Nisthill Wind Farm

Non-Technical Summary

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Abbreviations

AOD	Above Ordnance Datum
BNG	British National Grid
CO_2	Carbon Dioxide
CO2e	Carbon Dioxide Equivalent
EcIA	Ecological Impact Assessment
EIA	Environmental Impact Assessment
GMP	Grazing Management Plan
GVA	Gross Value Added
Ha	Hectares
HES	Historic Environment Scotland
HMP	Habitat Management Plan
HONO WHS	Heart of Neolithic Orkney World Heritage Site
IEF	Important Ecological Feature
IEMA	Institute of Environmental Management and Assessment
IFP	Instrument Flight Procedure
Km	Kilometre
LCCA	Local Landscape Character Area
LCT	Landscape Character Type
LCU	Landscape Character Unit
LDP	Local Development Plan
LNCS	Local Nature Conservation Site
LVIA	Landscape and Visual Impact Assessment
m	Metre
MW	Megawatt
MT	MillionTonnes
NS	NatureScot
NSA	National Scenic Area
NSR	Noise Sensitive Receptor
NTS	Non-Technical Summary
NVC	National Vegetation Classification
OIC	Orkney Island Council
PAC	Pre-Application Consultation Report
RCCA	Regional Coastal Character Areas
RVAA	Residential Visual Amenity Assessment
SAC	Special Area of Conservation

SEPA	Scottish Environment Protection Agency
SM	Scheduled Monuments
SOUV	Statement of Outstanding Universal Value
SSSI	Site of Special Scientific Interest
SLQ	Special Landscape Qualities
ZTV	Zone of Theoretical Visibility

1. Background

1.1 This document is a Non-Technical Summary (NTS) of the Environmental Impact Assessment Report (EIAR) which accompanies an application made by Nisthill Wind Farm Limited (the Applicant). Nisthill Wind Farm Ltd is a wholly owned subsidiary of InfinergyUK Ltd in partnership with local farmers Mr Adrian Breck of Ludenhill and Mr Paul Archibald of Nisthouse.

1.2 The Applicant is submitting a planning application to Orkney Islands Council (OIC) under the Town and Country Planning Act (Scotland) and deemed planning permission, to construct and operate Nisthill Wind Farm (hereafter referred to as the "Proposed Development"), located approximately 5km east of Birsay on the Orkney Mainland.

1.3 Renewable energy is a key factor in helping Scotland reach its target of Net Zero by 2045. The Proposed Development would make a meaningful contribution to those national targets for the generation of renewable energy and reduction in greenhouse gas emissions.

2. Purpose of the Proposed Development EIAR

2.1 ITPEnergised was appointed by the Applicant to assess the environmental impacts of the Proposed Development in accordance with The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017.

2.2 The Environmental Impact Assessment (EIA) process is reported in an Environmental Impact Assessment Report (EIAR), which describes the design iteration process and methods used to assess the beneficial and adverse environmental impacts predicted to result from the construction and operation of the Proposed Development. It also sets out mitigation measures designed to prevent, reduce and, if possible, offset any significant adverse environmental impacts. An assessment of residual effects, those expected to remain following implementation of mitigation measures, is also presented.

2.3 The Proposed Development consists of 4 turbines up to 180 metres to tip height, with an indicative installed capacity of 26.4 MW. The infrastructure required has been designed to minimise the construction footprint by using existing infrastructure where possible. This document is intended to present a summary of the findings of the EIAR in non-technical language.

3. Availability of the Proposed Development EIA Report

3.1 A hard copy of the EIA Report Volumes 1 to 4 is available for £650.00. In addition, all documents are available (as a PDF for screen viewing only) on a USB for free.

3.2 Electronic copies of the EIA Report can also be accessed at www.nisthillwindfarm.co.uk or at https://www.orkney.gov.uk/ as required under the Town and Country Planning (Miscellaneous Temporary Modifications) (Coronavirus) (Scotland) Regulations 2022 (Scottish Government, 2022).

3.3 A physical copy of the EIA Report will be made available during opening hours at the following location:

Birsay Community Hall,
Oxtro,
Birsay,
KW17 2LY

4. Representations to the Application

4.1 Any representations on the Town and Country Planning application should be made directly to Orkney Islands Council as follows:

Orkney Islands Council
School Place,
Kirkwall,
Orkney,
KW15 1NY Email: planning@orkney.gov.uk Web: www.orkney.gov.uk

5. Site Location and Description

5.1 The Proposed Development site is located approximately 5 km east of Birsay on the Orkney Mainland and immediately west of Loch of Swannay. Further detail on the site location can be found in Chapter 1 of the EIAR.

5.2 The site comprises of an area of approximately 120 hectares (ha). The site is predominately grassland with gently sloping topography up to 106 m Above Ordnance Datum (AOD). The surrounding area is rural with the land predominantly used for agriculture. The location and wider environment of the site is shown on Figure 1 below.

5.3 It is proposed all components including blades will be transported from Hatson Pier near Kirkwall, Orkney and continue to the proposed site entrance via Hundland Road.

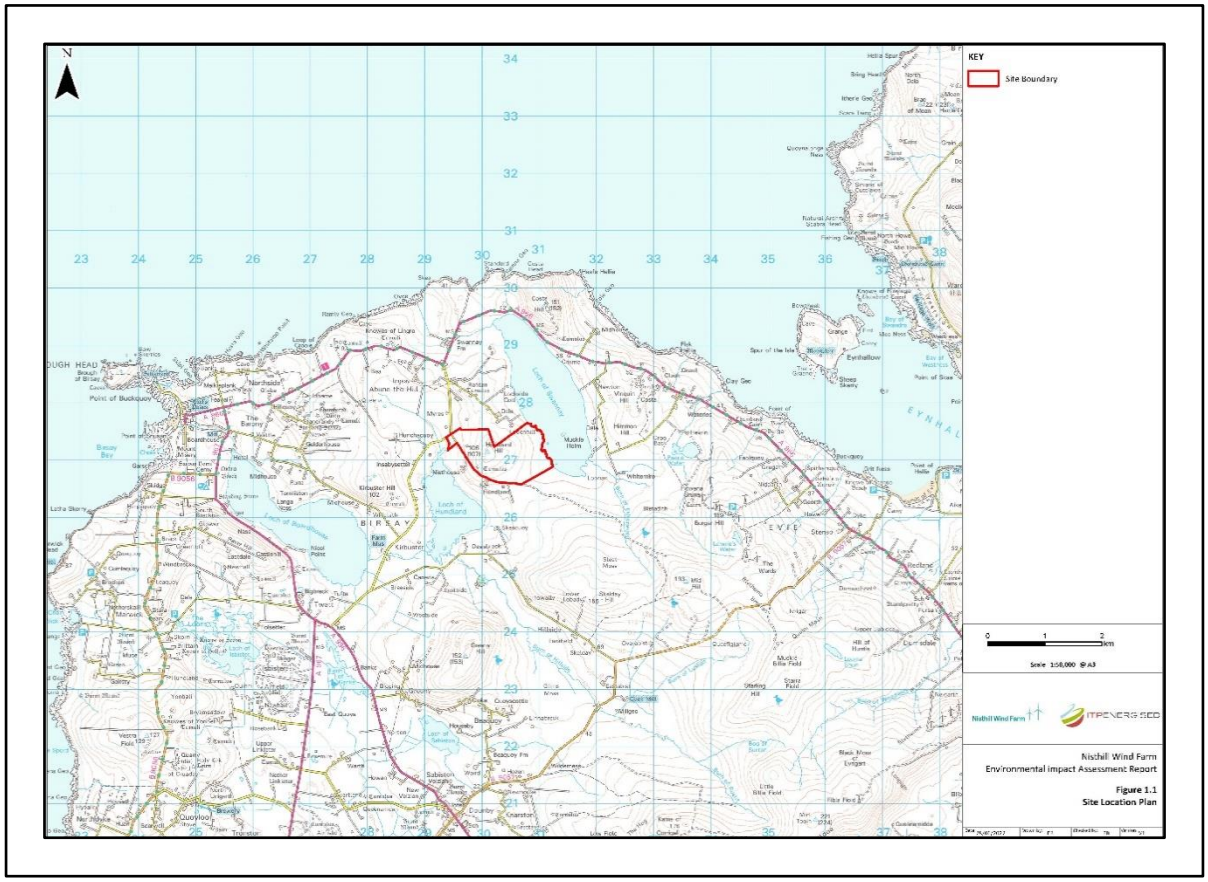


Figure 1 Site Location Plan

6. Site Selection and Design

Site Selection

6.1 The landowners of Nisthouse and Ludenhill Farm approached Infinergy with the proposal of developing a wind farm on their land. Infinergy is continually reviewing sites for possible wind farm developments across Scotland and the UK. The wind resource on the Orkney Islands is significantly higher when compared to the rest of the UK which is particularly beneficial.

Design Process

6.2 As part of the Environmental Impact Assessment (EIA) process, design iterations were prepared and considered for the turbine locations and on-site infrastructure, including access tracks, construction compound and substation locations.

6.3 The Applicant adopted the following principles during the design iteration process to ensure the final design of the Proposed Development was the most suitable for the site:

- Avoided locating turbines on the highest points of the site to minimise visibility;
- Respected cultural heritage constraints;
- Limited impact on protected habitats where possible;
- Proximity from Hoy and West Mainland National Scenic Area (NSA); and
- Maximised the potential electricity generation of renewable energy.

6.4 The design of any development is driven by the key objective of positioning turbines so that they capture the maximum energy possible within a suitable area further informed by environmental and technical constraints. All site constraints are discussed in more detail in Chapter 3 and are shown in Figure 3.1.

6.5 It is important to note that the identification of a constraint does not necessarily result in the exclusion of that area from the potential development envelope; rather it means that careful thought and attention was paid to the constraint and the design altered appropriately. The key constraints considered during the design process included:

- Landscapes and visual constraints;
- Presence of cultural heritage features;
- Location of residential receptors;
- Presence of protected habitats; and
- Location of existing small scale turbines.

6.6 The identification of constraints continued throughout the design evolution process as more detailed surveys refined the development envelope.

Turbine Layout and Scale

6.7 The Applicant has considered a number of alternative layouts for the Proposed Development (refer to Chapter 2 of the EIAR). The preliminary layouts took account of identified technical and environmental constraints based on both desk studies and field survey work, as well as preliminary wind yield analysis.

6.8 The Applicant considered the most appropriate design to maximise renewable energy generation from the site and to minimise the impacts to the on-site constraints. In addition, other operational and consented schemes near to the site were taken into account so the Proposed Development can be considered in keeping within the existing and future landscape in which it would be sited.

6.9 During the design iteration process, the design was amended to reduce impacts on cultural heritage features, noise levels as well as landscape and visual impacts from key receptors.

6.10 The final layout consists of four turbines with a maximum tip height of 180 m.

On-site Infrastructure Layout Iterations

6.11 The access tracks, crane hardstanding, construction compounds and substation compound were considered throughout the design process. The on-site infrastructure required has been designed and arranged in such a way as to avoid the on-site environmental constraints where possible.

6.12 Site access will be achieved via Hundland Road. The site tracks have been designed to follow a route which minimises the landscape and visual impacts, cultural heritage impacts and excessive gradients to ensure the safe delivery of turbine components and associated parts.

6.13 There is an existing borrow pit within the site boundary. Following a geological review, it is proposed to expand the existing borrow pit for the Proposed Development. During design optimisation, the locations of infrastructure and track design was refined in order to minimise the volume of earthworks and cut and fill required to construct the Proposed Development. The size of the borrow pit was selected to meet the estimated volume of rock required to construct the tracks, hardstandings and foundations

6.14 The proposed temporary construction compounds have been located with the aim of limiting the effects on sensitive habitats and cultural heritage features. Steep areas have been avoided to reduce the requirement for cut and fill. The construction compounds have also been located for practical purposes; to control traffic entering the site, to be located close to turbines and borrow pit and to facilitate construction of the substation.

6.15 The proposed substation will be located to the north east of the site and at the site entrance to minimise proximity to the electricity network

AT A GLANCE….

Number of Turbines: 4

Dimensions: 4 turbines with maximum height of 180 m to blade tip

Operational Lifespan: 40 - years[1]

Generation Capacity: Approximately 26.4 MW and around 89.7 GWh per year[1]

Community Benefit: £5.28 m in total

Energy Generated: Provide electricity for the equivalent of approximately 23,500 average UK households

7. The Proposed Development

7.1 The Proposed Development will comprise four turbines up to 180 m blade tip height. A number of ancillary development components are also proposed, including: two temporary construction compounds; crane hardstandings adjacent to the wind turbines for construction; access tracks; underground cables between turbines; an on-site substation and; expansion of existing borrow pit area. The Proposed Development layout is shown on Figure 2 below.

7.2 The total power generation capacity of the turbines within the Proposed Development would be approximately 26.4 MW with the exact capacity depending on the model and type of turbine selected. It would be expected that the site could generate around 89.7 GWh per year[1] (again depending on the turbine selected). The Proposed Development would generate enough electricity to power approximately 23,500 average UK household (based on BEIS 2021 average electricity consumption per household in Scotland of 3.748 MWh/year). The Proposed Development would contribute towards international and national targets for the generation of renewable energy and reduction in greenhouse gas emissions, including contributing significantly towards Scotland's target of net zero by 2045 (further information is provided on this in Volume 1, Chapter 3 of the main EIAR and the accompanying Planning Statement).

7.3 The electrical power produced by the individual turbines will be fed to an on-site substation via underground cables, both are located to the south-east of the site. The substation and control room building will accommodate all the equipment necessary for automatic remote control and monitoring of the Proposed Development, in addition to the electrical switchgear, fault protection and metering equipment required to connect the Proposed Development to the electricity network. The design of the substation and control room building is relatively flexible and where appropriate may be clad to match the local surroundings.

7.4 The Proposed Development's connection to the wider electricity network is still under assessment. The routing and design of the grid connection cable(s) between the on-site substation and the point of connection into the electricity grid will be the responsibility of the Network Operator.

7.5 To enable the construction of the turbines, a crane hardstanding area at each turbine location will be required to accommodate assembly cranes and construction vehicles. This will comprise a crushed stone hardstanding area measuring approximately 200 m long by 65 m wide but subject to the specifications required by the selected turbine manufacturer and crane operator and following detailed ground investigations prior to construction. They will remain in place during the lifetime of the Proposed Development to facilitate maintenance works.

7.6 A transport assessment (Volume 1, Chapter 11 and Volume 4, Appendix 11.1 of the EIAR) has been undertaken in support of the Town and Country Planning application for the Proposed Development and this provides greater detail on access routes to the site and provides an estimate of vehicle trip generation during construction. The transport assessment includes a review of the proposed construction route, and construction traffic impacts.

7.7 The new stretches of access track within the site boundary will have a typical 5 m running width

7.8 Two construction compound areas are proposed as a control centre for all site activities and to provide facilities for the day-to-day needs of the project and the workforce. The compound at the site entrance will comprise an area of approximately 50 m by 50 m, and the compound located at the borrow pit will comprise an area of 25 m by 50m. The main construction compound at the site entrance will house a temporary portable cabin structure to be used as the main site office and welfare facility, including toilets, clothes drying and kitchen, with the provision for sealed waste storage and removal. On completion of construction works, it is proposed that all temporary structures will be removed, and the compound areas restored.

[1] Calculated from 26.4 x 8760 (number of hours per year) x 0.40 (onshore wind load factor for Orkney).

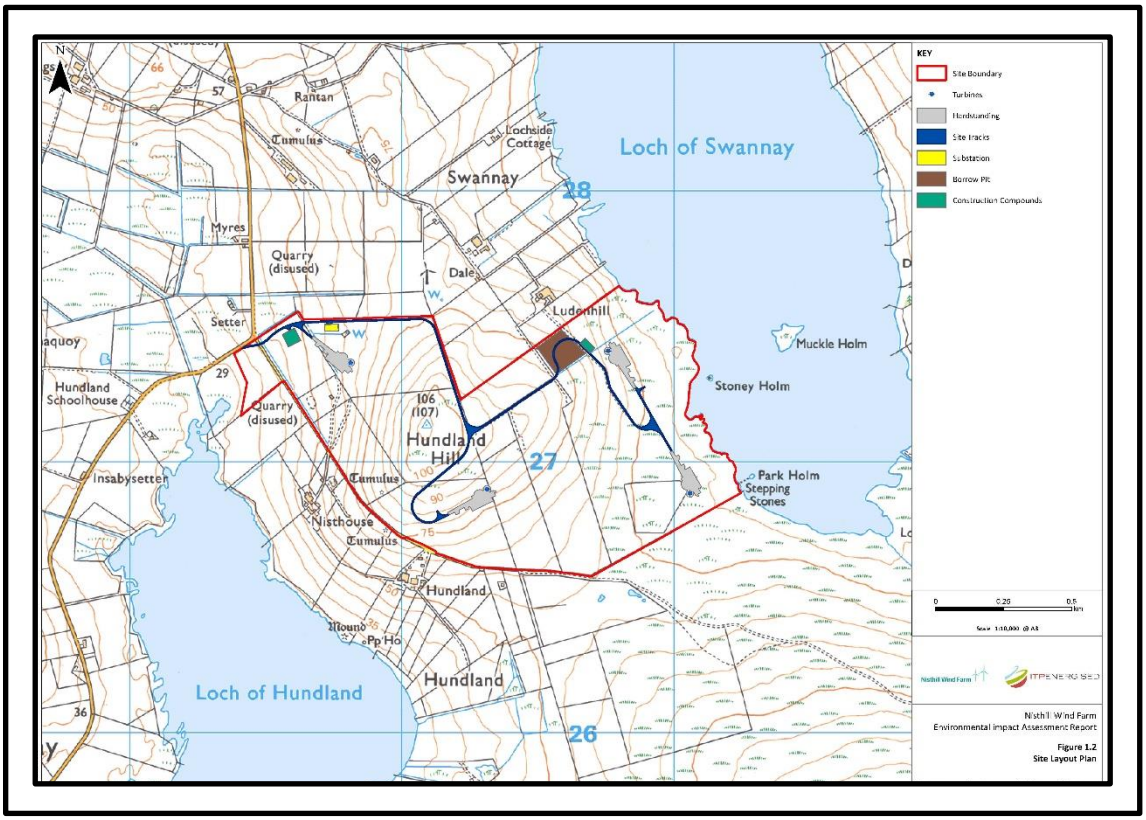


Figure 2: Proposed Development Layout

Forward Strategy & Community Benefits

7.9 During the operational period of the Proposed Development, the Applicant proposes to make community benefit contributions in line with Scottish Government best practice guidelines of £5,000 / MW of installed capacity per annum, which means that the project would generate an £5.3 million Community Benefit Fund (based on a total installed capacity of 26.4 MW) to local communities over its lifetime. The Applicant will engage with the local community about how this funding can best be used to support the local community. This may involve targeted measures to address fuel poverty, such as grants to improve energy efficiency. The provision of community benefit is not material in the planning process.

7.10 The Proposed Development would have an important strategic role for Orkney towards the achievement of the threshold set by Ofgem, in order for the construction of a new interconnector to be approved. This would in turn lead to additional socio-economic benefits and will support investment and innovation in the renewable sector in Orkney.

7.11 The Proposed Development represents a significant investment in the region and the Applicant has committed to taking a number of steps to ensure that benefits from the Proposed Development are maximised locally. The Applicant is committed to a local supplier approach that will endeavour to source supplier contracts locally wherever possible, sustaining local businesses and providing employment opportunities for local people.

7.12 The on-site construction period for the Proposed Development is expected to be approximately 12 months as shown in **Table 1.**

Table 1 - Indicative Construction Programme

Task	Month Number											
	1	2	3	4	5	6	7	8	9	10	11	12
Mobilisation												
Access & Site Tracks												
Foundations												
On-Site Cabling												
Substation Construction												
Crane Hardstanding												
Turbine Erection												
Site Reinstatement & Commissioning												

7.13 Normal construction hours will be between 07:00 and 19:00 Monday to Friday and 09:00 to 13:00 on a Saturday, no construction will take place on a Sunday. These times have been chosen to minimise disturbance to local residents. It must, however, be noted that during the turbine erection phase, operations may proceed outwith these times to ensure that lifting processes are completed safely i.e. once a component lift commences it is necessary to complete it.

7.14 The operational lifespan of the Proposed Development would be 40 years, after which it would be appropriately decommissioned. It is expected that decommissioning would take approximately 12 months. If, after the operational lifespan of the Proposed Development has expired there is potential for re-powering the development, this would be subject to a new and separate application.

8. Consultation

Statutory Consultation

8.1 A formal EIA Scoping Opinion was requested from OIC in March 2022 through the submission of an EIA Scoping Report. The EIA Scoping Report contained details of the site baseline, the Proposed Development, proposed environmental impacts to be assessed in the EIA, and the assessment methodologies that would be used. OIC consulted with a variety of statutory and non-statutory consultees before providing an EIA Scoping Opinion in May 2022.

8.2 Direct consultation has also been undertaken with specific statutory consultees, to confirm and agree the detailed approach to the technical surveys and assessments on a topic by topic basis.

8.3 Further information on the consultation process is given in Volume 1, Chapter 4 of the Proposed Development EIA Report.

Public Consultation

8.4 A stand-alone Pre-Application Consultation (PAC) Report has been prepared which gives details of the correspondence, online public consultation, in person community open days and other discussions which have taken place with the communities closest to the Proposed Development site.

8.5 The PAC report also details findings of that work and illustrates the ways in which community engagement has helped to identify potential issues arising from the emerging development proposal, and where appropriate, shape the final proposal which is now the subject of this application.

8.6 The Applicant is grateful to residents and local representatives for their input into the pre-application community engagement and for their participation in the discussions and consultation events.

9. Environmental Impact Assessment

9.1 The EIA considers the potential effects of the Proposed Development during construction, operation and decommissioning phases. Where appropriate, mitigation measures are proposed. The following topics and associated effects are assessed in the EIA:

- landscape and visual (assessing character of the landscape and views from agreed locations with NatureScot and OIC);
- ecology (protected habitats, flora and fauna, excluding birds);
- ornithology (birds and protected bird habitats);
- cultural heritage (the integrity and setting of historic sites and/or features);
- noise (effects on local properties from noise and vibration arising from the Proposed Development);
- traffic and transport (effects from traffic travelling to, and from, the Proposed Development on local roads and receptors);
- hydrology, geology, hydrogeology and peat (surface water, groundwater, rocks and soils);
- aviation and radar (civil and military aviation facilities and air space);
- socio-economics, tourism and recreation (local and national economy, local tourism businesses, and recreation facilities);
- telecommunications (telecommunications facilities); and
- shadow flicker (effects caused by the passing of the turbine blades in front of the sun).

9.2 Volume 1, Chapter 4 of the EIA Report describes the EIA process in more detail.

9.3 For each topic, the existing conditions (the baseline) was identified and the effects of the Proposed Development on these conditions assessed (the potential effects). Potential effects are assessed on a scale of negligible, minor, moderate and major, with effects of moderate or major deemed to be significant in the terms of EIA. Mitigation measures have then been proposed to minimise significant adverse effects where required. Following this, an assessment was undertaken of the effects of the Proposed Development on the existing conditions taking into consideration the proposed mitigation (the residual effects).

9.4 In addition to the above, the cumulative effects of the Proposed Development, i.e. effects considered in conjunction with other developments in the local area, primarily other wind farms, were assessed.

9.5 A summary of the baseline conditions, the proposed mitigation, the resulting residual effects and the cumulative effects for each topic is provided below. Full details of the EIA for each of the topics are provided in Volume 1, Chapters 6 to 15 of the EIA Report.

Landscape and Visual

9.6 The potential effects on the landscape and visual receptors that would arise as a result of the Proposed Development are provided in Chapter 6 of the Proposed Development EIA Report. The process taken involved identifying those receptors with the potential to be significantly affected and assessing the potential effects that the construction and operation of the Proposed Development would give rise to. The significance of these effects has been assessed through combining the sensitivity of each receptor with a prediction of the magnitude of change that would occur as a result of the Proposed Development.

9.7 The landscape and visual impact assessment (LVIA) study area for the Proposed Development covers a radius of 45 km and within this area, those receptors with the potential to be significantly affected have been assessed in detail. This has included one landscape element, 17 Landscape Character Types / Landscape Character Units (LCTs / LCUs), five Regional Coastal Character Areas (RCCAs) and their constituent Local Landscape Character Areas (LCCAs), one designated landscape area, and 19 representative viewpoints. Photomontages have been prepared for all of the viewpoints. The figures also include a wireline of the Proposed Development on its own and a wireline with all other cumulative Proposed Developments. These visualisations have assisted in the assessment process. Figures 6.1 to 6.18 in Volume 2 of the EIA Report show plans of the Study Area, landscape receptors, visual receptors and Zone of Theoretical Visibility (ZTVs) maps of the Proposed Development on its own and in combination with other cumulative windfarms, while Figures 6.19 to 6.37 in Volume 3 of the EIA Report show the photographs, wirelines and photomontages from the representative viewpoints.

9.8 The Proposed Development would give rise to significant effects on landscape and coastal character during the construction and operation of the Proposed Development, albeit contained within the localised extent of approximately 7 km. There would be no significant effects on the SLQs of the Hoy and West Mainland NSA, which lies beyond 10 km from the Proposed Development. The Proposed Development would give rise to significant effects on visual amenity in some locations out to approximately 7 km during the construction and operation of the Proposed Development (noting there are a number of viewpoints /areas within the 7 km which would not be significantly affected). While landscape and visual receptors beyond these ranges may gain views of the Proposed Development, these effects would not be significant. Furthermore, not all landscape and visual receptors within these ranges would be significantly affected, for example tracts of landscape where screening by landform occurs. Significant cumulative effects would arise in relation to landscape and visual receptors also out to approximately 4 km.

9.9 In Volume 4, Appendix 6.3 of the EIA Report, the visual effect of the turbine aviation lighting has been considered from three representative viewpoints. The Assessment has considered the worst-case scenario in terms of assuming that the intensity of lighting experienced at the representative viewpoints would be 2,000 candela (cd), with an assessment also of the reduced intensity at 200 cd that would be deployed in clear visibility at a range greater than 5 km. In considering the maximum intensity of 2,000 cd, and based on the assessment of the three representative viewpoints, it can be concluded that there would be the potential for significant effects associated with the hub aviation lighting to extend over an approximate 5 km radius of the Proposed Development, although, as previously stated, the maximum intensity of 2,000cd would be infrequently experienced. In considering the reduced intensity of 200 cd, this might give rise to significant effects on residents within an approximate 5 km radius but less likely to significantly affect road-users within this area.

9.10 In Volume 4, Appendix 6.4 of the EIA Report, the Residential Visual Amenity Assessment (RVAA) has considered the impact of the Proposed Development on the visual amenity of 56 properties within a 2 km radius. Residential Visual Amenity Threshold Assessment has identified one especially close-range property where the effects have the potential to be overwhelming or overbearing, namely Property 2: Dale at a minimum of 599 m from the closest turbine.

9.11 All effects during the construction of the Proposed Development would be short-term and reversible and all effects during the operation of the Proposed Development would be long-term and reversible. All effects would be adverse in nature.

Ecology

9.12 The full assessment of potential effects on ecology is provided in Volume 1, Chapter 7 of the Proposed Development EIA Report.

9.13 Following consultation with Orkney Islands Council (OIC), NatureScot and SEPA, a range of ecological studies were undertaken to identify the terrestrial ecological interests of the Proposed Development and to establish the ecological baseline for the Ecological Impact Assessment (EcIA). This included identification of existing wildlife records and nature conservation designations in the local area, as well as surveys of the habitats and faunal interests of the site.

9.14 A Phase 1 Habitat Survey and National Vegetation Classification (NVC) Habitat Survey have been undertaken.

9.15 The habitats (listed in order of size) identified on site are currently:

- improved grassland;
- marshy grassland;
- blanket bog;
- wet modified bog;
- valley mire (fen);
- wet heath/acid grassland mosaic;
- wet dwarf shrub heath;
- semi-improved acid grassland;
- flush and spring – acid and neutral;
- inundation vegetation; and
- acid dry dwarf shrub heath.

9.16 A few small water drainage ditches were recorded within the site also.

9.17 The Desk Study, which included a 5 km survey buffer, identified the presence of otter.

9.18 Through a standardised evaluation method, Important Ecological Features (IEFs) were identified and brought forward for assessment. IEFs taken forward to assessment include:

- Loch of Isbister Special Areas of Conservation (SAC);
- West Mainland Moorlands Sites of Special Scientific Interest (SSSI);
- Loch of Swannay Local Nature Conservation Site (LNCS);
- wet heath/acid grassland mosaic; and
- blanket bog.

9.19 Potential impacts of the construction and operation phases are presented, prior to the assessment of effects. In line with guidelines, the impact assessment process assumes the application of standard mitigation measures. With these in place, predicted effects were considered to be barely perceptible, and therefore not significant, with the exception of some loss of Loch of Swannay LNCS wet heath habitat and Loch of Swannay LNCS lowland fen habitats as well as wider area habitat types of wet heath/acid grassland mosaic and blanket bog.

9.20 Given these effects, biodiversity enhancement is proposed to be set out in a Habitat Management Plan (HMP) and a Grazing Management Plan (GMP). A pre-construction survey and Species Protection Plan dependant on the survey results is also proposed to further minimise any adverse effects on otter.

9.21 With the biodiversity enhancement and further mitigation detailed, residual impacts for the operation phase are considered to be negligible and therefore not significant for all IEFs except the LNCS burns and canalised burns feature where a low significant effect remains.

9.22 Likely cumulative effects of nearby developments (Costa Head, Burgar Hill, Hammars Hill and Holodykes wind farms), consented or at application stage, were also considered; no significant cumulative effects are anticipated.

Ornithology

9.23 The full assessment of potential effects on birds is provided in Volume 1, Chapter 8 of the Proposed Development EIA Report.

9.24 A full suite of ornithological surveys was adopted for the purposes of assessing the avian baseline conditions for the Proposed Development. The surveys included: Vantage Point surveys, breeding bird surveys and breeding raptor surveys; all undertaken from September 2020 to May 2022.

9.25 Four raptor species and owl species of high conservation value and two common raptor species were registered in the site during the Vantage Point and walkover surveys, of which hen harrier and short-eared owl were also assessed as breeding within the site or within the 2 km survey area. Nine species of wildfowl and divers were recorded during the surveys, with only greylag goose confirmed as breeding. Five species of gull were recorded during flight activity surveys with none recorded as breeding within the site. Twelve species of waders were recorded, six were recorded as breeding in the site. Great skuas were frequently recorded from flight activity surveys during the breeding season while small numbers of Arctic tern and Arctic skua were also recorded but none of the three were noted as breeding within the site.

9.26 Levels of flight activity recorded at risk height were considered to be low or moderate for all target species. Collision risk modelling was undertaken for the most frequently recorded at risk height. Red-throated diver and great skua which were the only two species likely to register a collision risk.

9.27 An assessment of ornithology effects arising from the construction and operation of the Proposed Development was undertaken, based on the proposed layout and turbine dimensions. Through a standardised evaluation method, Important Ornithological Features were identified and brought forward for assessment if concluded to be vulnerable to effects. Important Ornithological Features taken forward for further consideration included an international designation, Orkney Mainland Moors Special Protection Area, which is designed for breeding and wintering hen harrier, breeding short-eared owl and breeding red-throated diver; two locally designated sites, Loch of Swannay LNCS and Loch of Hundland LNCS; as well as three species, curlew, lapwing and great skua.

9.28 In accordance with guidelines, the impact assessment assumed the application of standard mitigation measures. With these in place, predicted effects were considered to be barely perceptible or low and therefore not significant for all Important Ornithological Features. There is no requirement for further specific mitigation for construction and operation phases as they are considered to have barely perceptible or low adverse significance, i.e. not significant although proposed enhancement measures for ground nesting birds is proposed and would have a long-term significant beneficial effect on the breeding population.

9.29 Likely cumulative effects with nearby operational developments, as well as those currently consented or at application stage of planning, were also considered. No significant cumulative effects are anticipated as a result of the Proposed Development.

Cultural Heritage

9.30 The full assessment of the potential effects on cultural heritage is provided in Volume 1, Chapter 9 of the Proposed Development EIA Report. The assessment has included the use of local knowledge as a source.

9.31 This assessment has identified seven cultural heritage assets located within the site boundary. These assets include the Nisthill Burial mound (Asset 61, SM1318) and the Hundland Hill Enclosure (Asset 65, SM13451) both of which are Scheduled and consequently considered to be of National importance as well as five non-designated assets of Negligible importance (Assets 163 to 167). The Proposed Development has been designed so as to avoid all known heritage assets of greater than negligible importance although direct impacts predicted to result in negligible/ neutral to minor significance of effects have been predicted for two of the non-designated assets (Assets 164 and 167) both of which are of probable post-medieval or modern date. Negligible/ neutral to minor effects are not considered significant although mitigation works are proposed.

9.32 Planning policies and guidance require that account is taken of potential direct effects upon heritage features/assets by proposed developments and that where possible such effects are avoided. Where avoidance is not possible, effects on any significant remains should be minimised or offset. Given the potential for presently unknown archaeological remains, in particular of prehistoric and post-medieval date, to survive within the site, a programme of archaeological works designed to avoid inadvertent damage to known remains and to investigate and mitigate against the possibility of uncovering hitherto unknown remains will be undertaken.

9.33 Potential operational effects on the settings of all designated heritage assets within 10km of the Proposed Development, as well as the potential effects upon the Heart of Neolithic Orkney World Heritage Site (HONO WHS) which extends beyond this buffer have been considered in detail as part of this assessment. Moderate effects have been predicted upon the settings of five Scheduled Monuments; the Hundland Hill Enclosure (Asset 65, SM13451) and the Nisthouse burial mound (Asset 61 SM1318) both of which lie within the site boundary as well as three Scheduled Monuments that are located within 1km (Park Holm Artificial Island and Causeway (Asset 72, SM1362), Stoney Holm Crannog (Asset 83 SM1394) and the two Mittens mounds (Asset 67, SM1350)). Although moderate effects are considered to be significant, this assessment has found that the predicted effects upon these assets would not affect the integrity of their settings and that consequently the predicted effects are compliant with Paragraph 145 of Scottish Planning Policy (SPP, 2014).

9.34 Given its international importance this assessment has given detailed consideration to the setting of the HONO WHS and its four individual component monuments Stones of Stenness Stone Circle And Henge (Asset 148, SM90285), Ring of Brodgar Stone Circle, Henge And Nearby Remains (Asset 146, SM90042), Maes Howe Chambered Cairn (Asset 147, SM90209) (these assets, which are located in the central part of West Mainland) and the Skara Brae Neolithic settlement (Asset 149, SM No. SM90276). However, in this instance the predicted levels of effect are considered to be minor and not significant, and it is therefore considered that the Proposed Development will not affect the attributes that are set out in the WHS's Statement of Outstanding Universal Value (SOUV). The proposals are therefore in accordance with Policy 8(B) of the Orkney Local Development Plan (LDP).

Noise and Vibration

9.35 The full assessment of the potential noise and vibration effects from the construction and operation of the Proposed Development on local receptors is provided in Volume 1, Chapter 10 of the Proposed Development EIA Report.

9.36 No potential vibration effects have been identified and consideration of vibration has therefore been scoped out. Planning permission in perpetuity is sought for the Proposed Development, therefore no specific decommissioning phase is proposed. It is anticipated, however, that should decommissioning be required, that associated noise effects would be similar to, but lesser than, construction phase effects.

9.37 The assessment of noise has comprised consultation with Orkney Islands Council (OIC) Environmental Health Department, characterisation of the baseline noise environment, prediction of noise levels associated with construction activities, construction traffic, operation of wind turbines and operation of other non-turbine fixed plant, and evaluation of predicted levels against derived criteria.

9.38 Construction noise will be limited in duration and confined to working hours as specified by OIC and can therefore be adequately controlled through planning condition. The application of mitigation measures where applicable will also ensure that any noise from site will be adequately controlled.

9.39 Overall noise effects from construction, including on-site activities and construction traffic, were found to be not significant. Noise effects from fixed non-turbine plant have been determined to be not significant.

9.40 The Applicant has committed to noise levels associated with operation of the Proposed Development meeting the development-specific noise limits to be agreed through the consenting process at all Noise Sensitive Receptors (NSRs). Where necessary, this may require a noise management plan to be put in place.

Traffic and Transport

9.41 The full assessment of the potential effects on traffic and transport is provided in Volume 1, Chapter 12 of the Proposed Development EIA Report.

9.42 The Proposed Development will be accessed from Nisthouse Road via a priority access junction constructed at the location of an existing agricultural access. In order to construct the Proposed Development, bulk materials such as concrete and rock will be imported to the site from local sources, whilst specialist loads such the turbine components will arrive on Orkney by ship and will be transported to site using specialist vehicles from Hatston Pier.

9.43 The construction activities will lead to increased traffic volumes across the study area during the construction phase only. The maximum traffic effect associated with construction of the Proposed Development is predicted to occur in Month 7 of the construction programme. During this month, an average of 149 HGV movements is predicted per day and it is estimated that there would be a further 16 car and light van movements per day to transport construction workers to and from the site.

9.44 Following commissioning of the Proposed Development, traffic flows will fall to two vehicles movements every fortnight.

9.45 No significant capacity issues are expected on any of the roads within the study area due to the additional construction traffic movements associated with the Proposed Development.

9.46 A series of mitigation measures and management plans have been proposed to help mitigate and offset the impacts of both the construction and operational phase traffic flows.

9.47 An assessment of likely effect using IEMA guidelines has been undertaken. This determined that, following mitigation measures, minor, non-significant effects could be expected relating to the increase in total flows and HGV flows within the study area at the following locations: Hundland Road, Nisthouse Road, Dounby, the A986, Finstown and along the A965.

Geology, Peat, Hydrology and Hydrogeology

9.48 The full assessment of the potential effects on important hydrological, hydrogeological, geological and peat features associated with the site is provided in Volume 1, Chapter 12 of the Proposed Development EIA Report.

9.49 A combination of desk study and field survey work was undertaken to identify and characterise the geological, hydrological and hydrogeological receptors which could be subject to impacts from construction, operation and decommissioning of the Proposed Development.

9.50 Potential effects have been identified, resulting from potential pollution and sedimentation of watercourses during construction, soil compaction, impact on the integrity of watercourse banks, impacts on drainage and groundwater flows during construction and operation, and excavation/ removal of peat deposits (though limited) during construction.

9.51 Embedded mitigation measures in addition to mitigation by design, include: pre-construction intrusive site investigations and groundwater monitoring prior to and during construction; provision of appropriate drainage measures during construction and operation; and development and implementation of a CEMP.

9.52 Additional, specific mitigation measures including implementation of a Peat Management Plan, construction oversight by a geotechnical engineer to ensure peat slide risks are minimised, suitable management and treatment of site drainage including from the borrow pit, measures to appropriately manage dewatering where required, and suitable measures to prevent pollution from accidental spillages and contamination.

9.53 Taking account of the committed mitigation measures, no significant residual effects on geology, hydrology and hydrogeology receptors are predicted.

9.54 No relevant developments which could give rise to significant cumulative effects on geology, hydrology and hydrogeology receptors have been identified.

Aviation and Radar

9.55 The full assessment of the potential effects on aviation and radar infrastructure is provided in Volume 1, Chapter 13 of the Proposed Development EIAR.

9.56 There are likely to be no aviation impacts, subject to an IFP impact assessment demonstrating no impacts to the Instrument Flight Procedures at Kirkwall Airport.

9.57 There are no aviation radars in the area that have any potential for impacts. The area is low priority for military low flying training. There are no air-ground-air radio stations of navigational aids sufficiently close to have any potential for impacts.

9.58 As the Proposed Development turbines exceed 150 m in height, there is a statutory requirement for aviation obstruction lighting. This will be implemented as one medium intensity, steady red

obstruction light on the nacelle of each turbine. The MoD has also requested aviation safety lighting in accordance with UK civil requirement.

9.59 In recognition of the need to minimise light pollution, Aircraft Detection Lighting Systems will be fully evaluated for their potential for deployment at the site, prior to construction. The CAA, together with the UK Wind Sector, is exploring the future use of Aircraft Detection Lighting Systems (ADLS).

Socio-Economics and Tourism

9.60 The full assessment of the potential effects on socio-economics and tourism is provided in Volume 1, Chapter 14 of the Proposed Development EIAR.

9.61 Orkney has a declining and ageing population in comparison to other areas of Scotland. While the labour market performs well, the area features higher costs of living in comparison to the rest of Scotland. Tourism plays an important part in the local economy and accounts for higher share of employment than the Scottish average.

9.62 During the development and construction phase, the Proposed Development could generate up to:

- £2.2 million GVA and 28 years of employment in Orkney; and
- £7.2 million GVA and 106 years of employment in Scotland.

9.63 During each year of the operational phase, the Proposed Development could generate up to:

- £0.2 million GVA and 2 jobs in Orkney; and
- £0.6 million GVA and 7 jobs in Scotland.

9.64 The Proposed Development would have an important strategic role for Orkney towards the achievement of the threshold set by Ofgem, in order for the construction of a new interconnector to be approved. This would in turn lead to additional socio-economic benefits and will support investment and innovation in the renewable sector in Orkney.

9.65 The Proposed Development would also provide community benefit funding for the local area of up to £132,000 annually, which could be used to the needs and concerns of the local community. In addition, it was estimated that the Proposed Development would pay £0.2 million each year in non-domestic rates, supporting local government services.

9.66 The most recent evidence on the relationship between wind farms and tourism suggests that there are no adverse effects on the tourism economy resulting from the development of onshore wind. An assessment of the likely effects of the Proposed Development on specific local tourism assets, accommodation providers and routes found no significant adverse effects are expected.

9.67 Overall, there were no significant adverse effects identified. While the beneficial construction and operation socio-economic effects are not significant in EIA terms, they would be important to the local and national economy, contributing to sustainable economic growth. The cumulative effect of supporting the needs case for an interconnector between Orkney and the Scottish mainland has been assessed as significant in EIA terms.

Telecommunications

9.68 The full assessment of the potential effects on telecommunication infrastructure is provided in Volume 1, Chapter 15 of the Proposed Development EIAR.

9.69 The telecommunications assessment, as informed by current guidelines and legislation, has been undertaken through consultation with the appropriate consultees namely:

- Airwave Solutions;

- Arqiva;
- Atkins;
- BT;
- EE;
- Joint Radio Company (JRC);
- Spectrum Licensing; and
- Vodafone.

9.70 The consultation process identified one telecommunications link located within the site boundary operated by EE. The links are shown on Figure 15.4.

9.71 Turbine 3 may cause interference with this link and therefore a 125 m micrositing buffer will be implemented on Turbine 3 only.

9.72 With the mitigation proposed, the Proposed Development will not impact any telecommunication links. Therefore, the Proposed Development will not have any cumulative effects on telecommunication links with other developments.

Shadow Flicker

9.73 The full assessment on the potential effects of shadow flicker is provided in Volume 1, Chapter 15 of the Proposed Development EIAR.

9.74 This assessment considers whether the effect known as 'shadow flicker' is likely to be caused by the Proposed Development and assesses the potential for impact on sensitive receptors. Shadow flicker is the effect of the sun passing behind the moving rotors of the turbines, casting a flickering shadow through the windows and doors of neighbouring properties. This occurs in certain combinations of geographical position, time of day, time of year and specific weather conditions.

9.75 Within the study area for shadow flicker there are 34 residential receptors with potential to experience shadow flicker effects.

9.76 Calculations have shown that effects from shadow flicker have the potential to be significant.

9.77 The model does not take into account existing screening features (structures and vegetation), dwelling orientation and local mitigation measures such as blinds or curtains which will reduce potential effects further. Receptors may also be in rooms that are not generally used at the affected times, therefore, the amount of time when shadow flicker is actually 'experienced' will likely be significantly less than what has been predicted.

9.78 The Applicant proposes that prior to the erection of the first turbine a 'Wind Farm Shadow Flicker Protocol' will be submitted to and approved in writing by OIC. This will set out mitigation measures to alleviate shadow flicker attributable to the Proposed Development as well as a protocol for addressing a complaint received from a receptor within the study area. Operation of the turbines would be required to take place in accordance with the approved Shadow Flicker Protocol and any mitigation measures that have been agreed through the protocol would require to be implemented as appropriate.

9.79 The residual effect of shadow flicker is, therefore, expected to be not significant for all receptors during the operational phase of the Proposed Development.

9.80 A cumulative assessment shows there are no receptors located within the Study Area which are also located within the relevant shadow flicker study area for any operational or proposed wind farms.

10. Benefits of the Proposed Development

10.1 The principle of wind development in this general location has already been established by the existing wind developments surrounding the site. The addition of th**e Proposed Development will deliver the following key benefits:**

10.2 The Proposed Development would contribute to the attainment of the UK and Scottish Government policies of encouraging renewable energy developments; and in turn contribute to the achievement of UK and Scottish Government targets for renewable electricity generation. The Proposed Development, with an installed capacity of approximately 26.4 MW, would make a valuable contribution to meeting such targets.

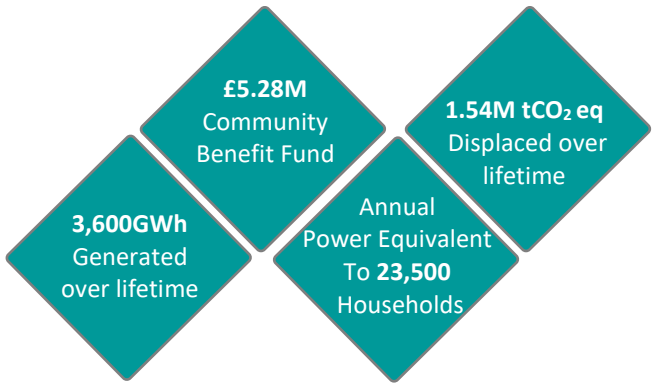
10.3 The Government has confirmed its long-term commitment to the decarbonisation of electricity generation and the Proposed Development would help advance this policy objective.

10.4 The Proposed Development would have a total capacity of 26.4 MW, generated by four ~6.6 MW turbines which together would produce around 89.7 GWh/year of clean power which would generate enough electricity to supply approximately 23,500 average UK households.

10.5 The Proposed Development is expected to displace approximately 1.53 million tonnes of CO2 eq over its lifetime.

10.6 Energy generated from renewable sources makes a significant contribution to Scotland and the UK's energy security. The Proposed Development will increase indigenous production of renewable energy in Scotland while reducing the country's reliance on foreign fossil fuels, generating wealth from our own natural resources and improving the country's energy security. This will occur at a time when the country requires to meet the demand for the transition to heat homes and the demand for electricity is set to soar with the move to electric vehicles; it is important that the additional generation capacity to meet that demand comes from renewable sources.

10.7 Based on an installed capacity of 26.4 MW, the Proposed Development will deliver approximately £132,000 per annum in Community Benefit Funding, equating to £5.28m in total over its 40-year operational life.



10.8 Total development and construction expenditure on the Proposed Development over its 40-year lifetime is estimated at approximately £24.8 million, and each year operations and maintenance expenditure could amount up to £1.1 million. The Applicant is committed to a local supplier approach that will endeavour to source supplier contracts locally wherever possible, sustaining local businesses and providing employment opportunities for local people.

10.9 In addition to the benefits linked to its construction, development and operations, the Proposed Development will contribute towards reaching the threshold set by Ofgem for investment in an interconnector between Orkney and the Scottish mainland to take place. At present Orkney's 40MW connection to mainland Scotland is operating at full export capacity and therefore new renewable energy developments are not feasible. The investment in an interconnector can take

place only if 135 MW of new generation have been awarded a Contract for Difference (CfD) or are likely to be developed by December 2022. Without the Proposed Development the interconnector is likely to fall short of the 135 MW of new generation required by December 2022.

10.10 If approved, the Proposed Development will be capable of rising to the challenge set by the Scottish Government for the onshore wind industry in Scotland to start building wind farms without public subsidy.

11. Conclusion

11.1 This Non-Technical Summary of the EIAR provides an overview of the EIA undertaken for the Proposed Development. A schedule of commitments is in Chapter 16 of the EIAR. This details the environmental mitigation measures, summarised above, which the Applicant has committed to implement.

11.2 Volume 1, Chapter 17 of the EIAR summarises the potential effects, the mitigation to be implemented and the resulting residual effects. It also provides a summary of the cumulative effects of the Proposed Development in combination with other proposed, consented and operational developments in the local area.

11.3 The final layout has been informed by a robust EIA and lengthy design iteration process, considering potential environmental impacts and their effects, physical constraints, and health and safety considerations. The information used to inform the design iteration process included consultation responses, baseline data and the impact assessment undertaken.

11.4 Consideration has been given to a range of design issues as well as various environmental, ecological and technical requirements. Predicted environmental effects arising from the Proposed Development have been mitigated as far as possible, if not eliminated during the iterative design process.

11.5 The Proposed Development site is considered an appropriate and viable location for a wind energy project due to:

- Initial desk-based studies and onsite wind data suggest that there is likely to be sufficient wind resource, and the site is available for wind energy development;
- Potential to source construction material for site infrastructure within the site, reducing offsite traffic, by extending existing borrow pits used previously;
- Ability to positively contribute to regional and national renewable energy and carbon reduction targets; and
- Ability to provide social and economic benefits to the local area.

11.6 Overall, the Proposed Development is an appropriately designed, and sensibly located wind farm which accords with and draws support from local and national planning policy. The Proposed Development has been designed to maximise renewable energy generation from the site, within acceptable environmental limits. The Proposed Development will provide a valuable contribution towards the ambitious national targets for electricity generation from renewable sources.

12. References

A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise, M. Cand, R. Davis, C. Jordan, M. Hayes, R. Perkins, Institute of Acoustics, May 2013.

Department for Business, Energy and Industrial Strategy (BEIS) (2021) National Electricity and Gas Consumption Statistics. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1079141/subnational_electricity_and_gas_consumption_summary_report_2020.pdf