The Greenspan Agency

Technical Description of the Proposed Development

Inchinnan Solar Park

Site Address	Houston Road Inchinnan Renfrewshire PA4 9LX
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Introduction

1.1. Planning permission is sought for a ground mounted solar photovoltaic project referred to as Inchinnan Solar Park. This will be built on approximately 40 hectares of land near Houston Road, to the west of Inchinnan Industrial Estate. A total of approximately 47,500 solar panels could be installed on the site, depending on final panel specifications. The project will have up to 14.3 MW generating capacity which will be exported to the national grid. This export capacity is limited by the characteristics of the local grid.

Description Overview

1.2. The solar panels will be mounted in rows facing south and inclined at an angle of approximately 30°. The scheme has been positioned to maximise exposure to sunlight.

1.3. The proposal also includes the associated electrical infrastructure, security fence and CCTV cameras. The main vehicular access will be via the southern end of the site.

1.4. The panel mounting system will be pile driven and require no other foundations, therefore impacts on the land will be temporary and reversible. The renewable electricity generated by the panels will be exported to the grid.

1.5. It is informative to refer to the submitted planning application drawings when reading the rest of this report.

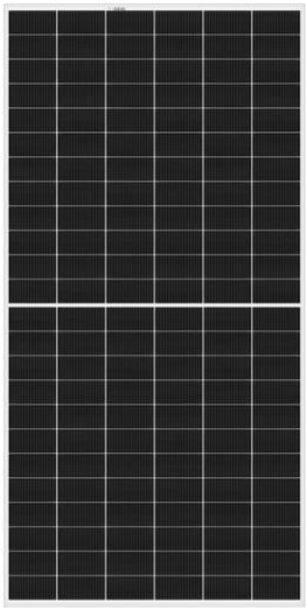
Project Detail

Solar Panels

1.6. The total number of panels may change after planning permission has been granted, as the site is optimised following more detailed electrical studies, procurement, panel micro-siting, and ground investigations, but the overall character and configuration will not change.

1.7. The exact panel make and model will be selected via a competitive procurement process. However, the industry has converged on a typical panel design with little variation in appearance. An example panel is shown in Figure 1; the size and appearance of the final panel chosen is likely to be consistent with this.

Figure 1: Example Polycrystalline Solar Panel



1.8. The panels will be fixed to a ground mounted structure and arranged in rows of various lengths. Each row will be 2 to 8 metres apart to minimise shading and allow for future access to the panels for maintenance purposes. The horizontal depth of each row, from the southern to northern edge (front to back), is likely to be no greater than 3.7m.

Figure 2: Example Solar Park Layout

Mounting Structure

1.9. The panels will be mounted on a metal frame. The final mounting system must be determined through a competitive tender process and may change. Different makes and models of frame are essentially very similar in appearance. Some mounting frames use two rows of uprights: one at the southern edge, and one at the northern edge of the panel row. Others use a single row of uprights nearer the centre of the row. See the photos below.

1.10. The maximum height of the highest part of the panels on the frame will be 3.3 m. This is a maximum for planning purposes, the actual height will almost certainly be lower.

Figure 3: Example PV Ground Mounting System 1
Supporting pile uprights front and back[1]

Figure 4: Example PV Mounting System 2
Single row of piled uprights penetrating the ground[2]

[1] Greenspan project, north Scotland.
[2] Third party development photographed in Fife.

Inverter / Transformer stations

1.11. The Direct Current (DC) electricity generated by the solar panels will be transmitted to an inverter station to convert it to Alternating Current (AC). This DC to AC conversion is needed because the electricity grid transmits AC electricity.

1.12. The voltage of the AC power will be stepped up at a transformer housed in the same unit alongside the inverter.

1.13. At the time of writing, it is expected that a central inverter station will be used, likely similar to the image below. This is a pre-assembled skid mounted system of around 6 m in length and 3 m in height.

Figure 5: Candidate Centralised Inverter System

Substation

1.14. Power from the transformers will be transmitted to the substations located at the north and south of the site. From here the electricity will be exported to Scottish Power Energy Networks distribution grid. Two substation enclosures will be needed for the grid operators' switchgear and connection equipment. The final design will need to adhere to SPEN requirements and is not certain at the time of writing. However, the largest would be up to 12 metres long, 2.6 metres high, and 4 metres wide, these are commonly coloured dark green, but may have a grey or brick finish. These are relatively small buildings in the context of the whole site.

Grid Connection

1.15. Three grid connection points have been agreed with the district network operator, Scottish Power Energy Networks, to export the electricity to the grid.

Auxiliary Transformer

1.16. An auxiliary transformer may be needed to supply electricity to parts of the site. Auxiliary transformer elevations have been provided within the drawings accompanying this planning application.

Office

1.17. A small, prefabricated, cabin will be provided as a site office. This will house some IT equipment for the remote operation of the site and provide a base for construction phase management. During operation this office will provide a base for site visits and serve as a dry store. The office will not be routinely occupied during operation.

Security

1.18. For public safety and security, it will be necessary to erect a fence around the perimeter of the site. CCTV cameras will also be installed. Drawings of the fence and CCTV camera mounting have been provided with this planning application.

Site Access

1.19. The main site access will be built in the south of the site connecting to Houston Road where the current field access is, pictured below.

Figure 6: Site Entrance from Public Road

1.20. The alternative access in the north, connecting to Greenock Road, is pre-existing.

1.21. New tracks will be built around the site for access as detailed in the Tracks and Access Road Plan. The Construction and Access Report provided with this planning application provides further details.

Turning Circle and Passing Places

1.22. The access tracks on the site will be supplemented by turning circles at both ends of the site, and one in the centre of the site. The turning circles will be large enough for construction HGVs to turn around and exit the site without reversing back down the access track.

1.23. Passing places will be situated along the access track as detailed in the Proposed Site Layout. The passing places will improve safety on the site and on the public road by removing the need for vehicles to reverse or wait at inappropriate locations.

Designing Around Existing Utilities

1.24. The solar panel mounting frames are supported by piles driven up to 2m into the ground. The location of these has therefore been considered to avoid underground utility infrastructure.

Gas

1.25. No gas pipelines are known to be present within the red line boundary of the site. One gas pipe is present to the southwest of the site, this is 212 m to the red line boundary, and 270 m to the closest area of construction.

Scottish Water

1.26. A 24-inch Scottish Water main runs along the west of the site. This has been given a 22 m standoff distance.

Electricity

1.27. There are two overhead lines crossing the site. The 11 kV line at the north of the site has been given a 10 m standoff distance. The 400 kV line running across the centre of the site has been given a 25 m standoff corridor where no panels will be situated. The access track crosses under the 400 kV line at a 90-degree angle, perpendicular to the line.