

Technical Note

Project:	Hilfield Solar Farm & Battery Storage Site		
Subject:	Solar Farm Capacity Review		
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Date:	14/06/2021	Project No.:	5193383

Document history

Revision	Purpose description	Originated	Checked	Reviewed	Authorised	Date
1.0	Release to Client	JG	TJ	IL	MS	14/06/21

Client signoff

Client	Hertsmere Borough Council
Project	Hilfield Solar Farm & Battery Storage Site
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1. Background

Atkins have been commissioned by Hertsmere Borough Council to provide an independent review of the capacity for a proposed solar farm (planning application reference 21/0050/FULEI). The solar farm would consist of ground mounted PV panels, inverters, and battery-based electricity storage containers, supported by the required infrastructure. Consultation comments in relation to the application have queried if the intended installed electrical generation capacity of the development may exceed 49.9MWe. The council have therefore commissioned this independent review of the developer's proposals to ascertain the proposed generation capacity ahead of the application being determined by the Planning Committee.

The proposed solar PV array size is 49.9MW which will cover 85 hectares [1] (out a total planning application site area of 130 hectares) as stated in a report by LDA Design and BSG Ecology who have produced a Landscape and Ecological Management Plan on behalf of Elstree Green Limited. A solar PV array of 50MW or more is defined as a Nationally Significant Infrastructure Project, therefore it is important the 49.9MW capacity is adhered to in order for this proposal to be determined by the Local Planning Authority. Any generation above the 49.9MW limit, or if the solar farm is extended in the future, will most likely need to go through a further consent application process for approval.

2. Review Summary

Site Overview

According to the submitted application documents, a total of four sites were considered as part of the siting assessment, and two sites have been identified as suitable options. Site 1 uses land to the West of Elstree Aerodrome and comprises of approximately 50 hectares and site 2 uses land to the East of Elstree Aerodrome and comprises of 80 hectares. This results in a combined total of approximately 130 hectares of land identified. Both of these sites are within proximity of the intended network connection at Elstree substation and the intention is that they would be connected via a new underground cable.

Expected Performance

At this time the developer has not procured the solar PV generation equipment, however they have confirmed that they will only procure and install solar modules and inverters up to the 49.9MWe. They have indicated that nominally this would be 16 inverter units, each rated to 3MW, which will provide a total capacity of 48MW at the solar farm. In addition to the solar generation there will be a number of battery storage units installed to allow electricity generated during daylight hours to be stored and exported at other times.

The presence of the batteries at the site do present the potential to export greater than 49.9MWe, however the developer has confirmed that Power Plant Controller (PPC) which is integrated within the PV control system will ensure that the export limit of 49.9MWe will be maintained at all times in full compliance planning consent being applied for.

The PPC implements closed loop control in real time and can control and limit the output of the individual inverters and the combined active power export to the grid at the point of connection to 49.9MWe.

This arrangement will ensure that the export limit of 49.9MW is not exceeded. The Council may wish to ensure that this stated capacity is not exceeded – for example via planning conditions or a legal agreement attached to any consent.

Site Analysis

The local substation is Elstree substation, which is located next to Hilfield Lane, Watford. The substation is currently constrained on the demand side, however there is significant generation capacity available in the area. A connection request has already been submitted for 49.9MW Transmission Entry Capacity (TEC) with a further 7.1MW of TEC also applied for by the developer. This application was completed by Aardvark EM Limited on behalf of Elstree Green Limited.

The available land area has been assessed by Atkins using Thermoflex software, which is a modelling tool used internally within Atkins. Based on our review, the area identified (85 hectares) [1] could site more than 49.9MWe of solar PV. Whilst the site may have space for a larger PV array size greater than 49.9MWe, the developer has confirmed they will only install 49.9MWe solar capacity along with battery capacity. This will allow for load shifting of generation to optimise how power is dispatched to the network and potentially provide grid services.

The current planning application does not propose the export of greater than 49.9MWe, and as described above the PCC will ensure the export is maintained below this limit.

In the future, as with all generation, the plant capacity could be extended either through increasing the number of solar generation modules or by changing the way the battery storage operates. Such a change would require the developer to apply for the appropriate consents at that time, which may include a Development Consent Order application to be submitted to the Planning Inspectorate for consideration as a Nationally Significant Infrastructure Project.

3. References

- [1] LDA Design and BSG Ecology, "Hilfield Solar Farm and Battery Storage Landscale and Ecological Management Plan on behalf of Elstree Green Limited," April 2021.