voltalia

Chapter 2: Site Design and Evolution

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2 SITE DESIGN AND EVOLUTION

2.1 Introduction

2.1.1.1 This Chapter outlines the process undertaken by Voltalia UK Ltd (the Applicant) in selecting the area in which the Proposed Development is intended to be built ("the Site") as a potential location for a solar farm and Battery Energy Storage System (BESS) development, herein referred to as the Proposed Development, and articulates the design evolution process.

2.1.1.2 One of the principles of the Environmental Impact Assessment (EIA) process is that Site selection and project design should be an iterative and constraint-led process. This principle has been followed as part of the evolution of the Proposed Development. This has ensured that potential negative impacts, which may potentially result from the Proposed Development, have been avoided or minimised as far as reasonably practicable.

2.1.1.3 This Chapter of the EIAR has been prepared in accordance with Clause 2 of Paragraph 2 of Schedule 4 of the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (the EIA Regulations) which requires a description of the reasonable alternatives considered, the reasons for selecting the chosen option, and a comparison of the environmental effects[1].

2.1.1.4 This Chapter of the EIAR considers the following:

- Need for the Proposed Development;
- Site Description and Environmental Context
- Site Selection;
- Design Evolution; and
- Embedded Mitigation.

2.1.1.5 This Chapter draws on issues considered in more detail in the relevant technical chapters (**Chapters 6 to 15**). This Chapter does not pre-empt the conclusions of the later technical chapters but is intended to explain how potential environmental effects have informed the design of the Proposed Development.

2.1.1.6 The final design of the Proposed Development is described in **Chapter 3 Development Description** and is shown on **Figure 1.2**. This Chapter is also supported by **Figures 2.1 (a – c)** which detail the key design iterations, described later in this Chapter.

2.2 Need for the Development

2.2.1.1 In order to meet the Scottish Government's target to achieve net zero by 2045, a rapid shift to increase renewable energy generation is required. The Scottish Government has outlined

[1] Scottish Government, (2017), The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017. [Online] Available at: https://www.legislation.gov.uk/ssi/2017/101/contents (Accessed 3 March 2025)

its ambition for the deployment of between 4 – 6 GW of solar power generating capacity by 2030[2]. The Proposed Development would therefore provide a substantial contribution towards this goal, through the addition of up to approximately 165 MW (AC) of generation capacity from the Solar Arrays. Additionally, up to 80 MW of generation capacity from the BESS will provide additional grid balancing capacity to the electric network, which is of great importance in an energy grid which is dominated by renewable generation stations.

2.2.1.2 If we were to consider a "do nothing" scenario, the scenario in which the Proposed Development was not carried out, it would be clear that the significant additional generating capacity provided by the Proposed Development would not be available to aid in meeting the Scottish Government's stated net zero Targets. As such this "do nothing" scenario is not considered further in this EIAR.

2.3 Site Description and Environmental Context

2.3.1 Location

2.3.1.1 The Site is centred on grid coordinates National Grid Reference (NGR) NT 78702 67899 approximately 2.4 kilometres (km) south of Cockburnspath, and 13 km southeast of Dunbar.

2.3.1.2 The Site will occupy an area of approximately 190 hectares (ha) of land; the extent of which is shown in **Figure 1.1**. The Site is wholly located within the Scottish Borders Council local authority area.

2.3.1.3 The Site lies within a wider pastoral landscape, and occupies 14 agricultural fields, primarily utilised for livestock and arable farming in rotation.

2.3.1.4 The topography of the Site slopes upwards to the northwest from approximately 125 m above ordnance datum (AOD) to approximately 230 m at its highest point. Bowshiel Farm and several farm buildings and cottages lie within the centre of the Site. The fields are delineated by a mixture of hedgerows and post and wire fencing.

2.3.1.5 The nearby major road is the A1 Trunk Road, which borders the east of the Site.

2.3.1.6 There are several communities surrounding the Site, including (but not limited to):

- Cockburnspath, 2.4 km north of the Site;
- Grantshouse, 2.2 km southeast of the Site;
- Oldhamstocks, 4 km northwest of the Site;
- Innerwick, 7.5 km northwest of the Site; and
- Dunbar, 13 km northwest of the Site.

[2] Scottish Government (2023), "Announcement of Solar Ambition for Scotland", [Online], Available at: solar-ambition-for-scotland-28-october-2023.pdf, (Accessed: 20/05/2025)

2.3.2 Designations

Within and Adjacent to the Site

2.3.2.1 There are no designated sites located within the Site boundary.

2.3.2.2 However, the following are located adjacent to the Site

- Scheduled Monument (SM369, Ewieside Hill) lies 0.2 km northwest of the Site; and
- Penmanshiel Wood Ancient (of semi-natural origin) lies approximately 0.7 km east of the Site on the opposite side of the A1 from the Proposed Development.

Wider Site Surroundings

2.3.2.3 Nationally and internationally ecologically designated sites for nature conservation within 5 km of the Site include:

- Pease Bridge Glen Site of Special Scientific Interest (SSSI), 0.89 km north;
- Pease Bay Coast SSSI, 2.43 km north;
- St. Abb's Head to Fast Castle Special Area of Conservation (SAC) and SSSI, 4.42 km north;
- Berwickshire Coast (Intertidal) SSSI, 4.5 km northeast; and
- Drone Moss SSSI, 4.54 km east.

2.3.2.4 The following nationally and internationally ecologically designated sites for ornithological features within 10 km of the Site include:

- Outer Firth of Forth and St. Andrew's Bay Complex Special Protection Area (SPA), 4.47 km north; and
- St. Abb's Head to Fast Castle SPA, 4.42 km north.

2.3.2.5 The above mentioned ecologically designated sites are illustrated in **Figure 8.1a** and detailed further in **Table 8.4** of **Chapter 8: Ecology and Nature Conservation**.

2.4 Site Selection

2.4.1.1 The selection of an appropriate site, which has the potential to support a commercial solar farm is a complex process. It involves examining and balancing a number of environmental, technical, social and commercial issues. National Planning Policy Framework 4[3] (NPF4) Policy 11 sets out the key areas and issues that should be considered during the design of a proposed renewable energy development.

[3] Scottish Government (2023) 'National Planning Framework 4'. [Online]. Available at: https://www.gov.scot/publications/national-planning-framework-4/ (Accessed April 2025)

2.4.1.2 The Applicant first identified the area surrounding the Proposed Development in 2021, during a wider site selection exercise undertaken by the Applicant, throughout Scotland and the United Kingdom.

2.4.1.3 Due to this area's favourable topography, level of mean sunshine hours, good accessibility via the A1, and an already established and expanding capacity for connection to the National Grid via Branxton Substation, it was selected as a key target for its development potential.

2.4.1.4 Following discussions with the Landowner, an initial feasibility study was undertaken of the Site which confirmed that the south facing aspect, accessibility and contained nature of the Site underlined its suitability for a solar farm and BESS development.

2.5 Design Evolution

2.5.1.1 The Proposed Development presented in the EIAR has undergone two iterations since the presentation of the Scoping Layout to mitigate predicted adverse effects through design, as far as reasonably practicable. Design changes made as a consequence of the key constraints are considered to be mitigation which is 'embedded' in the design (see **Section 2.6**).

2.5.1.2 There have been 3 main design layouts. These are detailed in further below, and include:

- Scoping Layout (**Figure 2.1a**); and
- Initial Application Layout (March 2025) (**Figure 2.1b**)
- Final Application Layout (May 2025) (**Figure 2.1c**).

2.5.1.3 Each Site layout iteration was developed based on the following technical parameters and constraints:

- Visibility from sensitive receptors, including nearby properties, settlements and designated landscapes;
- Presence of sensitive habitats and protected species;
- Presence of sensitive ornithological species;
- Presence of watercourses, private water supplies and related infrastructure;
- Presence of cultural heritage features;
- Proximity to noise sensitive receptors;
- Ground conditions and topography; and
- Key recreational and tourist routes.

2.5.1.4 Constraints were identified through desk study, site survey and analysis. This included consideration of stakeholder feedback from statutory and non-statutory bodies, as well as members of the public during the EIA process.

2.5.1.5 The key design iterations undertaken to reach the Final Application Layout are described in further detail in the following sub-sections, which demonstrate how the layouts have evolved throughout the EIA process.

2.5.2 Scoping Layout (August 2024)

2.5.2.1 The Scoping Layout (**Figure 2.1a**) was developed in the summer of 2024 by a multidisciplinary team, including the Applicant's engineering team, ecologists, cultural heritage specialists, and landscape and visual experts. The layout was presented to the ECU in the Scoping Report (**Technical Appendix: 4.1**) submitted September 2024 and Validated November 2024. The Site comprised land covering approximately 190 ha, centred on NGR NT 78702 67899.

2.5.2.2 This Scoping Layout maximised the potential number of solar PV panels and output, reflecting known constraints at the time which were not necessarily subject to detailed site work, technical assessments, or detailed consultation. The following key constraints were taken into account:

- Landscape and visual impacts;
- Buffer of known sensitive ecological habitats (e.g. Ancient Woodland);
- Avoidance of known cultural heritage assets:
  - Application of 100 m buffer around scheduled monuments;
- 10.5 m buffer of watercourses visible on 50k OS mapping; and
- The siting of taller infrastructure (e.g. substation and BESS) in lower lying areas of the Site

2.5.3 Initial Application Layout (March 2025)

2.5.3.1 Following the receipt of the Scoping Opinion (**Technical Appendix: 4.2**) and completion of the first Public Consultation period (20 August to 17 September 2024), feedback received, combined with results of field survey results further informed the design of the Proposed Development. This layout iteration is shown in **Figure 2.1b**, which comprised solar panels with a generating capacity up to 170 MW, 80 BESS units, and associated infrastructure.

2.5.3.2 During the consultation period, the feedback received highlighted that the visual impact of the Proposed Development in relation of nearby heritage assets was an important consideration for consultees. In response, a design workshop was held in November 2024 with technical specialists to explore how design elements, particularly visual and scale-related concerns, could be refined to address these concerns.

2.5.3.3 The key changes to the Scoping Layout that resulted in the Initial Application Layout are as follows:

- Reduction in number of panels in Field 14. Responding to the request by Historic Environment Scotland (HES) that all panels are sited such that their highest point remains below the 230 m AOD contour line to reduce potential visual impacts on SM369;

- Relocation of Substation and BESS compound to sit on lower lying area in the south-eastern portion of Field 13, as per request from HES to reduce potential impacts on SM369;

- Removal of panels from southwestern portion of Field 14. This was done to ensure that views between SM369 and the non-designated monument in the south of field 14 remain uninterrupted;

- Removal of panels in eastern portion of Field 18 below the 175m AOD contour line. This was done to improve the continuity of the boundary of the site, when viewed from the east of the site; and

- Consolidation of panels and fencing in the northern portion of Field 10 to remove unnecessary additional access tracks.

2.5.4 Final Application Layout (May 2025)

2.5.4.1 The Final Application Layout (May 2025) (**Figure 2.1c**), which is the subject of this EIAR, comprises solar panels with a generating capacity of up to 165 MW (AC), 40 BESS units, and associated infrastructure.

2.5.4.2 The Initial Application Layout (May 2025) was presented to the general public during the second round of public consultation held between 3rd of March and 30th of March 2025, alongside an in-person consultation event held in Cockburnspath Village Hall on the 12th of February. Following this consultation and initial further assessments of the previous layout, it was decided that further design changes could be accommodated.

2.5.4.3 The key design changes made to the Initial Application Layout (March 2025) and resulting in the Final Application Layout (May 2025) are as follows:

- The number of BESS units included as part of the Proposed Development was reduced to 40, which would provide a generating capacity of up to 80 MW. This reduction also resulted in a reduction in the number of associated items of electrical infrastructure (such as MV transformers) required in the BESS compound. Full details of these components can be found in **Chapter 3: Development Description**.

- The number of central invertors included in the Proposed Development was reduced to 24; and

- Throughout the site, several small changes were made to the location of solar panels in order to avoid, where possible, the placement of infrastructure within SEPAs Riparian Zone Buffers. Where infrastructure was unable to be removed from these buffer areas, a specific assessment is provided in **Chapter 9: Water Resources and Flood Risk.**

2.6 Embedded Mitigation

2.6.1.1 Mitigation measures for the Proposed Development have been embedded in its design to minimise adverse significant effects, including measures to avoid sensitive ecological habitats, cultural heritage assets and impacts on the visual setting of the surrounding area and features within it. These embedded measures have shaped the Proposed Development and reflect an iterative design process.

2.6.1.2 The following good practice construction measures and site specific management plans are also considered to be embedded mitigation measures. These measures are discussed in further detail later in this EIAR, and include:

- A Construction Traffic Management Plan;
- A Construction Environment Management Plan (CEMP); and
- A Landscape and Biodiversity Management Plan (LBMP).

2.7 Conclusions

2.7.1.1 In order to meet Scottish Government targets on achieving net zero by 2045, a rapid shift to renewable power generation is required. The Proposed Development presents the opportunity to make a substantial contribution to this goal.

2.7.1.2 In designing the Proposed Development, various environmental, technical, and economic factors were all considered in the iterative design process. These were informed through a variety of baseline surveys and consultation with a range of stakeholders.

2.7.1.3 The Final Application Layout design assessed in this EIAR is considered to successfully balance the Proposed Development's renewable energy generation potential, whilst taking key environmental and engineering factors into account through changes to the design of the Proposed Development made through the EIA process.