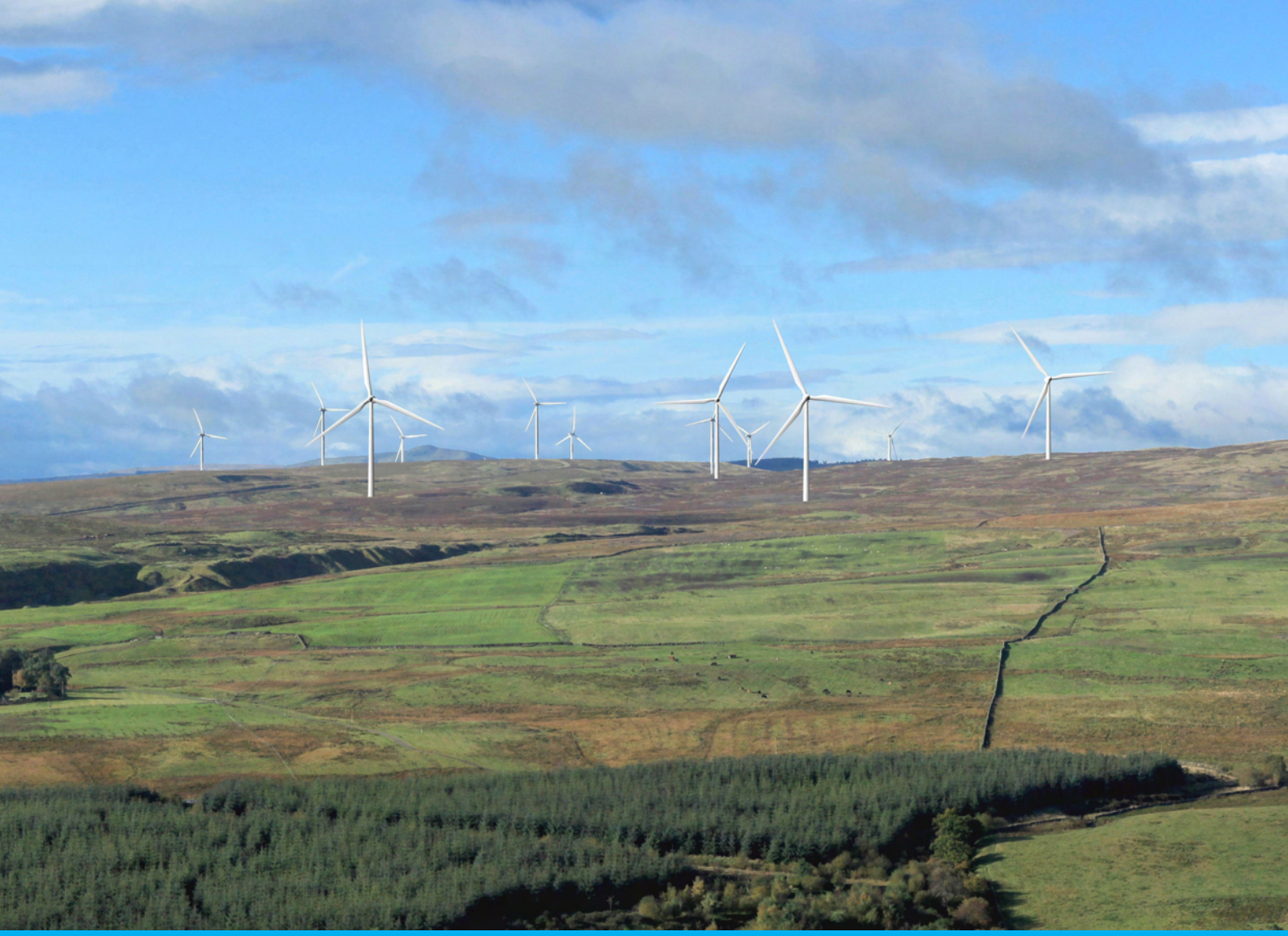

Drummarnock Wind Farm

Volume 1:

Non-Technical Summary

July 2024

Drummarnock Wind Farm Limited

Contents

Contents

Figures

Appendices

None

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Preface

This Non-Technical Summary (NTS) is an overview of the Environmental Impact Assessment Report (EIA Report), undertaken to support an application under the Town and Country Planning (Scotland) Act 1997 (as amended) ('the Planning Act') to develop a wind farm comprising four wind turbines (maximum of 180m tip height) and associated infrastructure known as Drummarnock Wind Farm (the 'Proposed Development').

The Proposed Development will have an indicative maximum electricity export capacity of approximately 30MW.

The Proposed Development Site is located approximately 10km south-west of Stirling, in the Fintry, Gargunnock and Touch Hills.

This application (including the EIA Report and this NTS) has been prepared by Atmos Consulting Ltd on behalf of Drummarnock Wind Farm Limited.

The EIA Report has been produced to provide information on the likely significant environmental effects of the Proposed Development.

The EIA Report includes the following documents:

- Volume 1: Non-Technical Summary;
- Volume 2: EIA Text;
- Volume 3: Technical Appendices; and
- Volume 4: Figures.

Additionally, this application is also supported by a Pre-Application Consultation Report, Design and Access Statement and a Planning Statement.

Electronic copies of the EIA Report are available to view at the following locations:

- On Stirling Council's Planning portal at www.stirling.gov.uk/planning-and-building/planning/; and
- The Applicant's website at www.drummarnockwindfarm.co.uk

The EIA Report can also be purchased from the Applicant (Telephone: +44 (0) 01352 748300/ Email: info@wind2.co.uk) either in electronic or hard copy. Charges for copies are:

Paper copies of the EIA Report (including Supporting Documents and Non-Technical Summary) may be purchased by arrangement from the above address for £1,400 per copy, or free per USB memory stick copy. The price of the paper copy reflects the cost of producing all of the Landscape and Visual photographs at the recommended size.

1 Introduction

Drummarnock Wind Farm Limited ('the Applicant') is seeking planning permission under the Town and Country Planning (Scotland) Act 1997 (as amended) ('the Planning Act') to develop a wind farm consisting up to four wind turbines (of maximum 180m tip height) and associated infrastructure, including a substation and control building, access tracks, turbine foundations and crane hardstandings, underground cabling, borrow pits (for stone extraction) and up to six watercourse crossings (the 'Proposed Development').

The wind turbines have an indicative electricity generation capacity of approximately 30MW for export to the National Grid.

The Scottish Government has set a target of achieving net zero carbon emission by 2045. This target relies on a large increase in renewable energy generation across Scotland and on the Scottish Government's ambitions to secure an additional 8-12 GW of installed onshore wind capacity by 2030, which the Proposed Development would help to achieve.

1.1 The Applicant

The Applicant, Drummarnock Wind Farm Limited, is a subsidiary of EDPR. Drummarnock Wind Farm is being developed by Wind2 on behalf of EDPR.

EDPR is a global leader in the renewable sector and the world's fourth-largest renewable energy producer. EDPR is currently present in the UK and internationally in another 27 markets.

EDPR has personnel based in Edinburgh and, through its joint venture with ENGIE (Ocean Winds), recently completed construction on the 950MW Moray East Offshore Wind Farm, which has the capability of supplying 40% of Scotland's electricity demand. Further information on EDPR can be found on its corporate website at https://www.edpr.co.en.

Wind 2 is a specialist onshore wind farm developer, founded in 2016. The company has staff based in the Highlands, Perth, Edinburgh, as well as Wales and in various locations throughout England, with significant expertise in renewable energy and a track record of successfully developing onshore wind farms throughout the UK.

Wind2 is working on the development of a number of renewable energy projects and is committed to investing in Stirlingshire. Further information on Wind2 can be found on its corporate website at https://wind2.co.uk.

1.2 Land Use

The Proposed Development is located approximately 10km south-west of Stirling, in the Fintry, Gargunnock and Touch Hills (the 'Proposed Development Site'). The Proposed Development Site is centred on National Grid Reference (NGR) (NS 74314 87247), is illustrated in Figure 1 and is located entirely within the boundary of Stirling Council (SC) local authority area.

The land cover within the Proposed Development Site is predominantly marshy grassland in the eastern part, with the western part dominated by a mosaic of blanket bog, shrub heath and unimproved acid grassland.

The Proposed Development Site features several watercourses, including the Loch Coulter Burn, the Bannock Burn and the Buckie Burn. The Proposed Development Site is currently used for livestock grazing, including sheep and cattle, and for occasional grouse shooting.

The settlement pattern in the wider area is characterised by scattered residences and farms with the nearest substantial settlement being the city of Stirling located approximately 4km north-east of the Site boundary at its closest point.

The nearest roads are an unclassified single-track road that runs south-west to north-east adjacent to the north-western boundary of the Site and an unclassified road that runs south-west to north-east adjacent to the south-eastern boundary of the Site. The M9 runs approximately north-south 3km north-east of the Site boundary at its closest point.

The closest commercial scale wind farm to the Site is the operational Craigengelt Wind Farm, located immediately adjacent to the south-west border of the Proposed Development Site. Beyond this, the operational Earlsburn and Kingsburn Wind Farms form a broad cluster between 2km and 7km west/north-west of the Site boundary, as illustrated on Figure 2.

1.3 Previous Application

The site has been subject to a previous planning application for a wind farm development of 11 wind turbines at 125m to tip height and associated infrastructure (Planning Application Reference: 09/00170/FUL), which was submitted to Stirling Council in March 2009 and refused in April 2012. The application was not subject to appeal.

The reasons for refusal focussed on visual effects in relation to the nearby Lewis Hill; visual effects on the setting of Stirling Castle; visual effects relating to cumulative wind energy development and effects on the Kings Yett cairn.

The application boundary for the previous planning application covered the area occupied by the Proposed Development Site but also included land further north, with a total of five turbines located on that land.

The Proposed Development is therefore a significantly smaller scheme than the previous application (albeit with larger turbines), located at a greater distance from the assets listed above. Since the previous application there have also been significant changes to the cumulative context, national and local policy and the declaration of a Climate Emergency by the UK Parliament and the Scottish Government. Stirling Council have also formally recognised the climate emergency.

1.4 Purpose of the EIA Report

The EIA Report presents the findings of the EIA process by identifying, describing and assessing the Proposed Development, the current conditions at the Proposed Development Footprint and the likely significant environmental effects which may result from the Proposed Development.

Where appropriate, measures designed to avoid, reduce or offset potentially significant effects are proposed (mitigation measures) and residual effects (those effects that are expected to remain after mitigation) are described.

The findings and conclusions of the EIA are summarised in this Non-Technical Summary (NTS) which is intended to allow anyone with an interest in the Proposed Development to understand and access information on its potential environmental effects.

1.5 EIA Approach

EIA is a systematic process used to inform consenting authorities of the environmental implications of a development by collecting background information about the existing environment and the determining of the potential effects of the development on the environment. Where significant negative (adverse) effects are identified, reduction of these effects is then sought by changing the design or applying mitigation measures.

The Proposed Development falls under Schedule 2 of the EIA Regulations[1] and an EIA has been undertaken as the Applicant recognises that the Proposed Development could have significant environmental effects.

Consideration has been given to the Pre-application consultation response undertaken with SC in May 2020 (Ref: PREAPP-2020-0093), as outlined in Chapter 2 of the EIA Report. The scope of the EIA was determined through a Scoping Opinion received from SC on 26 October 2020.

1.6 Development Description

1.6.1 Design Evolution

The key constraints assessed during the design and Scoping process include:

- Landscape character and visual amenity;
- Ground conditions, topography and peat;
- Proximity to noise sensitive receptors;
- Presence of watercourses, private water supplies and related infrastructure;
- Presence of sensitive ecology receptors;
- Presence of sensitive cultural heritage features;
- Presence of telecommunication and aviation/radar constraints; and
- Proximity to suitable grid connection.

These constraints are discussed in detail in the relevant chapters of the EIA Report.

Table 3-1 of Chapter 3 Description of Development presents the key design iterations that have taken place including pre-application and scoping layout, interim designs, design chill and design freeze, and the Design Evolution Layouts are shown on Figure 3-2 (a-b).

[1] The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017

1.6.2 The Proposed Development

The Proposed Development would consist of four wind turbines, each with a tip height of up to 180m above ground level (AGL), plus associated infrastructure as illustrated in Figure 3a – 3d.

The associated infrastructure includes:

- New access tracks;
- Construction of turbine foundations, crane hardstandings and storage areas;
- Underground cabling;
- One onsite substation which would accommodate 33KV equipment to collect electricity from the site. The substation compound would include a control and metering building;
- Construction compound;
- Up to four borrow pits; and
- Up to six watercourse crossings.

The wind turbines have an indicative total output of approximately 30MW.

The turbines will be built using standard concrete gravity base foundations, constructed on poured concrete with steel reinforcement depending on detailed geotechnical assessment. To allow the turbines to be installed, a crane hardstanding will be built beside the turbine base.

The Proposed Development includes the provision for 6.59km of new access tracks, which includes two onsite access options (Option A and Option B). However, only one of these onsite access options will be constructed, and therefore of the 6.59km of proposed new tracks, a maximum of up to 5.8km would be constructed, dependent upon the access option utilised. To ensure a robust and conservative assessment, the EIA has assessed the full 6.59km to support the full appraisal of both access options.

Turbine components are expected to be delivered to the port of Grangemouth. The components will be transported by road to the Proposed Development Site access point. The route for delivery of turbine components to the Proposed Development Site is likely to be from Junction 9 of the M9.

The proposed route would take the A872 northbound onto the Pirnhall Road, before passing south over the M9 on the New Line Road, and travelling along approximately 6km of minor roads to reach one of the two points of entries presented in the EIA for the Proposed Development.

Once the turbines have been installed, the access tracks and crane hardstand areas around the turbines will remain in place as permanent infrastructure. The temporary construction compound will be restored.

The Proposed Development includes the use of up to four potential borrow pits for the excavation of on-site aggregate to be used in the construction of the Proposed Development.

The electrical power produced by the individual turbines will be fed to an onsite substation via underground cables or overhead lines. The grid connection will be subject to a separate application, however, connection capacity has been secured.

Dependent on which onsite track option is constructed, up to six new watercourse crossings will be required for the proposed new access tracks within the Proposed Development Site. All watercourse crossings will be designed in accordance with relevant guidance (WAT-SG-25), and designed to accommodate 1 in 200 year events.

The construction of the Proposed Development is anticipated to take approximately 12 months. Construction will take place in accordance with a Construction Environmental Management Plan (CEMP).

An outline CEMP is provided in Appendix 15-1 of the EIA Report. The CEMP will provide the overarching environmental management principles that will be taken forward into all environmental management plans, supporting documents and method statements during the construction phase.

The Proposed Development will have an operational lifespan of 40 years after which it will be decommissioned if no further consents are granted.

1.7 Benefits of the Proposed Development

Once operational, the Proposed Development will generate approximately 91,980 MWh of electricity per year, supporting the realisation of the Scottish Government's ambition for 20 GW of installed onshore wind capacity in the country by 2030.

This will displace an equivalent amount of fossil fuel generated electricity amounting to a reduction in the release of greenhouse gases equal to 19,040 tonnes (CO_2 equivalent) per year.

The Scottish Government's Online Carbon Calculator was used to calculate the carbon payback period for the Proposed Development (online Reference CZS7-1TLY-VOE0 v3). When taking into consideration the potential carbon loss of various construction and operational phases such as peat extraction for access tracks, the Proposed Development is expected to payback the carbon cost in 3.3 years.

The results of the Carbon Calculator are presented in Technical Appendix 13-1 of the EIA Report.

The Applicant is proposing a community benefit package of up to £5,000 per MW per annum over the 40-year life of the Proposed Development, which will equate to £150,000 per annum. While this benefit package is a voluntary contribution by the Applicant, its benefits are not a material planning consideration.

The development of a wind farm is a substantial investment that results in the generation of employment. It is estimated that the Proposed Development will generate up to 34 jobs during the construction phase and up to six jobs per annum during the operation phase, with a likely predicted total GVA of over £2 million during the construction phase and just under £325,000 per annum during the operational phase.

It is likely that the Proposed Development will also have wider beneficial economic effects that are not possible to quantify at this stage. Nevertheless, these would be expected to have positive effects on local, regional and national economies.

2 Planning and Energy Policy

2.1 National Planning Policy

The Proposed Development takes into account national planning policy, specifically:

National Planning Framework 4 (NPF4)

NPF4 was adopted by the Scottish Government on 13th February 2023. It sets out the principles for spatial development, defines national developments and regional priorities and sets out national planning policy.

NPF4 sets out significant and increased emphasis on the climate change and net zero agenda to bring together cross-cutting priorities and achieve sustainable development through three key themes: sustainable places, liveable places and productive places.

In terms of renewable energy generation, NPF4 (Annex B – National Developments of Need) states that:

> *"A large and rapid increase in electricity generation from renewable sources will be essential for Scotland to meet its net zero emissions targets",* noting that*:*
>
> *"Additional electricity generation from renewables and electricity transmission capacity of scale is fundamental to achieving a net zero economy and supports improved network resilience in rural and island areas".*

2.2 Local Planning Policy

The Local Development Plan for the Proposed Development comprises NPF4 and the following:

- SC LDP (Adopted 2018); and
- Relevant supplementary guidance, including the SC Supplementary Guidance on Wind Energy Developments (2019).

2.3 Climate Change and Energy Policy

The UK and Scottish Governments and Stirling Council have all declared a Climate Emergency, and climate change has been described as the greatest environmental challenge facing the world today.

Scottish Energy Strategy

The Scottish Energy Strategy (SES): The Future of Energy in Scotland was published in December 2017. The SES sets two new targets for the Scottish energy system by 2030:

- The equivalent of 50% of the energy for Scotland's heat, transport and electricity consumption to be supplied from renewable sources; and
- An increase by 30% in the productivity of energy use across the Scottish economy.

For the longer term the SES states that;

> *"Scotland's long term climate change targets will require the near complete decarbonisation of our energy system by 2050, with renewable energy meeting a significant share of our needs"*

This commitment has been brought forward to 2045 following the Climate Change (Emission Reduction Targets) (Scotland) Act 2019 and noted in Scotland's Energy Position Statement (2021).

Onshore Wind Policy Statement

The Onshore Wind Policy Statement (OnWPS) 2022 (Scottish Government, 2022) was published on 21 December 2022 and outlines the Scottish Government's ambitions for the Onshore Wind Sector, highlighting how these can be delivered. The urgency and relevance of the need to meet Net Zero targets is stressed through the statement that:

> *"We must now go further and faster than before".*

The OnWPS noted Scotland's installed onshore capacity was 8.7GW as of June 2022, and the aim to maintain a supportive policy and regulatory framework, which will enable an increase in renewable energy deployment and the realisation of the overall ambition of 20 GW of installed onshore wind capacity in the country by 2030. In March 2024 Scotland's onshore wind capacity was 9.6GW, as published by the Scottish Government (2024).

The OnWPS identifies the opportunity for wind energy development to contribute significantly to improving biodiversity.

The OnWPS emphasises the Scottish Government's support for: "*all forms of renewable, low-carbon and zero emission technologies*" and clarifies that:

> *"the only areas where wind energy is not supported are National Park and National Scenic Areas. Outside of these areas, the criteria for assessing proposals have been updated, including stronger weight being afforded to the contribution of the development to the climate emergency, as well as community benefits."*

3 Landscape and Visual Impact Assessment

Landscape and Visual Effects are considered in Chapter 5 of the EIA Report.

Landscape character and visual resources are considered to be of importance in their own right and are valued regardless of whether they are seen by people. Effects on views and visual amenity as perceived by people are clearly distinguished from, although closely linked to, effects on landscape character and resources.

The assessment methodology for the assessment has been developed in accordance with the Guidelines for Landscape and Visual Impact Assessment (3rd Edition, 2013) (GLVIA3), and is detailed in Technical Appendix 5-1 LVIA and Visualisation Methodology.

The assessment deals with landscape and visual effects separately, including an assessment of cumulative landscape and visual effects in each relevant section. The baseline for the primary LVIA, against which the effects of the Proposed Development are assessed, includes wind farms which are operational and under construction only.

The cumulative landscape and visual impact assessment (Cumulative LVIA) includes consideration of the Proposed Development in a theoretical future baseline which includes all wind farms within the study area that are operational, under construction, consented and at application stage.

Significant Landscape Effects

Significant effects are predicted on the landscape resource of the Site during construction (Major) and operation (Moderate).

During operation, significant effects on landscape character (Moderate) are predicted for the Lowland Hills (149) Landscape Character Type (LCT) – Central. This is the LCT in which the Proposed Development is located (the 'host' LCT).

Significant effects are predicted from a very localised area around the Site and to the northeast of Craigengelt Wind Farm (extending to the eastern boundary of the host LCT and approximately 4km to the north, in the Touch Hills). In terms of wider effects on the host LCT, these are not judged to be higher than Not Significant (Minor).

Significant effects on landscape character at the Site level are usually unavoidable for wind farm developments. A modest number (four) of further turbines to the northeast of the operational Craigengelt Wind Farm will slightly intensify the landscape effects of turbines over the host LCT.

The existing turbines of Craigengelt Wind Farm have altered the character of the host LCT, and in landscape terms the Proposed Development will generally read as a modest extension to this scheme. As such, landscape effects will not be as great as effects associated with the introduction of a new wind farm in an area which hasn't been subject to development of this type.

No significant effects on other LCTs are predicted.

The Proposed Development is located within the Southern Hills Local Landscape Area (LLA), areas of which have been altered by operational wind farms. Drummarnock will generally be seen as an extension to an operational wind farm in views towards the LLA, this is not judged to significantly alter the overall integrity of the Southern Hills LLA.

Furthermore, the experience of the LLA from large areas of the LLA, to the west of the operational Craignengelt Wind Farm, will not be altered..

Significant Visual Effects

Significant (Moderate and above) effects on views are predicted at five of the 16 representative viewpoints (Viewpoints 1, 2, 3, 4 and 8). The majority of significant visual effects are contained within 6km and represent closer proximity and more open views (Viewpoints 1 to 4).

Viewpoint 8 – Stirling Castle is 8.4km distant and represents a very high sensitivity view, from a nationally important historic visitor attraction. Less sensitive views from Stirling will fall below the threshold of significance.

In general terms the Proposed Development is seen in the context of the operational Craigengelt Wind Farm. In many views, the Proposed Development is largely contained within the horizontal field of view of the operational Craigengelt turbines.

The difference in scale between the operational Craigengelt turbines (8 turbines at 125m to tip) and the proposed turbines (4 turbines at 180m to tip) is notable in certain views. However, this difference in turbine scale does not stop the two schemes generally reading as one wind farm. It is not uncommon for wind farm extensions to utilise advances in turbine technology, and use more efficient and larger turbines, seen next to smaller older turbines.

Significant (Major) effects are also predicted from open sections of the Core Path network, within 4km to the northeast of the Proposed Development. No significant effects from any settlements (overall) are predicted.

Residential Visual Amenity

Effects on residential visual amenity, from the closest properties (within 2.5km) are considered in Technical Appendix 5-2. No properties will be subject to effects which breach the Residential Visual Amenity Threshold.

Aviation Lighting

Landscape and visual effects associated with permanent aviation safety lighting, are considered in Technical Appendix 5-3. A reduced lighting scheme (proposed by Straten CSL) was agreed through consultation with the Civil Aviation Authority. This requires only four hub lights with no intermediate mid tower lights. As a result, significant landscape and visual effects associated with aviation lighting are judged to be limited.

Cumulative Landscape and Visual Assessment Summary

There are many operational wind farms across the landscape of the study area. The number of wind farms will increase should all consented and application stage wind farms be built.

The emerging pattern of wind farms typically sees larger developments located on upland areas. In lowland settled areas, the pattern of wind farm development is more dispersed and smaller scale, associated with industrial areas; rural areas between Edinburgh and Glasgow; or smaller turbines typically associated with farms.

The key cumulative interactions between the Proposed Development and other wind farms is typically with the closest groups of wind farms, in the Gargunnock and Touch

Hills. These include the operational Craigengelt, to the immediate southwest of the Site; and the operational Earlsburn and Kingsburn, which extends with the consented Shelloch and application stage Earlsburn Extension in a theoretical future cumulative baseline.

Wind farm groups in the Ochil Hills and rural areas between Edinburgh and Glasgow will also extend, in a theoretical future cumulative baseline.

Overall, the Proposed Development will create a slightly larger cluster of turbines in the Gargunnock and Touch Hills, marginally intensifying the influence of turbines to the northeast of the operational Craigengelt Wind Farm. In this alternative context, landscape and visual cumulative effects will generally reflect effects as identified in the primary assessment.

4 Ecology

Chapter 6 of the EIAR considers the potential significant effects of the Proposed Development on habitats and non-avian animal species.

Surveys were undertaken within and the Proposed Development Site. These areas are defined within the Chapter and four Technical Appendices. The purpose of surveys was to ascertain the status of ecological features, including habitats, terrestrial mammals. and bats. A Habitat Management Plan has been produced as the mechanism to deliver mitigation in relation to sensitive habitats such as peat.

All designated sites are scoped out of further assessment based on distance from the Proposed Development Site or that they occur within different catchments.

The main potential impacts of the construction, and operational phases of the development on ecology, in the absence of mitigation, are considered to be:

- Direct habitat loss or damage (permanent and temporary);
- Indirect habitat loss from drying out effects caused by works in the vicinity;
- Sedimentation or other pollution of watercourses from construction activities and vehicular traffic;
- Secondary effects on sensitive habitats through siltation/pollution/spread of invasive species; and
- Inadvertent killing, injuring or disturbance of fauna during construction.

Three provisional Local Nature Conservation Sites (pLNCS) were included in the assessment but on installation of mitigation to prevent potential pollution, no adverse effects were concluded. The pLNCSs in question are the Bannoch Burn, Loch Coulter Burn and Loch Coulter which are located within 0.1km of the Proposed Development Site.

Habitat surveys were aimed at identifying important habitat types, including priority peatlands either likely to fall under the footprint of the Proposed Development Site or with potential to be affected by it. Direct and indirect loss of 10.2ha of priority peatlands will occur as a result of the Proposed Development. The loss of Priority peatlands will be compensated by the replacement of 15.9ha as detailed within a Technical Appendix 6-5 (Habitat Management Plan (HMP)). Opportunities for more compensation are limited by the lack of available erosion features within the peat resources in which to restore.

A nationally scarce moss (Hamatocaulis vernicosus) was noted 80m from infrastructure but upslope and up-gradient of a section of new track east of watercourse crossing 5 (Figure 3a) as such impacts are considered unlikely. Chapter 8 Hydrology, Geology and Hydrogeology should be viewed for an assessment of potential impacts on Ground Water Dependant Terrestrial Ecosystems.

Emergence surveys for bats took place in 2020 and 2021 on several trees and a bridge on the edge of the Proposed Development Site. No roosting bats were observed. Due to subsequent design changes these features were moved beyond the Zone of Influence of the Proposed Development Site.

Automated bat static surveys were undertaken in 2023 at approximate turbine locations and a range of activity recorded between the three survey periods in 2023

within the Proposed Development Site. There was minimal activity during the first (Spring) visit where only common pipistrelle was recorded during April. This corresponds with bats not quite emerging from their post winter hibernation. Activity increased during the second survey period, in June, mostly of both pipistrelle species across four of the turbines which were classified as medium levels of activity. Given the low quality of foraging and roosting habitats for pipistrelle species it is considered unlikely that collision risk will be a substantial issue in relation to these species. The risk of turbine mortality for common and soprano pipistrelle species is considered medium, but when considered at the population level the risk of significant mortality is low.

Myotis spp., noctule and brown-long eared bats were also recorded but mostly at low levels of activity. As such, they were screened out of the assessment.

An assessment of cumulative effects from other projects and plan was undertaken with no significant effect considered likely upon identified features.

Several mitigation measures are proposed that include minimisation of the works footprint, measures to time specific works to avoid disturbance or potential direct mortality of species and effects upon habitat and will be managed through a Construction Environmental Management Plan (CEMP (Technical Appendix 15-1), in addition to the HMP. Ecological mitigation will be managed by an Environment Clerk of Works (EnvCoW).

After this no residual significant effects would remain on any identified feature.

5 Ornithology

Chapter 7 Ornithology of the EIA report considers the effects of the Proposed Development on ornithological receptors.

The bird interests of the Site have been assessed using current NatureScot and Chartered Institute of Ecology and Environmental Management (CIEEM) guidelines. Pre-application, scoping and post-scoping consultation was undertaken with Stirling Council and NatureScot.

A comprehensive suite of bird surveys was undertaken at the Proposed Development Site which have informed the impact assessment. These surveys were undertaken during 2019 to 2021 and included flight activity surveys, breeding wader and raptor surveys, along with targeted surveys for black grouse.

Following a data review and consultation with NatureScot it was agreed that a second year of non-breeding season surveys was not required. This is due to the fact that it is unlikely that the Proposed Development will have a significant effect on any qualifying species for the Firth of Forth SPA/Ramsar or the Slammannan Plateau SPA.

During construction, nest damage or destruction, habitat loss and disturbance/ displacement has the potential to affect the following important species breeding within the Proposed Development Site: lapwing, curlew, snipe and short-eared owl. Following the implementation of good practice measures no significant negative effects for any ornithological receptors are likely during construction.

During operation, disturbance/ displacement has the potential to affect the following important species breeding within the Proposed Development Site: lapwing, curlew, snipe and short-eared owl. Following the implementation of proposed mitigation and enhancement measures no significant negative effects for any ornithological receptors are likely during the operation of the Proposed Development.

During operation, collision risk mortality is likely to affect the following important bird species: curlew, short-eared owl and kestrel. Other species were not considered significantly at risk due to the relatively low level of flight activity recorded during the surveys. The likely potential impact of collision mortality on all species assessed would not be significant.

Potential cumulative effects from the Proposed Development include potential habitat loss and disturbance/ displacement for lapwing, curlew, snipe and short-eared owl, along with collision mortality for curlew, short-eared owl and kestrel. These effects were assessed in combination with other wind farm developments in Natural Heritage Zone 17 (West Central Belt).

No significant cumulative negative effects on important bird species are predicted. During operation additional displacement impacts are predicted for curlew, snipe and short-eared owl; and additional collision mortality impacts are predicted for curlew, short-eared owl and kestrel. None of these cumulative impacts are predicted to be at a significant level.

Post consent monitoring is proposed, such as informal bird carcass monitoring; flight activity surveys, and targeted wader surveys.

6 Hydrology, Geology and Hydrogeology

The Proposed Development Site is 10km southwest of Stirling. It comprises four turbines with crane hardstanding, a construction compound, and substation; four borrow pit search areas, 5.8km of access track with six watercourse crossings.

The Proposed Development Site is on low hills, rising from 205m in the east, to 373m in the west. Bedrock is mostly Carboniferous basalts with a small northeast area underlain by Carboniferous micro-gabbros and limestones. Superficial deposits comprise glacial Diamicton till with occasional hummocky glacial deposits and alluvium along watercourses.

Peat is present over much of the Proposed Development Site in the west, generally <1m in depth, but occasionally up to 2m in isolated pockets. Peat is generally absent in the eastern half of Site, except for a few localised areas.

The geology is of low permeability but with small shallow groundwater areas of moderately permeable alluvium along watercourses. Springs and seepages across the Proposed Development Site give rise and provide baseflow to watercourse tributaries.

The Proposed Development Site drains: north into the Bannock Burn (Source to Sauchie Burn confluence) waterbody and its tributaries; south into the Buckie Burn and its tributaries, part of the River Carron (Carron Valley Reservoir to Avon Burn Confluence) waterbody; and east into Loch Coulter Burn and its tributaries, part of Auchenbowie Burn (Loch Coulter Reservoir to River Carron) waterbody. There are no mapped surface or river flood risks.

The River Carron waterbody overall status is 'Good'. The Auchenbowie Burn overall Status is 'Moderate'. The Bannock Burn waterbody overall status is 'Poor', according to SEPA Classification Hub, and 'Good', according to SEPA Environment Hub. The Auchenbowie Burn waterbody has an objective to improve to Good by 2027. All waterbodies are designated as heavily modified waterbodies: Bannock Burn due to hydroelectric use downgradient and River Carron and Auchenbowie Burn due to public drinking water use in Carron and Loch Coulter reservoirs.

The groundwater supports highly dependent M6, M23 and M35 GWDTE. M6 flushes and M23 rush pasture occur in the east and centre of the Site, in elongated peaty valley bottoms and sides, in peaty depressions, and on the edges of blanket bogs and raised mires. They are also found in several larger patches in the west. There are two very small highly dependent M35 spring GWDTE. There are large areas of moderately groundwater dependent MG10 GWDTE grasslands in the extensively drained areas in the east, on mineral or thin peaty soils. Moderately dependent M25 GWDTE occurs in several small peaty areas.

Muirpark Farm spring Private Water Supply (PWS) is potentially in hydrological connectivity, as is Muirpark unregistered pond. North Third Reservoir is <1 km downgradient and in hydrological connectivity via Bannock Burn but has no Drinking Water Protected Area (DWPA).

Embedded mitigation by design included: minimising watercourse crossings by routing track round headwaters; maintaining minimum 50m buffers from OS mapped watercourses (where possible); avoiding infrastructure on deep peat; floating tracks on peat >0.5m when crossing peat is unavoidable (where gradients allow and where

lengths and cut and fill requirements do not preclude their construction); and avoiding direct and indirect GWDTE loss.

High sensitivity receptors are surface water, GWDTE, PWS and public water supplies. Peat and groundwater are medium sensitivity receptors. Flood risk and designated sites are scoped out as they are not sensitive receptors. There are no peat landslide hazard effects.

Predicted significant effects pre- mitigation are:

- Major effects on water quality during construction and moderate effects during operation and decommissioning;
- Major effects on peat during Construction only;
- Precautionary Major effects on Muirpark PWS and Moderate effects on the Muirpark agricultural pond during construction; and
- Moderate effects on direct and indirect loss of GWDTE during construction.

There are no predicted cumulative effects on hydrology and hydrogeology.

Consequently mitigation additional to that embedded in design is recommended:

- Develop a series of environmental plans: CMS, DMP, DIA and PPP;
- Provision of an Environmental Clerk of Works with micro siting powers;
- Best practice to be followed in all aspects of construction, operation and decommissioning, to avoid and minimise effects;
- Watercourse crossings will be designed in accordance with relevant guidance (WAT-SG-25), and designed to accommodate 1 in 200 year events;
- Achieve a peat balance for excavation and reinstatement and borrow pit reuse;
- Implement the precautionary PLHRA mitigation and control recommended actions;
- Further data collection, site visit and risk assessment of Muirpark PWS and pond;
- Prepare and implement pre, during and post construction monitoring and emergency plans for surface water quality Muirpark PWS, and peat reuse; and
- Agree contingency plans with owner of Muirpark PWS and pond.

The mitigation will result in a residual assessment where all predicted effects on sensitive receptors will be either Moderate, Minor or Negligible.

7 Transport and Access

Chapter 9 Transport and Access of the EIA Report assesses the impact of the Proposed Development on transportation and access. This includes an assessment of the potential environmental effects associated with increased traffic generated by the Proposed Development.

The chapter is supported by an Abnormal Loads Assessment which is contained within Technical Appendix 9-1 of the EIA Report.

To determine appropriate access routes to the Proposed Development Site, detailed consideration and assessment of the surrounding road network has been undertaken in the form of a desk-based study.

This established that the most likely route for general construction traffic travelling to the site is via the M80 or M9 to junction 9 (Pirnhall Interchange), then north on the A872 for approximately 300m, then turning west onto Pirnhall Road, then south onto New Line Road and continuing on minor roads for approximately 5km to the Proposed Development Site.

These routes form the study area for the assessment. Some traffic may also travel up the A872 from the Denny area to access the site.

It is expected that the turbine components would be transferred by abnormal load vehicles to the Proposed Development Site from the port at Grangemouth, from where the vehicles would navigate onto the M9 then travel west until leaving the M9 at junction 9.

Turning north onto the A872, the vehicles will route north for approximately 300m before turning west onto Pirnhall Road then south onto New Line Road, continuing on the minor road to the Proposed Development Site.

The traffic generated by construction of the Proposed Development (over a 12 month period) will result in a temporary increase in baseline traffic levels. This is anticipated to give rise to effects that are classed as ranging from negligible to moderate with the moderate effects requiring mitigation.

With mitigation in place, in the form of a Construction Traffic Management Plan (CTMP), the potential traffic and transport related environmental effects during construction are considered to be Not Significant.

During the operational phase of the Proposed Development, only a small number of vehicles will attend the Site on an infrequent basis to undertake inspections or maintenance activities. As such, no significant operational effects are anticipated, and no detailed assessment of such effects has been undertaken.

Traffic levels associated with the decommissioning stage are anticipated to be significantly less than that generated during construction. Given the timescales involved and the likelihood for changes to the baseline situation during this period, the traffic and transport impacts and effects of wind farm decommissioning are not assessed in this Chapter.

A CTMP will be produced for approval by Stirling Council in consultation with Police Scotland and Transport Scotland to minimise potential effects of construction traffic including any cumulative effects.

The final CTMP would confirm the route proposals for the abnormal load vehicles and general construction vehicles, timing of deliveries, route condition survey details and measures proposed to mitigate potential transport effects.

This is likely to include measures such as temporary contractor speed limits, informative road signage and measures to minimise the movements of HGVs. The final CTMP would ensure that there is a line of communication with other wind farm developments in order that high traffic generating activities, such as stone and concrete importation, can be staggered to avoid significant cumulative effects.

No significant residual effects from construction traffic are predicted to arise either as a result of the Proposed Development in isolation or cumulatively when other developments are considered as part of the cumulative assessment.

8 Cultural Heritage

Chapter 10 Cultural Heritage of the EIA Report assesses the potential for direct and settings effects on the cultural heritage resource within the Proposed Development Site and surrounding Study Areas during construction, operation and decommissioning of the Proposed Development.

The chapter is supported by Technical Appendix 10-1 Historic Environment Assessment and 10-2 NPF4 Addendum of the EIA Report.

No designated heritage assets are located within the Proposed Development Site.

29 non-designated heritage assets have been identified within the Proposed Development Site. These are characterised by the remains of pre-Improvement Era farmsteads, rig and furrow cultivation, a shieling and limestone quarries and associated limekilns.

Evidence of historic land use on enclosed moorland within the Proposed Development Site is limited to that of seasonal grazing and later sporting activities. This exposed and unproductive environment suggests there is a negatable to low potential for previously unrecorded buried archaeological remains.

Heritage assets within the Study Areas are characterised by evidence of prehistoric activity from the Bronze Age to the Iron Age, including Bronze Age funerary and ritual monuments, later prehistoric settlements, such as Iron Age hillforts and duns.

The conurbation of Stirling, including Stirling Castle is located within the Outer Study Area. Also included in the historic environment baseline are the remains of pre-Improvement farmsteads and townships, post-medieval buildings, some of which are listed buildings, and gardens and designed landscapes associated with county house estates.

No direct physical effects on heritage assets have been identified resulting from the construction of the Proposed Development.

A number of designated heritage assets may experience setting change as a result of the operation of the Proposed Development.

These changes have the potential to affect the contribution their current setting makes to how they are experienced in the landscape. The elements of their setting which contribute most to their cultural significance and the evidential and historical value of their physical remains will not be affected.

Potential direct effects resulting from setting change have been identified for four scheduled monuments of high importance and one non-designated heritage asset of low importance (Buckie Burn Sheiling-Hut; SC HER Ref: 3379).

Changes to the setting of the King's Yett, Cairn, Dundaff Hill, Mound and Dundaff Hill, Enclosure, Stirling Castle and Buckie Burn Sheiling-Hut (SM2580; SM6553; SM7131; SM90291; SC HER Ref: 3379) will affect the way elements of their settings contribute to how they are experienced in the landscape but this is considered to be not significant effect in EIA terms.

The design of the Proposed Development has sought to avoid or minimise (as far as reasonably possible) effects to heritage assets. The design has been influenced by the reasons for refusal for a previous planning application within the Proposed

Development Site. This included avoiding and minimising direct effects due to setting change to Stirling Castle and Kings Yett Cairn.

Each iteration of the design has been reviewed to ensure that direct physical effects to known heritage assets are avoided. Similarly, how turbines will appear within the setting of heritage assets has been a key consideration in design refinements, including the number and location of turbines.

No specific mitigation for potential physical effects during construction on previously unrecorded heritage assets, including buried archaeological remains, has been proposed.

The Outline Construction Environmental Management Plan (CEMP) for the Proposed Development identifies construction best practice measures for protecting the historic environment.

This includes the appointment of an Archaeological Clerk of Works (ACoW) to supervise targeted ground-breaking operations and provide onsite advice on avoidance of effects and the implementation of a working protocol should previously unrecorded heritage assets, including buried archaeological remains (e.g. archaeological deposits and features) be discovered.

No significant effects on cultural heritage have been identified as a result of the construction or operation of the Proposed Development.

9 Noise

Chapter 11 Noise of the EIA Report considers the potential noise impacts arising from the construction and operation of the Proposed Development on noise sensitive receptors (inhabited residential properties).

Construction noise is anticipated to be generated during construction activities to prepare the relevant site areas, erect turbines, construct access tracks, and install substation equipment. Similar or less noise-generating activity is anticipated to occur during decommissioning. Operational noise is anticipated to occur due to the rotation of the turbines.

The assessment has been undertaken following the latest available guidance and assessment methods. Construction noise has been assessed with reference to BS 5228 Code of practice for noise and vibration control on construction and open sites, while operational noise has been assessed with reference to ETSU-R-97, The Assessment and Rating of Noise from Wind Farms.

The assessment found no direct significant noise effects associated with the construction or operation of the Proposed Development, and no significant cumulative construction noise effects.

Potentially significant cumulative operational noise effects were identified at one receptor, occurring for some wind speeds and directions. Mitigation in the form of a curtailment strategy (Technical Appendix 11-4) has been provided to demonstrate that these effects can be reduced such that the residual effect is not significant.

10 Socio-economics, Tourism and Recreation

Chapter 12 Socio-economics, Tourism and Recreation of the EIA Report assesses the likelihood of significant socio-economic, recreation and tourism effects of the Proposed Development on the surrounding area, focusing on the local economy, tourism, and recreation.

Surveys of the public's attitudes to wind farms provide no clear evidence that the presence of wind farms in an area has a negative impact on local tourism.

Tourists using the local core paths and local tourist attractions may have a particular sensitivity to visual effects; however, access to tourist facilities will be unaffected.

Hence, even where significant visual effects are predicted they are not likely to have a significant effect on tourism and recreational receptors, including attractions, trails and paths and visitor accommodation, in accordance with the EIA Regulations.

Approximately 5 jobs are expected to be created during the development phase of the Proposed Development, with up to 34 jobs predicted to be created during the construction phase, and up to 6 jobs per annum predicted to be created during the operation phase. The Proposed Development could also generate approximately £324,359 annual turnover in GVA during the operational phase alone.

The Applicant is proposing a community benefit package of up to £5,000 per MW per annum over the 40-year life of the Proposed Development, which will equate to £150,000 per annum.

The Applicant is also keen to explore interest in part community shared ownership in the Proposed Development. This would provide an opportunity for the communities around the site to invest in the Proposed Development, receiving up to five percent of the project net profit after tax in return.

Overall, the socio-economic impact during construction of the Proposed Development was assessed as minor beneficial. The annual economic impacts related to operation were assessed as negligible to minor beneficial. All effects have been assessed as not significant.

No mitigation measures have been considered for the Proposed Development as there are no significant adverse effects anticipated.

11 Climate Change and Carbon Balance

Chapter 13 Climate Change and Carbon Balance of the EIA Report assesses effects of the Proposed Development on climate change, carbon balance, and presents a Climate Change Impact Assessment (CCIA).

Through the use of the Scottish Government Carbon Calculator the influence of the Proposed Development on climate change is considered. In addition, the vulnerability of the Proposed Development, as a receptor, to climate change is evaluated.

The results of the carbon balance assessment indicate that there is a moderate (positive) influence of the Proposed Development to Climate Change and national and international targets to combat climate change. An iterative design approach was taken for the wind farm layout to avoid siting infrastructure in areas of peat where possible in order to minimise disturbance of peat soils and associated carbon losses.

The cumulative effect of the Proposed Development with other Scotland and UK renewable generation is considered to have a major, positive, environmental effect that is significant under the EIA Regulations.

Climate related parameters considered to have the potential to impact upon the operation of the Development including wind, temperature and precipitation were evaluated.

Over the lifetime of the Proposed Development, The UK Climate Projections (UKCP18) show the change in wind speeds and storms is limited to well within the limits of current inter-annual variability. These changes will have a low / negligible magnitude of effect on energy projections and on the efficient operation of the Proposed Development.

The vulnerability of the Proposed Development to Climate Change is therefore considered to be not significant under the EIA Regulations.

12 Other Considerations (including aviation, telecommunication and shadow flicker)

Chapter 14 Other Considerations of the EIA Report summarises the potential effect of the Proposed Development on aviation and telecommunications as well as the potential shadow flicker effects on sensitive receptors. Stakeholders have been consulted during the EIA process and their feedback has informed the assessments.

Aviation and Radar

Initial consultation with Cumbernauld Airport confirmed that the Proposed Development lies within the Aerodrome Safeguarding Zone and noted concerns regarding potential effects on aircraft operating to and from the airport. The Applicant has undertaken further consultation with Cumbernauld Airport in an effort to address these concerns.

NATS initially objected to the Proposed Development resulting in further consultation in order to agree suitable mitigation to ensure that the Proposed Development has no impact on NATS operations. A suitable mitigation agreement was reached in September 2023.

Ministry of Defence (MOD) had no concerns about the Proposed Development but requested turbines are fitted with MOD accredited aviation safety lighting in accordance with the Civil Aviation Authority (CAA), Air Navigation Order 2016. The Applicant appointed Straten Consultancy Services Limited to develop a lighting strategy that meets CAA and MOD requirements.

Subject to the approval of CAA aviation lighting report, and the agreement of suitable mitigation measures with NATS, it is anticipated that the Proposed Development will not adversely affect aviation interests.

Telecommunication

The moving rotors of wind turbines have the potential to affect telecommunication and television signals by causing Electromagnetic Interference (EMI). Wind turbines cause EMI by reflection of signals from rotor blades so that a nearby receiver picks up both a direct and reflected signal.

The types of civilian and military communication signals which may be affected by EMI include TV and radio broadcasting, microwave and cellular radio communications and various navigational and air traffic control systems. A turbine located within, or near to, the communication link may interfere with the signal causing unwanted 'noise'.

The potential for negative effects on domestic television reception are greatly diminished post digital switchover, which was completed across the UK in 2012.

Extensive direct consultation with telecommunications operators has been undertaken, including Airwave/Motorola Solutions, Arquiva, Atkins, British Telecommunications (BT), Ericsson, Joint Radio Company, MLL Telecom, Mobile Broadband Network Limited (MNBL), Virgin/O2, and Vodaphone.

Airwave/Motorola Solutions identified that one turbine was anticipated to have an impact on two telecommunication links. The design of the Proposed Development was altered to remove infrastructure from the buffer zones associated with those links.

Arqiva raised concerns about the distances of certain turbines to telecommunication buffers. The Applicant consulted further with Arqiva, confirming that the proposed location of the turbines would not cause unacceptable impacts to their telecommunication links.

BT identified one telecommunication link in the vicinity of the Proposed Development and advised that this would be affected by two of the turbines. Following Ofcom guidance BT were content that one of these turbines was suitably situated, but advised the second turbine must be moved. The Applicant has designed the final layout to adhere to BT's requirements.

Ericsson raised an initial concern regarding a single telecommunication link; however, it was later confirmed that this link had been decommissioned and therefore would not be impacted by the Proposed Development.

MLL Telecom raised an initial concern regarding a single telecommunication link; however, the link was later identified as being non-operational and therefore not subject to impact from the Proposed Development.

No significant effects are anticipated on telecommunication links as a result of the Proposed Development.

Shadow Flicker

Shadow flicker can arise from the passing of the moving shadow of a wind turbine rotor-blade over a narrow opening such as the window of a nearby residence. A similar effect can also occur when the gloss blades of a rotating turbine reflect the sun causing a flashing light.

The flickering may have the potential to cause disturbance and annoyance to residents. It is, however, not possible for turbines to cause photosensitive epilepsy.

Shadow Flicker effects can occur within 130 degrees either side of North and within 10 rotor diameters of the turbine position. There are three properties within potential shadow flicker impact distance of the Proposed Development turbines; however, climate adjusted modelling of proposed turbine locations has demonstrated there are no significant effects anticipated on receptors.

13 Summary and Conclusion

Drummarnock Wind Farm Limited ('the Applicant') is seeking planning permission under the Town and Country Planning (Scotland) Act 1997 (as amended) ('the Planning Act') for the construction and operation of an electricity generating station consisting of up to four wind turbines (maximum of 180m tip height) and associated infrastructure.

Consideration has been given to the Pre-application consultation response undertaken with SC in May 2020. The scope of the EIA was determined through a Scoping Opinion received from SC in October 2020.

The EIA also considered advice obtained from consultation with other stakeholders to inform assessments of the effects on the Proposed Development on the following:

- Landscape and Visual;
- Ecology;
- Ornithology
- Hydrology, Geology and Hydrogeology;
- Transport and Access;
- Cultural Heritage;
- Noise;
- Socio-Economics, Tourism and Recreation;
- Climate Change and Carbon Balance; and
- Other Considerations (including aviation, telecommunication and shadow flicker).

Extensive mitigation by design has been undertaken to reduce impacts as far as possible on the various elements of the EIA. Please refer to individual EIA chapters for details.

Best practice will be used to control the potential effects of construction activities including undertaking the work in accordance with the guidelines of best practice proposed in the Outline Construction Environment Management Plan (CEMP) and Outline Habitat Management Plan (HMP) provided as Appendices 15-1 and 6-5, respectively, as part of this EIA Report.

The residual effects of the Proposed Development following the implementation of embedded and additional mitigation are assessed within each technical chapter of this EIA Report (Chapters 5 to 14).

Significant residual effects are predicted in relation to Landscape and Visual (Chapter 5), and a moderate adverse effect is predicted on GWDTE (direct and indirect loss) (Chapter 8 Hydrology, Geology and Hydrogeology). The effects on both Landscape and Visual and GWDTE have been minimised so far as possible through design modifications and input to the design process. The Proposed Development brings significant benefits by reducing GHG emissions through displacing conventional electricity generation, contributing to Net Zero (Chapter 13 Climate Change and Carbon Balance).

The generated renewable energy will also help decrease the UK's reliance on fossil fuels, aligning with the Climate Change Committee's June 2023 Report to the UK Parliament, which highlights the need for increased onshore wind deployment.

Minor beneficial effects are also anticipated in terms of public access for tourism and recreation purposes, employment and GVA terms in the context of local and national economies (Chapter 12 Socio-Economics, Tourism and Recreation).