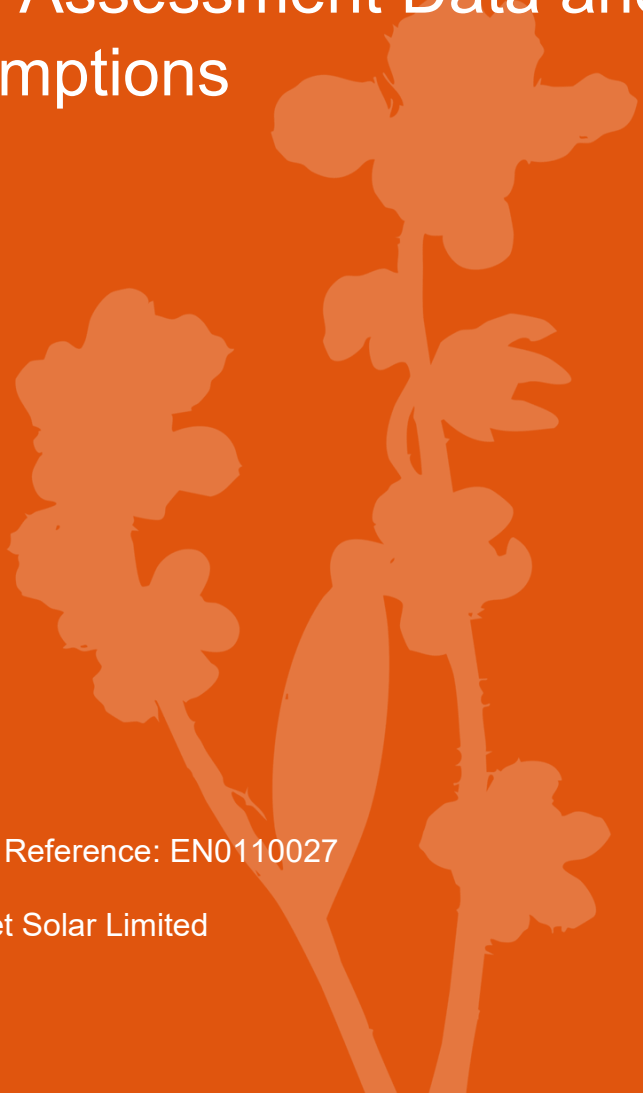
South Brooks Solar Farm

Preliminary Environmental Information Volume 2: Appendix 11.2: Preliminary GHG Assessment Data and Assumptions



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1 Preliminary GHG Assessment Data and Assumptions

1.1 Introduction

This appendix presents some of the raw data and assumptions used to carry out the preliminary GHG assessment. It is intended to be read in conjunction with the PEIR Chapter 11: Carbon and Climate Change, which includes further context on the preliminary assessment. More detailed information on the raw data, assumptions and emissions factors will be provided within the GHG assessment presented in the Environmental Statement.

Emissions calculations apply the following format:

- Activity data x emissions factor = emissions in mass of CO_2e

1.2 Data and assumptions

Data associated with the activities contributing to the construction phase of the Proposed Development have been provided by the Applicant. Where it has not been possible to provide this data, as this preliminary assessment represents a forecast of emissions and some information may not yet be known, secondary data (such as estimates, extrapolations, benchmarks, and proxy data such as distance travelled) have been used. Key assumptions are listed below:

- It has been assumed that the construction period will last for approximately 48 months.
- The number of solar PV modules is assumed to be 1,000,000. This estimation has been provided by the Applicant.
- The weight of solar PV frames has been assumed 1.5kg per frame, based on publicly available research.
- To determine the weight per foundation (kg) for solar PV steel foundations, a metric of 4,887 kg per 1 MW generation capacity has been applied. This metric is derived from a similar UK based solar project.
- The number of BESS batteries has been assumed equal to the number of BESS containers (332). The total power capacity (kWh) of BESS batteries has also been estimated using this assumption.
- Two substations are assumed to be constructed as a worst-case scenario, comprising 30,000 m^3 concrete.
- Data have been provided by the Applicant to consider both string and central inverters, as the exact type is not known at this stage. Central inverters have been used in preliminary calculations, as the most conservative model.
- The power capacity per main transformer has been assumed 280 MVA based on information provided by the Applicant, as exact information is not available at this stage.

- In the absence of data, the component 'switchgear' has been excluded from the preliminary assessment. Based on similar solar projects, the emissions from this component are likely to be negligible; therefore, excluding is appropriate.
- Plant use for construction has been assumed as 1,548,000 litres of diesel based on high level assumptions from information provided by the Applicant, and RICS guidance.

Based on information provided from the Applicant, it is assumed that construction workers (600 pax) travel a one-way commuting distance of 15km by either car sharing (2 persons via petrol car) or 8 persons (diesel van) assuming a 50/50 split of the two transport modes. Operational worker transport is assumed to be 42 workers per 24 hour period, travelling 15km one-way distance, with one worker per petrol car. Maintenance transport is assumed to be two maintenance visits per week, commuting a one-way distance of 15km, and one worker per diesel van.

It is assumed that the Solar PV panels, Solar PV foundations, Solar PV frames, BESS, transformers, central inverters, and Substations are sourced from Asia.

To estimate emissions associated with replacement of assets over the 60-year service life of the Project, the following assumptions have been applied.

Table 1-1: Service life of the Project components

Item	Service life (years)
Solar PV panels	40
Solar PV frames	40
Solar PV foundations	40
BESS batteries	20
BESS containers	20
Central inverter	40
Transformer	60
Inverter Transformer Stations	40

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