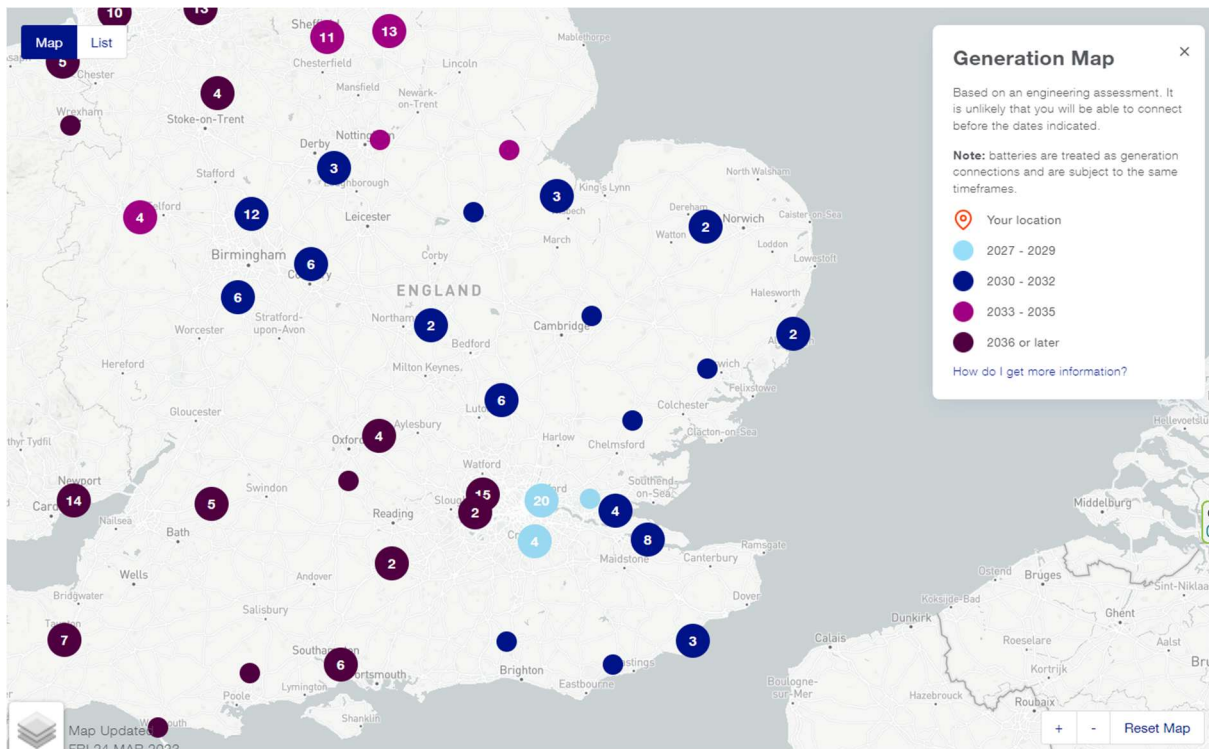


Anglo ES Whites Farm Ltd – Grid Capacity and Site Selection

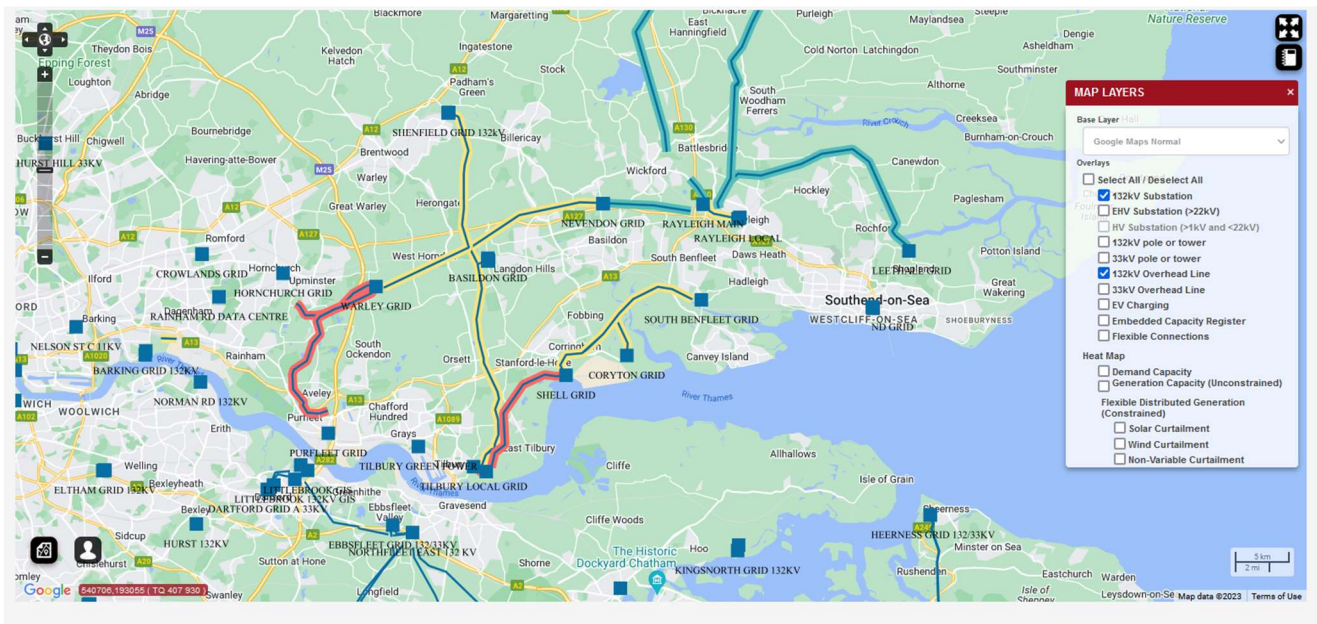
As set out in the 'Battery Energy Storage – Sequential Site Selection Process' report submitted with this application, and further information submitted to officers the ability to connect to the grid network is a key determining factor in the location of Battery Energy Storage Sites (BESS) and renewable energy projects in general.

The whole country is now seeing significant connection delays for new connections due to the requirement for significant infrastructure upgrades by National Grid. In the Essex area new connections at transmission will have connection dates of 2030 - 2032. This also applies to UKPN connections as UKPN needs approval from National Grid for all connections over 1MW.



Data source available here: <https://customer.nationalgridet.com/s/pre-application>

At a UKPN (Distribution) level the picture is equally as constrained. The image below shows the 132kv network in the southeast Essex area. This is the infrastructure needed to be connected to for a scheme such as that at Whites farm.



Data Source – UKPN Heat map

The plan shows that all of the 132kV lines are highlighted. The highlighting shows these circuits have minimal or zero capacity available on them due to either Thermal (Yellow) or Fault Level (Blue and Red) limits on the network already being reached. These technical considerations are considered as part of all new connection applications. The lack of connection opportunity on to those other circuits pushed us to choose the location of the site where these technical limits allowed a connection.

For a scheme of over 20MW in capacity, you will generally either need to connect directly back into a National Grid Exit Point (Such as Rayleigh or Tilbury substations) or to connect into the nearest 132kV circuit. In this case, we are connecting into a tower line between Rayleigh and Tilbury.

It is not always feasible to connect back into a National Grid exit point for a number of reasons. These can be, but not limited to the following:

- Space constraints to allow a new 132kV breaker to be installed.
- Configuration of exit point not allowing additional connections.
- Too many sites and ends under the DNO guidelines to install more.

It is possible to ‘break in’ to a passing 132kV overhead or underground line and create a new substation on site for the connection. This area has predominantly overhead circuits which are held on large 132kV Tower Lines.

Due to the costs involved of creating new 132kV circuits and the restrictions of constructing new overhead tower lines, BESS schemes will usually need to be within 1km or closer from existing lines of points of connection.

A further consideration is many of the towers within the overhead line are not able to be altered or broken into due to technical integrity of the line and due to many connections within that stretch of network, these factors further reduce connection location opportunities.

UK Power Networks system is heavily loaded with connections, both for Generation (export on to the network) and for demand/load schemes (import). This is particularly relevant with densely populated area and power flows of energy from more rural area hosting wind and solar towards London. The volume of connections and power flows mean much of the infrastructure is at capacity and new connection could only be achieved via significant upgrading, as is being seen as needed at the transmission level.

According to National Grid, to meet the government's net zero target, *the GB grid must deliver more than five times the amount of electricity transmission infrastructure in the next seven years, than has been built in the past 30 years.*

Existing network usage further reduces the opportunities for connecting on to different circuits and substations in the wider area.

The applicant has secured a connection on to the 132kv tower line between Rayleigh and Tilbury. The identification of the proposed site included significant work with UKPN to identify a viable connection point which considers all of the factors above. Due to the wider grid constraints, the nature of the surrounding area, the environmental consideration, land availability and landscape impact the ability to connect elsewhere is minimal. As agreed by officers no other points on the 132kv line being connected to would offer less impact.