



Balgray Wind Farm

Chapter 2: Site Selection and Design Evolution

June 2025



Fred. Olsen Renewables

Contents

2. SITE SELECTION AND DESIGN EVOLUTION.....	3
2.1. Introduction	3
2.2. The Site Selection Process	3
2.3. Initial Feasibility Assessment	4
2.4. The Consultation Process	8



List of Abbreviations

Abbreviation	Description
BESS	Battery Energy Storage System
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
GIS	Geographic Information Systems
GWDTE	Ground Water Dependant Terrestrial Ecosystems
LiDAR	Light Detection and Ranging
MoD	Ministry of Defence
PAC	Pre-Application Consultation
PAN	Planning Advice Note
UK	United Kingdom



2. Site Selection and Design Evolution

2.1. Introduction

- 2.1.1. This chapter sets out the main stages followed in the design evolution of the Proposed Development. It demonstrates how the site selection, design and the layout of the turbines and other components has evolved through the initial site selection process, identification of various constraints and site-specific factors, and highlights the key design criteria applied. It also describes the processes applied in undertaking the Environmental Impact Assessment (EIA) for the Proposed Development and in compiling this Environmental Impact Assessment Report (EIAR).
- 2.1.2. 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 applications for planning permission for major developments in terms of Regulation 13 of the Town and Country Planning (Development Management Procedure) (Scotland) Regulations 2013. 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. It also provides a description of the reasonable alternatives considered by the developer as required under Regulation 5(2)(d) of the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 to consider alternatives.

2.2. The Site Selection Process

- 2.2.1. The Applicant has a portfolio of sites across the United Kingdom (UK) that it has investigated for the potential for wind energy development across a number of years. This includes the consideration of extensions to existing projects and the investigation of new and separate sites. The overarching aim of the selection process was to have a layout that maximised efficiency whilst limiting the potential environmental impacts. Factors influencing the suitability of the site included:

- Suitable wind speeds;
- Standard separation distance from dwellings;
- Reasonably close proximity to viable grid connection;
- Willing landowner(s);
- Potential to use existing infrastructure, as far as practical;
- Suitable land area to accommodate generating capacity;
- Minimised impacts to the local communities and existing infrastructure; and



- No significant strategic constraints preventing further development.

2.2.2. Figure 1.1 of the EIAR illustrates the regional context of the Proposed Development area.

2.2.3. Initial feasibility assessments indicated that there was opportunity for wind energy development at the site of Balgray.

2.3. Initial Feasibility Assessment

2.3.1. An application was made to the Scottish Government by an unrelated Applicant for a substantially different 21 turbine development known as Newfield Wind Farm (09/C/4/0011) in August 2010 on land that includes the proposed application site at Balgray. This site was refused due to landscape and visual effects, the cumulative impact and the visual impact on a number of residential properties.

2.3.2. The proposed Balgray Wind Farm development is within a much-reduced development area which is pulled back into the site, with a reduced number of turbines to that considered under the Newfield Wind Farm application.

2.3.3. In 2020, an initial layout was generated for the Proposed Development, comprising 19 turbines, that was designed to maximise generation, without considerations of on-site constraints and using additional land parcels which are no longer part of the Proposed Development.

2.3.4. Throughout the initial feasibility assessment, the site area reduced in size due to changes in landowner agreements and feedback reviewed in relation to the previously proposed Newfield scheme. Turbine positions were identified based on known on-site constraints (prior to more detailed site exploration) and most suitable layout to maximise turbine performance.

2.3.5. An initial scoping design for the Proposed Development was submitted to the Energy Consents Unit in January 2024. This was a 7-turbine proposal comprising turbines with a tip height of 230 m, alongside a Battery Energy Storage System (BESS) and associated infrastructure.

2.3.6. Following feedback from consultees, as described below, a number of further changes were made, including the removal of one of the original 7 turbines, a reduction in proposed turbine tip height, and relocation of the remaining 6 turbines, resulting in the current Proposed Development.

2.3.7. A full EIA has been undertaken on this reduced layout. The results of the EIA are presented within the relevant chapters of this EIAR.



Policy Context

2.3.8. With regard to the full range of impacts, these have been considered throughout the EIAR chapters. A full review of legislation and planning policy has been provided in the supplementary Planning Statement, whilst a summary of relevant policy and legislation is provided in the individual EIAR chapters.

Wind Resource

2.3.9. Wind speed measurements using LiDAR have been collected over a 12-month period on the Balgray Estate and the site is known to have an average wind speed of around 8 m/s. As such, the Applicant is confident that the Proposed Development can generate renewable energy at this site on an economically viable basis.

Grid Connection

- 2.3.10. A grid connection application will be made for the Proposed Development following submission of the Section 36 application to the Energy Consents Unit.
- 2.3.11. The grid connection route and details will be subject to separate applications, which will be submitted by the relevant grid connection company.

Access

- 2.3.12. The proposed access route for the Proposed Development has also undergone significant design changes during the assessment process. Whilst initially routes from the south and east were considered, the proposed route to site will principally use public roads to the north and west of the site (similar to those used for the nearby Cross Dykes Wind Farm) before making use of existing forest tracks to enter the site from the north. Further detailed work on the access route will be undertaken when a turbine model has been selected for the site. Details of the proposed access route and the potential effects of the Proposed Development on transport and access have been fully assessed in the EIA and the results are presented in Chapter 12: Access, Traffic & Transport, of the EIAR, and the accompanying Abnormal Load Assessment (see Appendix 12.1 in Volume 4 of the EIAR).

Ecology and Ornithology

- 2.3.13. Pre-planning ecology assessments were conducted to assess the site connectivity with local statutory designated sites and to identify the presence of priority habitats and species. As a result of the pre-planning ecology assessment of the Proposed Development, it was considered unlikely to impact on designations. Where priority species and habitats were found on site, these were investigated further in order to inform design alongside opportunities for mitigation and enhancement. Potential significant effects upon ecology and ornithology are fully assessed in the EIA and the findings are presenting in Chapter 8: Ecology and Chapter 7: Ornithology, of the EIAR.



Landscape and Visual

- 2.3.14. Landscape and visual considerations were taken on during the early stages of the project, as these were understood, from lessons learned from the previous Newfield application, to be key to the progression of the Proposed Development.
- 2.3.15. The assessment has also been informed by knowledge gained through previous experience of the Applicant in designing, constructing and operating wind farm developments across the country. This has informed effective embedded mitigation which can also be applied to the Proposed Development.
- 2.3.16. An independent landscape architect has worked closely with the project team from the outset, inputting into the siting and design of the wind farm in order to minimise, as far as practical, the potential landscape and visual and cumulative effects of the Proposed Development.
- 2.3.17. Detailed consideration to design from a landscape and visual perspective including assessment of the effects of aviation lighting is presented in Chapter 6: Landscape and Visual Impact Assessment of the EIAR.

Cultural Heritage

- 2.3.18. During the initial feasibility assessment, the presence of cultural heritage was investigated within and out with site boundary. The presence of cultural heritage assets within the Proposed Development was used to inform the site design and layout, alongside consultation with Dumfries and Galloway Council's Archaeological Service and Historic Environment Scotland. A full cultural heritage assessment is provided in Chapter 11 of the EIAR.

Hydrology, Geology and Hydrogeology

- 2.3.19. As part of the hydrology assessment all mapped watercourses were marked as a constraint and a 50 m buffer was applied to the proposed turbines and their associated infrastructure to protect watercourses from disturbance and potential effects on water quality during construction and operation. Peat Depth has been surveyed across the site and the areas of deep peat have been avoided where practical. Ground Water Dependant Terrestrial Ecosystems (GWDTE) have also been identified and avoided where possible. A detailed assessment of hydrological elements is provided in Chapter 9: Hydrology, Geology and Hydrogeological Assessment, of the EIAR.

Military and Civil Aviation

- 2.3.20. 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 Proposed Development is located near two potential areas of aviation constraint. The potential effects on Military and



Aviation and proposed mitigation are detailed in Chapter 14: Aviation & Radar, of the EIAR.

Existing Infrastructure

- 2.3.21. 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, subject to further assessment. A desktop study undertaken using the online resource tool 'Linesearchbeforeudig' also indicates that the Proposed Development does not affect existing infrastructure, subject to a detailed further assessment of the entire Proposed Development Area prior to construction.

Land Use

- 2.3.22. The Proposed Development is located approximately 6 km north of the town of Lockerbie and approximately 1km east of the village of Sibbaldbie. The proposed turbine locations are on land owned by Balgray Estate which is currently used for agricultural grazing. The access to the north utilises existing tracks through an area of commercial forestry which is in separate ownership. The land is currently crossed by an existing overhead transmission line which has been avoided through appropriate setbacks. An assessment of socio-economic impacts has been provided in Chapter 13: Socioeconomics, Tourism and Recreation, of the EIAR.

Proximity of Dwellings

- 2.3.23. The nearest dwellings are located approximately 1.1km from the Proposed Development.
- 2.3.24. Potential Noise, shadow flicker and visual amenity impacts have been given consideration during the design iterations to ensure minimised effects on nearby residents. A detailed noise assessment is provided in Chapter 10 of the EIAR, and shadow flicker is also considered in Chapter 15: Other Issues, of the EIAR. Residential Visual Amenity is considered fully in Chapter 6: Landscape and Visual Impact Assessment, of the EIAR.

Initial Site Feasibility Assessment Conclusion

- 2.3.25. The initial site feasibility assessment concluded that the site offers a potential for a 7-turbine development. The initial feasibility assessment indicated that:
- There is a good wind resource across the site assuming the use of larger turbines;



- With embedded mitigation and enhancement, the Proposed Development was unlikely to impact significantly on any ecological designation and/or target species;
- Sufficient grid capacity could be secured;
- The scale of the development is appropriate in relation to the landscape context in which it is located;
- There would be limited significant impacts on archaeological and cultural heritage features;
- The Proposed Development would not be expected to interfere unacceptably with any known existing infrastructure; and
- Whilst there could be potential impacts on other infrastructure, notably the Eskdalemuir Seismic Array these impacts are considered to be mitigatable.

2.3.26. Further assessments however were required to optimise the design and layout of the Proposed Development.

2.3.27. These included, but are not limited to the following:

- Further in-depth assessment of the wind resource and wind flow characteristics of the site;
- 100m grid peat depth survey;
- Detailed ecological surveys focusing on the presence of Marsh Fritillary butterflies within the site.
- Ornithological survey, with a particular focus on target species;
- A full landscape and visual impact assessment, including a cumulative assessment;
- 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;
- Consultation with the Ministry of Defence (MoD) to formally agree the mitigation solutions for Eskdalemuir; and
- Further on-site archaeological investigation.

2.4. The Consultation Process

2.4.1. The consultation process was carried out to:



- Identify any further key considerations;
- 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.

2.4.2. A summary of the consultation responses is set out in the Pre-Application Consultation (PAC) report which is submitted alongside this EIAR in support of this application.





Fred. Olsen Renewables Ltd
Ochil House, Springkerse Business Park
Stirling FK7 7XE

www.fredolsenrenewables.com

