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Balgray Wind Farm

Design and Access Statement

18 July 2025



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List of Abbreviations

Abbreviations	Description
AIL	Abnormal Indivisible Load
AOD	Above Ordnance Datum
BESS	Battery Energy Storage System
CEMP	Construction Environmental Management Plan
DAS	Design and Access Statement
ECU	Energy Consents Unit
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
ES	Environmental Statement
HES	Historic Environment Scotland
HGV	Heavy Goods Vehicle
km	Kilometre
kWh	Kilowatt-hour
LDP	Local Development Plan
LPA	Local Planning Authority
LVIA	Landscape and Visual Impact Assessment
m	Metre
mm	Millimetre
MW	Megawatt
NPF	National Planning Framework
O&M	Operations and Maintenance
PAN	Planning Advice Note
SEPA	Scottish Environmental Protection Agency
SG	Supplementary Guidance
SPP	Scottish Planning Policy
tCO ₂ e	carbon dioxide equivalent
UK	United Kingdom
VP	Viewpoint



1. INTRODUCTION

This Planning, Design and Access Statement (PDAS) supports an Application by Fred. Olsen Renewables Limited (“the Applicant”) under section 36 of the Electricity Act 1989 and for a direction under Section 57(2) of the Town and Country Planning (Scotland) Act 1997 that planning permission be deemed to be granted for a wind farm generating station comprising of up to six wind turbines, with a height of up to 200 metres from base to blade tip and a generating capacity of approximately 43MW, and associated infrastructure, including a battery energy storage system (BESS) of approximately 43MW (“the Proposed Development”).

The PDAS outlines the key stages in the design evolution of the Proposed Development, from initial site selection through to the final submitted design. It details how the design has developed over time, taking into account site-specific factors, including those identified through the Environmental Impact Assessment (EIA) process and the preparation of the Environmental Impact Assessment Report (EIAR). The EIA identifies environmental and technical constraints such as ecological sensitivities, landscape character and cultural heritage, which have directly influenced the design at each stage.

The PDAS also outlines the intended access arrangements for the Proposed Development. It considers both construction and operational access, taking into account existing road infrastructure, the need to minimise impacts on local communities and requirements for safe, efficient vehicle movements to and from the Site. In addition, the document provides a summary of key planning policies at national, regional and local levels that have informed the design approach. These policies have shaped decisions on siting, scale, layout and land use compatibility, ensuring the project aligns with broader planning objectives and regulatory frameworks.

While Design and Access Statements (DAS) are a statutory requirement for Major Developments in terms of Regulation 13 of the Town and Country Planning (Development Management Procedure) (Scotland) Regulations 2013, they are not mandated for Section 36 developments. However, a DAS has been prepared in this instance for completeness and to provide as much detailed information as possible about the design approach, rationale and site-specific conditions. This supports transparency and offers stakeholders a clear understanding of the project’s context, objectives and design evolution. 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.

1.1 The Applicant

The Applicant, Fred. Olsen Renewables Limited (FORL) has been developing and operating wind farms since the mid-1990’s and is fully committed to the Scottish and UK renewable energy generation market. In addition to the UK, they now have activities in Norway and Sweden where a number of projects are currently in development.

Fred. Olsen Renewables is one of very few developers to take a project from initiation and development, through to operation and ultimately decommissioning. The company continues to operate Scotland’s first consented wind farm, Windy Standard Wind Farm, also in Dumfries and Galloway.

Fred. Olsen Renewables’ portfolio consists of 258 operational turbines, alongside a further 75 consented. This, combined with projects in Norway and Sweden, brings the total operational capacity to 804.9 MW – providing enough power for approximately 698,340 homes.

1.2 EIA Chapters and Project Team

The project has been designed and assessed by the Applicant in association with their lead consultants, Locogen. Locogen has been appointed to coordinate and produce the EIAR and associated EIA documentation. The following details also provide a statement of competency under the EIA Regulations.



Locogen is an independent Scottish company comprising a team of professional project managers, engineers, planners and environmental consultants with expertise in the development and implementation of low carbon generating technologies. Locogen has extensive experience in the development and delivery of a range of renewable technologies for commercial, public sector and community organisations.

The specific services provided for wind energy projects includes (among others): Environmental screening and scoping works; Management of the EIA, planning submission and appeal process; Grid connection applications, negotiations and agreements; and wind monitoring and detailed wind resource and energy yield assessments. Locogen has successfully project managed the construction of over 40 commercial wind energy projects.

Table 1 lists and describes the EIAR chapters alongside the specialist consultants appointed to undertake detailed assessments of each topic area. Locogen prepared Chapters 1-5, 8, 15 and 16 and comprehensively reviewed all chapters developed by subject matter experts, along with a full review of the EIAR.

Table 1: EIAR chapters and appointed lead consultants.

EIAR Chapter	Consultant
Chapter 1: Introduction	Outlines the application details, provides an overview of the previous Newfield application and introduces the project team.
Chapter 2: Site Selection and Design	Provides a detailed written statement about the design principles and concepts that were applied to the Proposed Development, including the design process and the rationale for location of the Proposed Development.
Chapter 3: Project Description	Includes a comprehensive description of the development and outlines access arrangements for the Site during all phases of development.
Chapter 4: Approach to EIA	Sets out the approach taken to produce the EIAR, including details of the scope and consultation undertaken.
Chapter 5: Policy Context	Describes the legislative and policy background relevant to the Proposed Development.
Chapter 6: Landscape and Visual Impact Assessment	The LVIA was undertaken by a leading consultant at Pegasus Group, supported by a team of landscape architects, GIS specialists and environmental planners with experience in undertaking and overseeing LVIAs for wind energy developments within Dumfries and Galloway and more widely across Scotland.
Chapter 7: Ornithology	Ornithology assessments have been carried out by a highly experienced consultant ecologist and ornithologist with over three decades of international expertise, having worked on more than 400 onshore and offshore wind and solar energy projects across the UK, Europe, Asia, Africa, and Australasia.
Chapter 8: Ecology	Prepared by Locogen's in-house ecology team, this chapter provides an overview of the baseline ecological conditions relating to the habitats and (non-avian) fauna present within the Proposed Development area and immediate surrounding environment. An assessment of potential impacts and proposed mitigation measures is also presented. The Marsh Fritillary Assessments which form part of the Chapter were supported by Chris Catherine at RSK Biosphere.
Chapter 9: Hydrology, Hydrogeology and Geology	SLR Consulting was appointed to undertake this assessment, led by a principal consultant with over 30-years of experience in environmental and geotechnical investigations. It provides a comprehensive assessment of the Site's geological characteristics, surface and groundwater dynamics and soil conditions, with



	particular emphasis on identifying, classifying and evaluating peat and carbon-rich soils due to their environmental sensitivity and carbon storage value.
Chapter 10: Noise	The Noise assessment was prepared by a leading consultant and director at Ion Acoustics, a member of the Institute of Acoustics with 30 years of experience in wind turbine noise assessments.
Chapter 11: Cultural Heritage	This chapter evaluates the potential impact of the Proposed Development on archaeological sites and the wider heritage landscape. A qualified and highly experienced consultant from Headland Archaeology was appointed to ensure a thorough, impartial assessment. Their review considered both direct effects and visual impacts on heritage assets.
Chapter 12: Traffic and Transport	Access, Traffic and Transport assessments have been carried out by SYSTRA Ltd (SYSTRA). SYSTRA's EIA team has produced Traffic and Transport EIAR chapters and Abnormal Loads assessment reports for numerous wind farm developments within the Dumfries and Galloway administrative area.
Chapter 13: Socioeconomics, Tourism and Recreation	This chapter was compiled by MKA Economics who have led the socio-economic, tourism, recreation and land use assessment for over 30 onshore wind farms across Scotland, a number of which being located in Dumfries and Galloway. Additionally, MKA Economics bring local knowledge from the evaluation of regional funding programmes and other leading economic development studies, including Dumfries Town Centre Masterplan and Annan Harbour Masterplan.
Chapter 14: Aviation and Radar	The Aviation assessment was prepared by a specialist consultancy – Gladhouse Planning Ltd - with 29 years' experience of assessing the impacts of wind energy developments on aviation. assesses the potential for impact upon aviation, Ministry of Defence (MoD) interests, communication operations and existing site infrastructure and demonstrates the consulting process undertaken and outlines mitigation where it is deemed necessary.
Chapter 15: Other Issues	Locogen used its in-house expertise to assess shadow flicker and ice throw, while recognised experts Xi Engineering undertook the Eskdalemuir Seismic Array assessment.
Chapter 16: Synergistic Effects, Schedule of Environmental Commitments and Residual Effects	Summarises the findings of the EIA presented in the EIAR chapters described above, assesses synergistic effects and all of the mitigation measures presented in this EIA Report with a summary table of all predicted residual effects.

2. Overview of the Proposed Development

The Proposed Development is located entirely within the Dumfries and Galloway Council area, approximately 6 km northeast of Lockerbie. Most of the Proposed Development is on land owned by Balgray Estate, with the access route to the north of the Proposed Development in separate ownership. Access will principally use public roads to the north and west of the site (similar to those utilised for the nearby Cross Dykes Wind Farm) before making use of existing forest tracks to enter the Site from the north.

The application is for a wind farm generating station comprising of up to six wind turbines, with a height of up to 200 metres from base to blade tip and a generating capacity of approximately 43MW. The wind farm is expected to have a 35-year operational lifespan.



The application also includes associated infrastructure, including: approximately 43MW of battery energy storage system, external transformer housings, control room, crane pads, turbine foundations, access tracks, substation, underground electricity cables between the turbines and the onsite substation, up to 2 temporary borrow pits, water crossings and drainage attenuation measures as necessary, forestry felling and restocking, Health and Safety signage, temporary construction and storage compounds and ancillary infrastructure.

A full description can be found in Chapter 3: Project Description of the EIAR.

3. Planning & Policy Context

The design approach for the Proposed Development has been shaped by the relevant planning policies and established best practice standards. Information regarding the planning policy framework is set out in the accompanying Planning Statement and in Chapter 5: Policy Context of the EIAR. This section offers a summary and evaluation of the design-related policy considerations at both national and local levels.

The Development Plan for the Site comprises of the National Planning Framework 4 (NPF4) and the Dumfries and Galloway Local Development Plan 2. As the Proposed Development exceeds 50 MW, it falls under Section 36 of the Electricity Act 1989 and requires consent from the Scottish Ministers. For the purposes of Section 36 decision making, Section 25 of the Town and Country Planning (Scotland) Act 1997 ('the 1997 Act') is not engaged and the Development Plan is not the main consideration for decision making. However, the Development Plan does form a significant material consideration in the overall decision-making process and the national and local planning policies have therefore informed the site selection and project design process. A summary of the relevant policies is provided below.

Although not strictly a material planning consideration, the planning history for the Site has also informed the design of the Proposed Development. The relevant planning history is therefore also summarised in this section.

3.1 National Planning Policy on Design

The National Planning Framework 4 (NPF4) was formally adopted following approval by the Scottish Parliament on the 11th of January 2023 and became effective from the 13th of February 2023. NPF4 outlines a long term strategy for how planning and development will achieve Net Zero and a sustainable Scotland by 2045 while also supporting the implementation of the United Nations Sustainable Development goals. NPF4 establishes a national vision for future growth, focusing on addressing climate change through substantial infrastructure investment aimed at supporting the transition to Net Zero.

The national planning policies relevant to the Proposed Development are:

Policy 1 (Tackling the climate and nature crises);

Policy 3 (Biodiversity);

Policy 4 (Natural Places);

Policy 5 (Soils);

Policy 7 (Historic Assets and Places);

Policy 11 (Energy); and

Policy 22 (Flood Risk and Water Management).



3.2 Local Planning Policy on Design

3.2.1 Dumfries and Galloway Local Development Plan 2

The Dumfries and Galloway second Local Development Plan 2 (LDP2), adopted in September 2019, covers all of Dumfries and Galloway and provides the planning framework for and guides the future use and development of land in towns, villages and rural areas. The LDP was prepared and adopted prior to NPF4 coming into force and reflects the provision of the former NPF3 and Scottish Planning policy (SPP), both now superseded. In cases where the Local Development Plan conflicts with or does not address certain issues covered by NPF4, the policies set out in NPF4 will take precedence.

In design terms, Policy OP2 'Design Quality and Placemaking' is an overarching policy that sets out general considerations in relation to design quality of new development. It highlights that development proposals should achieve high quality design in terms of their contribution to the existing built and natural environment, contributing positively to a sense of place and local distinctiveness.

Other policies of relevance include:

Policy OP1: Development Considerations;

Policy HE1: Listed Buildings;

Policy HE2: Conservation Areas;

Policy HE3: Archaeology;

Policy HE4: Archaeology Sensitive Areas;

Policy HE6: Gardens and Designed Landscapes;

Policy NE2: Regional Scenic Areas;

Policy NE4: Site of international importance for biodiversity;

Policy NE5: Species of international importance;

Policy NE6: Sites of national importance for biodiversity and geodiversity;

Policy NE11: Telecommunications;

Policy NE12: Supporting the Water Environment;

Policy NE15: Protection and Restoration of Peat Deposits as Carbon Sinks; and

Policy T1: Transport Infrastructure.

3.3 Other Design Guidance

The LDP2 'Wind Energy Development: Development Management Considerations' Supplementary Guidance (SG) (February 2020) provides further detail in support of the development management considerations in Policy IN2 'Wind Energy'. It outlines the primary factors that should inform planning decisions and elaborates on the policy's criteria.

Appendix C of the SG includes the 'Dumfries and Galloway Wind Farm Landscape Sensitivity Study'. This study was recently revised, and the updated version was published in February 2025.

3.4 Site Planning History

In August 2010, a separate applicant submitted a proposal to the Scottish Government for a much larger 21-turbine project, referred to as Newfield Wind Farm (planning ref. 09/C/4/0011), on land that includes the application site of the current Proposed Development.



Dumfries and Galloway Council objected to the Newfield proposals, prompting a Public Local Inquiry (PLI) which was held between 2011 and 2013. The PLI report was issued in November 2013 and submitted to the Scottish Government. The report recommended that consent under Section 36 of the Electricity Act 1989 should not be granted. The grounds for refusal included concerns over landscape and visual impacts, the cumulative effect of the Proposed Development and adverse visual impacts on a number of residential properties. It is noted that this decision is now relatively dated and that the planning policy and site context has changed significantly since that time. However, the reasons for refusal for the previous application have informed the design of the current Proposed Development, which has sought to avoid the same issues. As discussed in more detail in Section 4 below, the current Balgray Wind Farm proposal covers a smaller development area, with the layout pulled further back into the Site and features significantly fewer turbines compared to the earlier Newfield Wind Farm application.

4. Site Selection and Design Evolution

4.1 Site Selection

The Applicant has spent several years assessing a portfolio of sites throughout the United Kingdom (UK) for their potential in wind energy development. This involved evaluating potential extensions to existing projects as well as exploring entirely new sites. The primary objective of the selection process was to design a layout that maximised efficiency while minimising 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.

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

4.2 Design Strategy

In August 2010, a separate applicant submitted a proposal to the Scottish Government for a significantly different 21-turbine project known as Newfield Wind Farm (planning ref. 09/C/4/0011), which included land overlapping the Proposed Development. This application was refused due to concerns over landscape and visual impacts, cumulative effects and the visual impact on a number of residential properties.

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.

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.

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.



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

Following feedback from consultees, further changes were made, including the removal of one of the original seven turbines, a reduction in proposed turbine tip height, and relocation of the remaining six turbines, resulting in the current Proposed Development.

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

4.3 Design Evolution

The Proposed Development has been in the design process for a number of years and the layout has evolved iteratively to respond to potential issues raised during and after Scoping. The various iterations have considered different numbers and sizes of turbines; see Chapter 2 of the EIAR for full details. Changes to the design have been influenced by several factors including stakeholder feedback, planning policy, potential environmental effects and economics.

4.3.1 Design 1: Initial layout

The preliminary layout before Scoping was a 19-turbine development designed to maximise generation (Figure 1: Initial layout (EIAR Volume 1, Non-technical summary)). Following changes to landowner agreements and consideration of the feedback in relation to the Newfield Wind Farm scheme previously proposed by a different applicant, the layout was reduced to seven turbines, and this layout proceeded to formal Scoping in January 2024 (planning ref. ECU00005016).

The purpose of scoping is to identify those potentially significant environmental effects which might require further assessment and to scope out those which do not.

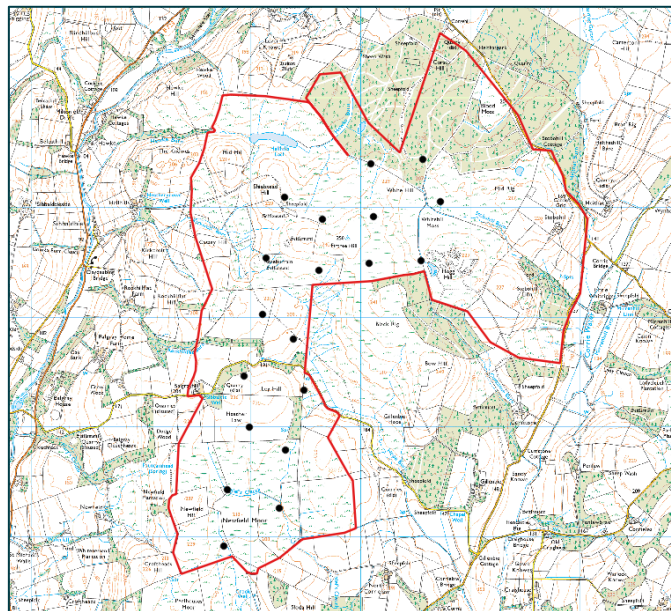


Figure 1: Initial layout (EIAR Volume 1, Non-technical summary).

4.3.2 Design 2: Scoping

The scoping layout considered a development of seven turbines, each with a maximum height of 230 metres (Figure 2: Scoping layout (EIAR Volume 1, Non-technical summary)). The turbines were re-positioned based on known onsite



constraints (identified before more detailed site investigations) and the layout deemed most effective for maximising turbine performance. A scoping opinion was issued by the ECU on 24th April 2024.

Scoping Responses

Respondents to the scoping process included Historic Environment Scotland (HES), the Scottish Environmental Protection Agency (SEPA) and NatureScot, and their feedback informed a redesign of the Site. A full list of consultees is provided in Table 2.1 of the Pre-Application Consultation (PAC) Report. Details of how the Applicant responded to the consultation are outlined in the Gatecheck 1 Report submitted to the ECU on 20th September 2024. Chapter 4: Approach to EIA of the EIAR provides further detail on how this feedback influenced the final design of the Proposed Development.

Public Consultation

Although not a legislative requirement for applications made to the Scottish Ministers under S36 of the Electricity Act 1989, the applicant undertook public consultation to inform and engage local communities. Two rounds of public consultation were held in February and November 2024, with events taking place in Lockerbie and the village of Boreland. These sessions provided an opportunity for residents and stakeholders to learn about the project, ask questions and share their views. Full details from the consultation events, including a summary of the feedback received and how it has been considered, are provided in the PAC report.

The EIAR outlines in detail how environmental matters and stakeholder feedback influenced the design process; the key issues which impacted the design include:

- Reducing landscape and visual effects by removing turbines and reducing the tip height;
- Reducing impacts on plant and animal species, including the Marsh Fritillary Butterfly;
- Avoiding areas of deeper peat identified during Phase 1 peat probing;
- Protecting buried archaeology within the Site; and
- Minimising impacts on watercourses and the aquatic environment.

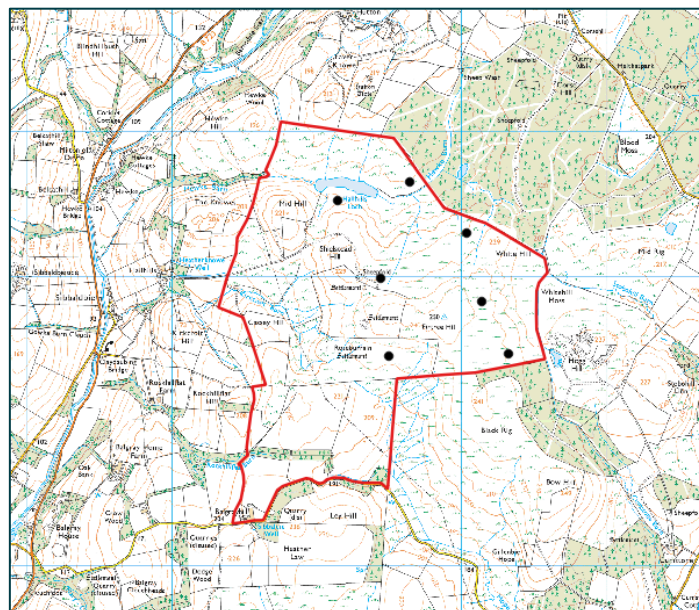


Figure 2: Scoping layout (EIAR Volume 1, Non-technical summary).



4.3.3 Design 3: Design Chill (August 2024)

After the Scoping Opinion (Vol 1, Technical Appendix 1.2) was received and following public consultation and receipt of the results of onsite survey work, the number of turbines was further reduced from 7 to 6 (removal of Turbine 5), and the tip height of all turbines was reduced from a tip height of 230 m to a tip height of 200 m (Figure 3: Design chill (EIAR Volume 1, Non-technical summary)). The turbines were further re-located to account for peat depth, groundwater dependency, watercourse and archaeological buffers, as well as ecological constraints related to bat stand-off distances. Turbine 5 was removed entirely due to concerns regarding visual impact. The specific onsite constraints relating to each turbine are detailed in the Gatecheck 1 report (EIAR Volume 4, Technical Appendix 4.1).

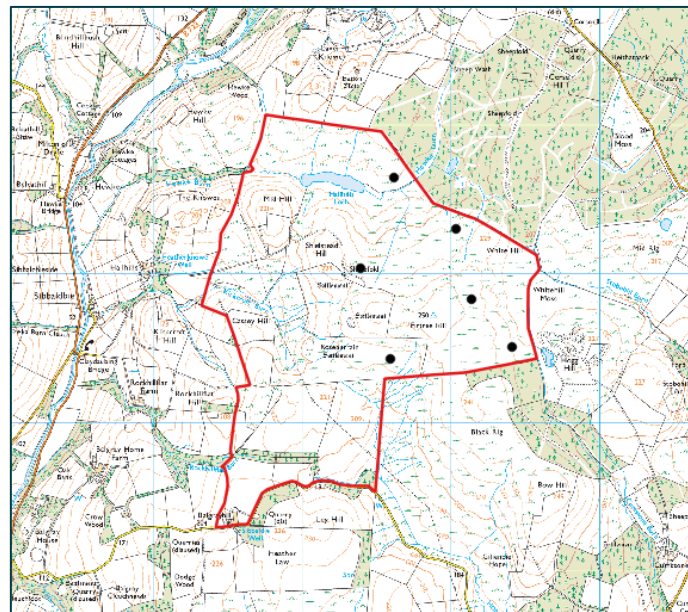


Figure 3: Design chill (EIAR Volume 1, Non-technical summary).

4.3.4 Design 4: Design Freeze

The design freeze, representing the fourth iteration, is the final design submitted as part of the application for planning permission and is the version that will be considered by the ECU (Figure 4: Design freeze (EIAR Volume 1, Non-technical summary)). Following the Gatecheck process and as part of the EIA, further detailed on-site surveys were undertaken, leading to additional refinement of turbine placements. The most significant change at this stage was the decision to access the Site from the north after it became clear during consultation that the originally proposed southern route was unfavourable.

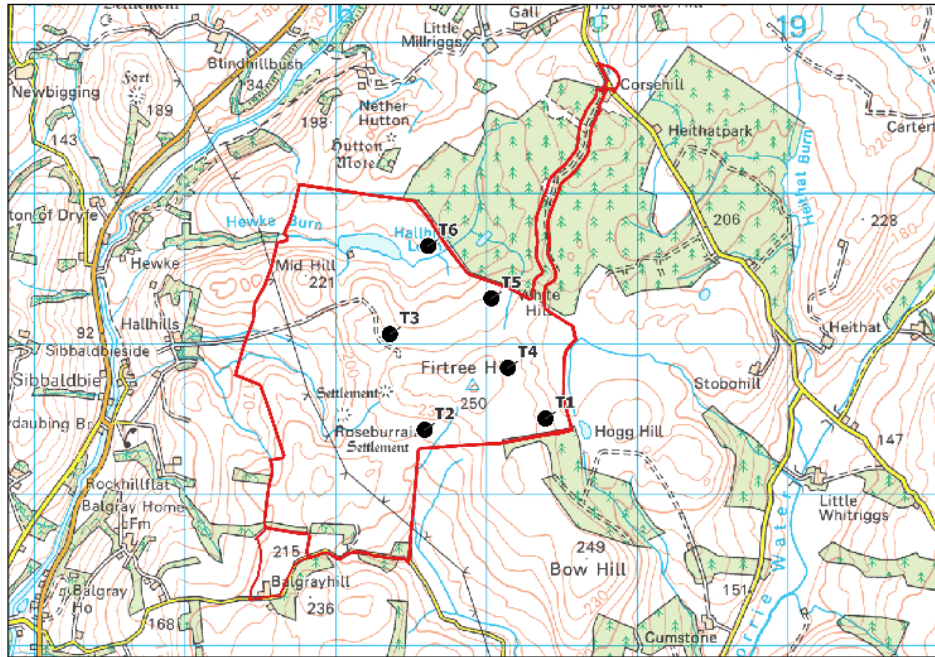


Figure 4: Design freeze (EIAR Volume 1, Non-technical summary).

4.4 Environmental Effects

4.4.1 Landscape and Visual Impact Assessment

Landscape and visual impact have been carefully considered throughout the evolution of the Proposed Development. From the earliest stages of design through to the final submission, the layout and form of the scheme has been shaped by a detailed understanding of the Site's landscape context, key visual receptors and relevant planning considerations.

A key lesson learned from the refusal of the previous Newfield application was the degree of importance placed on landscape and visual impact by both planning officers and consultees. In response, the Balgray proposal reflects a significantly more sensitive approach, both in terms of layout and design. Notably, the number and height of turbines has been reduced, and their positioning has been revised to pull the Proposed Development further into the Site. These changes reduce the visual envelope and lessen the potential for significant landscape and visual effects.

The Applicant is an experienced renewable energy developer with a strong track record in delivering and operating wind farms across the country. This national experience has contributed to a well-informed and carefully considered approach that reflects the specific characteristics of the Site and its setting.

To ensure objectivity and design quality, an independent landscape architect was engaged from the outset, inputting into siting and design of the wind farm in order to minimise, so far as practical, the potential landscape and visual and cumulative effects of the Proposed Development. As the project progressed, an independent landscape architect was appointed to carry out the Landscape and Visual Impact Assessment (LVIA). Mitigation has largely been embedded within the design itself, rather than applied retrospectively, resulting in a layout that responds to the landscape character and visual sensitivity. This mitigation by design approach ensures that the landscape and visual considerations are central to the overall development strategy and the final design demonstrates a clear response to concerns raised in the Newfield application.

4.4.1.1 Viewpoint analysis

The LVIA includes Zone of Theoretical Visibility (ZTV) maps that help define a focused study area, based on the surround landscape character and likely visibility. Refer to Chapter 6 of the EIAR for further details. While ZTVs illustrate where



the Proposed Development could be seen, they represent a worst-case scenario and tend to overstate actual visibility. Viewpoints (VP) were selected to reflect a range of receptors including residents, road users and recreational visitors. VPS 1 – 17 were assessed and can be found in Volume 3b, Technical Appendix 6.5. Viewpoints 1 and 4 attracted the most interest from local residents during the public exhibitions held as part of the consultation process and are discussed in further detail below.

Viewpoint 1 Croftfoot is located approximately 1.7 km to the north-west of the nearest turbine. Visualisations are provided in Volume 3b of the EIAR and have been included below in Figure 5: Viewpoint 1 - B723, Croftfoot (EIAR Volume 3b Figure 6.28).

The VP represents views from the B723 near the Blindhiltbush farmstead and the nearby property Croftfoot at approximately 139 Above Ordnance Datum (AOD). The view is south-east facing across agricultural grassland towards a low ridge beyond Dryfe Water. Woodland is visible on the hillsides, with overhead lines, poles and pylons present in the landscape. A hedgerow and field gate partially filter the foreground view. The VP is not within a designated landscape designated for its scenic value. The value of the view is therefore considered medium. Road users passing this viewpoint are considered to have a medium susceptibility to the type of change proposed, however residents are considered to have high susceptibility. Receptors at this viewpoint are therefore assessed as having high sensitivity to the change proposed.

All six proposed turbines would be visible with full or partial views of towers and blades. Turbines T4, T5, and T6 would appear evenly spaced, though some stacking would occur between T1 and T4. The array would be read as a single group, occupying a medium portion of the view. Ground-level infrastructure would not be visible. While the turbines introduce larger vertical elements than existing features, they remain broadly comparable in scale to existing electricity infrastructure. Overall, the magnitude of change is assessed as high and therefore it is considered that the Proposed Development would result in a major level of effect that would be considered significant.



Figure 5: Viewpoint 1 - B723, Croftfoot (EIAR Volume 3b Figure 6.28).

Viewpoint 4 Sibbaldbie is located approximately 1.9 km to the west of the nearest turbine. Visualisations are presented at Volume 3b of the EIAR and have been included below in Figure 6.

This VP represents views from the B723 near residential properties in the small settlement of Sibbaldbie, at approximately 92m AOD. It reflects views experienced by both local residents and passing road users. The VP includes medium range views towards the hillside east of Dryfe Water, across agricultural grassland and the B732. View of nearby residential properties and woodland are partially filtered by trees and hedgerows. Low voltage electricity and telecommunications wires and poles traverse the landscape, back clothed against the hillside.

The VP is not located within a landscape designated for its scenic value. The value of the view is therefore considered medium. Road users passing this viewpoint are considered to have a medium susceptibility to the type of change proposed, however residents are considered to have high susceptibility. Receptors at this viewpoint are therefore assessed as having high sensitivity to the change proposed.

Based on wirelines and photomontages (Volume 3b, Figure 6.31), only limited parts of two turbines (T3 and T6) would be visible. Dense tree cover would heavily screen views, particularly of turbine T6. While parts of the turbines may appear above the horizon, they remain below the treeline and visually subordinate to existing features. As a result, the development would occupy only a small portion of the view, resulting in a low magnitude of change. It is considered that the Proposed Development would result in a moderate minor level of effect that would be considered not significant.

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.



Figure 6: Viewpoint 4 - B723, Sibbaldie (EIAR Volume 3b Figure 6.21).

4.4.2 Cultural Heritage

The impact of the Proposed Development on cultural heritage is also a key area of focus in terms of environmental effects. A qualified archaeologist was commissioned to conduct an extensive, thorough and impartial assessment of the Site and surrounding area for culturally significant sites. Based on the findings, the project design was modified to protect key locations identified by the survey. For example, Turbine 2 was relocated to remove direct sightline between Firtree Hill fort and Burnswark Hill fort, and Turbine 3 was repositioned outwith a buffer to ensure the protection of buried archaeological features. These modifications demonstrate a commitment to safeguarding cultural heritage in the planning process and following the implementation of mitigation measures, no residual significant effects on cultural heritage are expected.

5. Final Design

5.1 Introduction

The final design of the Proposed Development, design freeze, incorporates findings from site surveys and integrates feedback received from consultees during the detailed design phase of the project. Careful consideration has been given to key design aspects, such as the Proposed Developments location and scale, alongside a thorough evaluation of both technical and environmental factors.



5.2 Development details

The following sub sections address each of the character elements of the Proposed Development.

5.2.1 Turbines

The selected turbines would be of a modern design with three blades mounted on a horizontal axis, attached to a nacelle, housing the generator, gearbox and other operating equipment. The nacelles would be mounted on a tubular tower which allows access to the nacelle. The height from base to tip for each of the 6 turbines will not exceed 200 m. It is expected that the turbine cut in wind speed will be approximately 3m/s and will rotate clockwise.

The turbines will be fitted with mandatory aviation lighting. See chapter 6: Landscape and Visual Impact Assessment of the EIAR for details including mitigation proposed. An aviation lighting scheme will be established post-consent.

Wind turbine towers will likely be constructed from steel and the blades from fibreglass. It is proposed that the turbine tower, nacelle and blades will be finished in a semi-matt, off-white/pale grey colour. A typical turbine specification of the type being considered for use on the site indicating the turbine height proposed is presented in Figure 3.3 of the EIAR and included in Figure 7 for reference. In order to comply with Health and Safety requirements for the site, the Applicant would propose to apply identification numbers to the sides of the turbines. Numbers would be up to 1000 mm tall by 900 mm wide and would be positioned between 1.5 m and 3 m from ground level in order to be visible from the approaching access track. Details of these would be agreed as part of the Construction Environmental Management Plan (CEMP).

There may be a need for transformer housings to be situated adjacent to each of the turbine towers. The requirement for such structures, along with their dimensions, will vary based on the final turbine choice (some turbine types require two stacked transformer housings). Indicative design for typical transformer housing is shown in Figure 3.4, Volume 3a.

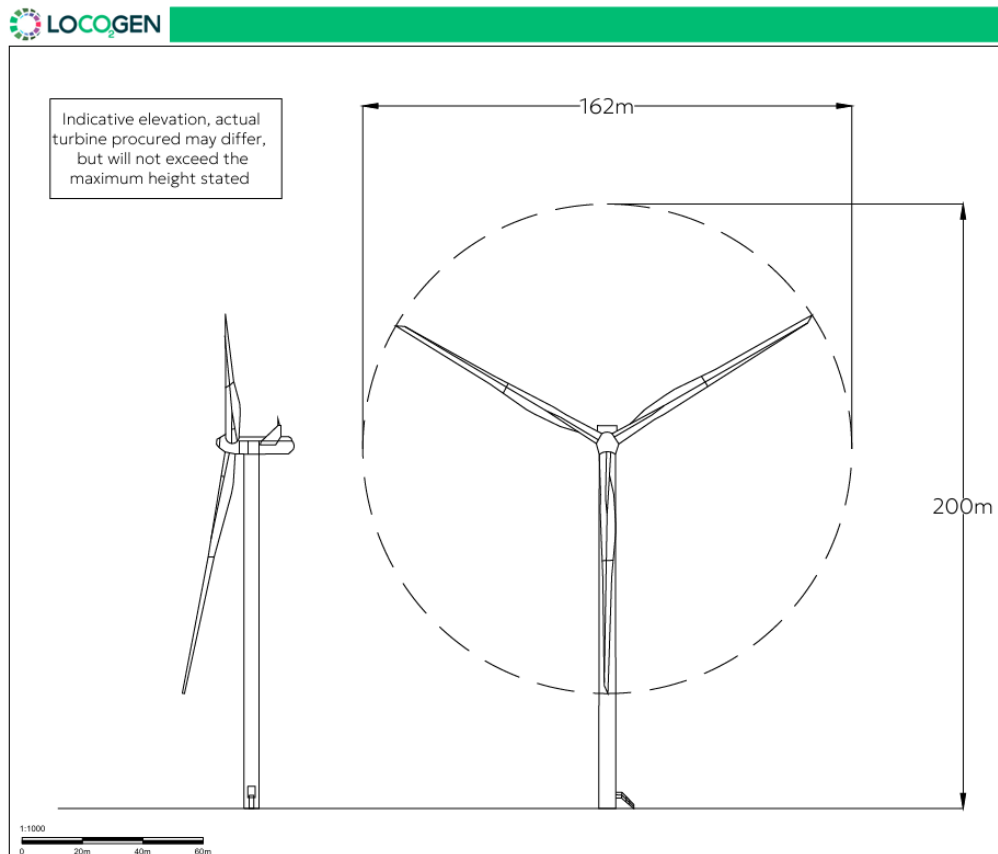


Figure 7: Turbine specification (EIAR Volume 3a Figure 3.3).

5.2.2 Battery Energy Storage System

A BESS facility with an expected upper capacity of 43MW forms part of the Proposed Development alongside the wind farm. Battery storage facilities are increasingly playing an important part in the UK energy network in providing grid stabilisation services. When connected to a wind farm such as the Proposed Development, they allow wind turbines to generate electricity in periods of high wind but low demand (when wind farms may otherwise be depowered); and provide electricity when this scenario reverses (lower wind speeds but higher electricity demand). Battery storage technologies are rapidly advancing and are seen as a necessary component in the energy network to reach net zero targets (National Grid, 2021).

The battery storage facility for the Proposed Development is to be installed to the south of the wind farm. It will indicatively comprise 78 containers approximately 3m high (Figure 3.13 of the EIAR). The maximum dimensions of the facility will be around 120 m x 100 m, and it will be surrounded by a security fence approximately 2.5m in height. Figure 3.7 of the EIAR illustrates the indicative layout of the battery storage facility.

5.2.3 Site Infrastructure

The Proposed Development layout is shown on EIAR Figure 1.2, designed in line with the technical and environmental constraints, including (but not limited to) visual impact, location of watercourses, ecological buffers, location of access infrastructure, impact on cultural heritage and site topography. Technical factors such as appropriate spacing between turbines have also been a consideration.

The Proposed Development will involve the erection of up to six turbines with a maximum blade tip height of 200m. A typical wind turbine is shown on EIAR Figure 3.3. The Proposed Development also includes associated infrastructure including: a temporary construction and storage compound (see EIAR Figure 3.2); access tracks within the application site (see EIAR Figure 1.2 'Site Layout'); turbine foundations (see EIAR Figure 3.6); crane hardstandings (see EIAR Figure



3.5); and drainage works. Further details on each of these elements can be found in EIAR Chapter 3: Description of Development.

The final design presented within this application represents the best layout which seeks to minimise adverse environmental effects, and which has allowed the most appropriate layout to be achieved.

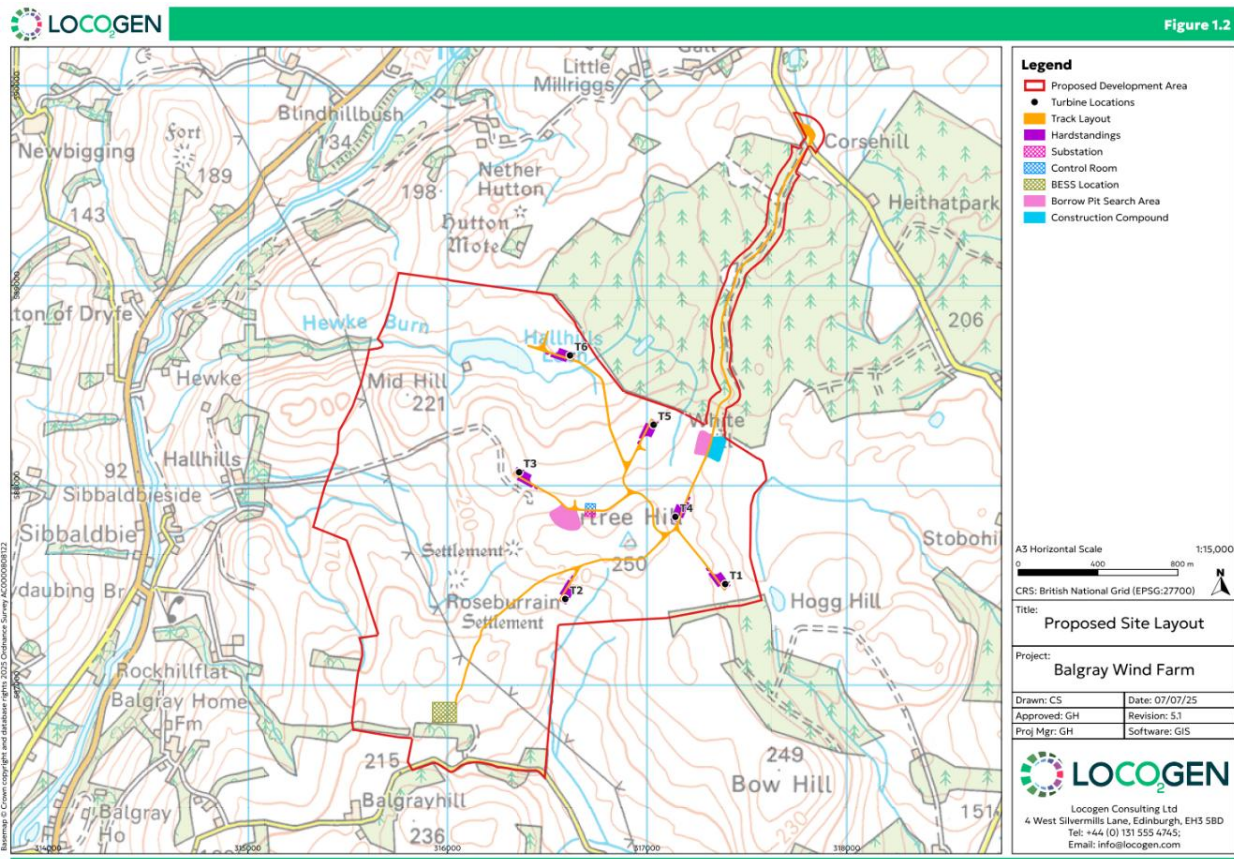


Figure 8: Proposed site layout (EIAR Volume 3a Figure 1.2).

5.2.4 Micro-siting

Micro-siting allows the exact turbine location and infrastructure to be modified post consent, following detailed ground investigation and ground clearance. Through industry experience, a micro-siting allowance of 50 m is considered appropriate for turbines and infrastructure.

5.2.5 Site reinstatement

Site reinstatement works will occur prior to the operational phase of the Proposed Development and will include the targeted re-use of peat. Prior to construction excavation works, consideration will be given to methods for handling and holding any excavated materials, particularly peat or peaty soils as peat has the potential to lose structural integrity upon excavation particularly when double handled or moved around the site (see Appendix 9.5: Peat Management Plan in Volume 4 of the EIAR).

5.2.6 Decommissioning and site restoration

At the expiry of the consent, or at the end of the wind farm's useful life, it is proposed that the turbines, transformers and the on-site substations would be removed. The upper section of the turbine foundations, to a depth of at least 1 m, would be removed and backfilled with appropriate material. Peat or topsoil would be replaced and the area reseeded. This process will be discussed in greater detail within the Pollution Control and Waste Management Plan



contained within the CEMP. Tracks will be left and allowed to grass over or would be covered with soil and reseeded. Seed mixes used for site reinstatement would be agreed with the Planning Authority in consultation with NatureScot.

The timeline and actions for the ultimate reinstatement of the site will be conditioned and agreed with the Planning Authority in consultation with NatureScot and SEPA.

5.3 Land Use

The Proposed Development is located approximately 6 km north of the town of Lockerbie and approximately 1km east of the village of Sibbaldie. 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.

5.4 Community Safety

5.4.1 Construction Phase

Throughout the construction phase of the Proposed Development the relevant statutory requirements would be adhered to. All potentially hazardous areas would be fenced off and all unattended machinery would be stored in the site compound or immobilised to prevent unauthorised use. In addition, temporary construction safety signs would be placed at each possible entrance to the site and in areas where there may be further danger, e.g. around settling lagoons and borrow pits.

Throughout construction, measures to manage diversion routes would be put in place. The diversion routes would be clearly marked and for safety reasons would direct the user away from any areas of construction.

5.4.2 Operational Phase

Wind farms have a proven track record for safety. A very small number of wind turbines have been known to suffer mechanical damage through lightning strikes or mechanical failure. Experience on existing sites has shown that public access to operational wind farms does not lead to a compromise with respect to safety issues.

Companies supplying products and services to the wind energy industry operate to a series of international, European and British standards. A set of product standards for wind energy equipment has been developed by the International Electrotechnical Commission – IEC 16400. There are a number of British Standards that correspond to it, for example, BS EN IEC 61400-1: 2019 “Wind turbines generation systems – Design requirements”.

Public access to the site after construction has been completed would remain, subject to various health and safety measures. Appropriate warning, directional and identification signs would be installed directing to and on the turbines, transformers and onsite substations, and access to these would be restricted to wind farm personnel. At all times, these facilities would be locked. Additionally, safety and/or directional signs would be placed at strategic points across the site area to make people aware of potential hazards and provide direction for emergency services should the need arise. Any signage would be agreed with the relevant authorities as part of the CEMP.

No resulting safety risks are expected as a result of public access to the Proposed Development area. Turbine models being considered for the site would operate automatically and have sensors to detect any instabilities or unsafe operation during high wind speeds. Should sensors placed within the nacelle and tower of the turbine detect any other malfunction in operation or should wind speeds increase over maximum operational thresholds, the brakes would be automatically applied in order to rapidly shut the turbine down.

If the cause of the shutdown was high wind speeds, then the turbine would automatically begin operation once the average wind speed reduced to within operational levels. Under other causes of shutdown, e.g. through malfunction, the turbine would remain shut down and in a safe condition (i.e. commonly with the blades orientated 90° to the wind



direction) until manually restarted by a member of the Operations and Maintenance (O&M) team following satisfactory inspection and/or repair. This procedure ensures safe operation of turbines to protect members of the public walking, cycling or riding past turbines during the operational phase. In addition, the vibrometers in the nacelles would detect rotor imbalance in blades caused by icing and the wind turbine's control and monitoring system would shut the turbines down under these conditions. The turbines are also equipped with lightning protection equipment so that strikes will be conducted from the nacelle down the tower into the earth.

Consideration will be given during the procurement of turbines to minimise the residual impact of ice throw. This is considered further in Chapter 15: Other Issues, of the EIAR.

The safety record and features of wind turbines are identified above, and it is concluded that the Proposed Development would not present a significant safety risk to the public.

5.5 Environmental Sustainability

The Proposed Development will have a total installed capacity of 86 MW, comprising 43 MW generated by six turbines and a 43 MW Battery Energy Storage System (BESS). The wind turbines will produce renewable electricity, while the BESS will store excess energy generated during periods of high wind and release it when demand is higher or wind conditions are low. This combination enhances the reliability and flexibility of the electricity supply, supports grid stability and maximises the use of renewable energy. The integrated system contributes to the decarbonisation of the energy sector and the transition to a more resilient, low-carbon energy infrastructure.

The Proposed Development will deliver a range of environmental benefits by displacing electricity that would otherwise be generated by fossil fuel power stations. This will result in a reduction in greenhouse gas emissions, including carbon dioxide, and help mitigate the impacts of climate change. In addition, the Proposed Development will reduce emissions of other harmful pollutants such as sulphur dioxide and nitrogen oxides, which are typically associated with gas-fired power stations and contribute to problems such as air pollution and acid rain.

Carbon balance assessments have typically been undertaken for wind developments to evaluate lifecycle emissions; such an assessment is not considered necessary as it is now widely accepted that wind energy offers significant and long-lasting carbon savings when compared to hydrocarbon-based electricity generation. The Proposed Development is expected to generate enough clean electricity each year to power the equivalent of around 48,000 average UK households (in line with Ofgem's benchmark for a typical annual household electricity usage of 2,700 kWh). This level of generation directly offsets the equivalent emissions that would be produced by fossil fuel power stations and delivers quantifiable reductions in carbon output. Any short-term emissions associated with the construction phase would be quickly outweighed by these operational savings, resulting in a sustained net environmental benefit.

Based on the findings of a Carbon Balance Assessment, the construction, operation and decommissioning of the Proposed Development is expected to result in net emissions of approximately 67,888 tonnes of carbon dioxide equivalent (tCO₂e). According to guidance published by the Scottish Government (2018), carbon savings from wind farms should be assessed using a fossil fuel based electricity generation scenario as the baseline for comparison, rather than the average grid mix. Taking this into account, the Proposed Development is expected to deliver annual carbon savings of approximately 60,652 tonnes of CO₂, resulting in total savings of over 2.1 million tonnes of CO₂ over its anticipated 35-year operational lifetime.

The carbon payback time has been calculated by comparing this net carbon loss with the anticipated carbon savings from the wind farm displacing electricity generated from fossil fuel sources. On this basis, the carbon payback time of the wind element of the Proposed Development is expected to achieve a time of 1.1 years (approximately 13 months), with a range between 0.6 and 1.4 years.

As set out in current guidance, carbon savings from wind farm developments are typically assessed against a baseline scenario in which electricity is generated from fossil fuels. While this provides a relevant comparison in the short term, it is unlikely to reflect the longer-term evolution of the electricity grid, which is expected to increasingly incorporate lower-carbon sources such as renewables and nuclear. To account for this, an alternative assessment has also been



undertaken using the average grid-mix as the baseline, which represents the overall carbon intensity of electricity generation in the UK. Under this scenario, the Proposed Development is projected to deliver annual carbon savings of approximately 27,150 tonnes of CO₂, resulting in a carbon payback period of around 2.5 years.

The carbon dioxide savings associated with the Proposed Development would contribute meaningfully to the UK Government's binding target of achieving net-zero greenhouse gas emissions by 2050. In addition to reducing carbon dioxide emissions, the development would also help offset emissions of other harmful pollutants typically released by conventional fossil fuel-based power stations.

As an onshore wind farm with battery storage, the Proposed Development supports wider national energy and environmental policy objectives. It contributes to improving energy security and resilience and reduces the reliance on imported fossil fuels. Importantly, the project aligns with the UK Government's commitment to achieving net-zero carbon emissions by 2050 and contributes to national and international renewable energy and climate change targets.

6. Access

6.1 Introduction

Vehicle access will be necessary for the Proposed Development throughout its construction, operational and decommissioning phases. The following section outlines the expected traffic impacts during each phase, along with any effects on public and disabled access.

The proposed access route has undergone significant design changes during the assessment process. Although routes from the south and east were initially considered, the final proposed route will instead use public roads to the north and west of the Site (similar to those used for the nearby Cross Dykes Wind Farm), followed by existing forest tracks to access the site from the northern side.

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 EIA, and the accompanying Abnormal Load Assessment (see Appendix 12.1 in Volume 4 of the EIA).

6.2 Offsite Access/Construction Traffic

The King George V (KGV) Docks in Glasgow has been identified as the most suitable Port of Entry (PoE) for shipping of the turbine components with the blade components representing the worst case in terms of the length and width combination. The preferred abnormal loads route assessed is as follows:

- Exit KGV Docks continuing east on to Kings Inch Drive;
- Turn left onto the M8 towards junction 25A;
- Merge onto the M74;
- Exit the A74(M) at Junction 17, turning left onto the B7068;
- At the roundabout turn left onto the B7076 heading north;
- Turn right onto the link road and then right again to turn onto Breckenry Road;
- At Boreland continue straight ahead from the B723 onto the Unclassified Road (C81a); and
- Turn right onto site access track (to be constructed utilising existing forestry tracks where possible).



A full assessment of the preferred abnormal loads route is contained within Technical Appendix 12.1. The preliminary design for the access junction including swept paths is provided within Technical Appendix 12.2. It is noted that the access junction is an existing junction which will be upgraded to serve the Proposed Development.

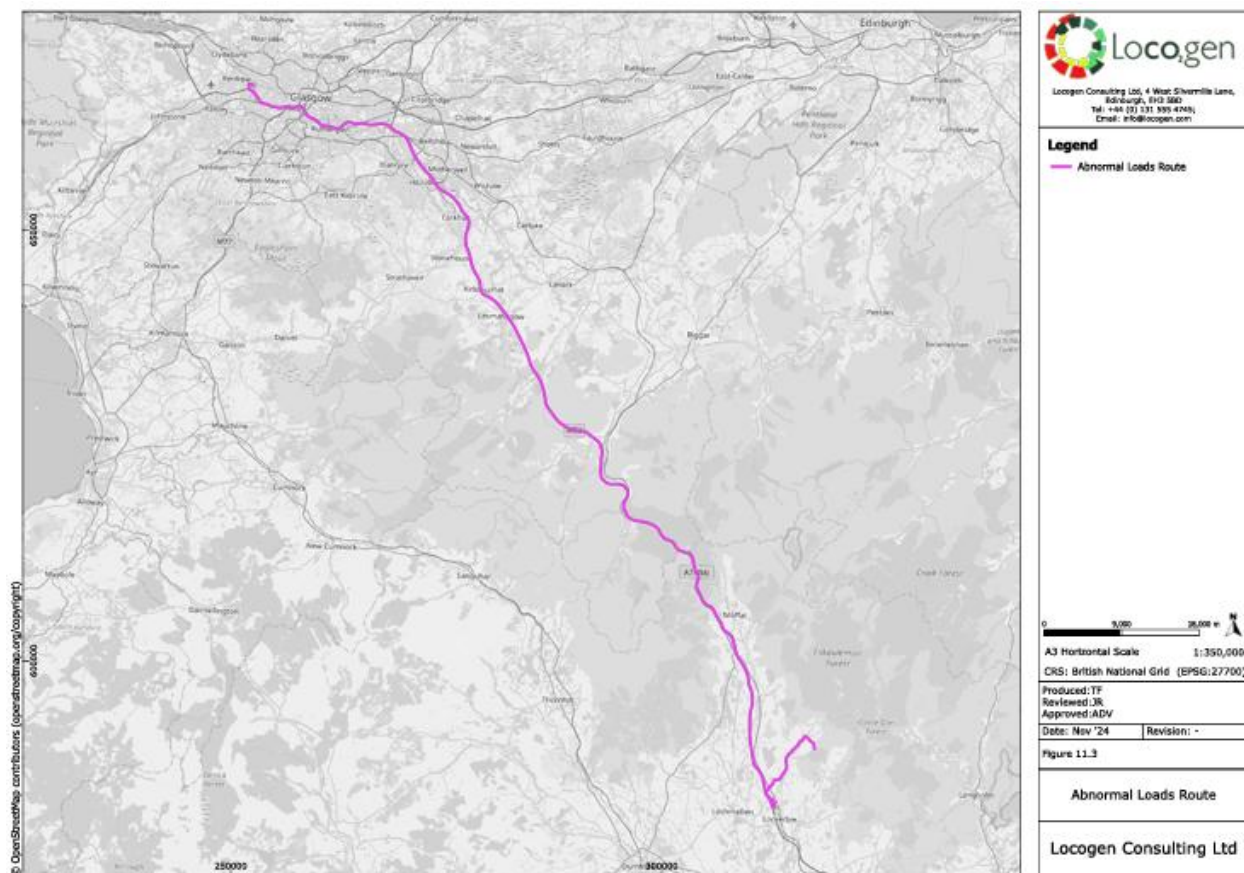


Figure 9: Abnormal loads route (EIAR Volume 3a Figure 12.3).

6.3 On-site Construction Traffic

Approximately 5.4 km of new on-site tracks and 1.4 km of upgraded tracks would link the proposed turbines and infrastructure to the road network. The design philosophy behind the track layout has taken into account a number of factors including topography, hydrology, watercourse crossing, ground conditions and construction parameters and has been based on best practice methodology developed at other wind farm sites. It is proposed that existing tracks are used where possible to reduce the need for construction of further tracks. Using existing tracks will also further reduce the degree of disturbance to the local environment. The proposed track layout has been designed following an onsite review and minimised the number of water crossings necessary and used as far as possible the existing infrastructure in place to minimise impacts on the environment.

6.4 Operational Traffic

Once the Proposed Development is operational, the amount of traffic associated with a wind farm is minimal, relating to maintenance of the turbines only. The wind turbines can be controlled remotely or from the on-site metering building. Regular visits will be made by technicians to infrastructure and turbines in four-wheel drive (4WD) vehicles or similar. In addition, longer servicing visits would be required, typically every six months, along with irregular unscheduled maintenance as necessary. Occasional use of larger vehicles, such as cranes or lorries similar to those used during construction may be necessary, should there be a requirement for replacement of major turbine components.



6.5 Access for All

The Proposed Development will operate as a wind farm, and the access tracks included in the project are intended primarily to support construction and maintenance vehicle access. While these new tracks may provide additional walking opportunities for the general public, they are not specifically designed for recreational use and do not include features to make them easier to use for people with disabilities.

7. Summary and Conclusions

The Proposed Development is the result of a rigorous and responsive design process, informed by detailed environmental impact assessment, public and stakeholder consultation and awareness of past planning decisions in the area. In particular, lessons learned from the previously refused Newfield wind farm, though not directly related, highlighted the importance of landscape sensitivity, cumulative impact and community engagement. These factors have influenced the approach taken and contributed to key design decisions.

The final design comprises 6 turbines with a maximum height to tip of 200 metres. This reflects a significant reduction from earlier design options, aimed at minimising visual and environmental impacts while ensuring the project remains effective and deliverable.

Mitigation has been addressed mainly through careful design. Consideration has been given to ecology, ornithology, hydrology, peatland and cultural heritage, along with the need to protect residential amenity, public safety and community wellbeing throughout all phases of development. The proposed access route has also been selected to minimise disruption to local communities.

Overall, the final design is smaller in scale and more sensitive to its surroundings. It represents a balanced approach that supports renewable energy goals while respecting the local environment and the people who live and work in the area.

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