

7000 Acres

Summary of Oral Submissions – ISH 4, Wednesday 6th December

Cottam Solar Project

Deadline 3, 19th December 2023

1ISH 4, Wednesday 6th December (from 10am)

Within 4 “Main Discussion Points”, 7000Acres response

“Climate change – the Applicant will be asked to explain how it has reached the conclusion for a major beneficial cumulative effect.”

1 Basis of output:

First of all, it is not clear upon what basis the Applicant has calculated annual output in year 1 to be 945,000 MWh.

At a roughly 11% load factor for solar in the UK, this would imply an installed capacity – without any constraint on the export grid capacity, of around 980MW.

Clearly, the publicity material for Cottam is for a 600MW scheme, and based upon that figure, the likely year 1 generation would be 580,000MWh. On this basis, the Applicant has used an output figure that is significantly higher than the capacity indicated in their consultation material.

The baseline capacity the Applicant is using for their calculations is therefore not clear.

This may relate to the extent the scheme is being “overplanted”, as has been previously discussed by the developer at other hearings for their West Burton scheme, where they are exploring the economics of “overplanting” by 30% to 50%, i.e. laying down more panels, with a lower utilisation rate, to make greater use of the grid connection.

And because the capacity is not clear, the number of panels in the baseline assessment cannot easily be understood.

2 Comparison Methodology:

In terms of the methodology behind claiming a “major beneficial cumulative effect”:

- The Applicant’s methodology is based upon this project compared with no equivalent solar capacity going ahead, and the entire output being replaced by generation with the average grid intensity of CO₂.
- In reality, if this project does not go ahead, and other solar schemes do go ahead, there will only be a negligible difference in CO₂ emissions. For instance, if the same capacity were deployed through domestic rooftops, the CO₂ difference would be marginal, based upon the trade-off between:
 - The advantage arising from the economies of scale, deploying large scale solar
 - The disadvantage of having not deployed on rooftops, at low voltages, which therefore removes the capital cost and carbon investment in high voltage transformers and transmission lines – and which would also eliminate transmission losses, as the bulk of rooftop solar power would be consumed at the point of generation.
- On that basis:
 - The lifetime emissions reduction of 5.9m t CO₂ would be decimated.
 - The “payback” period to offset the development emissions will be significantly longer, if at all.

3 Not All Energy is Equal:

In addition, within the assessment, the Applicant has considered “all energy to be equal”. The key difference between solar energy and “grid supplied” energy, or higher CO₂ fossil sourced energy that is “dispatchable”, is that such power is available upon demand, therefore, while energy may be equivalent in volume, it is not equivalent in value. For instance:

- Grid energy can replace 1 kWh of solar energy at any time.
- Solar energy can only replace 1kWh of grid energy when there is sufficient sunlight.

In this way, the calculation by the Applicant is oversimplified.

At present, the higher carbon sources of electricity are used when wind and solar are at their lowest, therefore, using an average grid CO₂ intensity doesn’t reflect that these higher-carbon, dispatchable sources of generation are more likely to be deployed when wind or solar are not available.

The solar scheme will therefore act to reduce CO₂ intensity of the grid by adding to the quantity of solar already available, at times when there is already a relatively low CO₂ intensity.

During the winter at points of peak demand, the electricity market prices spike, despite its low CO₂ intensity, solar cannot contribute energy to displace other forms that are available. It is at these peak times when higher CO₂ fossil fuels are more likely to be used, and the scheme be able to make only a minimal impact in reducing the carbon intensity of the grid at these times, if at all.

4 No Curtailment Modelled:

Furthermore, the assessment assumes all the output will be used, and that the scheme is never “curtailed”. Curtailment occurs already when there is an excess of renewable generation than the demand required. This additional energy is switched off and not used. It can therefore not displace any other form of generation. The Applicant has not estimated the volume of curtailment the scheme will face, but this will serve to reduce the lifetimes emissions reduction claimed.

As an indication of the scale of this issue, National Grid foresee that the amount of curtailment will reach between 30 and 60 TWh by 2035, in comparison to the annual output of the Cottam scheme, estimated by the Applicant to be almost 1 TWh.

Solar is particularly susceptible to periods of curtailment, as it generates a predictable peak of generation that is typically out of phase with the demand curve of the grid.

It is therefore potentially material to the output of the scheme that the extent to which the scheme may be curtailed is factored into the lifetime output of the scheme, and therefore the rate at which it can be seen to offset development emissions.

5 Significance:

The contribution to energy and therefore decarbonisation will be limited.

Taking the 600MW used in consultation, the annual output will be 0.58 TWh.

- This represents 0.2% of current annual electricity demand of 300TWh.

- As demand is forecast to rise to between 800 and 900TWh by 2050, the contribution from this scheme would fall to around 0.07% of national electricity supply.

Even using the Applicant's higher figure of 0.945TWh per year, it would only supply 0.1% of national demand.

The project will not make a material contribution to energy or decarbonisation – for all its adverse impacts.

In Conclusion:

- Overall, there is a question about the output assumed by the Applicant in their calculations.
- The methodology used by the Applicant has been designed to create an impression of significant CO2 emissions reductions and underpin a claim to have a "major beneficial impact".
- In reality, a number of assumptions have been used to help create this impression, and therefore little weight should be given to the evidence provided by the Applicant without independent verification.