitat to be created or enhanced around the solar panels. We want to see all large-scale ground-mounted solar arrays designed to bring benefits to wildlife and the natural environment in this way to support the delivery of the LNRS. Each proposal needs a robust operational management plan that is available for comment early in the process.

⁸ Natural England (2017): Evidence Review of the Impact of Solar Farms on Birds, Bats & General Ecology (NEER012). First Edition

⁹ SG Ecology (2019): Potential Ecological Impacts of Ground-Mounted Photovoltaic Solar Panels. An Introduction & Literature Review

¹⁰ Building Research Establishment (undated): Planning guidance for the development of large scale ground-mounted solar PV systems

An ambitious approach to Biodiversity Net Gain (BNG) should be provided, with a target beyond the mandatory 10%. We recommend that a target of at least 20% is aspired to. Opportunities to enhance existing features for biodiversity and ecological connectivity should be incorporated into solar farm design.

There is potential for solar developments to be sited on suitable arable fields or other land of currently low value for wildlife. However, it is not appropriate to develop solar energy generation capacity or its associated infrastructure directly on areas of recognized existing high wildlife value habitat, either within designated nature conservation sites¹¹ or outside them, or where harm is likely to be caused to populations of vulnerable, threatened or endangered species.

There should be a presumption against the use of high-grade agricultural land for development of solar farms, in the interests of food security.

Appropriate consideration should be given to the Local Nature Recovery Strategy (LNRS) (when published), the importance of maintaining/enhancing ecological connectivity and to any local wildlife and nature recovery projects.

We expect there to be genuine community benefit from such schemes. Imposing unpopular schemes on local communities risks the danger that there is a move away from the support of the transition to net zero as a result, thus harming our collective efforts to transition away from fossil fuels. There should be a wider community financial benefit beyond just a modest benefit fund, which should see those who experience the greatest amenity impacts provided with direct financial benefits such as discounted bills.

It is important that a full decommissioning programme is part of any consent and there must be strict adherence to regulatory standards to ensure minimal environmental impact. Appropriate consideration should be given to the recycling of materials, managing waste and preventing soil contamination. Restoration of the land should seek to retain and preferably enhance its biodiversity value, whilst avoiding adverse impacts on wildlife and the environment.

Whenever solar generation capacity is installed academic bodies, environmental organisations, developers and their trade associations should take the opportunity to **monitor the impacts on wildlife and the surrounding environment** and to carry out more research. This will improve our understanding and contribute to improved future policy and practice.

¹¹ Ramsar Sites, Special Protection Areas, Special Areas of Conservation, Sites of Special Scientific Interest, National Nature Reserves, Local Nature Reserves, local Wildlife Sites.