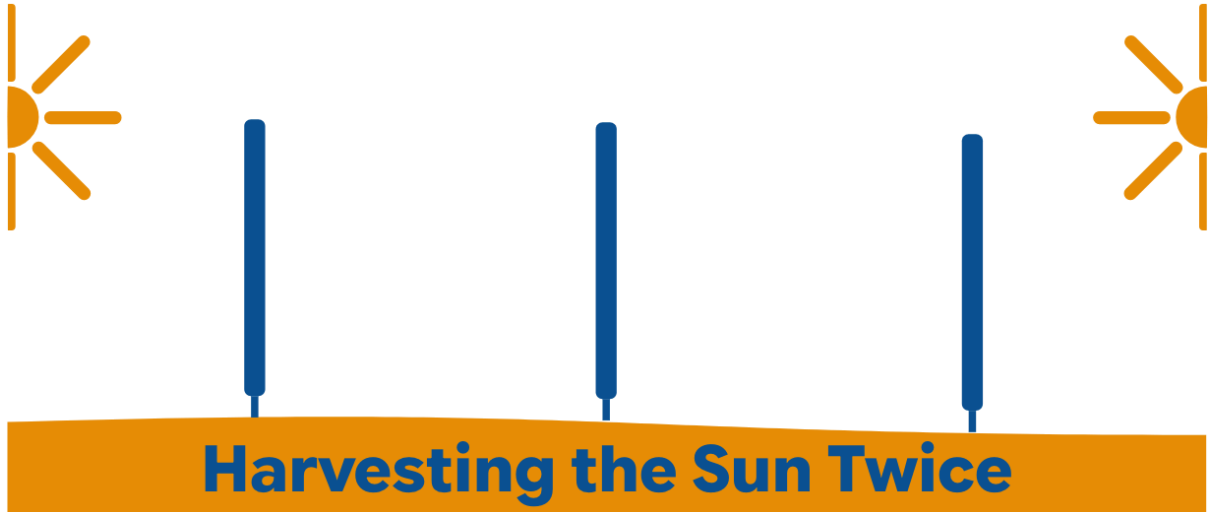


Written Representation to the Examination of

The Drovers Solar Farm DCO

Planning Inspectorate Reference: EN0110013

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1. Introduction and Standing

This Written Representation is submitted by **Paul Bird**, Campaign Director of *Harvesting the Sun Twice* (harvestingthesuntwice.org) and Director of *Dual Harvest Agrivoltaics*, an independent agrivoltaics consultancy.

The representation does not oppose the principle of solar energy development at the Droves site, nor does it seek refusal of the application. Its purpose is to draw to the attention of the Examining Authority a specific technical argument: that the configuration of photovoltaic arrays proposed — conventional fixed-tilt, south-facing panels (TBPV) — is the proximate cause of the Ministry of Defence's radar and aviation safety objections, and that an alternative configuration — Vertical Bifacial Photovoltaic (VBPV) arrays — would resolve those objections structurally, by design, rather than through mitigation measures applied retrospectively.

The author has over 25 years of agricultural engineering experience, including multiple patents held during a senior engineering career at Ocado Technology, and a background in Lincolnshire arable farming. Over the past 18 months he has developed a substantive evidence base on agrivoltaic system configurations and their implications for land use, grid infrastructure, and planning policy, and has engaged formally with the Department for Energy Security and Net Zero (DESNZ) on related matters (correspondence reference TOB2026/04355).

2. Summary of Representation

The Ministry of Defence has objected to the Droves application on three grounds:

- Multi-path radar interference with the precision approach radar at RAF Marham, arising from the metallic and highly reflective character of the proposed arrays;
- Glint and glare hazard to pilots on approach to runway 23, and to air traffic control tower staff; and
- Birdstrike risk from proposed wetland habitat creation.

This representation addresses the first two grounds. It sets out that both objections are direct consequences of the proposed flat-panel (TBPV) configuration, and that adoption of a Vertical Bifacial PV (VBPV) configuration — using the same bifacial panel technology deployed vertically in east-west orientation — eliminates both concerns by geometric design rather than by management plan.

The Examining Authority is respectfully asked to require the applicant to consider VBPV configuration as part of its response to the MoD's objections, and to address the configuration question explicitly in its examination of the radar and glint/glare issues.

3. Technical Background: TBPV and VBPV Configurations

Bifacial photovoltaic panels — capable of generating electricity from both front and rear surfaces — are now the dominant panel technology in utility-scale solar development. The same bifacial panel may be deployed in two fundamentally different system configurations:

Tilted Bifacial PV (TBPV) — the proposed Drovers configuration

Panels are mounted on fixed-tilt racking at a low elevation angle (typically 10–35 degrees from horizontal), facing south. The panel face presents a large, near-horizontal reflective surface oriented toward the sky. This is the configuration proposed for the Drovers Solar Farm.

Vertical Bifacial PV (VBPV) — the alternative configuration

Panels are mounted vertically (90 degrees), facing east-west. Each row of panels acts as a fence-like structure. The panel faces are oriented perpendicular to the ground, presenting a narrow edge-on profile when viewed from most horizontal directions. Commercial-scale VBPV installations are operational across Europe, including at Frankfurt Airport — a directly analogous aviation context — developed by Next2Sun GmbH, and at multiple agricultural sites in Germany, France, and the Netherlands.

Critically, VBPV uses identical panel technology to TBPV. The difference is orientation only. There is no change to the electrical generation technology, the grid connection, the BESS, or the substation infrastructure. A VBPV configuration at the Drovers site would be technically feasible and would not require a fundamental redesign of the application.

4. Radar Interference: Why TBPV Creates the Problem

The MoD's letter of objection states that 'the metallic content and highly reflective nature of the materials used in the construction of the arrays' will cause 'multi-path reflections of the radar's transmissions,' interfering with the precision approach radar at RAF Marham runway 23.

Multi-path radar interference from solar arrays is a well-documented phenomenon. It arises when a radar signal reflects off a large, coherent, near-horizontal surface and reaches the radar receiver via a secondary path, causing false returns or signal degradation. The physics of this mechanism are directly dependent on the geometric relationship between the radar beam, the reflective surface, and the receiver.

Why TBPV is vulnerable

A fixed-tilt south-facing array presents a large planar reflective surface at a low elevation angle — typically 10–35 degrees from horizontal. RAF Marham's precision approach radar is positioned to the west-northwest of areas within the proposed Droves site. A TBPV array in radar line-of-sight to that radar will present a surface from which specular and near-specular reflections can redirect the radar signal along secondary paths. The MoD's objection is a direct and predictable consequence of this geometry.

Why VBPV eliminates the mechanism

A VBPV array presents its panel face perpendicular to the ground, oriented east and west. When viewed from the direction of RAF Marham's precision approach radar, a VBPV array presents its narrow structural edge — not its panel face. The coherent reflective surface area in the radar's line of sight is reduced by approximately 85–90% compared to an equivalent TBPV installation. The multi-path reflection mechanism the MoD describes requires a substantial, coherently-oriented reflective surface. That surface does not exist in a VBPV array oriented east-west.

This is not a matter of degree — it is a structural geometric difference. VBPV does not require a radar mitigation plan because the reflective mechanism is not present in the first place.

5. Glint and Glare: Why TBPV Creates the Problem

The MoD's objection also identifies glint and glare as a hazard to pilots on approach to runway 23, and to air traffic control staff. The objection notes that solar photovoltaic development 'close to RAF Marham has the potential to have an impact on aviation safety through glint and glare effects,' potentially 'dazzling pilots at critical stages of flight.'

The geometry of glint from TBPV

Glint occurs when a solar panel surface produces specular reflection directed toward an observer. For a fixed-tilt south-facing array, specular glint toward a low-elevation observer — such as a pilot on final approach — occurs at specific sun angles when the panel face, the sun, and the observer are in a geometrically defined relationship. Runway 23 at RAF Marham is oriented broadly south-southwest. An aircraft on final approach to runway 23 from the northeast will, at certain times of day, be in the glint reflection zone of south-facing panels in the Droves site. The MoD's concern is geometrically well-founded for a TBPV installation.

Why VBPV cannot produce this glint geometry

A VBPV panel facing east produces specular reflections in the eastern hemisphere — toward the morning sky. A VBPV panel facing west produces specular reflections in the western hemisphere — toward the afternoon sky. Neither panel face can produce specular reflection directed toward an aircraft on approach to a south-southwest runway from the northeast. The

geometry is simply absent. VBPV arrays have been assessed for glint and glare in aviation contexts, including at Frankfurt Airport, and have been found to present no significant hazard — precisely because of this east-west orientation.

A glint and glare management plan — as requested by the MoD — would not be required for a VBPV array because the glint mechanism toward the relevant approach paths does not exist. The developer's obligation to produce such a plan is itself an artefact of the TBPV configuration choice.

6. Additional Benefits of VBPV Configuration

The radar and aviation safety arguments are the immediate relevance of this representation to the examination. However, the Examining Authority should be aware that VBPV configuration also offers substantive advantages in other areas relevant to this examination:

Agricultural productivity

VBPV arrays, deployed in widely spaced east-west rows, allow continued arable and pastoral farming between and beneath the panels. Independent studies — including the University of York (Badran and Dhimish, 2024) and commercial operational data from Next2Sun's Wellingen and Donaueschingen sites — demonstrate 70–85% retention of agricultural productivity under VBPV configuration. This directly addresses the loss of productive farmland that has been a central concern of objectors to the Droves application.

Grid alignment and BESS reduction

VBPV's east-west orientation produces a dual morning and evening generation peak, closely aligned with grid demand. The midday generation peak characteristic of south-facing TBPV arrays creates a structural mismatch with grid demand that requires large-scale battery energy storage (BESS) to be commercially manageable. VBPV configuration reduces BESS requirements by approximately 50%, with consequent reductions in capital cost, land take, and embedded carbon.

Landscape and visual impact

VBPV arrays have a lower visual mass than TBPV installations of equivalent capacity. The fence-like structure of VBPV rows, with open ground between, is materially less intrusive in an open agricultural landscape than the dense, continuous panel coverage of conventional TBPV deployment.

7. Request to the Examining Authority

The Examining Authority is respectfully asked to:

1. Require the applicant to address, in its response to the MoD's radar and glint/glare objections, whether VBPV configuration has been assessed as an alternative to TBPV, and if so, to provide the basis for any conclusion that VBPV would not resolve the MoD's concerns;
2. Note that the MoD's objection is a configuration-specific objection, not a technology-specific objection, and that the examination of mitigation measures should include consideration of configuration change as a primary mitigation option; and
3. Consider whether a condition or requirement addressing panel orientation — specifically the option of VBPV configuration for those array sections in radar line-of-sight to RAF Marham's precision approach radar — would be appropriate in the event that consent is granted.

8. Offer of Further Evidence

The author is willing to provide further written or oral evidence to the examination on any of the technical matters raised in this representation. A substantial evidence base on VBPV system performance, agricultural compatibility, radar cross-section characteristics, and commercial deployment examples is available and can be provided in any format useful to the Examining Authority.

Contact details are provided on the title page of this document. The campaign's public evidence library is available at harvestingthesuntwice.org.

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