



MANAGING THE BIODIVERSITY IMPLICATIONS OF SOLAR FARMS ON RURAL AND PERI-URBAN LAND

SUMMARY

It is sometimes argued that rural and peri-urban solar farms reduce arable and grazing land and harm biodiversity. When planned effectively, however, they can enhance rather than harm biodiversity. By applying lessons from recent research and utilising innovative technology, such conflicts can be effectively mitigated and even overcome. Hence, solar farms can contribute to **positive** synergies as part of mixed land-use, thus also achieving biodiversity net gains and contributions to climate change and sustainability policies. This policy brief outlines practical recommendations for applicants, local planning authorities and other stakeholders to achieve biodiversity net gains and livelihood diversification, while contributing to climate and sustainability goals.

KEY RECOMMENDATIONS

- Consider solar arrays as one component of mixed farming alongside arable, grazing and/or agroforestry contributing to overall livelihood security, biodiversity net gain, rural sustainability and resilience
- Introduce pre-application consultations for solar farm proposals with local planning authorities (LPAs) as good practice to ensure that applications reflect the state of the art in minimising trade-offs and maximising synergies
- Where practicable, raise biodiversity net gain targets to enhance outcomes
- Build long-term partnerships between local communities, environmental organisations and industry to promote understanding and enhance ongoing biodiversity enhancement and management as part of livelihood diversification.

BACKGROUND

The slow increase in the number of solar farms on rural and peri-urban land in the UK has, in the last few years, begun to accelerate as part of the drive to switch from fossil fuels to renewable energy as a contribution to reaching the country's net zero target in 2050.

This reflects several factors, perhaps most notably the rapid real and relative decline in the costs of photovoltaic (PV) panels, making solar one of the cheapest forms of energy per installed kWh. Impetus has just been increased yet further by the new government's commitment to achieving clean power generation by 2030 to underpin the broader green economic transformation.

As Energy Secretary, Ed Miliband, pointed out to the Common in July "(c)redible external estimates suggest that ground-mounted solar used just 0.1% of our land in 2022. The biggest threat to nature and food security and to our rural communities is not solar panels or onshore wind; it is the climate crisis, which threatens our best farmland, food production and the livelihoods of farmers."

For farmers and other rural or peri-urban landowners, solar arrays represent a welcome opportunity to diversify and boost their income streams as many struggle to survive amid reductions in farming subsidies and other challenges. To others, both locals and visitors from urban areas, solar arrays may appear as visual and sometimes literally glaring intrusions that are 'out of place'. With thoughtful land-use practices, solar farms can support national food production while enhancing environmental and wildlife conservation efforts.

UNDERSTANDING THE PROBLEM

The conventional layout of solar arrays comprised parallel rows of PV panels mounted on aluminium frames at an appropriate south-facing angle to maximise exposure to the sun. These rows can sometimes be close together, with the lower edge one metre or less above the ground.

Many solar farms have been built on poor quality agricultural land with low biodiversity, so that trade-offs with farming are lower than sometimes claimed. Despite shading and rain shadow effects from solar panels, modified grassland with under 6 species per m² is also possible. However, livestock require at least a metre of clearance to access grazing or shelter.



LESSONS LEARNT – FROM PROBLEM TO OPPORTUNITY

However, research in the UK and abroad, improved technologies, greater awareness of the harmful biodiversity effects and a desire to improve visual aesthetics have transformed the situation. The following interventions can have significant positive impacts:

- Thinking and planning holistically for solar arrays as one element of diversified rural livelihoods at field, farm and community scales
- Raising the bottom edge of PV frames to at least 1.2 m, where practicable and not visually intrusive, and increasing or varying the distance between rows
- Newer PV panels require less bulky mounting frames, enhancing appearance
- Consider single-access tracker systems, which enable mounted frames to pivot to track the sun, thus extending their period of exposure to solar radiation, while exposing the land below to regular sun and rain
- Where space allows, leaving wide margins around arrays or restricting them to only a portion of a farm can allow grass, wildflower meadows or even some forms of arable farming to flourish, thus also providing habitats for diverse animal species
- Consider increasing natural vegetation to screen panels from adjacent roads, footpaths or homes, while increasing biodiversity – e.g. planting new, or restoring traditional hedgerows around field boundaries, adding orchards or agroforestry lots – and farming incomes, possibly including from fee-paying eco-tourists.



THE PLANNING CONTEXT AND SPECIAL PROTECTIONS

Solar arrays under 50 MW require formal planning approval by the local planning authority (LPA), which is the unitary – usually county – council or, in two-tier local authority areas, the borough or district council. Solar farms above 50 MW in England are considered Nationally Significant Infrastructure Projects (NSIPs) for which approval is determined by the Secretary of State.

LPAs must assess applications in relation to

- the National Planning Policy Framework (NPPF), which may be amended following the current consultations
- statutory protections afforded to particular localities, including Green Belt, Areas of Outstanding Natural Beauty (AONB) and Sites of Special Scientific Interest (SSI)
- their Local Plan drawn up in terms of the above and other pertinent laws and regulations
- their climate change, sustainability, resilience, biodiversity net gain (BNG) and Local Nature Recovery strategies and policies.

Particularly on the outer fringes of Greater London, most solar farm planning applications rejected or referred for revision to date have been on account of conflict with Green Belt protections.

- Although precedent is an important factor, applications must be assessed individually, thereby focusing attention on their marginal impact without being able to take account of overall effects or impact on desirable ceilings. This requirement reduces an LPA's ability to assess area or community impacts or benefits holistically.
- Current planning guidelines recommend a minimum biodiversity net gain (BNG) of 10% for schemes but this is unduly modest so that almost all schemes can achieve or exceed that. Indeed, many well-designed schemes achieve 25-30%, with some even up to 70%

Aspect	Solar not designed for biodiversity	Biodiversity solar farm
Design and layout	Close rows, low panels height sterilising ground beneath	Wider spacing, raised panels allowing sunlight and rain to reach the ground
Impact on biodiversity	Limited vegetation and habitat, Loss of wildlife biodiversity	Diverse ecosystems enriched with colourful wildflower meadows, healthy pollinator habitats, and carefully integrated wildlife corridors, fostering a wide range of species and enhancing ecological harmony.
Land use integration	Single use: energy generation only	Mixed-use: grazing, apiculture, horticulture, agriculture alongside with energy production.
Economic benefits	Income from energy production only	Additional revenue from grazing, agriculture, eco-tourism and reduced maintenance costs.
Community perception	Often viewed as visually intrusive and disruptive	Enhanced aesthetic appeal with hedgerows, orchards, and natural landscapes.



RECOMMENDED CHANGES TO PLANNING PROCESSES AND TREATMENT OF APPLICATIONS

- Adopt a more holistic approach to the assessment of individual planning applications
- Consider solar arrays as one component of mixed farming alongside arable, grazing and/or agroforestry contributing to overall livelihood security, biodiversity net gain, rural sustainability and resilience
- Hold pre-application consultations for solar farm proposals with local planning authorities (LPAs) to ensure that applications reflect the state of the art in minimising trade-offs and maximising synergies
- Where practicable, raise biodiversity net gain targets to enhance outcomes
- Build long-term partnerships between industry, local communities and environmental organisations to promote understanding and enhance ongoing biodiversity enhancement and management as part of rural livelihood diversification.
- Enhance clear and accessible written and other materials on best practices for solar farm applications and management, organized into two primary areas:

Installation and Infrastructure

- » Optimal panel height and inter-row spacing
- » Incorporate water features or site solar farms near existing water bodies
- » Implement 'smart' solar panel rotation systems where financially feasible
- » Address glare and polarized light Issues to protect local insects and wildlife

Biodiversity Integration

- » Establish wildflower meadows and diverse grasslands
- » Install hedgerows and fruit trees for pollinator habitat and to screen solar arrays
- » Integrate apiculture and support animal grazing for habitat diversity

PARTNERS' KEY RESOURCES

Heathrow Strategic Planning Group:

www.heathrowstrategicplanninggroup.com/resources/natural-environment

Runnymede Borough Council register of planning applications: www.runnymede.gov.uk/planning-permission/view-object-support-application-1/1

Solar Energy UK: <https://solarenergyuk.org/resources/> especially <https://solarenergyuk.org/resource/solar-habitat-2024-ecological-trends-on-solar-farms-in-the-uk/>

Southill Community Energy: <https://southillcommunityenergy.coop/>

SSE: www.sse.com/our-technologies/solar/

Surrey Amphibian and Reptile Group: www.surrey-arg.org.uk/SARGWEB.php?app=Home

Surrey County Council: www.surreycc.gov.uk/community/climate-change

Surrey Wildlife Trust: www.surreywildlifetrust.org/what-we-do/professional-services



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