



## SPE ELECTRICAL – RENEWABLES & ENERGY STORAGE



SPE Electrical Limited (SPE) a UK based, small, independent Electrical Engineering consultancy, well-positioned to offer strong and continuing support for the renewables and energy storage industry, from concept development to design and commissioning.

The renewable and energy storage industry is a rapidly changing industry and competitive marketplace, and it is therefore essential to be able to design robust, cost effective and flexible solutions to projects. SPE are well positioned to help navigate this complex area, and to find low cost solutions.

One of the many challenges faced by the renewables and storage industry are the various network constraints that the DNO impose on this type of new connection. In many cases the grid connection cost, and reinforcement needed for their own network forms a major part of the overall project cost and can also considerably increase the project timescales – leading to problems of the overall project viability.

One of the areas where SPE can assist is in helping to understand the DNO constraints and specify the equipment parameters and design configuration such that the grid connection costs is reduced is simplified. We can also assist in reviewing connection offers from the DNO to ensure that all the risks, constraints and costs are fully understood by our Clients. We can also carry out very simple preliminary low-cost studies to parametrize the design issues. Typical services include:

- Providing guidance of DNO connection processes
- Ensuring compliance with DNO standards
- Early design studies
- Review of DNO offers and Developer Invitations To Tender

Members of this team, working together, have successfully worked on several notable projects, which are summarized below:

### **Netley North PV – Ethical Power**

SPE were appointed by Ethical Power to assist on development of a new 33kV connected 3.2MW PV Solar farm. SPE's scope included development of the 33kV electrical grid connection design and several power system studies to ensure compliance with the DNO requirements. SPE carried out development of the overall system Single Line Diagram, the cable routing design, tee-boot substation design, HV earthing study, P28 voltage disturbance study and protection coordination study.

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### **Forest Park Energy From Waste – Trant Engineering**

SPE were appointed to carry out all of the HV design and key parts of the LV and control design for a new waste to energy plant containing a 4.5MW Steam Turbine Generator. As part of our scope SPE developed an HV protection & control drawing, LV protection and control drawing, operating and control philosophy, control block diagram, short circuit study, P28 / voltage disturbance study and protection coordination study in ETAP. SPE also provided assistance in helping coordinate and define the supplier roles and responsibilities and the interfaces to the end user and DNO.

### **Stonehills, Twin Yards and Whitton PV Sites - UCP Choice**

SPE were appointed by UCP Choice to undertake a series of power system studies for 3 different 33kV, 4MW solar farm sites within the UK (Stonehills, Twin Yards and Whitton Mawr). SPE scope included a P28 voltage disturbance study a P29 voltage unbalance study and a stage 3 G5/4 harmonic assessment for. SPE undertook the G5/4 and P29 studies using the DigSilent simulation package and the P28 studies using PSCAD.

### **Keith Hill Windfarm – Windcare**

SPE were appointed by Windcare to carry out all of the power system analysis studies on a new 4.5MW, 33kV connected wind farm in Scotland. SPE undertook a wide range of power system studies including reactive power compensation, harmonic analysis, fault ride through / stability, transformer energisation and an earthing study. SPE undertook the studies in ETAP and then repeated the studies in DigSilent to validate the new DigSilent software license recently purchased. SPE also undertook an earthing study for the entire site using the CDEGS package.

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