



# Frodsham Solar Grid Connection Statement

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**Planning Act 2008; and Infrastructure Planning (Applications:  
Prescribed Form and Procedure) Regulations Regulation 5(2)(q)**

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## 1. INTRODUCTION

### 1.1 Background

- 1.1.1 Frodsham Solar Limited (the 'Applicant') has prepared this Grid Connection Statement (the 'Statement') as part of an application for a Development Consent Order (DCO) to construct, operate, maintain and decommission the Frodsham Solar Project ('the Proposed Development').
- 1.1.2 The Proposed Development comprises a new solar energy generating station and an associated on-site Battery Energy Storage System (BESS) on land at Frodsham Marsh, Frodsham, Cheshire West and Chester ('the Site'). The Proposed Development also includes the associated infrastructure for connection to the local electricity distribution network, as well as a private-wire electricity connection that would enable local businesses to utilise the renewable electricity generated by the Proposed Development.
- 1.1.3 The Proposed Development would enable the generation of approximately 207 megawatts peak (MWp) (DC)<sup>1</sup> of electricity, resulting in approximately 147 megawatts (MW) (AC)<sup>2</sup> following inversion. The proposed BESS would be capable of storing approximately 100MW of electricity over a 4-hour duration (400MWh).
- 1.1.4 The precise generating capacity and storage capacity will be subject to detailed design. It should be noted that at present the grid connection offer from the Distribution Network Operator (DNO) is for 100MW (AC) export and 50MW (100MWh) import. As noted above, the Proposed Development would also be capable of exporting electricity directly to local businesses, providing opportunity to utilise the full generating capability of the Proposed Development. In a similar regard, the higher storage capacity of the BESS design, beyond that of the import agreement, will enable electricity generated by the proposed solar generating station to be stored in the batteries during periods of low demand on the distribution network, and then dispatched onto the network during peak times of high demand.

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<sup>1</sup> Accumulated peak capacity of all installed solar modules, generated in Direct Current (DC)

<sup>2</sup> The generating capacity is described in terms of the maximum combined capacity of installed inverters, measured in Alternative Current (AC)

- 1.1.5 Subject to obtaining the necessary consents, construction is anticipated to commence in early 2028 and be completed in mid-2030. The Proposed Development comprises a temporary development with an operational phase of up to 40 years. Decommissioning activities would therefore commence in 2070, 40 years after final commissioning.
- 1.1.6 The Proposed Development is being developed by the Applicant. The Applicant is a subsidiary of Cubico Sustainable Investments. Cubico is one of the world's leading privately-owned renewable energy providers. The company holds a portfolio of circa 2.8GW of installed renewable power capacity worldwide, with a further 450MW currently in construction and 17.5GW in development. In the UK, Cubico holds a portfolio of 18 operational renewable energy projects, totalling 252MW installed capacity, plus a development pipeline of 2.4GW.

## 1.2 Statement Purpose

- 1.2.1 This Statement is to accompany the suite of documents submitted by the Applicant pursuant to Section 55 of the Planning Act 2008, and Regulations 5 and 6 of the Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 (APFP Regulations).
- 1.2.2 This statement has been prepared in accordance with Regulation 6(1)(a)(i) of the APFP Regulations, which requires an applicant for a DCO in respect of an onshore generation station to provide a statement of who will be responsible for designing and building the connection to the electricity grid.
- 1.2.3 Overarching National Policy Statement for Energy (NPS EN-1) paragraph states (with similar language used in the consultation draft NPS EN-1 published shortly before submission of the application) that:

*In the market system, it is for the applicant to ensure that there will be necessary infrastructure and capacity within an existing or planned transmission or distribution network to accommodate the electricity generated. The applicant will liaise with National Grid who own and manage the transmission network in England and Wales or the relevant regional Distribution Network Operator (DNO) to secure a grid connection. It may be the case that the applicant has not received or accepted a formal offer of a grid connection from the relevant network operator at the time of the application, although it is likely to have applied for one and discussed it with them. This is a commercial risk the applicant may wish to take for a variety of reasons, although the [Secretary of State] will want to be satisfied that there is no obvious reason why a grid connection would not be possible.*

- 1.2.4 Paragraph 4.9.2 of NPS EN-1 (and paragraph 4.11.7 of the consultation draft) states that:

*The Government ... envisages that wherever possible, applications for new generating stations and related infrastructure should be contained in a single*

*application to the [Secretary of State] or in separate applications submitted in tandem which have been prepared in an integrated way.*

- 1.2.5 This Statement details the status of the grid connection offer and provides confirmation that the grid connection forms part of the Proposed Development and, as such, constitutes a single application to the Secretary of State.

## 2. GRID CONNECTION AGREEMENT

- 2.1.1 The Proposed Development will comprise a new solar energy generating station with battery energy storage system, and the associated infrastructure to connect it to the 132kV Frodsham Substation.
- 2.1.2 The Proposed Development has entered into a connection agreement with Scottish Power Manweb PLC (SP Manweb). SP Manweb is a regulated Distribution Network Operator and part of SP Energy Networks (SPEN). The connection agreement allows both the proposed generating station and BESS to connect to SPEN's distribution system – agreement reference 61614294. SPEN deemed that the facility could affect the GB Transmission System, which necessitated the Applicant to enter into a Bilateral Embedded Generation Agreement (BEGA) with the National Grid Electricity System Operator (ESO) – agreement reference No. A/NGET/PEEL/22/FROD-EG(0). In association with the BEGA, there is also a Connection and Use of System Code (CUSC) Accession Agreement, Construction Agreement, and Transmission Related Agreement in place with NESO.
- 2.1.3 These signed agreements allow for the export of up to 100MW (AC) of electricity onto the distribution system, and up to 50MW import for storage. The overall scheme generating capacity will be higher than 100MW, enabling electricity generation to be exported onto the distribution system *and* supplied directly to local industrial off-takers via the proposed private-wire<sup>3</sup>.
- 2.1.4 The Applicant has maintained contact with SPEN and the renamed National Energy Systems Operator (NESO) to facilitate the grid connection date of 2029 as set out in the above agreements, in-line with the current project programme (which whilst not having construction complete until 2030, will be able to part energise from 2029). This will enable the Proposed Development to form part of the energy infrastructure to meet the target of at least 95% of Great Britain's power generation coming from clean sources in 2030<sup>3</sup>.

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<sup>3</sup> Clean Power 2030 Action Plan: A new era of clean electricity – main report (DESNZ, December 2024)

2.1.5 The Proposed Development will adhere to all relevant industry codes including the Grid Code, Balancing and Settlement Code (BSC), and Connection and Use of System Code (CUSC), ensuring full compliance with regulatory standards. Specifically, the Proposed Development will comply with the Grid Code by ensuring that all technical and operational standards for connection, performance, and safety are met (for example the design specifications include single-line diagrams and protection schemes, calculations of electrical losses, high-voltage cable designs, transformer specifications, physical equipment fitness, and a low-voltage redundancy source). It will adhere to the BSC by participating in the balancing and settlement processes, accurately reporting energy flows to ensure proper market settlements. Compliance with the CUSC will be achieved by meeting all connection and use of system requirements, including the payment of applicable charges and adherence to operational protocols.



### 3. GRID CONNECTION DESIGN AND BUILD

- 3.1.1 The Applicant instructed Skyray Engineering Limited to produce a bespoke electrical design for the Proposed Development, which they duly undertook. This included electrical front-end engineering design, substation equipment and compound design. Skyray Engineering is an experienced and competent consultancy, providing technical design services in the solar and battery storage sector.
- 3.1.2 Additionally, the Applicant instructed EDES Limited to produce a bespoke electrical and civil design for the proposed single-circuit overhead line, facilitating the SPEN Connection, which they duly undertook. EDES is also an experienced and competent consultancy, specialising in high-voltage engineering services.
- 3.1.3 The following section summarises relevant elements of *'Work Package No.4 – works to provide an electrical connection from Frodsham Solar Substation to Frodsham SPEN Substation and to facilitate a direct private wire connection to nearby businesses'*.
- 3.1.4 Work No.4a comprises an electrical connection from the proposed Frodsham Solar Substation (Work No. 3) to the existing Frodsham SPEN Substation including:
- a) Above ground and below ground 132kV electrical cables connecting Work No. 3 to the Frodsham SPEN Substation;
  - b) pylons; and
  - c) works to the SPEN Frodsham substation to facilitate connection of the authorised development to the SPEN Frodsham substation
- 3.1.5 It should be noted that there will be no requirement to extend Frodsham SPEN Substation, with the connection linking into existing bays within the substation. The electricity generated by the solar PV modules and the electricity imported and exported from the BESS facility would be transferred to and from the Frodsham Solar Substation via a 132kV electrical cable connection.
- 3.1.6 The Frodsham Solar Substation would connect to the SPEN Frodsham Substation via overhead 132kV cables. The connection would be a single

132kV circuit comprised of three sets of cables and a fibreoptic link and would be just under 2km in length.

- 3.1.7 The overhead lines would be supported on wooden poles/pylons, referred to as Trident poles. The poles would be constructed from pressure impregnated softwood, treated with a preservative to prevent damage to structural integrity. New poles would be dark brown in colour and weather gradually to a light grey. Single and double 'H' poles would be used. H poles are typically required where the route of the cable changes angle or at terminal ends of the connection, metal cable stays are required to provide support to H poles, and occasionally for single poles.
- 3.1.8 Wooden poles have a recommended span of 100-130m but can reach up to 200m in certain cases. Poles are typically 10-12m in height, including steel work, mounting and insulators fixed to the top of the poles. This height can be varied where specific clearances are required, and the Environmental Statement has assumed a total maximum height of 15m.
- 3.1.9 The SPEN Connection would cross the River Weaver. There are no specific clearance heights specified for the River Weaver at this location. The closest structure which limits headroom above the water is a bailey bridge approximately 260m downstream of the proposed SPEN Grid Connection crossing point. The planning drawings for this bridge indicate a clearance above water level of 40 ft (12.2m) and the SPEN Connection will be designed to be no lower than this.
- 3.1.10 15m high poles are proposed either side of the River Weaver to provide a minimum clearance of 12.2 m above the water level of the River Weaver.
- 3.1.11 The overhead line installation typically involves:
- i) Excavation of foundation (typically 3 x 3m up to 3m deep)
  - ii) Installation of pole brace block and/or steel foundation braces
  - iii) Erection of pole and fixture into foundation using a 360-degree tracked excavator
  - iv) Stringing of conductors

- 3.1.12 A construction area of approximately 30m x 15m is required around a pole location to provide sufficient working room and area to layout the pole and associated equipment.
- 3.1.13 Access for the poles erected within the Solar Array Development Area (SADA) would be taken via the internal access tracks and across the fields. Access for the two poles proposed on the northern side of the River Weaver would be via existing access corridors used for the construction and maintenance of existing electrical infrastructure surrounding the Frodsham SPEN Substation and the adjacent National Grid Electricity Transmission (NGET) Substation. These existing access routes may need to be improved by laying and compacting loose aggregate or alternatively laying temporary matting to enable construction plant to access the pole locations.
- 3.1.14 The foundation solution for the poles located within the SADA is likely to be as outlined above i.e. pole brace block and/or steel foundation braces. However, on the land adjacent to the Frodsham SPEN Substation and the adjacent NGET Substation it may be necessary to utilise an alternative foundation depending on the ground conditions identified at the point of detailed design. The foundation solution in this location could be:
- i) Pole brace block and/or steel foundation braces; ii) Soil mixing with a cementitious product;
  - ii) Concrete mass foundation (with pole fixed to the foundation block);
  - iii) Piled concrete slab (with pole fixed to the concrete slab).
- 3.1.15 At the terminal ends of the connection i.e. the connection into the Frodsham Solar Substation and the Frodsham SPEN Substation, the electrical cables would be ducted down the poles and a short underground section would provide the final connection into the substation equipment.
- 3.1.16 At the Frodsham SPEN Substation, the cable would connect into an existing circuit breaker bay within the substation. It would be necessary to equip the bay with new circuit breaker / disconnectors, a voltage transformer and Supervisory Control and Data Acquisition (SCADA) systems. This equipment would all be accommodated in the current compound.

### **3.2 Responsibilities for Design and Build**

- 3.2.1 The grid connection agreement between the Applicant and SPEN stipulates that the majority of the detailed design and building of the works described in the afore-section, are permitted to be undertaken by an accredited Independent Connections Provider (ICP).
- 3.2.2 The majority of the works are defined as 'contestable' and as such are permitted to be designed and built by the Applicant's appointed ICP. It is the Applicant's intention to appoint an ICP to undertake these works.
- 3.2.3 The following works are defined in the agreement as 'non-contestable' and as such will be designed and built / undertaken by SPEN, pursuant to their permitted development rights:
- Equip an existing single 132kV CB bay at SPEN Frodsham Substation with new CB/disconnectors, VT, protections and SCADA mods;
  - Terminate 132kV cable and optical fibre at Frodsham SPEN Substation;
  - Witness testing of Frodsham Solar Substation.
- 3.2.4 SP Energy Networks will liaise with National Energy System Operator and National Grid Electricity Transmission to ensure that any impact on the Transmission system is understood, to install the required inter-trips and to ensure flows and fault levels at the GSP at Frodsham are within limits.

## 4. CONCLUSION

- 4.1.1 Frodsham Solar Limited (the 'Applicant') has prepared this Grid Connection Statement (the 'Statement') as part of an application for a Development Consent Order (DCO) to construct, operate, maintain and decommission the Frodsham Solar Project (the 'the Proposed Development').
- 4.1.2 This statement has been prepared in accordance with Regulation 6(1)(a)(i) of the APFP Regulations, which requires an applicant for a DCO in respect of an onshore generation station to provide a statement of who will be responsible for designing and building the connection to the electricity grid.
- 4.1.3 The Proposed Development has entered into a connection agreement with Scottish Power Manweb PLC (SP Manweb). SP Manweb is a regulated Distribution Network Operator and part of SP Energy Networks (SPEN). The connection agreement allows both the proposed generating station and BESS to connection to their distribution system. SPEN deemed that the facility could affect the GB Transmission System, which necessitated the requirement to enter into a Bilateral Embedded Generation Agreement (BEGA) with the National Energy System Operator (NESO).
- 4.1.4 The Applicant instructed Skyray Engineering Limited to produce a bespoke electrical design for the Project, which they duly undertook. This included electrical front-end engineering design, substation equipment and compound design.
- 4.1.5 Additionally, the Applicant instructed EDES Limited to produce a bespoke electrical and civil design for the proposed single-circuit high-voltage overhead line, facilitating the grid connection route, which they duly undertook.
- 4.1.6 The grid connection agreement between the Applicant and SPEN stipulates that the majority of the detailed design and building of the works described in this statement, are permitted to be undertaken by an accredited Independent Connections Provider (ICP). It is the Applicant's intention to appoint an ICP to undertake these works.

- 4.1.7 A minority of the works, described in this statement, are defined in the agreement as 'non-contestable' and as such will be designed and built by SPEN.