1. Priory Farm Solar Array Grid Connection

1.1. At a high level, there are two electricity networks that a project can connect to, either the Transmission Network (National Grid) or the Distribution Network (DNO). Historically, most renewable energy projects have been connected into Distribution Network and the connection to the Transmission Network has largely been dominated by a small number of large connections from central power stations (gas CCGT, coal, Nuclear etc). The electricity network is in a great degree of flux as the power system fights to decarbonise and move away from large central power stations to a renewable system where projects are distributed across all networks and voltages across the country and new connections are now being connected at all voltage levels; from large 132kV to smaller 11kV projects.

1.2. Heat Maps and Connection Process

1.3. The Distribution Networks Operators have various information available for a developer to assess what capacity is available and in which area of the network. An example of this was the DNO Heat Maps. These seek to identify at a high level where there was likely to be grid capacity and what level of curtailment the project was likely to suffer. It is a guide of where grid capacity may be, but does not cover the level of detail required for a specific connection at a certain point.

1.4. The Heat Map, at the time, covered capacity and curtailment.

1.5. Capacity – this indicated whether you may be able to connect a project in a very general area but further analysis would still be required on a desktop level. This would entail further technical analysis into the size of substation, the voltage level and other technical parameters to understand how much capacity you may be able to connect at which point of connection. Although, a small substation may appear unconstrained but it would not be able to accommodate a high capacity connection due to physical limitations.

1.6. Curtailment – the DNO has moved to offering Active Network Management connections (rather than firm connections), which effectively allow the DNO to turn projects off and prevent projects exporting during periods of high generation on their local grid. Curtailment is a critical issue as it was only an estimate from the network and it increased the risk exponentially for a project being turned off at any time for no compensation. This made projects with high level of curtailment incredibly difficult to deliver.

1.7. Outcome of Heat Maps and Capacity Availability Analysis

1.8. The heat map identifies groups of substations that may have capacity but further analysis is required to determine if they would be suitable for a solar project. The key considerations are:

1.8.1. ***Physical Size of the Substation***: The physical size and capacity of each substation and transformer. For example, even if 10MVA transformer could accept 100% of its capacity, it could still only connect 10MVA.

1.8.2. ***Location of the substation in the network;*** connecting generation at the end of the network at lower voltages is more difficult. Connected generation would drive power flows upstream which in turn would be subject to network constraints, including cable sizing, fault levels and capacity. This would likely result in upstream reinforcement works.

1.8.3. ***Physical Location of the substation***; This affects the cable routes with the aim of avoiding long cable runs through towns and urban areas distant from potential landholdings for solar arrays.

1.9. The Planning Statement identifies the primary substations with potential capacity. However, each of these substations is further constrained by one or more of the above factors. This is explained below.

Substation	**Constraint**
East Harpenden	Small substation. Land ownership unclear. Next to sewage/water plant. Constrained connection route through residential area.
North Hitchin	Located within urban setting. Disruption to residents and cost of cable route. Site is bounded by trainlines
North Stevenage	Located in urban setting. Disruption to residents and cost of cable route.
Reed Primary	Technical size, position at the network and the existing generation at the substation. All of these would make it unviable to connect a scheme to the network at this time. (Further consideration is considered below)
Stevenage Primary	Located in urban setting. Disruption to residents and cost of cable route.
South Hitchin Primary	Located in urban setting. Disruption to residents and cost of cable route.

* Reed Primary is located at the end of the network feeding back to Cherry Green, Knebworth, Warren Springs and Stevenage. A schematic of the network is shown in Appendix 1 and shows its location. The substation is small and not capable of connecting large scale solar or

generation to the site. Even if it were possible, the reinforcement required upstream of the substation would be significant and not viable.

2. Conclusion for EHV Substations (>22kV)

2.1. It is clear from the above that none of the identified primary substations would provide a suitable connection for the grid for the proposed development.

2.2. It is worth noting that since 2019, there have been no accepted grid offers from other developers from these substations as published on UKPN connections register. This demonstrates that our analysis stands. You would expect other developers to have applied and accepted connections to these substation if grid capacity was indeed available and the substations were suitable. (North and South Hitchin, Reed, Stevenage, or East Harpenden).

2.3. Transmission Connection Process

2.4. As identified in the Planning Statement it is potentially possible to connect into the National Grid 132kV substations. These are identified in the planning statement in paragraph 5.4.73. There were two within North Hertfordshire and 4 within 4km of the district.

2.5. An application was made to National Grid for a tertiary connection at Wymondley GSP. This is a specific type of connection for a project of this size and it is not available at all transmission level substations. The reason for connecting at Wymondley rather than other substations was for the type and viability of the 33kV/13kV connection. All other connections would likely have resulted in a 132kV connection. This substantially increases the cost to connect and generally this is only viable for connections above 50MW.

2.6. A key point of difference for transmission connections is that they could be secured (at that time) without having identified a specific site. This meant that developers can secure the grid connection and then run a detailed site assessment across a number of sites, approach landowners and identify a site that is deliverable and available within an appropriate distance (4km) from the connection.

3. Proximity to Grid Connection and Other buildability issues

3.1. 4km is considered the maximum distance radially from the point of connection to a site. Our experience shows that increasing this distance has an exponential increase in costs and complexity. The base case of all grid connections are through the public highway and by increasing this radius, the physical length of the grid route increases as you have to follow the public roads.

3.2. In turn this exponentially increases;

- the disruption to businesses and residential properties,
- increases the risk of infrastructure crossings (technical hurdles such as bridge crossings, railways, motorways and rivers etc).
- risk of third party land rights being required
- Construction issues; ground type; flooding etc

3.3. All of this delays the project, increases costs and in many cases makes the project unbuildable for technical reasons.

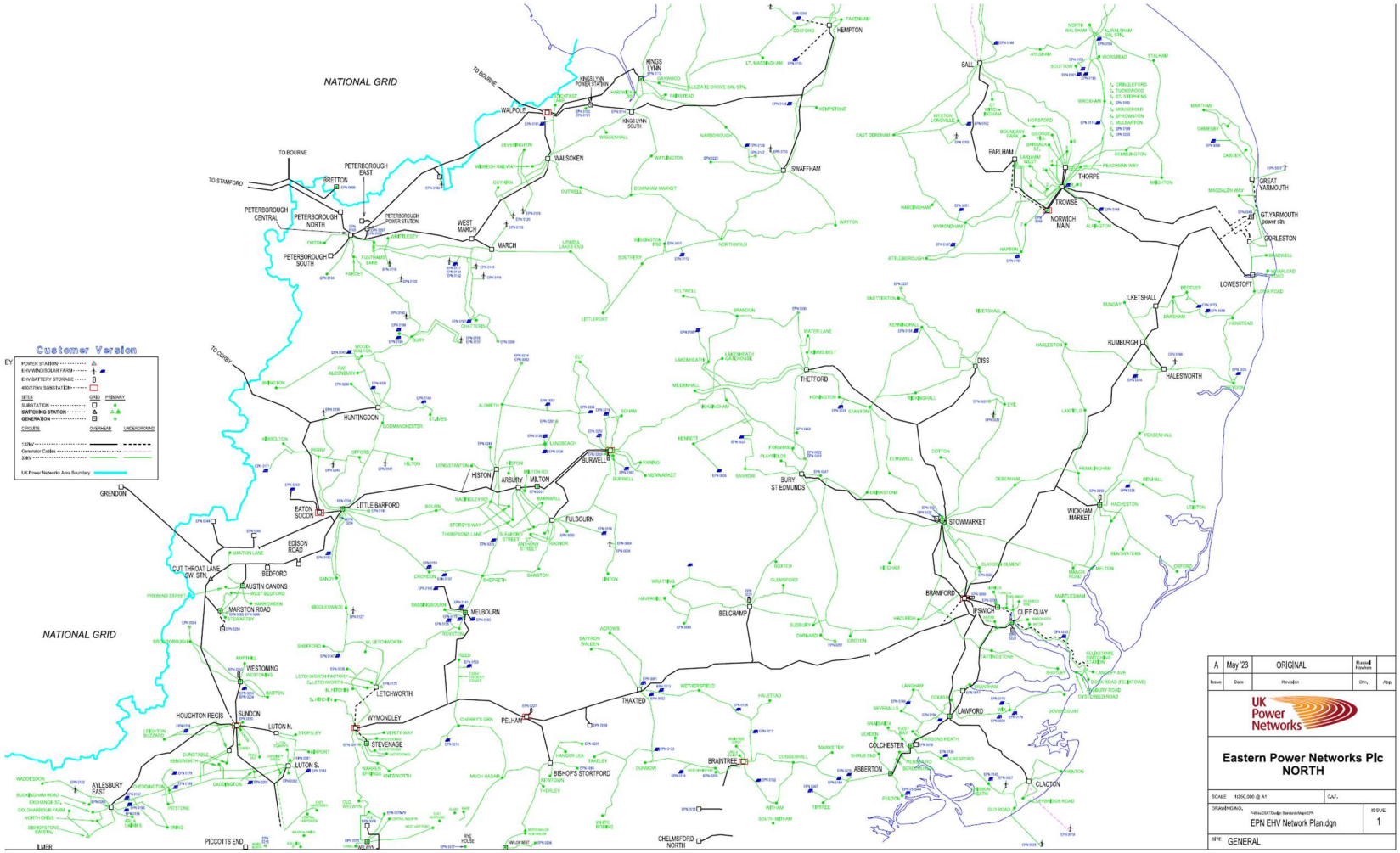
3.4. While in the process of securing the grid connection, AGR engaged a land agent to work on land acquisition for the project. The search criteria would have been set at 4km from the connection point, focusing on landholdings large enough for a 49.9MW solar project, reasonably distant from residential properties and taking due consideration of the constraints. (CD157).

3.5. There were a number of landowners that were interested in engaging on this project the project. Some were further to the west which may have impacted on the AONB and another site further to the south was already in talks with a developer. I believe that this landowner has gone on to secure consent for a battery project and has an application in for the Sperberry Farm. A screenshot of these proposed landholdings can be seen in Appendix 3.

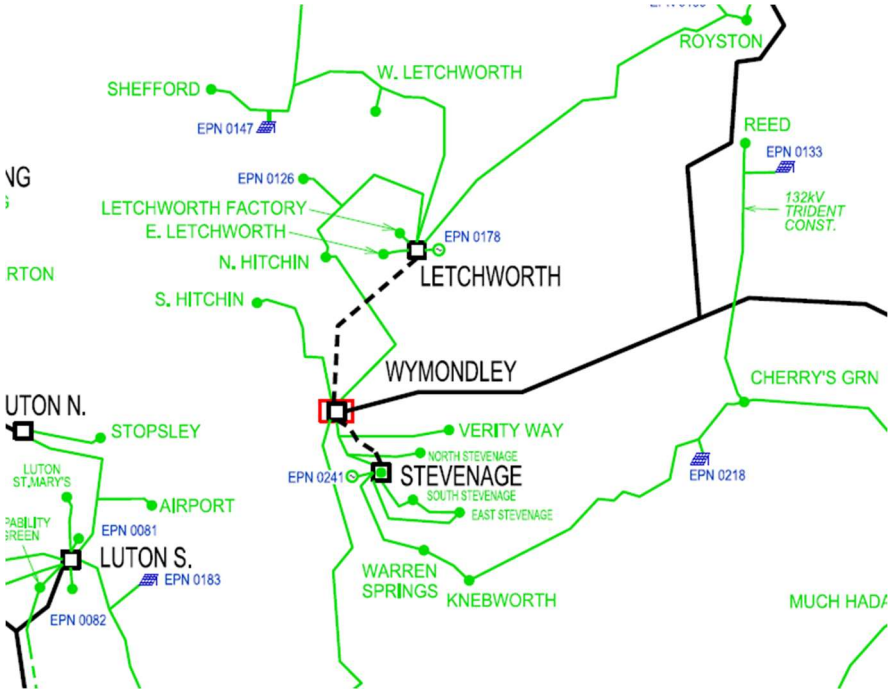
3.6. The application site was chosen as it was available, deliverable, unconstrained at high level appraisal and within 4km of the grid connection. At that point we engaged Axis to undertake the necessary environmental studies to inform the preparation of the planning application.

AGR RENEWABLES

APPENDIX 1:



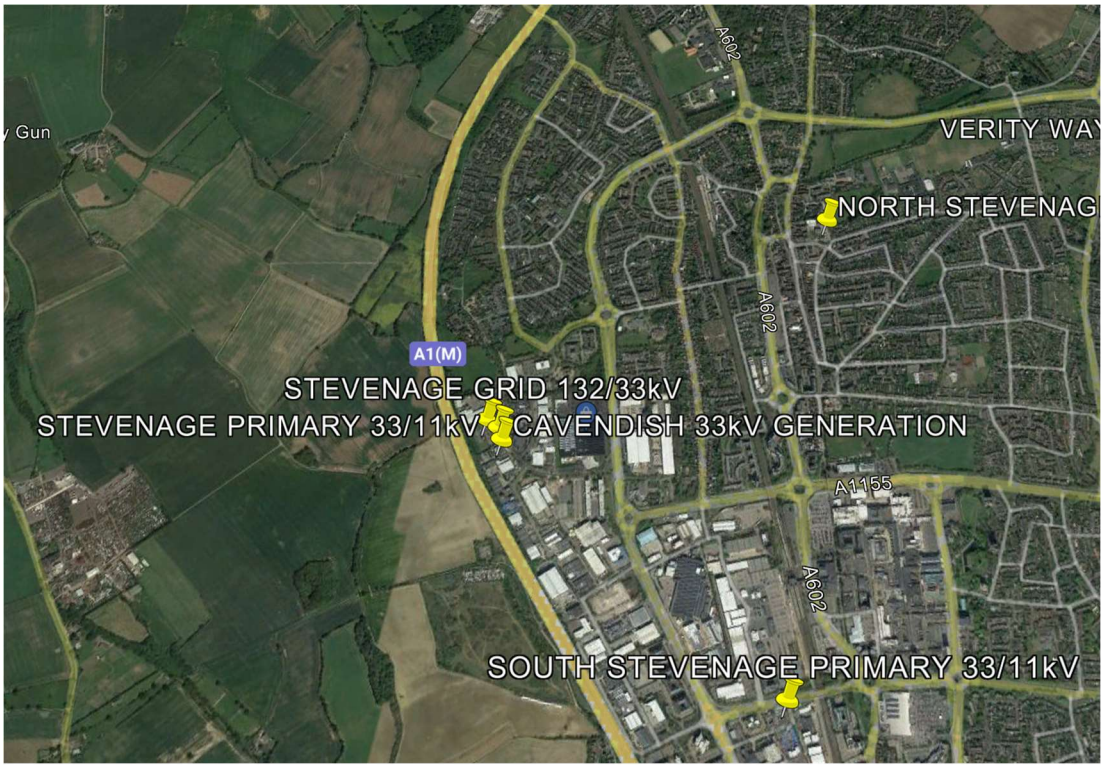
AGR RENEWABLES



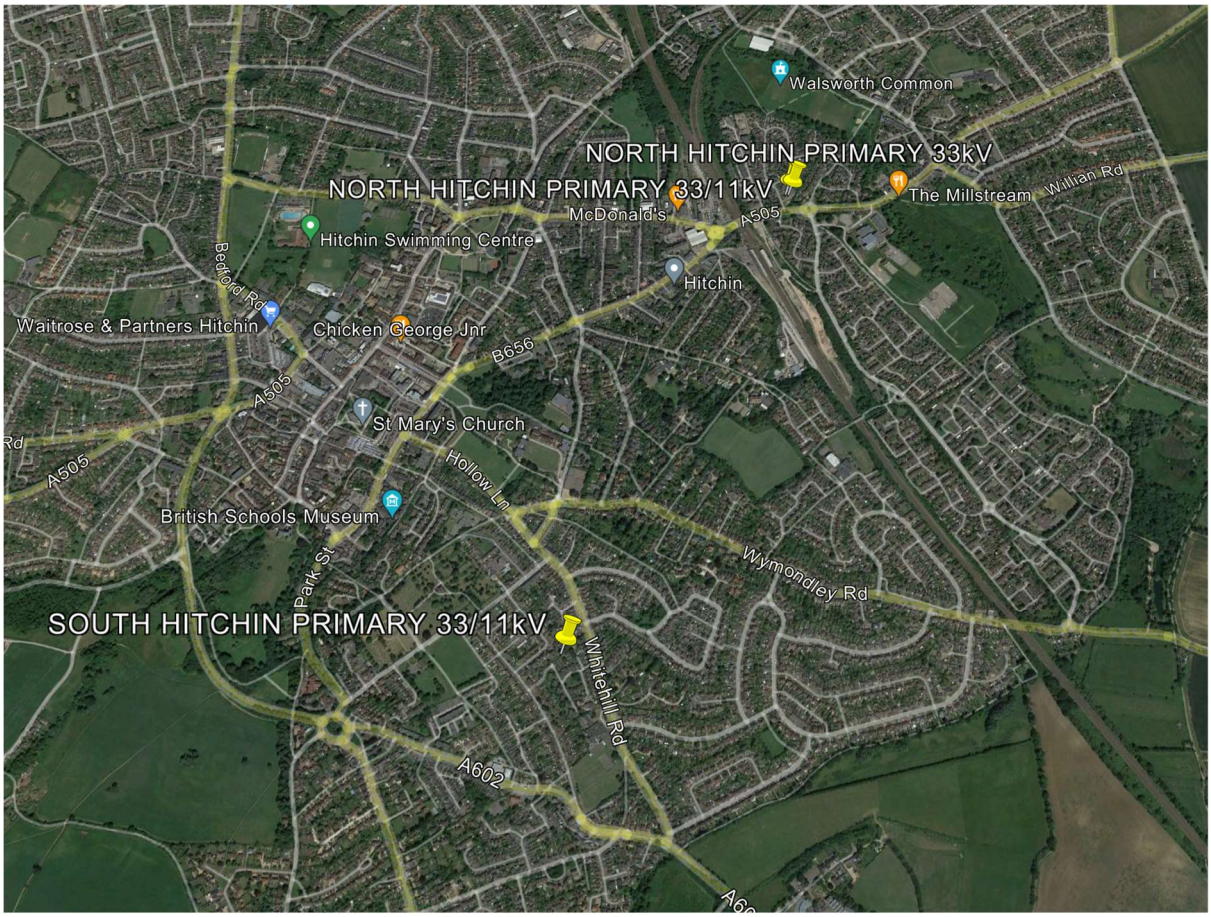
APPENDIX 2: SUBSTATION SCREENSHOTS

EAST HARPENDEN

NORTH STEVENAGE AND STEVENAGE PRIMARY



NORTH & SOUTH HITCHIN



REED PRIMARY

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www.agr-group.co.uk

APPENDIX 3: EXAMPLE LAND ACQUISITION

IDENTIFIED LANDHOLDINGS LARGE ENOUGH TO ACCOMMODATE COMMERCIAL SCALE SOLAR. LAND TO THE WEST OWNED BY 4 LANDOWNERS LAND TO THE SOUTH OWNED BY 2 LANDOWNERS.