

SCLENTEUCH WIND FARM

Environmental Impact Assessment Report

Non Technical Summary



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1 Introduction

1.1 Introduction

1.1.1 An application has been made by Renewable Energy Systems Ltd (RES) to Scottish Ministers under Section 36 of the Electricity Act 1989 and deemed planning under section 57(2) of the Town and Country Planning Act 1997 for consent to construct and operate Scienteuch Wind Farm (hereafter referred to as the Proposed Development). This Non-Technical Summary (NTS) has been produced in accordance with the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (as amended), (hereafter referred to as the EIA Regulations). The Application is accompanied by an Environmental Impact Assessment Report (EIAR) which presents the results of the Environmental Impact Assessment (EIA) undertaken to establish the potential effects that the Proposed Development may create. As per Regulation 5(2)(e) of the EIA Regulations, this NTS provides a non-technical summary of the following:

- i a description of the development comprising information on the site, design, size and other relevant features of the development;
- ii a description of the likely significant effects of the development on the environment;
- iii a description of the features of the development and any measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment;
- iv a description of the reasonable alternatives studied by the developer, which are relevant to the development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the development on the environment.

1.2 The Applicant

1.2.1 RES is the world's largest independent renewable energy company active in onshore and offshore wind, solar, energy storage and transmission and distribution. At the forefront of the industry for 39 years, RES has delivered more than 18 GW of renewable energy projects across the globe and supports an operational asset portfolio exceeding 6 GW worldwide for a large client base. Understanding the unique needs of corporate clients, RES has secured 1.5 GW of power purchase agreements (PPAs) enabling access to energy at the lowest cost. RES employs more than 3,000 people and is active in ten countries.

- 1.2.2 From its Glasgow office RES has been developing, constructing and operating wind farms in Scotland since 1993. RES has developed and/or built twenty-one wind farms in Scotland with a total generation capacity of 597 MW. RES is currently constructing Blary Hill Wind Farm in Argyll and Bute and has recently finished constructing Solwaybank Wind Farm in Dumfries and Galloway and Freasdail Wind Farm in Argyll and Bute. The Applicant has the necessary knowledge and experience in renewable energy to develop the Proposed Development.

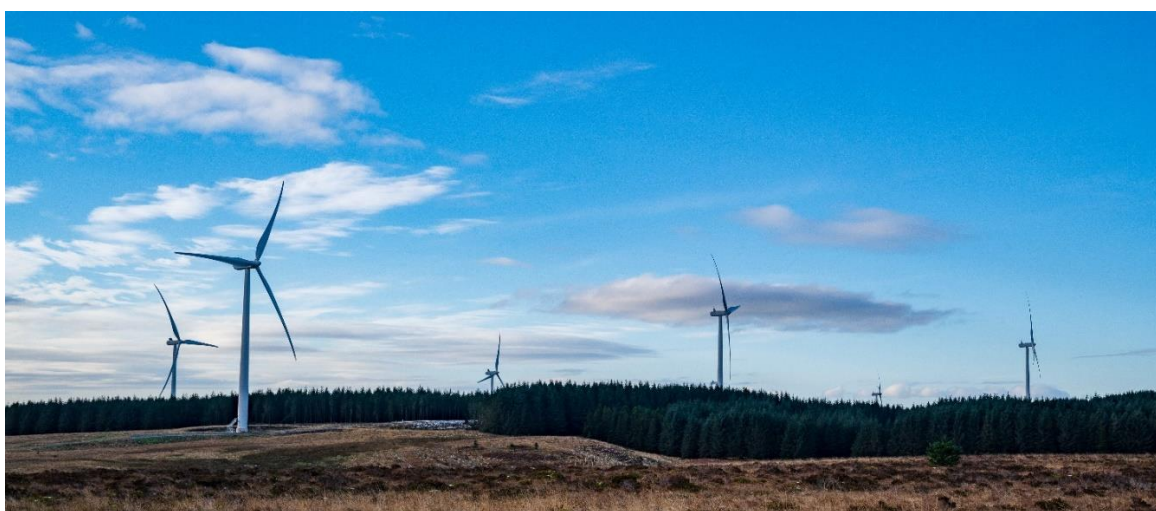


Diagram 1: Solwaybank Wind Farm

1.3 Consultants

- 1.3.1 Natural Power Consultants Limited (Natural Power), the lead consultancy on the project, has been providing expertise to the renewables energy industry since the company was formed in 1995 and is one of the UK's leading renewable energy and infrastructure consultants. As well as development and EIA services, Natural Power also provide expert advice and due diligence consultancy, site construction management and site operation and maintenance.
- 1.3.2 Natural Power employs over 400 people working full time on providing renewable energy services internationally. In Scotland, Natural Power has offices in Stirling and Inverness and its headquarters 'The Green House' is an award winning, environmentally friendly office building located in Dumfries and Galloway, just 16.1 km from the Proposed Development.

- 1.3.3 Testimony to Natural Power’s experience and ongoing commitment to competency and continual improvement, it’s Planning and Environment departments are accredited by the Institute of Environmental Management and Assessment (IEMA) and EIAs prepared by Natural Power display IEMA quality mark. In addition, Natural Power also operates in formally accredited health and safety (ISO 45001), environmental (ISO 14001) and quality (ISO 9001) management systems.
- 1.3.4 Other consultants involved in the EIA have provided independent professional input for Landscape and Visual Impact, Cultural Heritage, Geology, Hydrology and Hydrogeology, Forestry, and Traffic and Transport:
- Land Use Consultants (LUC) - Landscape and Visual Impact
 - Archaeological Management Solutions (AMS) - Cultural Heritage
 - SLR - Geology, Hydrology and Hydrogeology
 - DGA Forestry - Forestry
 - Pell Frischmann - Traffic and Transport

1.4 Terminology

- 1.4.1 The following terminology will be used throughout this document:
- The ‘Proposed Development’: the turbines and all associated infrastructure required for Scienteuch Wind Farm;
 - The ‘Proposed Development Area’: all land within the current application site boundary, including the main wind farm area (refer to EIAR Figure 1.3 or Diagram 4.1 of this NTS for example).

2 Environmental Impact Assessment Report

- 2.1.1 The Environmental Impact Assessment Report (EIAR) has been prepared in line with the EIA regulations. The EIAR reports the findings made in the Environmental Impact Assessment (EIA) of the Proposed Development. The scope of the EIA was the subject of a formal scoping opinion from the Scottish Government Energy Consents Unit on behalf of the Scottish Ministers. This included input from the Local Planning Authority, which is East Ayrshire Council and South Ayrshire Council, and from other consultees including Scottish Environmental Protection Agency (SEPA), NatureScot (formerly known as Scottish Natural Heritage (SNH)) and Historic Environment Scotland (HES). A scoping opinion was sought from Scottish Ministers in August 2021.

2.1.2 During the EIA process, site visits, surveys, and desktop assessments, in line with relevant guidance, were carried out to ascertain the potential impacts of the Proposed Development on the environment and mitigation measures to be made. A review of planning and other relevant policies was also made to inform the assessment process and ensure the Proposed Development adequately considered local and national policy. The EIAR has been prepared in accordance with the EIA regulations and follows the structure presented in Table 1 below. Where each relevant EIAR chapter considers the baseline movement, the likely significant effects for each phase of the development, any required mitigation, and cumulative impacts.

Table 1: EIAR Structure

Volume	Heading	Description
1	EIAR Chapter 1: Introduction	Prevents the Proposed Development and provides a brief overview of the Applicant and the EIAR.
1	EIAR Chapter 2: Proposed Development/Project Description	Provides a detailed description of the infrastructure associated with the Proposed Development.
1	EIAR Chapter 3: Design Evolution and Alternatives	Explains the site selection and the design evolution process that has resulted in the Proposed Development.
1	EIAR Chapter 4: Approach to EIA Climate Change, Legislative and Policy Context	Identifies the energy and land use policies and outlines the need for the Proposed Development and its benefits within the context of international climate change agreements and European, UK and Scottish renewable energy policy. Includes analysis of the Proposed Development carbon payback.
1	EIAR Chapter 5: Landscape & Visual	Provides an assessment of the Landscape and Visual Impacts of the Proposed Development including Residential Visual Amenity and Night-time effects.
1	EIAR Chapter 6: Cultural Heritage Assessment	Provides an assessment of the potential effects of the Proposed Development upon cultural heritage assets.
1	EIAR Chapter 7: Ecology	Provides an assessment of the habitats and (non-avian) fauna present within the Proposed Development area and immediate surrounding environment.
1	EIAR Chapter 8: Ornithology Assessment	Provides an assessment of the potential effects upon avian species.
1	EIAR Chapter 9: Geology, Hydrology and Hydrogeology	Assesses the effects on the hydrological, geological, and hydrogeological environment by the Proposed Development, including private water supplies and peat.
1	EIAR Chapter 10: Forestry	Assesses how the Proposed Development will affect the existing plans for felling, restocking, and proposes suitable amendments to forestry design plan(s) to accommodate the Proposed Development.
1	EIAR Chapter 11: Traffic and Transport	Assess how the Proposed Development will affect the existing plans for felling, restocking, and proposes suitable amendments to forestry design plan(s) to accommodate the Proposed Development.

1	EIAR Chapter 12: Noise	Provides an assessment of the potential noise effects of the Proposed Development.
1	EIAR Chapter 13: Socioeconomics	Provides an assessment of the potential socioeconomic and tourism effects of the Proposed Development.
1	EIAR Chapter 14: Climate Change	Climate impact assessment of the Proposed Development.
1	EIAR Chapter 15: Aviation, Safety and Other Issues	Provides an assessment of the potential effects upon safety, aviation, Ministry of Defence (MoD) interests, communication operations and existing site infrastructure.
1	EIAR Chapter 16: Synergistic effects, Residual Effects and Schedule of Environmental Mitigation.	Assesses the potential synergistic effects created by effects from different subject areas in combination and summarises the proposed mitigation and residual effects of the Proposed Development. Schedule of mitigations.
2a	Figures	EIAR Figures except for LVIA
2b	Figures	LVIA Figures only
2c	Figures	LVIA and Cultural Heritage Visualisations
3	Technical Appendices	Provide additional supporting documents and data which inform the EIA.
4	Non-Technical Summary	Provides a high-level summary of the EIA's results in terms that can be understood by a layperson.

2.1.3 The application is also supplemented by an accompanying Planning Statement and a Pre-Applicant Consultation (PAC) Report.

2.1.4 Copies of the EIA Report may be obtained from Carey Green (telephone: +44 1872 226 931 / email: carey.green@res-group.com) at a charge of £400 per hard copy or free of charge on DVD/CD/USB.

3 Overview of Proposed Development

3.1.1 The Proposed Development is located in both South Ayrshire and East Ayrshire near Waterside, west of the A713.

3.1.2 The site of the Proposed Development (the 'Proposed Development Area') is currently a used for a mixture of commercial forestry and sheep grazing. It occupies forested hills of Green Hill and Lamdoughty Hill. The River Doon valley passes to the east, with settlements at Dalmellington, Waterside and Patna. To the west is the Water of Girvan, which flows through the village of Straiton. To the south the operational Dersalloch Wind Farm across the B741. The Proposed Development Area is centred on Ordnance Survey grid reference 240700E, 607500N and covers an area of approximately 1,000 ha.

3.1.3 A proportion of the Proposed Development Area was subject to a previous application for wind development by the Applicant in 2013, Keirs Wind Farm application. The Keirs Hill Wind Farm application was for 17 turbines each up to 149 m to blade tip, and whilst it was unfortunately refused at Public Local

Inquiry (PLI) the reporter concluded that ‘the site is a suitable one for a wind farm development’.

- 3.1.4 The Proposed Development Area was previously considered to have sufficient capacity for approximately 33 wind turbines; however, the Proposed Development considers a reduction to 9 wind turbines to mitigate some concerns raised on the previous Keirs Hill Wind Farm application, for 17 wind turbines.
- 3.1.5 The Proposed Development’s generating capacity of renewable electricity of up to 54 MW subject to final wind turbine procurement, excluding battery storage. There is, potentially, up to 45 MW of storage capacity also proposed within the battery energy storage system compound.
- 3.1.6 The details of the Proposed Development as set out in Chapter 2: Proposed Development/Project Description but the application is seeking consent for the following main elements:
- up to nine wind turbines of up to 200 m tip height, including within the hardstand arrangement:
 - low to medium voltage transformers and related switchgear;
 - permanent wind turbine foundations;
 - permanent crane hardstand;
 - a network of access tracks including passing bays and a site entrance from the public road;
 - a substation compound including a communications mast;
 - potential for battery energy storage system compound of up to 45 MW;
 - a network of buried electrical cables;
 - borrow pits (dependent on availability of stone on-site);
 - signage;
 - felling and replanting of forestry;
 - temporary construction compounds, working areas and laydown areas; and
 - improved and new walking trails (Keir Glen Trail), footbridges and pass through gates for pedestrian access.
- 3.1.7 Any public road to the site entrance may be utilised subject to upgrades where necessary.
- 3.1.8 The land where a number of turbines are proposed is forested recently and, as such, forest felling and replanting may be undertaken to facilitate the Proposed Development.

- 3.1.9 The Proposed Development is expected to have an operational life of up to 50 years. For the purpose of assessment, the Applicant has considered turbines with a maximum height base to tip height not exceeding 200 m.
- 3.1.10 Figure 1.3 of the EIAR illustrates the layout of the Proposed Development.
- 3.1.11 Locations (subject to micro siting) and indicative dimensions of the proposed turbines are shown in Table 2.

Table 2: Turbine Locations

Wind Turbine	Easting	Northing	Tip Height (m)	Hub Height (m)
T1	240561	606791	200	125
T2	240421	607686	200	125
T3	240939	607242	200	125
T4	241459	606902	200	125
T5	240860	608277	180	105
T6	241367	607831	180	105
T7	242026	607321	180	105
T8	242038	606687	200	125
T9	242550	606977	180	105

4 Reasonable Alternatives

- 4.1.1 The Applicant has studied many sites across Scotland for the potential for wind energy development. Some are not progressed whilst others make it all the way to application stage and constructed following consent.
- 4.1.2 Desk-based feasibility studies and site visits to the area in the vicinity of Scienteuch were undertaken at an early stage to understand the potential scope for an onshore wind farm.
- 4.1.3 The overarching aim of the selection process was to achieve a layout that maximised the efficiency of the Proposed Development whilst limiting the potential environmental impacts. Factors influencing the suitability of the site included:
- Suitable wind speeds;
 - Suitable separation distance from dwellings and settlements;
 - Proximity to sensitive landscape and visual receptors;
 - Reasonably close proximity to viable grid connection;
 - Willing landowner(s);
 - Potential to use existing infrastructure, as far as practical;

- A feasible route for transporting components to site by the public road network;
- Suitable land area to accommodate generating capacity and civil engineering requirements; and
- No significant environmental constraints preventing development.

4.1.4 The results indicated that the Proposed Development Area would be a technically and environmentally appropriate location to develop a wind farm.

4.1 Site Design

4.1.5 Environmental survey of Scienteuch, for example for birds and other species, peat depth, archaeology and other matters of interest, ran over a period from 2020-22 and also made use of data gathered for the previous Keirs Hill Wind Farm application. The data gathered enabled the team to investigate six different design iterations before settling on the final design which maximises the efficiency of the Proposed Development whilst limiting the potential environmental impacts. The Proposed Development Area has also been assessed by checking it against a number of strategic constraints. Figure 1.3 of the EIAR, illustrates the location and layout of the Proposed Development, presented below Diagram .

Source: RES

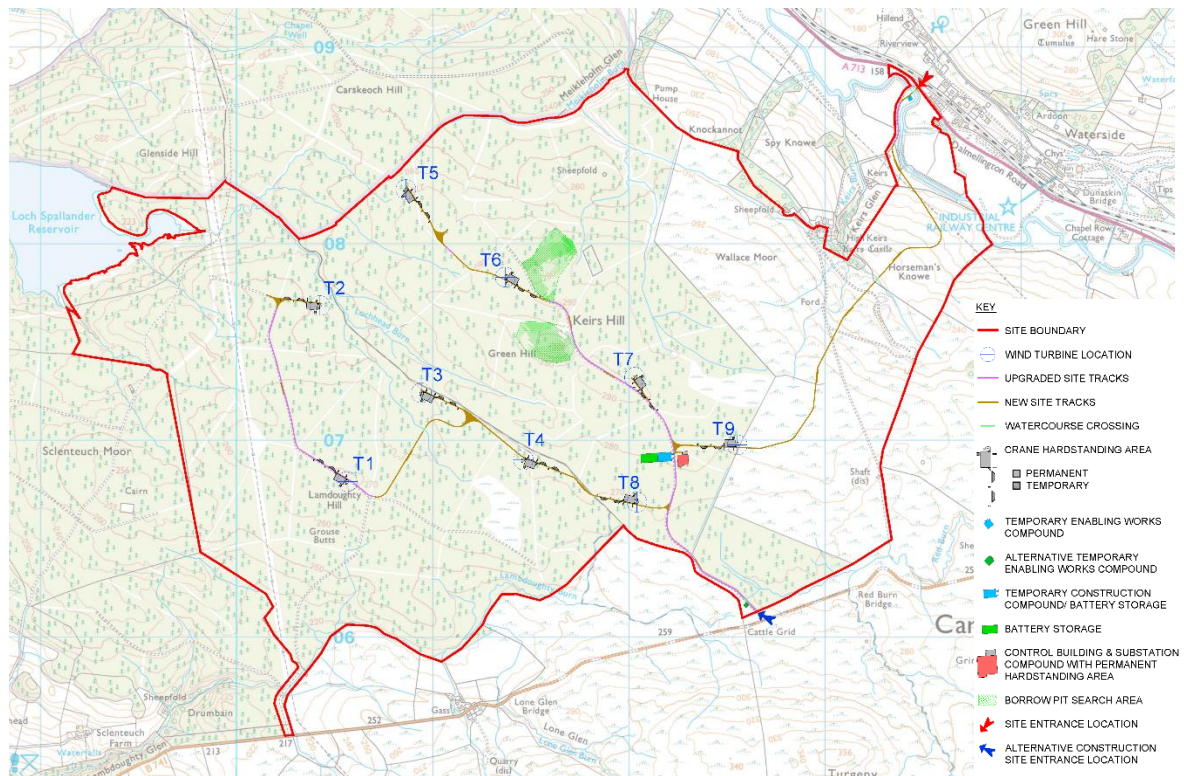


Diagram 2: Location and Layout of Proposed Development

- 4.1.6 The Proposed Development has been in the design process for a considerable time and the layout has evolved iteratively, including responding to issues raised during and after Scoping, having considered responding to issues raised during and after Scoping, having considered different number and size of turbines; see Chapter 3 of the EIAR for full details. Such changes have been influenced by several factors including economics, stakeholder feedback, planning policy and potential environmental effects.
- 4.1.7 Diagram 3 illustrates the Proposed Development at Scoping stage in 2021. This layout represented what was likely to provide the most benefit in terms of electricity generation, climate mitigation, net biodiversity gain, supply chain, and community benefit (£/MW), but would also be the ‘worst case’ with regard to potential adverse environmental effects. The Scoping layout, therefore, comprised the largest extent of land and the tallest and greatest number of turbines which was expected to be put forward for consideration resulting in an initial proposal for 9 turbines all up to 200 m in tip height.

Source: Scienteuch Scoping Report 2021

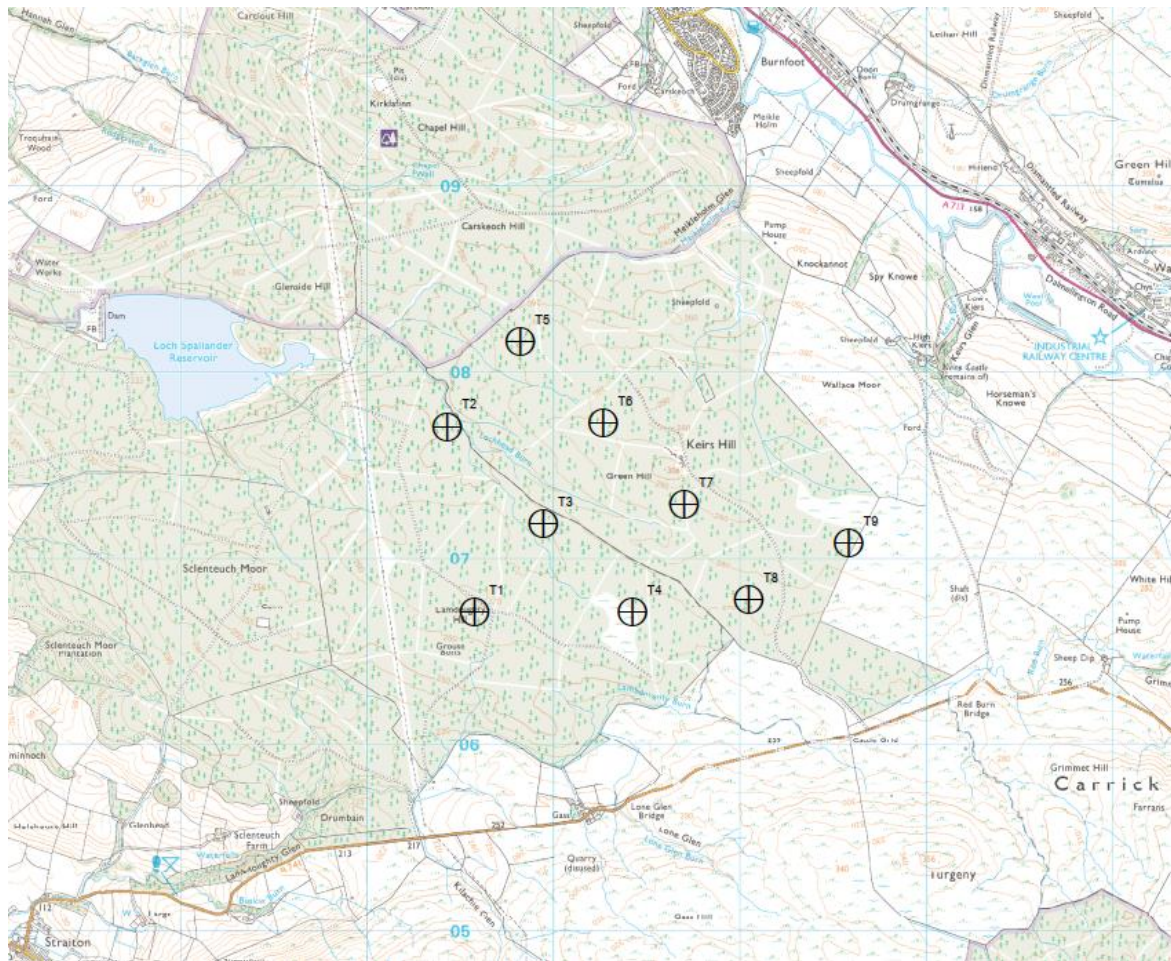


Diagram 3: Scoping Layout 2021 (not to scale)

- 4.1.8 Taking account of relevant guidance, the Proposed Development has been designed to optimise a number of factors including environmental, technical and engineering considerations, and the preferred option is being taken forward.
- 4.1.9 The design aim has been to achieve reduced ornithological and landscape and visual effects whilst achieving an appropriate landscape fit, and avoiding areas constrained by other environmental considerations such as ecology, geology, hydrology and archaeology.
- 4.1.10 The EIAR outlines in extensive detail how environmental matters and stakeholder feedback have influenced the process, however particularly prominent issues which affected the design include:
- maintaining the separation of the Proposed Development from the designed gardens and landscape at Blairquhan, as per Keirs Hill Wind Farm application;
 - limited visibility of the Proposed Development from Craigengillan Estate to the south; and

- limited visibility of the Proposed Development from the Scottish Dark Skies Observatory located to the south.

4.1.11 The turbine height will allow for the replanting of the commercial forestry plantation across the majority of the Proposed Development Area.

4.1.12 Ancillary infrastructure, both permanent and temporary, has been carefully sited to respect logistical, economic, visual and other environmental sensitivities.



Diagram 4: Wind Turbine Erection at Blary Hill Wind Farm

4.2 Planning Policy

Design consideration

4.2.1 According to Scottish Planning Policy criteria, the eastern portion of the Proposed Development Area falls predominantly within Scottish Planning Policy (SPP) Group 2 'Areas of Significant Protection' on account of its proximity to the defined settlement boundaries for Patna and Waterside. The western portion is located mostly in an 'Area with Potential for Wind Farm Development' (Group 3) with pockets of land categorised as 'Areas of Significant Protection' (Group 2) owing to the mapped presence of carbon rich soils/deep peat. These were taken into account in the design process and avoided as much as possible (see EIAR

Figure 9.2 for example). Those parts of the site which fall within Group 2 due to the strategic identification of carbon rich soils have been found after further assessment not to be carbon rich soils. Therefore, the Proposed Development has strategic support in this regard from SPP.

Policy Context

International climate policy

- 4.2.2 Nations including the UK signed the Paris Agreement in April 2016 to make the global plan to limit global warming below 2 °C legally binding and entered into force in November 2016. In addition to the target of keeping global warming below 2 °C of pre-industrial levels, there is a commitment to pursue efforts to limit the temperature increase to 1.5 °C, The UK hosted the UN’s Conference of Parties climate summit (‘COP26’) summit in November 2021 which was an opportunity to demonstrate the UK’s climate leadership and provide clear milestones for the next steps in the UK’s emission targets climate adaptations, as well as to push forward international commitments.
- 4.2.3 COP26 finalised the Paris agreement with nearly 200 countries agreeing to the ‘Glasgow Climate Pact’, which committed to the 1.5 °C target and resolved a number of important outstanding elements of the Paris Agreement.

Domestic climate policy

- 4.2.4 The Scottish Government is a devolved administration and is responsible for climate change and energy issues in Scotland. In line with the UK’s agreement with the Kyoto Protocol and the Paris Agreement, the Scottish Government brought into force:
- The Climate Change (Scotland) Act 2009;
 - The Scottish Energy Strategy 2017; and
 - The Scottish Onshore Wind Energy Policy Statement 2017.
- 4.2.5 The Scottish Energy Strategy includes the aim to meet 50% of Scotland’s whole energy demand from renewables by 2030.
- 4.2.6 The document outlines a vision to drive Scottish Energy Production for 2050 and stresses the importance of renewable energy in achieving a low carbon economy in Scotland.
- 4.2.7 More explicitly the Scottish Onshore Wind Energy Policy Statement sets out the role of onshore wind in meeting these targets. The Scottish Onshore Wind Policy

Statement is being reassessed at present and undergoing consultation to update and produce a draft in 2022.

- 4.2.8 Since the publication of these landmark documents, considerable additional weight has been afforded to the matters raised by them through the publication of amongst other things:
- The Climate Change Plan 2018 (and 2020 update)
 - The Climate Change (Emissions Reduction Targets) (Scotland) Act 2019 setting the target for net zero carbon emissions by 2045
 - Net Zero - The UK's Contribution to Stopping Global Warming 2019
 - Climate Emergency: Scotland
 - Reducing emissions in Scotland Progress Report to Parliament Committee on Climate Change October 2020
 - Protecting Scotland, Renewing Scotland: The Government's Programme for Scotland 2020-2021
 - The Sixth Carbon Budget, Climate Change Committee, December 2020
- 4.2.9 In August 2021, the Scottish Government and the Scottish Green Party Parliamentary Group created a shared draft policy programme - the Bute House Agreement - that would see the parties working together to achieve objectives relating to the climate emergency over the next five years. It details commitments to investing at least £1.8 billion over this period in energy efficiency and renewable heating and creating a bigger focus on green jobs.
- 4.2.10 These documents are the main drivers in steering Scotland towards a low-carbon economy and meeting international targets on climate change and renewable energy generation.

Planning policy

- 4.2.11 The Planning etc. (Scotland) Act 2006 amended the 1997 Act to put National Planning Framework on a statutory footing. The current edition, the third edition ('NPF3'), was published in June 2014¹. It sets out a strategy for Scotland's development over the next 20 to 30 years, providing a national context for development plans and planning decisions, to inform wider programmes of government, public agencies and local authorities.
- 4.2.12 NPF3 confirms the importance of renewable energy to Scotland's energy mix and highlights upgrades to the electricity transmission system infrastructure that are needed to facilitate this development. The vision for Scotland portrayed in NPF3 is that of a successful, sustainable place, a low-carbon place, a natural resilient

¹ Available at: <http://www.gov.scot/Resource/0045/00453683.pdf> (last accessed 24/05/2022).

place and a connected place. These visions put emphasis on the aspirations of Scotland being a leader in low-carbon energy generation, both onshore and offshore, to create a more energy efficient economy with fewer greenhouse gas emissions. The target is to generate the equivalent of Scotland’s gross annual electricity consumption from renewable sources by 2020. The 2015 target of 50% was exceeded and recent data has stated that renewable electricity generation has risen from 90% in 2019 and is now equivalent to approximately 97% of Scotland’s gross electricity consumption in 2020².

- 4.2.13 Preparation of NPF4 has been delayed by the impacts of COVID-19 but is underway and whilst it may not be published before the application for the Proposed Development is determined it may be relevant and still hold some weight as a relevant consideration, depending upon the stage reached.
- 4.2.14 Finally, both East Ayrshire and South Ayrshire councils have developed strategies to reduce greenhouse gas emissions and improving, protecting and enhancing the local environments^{3,4}



Diagram 5: Glenchamber Wind Farm

4.3 Wind Resource

- 4.3.1 Wind speed measurements using temporary anemometer masts have been recorded for the Proposed Development. With the relatively high wind speeds recorded, the Applicant is confident that the Proposed Development can

² Available at: <https://www.scottishrenewables.com/our-industry/statistics> (last accessed 24/05/2022)

³ South Ayrshire Council Sustainable Development and Climate Change Strategy, 2019

⁴ East Ayrshire Council State of the Environment Report, 2019

generate renewable electricity at this site on an economically viable basis. The anticipated capacity factor at Scienteuch is 31.16 %, which compares favourably to the UK average figure for onshore wind of 26.45 %⁵. Capacity factors are a ratio used in the electricity industry to express the actual electrical output of a power plant compared to its theoretical maximum over a given period (typically a year) and is used to make comparisons of the relative efficiencies of different facets of the same technology (e.g. location or turbine model for onshore wind) or comparing different types of power generating technology.

4.4 Grid Connection

4.4.1 The expected point of connection for the Proposed Development into the electricity grid system is at the substation compound. The Proposed Development would most likely be connected at Coylton Substation, a substation located approximately 13 km north of the Proposed Development. The connection would be comprised of buried 132 kV cables and/or OHL. The exact arrangement of this grid connection is subject to detailed design by Scottish Power Transmission, the Transmission Operator (TO). To confirm the Applicant has made an application to the TO for an offer of grid connection.

4.5 Summary

4.5.1 The Proposed Development has been located in a suitable area for wind farm development following a site selection process. The rigorous design evolution has taken place over several years through many changes which have reacted to environmental data gathered on the site, new policies, market dynamics and consultee responses. Through balancing the various site constraints with the scale of development required to be economically viable, the Applicant believes that the Proposed Development provides optimum use of the Proposed Development Area with respect to the potential renewable electricity generating capacity balanced against the potential environmental and other effects.

4.5.2 This section of the NTS has addressed the requirement of Regulation 5(2)(d) of the EIA Regulations in considering reasonable alternatives.

⁵ <https://www.gov.uk/government/statistics/energy-trends-section-6-renewables>

5 Potential Effects and Mitigation

5.1.1 This section of the NTS presents the potential significant effects of the Proposed Development and the measures taken or put forward to reduce the potential significant effects identified (mitigation). In doing so, it addresses Regulation 5(2)(b) and 5(2)(c) of the EIA Regulations.

5.1 Landscape and Visual

5.1.2 Landscape and visual considerations were taken on board at an early stage of the project as these were understood to be key to project progression.

5.1.3 During the design process, visibility from residential receptors in the Doon Valley to the east and Girvan Valley to the west was a key design consideration. The turbines were positioned further back from these valleys, including the settlements of Patna, Waterside and Straiton, to reduce their vertical extent. Regard was had to receptors in the wider area, including the designed landscapes at Craigenkillan and Blairquhan, and the Scottish Dark Skies Observatory and Galloway Dark Sky Park to the south.

5.1.4 The number of turbines was also reduced during the design process, using fewer, larger turbines to reduce impacts on views. As part of the final design iteration, the tip heights of several turbines were reduced, in order to limit the visibility of turbines and reduce their apparent scale from the Doon Valley.

5.1.5 Whilst it is noted that opinion on wind farms and their visual effects varies and is subjective, for the purpose of assessment it has been assumed all visual impacts are negative.

5.1.6 of the on-site infrastructure, including the temporary construction compound, substation, control building, and energy storage have been located to avoid proximity to residential receptors. These features avoid ridgelines, steep slopes, and large areas of cut and fill as much as possible, and will be screened by retained forestry around the edge of the Proposed Development Area. The temporary construction related effects are also subject to reinstatement to remove the most detrimental aspects of impact, including replanting of felled forestry.

5.1.7 A reduced lighting scheme limiting the number of turbines with visible aviation warning lights and the type of light to be used has been agreed with the Civil Aviation Authority (CAA) and Defence Infrastructure Organisation (DIO) (see Chapter 15 for proposed scheme).

5.1.8 Chapter 5 considers the Proposed Development’s potential, direct, indirect, cumulative, and residual effects from the Construction and operational phase following the mitigation measures which have been incorporated during the design of the proposed layout.

Table 3: Potentially Significant Landscape and Visual Effects

Impact Upon:	Potential Significant Effect
Landscape Character	During Construction, significant effects on the landscape will be localised to the Proposed Development Area and will be temporary, ceasing after the construction period. During operation, significant effects on the landscape character are predicted to extend across the Proposed Development Area and the immediately surrounding landscape. This includes the forested Scienteuch Moor and Keirs Hill, as well as the Doon Valley between Patna and Waterside, and the eastern fringe of the Girvan Valley. Significant effects on landscape character are not anticipated beyond 2 km from the proposed turbines.
Landscape Designations	Significant effects on landscape character will occur within locally designated landscapes: within a small part of the Doon Valley Special Landscape Area (SLA); and within a very small part of the Water of Girvan Valley Local Landscape Area (LLA). It is concluded that the Proposed Development will not significantly affect the special qualities of these designated landscapes, and will not affect their overall integrity.
Visual Amenity	Sixteen representative viewpoints were examined to inform the assessment of effects on views, and significant effects were predicted at nine of these. Significant effects are predicted for sensitive receptors up to 7 km from the Proposed Development. The greatest effects are predicted from the closest viewpoints and from surrounding elevated viewpoints where the whole of the Proposed Development will be visible. More screened views from within the Doon Valley will be affected to a lesser extent, although high sensitivity receptors in and around Waterside and Patna will experience moderate and significant effects. There may be moderate and significant effects on specific views from within other settlements, such as Dalmellington, but overall effects on views from this and other settlements are not predicted to be significant. Moderate and significant effects are predicted for users of local minor roads, the B741, and local core paths within the Doon Valley and Girvan Valley, where these have clear views of the Proposed Development. Effects on views from the other viewpoints examined are not predicted to be significant. This is due either to the screening effect of topography (e.g. views from Straiton or the A713) or due to the distance to the Proposed Development (e.g. views from Cornish Hill and the Southern Uplands).
Residential Visual Amenity	A Residential Visual Amenity Assessment (RVAA) was carried out to examine effects on the visual component of overall residential amenity. Although receptors at a number of locations assessed in the RVAA have the potential to experience a significant visual effect, none of these receptors would be affected to such a degree that their property would be widely regarded as an unattractive place in which to live.
Visual amenity at night due to aviation lighting	No significant effects on landscape character are anticipated as the Proposed Development will introduce lights in an area where other light sources are often visible. Effects on views are considered for a maximum brightness scenario, where lights are at their fullest intensity, and a reduced scenario, where lights are dimmed to 10% intensity during clear

	<p>weather conditions. The latter scenario is considered more likely to be seen by receptors. In addition, the assessment considers mitigation whereby the emitted light reduces with the angle of view. No significant effects were predicted for closer viewpoints in settled areas with established lighting. Significant effects were identified in the context of the darker outlook from Cornish Hill, but only in the less likely maximum brightness scenario. This means that significant effects on views from Cornish Hill and other locations within the Galloway Dark Sky Park and Merrick WLA are unlikely in practice, and would only be experienced by a small number of visual receptors visiting this location at dusk and by night. There will be no visibility of turbine lighting from the location of the Scottish Dark Sky Observatory.</p>
Wild Land	<p>The effects of the proposed Development on the key attributes and qualities of the Merrick Wild Land Area (WLA) were assessed. The WLA is over 12 km from the Proposed Development Area. By day, the Proposed Development will be seen behind an existing wind farm. The WLA's "strong perception of naturalness" may be slightly altered at night due to the introduction of aviation lighting in views to the north. The visibility of existing human development during the day and existing artificial lighting at night results in the effects on the key attributes of the Merrick WLA to be judged as not significant.</p>

5.1.9 Chapter 5 of the LVIA, and the accompanying Technical Appendices, should be referred to for the full detailed assessment of each receptor.

5.2 Cultural Heritage

4.2.15 The potential types of impacts that could result from the Proposed Development can be divided into construction effects and operational effects.

Construction Effects

4.2.16 Construction effect types would mainly consist of partial or total removal of heritage assets, recorded or unrecorded, through groundworks (permanent or temporary), disturbance and/or compaction of archaeological deposits by construction traffic and structures. The physical construction effects would in general be permanent and irreversible.

4.2.17 A single recorded heritage asset has the potential to be impacted by the Proposed Development. This consists of post-medieval drainage ditches and banks (Asset 1 - see figure 6.1 of EIAR). The given location of this asset intersects with the area of a borrow pit search area. The current record is relatively imprecisely located. The asset is assessed to be of negligible value. If the entire asset was removed by quarrying, the magnitude of impact would be high, resulting in an adverse significance of effect of very slight significance.

4.2.18 Asset 14 (see figure 6.1 of EIAR) is a small enclosure of unknown date, probably relating to post-medieval sheep rearing activity in the area, but potentially the remains of an older asset. While this asset is not in the footprint of the proposed

development, it is close to the proposed crane hardstanding at Turbine 9. Preventative mitigation in the form of fencing is therefore proposed to ensure there will be no construction impacts.

Operational Effects

- 4.2.19 None of the operational effects have been assessed to be significant in EIA terms. The assessed operational effects range between none and minor significance.
- 4.2.20 Chapter 6 of the EIAR should be referred to for the full detailed assessment of each asset.

Mitigation and Residual Effects

- 4.2.21 No significant construction effects are predicted to occur. The limited non-significant potential construction effects can be mitigated through the fencing off of Asset 14 prior to construction activity to avoid accidental damage. Potential impacts on Asset 1 can be either avoided through initial investigations to establish the extent of the asset and fencing off to avoid impacts, or through a programme of investigation and mitigation through a watching brief or strip map and sample programme as deemed appropriate.
- 4.2.22 The precise programme of mitigation would be agreed with West of Scotland Archaeology Service (WoSAS) as the local authority archaeological advisers and recorded in a Written Scheme of Investigation (WSI) that would lay out the methods and standards of investigation and reporting to be adhered to.
- 4.2.23 No additional mitigation is proposed for operational effects beyond the mitigation through the iterative design process to reduce intervisibility with heritage assets where possible.
- 4.2.24 Mitigation of the potential impacts on Asset 1 through a programme of archaeological investigation would provide information on the nature of the archaeological remains and enhance local archaeological knowledge, specifically with regard to post-medieval upland rural settlement. This would reduce the impact to an effect of **negligible** significance .
- 4.2.25 The protective measures proposed for Asset 14 would prevent accidental impacts on the asset, ensuring **no** effects.

5.3 Ecology and Ornithology

- 5.3.1 The Proposed Development is not located within any ecological or ornithological designation. Assessments of the relevant potential effects upon ecology and ornithology are presented in Chapters 7 and 8 of the EIAR respectively. The Proposed Development is assessed to **not have any significant effects** in this regard.
- 5.3.2 Whilst there are no significant effects predicted, additional controls will be put in place during the construction phases and will be detailed in the Construction Environment Management Plan (CEMP) and Species Protection Plan. The detailed measures will be implemented during construction to protect species in the Proposed Development Area and an Environmental Clerk of Works (ECoW) will be appointed to monitor adherence to such plans.
- 5.3.3 In addition, further mitigation in the form of a Water Quality and Fish Monitoring Plan (WQFMP) to monitor fish and freshwater pearl mussel (FWPM) are proposed for the Proposed Development Area.

5.4 Geology, Hydrology and Hydrogeology

- 5.4.1 Scottish Water, SEPA, NatureScot, East and South Ayrshire Council and other engaged stakeholders have been consulted during the EIA and their guidance used in designing the layout to protect watercourses from disturbance and potential effects on water quality during construction and operation.
- 5.4.2 Good Practice Measures during construction, adherence to the final CEMP and the included water monitoring programme agreed the local planning authorities (LPAs) in consultation with SEPA, NatureScot and Ayrshire Rivers Trust as well as appointment of an ECoW have been considered as embedded mitigation. As a result of the proposed Good Practice Measures the Proposed Development does not have a significant effect on soils, geology, and water.
- 5.4.3 The location of private water supplies have been confirmed and none of the Proposed Development is in the water catchments to these. It has also been shown that there are no designated sites near the Proposed Development that are hydraulically connected to the Proposed Development. Potential GWDTE has been identified and the source of water that sustains this habitat has been confirmed as surface water, not ground water.

- 5.4.4 It has been proposed in the final CEMP that a programme of water monitoring is undertaken prior to any construction activity and during construction of the Proposed Development. It is expected that the monitoring programme would be agreed with the LPAs in consultation with SEPA, NatureScot and Ayrshire Rivers Trust and would include monitoring watercourses within and downstream of the Proposed Development.
- 5.4.5 The performance of the good practice measures would be kept under constant review by the water monitoring programme, based on a comparison of data taken during construction with a baseline data set, sampled prior to the construction period.
- 5.4.6 An assessment of the hydrological elements is provided in Chapter 9 of the EIAR.

5.5 Forestry

- 5.5.1 The Forestry Study Area (FSA) extends to approximately 650.1 ha and comprises of privately owned and managed woodlands within the Proposed Development Area.
- 5.5.2 Felling would be advanced on 113.5 ha for construction of the Proposed Development.
- 5.5.3 The species composition of the forest would change as a result of the Proposed Development forestry proposals. In particular, the area of conifer woodland would decrease by 52 ha.
- 5.5.4 The area of unplanted ground would increase and, as a result, there would be a net loss of woodland area of 57.1 ha.
- 5.5.5 In order to comply with the Scottish Government's Control of Woodland Removal Policy, compensatory planting would be required to mitigate for the loss of woodland area (57.1 ha). The Applicant is committed to providing appropriate compensation to replace loss of woodland area in terms of the relevant policy requirements as applicable at this time. The extent of such planting to be agreed with Scottish Forestry (SF), considering any revision to the felling and restocking plans prior to the commencement of construction.

5.6 Access, Transport and Traffic



Diagram 6: Wind Turbine Blade Transport (Solwaybank Wind Farm)

- 5.6.1 The Proposed Development will be accessed directly from the A713 via a new site entrance near Waterside. The new site entrance will be designed to accommodate deliveries for wind farm components and infrastructure. However, until the new site entrance from A713 and access track are constructed, initial construction access to the Proposed Development will be primarily taken via the B741 onto the existing track into High Keirs Forest. Once the access track and site entrance from the A713 are constructed, construction access will be switched to via the A713.
- 5.6.2 A Traffic Management Plan (TMP) would be prepared for Abnormal Indivisible Loads (AIL) traffic movement only, with consultation undertaken with relevant road authorities and police to minimise the effects on local and trunk road networks.

5.6.3 The assessment of potential effects upon traffic and transport is provided in Chapter 11 of the EIAR. It concluded that there would be a temporary increase in traffic volume due to additional construction traffic movements associated with the Proposed Development and no significant capacity issues are expected. However, the assessment of significance suggests that Core Path Users would experience significant effects, prior to the application of mitigation measures.

5.6.4 With the implementation of appropriate mitigation, no significant residual effects are anticipated in respect of traffic and transport issues. The residual effects are all assessed to be slight or insignificant but as they will occur during construction phase only, they are temporary and reversible.

5.7 Noise and Vibration

5.7.1 The acoustic impact for the operation of the Proposed Development on nearby residential properties has been assessed in accordance with the guidance on wind farm noise as issued in the DTI publication “The Assessment and Rating of Noise from Wind Farms”, otherwise known as ETSU-R-97, and Institute of Acoustics Good Practice Guide (IoA GPG), as recommended for use by relevant planning policy.

5.7.2 To establish baseline conditions, background noise surveys were carried out at six nearby properties and the measured background noise levels used to determine appropriate noise limits, as specified by ETSU-R-97 and the IoA GPG.

5.7.3 Operational noise levels were predicted using a noise propagation model, the layout of the Proposed Development, terrain data and assumed turbine emission data. The predicted noise levels are within noise limits derived in accordance with ETSU-R-97 at all properties at all considered wind speeds when the Proposed Development is considered on its own.

5.7.4 A construction noise assessment carried out in accordance with BS 52281:2009 “Noise control on construction and open sites Part 1 Noise” found that construction noise levels are predicted to temporarily exceed construction noise criteria at nearby properties although appropriate mitigation measures have been identified.

5.7.5 Vibration and air overpressure due to blasting are not expected to have a significant impact on nearby residents should the mitigation measures described within chapter 12 of the EIAR be adopted.

- 5.7.6 A cumulative operational noise assessment was completed to determine the potential impact of the Proposed Development alongside the existing Dersalloch Wind Farm. The predicted noise levels are within noise limits derived in accordance with ETSU-R-97 at all properties at all considered wind speeds.
- 5.7.7 The potential impact of the Proposed Development, along with the mitigation proposed and any residual impact, is summarised in Table 4.

Table 4: Summary of Potential Impacts, Mitigation and Residual Impacts

Potential Impact	Mitigation Proposed	Means of Implementation	Outcome/ Residual Impact
Operation			
Potential impact on residential amenity due to operational noise	Impact is deemed to be acceptable as wind farm meets noise limits specified by relevant guidance both alone and in the cumulative scenario No mitigation measures are required due to absence of identified significant effect	Not applicable	Not significant
Construction			
Potential for noise to be created during general construction activities and by construction traffic	Due regard for 'best practicable means' (defined by Section 72 of the Control of Pollution Act 1974) A range of noise mitigation measures are proposed for the construction phase in accordance with measures outlined in BS 5228-1:2009 Site operations to be limited to 0700-1900 Monday to Saturday (except during turbine erection and commissioning/periods of emergency work)	Noise mitigation measures would be implemented as part of the Construction and Environmental Management Plan which would be required to be agreed as a condition of consent	Not significant
Decommissioning			
Potential noise from Proposed Development decommissioning activities	General best practice measures of reducing noise, employed during the construction phase, would be adopted as precaution	A Decommissioning and Restoration Plan would be submitted for approval no later than twelve months prior to the final	Not significant

		decommissioning of the wind farm.	
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5.8 Socioeconomic, Tourism and Recreation

- 5.8.1 In terms of development and construction impact, of the £81.4 million wind farm development and construction value, there is potential for £9.6 million to benefit the local economy and £30.4 million to benefit the Scottish economy. Applying industry assumption provides an estimate on the level of development and construction employment at the Scottish level for the wind farm development as 232 jobs contributing £14.3 million in Gross Value Added (GVA). At the local level, the development and construction phase of the Proposed Development could sustain up to 72 jobs and contribute £4.4 million in GVA.
- 5.8.2 The operation and maintenance phase is also expected to generate economic impacts. Applying the data from the RenewableUK research to the Proposed Development (54 MW) provides an estimate of the turnover in the UK associated with the Proposed Development during the operations and maintenance stage, £2.8 million. Of this, £1.4 million could benefit the local economy and £1.9 million could be injected into the Scottish economy on an annual basis. Applying the industry assumptions gives the level of operational employment at the Scottish level for the Proposed Development as 15, contributing £806k GVA per annum. At the local level, the operation and maintenance phase of the Proposed Development is expected to sustain 11 jobs, contributing £584k in GVA per annum.
- 5.8.3 These direct economic benefits should be set against the challenging socio-economic conditions in East Ayrshire and South Ayrshire from underlying structural weaknesses. Per capita output in 2019, measured by GVA per head of population at basic current prices) for East Ayrshire and North Ayrshire mainland⁶ is 54% of the UK level and for South Ayrshire, 74% of the UK level. The local area of East Ayrshire and South Ayrshire also has higher levels of employment in comparison to the Scottish average. In addition, the Gross Disposable Income per head was lower than the Scottish levels with East Ayrshire, in particular, having the second lowest in the Glasgow and Strathclyde region and third lowest overall across Scotland as a whole.

⁶ Due to data availability, East Ayrshire and North Ayrshire mainland statistics were used.

- 5.8.4 Within the context of Environmental Impact Assessment legislation, none of the economic impacts considered is significant.
- 5.8.5 In addition to the stated economic opportunities from the development, construction and operation phases, there is also a variety of wider economic impacts which are excluded from the construction, development and operational economic assessment. The wider impacts which should also be noted as having positive effects on the regional and national economies include:
- *Supporting policy objectives:* the Proposed Development can play an important role in supporting regional and national policy objectives. It will create more green jobs which are at the heart of the Scottish Government’s plans for a fair, resilient and green economic recovery as stated in Scotland’s Energy Strategy Position Statement. In addition, the Proposed Development will contribute to the continued growth of Scotland’s renewable energy industry which is fundamental to enabling the transition to net zero. For the local policy strategies, East Ayrshire set out key focus areas in its local development plan to include renewable energy and energy efficiency measures in efforts to take a more sustainable approach to development activity in East Ayrshire. Furthermore, South Ayrshire’s local development plan states that local benefits arising from wind farms can be important to the economic future of rural communities;
 - *Local supply chain opportunities:* the research carried out by RenewableUK which estimated that the expenditure of workers who visit the local area benefit the accommodation and food service sector to the value of around £7,500 per MW constructed. The wider ‘knock-on’ effects can in turn support the supply chain of other activities such as the spending habits of retail operations and accommodation providers;
 - *Income effects:* the economic analysis has focused on the GVA impact of generated employment as this is the ‘real’ impact on the economy. However, it is worth noting that new employment will generate additional wages and salaries, much of which will be spent in the UK; and
 - *Community benefit funds:* the Applicant has offered to create a walking and nature trail increasing the routes for visitors and tourists to use for outdoor pursuits. In addition, the Applicant is also offering to provide a tailored local benefit package as part of the proposal.

- 5.8.6 In terms of tourism effects, the literature review of secondary review indicates that wind farms have a minor impact on visitor activity. Recent studies from 2017 on wind farms and tourism trends (BiGGAR Economics) determined that the number of wind farms increased across almost all local authority areas while employment in sustainable tourism also grew substantially. The study found no correlation between tourism employment and the number of turbines at the national or local authority area.
- 5.8.7 More recent research published in 2021 on the economic impact of wind farms on tourism (BiGGAR Economics) analysed trends at the local authority area and found no relationship between the growth in the number of turbines and the level of tourism employment. In addition, the analysis found that tourism related employment in the vicinity of wind farms had outperformed the trend for Scotland as a whole and for the local authority area in which the wind farm was based.
- 5.8.8 A national tracker survey published in 2021 also outlined that support for renewable energy had been consistently high with 87% expressing support for the use of renewables with the opposition being very low at 1%.
- 5.8.9 The tourism baseline indicates that although East Ayrshire and South Ayrshire are popular tourism destinations, the local area does not contain a high number of bed spaces, which suggests it is more of a day visit location and more reliant on passing trade.



Diagram 7: Glenchamber Wind Farm

- 5.8.10 The assessment has considered the impact on baseline conditions of tourism and recreational assets arising from the Proposed Development. The findings from this assessment conclude that the likelihood for potential negative impacts of the Proposed Development on tourism and recreational assets is considered to be low.
- 5.8.11 Several of the core paths around Straiton, Doon Valley and A713 (Galloway Tourist Route) have been assessed as having a moderate effect however this effect will only be experienced in short sections along the routes. The assessment does not consider that these effects from the Proposed Development are sufficiently adverse enough to deter a significant number of visitors away from these particular assets and as such, the Proposed Development is not likely to have any detrimental significant impacts on visitor numbers or the visitor economy.
- 5.8.12 Any potential negative impacts on tourism are likely going to be far outweighed by the wider positive benefits for the local area and Scotland as a whole in terms of employment opportunities, enhanced access and investment into the area and contributions toward achieving renewable energy generation targets and Net Zero.

5.9 Air Quality and Climate Impact

- 5.9.1 The air quality of the Proposed Development Area is expected to be good due to the rural location, with few pollution sources. During construction of the Proposed Development, the increased traffic flow on local roads and construction plant would generate exhaust emissions. However, given the short-term nature of the construction period and limited area to be developed, effects on air quality are likely to be negligible. During dry spells, construction activities have the potential to generate dust, which may adversely affect local air quality. Given the scale and nature of construction activities and given the distance between construction areas and the nearest residential properties, it is considered that dust from construction is unlikely to cause a nuisance or cause significant effect upon local air quality.
- 5.9.2 An operational wind farm produces no notable atmospheric emissions. The operation of the Proposed Development would therefore have no discernible adverse effects on local or national air quality.

- 5.9.3 The results of the Climate Impact Assessment (Chapter 14) reveal that the net impact of the Proposed Development at Scienteuch will be positive overall.
- 5.9.4 Peatland is an important carbon store and the Proposed Development will have an impact on on-site peatlands, despite mitigations proposed to limit disturbance to peat and bog habitats. A carbon balance assessment report has been produced and SEPA's Carbon Calculator completed to determine the carbon payback time for the Proposed Development (see EIAR chapter 14 for full details). The results from the carbon calculator reveal that the net impact of the Proposed Development will be positive overall, as over a 50-year lifespan of the Proposed Development, it is expected to generate over 47 years' worth of clean energy if it replaced fossil fuel-mix electricity generation and nearly 46 years' worth of clean energy even if it replaces cleaner grid-mix electricity generation.
- 5.9.5 In addition, over the expected 47 years that the wind farm is likely to be generating carbon-free electricity, this could result in over 3.1 million tonnes⁷ of net CO₂ emission savings when replacing fossil fuel-mix electricity generation. Since the negative payback period represents approximately 6.0 % (3 years) of the operational period (50 years) and the positive contribution is 94% (47 years), it is possible to conclude that the positive contribution is statistically significant. The Proposed Development therefore illustrates a significantly **positive** net impact in terms of its contribution towards the reduction of greenhouse gas emissions from energy production.

⁷ Calculation is 47 years x 66,330 tCO₂ (as shown in Table 14.6 of EIAR and online submission).



Diagram 8: Aerial of Battery Energy Storage System (BESS) at Broxburn Wind Farm by Keith Arkins

5.10 Aviation & Radar

- 5.10.1 The potential effects upon aviation are assessed in Chapter 15 of the EIAR. The Civil Aviation Authority (CAA) requires any structure equal to and taller than 150 m in height to be fitted with visible aviation warning lighting. The CAA has been consulted and a lighting scheme agreed.
- 5.10.2 Under the usual planning conditions expected in the consent, if granted, the Ministry of Defence (MOD) would be informed of the dates of commencement, completion, final turbine locations and heights. In addition, infrared lighting will be agreed with the Defence Infrastructure Organisation (DIO) for the MOD low flying requirements.

- 5.10.3 Proposed Development will potentially impact the Glasgow Prestwick Airport (GPA) primary radar, Instrument Flight Procedure (IFPs) and VHF Communications and the NATS En-Route Ltd (NERL) Lowther Hill radar. A Radar Mitigation Scheme will be agreed by the Applicant and NATS to address the effects of the Proposed Development on these radars.
- 5.10.4 In summary, it is concluded in the EIAR that with this mitigation in place there are **no significant residual effects** from the Proposed Development upon aviation interests.

5.11 Public Rights of Way

- 5.11.1 The Proposed Development has been designed to ensure a safe passage across the Proposed Development Area is maintained. The Straiton to Patna Hill Track (SKC11) right of way passes through the western edge of the Proposed Development Area. The Proposed Development does not intersect the right of way. The nearest section of proposed infrastructure is approximately 370 m from the right of way and the nearest proposed wind turbine is approximately 520m from the right of way.
- 5.11.2 Although members of the public have the right to roam land in Scotland under the Land Reform (Scotland) Act 2003 there will be restricted access during the construction phase for Health & Safety purposes. It is expected that the Proposed Development Area will be managed during the construction phase under the Construction (Design and Management) Regulations 2015. It is proposed that a Path Management Plan is included in the CEMP and is discussed further in Chapter 11: Transport & Traffic.
- 5.11.3 The potential risk to members of the public or staff arising from safety matters related to the Proposed Development is low and will be minimised through the construction phase through the CEMP. The ongoing maintenance regime and meteorological monitoring throughout the operational life of the Proposed Development, alongside provision of public notices about potential hazards and risks on-site, will further help to minimise ongoing safety risks through the Proposed Development's operational life.
- 5.11.4 There are no direct adverse effects upon public rights of way or to the Applicant's proposed additional and improved public access to the Proposed Development Area. Paths would be appropriately managed during construction for health and safety purposes.

5.12 Telecommunications Networks

- 5.12.1 Telecommunications and broadcasting network operators were consulted during the scoping exercise. Openreach responded to confirm that the Proposed Development should not cause interference to BT's current and presently planned radio network. The Joint Radio Company Limited did not respond to scoping, however a search on the Ofcom Spectrum Information Portal has not identified any links that would be affected. It is acknowledged that the wind turbine layout has changed since scoping however from information gained these particular assets do not feature within the Proposed Development Area and therefore it is expected that these stakeholders will remain unaffected.
- 5.12.2 Airwave Solutions Limited and Vodafone were also consulted on the potential effects the Proposed Development layout may have on their networks. The Applicant received confirmation that the Proposed Development was unlikely to cause any interference.
- 5.12.3 With the information available to the Applicant, the Proposed Development does not directly affect microwave fixed links and the potential effect on microwave fixed links is not significant. Pre-construction checks would be undertaken to ensure this still remains the case nearer the time of construction.

5.13 Shadow Flicker

- 5.13.1 Wind turbines are tall structures which can cast long shadows when the sun is low in the sky. Under certain conditions (e.g. clear skies, enough wind for the turbines to be rotating and a low angle of the sun in the sky), residents of properties close to a wind farm could experience a phenomenon commonly known as "shadow flicker", where the rotating turbine blades pass between the sun and the observer creating an intermittent shadow through window openings. It is, however, part of the nature of long shadows that they pass any particular point relatively quickly and the effect, if present lasts a short period of time, due to the movement of the sun across the sky. They are generally only observed in the period after dawn and before sunset as the sun is rising and setting.

- 5.13.2 In the event of shadow flicker causing a nuisance, a range of mitigation measures could be incorporated at the operational phase of the Proposed Development to reduce the instance of shadow flicker. Mitigation measures include planting tree belts between the affected residential property and the responsible wind turbine(s), installing blinds at the affected residential property or shutting down individual wind turbines during periods when shadow flicker could occur.
- 5.13.3 There are 5 occupied and 74 consented properties within 10 rotor diameters that may potentially experience shadow flicker from the Proposed Development, none of which have financial interest with the Proposed Development. It is therefore concluded that the Proposed Development would not cause a significant effect upon amenity due to shadow flicker.



Diagram 9: Glenchamber Wind Farm

6 Conclusion

- 6.1.1 This document has provided a non-technical summary of the Proposed Development, which is assessed in greater detail throughout the EIAR. It has presented the information required of the EIA Regulations in a manner that can be readily understood.

- 6.1.2 The Proposed Development has been located in a suitable area for wind farm development following a site selection and design process. The design stages have taken place over several years utilising a number of iterations in response to environmental data, new policies, market dynamics and consultee responses. Through balancing the various site constraints with the scale of development required to be economically viable, the Applicant considers that the Proposed Development provides the best use of the site with respect to the potential renewable electricity generating capacity balanced against the potential environmental and other effects.
- 6.1.3 The EIAR presents the potential effects of the Proposed Development as well as potential synergistic effects which consider such effects in combination. Following the use of mitigation, potential significant adverse effects are restricted to isolated landscape and visual effects upon limited receptors within close proximity of the Proposed Development.
- 6.1.4 The Applicant has proposed enhancements including habitat management which will restore degraded peat habitat, improve natural flood drainage and improve habitat for some breeding bird species. The Proposed Development will provide socioeconomic benefits through continuing employment opportunities it has already provided at the planning stage throughout the lifetime of the project following consent. The Proposed Development will contribute towards meeting national renewable energy targets and have a significant positive effect on reducing carbon dioxide emissions to help reach the national carbon net zero target.