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Chapter 3

Site Selection and Design Evolution

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Glossary

Term	Definition
Environmental Impact Assessment	Environmental Impact Assessment (EIA) is a means of drawing together by the developer, in a systematic way, a description of the development and information relating to the likely significant environmental effects arising from a Proposed Development
Environmental Impact Assessment Report	A document reporting the findings of the EIA and produced in accordance with the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 Regulation 5
The Proposed Development	The proposed Scawd Law Wind Farm development
The Proposed Development Area	The development area within the red line site boundary (application area) as shown in Volume 3a Figure 1.2: Site Layout.

List of Abbreviations

List and describe your abbreviations here.

Abbreviation	Description
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
GIS	Geographical Information Systems
GWDTE	Groundwater Dependent Terrestrial Ecosystems
LCA	Landscape Character Area
LCT	Landscape Character Type
MoD	Ministry of Defence
PAC	Pre-Application Consultation
PAN	Planning Advice Note
SAC	Special Area of Conservation
SBC	Scottish Borders Council
SNH	Scottish National Heritage (Now NatureScot)
SPA	Special Protection Areas
SSSI	Sites of Special Scientific Interest
SUW	Southern Upland Way
RVAA	Residential Visual Amenity Assessment
RAF	Royal Air Force
ZTV	Zone of Theoretical Visibility

3.1 INTRODUCTION

3.1.1 This chapter sets out the main stages followed in the design evolution of the Proposed Development. It describes the site design and evolution of the turbine layout through the initial site selection process, discusses the identification of various constraints and site-specific factors, and highlights the key design criteria applied.

3.1.2 Planning Advice Note (PAN) 68: Design Statements explains the process of undertaking a design statement. Design and Access Statements are a statutory requirement for all major developments under the terms of the Planning etc. (Scotland) Act 2006. Although not a statutory requirement for the Proposed Development, for which an application will be submitted under Section 36 of the Electricity Act 1989, this chapter nonetheless explains the design process which has been undertaken to arrive at the proposed layout.

3.1.3 This chapter refers to the following chapters (Volume 2) and figures (Volume 3a):

- Chapter 2: Policy Context;
- Chapter 4: Project Description;
- Chapter 6: Landscape and Visual;
- Chapter 12: Traffic and Transport;
- Chapter 14: Aviation and Other Matters;
- Figure 1.1: Regional context;
- Figure 1.2: Site Layout; and
- Figure 3.1: Design Evolution of Site - iterative turbine layouts;

3.2 CONSIDERATION OF ALTERNATIVES

3.2.1 Paragraph 5(2)(d) of The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 requires that the EIAR includes a description of reasonable alternatives studied by the Applicant, which are relevant to the development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the development on the environment. As noted in PAN 1/2013, “Whilst the Directive and the Regulations do not expressly require the applicant to study alternatives, those alternatives which are in any case considered as part of the project planning and design process must be assessed, and an outline of the main alternatives studied by the applicant included in the ES[1]. The ES must also give an indication of the main reasons for the choice made, taking into account the environmental effects”.

3.2.2 The Applicant has considered a number of alternative turbine layouts for the Proposed Development through an iterative design process described below. The finalised layout is the sixth iteration of the Proposed Development.

3.3 THE SITE SELECTION PROCESS

3.3.1 The Applicant is engaged in a continual search and assessment of potential wind farm sites throughout the UK to progress and develop into wind farm applications. This search began in the mid 1990’s and the process has yielded a number of sites which have progressed to operational wind farms.

3.3.2 The Applicant’s site search process uses rigorous selection involving constraints mapping, site visits and continual review of technical, environmental and planning considerations. The Proposed Development Area passed all initial stages of site selection and was then progressed through the rigorous internal check systems prior to submission of Scoping.

[1] Environmental Statement (ES) hereby referred to as Environmental Impact Assessment Report (EIAR) according to Scottish policy.

3.4 PROGRESSING SITE DESIGN AT SCAWD LAW

3.4.1 To progress the chosen Scawd Law Wind Farm site, the design process aimed to have a layout that maximised the output of renewable energy whilst limiting the potential for environmental impacts during construction and operation. Factors influencing the suitability of the layout include:

- Suitable wind speeds and quality of wind flow to optimise generation outputs;
- Suitable separation distance from dwellings so that unacceptable impacts related to potential noise, shadow flicker and residential visual amenity can be avoided;
- Consideration of the Scottish Borders Landscape Capacity and Cumulative Impact Study (2016);
- Located mostly within a Group 3 area as defined by Scottish Planning Policy (2014);
- Not located in any national or local landscape designations;
- Not within a cultural heritage designation including Conservation Area, Historic Garden & Designated Landscape or within proximity to a Scheduled Ancient Monument;
- Not within ecological designations of international or national importance;
- Reasonably close proximity to a viable grid connection; and
- Topography of the Proposed Development Area is compatible with the construction and operation of a commercial scale wind farm.

3.4.2 The Proposed Development Area has also been assessed by comparison against a number of strategic constraints. Figure 1.1 in Volume 3a of the EIAR illustrates the regional context of the Proposed Development Area.

3.5 INITIAL FEASIBILITY ASSESSMENT

3.5.1 An initial feasibility assessment was undertaken after the site selection and suitability criteria identification process to further investigate site suitability at a high level. This covered the topics listed below.

- Landscape and Visual;
- Policy Context;
- Wind Resource;
- Grid Connection;
- Access;
- Land Use;
- Proximity of Dwellings,
- Ecology and Ornithology;
- Hydrology, Geology and Hydrogeology;
- Cultural Heritage; and
- Aviation and Existing Infrastructure.

Landscape and Visual

3.5.2 Landscape and visual was considered from the early stages of the project, as these were understood to be key to project progression. Several sources of information were used to inform the design. These include, but are not limited to, the following:

- Guidelines for Landscape and Visual Impact Assessment, Third Edition (GLVIA3) (Landscape Institute and the Institute of Environmental Management, 2013);
- Siting and Designing Wind Farms in the Landscape, Guidance, Version 3a (SNH, 2017);
- Scottish Borders Local Development Plan Supplementary Guidance: Renewable Energy (2016); and
- Scottish Borders Landscape Capacity and Cumulative Impact Assessment (2013).

3.5.3 This topic looked at maximising wind yield without substantially increasing the potential effects on landscape and visual amenity. The feasibility study confirmed that the River Tweed valley which runs to the south of the site is ‘highly’ sensitive to development of wind turbines seen on the skyline.

3.5.4 The site lies within the Moorfoot Plateau Landscape Character Area (LCA), one of three areas of Dissected Plateau Moorland Landscape Character Type (LCT) located in the Scottish Borders.

3.5.5 The Initial Feasibility Assessment report highlighted the local policy which, states that the LCA could accommodate further large-scale wind energy development and that turbines of 120 m plus could be accommodated in smaller numbers where topography aids screening (it suggests groups of up to 10 turbines). Turbine development should not however adversely encroach onto the visually prominent escarpment and skyline to the north of the Tweed valley which is discussed in more detail in paragraph 3.5.7.

3.5.6 Initially, an 18-turbine layout using a variety of turbine tip heights was developed across four ridgelines of the Proposed Development Area (Figure 3.1). Zone of Theoretical Visibility (ZTV) mapping was analysed to gain an appreciation of the theoretical visibility of these turbines within the Tweed valley.

3.5.7 There would however, likely be potentially continuous visibility of the layout from the Southern Upland Way (SUW) to the south-west of the site where it descends Blake Muir down to Traquair over a distance of approximately 4 km. From this section of the SUW, and when moving from west to east along this route, the layout would be seen in the centre of the view above Innerleithen. However, the feasibility report demonstrated that the site provides an opportunity to design a balanced composition with the removal of some peripheral turbines which would substantially mitigate perceived adverse effects. Analysis of this layout concluded that there was potential to improve the layout to minimise visibility from sensitive receptors within the Tweed valley between Peebles and Innerleithen such as the A72 road, the B7062 road west of Howford, and area around Traquair House and estate.

3.5.8 Consideration of cumulative effects was also included within the initial feasibility assessment for developments located nearby to the Proposed Development Area and also projects under construction and in Scoping.

Policy Context

3.5.9 For the feasibility assessment, a review was undertaken of design guidance documents and other standard texts on wind farm development, such as Scottish Natural Heritage (SNH) (now NatureScot) guidance on ’Siting and Designing Wind Farms in the Landscape’ (February 2017).

3.5.10 Local Development Plan (LDP) policy ED9: Renewable Energy states ‘The Council will support proposals for both large scale and community scale renewable energy development including commercial wind farms, single or limited scale wind turbines, biomass, hydropower, biofuel technology, and solar power, where they can be accommodated without unacceptable significant adverse impact considerations’. The Ironside Farrar (IF) Landscape Capacity and Cumulative Impact Study is a material planning consideration in the assessment of wind turbine proposals within the Scottish Borders. In addition, policy EP5: Special Landscape Areas (SLA) protects against visual impact of development in certain sensitive areas of the Tweed Valley.

3.5.11 Relevant LDP Policies are: EP1 International Nature Conservation Sites and Protected Species, EP2 National Nature Conservation Sites and Protected Species and EP3 Local Biodiversity.

Wind Resource

3.5.12 Initial long-term wind resource estimates were derived from multiple sources including measurements collected on the proposed site.

3.5.13 Detailed assessments have been undertaken using state of the art VENTOS Computational Fluid Dynamics modelling to better understand the local wind regime. This has led to an improved understanding of the specific complex flow regime that results from the terrain and forestry surrounding the Proposed Development Area. The turbulence intensity, wind shear, inflow angle and veer across the site were assessed to inform the design process (along with all relevant physical, environmental and technical constraints). The process was undertaken iteratively to arrive at the appropriate number, size and location of turbines to minimise project risks (turbine performance/operational issues) and maximise project efficiency and energy yield.

3.5.14 A full anemometry monitoring campaign has commenced, using industry best practice monitoring techniques (LiDAR remote sensing from spring 2020 and an anemometer mast deployed autumn 2021) to capture detailed wind profiles and further refine the wind resource on site.

3.5.15 Wind energy assessments indicate that the Proposed Development Area has excellent wind resource allowing for more efficient energy generation with less infrastructure.

Grid Connection

3.5.16 It is anticipated the grid connection will be in the town of Galashiels, approximately 15 km east of the Proposed Development Area. Initial assessments indicated that a grid connection for a wind farm >50 MW at this location is viable.

Access

3.5.17 During the initial feasibility assessment viable road access routes were identified for the delivery of Abnormal Indivisible Loads to the proposed site entrance using anticipated blade lengths for candidate turbine models. Pinch points were identified for further analysis using traffic management, topographic surveys and land agency for access rights from third party landowners.

3.5.18 The condition of the public road along the access route would be surveyed and recorded prior to it being used for wind farm construction. Where required, repair and maintenance work will be carried out on utilised roads during and following the construction period to rectify any identifiable damage which is directly attributable to the Proposed Development.

3.5.19 Initially a route along the A72 via Walkerburn was identified accessing the site from the south. Ongoing feasibility work on the site determined that blade lengths for the candidate turbine at the Proposed Development could not be transported through Walkerburn. Therefore, another access route was identified approaching the Proposed Development from the north along the B709. See Chapter 12: Traffic and Transport for more information.

Land use

3.5.20 The Proposed Development Area is located in an area of semi-improved grassland, with extensive plantation forestry situated approximately 1 km to the south and west. The proposed turbine locations are on privately owned land. The land is currently used for sheep farming and the estate also release birds (pheasant *Phasianus colchicus* and red-legged partridge *Alectoris rufa*) for game shooting which will be able to continue alongside the wind farm..

Proximity of Dwellings

3.5.21 The nearest dwelling, Seathope which is financially involved. It is owned by the host estate an used as accommodation for an estate worker, was located approximately 500 m from the nearest turbine in the 18-turbine layout. There are 6 dwellings within 3 km of the proposed turbines and these have been considered in the Residential Visual Amenity Assessment (RVAA) in Chapter 6: Landscape and Visual.

Ecology & Ornithology

3.5.22 Pre-planning ecology assessments were conducted to assess the site connectivity with local statutory designated sites and to uncover existing records of raptor activity within the Proposed Development Area. A desk study of the Proposed Development Area was conducted, the results of which state that there are no designated ecological or ornithological constraints, such as Sites of Special Scientific Interest (SSSI), Special Protection Areas (SPA) or Ramsar, within the site boundary. As a result of the pre-planning ecology assessment, the layout was considered unlikely to impact on designations and have a significant impact on any target species, and as such the site was considered potentially suitable for wind energy development, subject to further detailed assessment.

Hydrology, Geology and Hydrogeology

3.5.23 Hydrologically, the site lies within the catchment of the River Tweed and all onsite watercourses are tributaries of the River Tweed. The River Tweed is designated as a Special Area of Conservation (SAC) and SSSI.

3.5.24 Geologically, the majority of the site is mapped with no superficial deposits. Within the areas where no superficial deposits are mapped, including higher elevations and summits, it is expected that there will be a layer of weathered bedrock overlain by soil. The bedrock geology of the site is primarily underlain by Gala Unit 7 – Wacke. The sedimentary rocks are of marine origin and are detrital.

3.5.25 The site is mapped as a low productivity aquifer where flow is virtually through fractures and other discontinuities. Groundwater Dependent Terrestrial Ecosystems (GWDTE) have been assessed based on their potential groundwater dependency, location and underlying geology.

Cultural Heritage

3.5.26 During the initial feasibility assessment, the presence of cultural heritage receptors was investigated within and outwith the site boundary. No cultural heritage receptors were identified within the Proposed Development Area. Receptors with potential visibility of the development and with potential impacts on setting, including Traquair House, hilltop settlements and forts were highlighted for further consideration during the EIA process.

Aviation and Existing Infrastructure

3.5.27 The potential for the Proposed Development to interfere with military and civil aviation assets has been considered during the feasibility phase. A map assessment indicated that the site is located near a potential area of aviation constraint. Initial assessment identified that layout was potentially within line of sight of the Deadwater Fell radar at Royal Air Force (RAF) Spadeadam, however the site was found not to be within RAF Spadeadam's Area of Operational Responsibility. There were no air defence or meteorological radars within range and line of sight of turbines up to 200 m tip height on the site and there were also no airfields, airstrips, gliding or other aviation sites within 20 km of the site. The Proposed Development Area was found to be within a Ministry of Defence (MoD) low flying zone however this was found to be of low priority and less likely to raise concerns. These constraints were noted for further aviation assessment and layout iterative design.

3.5.28 The presence of existing infrastructure such as service pipes and cables, TV transmission, mobile telephone networks and electromagnetic paths were considered. Geographic Information Systems (GIS) data used within the initial feasibility study indicated there was no existing infrastructure within the Proposed Development Area that would be impacted by the Proposed Development.

Initial Site Feasibility Assessment Conclusion

3.5.29 The initial site feasibility assessment concluded that the site offers good potential for a wind development at Scawd Law. The initial feasibility assessment indicated that:

- There is a good wind resource across the site assuming the use of larger turbines;

- The Proposed Development was unlikely to impact significantly on any ecological designation and/or target species;
- Sufficient grid capacity has identified;
- There is opportunity to design a wind farm of a scale that is appropriate in relation to the landscape context in which it is located if designed sensitively;
- There would be limited impacts on archaeological and cultural heritage features;
- Identified to be located within the 50 km buffer for the Eskdalemuir Siesmic Array (studies carried out on behalf of the Scottish Government have concluded that there is scope for revising the method of calculation of the noise budget in order to facilitate further wind energy development within 50 km of the array. In addition it has been proposed that an extension of the wind farm exclusion zone to 15 km radius would free up noise budget for projects at greater range from the array, by eliminating the disproportionately high consumption of the budget by large projects close to Eskdalemuir. The Proposed Development is of relatively small scale and is located in the outer third of the zone within which the 'noise budget' applies. Since the detected noise at the array reduces with wind farm size and range from the array, it is expected that the Proposed Development will be capable of accommodation within the revised noise budget and safeguarding zone structure that are under consideration by the Scottish Government and the MoD. See Chapter 14: Aviation and Other Matters);
- That a wind energy generation development in this location would not be expected to interfere unacceptably with any known existing infrastructure; and
- Whilst there could be some potential impacts on military and civil aviation radar, these impacts are considered to be mitigatable.

3.5.30 As a result of the initial feasibility assessments, the site was considered to have the potential for minimal impact on designations and insignificant impacts on sensitive species and habitats. Therefore the site was considered potentially suitable for wind energy development, subject to further detailed assessment described below.

3.5.31 Further assessments were required to optimise the design and layout of the Proposed Development. These included, but were not limited to the following:

- Further in-depth assessment of the wind resource and wind flow characteristics of the site;
- 100 m grid peat depth survey;
- GWDTE/National Vegetation Classification surveys;
- Ornithological surveys with a particular focus on target species;
- A detailed landscape and visual review;
- Review and confirmation of existing public access and infrastructure;
- Site investigation to establish the presence and extent of anticipated constraints to construction, and to gain a better understanding of the ground conditions; and
- Further on-site archaeological investigation.

3.6 THE CONSULTATION PROCESS

3.6.1 The consultation process commenced prior to Scoping in January 2018. In accordance with the Scoping Guidelines provided by the Scottish Government's Energy Consents Unit (ECU), the Applicant undertook initial pre-Scoping meetings with NatureScot, Scottish Borders Council (SBC) and the ECU to provide a general introduction to the site. The Scoping Report was submitted on 28th July 2020, after which statutory consultation responses were received. Non-statutory consultees were also engaged during the Scoping process; a full list of which can be found within the Pre-Application Consultation (PAC) Report, a supplementary document to the Section 36 application. Community consultations also began during the Scoping period with meetings; email and telephone communications; and two rounds of public exhibitions, using a mixture of online and in-person events dependent on evolving COVID-19 regulations.

3.6.2 The consultation process was carried out to:

- Identify any further key considerations and highlight concerns from statutory consultees;
- Clarify the key points raised during the initial feasibility assessment;
- Promote communication with both statutory and non-statutory consultees and other stakeholders concerning key issues; and
- To confirm and agree the proposed methods for survey, evaluation and assessment.

3.6.3 For a complete summary of PAC activities undertaken for Scawd Law Wind Farm, see the PAC Report which accompanies this EIAR.

Key Considerations Identified Through the Consultation Process

3.6.4 The consultation process confirmed the findings of the feasibility studies and showed that whilst the findings demonstrated the site is suitable for wind energy development some key issues should be prioritised during the design process:

- Landscape and visual impact on the Tweed Valley SLA, cultural heritage receptors and other locations of local importance, and requests for additional viewpoints;
- Proposed Development Area lies within a core area for Black Grouse;
- Potential for connectivity between the Proposed Development Area and blanket bog habitat with Moorfoot Hills SAC and River Tweed SAC;
- Proposal located within the Eskdalemuir Seismological Recording Station Statutory safeguarded area; and
- NATS Holdings, formerly National Air Traffic Services, potential impacts on Prestwick Airport Air Traffic Control radar systems (requires mitigation).

3.6.5 All of the above raised concerns are fully addressed within the relevant chapters of this EIAR for the Proposed Development.

3.7 DESIGN EVOLUTION

3.7.1 This subsection describes the design considerations for the Proposed Development and discusses how the site design and layout continued to evolve throughout the EIA Process. The layout of the Proposed Development was designed under the guidance, requirements and considerations of Scawd Law Wind Farm, specialist contributions from within Natural Power and from other expert contractors such as an aviation consultant and an archaeologist. The site design process was also guided by the findings of the baseline surveys, by the recommendations of the specialist consultants and by issues raised by statutory and non-statutory consultees in line with Scottish Planning Policy (2014).

3.7.2 The aim of the siting and design process was to arrive at a design that would minimise environmental effects, limit significant landscape and visual effects, be technically feasible, and economically viable using the best available techniques and engineering principles. The design optimised the site for the generation of low carbon and low-cost electricity to contribute to national targets to decarbonise energy sources. The design process included the selection in number and size of turbines, placement of turbines, tracks and other associated infrastructure whilst taking account of topographical, landscape and visual, cultural heritage, ecology, hydrology and peat concerns.

3.7.3 The location of individual turbines was guided by the technical requirements for construction and operation including the potential manufacturer's warranty requirements, slope angles and the nature of the topography in

which the turbine is to be located. Siting was also guided by the results of the baseline studies scoping exercise, with particular attention given to the likely landscape and visual effects, residential amenity and the hydrology and peat resource at the site.

3.7.4 Computer modelling of wind resource and constraints was used as a tool to aid the development of the designed layout. Additionally, wirelines were generated for views from sensitive locations around the site and used to 'test' the design in key views from the surrounding area.

3.7.5 The remainder of this chapter highlights the site design considerations and the key stages in the site design evolution, illustrating the iterative process that has resulted in the Proposed Development. Through each of the design iterations considered, key technical and environmental constraints and design criteria have been applied.

Influence of the Policy Context

3.7.6 The full range of predicted impacts have been considered throughout this EIAR. A review of legislation and planning policy has been provided in Chapter 2: Climate Change, Legislative and Policy Context and an assessment of such material is provided in the accompanying Planning, Design and Access Statement, as well as in individual EIAR chapters. A review was undertaken of design guidance documents and other standard texts on wind farm development such as the NatureScot (then SNH) guidance on 'Siting and Designing Windfarms in the Landscape' (Version 3a August 2017). These are considered further in Chapter 6: Landscape and Visual.

3.7.7 The iterative design process was concluded and the final 8-turbine design fixed, when it was considered that an acceptable balance had been struck between the requirements of Scawd Law Wind Farm in the context of the policies and the various other environmental constraints and influences identified in this chapter.

Design Strategy Principles

3.7.8 The design strategy for the key elements of the Proposed Development has considered the following objectives:

- To maximise site efficiency and low carbon electricity production;
- To provide a turbine layout with simple form, which relates to the landscape character of the site and its surroundings;
- To avoid areas of constraint where practical;
- To create a turbine layout which reflects the scale of the landscape in which it is located;
- To avoid an overly complex and visually confusing layout;
- To achieve a balanced composition of the turbines against the landscape and skyline from key viewpoint locations;
- To relate turbine height to topography;
- To give due consideration to turbine proportions; and
- To reflect the pattern of nearby existing and proposed wind farms as far as practical.

3.7.9 In addition, noting the current economic climate which is influencing greater efficiency in electrical generation within a very competitive energy market and turbine availability from manufacturers, turbines of up to 180 m tip height are considered within the design of the Proposed Development. This scale of turbine with larger rotor diameters are capable of significantly increasing the total energy output and represent a realistic candidate turbine to allow this development being realised if planning can be secured. In addition, the land take of the Proposed Development is reduced as fewer turbines are required to generate a greater total energy output than turbines with lower tip heights. This also reduces the environmental impacts and the carbon footprint of the Proposed Development.

Constraints to Development

3.7.10 The main environmental considerations on site which have influenced the final design of the Proposed Development are:

- Landscape and visual; and
- Topography.

Public Consultation

3.7.11 The principles of effective public engagement have been followed as described in PAN 3/2010: Community Engagement:

- Access to information;
- The opportunity to contribute ideas;
- The opportunity to take an active part in developing proposals and options;
- The opportunity to be consulted and make representations on formal proposals and policies; and
- The opportunity to receive feedback and be informed about progress and outcomes.

3.7.12 The Applicant has liaised with the local community during the Scoping. The Applicant took over the community liaison role during the EIA period, ensuring that communities were given additional information if required and ensuring that all queries from community councils, community groups and members of the community were answered and followed up if required.

3.7.13 Due to the COVID-19 pandemic virtual online webinars took place on 3rd, 8th and 14th September 2020; and virtual online exhibitions on the 12th and 13th January 2021. Further online and in-person exhibitions took place between 6th, 7th and 8th September 2021. Details of these exhibitions and other stakeholder engagements can be found in the accompanying PAC Report to the EIAR.

Iterative Design Process

3.7.14 The iterative design approach aimed, as far as practically possible, to avoid and then mitigate significant effects through the careful siting and design of the Proposed Development, which was repeatedly assessed and amended, balancing different environmental issues and consultee concerns expressed during early consultation. This embedded mitigation design process has also considered advice contained within SNH's (now NatureScot) current guidance 'Siting and Designing Wind Farms in the Landscape' (Version 3a August 2017).

The design process began with a nine turbine layout (Figure 3.1, Volume 3a) which was presented to Scottish Borders Council at a Pre-Application workshop in January 2019, before Scoping was submitted. The Applicant also discussed this layout with NatureScot.

Following more detailed feasibility studies, noting the limited visibility of the potential windfarm from the Tweed valley and that visibility from the SUW was unavoidable, further design options increasing the number of turbines were explored with the aim of maximising energy yield without substantially increasing landscape and visual effects. Therefore, the project could be enhanced by considering layouts involving more and potentially larger turbines which could increase the energy generation capacity for limited additional impact. Thus, improving the business case and ability of the project to very substantially support the energy transition to Net Zero.

3.7.15 Consequently, 15-turbine and 18-turbine layouts were developed by extending the site in multiple directions (Figure 1.3, Volume 3a). When compared with the extent of theoretical visibility of the nine turbine layout, the pattern of theoretical visibility was similar and visibility from the Tweed valley and other areas frequented by people remained substantially limited.

3.7.16 The worst-case scenario of an 18-turbine development was assessed in the Initial Feasibility Assessment. From this point, turbines were relocated, modified or removed from the layout using physical constraints, such as: areas of deep peat; steep slopes; sensitive wildlife habitats; species locations; and initial visual and landform sensitivities, whilst balancing the potential effects on landscape and visual amenity.

3.7.17 Following pre-application discussions, a site visit with SBC and a formal response to the pre-application, it was SBC's view that due to the proximity of the Proposed Development to the central area of the Borders and the heavily used Tweed Valley, that an 18-turbine development could not receive support due to the limited containment and visual impact.

3.7.18 Natural Power and the Applicant then undertook extensive survey work (including peat probing, breeding bird surveys and GWDTE, amongst others) and reviewed the viability of a 15-turbine scheme. Following this review, a further three turbines were removed resulting in a 12-turbine layout before proceeding to formal Scoping.

3.7.19 After the Scoping Opinion and responses were reviewed, and additional consultations carried out with SBC, local communities and groups, a further two turbines were removed from the Proposed Development due to potential landscape impacts upon the Tweed valley, topography and wind resource resulting in a 10-turbine layout.

3.7.20 Further community engagement, development activities and engineering design works were undertaken throughout summer 2021 which continued to refine the site and led to the removal of a further two turbines. The removed turbines were to the east of the site and were removed to reduce required engineering works on site for build-out and to improve visual cohesion. This concluded the design process, and the site was frozen at eight turbines. Figure 1.2 (Volume 3a) contains a detailed site turbine layout with associated infrastructure for the Proposed Development after design freeze. This is the layout which is applied for and this EIAR describes.

3.7.21 The access track in the Proposed Development joins the site from the west, leaving the B709 approximately 1 km south from Colquhar. In previous iterations of the site design the primary access track joined the site from the south, leaving the A72 at Gatehopeknowe. The western access route from Colquhar became the primary access through design iteration which took into account site topography, proximity of dwellings, delivery guidelines from potential turbine manufacturers and required new track length.

3.8 FINAL AND PROPOSED LAYOUT

3.8.1 The final and Proposed Development layout comprises of eight turbines with a blade tip of up to 180 m (Figure 1.2: Site Layout, Volume 3a). This current layout is considered a well-balanced design from key viewpoints and receptors, whilst also giving due consideration to other key environmental constraints and sensitives, as well as construction limitations.

3.8.2 The total power output of the Proposed Development would be around 60 MW which includes approximately 48 MW generated by the wind turbines and 12 MW of battery storage. A 60 MW development requires a Section 36 of the Electricity Act (1989). Based on a calculated capacity factor, the annual indicative total power output for the Proposed Development would be approximately 139.1 GW hours per annum, indicating the Proposed Development would generate enough electricity to power over 38,800 average UK households (based on average electricity consumption per household in the UK, quoted by the Department of Business, Energy and Industrial Strategy, of 3,748 kWH per year, 2021[2]). The Proposed Development would contribute towards international and national targets for the generation of renewable energy and reduction in greenhouse gas emissions. The Proposed Development is fully described in Chapter 4: Project Description and a site layout is shown in Figure 1.2 (Volume 3a).

3.9 CONCLUSION

3.9.1 In line with good practice advice from the Scottish Government and procedures normally required for Section 36 of the Electricity Act (1989) applications, the Proposed Development has been subject to a detailed and iterative design process. Alternative layouts and access routes have been considered. The final design has sought to balance the technical requirements of the Applicant with the environmental considerations highlighted by consultees and the public during early consultation. The residual impacts of the design process are considered in the following EIAR chapters.

[2] Wind Energy Statistics Explained, RenewableUK, Available at: https://www.renewableuk.com/page/UKWEDExplained/Statistics-Explained.htm, accessed 25/03/2022.