

Design and Access Statement

Beinneun 2 Wind Farm

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1 INTRODUCTION

This document summarises the key design aspects of the Beinneun 2 Wind Farm ('the Development') and access considerations that have been taken into account in the design. This document meets the requirements of relevant guidance on Design and Access Statements^{1,2,3}.

2 SITE DESIGN PRINCIPLES

The design aim for the Development was to maximise the generation capacity within the Site, taking into consideration environmental, human and engineering constraints. Other key design principles were to:

- Minimise environmental impacts through application of the mitigation hierarchy;
- Ensure applicable safety standards are met for the BESS; and
- Conserve, restore and enhance biodiversity, including nature networks so they are in a demonstrably better state than without intervention.

An assessment of compliance with these principles is provided in Section 4 of this document.

3 SITE COMPONENTS

The Development would consist of the following separate elements, as listed below. The application (EIA Report, Volume 2) includes figures showing the layout and dimensions of these:

- Up to 19 wind turbines and external transformers (if required), each with a maximum tip height of up to 200 m;
- Associated foundations and crane hardstandings at each wind turbine location;
- Access tracks totalling approximately 17.5 km in length;
- Battery Energy Storage System (BESS) compound containing approximately 27 battery containers;
- One meteorological mast;
- Network of underground cabling;
- A new substation compound; and
- Two construction and storage compounds.

3.1 WIND TURBINES

Up to 19 turbines, with a maximum tip height of up to 200 m. Each turbine will require a small transformer located either inside the tower or adjacent to the turbine.

Each foundation would be designed according to the geotechnical site investigations undertaken during the enabling works to establish the nature of the subsoil condition at each turbine location. Typically, foundations are expected to have an approximate diameter of 25 m. The main working area at each hardstanding area composed of crushed stone will be approximately 115 m by 70 m, the footprint of the main hardstanding will be up to approximately 3,600 m², as shown on EIA Report Figure 4.4. In addition to the main hardstanding area, there will be smaller hardstanding areas for the crane assist and blade finger areas. Additional flattened areas will be used for crane assembly and turbine blade storage; however, these will be temporary and not constitute hardstanding.

¹ UK Government (1989) Electricity Act 1989, Section 36. Available at: <https://www.legislation.gov.uk/ukpga/1989/29/section/36> [Accessed 30/07/2025].

² Scottish Government (1997) Town and Country Planning (Scotland) Act 1997, Section 57(2). Available at: <https://www.legislation.gov.uk/ukpga/1997/8/section/57> [Accessed 30/07/2025].

³ Scottish Government (2017) Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (as amended). Available at: <https://www.legislation.gov.uk/ssi/2017/101/contents/made> [Accessed 30/07/2025]

3.2 BATTERY ENERGY STORAGE UNITS (BESS)

The BESS compound will be constructed at approximately NGR 223507 804875. This will be made up of approximately 27 BESS units and will measure approximately 100 m by 100 m. It will have capacity to store up to approximately 320 MegaWatt-hours (MWh) of energy and an instantaneous power output of approximately 160 MW. The battery units will be supported by Power Control System (PCS) units, comprising inverters and transformers, required to connect the batteries to the electrical grid.

3.3 METEOROLOGICAL MAST

One meteorological mast, of height up to 149.9 m, will be installed at NGR 220250, 805734. It will be secured with guy wires.

3.4 ELECTRICAL CABLING

Onsite cabling will be laid underground alongside or within the access tracks where possible, linking the turbine transformers to the wind farm control building, substation and the BESS. Cables will be laid at a depth of approximately 1 m below ground level. Cables will be marked above ground with white poles, c. 2 m tall.

3.5 SUBSTATION COMPOUND

A substation compound with a control building will be located in the southeast of the Site at approximately NGR 223411 804848, measuring approximately 100 m by 100 m with external transformer and connection equipment. The compound will also include space for any Distribution Network Operator equipment to facilitate the grid connection.

3.6 CONSTRUCTION AND STORAGE COMPOUND

Two construction compounds will be required during the construction of the Development, forming an area of hardstanding providing space for temporary construction cabins, parking and lay down areas. The first will measure approximately 130 m by 60 m and be located within the west of the Site, at approximately NGR 220551, 805946. Due to the size of the Site, a second construction compound will be required which will be located at the site of the substation and BESS compounds. The substation and BESS components will be constructed on the site of this temporary construction compound near the completion of the construction of the Development.

3.7 SITE FENCING

The BESS units would be enclosed within a fence that will include small holes, or gates, at ground level to allow small mammals through. As a further security measure, CCTV cameras will be sited within the compound.

3.8 LIGHTING

Civil Aviation Authority (CAA) guidance requires that 'en-route obstacles' at or above 150 m above ground level are lit with visible lighting to assist their detection by aircraft. As such, there is potential that parts of the Development may be visible at night. To ensure compliance with the Air Navigation Order 2016, the turbines at the Development will be fitted with lighting as agreed with the CAA. To minimise night-time amenity effects, the lighting will be kept to the minimum required by the CAA.

A proposal for this lighting has been presented to the CAA and, at the time of writing this EIAR, a response from the CAA is awaited.

In the absence of an agreement of a specific lighting proposal from the CAA, this EIA has been based on a worst-case scenario, which follows the specification of visible lighting set out in the CAA Onshore Wind Aviation Lighting Policy Statement:

- All obstacles at or above 150 m above ground level will be fitted with medium intensity (2000 candela) omni directional visible aviation lighting which, in the case of wind turbines, will be located on the hub;
- A secondary light (of the same specification) will be fitted for use only when the primary light fails and would not be lit concurrently; and

- Low intensity (32 candela) aviation lights will be provided at an intermediate level of half the hub height. These would need to be fitted around the towers to allow for 360° horizontal visibility.

The technical specifications for the visible aviation lighting specify how they are perceived from different viewing angles. This means that the lights only generate their nominal 2000 candela intensity in a relatively narrow band of elevation angles, from the horizontal to

several degrees above the horizontal, and that the intensity of the light reduces significantly at angles of elevation below the horizontal. An assessment of the effects of aviation lighting using these specifications is provided in the EIA Report Chapter 5: Landscape and Visual Impact Assessment.

The final lighting specification will be submitted for approval to the Planning Authority and Civil Aviation Authority prior to construction.

3.9 BIODIVERSITY ENHANCEMENT

As set out in the Outline Habitat Management Plan (oHMP), provided as Technical Appendix A6.6 of the EIA Report, the following habitat creation and enhancement measures are proposed:

- To restore and enhance a minimum of 131 ha of peatland habitat within the Site. This will increase the quality and extent of Annex 1 (UK Government, 1994) habitat and compensate for habitat loss and degradation incurred as a result of the Development; and
- To restore and enhance approximately 143 ha of broadleaved woodland habitat (cleuch and low density broadleaved blocks), with associated heath understory, within and close to the Site. This will enhance the existing broadleaved woodland within the Site and the proposed area nearby from 7 ha to 150 ha. The restoration and enhancement of this area is intended to offset both the permanent and temporary loss or degradation of non mire habitats (approximately 20 ha as compensation and 116 ha as enhancement). This will be of benefit to Black Grouse.

3.10 WATERCOURSE CROSSINGS

The track layout design has sought to limit the number of watercourse crossings; however, given the nature of the Site a number of crossing points are necessary. The access tracks will require two new watercourse crossings and the upgrade of six existing watercourse crossings across all sections of the Development. The locations of watercourse crossings are detailed in the EIA Report Technical Appendix A12.2: Watercourse Crossings.

The type and design of each watercourse crossing will be dependent on the stream morphology, peak flows, local topography and ecological requirements, and will be chosen so as to minimise potential environmental effects.

Crossings would be designed in accordance with Construction Industry Research and Information Association (CIRIA) Culvert design and operation guide (C689)⁴ and incorporating the most recent climate change allowances, to ensure sufficient capacities for spate or flooding events.

Crossings would be subject to the requirements of The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended)⁵ (CAR) and Water Environment (Miscellaneous) (Scotland) Regulations 2017⁶.

3.11 GRID CONNECTION

The grid connection does not form part of the Section 36 consent application for the Development. The consent for the grid connection will be sought by the relevant Distribution

⁴ Construction Industry Research and Information Association (CIRIA) (2010) Culvert design and operation guide (C689). London: CIRIA.

⁵ Scottish Government (2011) The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended). Available at: <https://www.legislation.gov.uk/ssi/2011/209/contents/made> [Accessed 24/02/2025].

⁶ Scottish Government (2017) Water Environment (Miscellaneous) (Scotland) Regulations 2017. Available at: <https://www.legislation.gov.uk/ssi/2017/389/contents/made> [Accessed 24/02/2025].

Network Operator (DNO), Scottish and Southern Electricity Networks, via a separate Section 37 application.

4 APPLICATION OF THE DESIGN PRINCIPLES

4.1 MINIMISING ENVIRONMENTAL IMPACT

Environmental impact has been minimised principally through the following measures:

- Avoiding impacts:
 - Selection of a site that is set away from locations used by many people;
 - Selection of a site that is not highly visible from a particularly wide or sensitive area;
 - Selection of a site that has no designations or other particularly highly valued or sensitive receptors;
 - Maintaining public access through the Site;
- Minimising impacts:
 - Setting back infrastructure from residential properties and conducting assessments of noise and residential visual amenity in advance of design fix, to ensure effects should be acceptable;
 - Locating the BESS at least 2 km away from residential properties;
 - Proposing SuDS measures to minimise drainage and pollution impacts;
 - Including an Outline Construction Environmental Management Plan (oCEMP) in the planning application, to ensure control of construction activity;
- Mitigating any unavoidable impacts, including a Bird Protection Plan; and
- Compensating for residual impacts, including proposing peatland restoration where practicable.

4.2 MEETING SAFETY STANDARDS FOR THE BESS

To meet this design principle, the NFCC guidance has been followed, resulting in a design in which:

- The batteries units are located at least 10 m away from vegetation;
- An alternative direction of access to the BESS compound has been integrated into the design to allow continued access to the Site for emergency vehicles, should an incident occur, and the main access track be inaccessible;
- The nearest residential property is over 400 m from the BESS, which exceeds the minimum distance;
- The prevailing winds at the Site are south-westerly. The access routes have been designed accordingly with the main access being from the northwest of the BESS compound, and an alternative access being from the southwest; and
- There will be a water tank onsite with the capacity of at least 228 m³. The proposed water tank is situated to the northwest of the BESS units. Multiple hydrants may be installed across the BESS compound to ensure at least one will be accessible regardless of what the wind direction is during an incident.

Other requirements of the NFCC guidance depend on the specific technology and model of equipment selected, which will be decided post-consent. The detailed layout of the BESS and the controls that the selected technology offers will be subject to consultation with the Scottish Fire and Rescue Service prior to commencing construction of the BESS.

4.3 CONSERVE, RESTORE AND ENHANCE BIODIVERSITY

Adverse impacts on habitats and biodiversity have been considered through the design of the Development, as assessed in chapter 6 of the EIA Report.

This demonstrates the minimisation of loss of some valued habitats (bog habitats), and the creation of substantially more highly-valued habitats. Specifically, the following habitat creation and enhancement measures are proposed, as summarised in Section 3.9, above:

- Peatland habitat; and
- Broadleaved woodland habitat.

The Outline Habitat Management Plan (oHMP), provided as Technical Appendix A6.6 of the EIA Report discusses the above and details how these measures will be monitored and reported on.

4.4 SUMMARY

Sections 4.1 to 4.3 of this report demonstrate that the design of the Development has met the design principles that were set out in Section 2.

5 ACCESS

Relevant guidance on Design and Access Statements, as set out in Section 1, sets out that the 'access' part should address how use of the site by persons with disabilities has been considered.

5.1 PUBLIC ACCESS

Access to the Site will be taken from the west via the A87, as shown on Figures 4.1 and 4.10. This access point will involve the creation of a new access junction.

The total length of onsite access tracks used by the Development will total approximately 17.5 km of new tracks.

New tracks will be constructed to connect the turbine locations to the access point, to enable the turbine components, construction materials and construction staff to be transported to their locations, and to enable access for subsequent maintenance visits. The proposed track layout is illustrated in Figure 4.1, with an elevation of both new and upgraded tracks shown in Figure 4.10.

Access tracks will be approximately 5.5 m in width, typically, though wider on tighter corners to allow for the long turbine delivery vehicles. The tracks have been designed to have sufficient radii for turning of the construction vehicles, abnormal loads and plant.

Figure 4.10 illustrates typical track designs which are likely to be employed for the Development's onsite tracks. It is anticipated that access tracks would be constructed using a 'cut track' design, given the absence of deep peat at the site. Topsoil is stripped to expose a suitable rock or sub-soil horizon on which to build the track. The track is built up, if required (depending on the sub-surface) on a geotextile layer by laying and compacting crushed rock to a depth dependent on ground conditions and topography. Generally, the surface of the track will be flush with or raised slightly above the surrounding ground level.

Excavated soils would be stored at no greater than 3 m in height, directly adjacent to, or near the tracks on ground appropriate for storage of materials i.e., relatively dry and flat ground, a minimum of 50 m away from any watercourses. Where possible, reinstatement will be carried out as track construction progresses.

Tracks would typically have drainage ditches adjacent to them, and electrical cabling would typically run alongside the tracks (see section 4.2.5).

5.2 DISABLED ACCESS

Once operational, the Development will not be staffed full time, but would be used by staff for service and maintenance.

The majority of the site, comprising access tracks and wind turbines, will be accessible by vehicle, but will necessarily be of rough (compacted stone) surface. Access to the turbines would require specialist equipment that may or may not be able to be made suitable to persons with disabilities, depending on the nature of the disability.

The detailed design of the substation compound will be prepared post-consent, when the make, model and specification of the technical equipment required as part of the substation will be decided. The parking and welfare facilities at the substation will be designed to be suitable for persons with disabilities, including low profile kerbs, ramps instead of, or as well as, steps, wide doors and wheelchair accessible toilets. The substation/control building will meet Building (Scotland) Regulations 2004 requirements and where applicable will take

cognisance of the relevant recommendations as contained in BS 8300:2009 – Design of Buildings and their approaches to meet the needs of persons with disabilities.

6 SUMMARY AND CONCLUSIONS

This document has set out the rationale guiding the design of the Development, the main components, and commentary on accessibility.