Chapter 2: Site Selection and Design Iteration

Cossans Solar & BESS EIA Report

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Supporting Figures (EIA Report Volume 2a)

Acronyms and Abbreviations

BESS	Battery Energy Storage System
EIA	Environmental Impact Assessment
PV	Photovoltaic
SuDS	Sustainable Drainage System

2. Site Selection and Design Iteration

2.1 Introduction

2.1.1 This chapter describes the Site identification and design iteration process which has been undertaken by the Applicant prior to arriving at the final design, described in **Chapter 3: Proposed Development Description**.

2.2 Background

2.2.1 The Applicant proposes to construct the Proposed Development on land at Cossans, near Forfar. The principles of the EIA process, that site selection and project design should be an iterative constraint-led process, have been followed as part of the Proposed Development. This has ensured that potential adverse environmental effects, as a result of the Proposed Development, have been avoided or minimised as far as reasonably possible.

2.3 Site Location, Site Selection and Alternatives

2.3.1 Following engagement with the landowners, a desktop assessment was conducted to identify areas of opportunity for a viable solar and battery energy storage system (BESS) development. The assessment reviewed:

- planning and environmental considerations such as designated areas, agricultural land quality, and local and national planning policy;
- technical factors such as the topography of the land, traffic access and shading; and
- land available to the Applicant.

2.3.2 Based on the outcome of this work, the Site was selected as a suitable location for the proposed solar farm (**Figure 1.1**).

2.3.3 The main alternatives including design, location, size, and scale have been considered for the Proposed Development. This chapter explores these options and explains how the final design of the Proposed Development has evolved.

Site Location

2.3.4 The Proposed Development Site is located approximately 1.6 km west of Forfar, 3.5 km southeast of Kirriemuir and 2.6 km northeast of Glamis within the Angus Council administrative area (as shown in **Figure 1.1**).

Site Selection

2.3.5 The Electricity Works Environmental Impact Assessment (EIA) Regulations 2017 (as amended) state that the EIA Report must include *"A description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by the developer, which are relevant to the proposed development and its specific characteristics, and an indication of the main*

reasons for selecting the chosen option, including a comparison of the environmental effects" (Schedule 4, Part 2) (Scottish Government, 2017).

2.3.6 The Site was identified as an area which would be appropriate for solar development through initial feasibility work which considered the following key issues:

- Development Plan policy;
- Landscape character;
- Distance from dwellings;
- Cumulative impact with other solar developments; and
- Feasibility of grid connection.

2.3.7 A description of the characteristics of the Site and surroundings is provided in **Chapter 3**: **Proposed Development Description**.

2.4 Design Process

Design Principles

2.4.1 In an EIA, the identification of constraints should continue throughout the design process as more detailed surveys reveal additional constraints to development. In this way, the findings of the technical and environmental studies can be used to inform the design of a development, and hence achieve a 'best fit' within the Site.

2.4.2 The Applicant adopted the following principles during the design iteration process where possible to ensure the final design of the Proposed Development was the most suitable for the Site:

- avoid designated and protected sites;
- sensitively site to avoid or minimise setting effects on heritage assets;
- avoid or minimise impacts on sensitive identified ecological habitats and species;
- minimise impacts in respect of noise and the visual amenity of residential properties;
- minimise traffic and transport impacts;
- consider topography in terms of suitability for siting panels;
- avoid areas of high-risk flooding; and
- maximise the potential renewable electricity generation.

2.4.3 The design of any solar development is driven by the key objective of positioning panels so that they capture the maximum energy possible within a suitable area, further informed by environmental and technical constraints.

2.4.4 Many solar developments now include Battery Energy Storage Systems (BESS) to store excess energy for use when solar generation is low, improving reliability and grid stability. The placement and capacity of BESS are determined by site-specific

factors such as available space, grid infrastructure, and environmental considerations, ensuring efficient operation within planning regulations.

2.4.5 All site constraints are discussed in more detail in **Chapter 3** and are shown in **Figure 3.1**.

2.4.6 It is important to note that the identification of a constraint does not necessarily result in the exclusion of that area from the potential development envelope; rather it means that careful thought and attention was paid to the constraint and the design altered appropriately. The key constraints considered during the design process included:

- Landscape and visual constraints, also taking account of potential mitigation and enhancement opportunities for example through landscape planting;
- Location of residential receptors;
- Location of existing infrastructure;
- Presence of cultural heritage features; and
- Presence of protected habitats.

2.4.7 The identification of constraints continued throughout the design evolution process as more detailed surveys refined the development envelope.

2.4.8 Details of how the design has evolved to minimise the potential environmental effects associated with the identified constraints are set out below.

Layout Evolution and Design Iterations

2.4.9 This section details the design iterations that have been undertaken as the Applicant has sought to achieve a viable design that maximises the renewable electricity generation from the Site, whilst minimising the environmental effects.

2.4.10 These design iterations have been made in line with the design principles set out in **paragraph 2.4.1**.

2.4.11 There have been three principal iterations in the design of the Proposed Development. These iterations, referred to as Layouts 1 to 3, are summarised below.

Proposed Site Layout 1 (Preliminary Layout – August 2024)

2.4.12 Layout 1 (**Figure 2.1**) was informed by preliminary desktop environmental studies and was the layout presented at initial community consultation events. This layout represents maximum coverage of the Site with solar photovoltaic (PV) panels based on maximising generating capacity of the Site whilst taking consideration of known site constraints, primarily ecological factors. The BESS was located in Field 4.

2.4.13 This design incorporated topography into the layout and included a buffer around the electric pylon of an overhead line that, although not yet installed, is planned. Further buffers were applied around a gas pipeline running underneath Field 3 to ensure safety and compliance with infrastructure requirements.

Layout 2 (Design Chill - January 2025)

2.4.14 Layout 2 (**Figure 2.2**) was shaped by input from the design workshop, ongoing surveys, consultations with Angus Council, and feedback gathered during community engagement efforts such as public exhibitions. This iteration features a reduced number of PV modules to address constraints identified by technical specialists, while also accommodating necessary site infrastructure. Areas prone to flooding were also considered, resulting in the exclusion of PV modules from sections of Field 2 that experience higher risk of flooding. A Sustainable Drainage System (SuDS) was incorporated near the BESS to manage water drainage. The BESS was relocated from Field 4 to Field 3, enhancing screening behind existing trees and increasing the distance from residential properties. The new placement keeps maintaining the BESS a minimum distance of 300 m from any property and placing it entirely outside any flood risk area. Furthermore, the PV module clearance height was increased to 1.5 metres above ground level to mitigate flood risk.

2.4.15 To further refine the design, ecology buffers were introduced, including buffers from ancient woodlands to the west of the Site, core paths, trees, bat habitats, and otter habitats. PV models within Fields 3 and 4 were repositioned to create at least a 15 m buffer from the trees and path to the north. This adjustment not only reduced the visual impact but also addressed ecological constraints. The PV modules within the fields were not extended further south due to flood risk and additional ecological buffers.

Layout 3 (Final Layout – March 2025)

2.4.16 Following the second public exhibition on 28th February 2025 and an online event on 3rd March, feedback was received regarding the visibility of the BESS due to its location on a ridgeline. Concerns were raised that, even with screening, the BESS remained visible from nearby locations. In response, the Applicant undertook a review of the BESS location and decided to relocate it away from the ridgeline, allowing for improved screening and a reduction in visual impact. This adjustment ensures that the BESS is better integrated within the landscape while maintaining its operational requirements and addressing community concerns, as seen in **Figure 2.3**.

Other Site Infrastructure

Site Access and Site Tracks

2.4.17 The proposed access to the Site has been carefully assessed throughout the design process, with various construction and operational access options considered. Initially, access from the south via the A94 was reviewed; however, following a detailed assessment, the primary site access is proposed to be via Drumgley Road from the east. This route effectively links the two sections of the solar farm, ensuring all construction and operational traffic follows a structured and controlled route.

2.4.18 The option to access the Site from the south via the A94 was not considered feasible due to the requirement to cross the River Tay Special Area of Conservation (SAC) at the Dean Water. The potential environmental risks, including disturbance to

protected habitats, watercourse pollution, and compliance with regulatory requirements, as well as technical engineering constraints, make this route unviable for site access.

2.4.19 Drumgley Road has been selected as the most viable and least disruptive option, ensuring controlled and efficient vehicle movement between the two sections of the solar farm while minimising ecological and residential impacts.

2.4.20 The Site is bounded to the north by a private road that provides access to Haughs of Cossans in the west and connects to Drumgley Road at Nether Drumgley in the east. This private road is lightly trafficked, single-track, and features passing places that primarily serve agricultural holdings.

2.4.21 The Drumgley Road / A94 junction is well-designed for large vehicles, and the A94 is a high-standard single carriageway located approximately 400m from the A90(T), providing efficient access to the strategic road network.

2.5 References

Scottish Government (2017) The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017. Available at: https://www.legislation.gov.uk/ssi/2017/102/contents/made.