Watten Wind Farm

Design and Access Statement

10 August 2023

EDF Energy Renewables Limited

Contents

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.
Environmental Impact Assessment Regulations	The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (EIA Regulations).
The Proposed Development	The proposed Watten Wind Farm development.
The Proposed Development Area	The development area within the red line boundary (application area).

List of Abbreviations

Abbreviation	Description
AIL	Abnormal Indivisible Load
AMP	Access Management Plan
AOD	Above Ordnance Datum
BESS	Battery Energy Storage System
ca	candela
CAA	Civil Aviation Authority
CaSPlan	Caithness and Sutherland Local Development Plan
CfD	Contract for Difference
DAS	Design and Access Statement
dB	Decibels
ECU	Energy Consents Unit
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
GW	Gigawatt
HES	Historic Environment Scotland
HGV	Heavy Goods Vehicles
HIAL	Highlands and Island Airports
HwLDP	Highland wide Local Development Plan
IEMA	Institute of Environmental Management and Assessment
JRC	Joint Radio Company
km	kilometre
LGV	Light Goods Vehicles
LPA	Local Planning Authority
LVIA	Landscape and Visual Impact Assessment
m	Metre
MoD	Ministry of Defence
MW	Megawatt
MWh	Megawatt hours
NATS	National Air Traffic Services
Natural Power	The Natural Power Consultants Limited
NPF	National Planning Framework
NSAs	National Scenic Areas
NTS	Non-Technical Summary
OWESG	Onshore Wind Energy Supplementary Guidance
PAC	Pre-Application Consultation
RVVA	Residential Visual Amenity Assessment
SEPA	Scottish Environment Protection Agency
SPP	Scottish Planning Policy
THC	The Highland Council

1. Introduction

The Natural Power Consultants Limited (Natural Power) on behalf of EDF Energy Renewables Limited (the Applicant) is submitting an application for a Section 36 of the Electricity Act 1989 consent and a direction that planning permission be deemed to be granted under Section 57(2) of the Town and Country Planning (Scotland) Act 1997 (as amended) for the development of Watten Wind Farm (the Proposed Development).

This statement will be submitted to the Energy Consents Unit (ECU) on behalf of the Scottish Government.

This Design and Access Statement (DAS) has been prepared by Natural Power to accompany this Application and sets out how development plan policies have been taken into account for the purposes of design and access. A full policy assessment of the Proposed Development is carried out in the Planning and Renewable Energy Statement.

1.1. The Applicant

EDF Energy Renewables Limited (the Applicant) is part of one of the world's largest electricity companies and is a joint venture between EDF Renewables Group (EDF's global renewable business) and EDF Energy (EDF's UK generation business).

The Applicant is one of the UK and Ireland's leading renewable energy companies, specialising in wind power, solar and battery storage technology. Through a dynamic team of more than 300 people, The Applicant develops, builds, operates and maintains renewable technologies throughout their lifetime and have over 25 years' experience in delivering renewable energy generation.

The Applicant has successfully completed approximately 1 Gigawatt (GW) of projects with a further 5 GW of projects in development. The Applicant have an operational portfolio of 37 wind farms, including two offshore wind farms, as well as two battery storage units.

The Applicant believes in the importance of working closely with the local communities and strive to benefit the local community by providing support, such as creating new jobs, boosting the local economy, and providing direct community investment through community funds.

1.2. Consultants

Natural Power, the lead consultancy on the project, has been providing expertise to the renewable energy industry since the company was formed in 1995 and is one of Scotland's and the UK's leading renewable energy consultants. Natural Power currently employs over 400 people working full time providing renewable energy services nationally and internationally.

Testimony to Natural Power's experience and ongoing commitment to competency and continual improvement, its Planning and Environment Departments are accredited by the Institute of Environmental Management and Assessment (IEMA) and registered to IEMA's Environmental Impact Assessment (EIA) Quality Mark scheme[1]. In addition, Natural Power also operates in formally accredited health and safety (IOSAS 18001), environmental (14001) and quality (9001) management systems. As well as development and EIA services, Natural Power also provides expert advice and due diligence consultancy, site construction management and site operation and maintenance. Thus, Natural Power is a competent, experienced consultant to co-ordinate and undertake EIA and to prepare the Environmental Impact Assessment Report (EIAR) and associated documentation such as Pre-Application Consultation (PAC) Reports, Planning Statements and DAS'.

[1] IEMA website, *EIA Quality Mark*. Available from https://www.iema.net/corporate-programmes/eia-quality-mark [Accessed 15/08/2023]

2. Design and Access

Design and Access Statements are a statutory requirement for all major developments under the terms of the Planning etc. (Scotland) Act 2006. The Applicant has provided a detailed written statement about the design principles and concepts that were applied to the Proposed Development before submission in Chapter 4: Site Selection and Design Evolution of the EIAR, as well as within individual environmental topic chapters. Access issues have also been addressed in the EIAR, in particular:

- Chapter 4: Site Selection and Design Evolution of the EIAR details the design process and the rationale for location and the design of the Proposed Development.
- Chapter 5: Project Description describes the arrangements for access in and around the site during construction and operational phases.
- Chapter 12: Traffic and Transport deals with access, primarily of larger components to the site during the construction phase (including Technical Appendix A12.1: Abnormal Indivisible Load Route Survey and Technical Appendix A12.2: Framework Traffic Management Plan).

It is therefore considered that this Design and Access Statement, in combination with the EIAR, fulfils the planning requirement for a statement on design and access.

3. Overview of the Proposed Development

The Proposed Development is located in Caithness, Scottish Highlands on land to the east of Halsary Wind Farm, approximately 3 kilometres (km) south-west of Watten village. The Proposed Development Area lies within a generally flat, gently undulating and generally smooth landform.

The Proposed Development comprises the following main elements:

- Up to seven wind turbines with a maximum blade tip height of 220 metres (m);
  - turbine foundations;
  - external transformer housing;
  - crane hardstandings and erection areas;
- Onsite substation, control building and compound;
- Battery energy storage system (BESS);
- New and floating access tracks, including watercourse crossings;
- Underground electricity cables connecting infrastructure within the Proposed Development Area;
- Temporary construction and storage compounds and ancillary infrastructure, laydown areas including cable crossing points;
- Site signage;
- Temporary construction gatehouse;
- Biodiversity enhancement and management (see Chapter 7: Ecology and associated Technical appendices for details);
- Waste water and surface water drainage; and
- Forestry felling and replanting.

Connection of the Proposed Development to the national grid will be at Mybster approximately 3 km north-west of the Proposed Development and will be subject to a separate application.

The land where turbines will be erected is currently a very sparsely settled landscape and settlement today takes the form of dispersed crofts, farms and estate buildings. Forestry felling and replanting will be undertaken to facilitate erection of turbines, and creation of new access tracks and/or upgrades to existing access tracks. Site restoration and landscaping will aim to integrate new infrastructure elements as sympathetically as possible. Biodiversity enhancement and management will be undertaken within the Proposed Development Area.

Full details of the infrastructure associated with the Proposed Development is provided in EIAR Chapter 5: Project Description and associated figures.

The Proposed Development is expected to have an operational life of up to 35 years.

A layout plan can be found in the EIAR Figure 1.2: Site Layout.

4. Context

The design of the Proposed Development has been influenced by a range of planning policy considerations, as well as good practice guidance. Full details of the planning policy framework are provided within the Planning Statement and within Chapter 2: Legal and Policy Context of the EIAR, which accompany this application.

This section provides an outline and assessment of the design policy framework at both a national and local level that is of relevance to the Proposed Development.

4.1. National Planning Policy on Design

4.1.1. National Planning Framework 4 (NPF4)

NPF4 was laid before the Scottish Parliament on the 8th November 2022 for approval. NPF4 received final approval from the Scottish Parliament on the 11th January 2023 and was adopted by the Scottish Ministers on the 13th February 2023. NPF4 superseded both National Planning Framework 3 (NPF3) and Scottish Planning Policy (SPP) on 13th February 2023 and now forms a part of the statutory Development Plan. NPF4 provides a spatial strategy and policy direction contained within a single document; and as a consequence, NPF4 will assume a greater role in decisions taken within the planning system. In presenting the document to the Scottish Parliament the Minister for Public Finance, Planning and Community Wealth, Tom Arthur MSP, was clear on the importance of the document. He said:

"It has been suggested that the fourth national planning framework represents the biggest change to our approach to planning in Scotland in 75 years. Indeed, NPF4 marks a turning point for planning: it is not a general policy update; it is about change and planning with courage and determination to make some of the difficult decisions that may lie ahead.

We have had the 75th anniversary of the Town and Country Planning (Scotland) Act 1947, which gave birth to our modern planning system. NPF4 is the biggest change that we have seen to our planning system since then, and it will change the wellbeing of our people, our businesses, our places and our communities. It will help to make Scotland a fairer, greener and more prosperous country. I hope that members will vote to approve it. In doing so, they will give a resounding statement from Scotland's Parliament about how we embrace change and plan places for the future.".

In the context of the Proposed Development, which is subject to an application submitted under Section 36 of the Electricity Act 1989, the Development Plan does not have primacy (as explained in Chapter 4 of the EIAR). That said, the weight to be attached to NPF4 as a material consideration is considered to be substantial given its recent approval by the Scottish Parliament, its detailed focus on renewables and other relevant topics, and given its very recent adoption.

Under Section 13(2)(3) of the Planning (Scotland) Act 2019, where there is any inconsistency between the Highland wide Local development Plan 2012 with NPF4, the latter should prevail as the most recent document.

As stated by the Minister in his concluding remarks during the debate on NPF4 in the Scottish Parliament on 13th January 2023 NPF4 2022 represents a significant change in the planning system.

The presumption in favour of development that contributes to sustainable development does not feature in NPF4. However, NPF4 contains stronger and much clearer spatial strategy and policy support about the weight that should be given to addressing the climate emergency and nature crisis when assessing applications.

NPF4 removes the Spatial Framework for Onshore Wind Farms (Spatial Framework) and replaces it with a strategic spatial strategy which clearly supports onshore wind electricity generation and associated grid infrastructure throughout Scotland. Policy 11 is clear that wind farms in National Scenic Areas (NSAs) and National Parks will not be supported. Outwith these areas, NPF4 states that proposals for all forms of renewable energy, including onshore wind farms *"will be supported"*. Applications will instead only be required to be considered against detailed policy factors. The Proposed Development is not within a NSA or National Park.

4.2. Local Planning Policy on Design

4.2.1. Highland-wide Local Development Plan (HwLDP)

The HwLDP was adopted in April 2012. Preparation of the second HwLDP (HwLDP 2) is underway, with preparatory stages such as the Main Issues Report complete and published. There is no anticipated date that the HwLDP 2 is to be adopted as The Highland Council (THC) has indicated that further review of the current HwLDP will be postponed until after the implications of the Scottish Planning Bill (2017) are better understood. It is understood that following the approval of NPF4 THC will move forward with the preparation of HwLDP 2. The HwLDP is therefore considered to be a relevant Local Development Plan, however, it is noted that the weight to be attached to the HwLDP is decreased as it is over five years old.

The HwLDP states:
'*The Highland area has great potential for renewable energy production and to contribute towards meeting ambitious targets set internationally, nationally and regionally*'.[2]

The HwLDP advises that THC will safeguard its environment by ensuring that the development of renewable energy resources are managed effectively with clear guidance on where renewable energy should and should not be located.[2]

The key policy which is relevant to the Proposed Development is Policy 67 Renewable Energy Developments. That policy is considered in detail in the Planning and Renewable Energy Policy Statement. Other policies which are relevant to the Proposed Development include:

- Policy 28 – Sustainable Design;
- Policy 55 – Peat and Soils;
- Policy 57 – Natural, Built and Cultural Heritage;
- Policy 58 – Protected Species;
- Policy 59 – Other Important Species;
- Policy 60 – Other Important Habitats;
- Policy 61 – Landscape;
- Policy 62 – Geodiversity;

[2] The Highland Council, 2012. Available from: Highland_wide_Local_Development_Plan%20(1).pdf [Accessed 15/08/2023]

- Policy 63 – Water Environment;
- Policy 64 – Flood Risk;
- Policy 66 – Surface Water Drainage
- Policy 72 – Pollution; and
- Policy 77 – Public Access.

4.2.2. Caithness and Sutherland Local Development Plan (CaSPlan)

CaSPlan was adopted in August 2018 and is the second of three new area local development plans that, along with the HwLDP and Supplementary Guidance, form the Highland Council's Development Plan to guide future development in Highland, particularly in the Caithness and Sutherland area.

The 'CaSPlan Strategy Map' seeks to show how the spatial strategy for future development applies across the plan area. The site is located in an Area for Energy Business Expansion.

Paragraph 53 of CasPlan states:

"Investment in renewable energy generation in North Highland is not only helping to meet Council and national climate change targets but it has also delivered economic benefits for the area. Onshore wind energy has grown significantly over recent years, particularly in the south and north-east of the Plan area."

CaSPlan considers the issue of Climate change and paragraph 82 states:

"The area also has a substantial renewable energy resource, with onshore wind and hydro energy sectors well established and offshore marine energy developments currently emerging."

Watten is identified as a settlement in CaSPlan and the plan advises on a number of placemaking priorities including the protection of the setting of Loch Watten and avoidance of adverse effects on the Loch Watten Special Area of Conservation, Site of Special Scientific Interest and the Caithness Lochs Special Protection Area.

4.3. Other Design Guidance

4.3.1. Onshore Wind Energy Supplementary Guidance (2017) (OWESG)

Supplementary Guidance forms part of the HwLDP. The relevant Supplementary Guidance pertaining to the Proposed Development is the OWESG. The OWESG sets out a range of matters that THC will consider when determining wind farm applications including landscape, aviation interests, roads, peat, and tourism. It contains a spatial framework for onshore wind energy development that applies to all wind energy development proposals.

The spatial framework presented in the OWESG classifies the Site as both '*Group 3: Areas with potential for wind farm development*' and '*Group 2: Areas of significant protection*'. These classifications do not rule out wind farm development, noting that further consideration would be required to demonstrate that any significant effects can be sustainably overcome by siting, design or other mitigation.

The Proposed Development is located within a mix of Group 3 and Group 2 areas. The group 2 areas are due to the presence of category 1 peat on the site.

The OWESG contains an Addendum SG 'Part 2b' (December 2017). Part 2b contains two landscape sensitivity appraisals for Black Isle, Surrounding Hills and Moray Firth Coast and Caithness. The Site is situated within the Caithness study area.

4.3.2. Siting and Designing Wind Farms in the Landscape – Version 3a, NatureScot (Updated 2017)

NatureScot has produced guidance entitled '*Siting and Designing Wind Farms in the Landscape'*, Version 3a, August 2017. Good design principles for wind farms are becoming established following approximately two decades of wind farm development in Scotland and with around 300 wind farms constructed and operating. NatureScot believes that good siting and design of wind farms is important for all parties involved, helping to produce development which is appropriate to a landscape whilst delivering the Scottish Government's renewable energy targets.

The guidance reflects the advance in understanding of the key landscape and visual issues relevant to wind farm development. It does not refer to wider technical design considerations (such as wind speed, access to grid) or to other natural heritage issues (such as impacts on birds, other wildlife and habitats) which are also of importance in relation to both siting and design. The content of the guidance focuses on Landscape and Visual Impact Assessment (LVIA) of wind farms, wind turbine design and layout, wind farm siting and design, and designing in landscapes with multiple wind farms. Guidance is provided on the appropriate turbine form, size, scale, layout and on the siting and design of wind farms in relation to landscape character, landscape with scenic value, landscape pattern, landform, perspective and focal features. The guidance and national and local policies of the development plan has informed the content of the DAS, which outlines the site context and proposed design solution for the Proposed Development.

5. Site Selection and Design Evolution

This section considers the steps that were undertaken during the process of site selection and design. This includes details of the iterative design process that has been undertaken to arrive at the final design contained within this application.

Prior to and as part of the EIA process, design iterations were prepared and considered for the turbine locations and onsite ancillary infrastructure. To establish the most appropriate development layout, potential environmental impacts and their effects, physical constraints and project economics were taken into account. Information was collated from desktop information, field surveys, the EIAR Scoping Opinion, consultation with statutory and non-statutory consultees, public consultation events, national and local planning policy, and recent case law. This information provided the baseline from which site issues and sensitivities could be identified and highlighted for further detailed assessment and given priority in influencing the layout iterations of the Proposed Development. The design evolution process is described in detail below.

5.1. Site Selection

Both the UK and Scottish Governments have set targets to reduce carbon emissions, with the UK aiming to be Net Zero by 2050 and Scotland by 2045. Development of renewable energy projects will help to achieve such targets and align with policy contained within NPF4 that both make it clear that the Scottish Government wants to continue to capitalise on the wind resource of Scotland and ensure such projects can be delivered.

The Proposed Development Area lies within a generally flat, gently undulating and generally smooth landform. The Proposed Development Area is currently a very sparsely settled landscape and settlement today takes the form of dispersed crofts, farms and estate buildings. Vehicular tracks within the wider area are used mainly to provide access for deer stalking and to fishing lochs and peat cuttings.

The Proposed Development location has a good wind resource and consequently a project located here will significantly contribute to the UK and Scottish Government's renewable energy targets. Wind farm design with turbines up to 220 m tip height is considered reflective of Scottish Government aspirations for demonstrably better energy yields from sites optimised with higher tip heights. As far as possible, the Proposed Development will also utilise and upgrade existing tracks which will further minimise potential effects on the local environment.

During the review process for the area, assessment has been carried out on the wind resource at the site and the key landscape and visual constraints. Key considerations to the scheme are as follows:

- A viable development in terms of energy yield;
- Relationship to the surrounding landscape; and
- Technical and environmental constraints.

The final layout presented in Figure 1.2 of the EIAR is considered to be the most optimal following an iterative design process which has taken all known constraints and wind yield analysis into consideration.

A key aim of the design process has been to limit the overall footprint of the Proposed Development, whilst maximising the positive renewable energy generation and other benefits and minimising the environmental impacts wherever possible.

A range of design constraints are elaborated on in more detail in Chapter 4: Site Selection and Design Evolution of the EIAR.

5.2. Design Strategy

There were a number of elements considered during the design process, these included (but not limited to):

- Local and national planning policies;
- Sufficient wind resource;
- Proximity to grid supply point;
- Traffic and transport;
- Existing land use;
- Proximity of dwellings (to consider noise, shadow flicker, visual impacts etc.);
- Landscape and visual;
- Ecology and Ornithology;
- Hydrology, Geology & Hydrogeology;
- Cultural Heritage;
- Forestry;
- Existing infrastructure; and
- Aviation.

Several of the above are illustrated on Figure 4.1: Constraints to Site Design of the EIAR, against the final turbine layout.

A number of surveys and assessments were undertaken during the Proposed Development's feasibility stage, following which it was considered that the application site was technically and environmentally viable for a wind energy development. As the next stage in assessing the site's feasibility, the Applicant undertook an iterative design exercise to investigate alternative designs solutions in order to identify any issues which would make the site unacceptable for development and to ensure that the final design was environmentally, economically and technically viable.

5.3. Design Evolution

The layout evolved under guidance, requirements, and considerations from consultees and Natural Power and their specialist consultants. Consideration has also been given to issues raised by the community at, and following, the public exhibition events. A number of different wind farm layouts were devised and, following extensive investigation and consultation, an optimum layout was chosen through numerous design iterations.

5.3.1. Abnormal Indivisible Loads ('AIL') Access Alternatives

An access study was carried out in June 2020 to determine the feasibility of the proposed public access route from Wick Harbour to the entrance of the Proposed Development Area for wind turbine AIL, using a candidate turbine with a c.57 m blade length as a candidate model at that time. The study assessed the delivery of wind turbine components and carried out a detailed swept path assessment. The access study was used within the initial feasibility study of the Proposed Development and as a result deemed that there was viable access from the A99, onto the A9 and then along on the B870 before reaching the entrance of the Proposed Development on the B870. As an alternative, the loads would exit Wick Harbour onto the A882 and then onto the entrance of the Proposed Development on the B870.

Since 2020 the candidate model of turbine has changed (to reflect the current market) and therefore an updated AIL Route Survey report was produced in November 2022 by Pell Frischmann based on 81.1 m blades. This document confirms that the proposed wind turbines can be delivered to the Proposed Development.

In the November 2022 AIL Route Survey report an accessibility of ports review was completed. The nearest ports to site are Scrabster and Wick Harbours. Wick Harbour has been discounted due to the limit of vessel length being 90 m. Scrabster harbour is limited by the requirement for loads to transit through the constrained town of Thurso route to site.

In light of these considerations, the assessment is based on two separate access routes; one for tower loads only and one for blade loads only. Blade loads arriving into Scrabster and then using a blade lifting trailer to negotiate Thurso, whilst tower loads would dock at the port of Nigg and be transported north to entrance of the Proposed Development.

The route from the Port of Nigg for AILs would be as follows:

- From the Port of Nigg, exit onto the B9175 joining the A9.
- Loads would then head northbound on the A9 towards Latheron and then westbound onto the A9 towards the existing Halsary Windfarm site entrance.

The route from Scrabster: for AILs would be as follows

- Loads would exit the harbour onto the A9, continuing south towards the existing Halsary Windfarm site entrance.

5.3.2. Evolution of the Market for Wind Turbines

Following the tender submission in May 2022, Vestas has (to date) increased the capacity of its V162 machine to up to 6.8-7.2 Megawatt (MW)[3]; Siemens-Gamesa has increased the capacity on its 155 m and 170 m machines to up to 6.6 MW[4]; Nordex has increased the capacity on its N163 machine to up to 6.5 MW[5]. GE unveiled its 164 m rotor machine (~82 m blade length) with 6.0 MW capacity in November 2020[6]. Vestas announced a new 172 m rotor (~86 m blade length) 7.2 MW machine in April 2022[7]. The increase in turbine size and capacities is a trend that can be reasonably expected to continue over the coming years.

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[3] Available from - https://www.nordex-online.com/en/2019/08/nordex-launches-163-metre-rotor-for-the-delta4000-5-x/ [Accessed 09/08/2023]

[4] Available from - https://www.siemensgamesa.com/en-int/newsroom/2021/09/husum-fair-upgrade-5x [Accessed 09/08/2023]

[5] Available from - https://www.nordex-online.com/en/2021/09/press-release-nordex-announces-entry-into-the-6-mw-class-with-the-n163-6-x-turbine/ [Accessed 09/08/2023]

[6] Available from - https://www.ge.com/news/press-releases/ge-most-powerful-onshore-wind-turbine-gets-even-more-powerful [Accessed 09/08/2023]

[7] Available from - https://www.vestas.com/en/media/company-news/2022/vestas-introduces-the-v172-7-2-mw--enhancing-performanc-c3539648 [Accessed 09/08/2023]

The history of wind turbine evolution has been that, as economics favour the newer larger models, particularly now in a subsidy-free environment of competitive contract-for-difference (CfD) auctions and power purchase agreement (PPA) tenders, older smaller models become comparatively unviable and then entirely out of production as limited factory space is given over to new lines. Given the sometimes-lengthy development process for wind farms in the UK, it is now not at all unusual to see "tip-height extension" or full-scale redesign applications with larger machines being made for relatively recently consented projects that were based on a market with subsidies and with turbine dimensions that are simply no longer viable or even being produced.

There is now a very clear trend in the UK, and around the world, towards new and redesigned applications in excess of 200 m to tip height. The UK's Renewable Energy Planning Database[8] shows that since December 2018 there have been at least 32 applications submitted including turbines of 200 m to tip and above, with 11 above 220 m to tip, and two with 250 m to tip; 11 such applications have been consented to date, with only two refused. Looking around Europe there are a great many more consented and operational, at heights up to 260 m. At time of writing there are a number of scoping and pre-scoping projects being announced in the UK with tip-heights of up to 260m[9] and taller heights still are possible with current technology.

The very clear intention of the Applicant is to seek consent for a scheme which is both environmentally acceptable on balance, but also actually implementable at the earliest opportunity, without the need for future redesign or tip-height increases, in order to be delivering the climate change and community benefits it offers as soon as possible.

5.3.3. Design 1: Scoping Layout (May 2022)

The design process began with a layout consisting of up to eight turbines, with tip heights of up to 220 m (Design 1, Figure 4.2 of the EIAR). A full infrastructure layout was presented to THC and other statutory consultees including NatureScot at a Pre-Application workshop in May 2022, before Scoping was submitted.

Scoping Responses (June 2022)

The eight turbine layout was presented to the ECU, THC and consultees in the scoping report in May 2022. A copy of this can be found in EIAR Technical Appendix A1.1, Volume 3. The full Scoping Opinion was issued by the ECU on 2nd September 2022 and is provided in Technical Appendix A1.2 of the EIAR and contains a copy of all the consultee scoping responses. This consultation helped identify and clarify key issues, promoted dialogue with both consultees and stakeholders, and confirmed methods for survey, evaluation and assessment going forward. The consultee responses were reviewed in partnership with the specialist sub-consultants in order to make sure all relevant issues identified were assessed as part of the Proposed Development survey work and were addressed in the relevant EIAR chapters.

In addition to the formal scoping and consultation, further discussions took place with THC, Historic Environment Scotland (HES), Scottish Environment Protection Agency (SEPA), NatureScot, National Air Traffic Services (NATS), Highlands and Islands Airports (HIAL), Joint Radio Company (JRC), and Defence Infrastructure Organisation Ministry of Defence (MoD) to agree the specifics of survey methodologies, potential mitigation should the Proposed Development gain consent and to update these consultees on progress.

Public Consultation (June 2022)

Detailed analysis of written feedback from the first round of public consultations can be found in the PAC Report. Key concerns raised in design terms, in summary, related to the size, visual impact, proximity and relationship of turbines to dwellings and communities, but also possible impacts to ecology, ornithology and hydrology, specifically peat. Turbine noise and flickering was also referred to by some of those attending the events.

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[8] Available from - https://www.gov.uk/government/publications/renewable-energy-planning-database-monthly-extract [Accessed 09/08/2023]

[9] Available from - https://dunsidewindfarm.co.uk/ [Accessed 15/08/2023]

Design Review Day #1 (July 2022)

The first formal design review day was held virtually (due to COVID-19) via Microsoft Teams in July 2022 between the Applicant and specialist consultants from relevant departments of expertise including; ecology and ornithology, hydrology, civils, landscape and visual, wind analysis, noise, forestry, cultural heritage, traffic and transport, and aviation. The aim of the design review day was to review the layout following receipt of the scoping opinion, consultee responses and collection of more desk study and site survey data.

Ahead of the design review day consultants reviewed the proposed layout from scoping (Design 1) which included assessing the proposed turbine locations together with preliminary infrastructure locations.

5.3.4. Design 2: Post Scoping Consultation and Surveys (July 2022)

Based on the comments received from scoping, design review day #1, public consultation and further survey work the Applicant amended the layout to produce Design 2. Changes that were made are summarised below:

- Turbine 1 was deleted due to a combination of factors:
  - LVIA – residential amenity concerns, potential overbearing effects on the property located to the north-west;
  - Ornithology – potential nearby hen harrier roost record in 2013/14 however possibility of hen harriers returning.
  - Noise – properties to the north of turbine 1 could exceed noise limits by approximately 10 decibels (dB). The level of curtailment required to meet the limits would make the turbine unviable; and
  - Hydrology – area south known as Black Pools which SEPA requested a 50 m buffer from any development and this area is known to be boggy.
- Turbine 2, moved north east to be outside of the turbine oversail buffer.
- Turbine 3, moved north west outside of ornithology buffers for merlin and hen harrier.
- Turbine 4, moved west outside of turbine oversail buffer, water course buffer and to avoid hardstand infrastructure impacting cultural heritage historic quarry.
- Turbine 5, moved south to avoid watercourse buffer.
- Turbine 6, moved south east to avoid Class 1 peatland and create distance from neighbouring forest boundary to reduce potential impacts on bats.
- Turbine 7, moved south to avoid very deep peat still located within an area of deep peat (Class 1 peatland); mitigation will be required, including piled foundations and hardstand considerations to minimise peat displacement and removal and to create distance from neighbouring forest boundary to reduce potential impacts on bats.
- Turbine 8 moved north-east to be outside of the turbine oversail buffer.

Design Review Day #2 (September 2022)

Following the first design review day there were some outstanding issues concerning peat. Therefore, in September 2022 a second design review day was held via Microsoft Teams between the Applicant and relevant departments of expertise including; ecology and ornithology, hydrology, civils, landscape and visual, wind analysis, noise, forestry, cultural heritage, traffic and transport, and aviation. The design review day again revisited all seven turbine locations and adjustments were made where necessary. The aim of the design review day was to review the layout following receipt of further correspondence with consultees and collection of more site survey data.

Ahead of the design review day consultants reviewed the proposed layout from Design Review Day #1 which included assessing the proposed turbine locations together with preliminary infrastructure locations.

5.3.5. Design 3: Design Chill (September 2022)

Based on further correspondence with consultees and further survey work the Applicant amended the layout to produce Design 3. Changes that were made are summarised below:

- Turbine 1, moved south west to be further away from 50 m hydrology buffer around Black Pools.
- Turbine 2, moved south west to accommodate move of T1 away from Black Pools buffer.
- Turbine 3, no change.
- Turbine 4, moved south to accommodate movement of T5 out of deep peat.
- Turbine 5, moved south-west to avoid deep peat.
- Turbine 6, moved south-west to avoid class 1 peatland and deep peat areas.
- Turbine 7, moved back south west as oversail buffer no longer a concern as land to the south owned by landowner.

Pre-Application Design Meeting (September 2022)

A Pre Application Design meeting was held with THC on 12 September 2022. Feedback was received on 12 October 2022. At this meeting the key design viewpoints were considered. The constraints which have influenced the design were also discussed and included deep peat, ornithology, noise and cultural heritage. As a result of the discussions a number of recommendations were made by THC and were considered as part of the design review process and are addressed as follows:

- Identify if the development can sit within a specific cluster (Halsary/Bad a Cheo etc., or, Bilbster/Camsters etc.). Reassess outlier turbines – more of a consideration in longer distant views and strive to achieve a consistent rhythm of turbines.
  - The design intention is to utilise the OWESG guidance and respect the existing pattern and separation between windfarm developments in this site design.
- Look at different sizes of turbines to reduce potential jarring visual effects of noticeable different turbine scales – this could reduce the effects of topography where turbines are sited on different Above Ordnance Datums (AODs).
  - Many potential solutions have been considered in the layout design to minimise visual effects whilst also having consideration for other constraints and economic viability.
- Consider the criteria identified in the Onshore Wind Energy Supplementary Guidance (2017) (OWESG) to refine the design of the development.
  - OWESG has been considered in the design process, see Chapter 4: Site Selection and Design Evolution of the EIAR..

Public Consultation (November 2022)

Detailed analysis of written feedback from the round two public consultations can be found in the PAC Report. Whilst generalised concerns, particularly around visibility, continued to be raised, with the reduction in local visual impacts from Design #1 as one turbine was deleted there were few tangible or actionable comments on specific turbine locations or views.

5.3.6. Design 3: Design Freeze (November 2022)

Following the pre-application design meeting with THC and further community engagement, no changes to turbine or built infrastructure locations were considered necessary so the layout remained unchanged from the design chill in September 2022.

The most common concerns raised by the public through consultations included the size of turbines as well as visual impact on surrounding settlements. By deleting one turbine the visual impact from a number of locations has been improved, therefore concerns raised at public consultation were considered as part of the design evolution.

This concluded the design process, and the Proposed Development was frozen at seven turbines. Figure 1.2 contains a detailed site turbine layout with associated infrastructure for the Proposed Development after design freeze. 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 sensitivities, as well as construction limitations and is the layout which is applied for and which the EIAR describes.

The final maximum tip height is proposed as 220 m for all turbines. At this early stage of a project the final turbine selection isn't known and therefore a possible range of turbines that could fit the maximum turbine height criteria is selected. Further information on assessment parameters for the turbines is discussed in Chapter 5: Project Description and included in Figure 5.2. It is expected that detail of final turbine dimensions and appearance will be a requirement of a condition to be agreed with THC prior to commencement of construction.

5.3.7. Residential Visual Amenity

During the design process, views from residential receptors within 3 km was a key design consideration and turbines were positioned further back from these sensitive receptors to reduce the vertical extent, and avoid the risk of being perceived as overbearing, within the view, or alter the area such that it becomes an unpleasant place to reside.

The Residential Visual Amenity Assessment (RVAA) consists of a detailed study of the visibility from individual properties within a 3 km radius of the outer turbine of the Proposed Development. In the absence of published guidance on the distance from the Proposed Development that should be adopted for a detailed study of visual amenity from residential properties, a 3 km study area is considered appropriate and was agreed with The Highland Council.

Thirty two properties were identified within 3 km from turbines however some properties were grouped together so 24 receptors were assessed. In terms of nearest properties, this was typically influenced by the location and directions of main views from properties, intervening screening from vegetation and buildings, the screening effects of topography, the existing appearance and influence of other human artefacts and built features, as well as the visual appearance and relative dominance of turbines in views.

The nearest dwelling to the proposed turbines is Shielton, an uninhabited financially involved property owned by the landowners of the Proposed Development Area. The property of Acharole is a financially involved property. There are 32 dwellings within 3 km of the proposed turbines, and these have been considered in the RVAA in Technical Appendix A6.9.

6. Final Design

6.1. Introduction

The final design of the Proposed Development is a consequence of undertaking site surveys and taking consultee responses into consideration during the detailed design phases of the project.

Consideration has been given to the design issues in terms of location and size of each of the component parts of the Proposed Development, as well as the technical and environmental requirements.

6.2. Character Elements

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

6.2.1. 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. It is expected that the turbine cut-in wind speed will be around 3 m/s and they will rotate clockwise.

Wind turbine towers will likely be constructed from steel and the blades from fibreglass. It is proposed that the turbine tower, nacelle and blades be finished in a semi-matt, off-white/pale grey colour. Typical turbine specifications, of the type being considered for use on the site, are presented in Figure 5.2. In order to comply with Health and Safety requirements for the site the Applicant proposes to apply identification numbers to the sides of the turbines. Numbers would be approximately 500 mm tall by 500 mm wide and would be positioned between approximately 1 m and 3 m from ground level so to be visible from the approaching access track.

Through consultation with the MoD and Wick Airport – safeguarded by HIAL, it has been agreed aviation lighting will be a requirement, and a lighting scheme should be established post-consent. See Chapter 13: Aviation and Existing Infrastructure of the EIAR for more detail. It is proposed that visibility sensors are installed on relevant turbines to measure prevailing atmospheric conditions and visibility range. Should atmospheric conditions (for example an absence of low cloud cover, rain, mist, haze or fog) mean that visibility around the site is greater than 5 km from the Proposed Development, Civil Aviation Authority (CAA) policy permits lights to operate in the lower intensity mode of 200 candela (ca) (being a minimum of 10% of their capable illumination). If visibility is restricted to 5 km or less, by weather conditions, the lights would operate at their full 2,000 ca. In effect, the CAA policy allows ‘dimming’ of the lights depending on meteorological conditions, which has the effect of reducing the perceived intensity of light in clear conditions.

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 5.3.

6.2.2. Site Infrastructure

The Proposed Development layout is shown on EIAR Figure 1.2, designed in line with the technical and environmental requirements detailed in Section 6 of this report, including (but not limited to) visual impact, location of watercourses, ecological constraints, location of 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 seven turbines with a maximum blade tip height of 220 m. A typical wind turbine is shown on EIAR Figure 5.2. The Proposed Development also includes associated infrastructure including: a temporary construction and storage compound (see EIAR Figure 5.10); access tracks within the application site (see EIAR Figure 1.2 ‘Site Layout’); turbine foundations (see EIAR Figure 5.5); crane hardstandings (see EIAR Figure 5.4); and drainage works. Further details on each of these elements can be found in EIAR Chapter 5: Project Description.

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,

Minor further refinement (micrositing) may be required post consent in order to construct the project, this will follow detailed ground investigations and ground clearance and will be allowed up to 50 m from the consented infrastructure locations.

6.3. Land Use

The felling of existing forestry will be managed by the applicant prior to any construction activities. Forestry is described in Chapter 11 of the EIAR, and it was concluded that the impact of the Proposed Development on forestry is not significant in EIA terms.

Operational effects on the existing land use are considered to be minimal. The current use of land within the application site for forestry will continue. The construction of the access tracks will benefit current land use practices through ease of access.

6.4. Community Safety

Wind turbines that are properly designed, erected and maintained are a safe form of technology. The nature of the Proposed Development is such that it raises no issues in terms of 'secured by design' criteria. The Applicant would commit to installing wind turbines and components that meet BS EN IEC 61400-1:2019 or IEC 16400 as appropriate.

Due to the industrial operations occurring during construction, signs are required on-site for safe day-to-day navigation for works traffic and personnel; access for emergency vehicles; and for the health and safety of the public.

During construction (as would be for the decommissioning phase) it is proposed that an Access Management Plan (AMP) will be prepared to indicate the restrictions for users and any proposed mitigation (through means of alternative routes and enhancement opportunities). Details of safety requirements will be confirmed post-consent.

During the operation of the Proposed Development, it is envisioned that there would be no restrictions placed on the movement of the public using the existing rights of way across the site, other than in exceptional circumstances e.g. turbine component replacement.

Blade icing is a rare occurrence that will only happen when the blades of the turbine are stationary and under near freezing temperatures and relatively high humidity, with either freezing rain or sleet. When ice becomes detached from the blades (through temperature increase or activation of blade heating systems), it can be thrown from the blades if they are rotating or fall vertically to the ground if the blades are at standstill. The risk of ice-throw is dependent on the local climate and weather conditions in which the wind turbines are situated.

Siting the turbines away from occupied buildings, roads and public areas can mitigate the risk, and this has been done as far as is practical with the Proposed Development. As mitigation, warning signs will be installed at entry points to the Proposed Development as well as in proximity to turbines.

Turbine manufacturers offer anti-icing and de-icing technological solutions to mitigate against icing of turbines. Anti-icing solutions aim to prevent ice build-up and include water and ice repellent blade coatings. De-icing solutions free turbine blades of ice if icing does occur, by heating turbine blades, causing the ice to melt while the blades are stationary or moving slowly. The overall view is that modern turbines which are fitted with climatic detection systems and passive/active de-icing solutions - like the models being considered for the Proposed Development - will help to mitigate against the occurrence of ice-throw. Turbine procurement, together with good practice site management procedures, including the use of visual warnings signs and curtailment during periods of ice build-up on blades, will mitigate and manage this potential hazard.

6.5. Environment Sustainability

Due to the location of the Proposed Development, it is unlikely that transport to and from the site by staff will be undertaken by public transport, walking or cycling, although it is assumed that there will be an element of car sharing.

The essential benefits of using wind energy for the generation of electricity are that it is renewable, safe and does not release any gaseous emissions into the atmosphere during operation. It also provides for diversity and security of supply which remain part of the Government's energy policy.

The total power output of the Proposed Development would be around 67.6 MW which includes 47.6 MW generated by the wind turbines and 20 MW of battery storage. A 67.6 MW development requires consent under Section 36 of the Electricity Act 1989 consent and a direction under Section 57(2) of the Town and Country Planning (Scotland) Act 1997 (as amended). The Proposed Development would generate enough electricity to meet the equivalent average annual domestic needs of over 28,926[10] 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[11]).

When generating electricity, the wind turbines would offset the generation of a similar amount of electricity that would otherwise be generated by conventional power stations. While the displacement or offset figure would change as the generation mix changes, the Proposed Development would, based on the current UK generation mix, offset the production of over 46,834,848 kg of carbon dioxide-equivalent per year[12] and so the Proposed Development would contribute towards international and national targets for the generation of renewable energy and reductions in greenhouse gas emissions.

Based on the findings of a Carbon Balance Assessment, see EIAR Technical Appendix A9.6, the construction, operation and decommissioning of the Proposed Development is expected to result in the net emissions of 64,141 tonnes of carbon dioxide equivalent. The carbon payback time for the wind farm is then calculated by comparing the net loss of CO_2 from the Proposed Development due to wind farm development with the carbon savings achieved by the wind farm while displacing electricity generated from coal-fired generation, grid-mix generation or fossil-fuel mix electricity generation. On the basis of the methodology used in that assessment, this could result in a carbon-payback time for the Proposed Development of 1.4 years (for the expected scenario based on replacement of fossil fuel-mix electricity generation). (For this assessment a conservative approach has been adopted using the UK 5 year average capacity factor between 2017-2021 of 26%. In reality, the Proposed Development is likely to have a notably higher capacity factor, anticipated to be above 35%, due to the greater tip heights proposed when compared to the operational wind farms in the UK during the 2017-2021 period).

The carbon dioxide offset would make an important contribution towards the government target to reduce carbon dioxide emissions by 100% by 2050. The Proposed Development would also offset emissions of the other greenhouse gases from conventional power stations; in particular coal fired generating plant. These gases including sulphur dioxide and oxides of nitrogen cause environmental problems such as acid rain.

Onshore wind farms, particularly those close to areas of electricity demand, provide an important contribution towards making Scotland and the UK more energy self-sufficient. The Proposed Development would help improve this self-sufficiency and narrow the energy supply gap.

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[10] Installed capacity (wind turbines only, BESS not included = 47,6 MW) x number of hours in a year x BEIS's long term average load factor for (onshore + offshore) wind. Divide the total by average electricity consumption per household in the UK.

47.6 MW x 8760 (hours per year) = 416,976 MWh/p.a.

416,976 x 0.26 = 108,414 MWh.

108,414,000 kWh/3,748 kWh = 28,926 households

[11] Wind Energy Statistics Explained, RenewableUK, Available at: https://www.renewableuk.com/page/UKWEDExplained/Statistics-Explained.htm [Accessed 14/07/2023]

[12] BEIS 'Digest of United Kingdom Energy Statistics', July 2022. Table 5.14 "Estimated carbon dioxide emissions from electricity supplied". BEIS's "all non-renewable fuels" emissions equate to 432 tonnes of carbon dioxide per GWh. This is an estimate of the current UK generating plant mix but may change over the lifetime of any project at Watten.

108,414,000 kWh x 432g-CO_2/kWh = 46,834,848 kg /year. Figures all rounded to nearest 100.

7. Access

7.1. Introduction

The Proposed Development will require vehicular access during construction, operation and decommissioning. The traffic impacts during these phases are discussed below together with any implications for public and disabled access.

7.2. Offsite Access/Construction Traffic

Construction traffic required to construct the wind farm falls into three broad categories; namely AILs, Heavy Goods Vehicles (HGVs) and Light Goods Vehicles (LGVs). The Site Entrance is located on the A9 via the existing Halsary Windfarm entrance south of Mybster.

Access Point

Chapter 12: Traffic and Transport of the EIAR fully details the public road network proposed for the transportation of turbine components. The turbine delivery routes are expected to arrive to the Halsary Windfarm existing site entrance via two routes along the A9. Tower loads only coming from the south along the A9, passing through Latheron from the Port of Nigg. The other for blade loads only, arriving from the north along the A9, passing through Halkirk and Mybster, if Scrabster Harbour were to be utilised. General construction deliveries are expected to be sourced locally using the A9, A99, and A882 where applicable.

7.2.1. Assessment

The increase in traffic movements that would be generated by the Proposed Development has been assessed against the baseline traffic flow figures for each road utilised with the construction of the Proposed Development. These figures can be found in Table 12.8 of Chapter 12: Traffic and Transport of the EIAR. The construction of the Proposed Development is estimated to lead to around 10,963 HGV movements (including AILs, excluding concrete deliveries) and 8,227 light personnel and LGV movements over the proposed 12-month period.

Table 12.10 and Chart 12.1 of Chapter 12: Traffic and Transport of the EIAR illustrates the distribution of traffic over the 12 month construction period. Within the table, the turbine foundations numbers only include reinforcement deliveries as it is not considered appropriate to simply distribute HGV numbers for concrete pours for the foundations over a month duration. Concrete pours for turbine foundations typically take place over a single day and hence the estimated 1,000 m^3 of concrete for a foundation would be delivered by HGVs within typically a 10-to-12-hour period.

Deliveries of construction materials and turbine components to the site will be carefully managed in accordance with a detailed traffic management plan.

7.3. On-site Construction Traffic

EIAR Figure 1.2: Site Layout shows the proposed access track and existing tracks to be upgraded for the Proposed Development. The tracks allow plant to dig new cable trenches and thereafter to access the site for operational and eventual decommissioning purposes. The site design makes use of existing access tracks wherever possible to minimise environmental effects.

Existing wind farm tracks within Halsary Wind Farm which will require some upgrades are utilised as part of the access route to site and new track is proposed to join Halsary existing track to the Proposed Development. The tracks within the Proposed Development Area will be all new tracks. The routes for the tracks were chosen to minimise potential impacts on the environment, while taking account of other site-specific constraints. The final location of the access tracks was decided by evaluating track length, cut and fill balance, avoidance of deep peat and minimising tree felling whilst balancing against the turbine transportation specifications.

7.4. Operational Traffic

Through the operational life of the Proposed Development there would be irregular and limited traffic movements consisting almost entirely of cars or vans for the service and maintenance of the Proposed Development Area. The number of vehicle movements during operation is infrequent and of a very low number such that the magnitude of their effect is considered to be negligible, leading to Negligible/Low Significance, when assessed using the significance criteria. The Applicant would encourage the wind farm operators to be aware of any local road sensitivities. During any major repair works required (e.g., to one of the turbines) cranes and HGV vehicles may need to visit site. Due to the low number of vehicles required this would still be considered to be of Negligible/Low Significance leading to "Not Significant" in EIA terms and no further assessment has been undertaken.

7.5. Access for All

The Proposed Development will be an operational wind farm, therefore the access tracks that will be built as part of the overall development are there to facilitate construction and maintenance vehicle access. Whilst these new access tracks will provide additional walking opportunities for all, they have not been designed for this purpose and measures such as hard surfacing or reducing gradients have not been considered in relation to specific disabled access.

8. Conclusion

The Proposed Development has been designed following the consideration of a range of constraints, both technical and environmental. The final design for the Proposed Development was the result of several design iterations which has allowed the layout to evolve.

The proposed layout comprises of up to seven turbines with maximum tip heights up to 220 m. The use of larger turbines reflects the need for efficiency in the project and advances in technology, thus responding to changes in Government policy, the climate change emergency and electricity market dynamics. Modelling of this layout in relation to the wind regime on site has produced a viable layout without the need for even larger turbines, which would have given rise to additional effects.

The layout presented within this application was developed based on a thorough understanding and appreciation of the environmental and technical investigations carried out as part of the EIA process, and continued stakeholder engagement throughout the project has ensured that key issues are addressed from an early stage and incorporated into the final design. The final turbine locations and access proposed mitigate and minimise adverse effects identified within the assessment process.

Access to the site from public highways and the local road network has been considered and assessed to minimise traffic impacts where possible.

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