7000Acres Response to Environmental Statement

Chapter 16: Glint and Glare and Appendix 16.1: Solar Photovoltaic Glint and Glare Study

Deadline 1A Submission – 7th December 2023

Executive Summary

The Applicant is required to demonstrate that the impact of glint and glare is minimal.

The Applicant has not taken account of actual observer heights, such as from the upstairs windows of a residence, so underestimating the impact of glint and glare.

The Applicant has chosen to define glare as having a high impact when an observer is exposed to glare for more than 60 minutes per day or 3 months per year. It is standard practice to use an exposure criteria of 30 minutes per day or 30 hours per year. Using the Applicants chosen glare criteria, they grossly underestimate the effect of glare on observers.

The Applicant has not taken full account of the cumulative effect of glint and glare, in accordance with Advice Notice Seventeen. Instead, the Applicant appears to confuse cumulative effects with concurrent effects.

The Applicant has used qualitative criteria, under the guise of "*professional judgement",* to minimise the impact of glare on local residents and road users. Quantitative criteria can be applied, as in one of the references they cite (FAA, 2015).

The Applicant has used vegetation and "*opaque fencing"* as the sole means of mitigation. No account has been taken of the time required for vegetation to grow. No detail of *"opaque fencing"* has been supplied or is considered elsewhere in the EIS.

The Applicant has not taken account of receptors with common eyesight conditions.

The Applicant has used Google Earth to conduct a desktop assessment of screening. This does not provide a valid assessment of the actual screening available, as rural views on Google Earth are frequently out of date, and certainly will not take account of seasonal variations in vegetation. Furthermore, the Applicant does not appear to have considered the vegetation being removed during construction.

The Applicant takes no account of the impact on livestock and equestrian activities, which are a feature of this area.

The Applicant dismisses the loss of amenity caused by glare.

Recommendations on how the assessment can be improved are provided.

Contents

1. Introduction

Glint and glare can be created by solar panels. The Applicant is required to assess the impact of glint and glare by National Policy Statement EN-3 paragraph 3.10.93: the policy does not provide an assessment methodology. ES Appendix 16.1 (PINS reference EN010132) contains a glint and glare assessment, prepared by Pager Power on behalf of the Applicant.

The Applicant has chosen to disregard any glint and glare created by the metal structures associated with the solar farm, even though EN-3 3.10.97 states that:

" When a glint and glare assessment is undertaken, the potential for solar PV panels, frames and supports to have a combined reflective quality may need to be assessed".

The BRE Planning Guidance for the Development of Large-Scale Ground Mounted Solar PV Systems paragraph O) states:

"The potential for solar PV panels, frames and supports to have a combined reflective quality should be assessed. This assessment needs to consider the likely reflective capacity of all of the materials used in the construction of the solar PV farm."

2. Applicant's Assessment Methodology

2.1 Policy

The Applicant correctly identifies that there are no local planning policies that define the level of acceptable glare. They do identify aviation criteria, in particular the Federal Aviation (FAA) Administration Policy: Review of Solar Energy System Projects on Federally-Obligated Airports, November 2021. The FAA Guidance is useful, especially regarding glare intensity. Furthermore, there are policies in other countries, such as Germany, that provide guidance on the acceptable level of glare for domestic receptors. In 16.4.1 the Applicant states:

"The glint and glare assessment methodology adopted in the Chapter has been derived from the information obtained through consultation with stakeholders and by reviewing any relevant guidance and studies."

However, they do not appear to apply any of the relevant guidance, merely relying on "*professional judgement".*

2.2 Applicant's Assessment Tool

The Applicant's assessment tool identifies if it is geometrically possible for a receptor to view glare. This assessment takes no account of the intensity of the glare, unlike some other methodologies, such as the FAA criteria quoted by the Applicant. The intensity of the glare and impact on receptors is assessed using "*professional judgement".*

2.3 Consultation Process

The Applicant states that consultation has taken place with *"relevant stakeholders*". They list what they consider to be "*relevant stakeholders*", which includes local airfields and Network Rail; no mention is made of residents or users of the area.

3. Features of an Objective Assessment

An objective assessment would have three stages:

1. Identify if it is geometrically possible for the receptor to view any glare.
2. Identify the period of time the receptor is exposed to glare.
3. Quantitatively identify the intensity of the glare.

3.1 Geometric Assessment

The Applicant has chosen to only consider the effects of glint and glare within 1km of the scheme. Although the scheme is vast in area and has solar panels 4.5 m high, no justification is provided for why only 1km is sufficient for this assessment.

For domestic viewers the Applicant assumes a viewing height of only 1.8 m [paragraph 5.2]. There is no consideration of higher viewing points, such as first floor windows. The glare from all relevant viewing points, not just ground level must be assessed.

The Applicant provides minimal details of their modelling, so it is difficult for an informed reader to assess the validity of their work.

3.2 Period of Time

The Applicant states that the glare impact will be low when glare is present for less than 60 minutes per day or 3 months per year. Other schemes, such as the Gate Burton NSIP, have used 30 minutes per day, or 30 hours per year to assess if the impact will be high: this figure is consistent with the German glare guidance, referenced by PagerPower[1] in their own online publication:

" The German glare guidance focuses primarily on dwellings and other buildings where the people inside them may experience glare. According to the Federal Emission Control Act, a 'significant nuisance' is caused if glare is experienced for more than 30 minutes on any given day or 30 hours per year."

The Longfield solar NSIP, which has development consent, also used an exposure period of 30 minutes per day, or 30 hours per year, as the criteria for a high impact[2].

The Applicant (Pager Power) does not provide any justification for the 60 minute per day/3 months per year criteria and why the standard figure of 30 minutes per day/30 hours per year is not used as the assessment criteria for high impact.

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[1] https://www.pagerpower.com/news/achtung-a-comparison-of-glare-guidance-in-germany-and-in-the-uk/#:~:text=The%20German%20glare%20guidance%20focuses,or%2030%20hours%20per%20year.

[2] https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010118/EN010118-000177-6.2_10G_Glint%20and%20Glare%20Assessment.pdf

3.2.1 Cumulative Impact

The Applicant appears to confuse cumulative with concurrent effects. Although a receptor may not be impacted by glare concurrently from two or more solar NSIPs, the cumulative effect (minutes and hours of glare per day) is relevant. In addition, the Applicant only takes account of possible cumulative effects within 1km of the scheme, whilst in reality the scheme will be visible from much further away.

In Appendix 16.1 paragraph 9.7 the Applicant dismisses the cumulative effects in the following manner:

"However, under the baseline conditions, shared receptors are unlikely to concurrently have visibility of multiple areas due to existing and proposed screening. Therefore, no significant cumulative effects are possible."

The cumulative effects of glare from any solar NSIP should count towards the standard criteria of more than 30 minutes per day/30 hours per year being a significant nuisance.

3.3 Intensity of Glare

EN-3 paragraph 3.10.95 includes the intensity of glare as a factor be assessed. The Applicant does not comply with EN-3 and uses "*professional judgement"* to assess the intensity of glare. No clear and quantitative assessment criteria are provided. The Applicant has referenced the FAA Guidance, which provides quantitative criteria in the Sandia Laboratories Solar Glare Hazard Analysis Tool (SGHAT). As open-source tools are available, such as SGHAT, to conduct a quantitative assessment, this approach should be used in preference to "*professional judgement".*

3.4 Applicant's Use of "*professional judgement"*

It is not clear how the Applicant has applied their "*professional judgement"* and the associated logic in their assessment. The Applicant does not provide any assessment criteria.

3.4.1 Road Users

In Appendix 16.1 paragraph 5.3 the Applicant appears to link the impact of glare to the number of road users:

"Technical modelling is not recommended for local roads, where traffic densities are likely to be relatively low. Any solar reflections from the proposed development that are experienced by a road user along a local road would be considered low impact in the worst case in accordance with the guidance presented in Appendix D."

No clear explanation is provided why glare on local roads would not require modelling and have low impact. It could be argued that glare could have a higher impact on driving along a single-track road than driving along an A Road. EN-3 paragraph 3.10.149 states:

"*Solar PV panels are designed to absorb, not reflect, irradiation. However, the Secretary of State should assess the potential impact of glint and glare on nearby homes, motorists, public rights of way, and aviation infrastructure (including aircraft departure and arrival flight paths).*"

The Applicant has failed to comply with the quantitative requirements in EN-3.

3.4.2 Dwellings

The analysis has only considered viewing points from the ground level (1.8 m), and not from upstairs windows, such as those from a home office. Therefore, the analysis must be repeated to consider all dwelling viewing points.

3.4.3 Pedestrians and Cyclists

Pedestrians are only considered on a Public Right of Way, whilst in reality pedestrians usually walk along the quiet local roads. The Applicant states:

"Glint and glare effects towards receptors on a PRoW are transient, and time and location sensitive whereby a pedestrian could move beyond the solar reflection zone with ease with little impact upon safety or amenity;"

Due to the size of the solar arrays, a pedestrian might not be able to move quickly beyond the solar reflection zone. Of more importance, it is disputed that glare does not result in a loss of amenity. Once again, the Applicant has not followed the requirements of EN-3 paragraph 3.10.149.

3.4.4 Non-Human Receptors

The Applicant takes no account of non-human receptors, such as livestock, horses and birds. The safety impact of glint and glare on equestrian activities has not been assessed, even though there are equestrian businesses adjacent to the solar site. Relevant Representations include reference to equestrian activity in the region. The combined impact of this and other local NSIPs may render the whole region unsafe for equestrian activities, such as hacking along minor roads and in the countryside. In a similar manner, some local fields may be rendered unusable by livestock as glint and sustained glare could result in distress.

4. Applicant's Mitigation

Even after dismissing the impact of glare using *"professional judgement"* rather than quantitative criteria, there are receptors that are still impacted. These are then further dismissed by stating (Appendix 16.1 paragraph 9.4):

" Within the landscaping plan, the developer has proposed mitigation in the form of vegetation. It is predicted that the proposed mitigation solution will reduce the impact to acceptable levels (the proposed screening is predicted to significantly reduce the visibility of the reflective area from observers located at the ground floor). If necessary, the developer will implement an interim mitigation measure (opaque fencing) before planting is established. Therefore, low impact is predicted at worst upon the identified dwelling receptors, and no further mitigation is recommended."

No details are provided regarding "*opaque fencing*" nor are they described in other sections of the EIA. Fencing high enough to screen the upstairs of dwellings from glare are likely to be very high and unsightly.

Using vegetation as mitigation is not suitable, as it could take many years to provide effective screening.

The only effective mitigation is to reduce the 4.5 m high solar panels to a height that current vegetation can screen. Typical Lincolnshire hedges are 2m high.

5. Recommendations

Due to the Applicant's shallow and deficient assessment of the effects of glare, the following course of action is strongly recommended. The Applicant should:

1. Broaden their assessment to take account of actual observer heights. These should include the upstairs windows for residential receptors (10m), agricultural vehicles (4m), and equestrians (2.5m).
2. Apply standard industry criteria, where more than 30 minutes of glare per day/30 hours per year is assessed as having a high impact.
3. Take account of the combined reflective capacity of all of the materials used in the construction of the solar PV scheme.
4. Comply with Advice Notice Seventeen and assess the combined glint and glare effects of all solar farms in the region. The daily exposure to glare should be the cumulative period from all solar schemes.
5. Take account of the effects of glint and glare of all receptors with eyesight diseases or deficiencies.
6. Take account of the effect on livestock and equestrian activities, using an equestrian expert.
7. After reassessing the potential for glint and glare, the mitigation applied by the Applicant for all receptors should be reducing the height of the PV panels until the impact is no longer significant.