

1 Introduction

I am an interested party, as whichever way I leave my village I will be affected by one or more of the huge solar industrial complexes being imposed on this area. I try to attend as many Hearings as possible, but I was not able to attend Issue Specific Hearing on 14th January 2025 due to work commitments outside this area.

I have viewed the recording of Issue Specific Hearing 2 and wish to make the following points.

2 Agenda Item 3a

2.1 Water Runoff

It is accepted that the total volume of rain water leaving the site will remain the same, pre and post construction of a solar scheme. However, due to the impervious solar panels channelling water into rivulets below the panels' drip lines, the rate of water run-off will be increased and is likely to result in flooding.

In their response to the ExA's Question 1.14.2 the Applicant cited a paper on the Hydrologic Response of Solar Farms (Lauren M. Cook, 2013). The Paper considered smaller solar schemes, and the Applicant did not explain how the results from this one paper could be extrapolated to a 3,000-acre scheme, where even a small increase in the rate of water run-off could have a serious impact on the local watercourses. It is unfortunate that the Applicant chose to cite this paper published in 2013, rather than recent research in the UK, such as that undertaken on behalf of the Welsh Government (Welsh Government, 2023). The Welsh Government Report identifies that:

“There is likely to be some instances of run-off from the solar panels, which could result in the compaction of soils at the base of the panels (Choi et al,2020). Over time rivulets can form along the trailing edge of the panel with potential risk of soil erosion creating rills and gullies across the site.”



Welsh Government Report - Figure 6: Channels created by panel runoff within 12 months of site operation commencing

The soil erosion under the PV dripline is an important finding, as this will increase the speed of water runoff. An increased rate of water runoff was also found during other more recent research (Biamamonte, Gristina, & Palermo, 2023)

There is no experience in the UK of solar schemes of the size of Tillbridge. Recent research indicates that a reasonable worst-case assumption is that PV driplines will lead to channels and rivulets, which will in turn increase the rate of surface water runoff. The increased rate of runoff will increase the risk of flooding.

If flooding in the area increases, what mechanisms are available to Lincolnshire County Council to force the solar operator to modify their scheme and/or compensate local residents?

3 Agenda Item 3b

3.1 Best and Most Versatile (BMV) Land

The Applicant quoted from EN-3 to defend their use of BMV land.

3.1.1 Ministerial Statement

In addition to the Ministerial Statement, quoted during the ISH, account must be taken of a recent High Court Judgement. The High Court case was brought by the

Applicant for the Lullington Solar Scheme, supported by Pinsent Mason (also lawyers for the Tillbridge Applicant), but failed as the High Court upheld the principle that any BMV land must not be used “*without compelling evidence*”. Importantly, the High Court case confirmed that the Written Ministerial Statement of March 25th 2015 remains extant and relevant, contrary to the Claimant’s argument that recent amendments to ‘net zero’ target and delivery budgets had reshaped the policy framework for renewable energy (Claimant Lullington Solar Park Ltd, 2024).

As the High Court has upheld the principle that BMV land must not be used “*without compelling evidence*”, Tillbridge Solar must exclude all BMV land from their scheme unless “*compelling evidence*” is provided”.

3.1.2 Damage to Soil

Research conducted on behalf of the Welsh Government identified that solar schemes can lead to the permanent loss of BMV land (Welsh Government , 2023). The Report contains the following relevant text:

“Research undertaken in Colorado, USA, by Choi (2020) recognised that utility scale solar PV sites are land intensive and can have negative impacts, such as ‘extensive landscape modifications that transform soil ecological functions, thereby impacting hydrologic, vegetative and carbon dynamics’. An investigation over a 7 year period reported that disturbance of the topsoil can accelerate erosion of fine soil particles and that site maintenance activities caused compaction along the panel rows.”

The Welsh Government research identified that installing large solar arrays on farmland results in deep soil compaction, increased water runoff and runoff from panels can lead to rivulets, which can lead to soil loss by erosion. Additionally, good quality soil can be downgraded by compaction and damage caused by removing the solar foundation and piles. As EN-3 states that renewable schemes are consented for a temporary period, permanently downgrading BMV land will result in a permanent loss of BMV land and therefore cannot be temporary use.

The Applicant does not appear to have taken any notice of this recent research when producing their Environmental Impact Assessment.

3.1.3 Summary of BMV Land

The High Court decision in 2024 upheld the principle that BMV Land must not be used without “*compelling evidence*” which the Applicant has failed to provide. Additionally, evidence shows that BMV land can be lost permanently due to the damage caused by solar panels. Permanent loss of BMV land is not consistent with EN-3.2.10.66, where it states that consent is time limited.

3.2 Farming

3.2.1 Sheep

The Applicant claimed that the land would remain farming land as sheep could graze it. Sheep farming is not a current feature of this region and is unlikely to be economically viable due to the current price of wool and lamb meat. As sheep grazing is not secured, a reasonable worst case assessment is that the land will be covered in rough grassland and invasive weeds.

This is typical of many other schemes where photographs are shown of sheep in small solar schemes, but nothing is secured in the DCO.

Penpergwm Solar Farm in Monmouthshire



“Sheeps” in front of solar panels, Germany



These are very well travelled sheep as they are also in Long Island, New York:



“

This report shows that in scaling up solar, we don't have to choose between one 'green' good—clean energy—and another—undisturbed forests, open spaces, and farmland....[W]ith the right approach, we have room for it all.

JESSICA PRICE

New York Renewable Energy Strategy Lead

They then travelled to Gloucestershire

Welcome

Renewable Connections is investigating the potential for up to 40MW solar energy farm in Maisemore, Gloucestershire. Once operational, the project would supply enough power for up to 9,358 homes, and make a valuable contribution towards tackling the climate emergency in Gloucestershire.

We welcome any feedback you wish to provide so please do get in touch.



3.2.2 Crops

During the hearing the Applicant's agricultural specialist was generally dismissive over the crops produced in the area. He failed to mention a number of higher value crops, such as oil seed rape. Additionally, no account has been taken of the use of cereals and other crops in the production of biofuels. Biofuels are part of the renewable energy mix and the transition to Net Zero, and so the negative impact of any loss of biofuel capacity should be taken into account in the Applicant's EIA.

For example, the UK aviation industry has a mandate to use a minimum of 2% of Sustainable Aviation Fuel (SAF) from 2025, increasing to 10% by 2030. SAF is a biofuel, with a large proportion of SAF produced by Philips 66 in Hull. A reduction in crops suitable for biofuels will have an adverse impact on the transition to Net Zero.

4 Agenda Item 3c

4.1 Need

The ExA questioned the 7000 Acres representatives on their understanding of the need for solar schemes, as outlined in EN-1 and EN-3. I agree that National Policy is to install utility scale solar schemes as part of the overall solar plan to meet a target for 70GW of peak solar production by 2035.

However, the number of solar applications for grid connections currently exceeds the government target by 100%, and by even more if Government Policy on roof mounted solar (Skidmore Review) was implemented. Therefore, over 50% of schemes can be refused and the Government's target still met. Due to its scale, local impact and cumulative impact on the region, the Tillbridge scheme can be refused without threatening the Government's targets.

4.2 BESS Associated Development

The ExA asked participants what they understood by the word "*only*" in the the PA (2008) Associated Development Guidance paragraph 5 (iii):

*“Developments should not be treated as associated development if it is **only** necessary as a source of additional revenue for the applicant, in order to cross-subsidise the cost of the principal development”.*

One of the partners of this scheme is Recurrent Energy (Canadian Solar) who was also a partner in the Mallard Pass solar NSIP. A Mallard Pass BESS could not import electricity from the grid due to technical reasons. However, the same case could have been made for a BESS at Mallard Pass as for Tillbridge, i.e. *“The BESS is constructed as part of the overall Scheme to enhance the efficiency and reliability of the solar PV operation, and its co-location with the solar stations emphasises its subordinate role.”* Tillbridge Applicant’s answer to ExA Q1.1.22.

It is fair to assume that a BESS was not included in the Mallard Pass Application as it could not provide the *“additional revenue”* from energy arbitrage. The Tillbridge Applicant states in ExA Q1.1.23 that the BESS will only support the PV generation for 30% of the time. The Applicant is also coy about the revenue available from energy arbitrage. In reality, the BESS will only be capable of storing one hour of peak generation and so its role in preventing curtailment will be minimal, although the operator will still be paid under the Contract for Differences scheme when curtailment occurs. Therefore, the revenue earned by the Applicant will be the same if the solar energy is stored in the BESS or if curtailed. Due to capital and operational costs, the BESS as a standalone system will reduce the operator’s profits, as it will earn no additional revenue beyond the fixed CfD price for solar generation. Thus, the purpose of the BESS can only be as an additional source of revenue to cross-subsidise the scheme (including its own installation), as a BESS that did not trade energy would reduce the operator’s profitability.

At night and in the winter when insignificant amounts of energy are being generated by PV, the scheme will trade power with the National Grid. The potential earnings from storing power at periods of low demand in winter and then selling it back to the grid is considerable. When market prices are high, as the market bids for power sources to meet peak demand, solar can do nothing to mitigate price peaks. For instance, during a December 2022 cold spell, with day-ahead prices at £675/MWhr, in the darkness of 5-6pm (peak demand), the price spiked to £2,586/MWhr (“UK

power prices hit record high amid cold snap and lack of wind power”, Guardian article, 11/12/2022).

Without the ability to trade energy with the National Grid, as demonstrated by Mallard Pass, there would not be a case to install a BESS, as it would only be used for 30% of the time, be able to store 1 hour of peak production and result in a reduction in profitability. Therefore, it is a reasonable assumption that a BESS trading energy with the National Grid is **only** necessary as an additional source of income.

Note: I could not find any reference to a maximum storage capacity of the BESS either in the dDCO or the Design Documents. There is a possibility that an uncapped capacity would provide a further opportunity for “*additional revenue*” further weakening the Applicant’s case.

4.3 BESS- Applicant’s Circular Argument

In the Applicant’s answer to ExA Question 1.1.18 they state that “*The proposed overplanting ratio is specifically tailored to the Scheme’s DC-coupled configuration, which allows for direct integration of solar generation with the Battery Energy Storage System (BESS)*”. In their response to ExA Question 1.1.22 they state that “*the BESS is sized to import all of the power from the solar PV*”.

So, applying the same circular argument, if the overplanting was reduced then the BESS could be smaller, both reducing the overall harm to the area.

The Applicant states that overplanting by 50% is to increase efficiency. In reality, they will use 50% more land, which achieves the same efficiency of 2-4 acres per MW peak generation, to increase generating capacity. The efficiency will not be increased as it will remain at 2-4 acres per MW.

4.4 Tillbridge Generating Capacity

The Applicant has not explained why they need a larger footprint to support a 500MW grid connection than the other solar NSIPs in the area.

4.5 Comment on Overplanting

The Applicant repeatedly misuses the term “*over planting*”. NPS-EN3 footnote 84 states:

“Overplanting” refers to the situation in which the installed generating capacity or nameplate capacity of the facility is larger than the generator’s grid connection. In the case described in paragraph 2.10.46 solar generators may install but not initially use additional panels to act as a backup for when panels degrade, thereby enabling the grid connection to be maximised across the lifetime of the site. For planning purposes, the proposed development will be assessed on the impacts of the overplanted site”.

The Applicant claims credit for the generating capacity of all the installed panels, even though some of the solar panels may not be initially used but held in reserve for when panels degrade. If the Applicant wishes to claim credit for the generating capacity of all the panels from day 1, then they should not use the term “overplanting”, nor rely on the overplanting provisions in EN-3. Instead, they should state they are seeking a circa peak 700MW generating capacity due to the intermittency and low efficiency of solar generation.

4.6 BESS Thermal Runaways

4.6.1 Water Supply

The National Fire Chiefs Council (NFCC) BESS Guidelines are being updated. The current Guidance requires each BESS site to have the capability of providing 1,900 litres a minute of water for a minimum of 2 hours (228,000 litres). As the Tillbridge BESS is distributed around the scheme, this volume of water will need to be available at each sub-site. In reality, a much larger volume of water will be required: the West Yorkshire Fire Brigade calculated 5 million litres would be required for a BESS thermal runaway. The Liverpool BESS (20 MW scheme) fire in 2020 took 59 hours to extinguish and local fire hydrants ran dry due to the volume of water required.

The currently available documentation does not explain how the Applicant will achieve this level of water supply.

4.6.2 Firewater Retention and Storage

In addition to providing water to contain a BESS thermal runaway, the considerable amount of polluted water resulting will have to be retained and stored. The Applicant has not explained how the vast quantities of water required to contain a BESS thermal runaway will be retained. At the Hearing the Applicant stated that swales will be lined to prevent polluted water contaminating the land. Swales will not be capable of successfully holding back the vast volumes of water required to contain a thermal runaway.

4.6.3 BESS Thermal Runaway Summary

The Applicant has provided insufficient evidence to support a BESS being consented as part of the Tillbridge scheme. It is accepted that the Applicant has applied a Rochdale Envelope to this scheme but Advice Notice Nine 2.3 states:

- *“the need for ‘flexibility’ should not be abused:
“This does not give developers an excuse to provide inadequate descriptions of their projects. It will be for the authority responsible for issuing the development consent to decide whether it is satisfied, given the nature of the project in question, that it has ‘full knowledge’ of its likely significant effects on the environment. If it considers that an unnecessary degree of flexibility, and hence uncertainty as to the likely significant environmental effects, has been incorporated into the description of the development, then it can require more detail, or refuse consent”*

To date, the Applicant has provided insufficient evidence how they will provide cooling water for a BESS runaway and retain the resulting polluted fire water.

5 Works Cited

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