EIA Report

Drumduff Extension Wind Farm Tip Height Increase

Non-Technical Summary

Drumduff Extension Limited

April 2025

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1 Preface

Planning History

In December 2016, consent was achieved for a single 126.5 metres (m) turbine planning application (reference: 0154/FUL/15) at Drumelzie, Blackridge.

In April 2024, a planning application (reference: 0504/FUL/23) was granted consent under the Town and Country Planning (Scotland) Act 1997 (as amended) by West Lothian Council (WLC) for an extension to an existing operating wind farm ('Drumduff Wind Farm'). WLC granted the application and issued a Planning Permission under delegated powers in April 2024 with the following description of development:

> *"Erection of 2 wind turbines with maximum height to blade tip of 149.9m and 1 wind turbine with maximum height to blade tip of 135m maximum with total 15MW generating capacity with associated infrastructure (EIA Development) (as varied from 3 turbines all 149.9m)"*

Hereon, application 0504/FUL/23 shall be referred to as the 'Consented Development'.

2 Overview

This Non-Technical Summary (NTS) is an overview of the Environmental Impact Assessment Report (EIA Report), undertaken to support a major planning application under the Town and Country Planning (Scotland) Act 1997 (as amended) (the Planning Act') for proposed changes to the consented Drumduff Extension Wind Farm, hereafter referred to as the 'Consented Development' by Drumduff Extension Limited ('the Applicant').

The Applicant wishes to increase the tip heights of the three consented wind turbines, hereafter referred to as the 'Proposed Development', with two of the turbine tip heights increased to a maximum of 180 metres (m) above ground level (AGL), together with minor relocations of approximately 61m and 25m, and the third turbine increased to a maximum tip height of 149.9m AGL, with no change to location.

The Proposed Development is located 1.3km north of Blackridge in the WLC area and remains almost identical to the Consented Development with the exception of the increase in tip height and minor alterations to the other infrastructure to accommodate the delivery and erection of the new turbines.

The Proposed Development also includes the construction of a substation, new and upgraded access tracks, a temporary construction compound and associated infrastructure. Please see Section 3.5 which outlines any differences in infrastructure from the Consented Development application.

The wind turbine generators will have a total indicative generating export capacity of approximately 17MW. When connected with the generation capacity of the existing Drumduff Wind Farm to the north of the Proposed Development (6.3MW), the combined onsite generating capacity totals approximately 23.3MW. This represents an increase in 2MW of generating capacity compared with the Consented Development.

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

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

The EIA Report includes the following documents:

- Volume 1: NTS;
- Volume 2: EIA Main Text;
- Volume 3: Technical Appendices;
- Volume 4a: Figures;
- Volume 4b: Visualisations; and
- Volume 5: Confidential Annex

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

- On the Scottish Government's ePlanning Portal (https://www.eplanning.scot/);
- On West Lothian Council's Planning Applications portal (https://planning.westlothian.gov.uk/publicaccess/); and
- The Applicant's website (https://greenpowerinternational.com/current-projects/drumduff-wind-farm-extension/).

Alternatively, the EIA Report can also be purchased from the Applicant by contacting GreenPower at enquiries@greenpowerinternational.com.

Charges for hard copies are:

- £950 for a paper hard copy (Full EIA and Supporting Documents, including Non-Technical Summary);
- £25 a paper hard copy of the Non-Technical Summary; or
- £30 for a link or CD/USB with access to all digital documents.

3 Introduction

Drumduff Extension 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 known as Drumduff Extension Wind Farm (the 'Proposed Development').

The Proposed Development will consist of up to three wind turbines, with two of the turbine tip heights increased to a maximum of 180 metres (m) above ground level (AGL), and the third turbine increased to a maximum tip height of 149.9m AGL and associated infrastructure including hardstandings, cabling and access tracks.

The turbine locations of Turbine 1 (T1) and Turbine 2 (T2) have also been slightly altered to allow greater separation from existing subsurface infrastructure. The location of Turbine 3 (T3) remains unchanged from the Consented Development application.

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 10 Gigawatts (GW) of installed onshore wind capacity by 2030, which Drumduff Extension Wind Farm would help to achieve.

3.1 The Applicant

The Applicant, Drumduff Extension Limited (Drumduff Extension Ltd), is an associated company of GreenPower (International) Ltd (GreenPower) and Thrive Renewables PLC.

Formed over 24 years ago and based in Alloa, GreenPower is one of Scotland's leading independent renewable energy developers and is well known in the West Lothian region for developing and operating Drumduff Wind Farm as a joint venture with Thrive Renewables, a leading company in sustainable energy investment – Thrive has been building and operating renewable energy projects in the UK for close to 30 years.

Building on this success, Drumduff Wind Farm Extension is a natural extension to the existing Drumduff Wind Farm, which is an award-winning project constructed on an abandoned open cast mine site, demonstrating the shift from fossil fuels to clean energy sources.

Drumduff Extension will make a positive contribution to national and international renewable energy and carbon emission reduction targets, together with the local community benefits, local jobs, and additional outcomes that renewable energy development can bring.

3.2 Land Use

Please refer to Appendix A : Drumduff Extension Wind Farm Non-Technical Summary for details on land use which remain unchanged from the Consented Development application.

3.3 Purpose of the EIA Report

Due to the minor changes proposed to the consented Drumduff Extension Wind Farm, the Consented Development EIAR has been updated where necessary to account for changes to the Baseline.

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 proposed changes to the Consented Development 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.

3.4 EIA Approach

Please refer to Appendix A : Drumduff Extension Wind Farm Non-Technical Summary for details on EIA approach which remain unchanged from the Consented Development application.

3.5 Development Description

The Proposed Development consists of three turbines; two up to a maximum 180m tip height and one up to a maximum 149.9m tip height plus associated infrastructure. This represents a tip height increase of 30.01m increase for T1 and T2, each and 14.9m for T3. To accommodate safety buffers to buried onsite infrastructure, T1 has also been relocated approximately 61m west, and T2 approximately 25m south.

The associated infrastructure includes:

- Upgrading of existing track and construction of 2.45km of new access tracks and turning heads (of which approximately 1.45km will be cut and 1.00km will be floated). This is compared to 2.02km of new access track and 1.22km of cut track for the Consented Development;
- Construction of slightly larger turbine foundations and hardstandings to accommodate the larger turbines:
  - The turbine foundation surface area for the Proposed Development is 380m^2 for Turbine (T1) and Turbine 2 (T2), each and 201m^2 for Turbine 3 (T3). This is compared to the 201m^2 turbine foundations for all three turbines (each) of the Consented Development. This represents a 179m^2 increase in surface area for T1 and T2 (each), and no increase in surface area for T3, compared with the Consented Development.
  - The permanent crane hardstanding surface area for the Proposed Development is 2,131m^2 for T1 and T2, each and 1,536m^2 for T3. This is compared to a 1,563m^2 surface area for all 3 turbines for the Consented Development. This represents a 568m^2 increase in surface area for T1 and T2 (each), and no increase in surface area for T3, compared with the Consented Development.
  - The temporary hardstanding areas (including crane pads) for the Proposed Development is 2,230m^2 for T1 and T2 (each) and 1,734m^2 for T3. This is compared to 1,905m^2 for T1 and T2 (each) and 1,734m^2 for T3 for the Consented Development. This represents a 325m^2 increase in surface area for T1 and T2 (each), and no increase in surface area for T3, compared with the Consented Development.
- A 300m2 decrease in surface area for the temporary construction compound (4,700m^2 for the Proposed Development compared with 5000m^2 for the Consented Development)

All other infrastructure remains unchanged from the Consented Development, except for minor alterations in alignment:

- Underground cabling;
- Construction of a substation and control room; and
- One watercourse crossing.

The wind turbine generators will have a maximum indicative output of approximately 17MW. Together with the export capacity of the existing Drumduff Wind Farm (6.3MW), the combined onsite generating output totals approximately 23.3MW.

The Proposed Development has been designed with an operational life of 40 years at the end of which it will be decommissioned unless further consents are granted. This remains unchanged from the Consented Development application.

It is currently proposed that turbine components are expected to be delivered to the Proposed Development Site from the Port of Entry at Rosyth or a similar Port of Entry via the M8, A801, A89 and Heights Road. The final Port of Entry will be confirmed prior to commencement of construction to suit component delivery and logistics.

Once the turbines have been installed, the access tracks and crane hardstand areas around the turbines will remain in place as permanent infrastructure. The boom assembly areas, temporary construction compound and hardstand working areas will be restored. This remains unchanged from the Consented Development application.

The turbines will be connected to an on-site substation using underground cabling, anticipated to be sited within the footprint of the existing and proposed access track. This remains unchanged from the Consented Development application.

The construction of the Proposed Development is anticipated to take approximately 9 months. Construction will take place in accordance with a Construction Environmental Management Plan (CEMP).

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. This remains unchanged from the Consented Development application.

The Proposed Development will have an operational lifespan of 40 years after which it will be decommissioned if no further consents are granted. This remains unchanged from the Consented Development application.

3.6 Benefits of the Proposed Development

Once operational, the Proposed Development will generate approximately 43,756MWh per year based on an estimated capacity factor of 33.3%. This is compared to 39,381MWh per year for the Consented Development.

The Proposed Development is estimated to displace an equivalent amount of grid mix generated electricity amounting to a reduction in the release of greenhouse gases equal to 17,240 tonnes (CO_2 equivalent) per year.

This is compared to 15,516 tonnes (CO_2 equivalent) for the Consented Development. Therefore, the Proposed Development is estimated to displace an additional 1,724 tonnes of Greenhouse Gases compared with the Consented Development.

The Scottish Government's Climate Change Plan (2018) states that by 2030 Scotland will have a largely decarbonised electricity system with a grid carbon intensity of 50g CO_2/kWh of generation.

The Proposed Development is expected to have a carbon intensity of 20.51g CO_2/kWh. This is compared to a carbon intensity of 19.68g CO2/kWh for the Consented Development. Though the carbon intensity of the Proposed Development is expected to be slightly greater, it is still well below the 2030 carbon intensity target of 50g CO_2/kWh.

The Proposed Development is anticipated to further support Scotland's Climate Change Plan by maintaining and succeeding the target already achieved.

The Applicant is adhering to the best practice recommendation and proposing a community benefit package of £5,000 per MW of generating export capacity.

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 a total of 162 jobs with a likely predicted total GVA of up to £9,685,818 during the construction phase.

This is compared to a total of up to 142 jobs and a likely predicted total GVA of up to £8,546,310 for the Consented Development during the construction phase, representing an increase of up to 20 jobs and a GVA of £1,139,508 for the Proposed Development. Please refer to Chapter 13: Socio-economics, Tourism and Recreation for full details.

It is likely that the Proposed Development will also have wider beneficial 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 including:

- Local supply chain opportunities – wider, 'knock-on' effects of expenditure of workers visiting the area, e.g., in the accommodation, food service and retail sectors;
- Income effects – the generation of additional wages and salaries from new employment, much of which will be spent regionally or nationally; and
- Exchequer effects – additional tax revenue, regionally and nationally from increased economic activity.

4 Planning and Energy Policy

Please refer to Appendix A : Drumduff Extension Wind Farm Non-Technical Summary for details on national and local planning policy which remain unchanged from the Consented Development application.

The following sections outline significant changes in Climate Change and Energy Policy since the Consented Development application was made in 2023.

4.1 International Policy

COP28 - The "Global Stocktake"

The COP28 climate summit took place in Dubai from November 30 and December 12, 2023. During this conference, an agreement was reached on the inaugural 'global stocktake,' urging participating parties to undertake measures to triple renewable energy capacity by 2030.

4.1.1 UN Emissions Gap Report

Th UN Emissions Gap Report (UNEP, 2024) is the fifteenth Emissions Gap Report produced by the UN Environment Programme (UNEP). The report has a particular focus on the mitigation in the Nationally Determined Contributions (NDCs) required from countries to 2035 to maintain the Paris Agreement Goals.

The report identifies more ambitious NDCs are needed as the NDCs to 2030, even if implemented unconditionally, would only reduce emissions by between 4 and 10% (as opposed to the 28% required to meet the 2°C goal and 42% to meet the 1.5°C goal).

Identifying that the power sector (i.e. electricity production) continues to be the largest global contributor to overall carbon emissions, the report states that increased deployment of solar and wind generation offers the largest proportion of emission reduction potential across all sectors.

4.2 United Kingdom Energy & Climate Change Policy

4.2.1 Progress in Reducing Emissions 2024 Report to Parliament

In July 2024 the Climate Change Committee (CCC) produced a report (CCC, 2024a) to the UK Parliament on the progress made towards meeting the UK's Climate goals.

The report is clear that;

> *"…the country is not on track to hit this target despite a significant reduction in emissions in 2023. Much of the progress to date has come from phasing out coal generated electricity, with the last coal-fired power station closing later this year. We now need to rapidly reduce oil and gas use as well."*

It identifies that;

> *"…almost all our indicators for low-carbon technology roll-out are off track, with rates needing to significantly ramp up"*

Identifying that installation rates for both offshore and onshore wind are slightly off track, the report states that:

> *"Onshore projects have stagnated in recent years due to planning barriers and government messaging."*

Operational onshore wind capacity was 15GW in 2023, but with only 0.5GW installed in 2023:

> *"Onshore wind installation rates will need to more than double compared to the average pace of deployment over the past three years."*

4.2.2 Seventh Carbon Budget – Advice for the UK Government

In February 2025, the CCC published its advice to the UK Government for the seventh Carbon Budget covering the years 2038 to 2045. This is recommending an emissions cap of 535 $MtCO_2e$.

Under the CCC's Balanced Pathway to Net Zero, electricity generation is identified as a key route to reaching the budget. According to the CCC, a projected increase in demand due to the electrification of the economy (possibly doubling by 2050 from 2023 levels), means a significant increase in renewable energy generation will be needed.

The CCC's Balanced Pathway therefore requires a doubling of onshore wind capacity to 32 GW by 2040. This will require recent annual installation rates:

> *"…to treble this decade, requiring installation rates comparable to the annual roll-out rates previously sustained during the mid-2010s."* (CCC, 2025)

The values that underpin this pathway require a significant and immediate increase in capacity in onshore wind.

Table 1: Projected Onshore Wind Capacity Required

Year	UK Onshore Wind Capacity Required
2025	16GW
2030	26GW
2035	29GW
2040	32GW
2050	37GW

4.2.3 Clean Power 2030

In December 2024, the UK Government published Clean Power 2030 to describe how we can decarbonise the electricity grid so that:

> *"…clean [electricity] sources produce at least as much power as Great Britain consumes in total over the whole year, and at least 95% of Great Britain's generation…"* (UK Government, 2024)

The report is clear that this requires a deployment of onshore wind to 27-29GW by 2030 exceeding CCC's recommendation for the Seventh Carbon Budget.

4.3 Scottish Energy & Climate Change Policy

4.3.1 Progress in Reducing Emissions in Scotland 2023 Report to Parliament

The March 2024 Climate Change Committee (CCC, 2024b) Progress in reducing emissions in Scotland 2023 Report to Parliament stated that;

> *"Most delivery indicators are off track, many significantly so… and overall policy progress has been insufficient over the past year"*

and;

> *"Given the pace at which supply chains and investment would need to develop, this rate of reduction is not credible. However, the Scottish Government should build on its high ambition and implement policies that enable the 75% emissions reduction target to be achieved at the earliest date possible."*

As with their advice to the UK Government in respect of the Seventh Carbon Budget, the CCC notes that the growth in onshore wind has slowed and is off track to meet the 2030 budget, meaning that operational capacity will have to more than double to meet the 2030 target.

In acknowledgement of this report, on 18 April 2024, the Scottish Government (2024) announced that whilst the climate change target to reduce emissions by 75% by 2030 would be removed, the overarching commitment to reach Net Zero by 2045 would remain, stating the intention to;

> *"…introduce expedited legislation to address matters that the CCC raised and to ensure that our legislative framework better reflects the reality of long-term climate policy making".*

The Scottish Government has stated that the adjustment of the 75% target and introduction of this expedited legislation will allow Scotland to;

> *"…retain our legal commitment to 2045, alongside annual reporting on progress, while introducing a target approach that is based on five-yearly carbon budgets."*

Onshore Wind Sector Deal (2023)

The onshore wind sector deal (Scottish Government, 2023d) sets out commitments from the Scottish Government and the onshore wind industry to deliver upon their collective ambition of 20 GW of onshore wind in Scotland by 2030 whilst delivering maximum benefit to Scotland.

It sets out the Government's commitment to work with developers and stakeholders to understand the development and operational barriers to delivering onshore wind and set out processes to help remove them.

The Government has a stated commitment to speed up consenting decisions, increase skills and resources in stakeholders and planning authorities; and streamline approaches

5 Landscape and Visual Impact Assessment

Chapter 5: Landscape and Visual of the EIA Report (Volume 2) presents the findings and assessment of potential effects of the Proposed Development on landscape character and views from key viewpoints during construction and operation, including cumulatively with other developments.

The Landscape and Visual Impact Assessment (LVIA) is based on recognised guidance and assessed the potential effects of the proposed changes to the Consented Development on landscape and visual receptors within a 20km radius study area of the Proposed Development Site, increasing to 45km for the assessment of cumulative effects.

Baseline conditions within the study area were identified and defined following extensive desk and field studies. The baseline identified landscape receptors including landscape character types, local and national landscape designations and visual receptors including settlements, route corridors and 13 representative viewpoints. The locations of the viewpoints were set out in correspondence to West Lothian Council.

The differences between the updated assessment for the Proposed Development, and the assessment for the Consented Development are outlined below.

The additional effects of the increase in the hub height and rotor diameters, and therefore the overall turbine heights, will slightly alter the overall assessment grades for Viewpoint 2, Beechbrae Woodland Centre from that previously stated for the Consented Development in the Further Environmental Information, October 2023 (Appendix 1-1). The key differences including a review of cumulative effects are set out in Table 5.35 of Chapter 5: Landscape and Visual.

These differences arise from the proposed change in turbine proportion and increased turbine size (a combination of a higher hub height and a larger rotor diameter/blade length). These changes would mainly be discernible from a small number of local viewpoints in relatively close proximity to the Proposed Development, where it would be visible in close views. The differences are most apparent through inspection of comparative wireline images (See Figures 5.5.1-5.5.13, Volume 4b of the EIA).

However, it is unlikely without the opportunity for direct comparison between wireline images for the Consented Development and the Proposed Development, that the difference between the Consented and Proposed Development would be apparent once built.

In the absence of being able to make a direct comparison, visual receptors are likely to view the Proposed Development as being very similar to that which is consented. Moreover, from a further distance from the Proposed Development (beyond 2.5 km), the size difference and changes to the layout of the Consented Development layout would be barely noticeable.

As a result, no substantive or material changes to the findings reported for the Consented Development are predicted beyond a 2.5 km radius.

With regard to the design implications of the Proposed Development there is no evidence to suggest that effects of a greater level of significance would result because of changes to the balance and cohesiveness of the composition. The proposed changes to the Consented Development would undoubtedly result in some discernible visual compositional changes.

This would include some slight increased visibility (higher hub heights and larger rotor diameters). However, this is not considered significant or unusual for wind farms in the vicinity.

Whilst there would be a slight change discernible in the zone of theoretical visibility, with some areas of additional visibility arising as a result of the Proposed Development, the slight increase in visibility does not indicate an increase in prominence.

The Proposed Development will result in a slight increase in excavations and associated disturbance to the landscape at the site, mainly because of the larger laydown areas required for the taller turbines.

It is concluded that the Proposed Development will result in minor appreciable changes in that the turbine arrangement will look very slightly different from the Consented Development but such changes will be relatively limited and confined to a small number of localised positions.

From the majority of locations, including all those at greater distance, the change will be hard to discern because the turbines will be seen against the context of the existing development, and at distances such that detailed appearance will be barely perceptible.

As a result, only very localised material changes to the findings reported for the Consented Development are predicted.

Please refer to Chapter 5: Landscape and Visual (Volume 2 of the EIAR) for further details.

6 Ecology

Chapter 6: Ecology of the EIAR (Volume 2) presents the findings and assessment of potential effects in relation to the ecological features (flora and non-avian fauna) which may be affected by the proposed changes to the Consented Development during the construction, operation and decommissioning phases.

A baseline for the Proposed Development was established following desk study and field surveys to provide information on habitats and protected species which were present within the Proposed Development Site and relevant survey buffers, where access permitted. All surveys followed relevant industry guidance.

The habitat within the Proposed Development Site was comprised mostly of coniferous woodland plantation with two areas of raised bog. The two areas of raised bog within the Proposed Development Site are both Local Biodiversity Sites (LBSs): East Blawhorn LBS and West Craigs Moss LBS.

The Proposed Development Site is also adjacent to Blawhorn Moss Site of Special Scientific Interest (SSSI), National Nature Reserve (NNR) and Special Area of Conservation (SAC).

Badger latrines, snuffle holes and runs were found during the protected mammal surveys undertaken for the Proposed Development, and no setts were found.

Higher levels of bat activity were observed during the 2024 bat surveying compared with the 2021 surveying undertaken for the Consented Development application with common and soprano pipistrelle bats the most frequently recorded species for both survey periods.

Although a higher level of bat activity was observed during the 2024 survey period, the relative comparison indicates that overall bat activity within the Proposed Development was low.

An assessment has been made of the predicted significance of effects of the Proposed Development on two Important Ecological Features (IEFs): East Blawhorn LBS and bats (pipistrelle species only). This assessment predicted no significant effects on any of the IEFs and no significant cumulative effects on any IEFs. This remains unchanged from the Consented Development application.

A CEMP will be produced to detail mitigation measures to be followed during construction. The presence of an Ecological Clerk of Works (ECoW) will ensure the necessary advice is given to ensure legal compliance and to endure the predicted effects do not worsen, resulting in an unexpected significant effect. This remains unchanged from the Consented Development application.

An update to the Outline Habitat Management Plan (OHMP) is provided as a cover letter to the original Appendix 6-4: Outline Habitat Management Plan (Chapter 6: Ecology, Volume 2 of the EIAR). The cover letter outlines that minor changes in habitat loss are predicted to occur with a minor 0.09ha increase in habitat loss in the Proposed Development application compared with the Consented Development application.

Please refer to Chapter 6: Ecology (Volume 2 of the EIAR) for further details.

7 Ornithology

Chapter 7: Ornithology of the EIAR (Volume 2) presents the findings and assessment of potential effects in relation to the ornithological features (birds) which may be affected by the proposed changes to the Consented Development during the construction, operation and decommissioning phases.

A baseline for the Proposed Development was established following desk study and field surveys undertaken between 2021 – 2022 to provide information on bird species which were present within the Proposed Development Site and relevant survey buffers, where access permitted. The survey data gathered between 2021 – 2022 remains valid for the Proposed Development and all surveys followed relevant industry guidance.

The main species recorded during vantage point surveys were pink-footed goose and curlew. The breeding bird surveys recorded a single territory of a target species (curlew).

The dedicated raptor surveys recorded no evidence of breeding within the surveyed area. Two species (hen harrier and curlew) were evaluated as part of the impact assessment, but no significant effects or significant cumulative effects were predicted for either species. This remains unchanged from the Consented Development application.

However, reference to general mitigation, and good practice is included to avoid an offence being committed due to reckless killing or disturbance under the Wildlife and Countryside Act 1981 (as amended, Scotland). Habitat Regulations Assessment (HRA) screening was undertaken for two nearby Special Protection Areas (SPAs): Slamannan Plateau SPA and Firth of Forth SPA. No Likely Significant Effect (LSE) was predicted for either site. This remains unchanged from the Consented Development application.

A CEMP will be prepared to detail mitigation measures to be followed during construction. The presence of an Ecological Clerk of Works (ECoW) will ensure the necessary advice is given to ensure legal compliance and to ensure the predicted effects do not worsen, resulting in an unexpected significant effect. This remains unchanged from the Consented Development application.

The proposed increase in turbine size and potential rotor swept area means that the collision risk modelling undertaken for the Consented Development is no longer applicable for the Proposed Development. Therefore, collision risk modelling has been carried out for the new turbine dimensions in the Proposed Development.

Collision risk modelling was performed for all species for which moderate levels of activity within the risk window were observed. The potential and residual effects for the collision risk of hen harrier and curler (Important Ornithological Features) are predicted as Not Significant.

Please refer to Chapter 7: Ornithology (Volume 2 of the EIAR) for further details.

8 Hydrology, Hydrogeology, Peat and Soils

Chapter 8: Hydrology, Hydrogeology, Peat and Soils of the EIA Report (Volume 2) presents the findings and assessment of potential effects of the proposed changes to the Consented Development during the construction, operation and decommissioning on the surface water, groundwater, and on soil, peat and geology across the Proposed Development Site.

The following hydrology, geology, and hydrogeology receptors remain unchanged from the Consented Development; therefore, these have not been reassessed and are not included in Chapter 8: Hydrology, Hydrogeology, Peat and Soils.

- Watercourses and aquatic fauna and flora – quality and morphology;
- Groundwater flow and quality;
- Groundwater Dependent Terrestrial Ecosystem (GWDTE);
- Private and public water supply; and
- Historic coal mining legacy issues

Please refer to Appendix 8-4: Drumduff Extension Wind Farm EIA Report: Chapter 8: Hydrology, Hydrogeology, Peat and Soils and Appendix 1-1: Drumduff Extension Wind Farm, Further Environmental Information (October 2023) (Volume 3 of the EIAR) for full details on these receptors.

However, Peat and Peat Landslide Hazard were reassessed for the Proposed Development, as detailed below.

Due to changes in the positioning and size of the T1 and T2 infrastructure for the Proposed Development, Phase 2 probing was undertaken in December 2024. Please refer to Figure 8-4-a: Interpolated peat depth (Chapter 8: Hydrology, Hydrogeology, Peat and Soils, Volume 4a of the EIAR) for the updated results of this additional probing.

The Proposed Development is classified as Class 3 carbon-rich soils i.e., the dominant vegetation cover is not priority peatland habitat. The peat is considered to be degraded species and unlikely to be highly active or capable of restoration.

However, it does represent a significant source of carbon sequestration. Peat occurs mainly on the western extent of the Proposed Development Footprint at depths between 0.6m and 1.0m with distinct areas of deeper peat between 1.5m and 3m depth. There are several very small areas with peat depths greater than 3m. This remains unchanged from the Consented Development application.

Due to the wider range of data points available for the Proposed Development, the average depth of peat on site has been calculated as 0.85m, compared with 0.98m for the Consented Development application.

The Peat Management Plan (PMP) was updated for the Proposed Development application, using the results of the Phase 2 peat probing that were undertaken in December 2024. The results have determined that:

- 4,284m^3 acrotelm and 6,837m^3 of catotelm will be temporarily excavated prior to being directly reinstated at the point of excavation. This represents an increase of 1,326m^3 of acrotelm and 2,909m^3 of catotelm from the Consented Development EIAR; and

- 5,168m^3 acrotelm and 8,294m^3 catotelm will be permanently excavated and require reuse. This represents a decrease of 595m^3 of acrotelm and an increase of 647m^3 of catotelm from the Consented Development EIAR.

All temporary excavations will be fully reinstated using peat excavated from their footprints, with catotelmic peat reinstated first and overlain with acrotelmic peat to reseal the underlying peat.

The Peat Landslide Hazard and Risk Assessment (PLHRA) was updated for the Proposed Development which shows that the landslide likelihood was found to be Very Low to Low across the majority of the Proposed Development Site.

A few small areas of 'Moderate' likelihood are present along the gully alignment and in other localised areas across the Proposed Development Site. This remains unchanged from the Consented Development EIAR.

Potential effects were assessed for the Proposed Development after considering embedded mitigation such as avoiding sensitive hydrological, hydrogeological and geological receptors where possible; maintaining a 50m distance from watercourses for turbines and hardstands; and positioning infrastructure to avoid and reduce impact on GWDTE and peat.

Additional mitigation was designed to further reduce potentially significant effects to a level that is not significant. The key mitigation includes the use of floating access tracks where feasible, and implementation of the following plans:

- Drainage Impact Assessment and Drainage Management Plan;
- Construction Environmental Management Plan;
- Pollution Prevention Plan; and
- PMP.

Taking into account mitigation, it is considered that the Proposed Development would have no significant effects to Hydrology, Hydrogeology and Soils receptors. This remains unchanged from the Consented Development application.

Please refer to Chapter 8: Hydrology, Hydrogeology, Peat and Soils (Volume 2 of the EIAR) for further details.

9 Transport and Access

Please refer to Appendix A : Drumduff Extension Wind Farm Non-Technical Summary for details on transport and access which remain unchanged from the Consented Development application.

Due to the larger blades proposed, the swept path analysis has been updated for the Proposed Development and is presented in Technical Appendix 9-2: Route Survey Report (Chapter 9: Transport and Access, Volume 3 of the EIAR).

10 Cultural Heritage

Chapter 10: Cultural Heritage of the EIA Report (Volume 2) identifies the archaeological and cultural heritage value of the Proposed Development Site and assesses the potential for direct and setting effects on heritage assets resulting from the proposed changes to the Consented Development during the construction, operation and decommissioning phases.

The Chapter also identifies any changes to the measures that are proposed to mitigate predicted adverse effects.

National planning policies and planning guidance as well as local planning policies require that account is taken of potential effects upon heritage assets by proposed developments and that where possible, such effects are avoided. Where avoidance is not possible these policies require that any significant effects on heritage assets be minimised or offset.

Chapter 10: Cultural Heritage has revealed no new finds or features within the Proposed Development Site.

Impacts upon the settings of designated assets such as World Heritage Sites, Listed Buildings, Scheduled Monuments, Conservation Areas, Inventoried Battlefields and Inventoried Gardens and Designed Landscapes are a material consideration in the planning process.

Potential operational effects on the settings of designated heritage assets within 10km of the Proposed Development Site have been considered as part of the assessment.

The Chapter has assessed that the level of potential operational effects on the settings of designated heritage assets within 10km of the Proposed Development Site remains unchanged from the Consented Development EIAR. Therefore, no significant setting effects have been identified.

Any heritage assets identified as requiring assessment through consultation with Historic Environment Scotland (HES) and West of Scotland Archaeology Service (WoSAS) which were included within the Consented Development EIAR have also been considered for the Proposed Development EIAR.

This includes non-designated heritage assets and heritage assets, designated or otherwise, beyond 10km of the Proposed Development Site.

The Proposed Development EIAR has assessed that there are no changes in terms of magnitude of impact or level of effect upon these assets from the Consented Development EIAR. Therefore, the assessment level for these assets remains as assessed in the Consented Development EIAR.

The possibility of cumulative effects has also been assessed. The Proposed Development EIAR has assessed that the level of cumulative effects remains unchanged from the Consented Development EIAR. Therefore, no significant cumulative effects have been identified.

Please refer to Chapter 10: Cultural Heritage (Volume 2 of the EIAR) for further details.

11 Noise

Chapter 11: Noise of the EIA Report (Volume 2) considers the potential noise impacts arising from construction and operation of the Proposed Development, including cumulatively with the operational Drumduff Wind Farm and Burnhead Wind Farm, on noise sensitive receptor locations in the vicinity.

A further cumulative operational assessment is made to include the additional effect of the proposed Heights Wind Farm. Noise sensitive receptor locations in this case are inhabited residential properties.

Noise during the construction phase of the Proposed Development will arise from construction vehicles accessing the Proposed Development Site and from construction activities within it, including track construction and turbine erection. Noise during the operational phase of the Proposed Development will arise from the installed wind turbines as they rotate to generate energy.

Construction noise impacts have been assessed in line with '*BS 5228:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites*' (BS 5228) (British Standards Institute (BSI), 2009). There may also be temporary impacts associated with construction traffic assessing the Proposed Development Site, which have been considered in the assessment.

The results of the construction noise impact assessment indicates that no significant effects will arise from the construction or decommissioning of the Proposed Development.

This is because the relevant noise limits set out in BS 5228 will be met. Noise will be audible at noise sensitive properties in the vicinity of the Proposed Development, particularly from construction vehicles accessing the Proposed Development Site. However, noise during the construction phase will be controlled and minimised through a CEMP.

Operational wind turbine noise impacts have been assessed against the noise limits that apply to the Consented Development. In addition, an assessment has been carried out in line with '*ETSU-R-97 The Assessment and Rating of Noise from Wind Farms*' (ETSU-R-97) (Department of Trade and Industry, 1996), and the associated guidance provided by the '*A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise*' (Institute of Acoustics (IOA), 2013).

Predicted operational noise levels from the Proposed Development acting in isolation and cumulatively with other wind farms in the vicinity meet the relevant noise limits as set out in ETSU-R-97, and therefore the noise impact is considered to be Not Significant. Noise during the operational lifespan of the Proposed Development will be controlled by noise limits that will be applied via planning conditions.

Please refer to Chapter 11: Noise (Volume 2 of the EIAR) for further details.

12 Forestry

Chapter 12: Forestry of the EIA Report (Volume 2) presents the findings and assessment of potential effects to forestry as a result of the proposed changes to the Consented Development during the construction, operation, and decommissioning phases of the wind farm.

The Forestry Study Area (FSA) extends to approximately 75.85ha and is comprised of privately owned and managed woodlands within the site boundary. The forest is comprised largely of commercial conifers with areas of mixed broadleaves and open ground. The primary conifer species is Sitka spruce which comprises 66.17% of the total study area.

A total of 38.16ha will require to be felled to enable the construction and operation of the Proposed Development. This represents a small 0.16ha increase in felling required compared with the Consented Development.

Of this, part will be replanted either with commercial conifers or native broadleaves; an area of 8.79ha has been identified as suitable for priority habitat restoration (compared with 9.15ha identified for the Consented Development). 17.02ha will be occupied by the Proposed Development infrastructure and associated buffer zones, a 1.61ha increase from the Consented Development EIAR.

As a result of the Proposed Development, there would be a net loss of stocked woodland within the FSA of 25.45ha. This is compared to a net loss of 24.19ha of stocked woodland for the Consented Development, representing a minor 1.26ha increase in loss of stocked woodland.

Under the Scottish Government's Control of Woodland Removal Policy, restoration of a priority habitat does not require compensatory planting.

Compensatory planting therefore would be required of 16.66ha. This represents an increase of 1.62ha required for compensatory planting compared with the Consented Development (15.04ha). In order to comply with the Scottish Government's Control of Woodland Removal Policy, the Applicant is committed to providing the appropriate area of off-site compensatory planting.

Please refer to Chapter 12: Forestry (Volume 2 of the EIA Report) for further details.

13 Socio-economics, Tourism and Recreation

Chapter 13: Socio-economics, Tourism and Recreation of the EIA Report (Volume 2) assesses the likelihood of significant socio-economic, recreation and tourism effects of the proposed changes of the Consented Development on the surrounding area, with regards to local residents.

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, negative effects of the operational phase of the Proposed Development are predicted not to have a significant effect on tourism and recreational receptors, including attractions, trails and paths and visitor accommodation, in accordance with the EIA Regulations. This remains unchanged from the Consented Development EIAR.

Approximately 24 jobs are expected to be created during the development phase with up to 162 jobs predicted to be created during the construction phase of the Proposed Development. This represents an increase in up to 2 jobs during the development phase and up to 20 jobs during the construction phase compared with the Consented Development EIAR.

The Proposed Development could also generate approximately £437,628 annual turnover in GVA during the operational phase alone. This represents an estimated additional £51,486 annual turnover in GVA during the operational phase compared with the Consented Development (£386,142 GVA).

The Applicant is adhering to the best practice recommendation and proposing a community benefit of £5,000 per MW of generating export capacity per year.

Overall, the socio-economic impact during construction of the Consented Development was assessed as minor beneficial in West Lothian and the wider area (Central Scotland), and negligible beneficial in Scotland.

The annual economic impacts related to operation were assessed as negligible beneficial for both study areas. All effects have been assessed as not significant. The Proposed Development will have a minor beneficial socio-economic impact on these assessed impacts.

No mitigation measures have been considered for the Proposed Development as there are no significant adverse effects anticipated. This remains unchanged from the Consented Development EIAR.

Please refer to Chapter 13: Socio-economics, Tourism and Recreation (Volume 2 of the EIAR) for further details.

14 Climate Change and Carbon Balance

Chapter 14: Climate Change and Carbon Balance of the EIA (Volume 2) assesses the effects of the proposed changes to the Consented Development on climate change, carbon balance, and presents a Climate Change Impact Assessment (CCIA).

In order to determine the potential contribution that the Proposed Development will make towards reducing carbon emissions and the statutory requirements of The Climate Change (Scotland) Act 2009, an updated carbon calculation reflecting the proposed changes to the Consented Development was carried out using the offline Scottish Government Windfarm Carbon Assessment Tool – Version 2.14.1 (the 'Offline ECU Carbon Calculator') dated 27/01/2023.

The Consented Development values for this application were calculated using the Offline ECU Carbon Calculator, in order to allow direct comparison between the Consented and Proposed Development. This is detailed fully in Chapter 14: Climate Change and Carbon Balance.

Through the use of the Offline ECU 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.

Once operational, the Proposed Development will generate approximately 43,756MWh per year based on an estimated capacity factor of 33.3%. This is compared to 39,381MWh per year for the Consented Development, representing a 4,375MWh per year increase in electricity generation.

The Proposed Development is estimated to displace an equivalent amount of grid mix generated electricity amounting to a reduction in the release of greenhouse gases equal to 17,240 tonnes (CO2 equivalent) per year. This is compared to 15,516 tonnes for the Consented Development. Therefore, the Proposed Development is estimated to displace an additional 1,724 tonnes of GHG compared with the Consented Development.

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 2.1 years (based on a grid-mix of electricity generation). The values for the carbon calculator inputs use indicative infrastructure values, and therefore the payback period of 2.1 years is indicative.

The Scottish Government's Climate Change Plan (2018) states that by 2030 Scotland will have a largely decarbonised electricity system with a grid carbon intensity of 50g CO_2/kWh of generation.

The Proposed Development is expected to have a carbon intensity of 20.51g CO_2/kWh. This is compared to a carbon intensity of 19.68g CO_2/kWh for the Consented Development. Though the carbon intensity of the Proposed Development is expected to be slightly greater, it is still well below the 2030 carbon intensity target of 50g CO_2/kWh. The Proposed Development is anticipated to further support Scotland's Climate Change Plan by maintaining and succeeding the target already achieved.

The results of the Carbon Calculator are presented in EIA Volume 2 Technical Appendix 14-2: Carbon Calculator Inputs.

Overall, the moderate (positive) influence assessed for the Consented Development to Climate Change and national and international targets to combat climate change remains unchanged for the Proposed Development. An iterative design approach was taken for the wind farm layout to avoid siting infrastructure in deep peat where possible 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. This remains unchanged from the Consented Development EIAR.

Please refer to Chapter 14: Climate Change and Carbon Balance (Volume 2 of the EIA) for further details.

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

Chapter 15: Other Considerations of the EIA Report (Volume 2) summarises the potential effect of the proposed changes to the Consented Development on aviation and telecommunications and the potential shadow flicker effects on sensitive receptors.

Stakeholders have been consulted during the EIA process and have informed the assessments. Stakeholders include the Ministry of Defence (MoD), BT, Glasgow Airport and Edinburgh Airport.

Aviation

It has been confirmed through consultation with Glasgow Airport that the Proposed Development would have no impact on the airport safeguarding criteria, with past applications on the site leading to no objection. This remains unchanged from the Consented Development EIAR.

For the Proposed Development, the Applicant commissioned an Instrument Flight Procedures (IFP) safeguarding report (Technical Appendix 15-2, Volume 3 of the EIA) to be undertaken which concluded that the Proposed Development will have no impact on IFPs at Edinburgh Airport.

It has been confirmed by Edinburgh Airport that impacts on safeguarding criteria due to turbines in line of sight of their Primary Surveillance Radar will occur as a result of the Proposed Development. The Applicant has previously identified mitigation with NATS which is being reassessed for the Proposed Development to cover the impacts on the Primary Surveillance Radar at Edinburgh Airport. The Applicant will enter into an agreement with Edinburgh Airport following the receipt of consent for the Proposed Development. This remains unchanged from the Consented Development EIAR.

The Applicant is also committed to entering into an agreement with Edinburgh Airport and MOD including an agreed lighting scheme to take into consideration any potential conflict, if required.

Due to the commitment to the mitigation agreements, it is considered that there will be no significant effects on Edinburgh Airport, NATS or MOD as a result of the Proposed Development. This remains unchanged from the Consented Development EIAR.

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.

Consultation with Atkins, acting on behalf of Scottish Water, has indicated that a scanning telemetry link runs between Garbethill and East Craigs, crossing the Proposed Development Site.

Discussions with Scottish Water have identified a mitigation option, and mitigation will be agreed as required pre-construction. Therefore, the potential effects from the Proposed Development are Not Significant.

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 occurs within a distance of 10 rotor diameters (1,620m for the case of the Proposed Development) and 130 degrees either side of north.

There is one residential property within the study area with the potential to experience shadow flicker (compared with no residential properties for the Consented Development EIAR).

UK Government guidelines note that a limit of up to 30 hours per year or 30 minutes on the worst affected day is considered acceptable

The property (receptor A), to the NW of the study area is anticipated to experience shadow flicker due to the Proposed Development, with 14.9 hours per year predicted. However, 2 days of the year are predicted to experience >30 minutes of shadow flicker from the Proposed Development.

Based on the Proposed Development alone, receptor A is predicted to not exceed the 30 hours per year threshold but it will exceed the 30 minutes on the worst affected day threshold, as per UK Government guidelines.

Following the calculation of a bare earth 'worst case scenario' for the Proposed Development in combination with the operational Burnhead Wind Farm, total annual shadow flicker increases at receptor A from 14.9 hours to 58.4 hours per year.

This exceeds the 30 hours per year threshold that has been applied for this assessment and therefore a climate adjusted calculations were undertaken for the Proposed Development only and the Proposed Development in combination with Burnhead Wind Farm. The results of the climate adjusted scenario show that receptor A is not predicted to have more than 30 minutes of shadow flicker on a single day.

In conclusion, whilst the climate adjusted scenario indicates that no receptors exceed the daily threshold, in specific conditions there is the possibility of shadow flicker events exceeding 30 minutes per day threshold. The probability of this however is Low.

As such no significant effects are predicted.

Please refer to Chapter 15: Other Considerations (Volume 2 of the EIA) for further details.

Summary and Conclusion

Drumduff Extension 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 known as Drumduff Extension Wind Farm (the 'Proposed Development').

An EIA has been conducted based on a Pre-Application Advice for the Consented Development and further consultation with West Lothian Council (WLC) as outlined in Chapter 2: EIA Approach and Methodology (Volume 2 of the EIA).

The EIA also considers advice obtained from technical consultation (summarised in Chapters 5 to 15) to inform assessments of the effects on the proposed changes to the Consented Development on the following:

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

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 CEMP, PMP and OHMP provided as Technical Appendices 16-2, 8-6 and 6-4 respectively as part of this EIA Report.

The assessments have not identified any residual (inclusive of mitigation measures) significant effects with the exception of Landscape and Visual.

Chapter 5: Landscape and Visual concludes that the Proposed Development will result in minor appreciable changes in that the turbine arrangement will look very slightly different from the Consented Development, but such changes will be relatively limited and confined to a small number of localised positions.

As a result, only very localised material changes to the findings reported for the Consented Development are predicted.

Mitigation of Landscape and Visual effects has been undertaken through design modifications and input to the design process.

There are significant beneficial effects in relation to the Proposed Development, in terms of recreational access (Chapter 13: Socioeconomics, Tourism and Recreation) and in terms of a greater reduction of GHG compared with the Consented Development, through the displacement of conventional electricity generation in terms of carbon balance and contribution to Net Zero (Chapter 14: Climate Change and Carbon Balance).

Minor beneficial effects are also anticipated both in employment and GVA terms in the context of local and national economies as well.

Appendix A : Drumduff Extension Wind Farm Non-Technical Summary

EIA Report

Drumduff Extension Wind Farm

Non-Technical Summary

Drumduff Extension Limited

June 2023

Contents

Preface

This Non-Technical Summary (NTS) is an overview of the Environmental Impact Assessment Report (EIA Report), undertaken to support a major planning application under the Town and Country Planning (Scotland) Act 1997 (as amended) ([the Planning Act') for consent of a proposed wind farm (hereafter referred to as the 'Proposed Development').

The Proposed Development is a three-turbine (up to 149.9m tip height) extension of the existing Drumduff Wind Farm, proposed to be located in Drumelzie Forest at land approximately 1.3 kilometres north of Blackridge, West Lothian (Central Grid Reference 289180, 668837) (the 'Proposed Development Site').

The Proposed Development also includes the construction of a substation, new and upgraded access tracks, a temporary construction compound and associated infrastructure. The wind turbine generators will have a total indicative installed generating capacity of approximately 15MW. When connected with the generation capacity of the existing Drumduff Wind Farm to the north of the Proposed Development (6.3MW), the combined onsite generating capacity totals approximately 21.3MW.

This application (including the EIA Report and this NTS) has been prepared by Atmos Consulting Ltd on behalf of Drumduff Extension 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: NTS;
- Volume 2: EIA Main Text;
- Volume 3: Technical Appendices;
- Volume 4a: Figures;
- Volume 4b: Visualisations; and
- Volume 5: Confidential Annex

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

- On the Scottish Government's ePlanning Portal (https://www.eplanning.scot/);
- On West Lothian Council's Planning Applications portal (https://planning.westlothian.gov.uk/publicaccess/); and
- The Applicant's website (https://greenpowerinternational.com/current-projects/drumduff-wind-farm-extension/).

Alternatively, the EIA Report can also be purchased from the Applicant by contacting GreenPower at enquiries@greenpowerinternational.com.

Charges for hard copies are:

- £950 for a paper hard copy (Full EIA and Supporting Documents, including Non-Technical Summary);
- £25 a paper hard copy of the Non-Technical Summary; or
- £30 for a link or CD/USB with access to all digital documents.

1 Introduction

Drumduff Extension 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 known as Drumduff Extension Wind Farm (the 'Proposed Development') consisting of up to 3 wind turbines (maximum of 149.9m tip height) and associated infrastructure including hardstandings, cabling and access tracks (the 'Proposed Development').

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 12 Gigawatts (GW) of installed onshore wind capacity by 2030, which Drumduff Extension Wind Farm would help to achieve.

1.1 The Applicant

The Applicant, Drumduff Extension Limited (Drumduff Extension Ltd), is an associated company of GreenPower International Limited (GreenPower) and Thrive Renewables PLC. Formed over 20 years ago and based in Alloa, GreenPower is one of Scotland's leading independent renewable energy developers and is well known in the West Lothian region for developing and operating Drumduff Wind Farm as a joint venture with Thrive Renewables, a leading company in sustainable energy investment – Thrive have been building and operating renewabale energy projects in the UK for close to 30 years Developing on this success, Drumduff Extension Wind Farm is a natural extension to the existing Drumduff Wind Farm, which is an award-winning project built on an abandoned open cast mine site, demonstrating the shift from fossil fuels to clean energy sources. The commitment to Drumduff Extension will make a positive contribution to national and international renewable energy and carbon emission reduction targets with the local community benefits, local jobs, and additional outcomes that renewable energy development can bring.

1.2 Land Use

The area within which the Proposed Development is located (the 'Proposed Development Footprint') in Drumelzie Forest, an area consisting of moorland and commercial forestry. Blawhorn Moss National Nature Reserve (NNR) is located adjacent to the Proposed Development Site boundary to the southwest.

The existing Drumduff Wind Farm (consisting of three turbines, 120m tip height) is located immediately to the north of the Proposed Development.

The closest residential properties to the Proposed Development Site are approximately 1.3km to the south at Blackridge.

The land cover within the Proposed Development Site is predominantly commercial forestry, moorland and areas of Class 1 degraded peatland. The Proposed Development Site is currently used for commercial forestry.

1.3 Purpose of the EIA Report

The EIA Report presents the findings of the EIA process by describing the Proposed Development, the current conditions at the Proposed Development Footprint and the likely 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.

1.4 EIA Approach

EIA is the systematic process used to inform consenting authorities of the environmental implications of a development by collecting background information about the existing environment and then determining 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.

Schedule 1 of the EIA Regulations lists those developments for which an EIA is mandatory, whilst Schedule 2 describes projects for which the need for EIA is considered against criteria set out in Schedule 3 on a case-by-case basis.

The Proposed Development is not a Schedule 1 development, but it does fall within Schedule 2 of the EIA Regulations as an installation for harnessing wind power for energy production with more than two wind turbines with a height exceeding 15 metres.

A Schedule 2 development is an EIA development if it is likely to have significant effects on the environment by virtue of factors such as its nature, size or location. It has been recognised by the Applicant that the Proposed Development would have the potential to have significant environmental effects. The Applicant has therefore voluntarily undertaken an EIA and is submitting an EIA Report. The EIA Report sets out to assess whether or not significant effects result from the Proposed Development.

1.5 Development Description

The Proposed Development consists of three turbines up to a maximum 149.9m tip height and associated infrastructure. The associated infrastructure includes:

- Upgrading of existing track and construction of approximately 2.02km of new access tracks and turnheads (of which approximately 1.30km will be cut and 0.69km will be floated);
- Construction of turbine foundations and temporary crane hardstandings;
- Underground cabling;
- Construction of a substation and control room;
- Construction of a Temporary Construction Compound; and
- One watercourse crossing.

The wind turbine generators will have a maximum indicative export capacity of approximately 15MW. Together with the export capacity of the existing Drumduff Wind Farm (6.3MW), the combined onsite generating output totals approximately 21.3MW.

The Proposed Development has been designed with an operational life of 40 years at the end of which it will be decommissioned unless further consents are granted.

The turbines will be built using standard concrete gravity base foundations made of steel reinforced concrete. To allow the turbines to be installed a crane hardstanding beside the turbine base will be built, approximately 201m^2 in area.

It is anticipated that approximately 2.02km of new track and turnheads is likely to be required to service the turbines and associated infrastructure.

Access to the Proposed Development will be via Heights Road off the A89 located to the south of the Proposed Development Site. It is currently proposed that turbine components are expected to be delivered to the Proposed Development Site from the Port of Entry at Kind George V Docks, Glasgow, although the final Port of Entry will be confirmed prior to commencement of construction to suit component delivery and logistics.

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

The turbines will be connected to an on-site substation using underground cabling, anticipated to be sited within the footprint of the existing and proposed access track.

The construction of the Proposed Development is anticipated to take approximately 9 months. Construction will take place in accordance with a Construction Environmental Management Plan (CEMP). 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.

1.6 Benefits of the Proposed Development

Once operational, the Proposed Development will generate approximately 43,362MWh per year based on an estimated capacity factor of 33.3%.

This will displace an equivalent amount of fossil fuel generated electricity amounting to a reduction in the release of greenhouse gases equal to 8,462 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 WH2V-C17Y-XOMD V6). 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 3.9 years.

The Scottish Government's Climate Change Plan (2018) states that by 2030 Scotland will have a largely decarbonised electricity system with a grid carbon intensity of 50g CO_2/kWh of generation.

The Proposed Development is expected to have a carbon intensity of 18.64g CO_2/kWh, which is below the 2030 carbon intensity target. The Proposed Development is anticipated to further support Scotland's Climate Change Plan by maintaining and succeeding the target already achieved.

The results of the Carbon Calculator are presented in EIA Volume 2 Appendix 14-1.

The Applicant is adhering to the best practice recommendation and proposing a community benefit package of up to £75,000 per annum over the 40-year life of the Proposed Development, based on a figure of £5,000 per MW for each of the 15 MWs installed generating capacity. 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 a total of 142 jobs during its design, construction and operation with a likely predicted total GVA of up to £8,546,310. It is likely that the Proposed Development will also have wider beneficial 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 including:

- Local supply chain opportunities – wider, 'knock-on' effects of expenditure of workers visiting the area, e.g., in the accommodation, food service and retail sectors;
- Income effects – the generation of additional wages and salaries from new employment, much of which will be spent regionally or nationally; and
- Exchequer effects – additional tax revenue, regionally and nationally from increased economic activity.

2 Planning and Energy Policy

2.1 National Planning Policy

National planning policy is taken into account within development proposals, specifically:

The Fourth National Planning Framework (NPF4) Revised Draft

NPF4 was approved and published by the Scottish Government (2023a) on 13th February 2023. NPF4 is the national spatial strategy for Scotland and also incorporates Scottish Planning Policy. 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 acknowledges 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:

- West Lothian Local Development Plan 1 (WLC LDP 1) (Adopted 2018);
- Relevant supplementary guidance, including the West Lothian Council Wind Energy Development Supplementary Guidance.

2.3 Climate Change and Energy Policy

Both the UK and Scottish Government have declared a Climate Emergency and climate change has been described as the greatest environmental challenge facing the world today. West Lothian Council also declared a climate emergency on 24 September 2019, recognising the serious and accelerating changes to the world caused by climate change.

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 2022

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 Statement notes Scotland's current installed onshore capacity of 8.7GW as of June 2022 and Scotland's aim to maintain a supportive policy and regulatory framework. It is stated that this will enable an increase in renewable energy deployment and meet the overall ambition of 20 GW of installed onshore wind capacity in Scotland by 2030.

Reversing degradation through peatland restoration is therefore central to mitigating and adapting to the linked climate and nature crises and the OnWPS identifies the opportunity for wind energy development to contribute significantly to improving biodiversity.

The criteria through which proposals will be evaluated has been updated to focus a stronger emphasis on the role which wind energy developments can play both in the response to the joint climate and nature crises as well as the resulting socioeconomic and community benefits.

3 Landscape and Visual Impact Assessment

Chapter 5 of the EIA Report presents the findings and assessment of potential effects of the Proposed Development on landscape character and views from key viewpoints during construction and operation, including cumulatively with other developments. More details are provided in Chapter 5: Landscape and Visual.

The Landscape and Visual Impact Assessment (LVIA) is based on recognised guidance and assessed the potential effects of the Proposed Development on landscape and visual receptors within a 20km radius study area of the Proposed Development Site, increasing to 40km for the assessment of cumulative effects.

Baseline conditions within the study area were identified and defined following extensive desk and field studies. The baseline identified landscape receptors including landscape character types, local and national landscape designations and visual receptors including settlements, route corridors and 14 representative viewpoints. The locations of the viewpoints were set out in correspondence to West Lothian Council.

The LVIA has established that the Proposed Development would result in differing degrees of change to the landscape and visual baseline conditions, arising predominantly during the 40-year operational phase.

The turbines of the Proposed Development will be seen as a three-turbine southern extension forming a coherent, well-designed cluster of development within the forested plateau landscape. The Proposed Development will be seen within the context of the existing Burnhead/Drumduff Wind Farms and will be perceived within the landscape as part of the same development. The proposed development will be seen to be in scale with the surrounding expansive plateau moorland landscape, avoiding encroachment into the transitional landscape of the farmed lowlands.

The landscape and visual assessment has established that during the construction phase there will be locally significant (at 2-3km) short term direct effects on the landscape resource, landscape character and visual amenity. The implementation of the Proposed Development would require the felling of those forestry coups within which the turbines are proposed, introducing short term change. Areas of felled forestry will be re-planted and returned to forestry uses after the construction phase.

The wind turbines and associated infrastructure will occupy only a small portion of the Proposed Development Site, leaving the majority of the existing landform, forestry and moorland unaffected. During the operational phase the direct effects from the Proposed Development on the landscape are not predicted to be significant. It will be limited in extent and largely reversible at the end of this phase of the Wind Farm.

A Zone of Theoretical Visibility (ZTV) map, to the blade tip height of the Proposed Development turbines, is illustrated in Figure 5-1-4a (Volume 4a), indicating the area over which the Proposed Development can theoretically be seen.

In local views the turbines will be seen as prominent, large-scale man-made features in the landscape, contrasting with the existing colour and texture of the forested plateau.

Existing windfarm development to the north at Burnhead and Drumduff Wind Farms, which is located within the same Landscape Character Type (LCT) already has a dominant influence on landscape character. The Proposed Development will introduce additional turbines to the south and will reinforce this as a component of the prevailing

landscape character. Within the Lowland Plateau-Lothians LCT it is considered that there will be locally significant effects on landscape character across the immediate site area, but generally across the LCT the effects will be Not Significant.

There is the potential for direct impacts on the perceived qualities and characteristics of the surrounding plateau lowland landscape, with a locally significant effect predicted by the assessment. Viewpoint 3, Figure 5-2-3 (Volume 4b), at East Craigs Hill, illustrates the typical nature of local views that would be experienced from the lowland plateau landscape to the east. Beyond 2-3km, the influence on wider landscape character is limited by local topography and by distance from the application site.

There will also be areas of inter-visibility from the wider plateau moorland landscape and the lowland hills and ridges (Bathgate Hills) where the Proposed Development will be seen in close siting with the established footprint of development at Burnhead/Drumduff Wind Farms with not significant effects.

Beyond 20km, due to the effect of distance, the proposed development will be a less visible element in the landscape, giving rise to minor (at most) effects on landscape character which are not considered to be significant.

No significant landscape effects are identified from Designated Landscapes.

No significant effects are identified on visual amenity from route corridors, National Cycle Routes or long-distance walking routes.

The viewpoint assessment identifies very limited significant effects from Blawhorn Moss and the northern edge of Blackridge, at the settlement edge, as illustrated in Viewpoints 1 and 13, Figures 5-2-1 and 5-2-13 respectively (Volume 4b). From elevated viewpoints the proposed development would be seen in close association with the existing Burnhead/Drumduff Wind Farm and would be seen as part of the same development with limited additional effects which would not give rise to significant effects on visual amenity. Limited significant effects were identified from the summit of East Craigs Hill, where the Proposed Development would be seen in combination with Burnhead/Drumduff Wind Farm and would increase the extent of windfarm development within the view, as illustrated in Viewpoint 3, Figure 5-2-3 (Volume 4b).

Cumulative effects arising from the contribution of the proposed development are limited with the Proposed Development appearing in the context of the existing Burnhead/Drumduff Wind Farm.

Only locally significant cumulative effects upon landscape character types were identified from the addition of the Proposed Development with built or consented windfarms. The addition of the Proposed Development will give rise to significant effects upon landscape receptors within c.1.5km on the host landscape of the Lowland Plateau – Lothians.

The cumulative viewpoint assessment found significant *total* cumulative effects with the built and consented baseline alongside the proposed site at Dewshill from elevated viewpoints within the Bathgate Hills to the east and the Pentland Hills. The *addition* of the Proposed Development in this scenario does not give rise to a significant cumulative effect.

4 Ecology

Chapter 6 of the EIAR presents the findings and assessment of potential effects in relation to the ecological features (flora and non-avian fauna) which may be affected by the Proposed Development during the construction, operation and decommissioning phases. More details are provided in Chapter 6: Ecology.

A baseline for the Proposed Development was established following desk study and field surveys to provide information on habitats and protected species which were present within the Proposed Development Site and relevant survey buffers, where access permitted. All surveys followed relevant industry guidance.

The habitat within the Proposed Development Site was comprised mostly of coniferous woodland plantation with two areas of raised bog. The two areas of raised bog within the Proposed Development Site are both Local Biodiversity Sites (LBSs): East Blawhorn LBS and West Craigs Moss LBS. The Proposed Development Site is also adjacent to Blawhorn Moss Site of Special Scientific Interest (SSSI), National Nature Reserve (NNR) and Special Area of Conservation (SAC). One badger sett was found within the survey area and no further evidence was found of other protected species during dedicated surveys. Bat activity was relatively low across the site and common and soprano pipistrelle bats were the most frequently recorded species. An assessment has been made of the predicted significance of effects of the Proposed Development on two Important Ecological Features (IEFs): East Blawhorn LBS and bats (pipistrelle species only). This assessment predicted no significant effects on any of the IEFs and no significant cumulative effects on any IEFs. However, reference to general mitigation, and good practice is included to avoid an offence being committed due to reckless killing or disturbance under the Wildlife and Countryside Act 1981 (as amended, Scotland). A shadow Appropriate Assessment (AA) was carried out on Blawhorn Moss SAC and no Likely Significant Effect (LSE) was predicted either alone or in-combination with other nearby developments.

A CEMP will be created to detail mitigation measures to be followed during construction. The presence of an Ecological Clerk of Works (ECoW) will ensure the necessary advice is given to ensure legal compliance and to endure the predicted effects do not worsen, resulting in an unexpected significant effect.

An Outline Habitat Management Plan (OHMP) has been created detailing habitat enhancement measures that will be implemented as part of the Proposed Development, including bog restoration and native broadleaved woodland planting. The aims of this OHMP are to mitigate for habitat loss as a result of the Proposed Development and to provide additional habitat enhancement in line with requirements set out in the National Planning Framework 4.

5 Ornithology

Chapter 7 of the EIAR presents the findings and assessment of potential effects in relation to the ornithological features (birds) which may be affected by the Proposed Development during the construction, operation and decommissioning phases. More details are provided in Chapter 7: Ornithology.

A baseline for the Proposed Development was established following desk study and field surveys to provide information on bird species which were present within the Proposed Development Site and relevant survey buffers, where access permitted. All surveys followed relevant industry guidance.

The main species recorded during vantage point surveys were pink-footed goose and curlew. The breeding bird surveys recorded a single territory of a target species (curlew). The dedicated raptor surveys recorded no evidence of breeding within the surveyed area. Two species (hen harrier and curlew) were evaluated as part of the impact assessment, but no significant effects or significant cumulative effects were predicted for either species. However, reference to general mitigation, and good practice is included to avoid an offence being committed due to reckless killing or disturbance under the Wildlife and Countryside Act 1981 (as amended, Scotland). Habitat Regulations Assessment (HRA) screening was undertaken for two nearby Special Protection Areas (SPAs): Slammanan Plateau SPA and Firth of Forth SPA. No Likely Significant Effect (LSE) was predicted for either site.

A CEMP will be created to detail mitigation measures to be followed during construction. The presence of an Ecological Clerk of Works (ECoW) will ensure the necessary advice is given to ensure legal compliance and to ensure the predicted effects do not worsen, resulting in an unexpected significant effect.

6 Hydrology, Hydrogeology, Peat and Soils

Chapter 8 of the EIA Report presents the findings and assessment of potential effects of the Proposed Development during the construction, operation and decommissioning on the surface water, groundwater, and on soil, peat and geology across the Proposed Development Site. More detailed are provided in Chapter 8: Hydrology, Hydrogeology, Peat and Soils.

Data collection and a series of surveys were carried out, including walkover surveys, peat depth probing and vegetation surveys.

The Proposed Development is underlain till, and peat. This overlies bedrock sandstone, siltstone and mudstone of the Scottish Lower Coal Measures Formation.

The Proposed Development lies within the catchment of the Drumtassie Burn, and upstream within the same catchment, west of the Proposed Development Site, lies the Blawhorn Moss SSSI.

There are legacy areas of coal mining within the Proposed Development Site. A Coal Mining Risk Assessment (CMRA) was carried out in accordance with the requirements of the Coal Authority. This concluded that there are some potential risks associated with the former coal mining workings. It is likely that any risks would be largely realised during the one-year construction period although some effects could increase over time such as mine gas migration, if present.

Groundwater Dependent Terrestrial Ecosystems (GWDTE) assessed as low and moderate dependency have been identified within the Proposed Development Site. Areas of GWDTE are typically associated with drainage channels and depressions and are therefore assumed to have a reasonable surface water supply. As the majority of potential GWDTE communities identified on-site are indicative of high dependency areas, an extent of groundwater dependency cannot be ruled out.

The Proposed Development is classified as Class 3 carbon-rich soils i.e., the dominant vegetation cover is not priority peatland habitat. The peat is considered to be degraded species and unlikely to be highly active or capable of restoration. However, it does represent a significant source of carbon sequestration. Peat occurs mainly on the western extent of the Proposed Development Footprint at depths between 0.6m and 1.0m with distinct areas of deeper peat between 1.5m and 3m depth. There are several very small areas >3m depth. 778m^3 of acrotelm and 1,440m^3 of catotelm will be temporarily excavated prior to being directly reinstated at the point of excavation. 5,659m^3 of acrotelm and 14,231m^3 of catotelm will be permanently excavated and require reuse.

Peat landslide likelihood was found to be Very Low to Low across the majority of the Proposed Development Site.

Six potential Private Water Supplies (PWS) have been identified within 1km of the Proposed Development Site. Five of these are unconfirmed wells identified from OS Mapping and one is a confirmed domestic supply. One of the unconfirmed wells is located within the Proposed Development Site Boundary.

Potential effects were assessed for the Proposed Development after considering embedded mitigation such as avoiding sensitive hydrological, hydrogeological and geological receptors where possible; maintaining a 50m distance from watercourses for

turbines and hardstands; and positioning infrastructure to avoid and reduce impact on GWDTE and peat.

Additional mitigation was designed to further reduce potentially significant effects to a level that is not significant. The key mitigation includes the implementation of the following plans:

- Drainage Impact Assessment and Drainage Management Plan;
- CEMP;
- Pollution Prevention Plan (PPP);
- Peat Management Plan (PMP); and
- Taking into account mitigation, it is considered that the Proposed Development would have no significant effects to Hydrology, Hydrogeology and Soils receptors.

7 Transport and Access

Chapter 9 of the EIA Report presents the findings and assessment of potential effects in relation to changes in traffic as a result of the Proposed Development during the construction, operation, and decommissioning phases of the wind farm. More details are provided in Chapter 9: Transport and Access.

The Proposed Development will lead to increased traffic volumes along road links within the study area during the construction phase. This increase will be temporary as traffic volumes will fall considerably outside of the peak period. It should also be noted that background traffic levels within the study area are considered low.

It is currently proposed that AIL components will be delivered to the Proposed Development Site from the Port of Entry at King George V Docks, Glasgow, although the final Port of Entry will be confirmed prior to the commencement of construction. The movement of the AIL traffic would require temporary remedial works at a number of locations along the identified delivery route.

The maximum traffic effect associated with construction of the Proposed Development is predicted to occur in Month 5 of the construction programme.

During this month, an average of 64 HGV movements is predicted per day and it is estimated that there would be a further 18 car and light van movements per day to transport construction workers to and from the Proposed Development Site. The greatest impact would occur along Heights Road.

Traffic levels during the operational phase of Proposed Development would be one or two vehicles per week for maintenance purposes. Traffic levels during the decommissioning of the Proposed Development are expected to be lower than during the construction phase as some elements may be left in-situ and others broken up onsite.

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

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

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 Minor or Not Significant but as they will occur during the construction phase only, they are temporary and reversible.

8 Cultural Heritage

Chapter 10 of the EIA Report identifies the archaeological and cultural heritage value of the Proposed Development Site and assesses the potential for direct and setting effects on heritage assets resulting from the construction, operation and decommissioning of the Proposed Development. This chapter also identifies measures that are proposed to mitigate predicted adverse effects. More details are provided in Chapter 10: Cultural Heritage.

National planning policies and planning guidance as well as local planning policies require that account is taken of potential effects upon heritage assets by proposed developments and that where possible such effects are avoided. Where avoidance is not possible these policies require that any significant effects on heritage assets be minimised or offset.

There is considered to be a low potential for heritage assets of all periods pre-dating the post-medieval period to be present within the Proposed Development Site. Known post-medieval assets are present within or close to the Proposed Development Site and relate to the deserted post-medieval farmstead at Drumelzie (Asset 88). Despite known assets of post-medieval date within the Proposed Development Site, the potential for further assets of this date to survive is considered low. Any such finds and features would likely be agricultural in nature and consist of agricultural features. If they do survive, they are also likely to be close to and within the footprint of the existing non-designated heritage asset of the deserted post-medieval farmstead of Drumelzie (Asset 88).

Impacts upon the settings of designated assets such as World Heritage Sites, Listed Buildings, Scheduled Monuments, Conservation Areas, Inventoried Battlefields and Inventoried Gardens and Designed Landscapes are a material consideration in the planning process.

Potential operational effects on the settings of designated heritage assets within 10km of the Proposed Development Site have been considered as part of this assessment. No significant setting effects have been identified.

Any heritage assets identified as requiring assessment through consultation with HES and WoSAS have also been included within this EIAR Chapter. This includes non-designated heritage assets and heritage assets, designated or otherwise, beyond 10km of the Proposed Development Site.

The possibility of cumulative effects has also been assessed. No significant cumulative effects have been identified.

9 Noise

Chapter 11 of the EIA Report presents the findings and assessment of potential effects in relation to noise as a result of the Proposed Development during the construction, operation, and decommissioning phases of the wind farm. The assessment also considers the effects of noise cumulatively with the existing Drumduff windfarm and that at Burnhead, on noise sensitive receptor locations in the vicinity. Noise sensitive receptor locations in this case are inhabited residential properties. More details are provided in Chapter 11: Noise.

Noise during the construction phase of the development will arise from construction vehicles accessing the Proposed Development site and from construction activities within it, including track construction and turbine erection. Noise during the operational phase of the development will arise from the installed wind turbines as they rotate to generate energy.

Construction noise impacts have been assessed with regard to relevant guidance in BS 5228:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites. There may also be temporary impacts associated with construction traffic accessing the site which have been considered in the assessment.

The results of the construction noise impact assessment indicates that no significant effects will arise from the construction or decommissioning of the Proposed Development as the relevant noise limits set out in BS 5228 will be met, although noise will be audible at noise sensitive properties in the vicinity of the Proposed Development, particularly from construction vehicles accessing the site. Although the relevant noise limits will be met, noise during the construction phase will be controlled and minimised through a construction and environmental management plan (CEMP) that will be prepared at the time of construction.

Operational wind turbine noise impacts have been assessed in line with ETSU-R-97, The Assessment and Rating of Noise from Wind Farms, and the associated guidance provided by the Institute of Acoustics (IOA) document, A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise.

Predicted operational noise levels from the Proposed Development acting in isolation and cumulatively with other windfarms in the vicinity meet the relevant noise limits as set out in ETSU-R-97, and therefore the noise impact is considered to be not significant. Noise during the operational lifespan of the Proposed Development will be controlled by noise limits that will be applied via planning conditions for the site.

10 Forestry

Chapter 12 of the EIA Report presents the findings and assessment of potential effects to forestry as a result of the Proposed Development during the construction, operation, and decommissioning phases of the wind farm. More details are provided in Chapter 12: Forestry.

The Forestry Study Area (FSA) extends to approximately 76.19ha and is comprised of privately owned and managed woodlands within the site boundary. The forest is comprised largely of commercial conifers with areas of mixed broadleaves and open ground. The primary conifer species is Sitka spruce which comprises 65.87% of the total study area.

A total of 38.00ha will require to be felled to enable the construction and operation of the Proposed Development. Of this, part will be replanted either with commercial conifers or native broadleaves; an area of 9.15ha has been identified as suitable for priority habitat restoration; and 15.41ha will be occupied by the Proposed Development infrastructure and associated buffer zones.

As a result of the Proposed Development there would be a net loss of stocked woodland within the FSA of 24.19ha. Under the Scottish government's Control of Woodland Removal Policy, restoration of a priority habitat does not require compensatory planting. Compensatory planting therefore would be required on 15.04ha. In order to comply with the Scottish Government's Control of Woodland Removal Policy, the Applicant is committed to providing the appropriate area of off-site compensatory planting.

11 Socio-economics, Tourism and Recreation

Chapter 13 of the EIA Report assesses the likelihood of significant socio-economic, recreation and tourism effects of the Proposed Development on the surrounding area, with regards to local residents.

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, negative effects of the operational phase of the Proposed Development are predicted not 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 21 jobs are expected to be created during the development phase with up to 142 jobs predicted to be created during the construction phase of the Proposed Development. The Proposed Development could also generate approximately £386,142 annual turnover in GVA during the operational phase alone.

The Applicant is adhering to the best practice recommendation and proposing a community benefit package of up to £75,000 per annum over the 40-year life of the Proposed Development, based on a figure of £5,000 per MW for each of the 15MWs installed generating capacity. While this benefit package is a voluntary contribution by the Applicant, its benefits are not a material planning consideration.

Overall, the socio-economic impact during construction of the Proposed Development was assessed as minor beneficial in West Lothian and the wider area (Central Scotland), and negligible beneficial in Scotland. The annual economic impacts related to operation were assessed as negligible beneficial for both study areas. 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.

12 Climate Change and Carbon Balance

This chapter assesses the 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. Stakeholder consultation with West Lothian Council (WLC) during the EIA process informed the assessments.

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 deep peat where possible 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.

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

This chapter of the EIA Report summarises the potential effect of the Proposed Development on aviation and telecommunications and the potential shadow flicker effects on sensitive receptors. Stakeholders have been consulted during the EIA process and have informed the assessments. Stakeholders include the Ministry of Defence (MoD); BT, Glasgow Airport and Edinburgh Airport.

Aviation

Consultation with Glasgow Airport confirmed that the Proposed Development is located outwith their obstacle limitation surfaces but within their radar consultation and IFP safeguarding areas but was deemed unlikely to attract a safeguarding objection.

Consultation with Edinburgh Airport included the commissioning of an IFP safeguarding report by the Applicant and a Line-of-Sight Assessment by Edinburgh Airport to determine potential effects on the Primary Surveillance Radar (PSR). The Applicant has identified mitigation with NATS and will enter into an agreement with Edinburgh Airport following the receipt of consent to allow the impacts on safeguarding criteria to be mitigated.

The Applicant is also committed to entering into an agreement with Edinburgh Airport and MOD including an agreed lighting scheme to take into consideration any potential conflict, if required.

Due to the commitment to the mitigation agreements, it is considered that there will be no significant effects on Edinburgh Airport, NATS or MOD as a result of the Proposed Development.

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.

Consultation with Atkins, acting on behalf of Scottish Water, has indicated that a scanning telemetry link runs between Garbethill and East Craigs, crossing the Proposed Development Site. At the time of writing, June 2023, consultation is ongoing between the applicant and Atkins and a response from Atkins is pending

Subject to the outcome of the Scottish Water assessment undertaken by Atkins, there will be no significant effects 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 occurs within a distance of 10 rotor diameters (1,360m for the case of the Proposed Development) and 130 degrees either side of north. There are no properties within potential shadow flicker impact distance of the proposed turbines. Therefore, there is no potential for the Proposed Development to cause shadow flicker.

As there are no residential receptors within the Study Area, no cumulative effects with other wind turbines are anticipated.

14 Summary and Conclusion

Drumduff Extension 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 known as Drumduff Extension Wind Farm (the 'Proposed Development').

An EIA has been conducted based on a Pre-Application Advice and consultation with West Lothian Council (WLC) as outlined in Chapter 2 EIA Approach and Methodology.

The EIA also considers advice obtained from technical consultation (summarised in Chapters 5 to 15) to inform assessments of the effects on the Proposed Development on the following:

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

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), Outline Peat Management Plan (PMP) and Outline Habitat Management Plan (HMP) provided as Appendices 16-1, 6-4 and 8-2 respectively as part of this EIA Report.

The assessments have not identified any residual (inclusive of mitigation measures) significant effects with the exception of Landscape and Visual. A limited number of adverse significant residual effects are predicted on landscape fabric, views within 1-2km, the landscape character and at five viewpoints.

Mitigation of Landscape and Visual effects has been undertaken through design modifications and input to the design process.

There are significant beneficial effects in relation to the Proposed Development, in terms of recreational access (Chapter 13: Socioeconomics, Tourism & Recreation) and in terms of the reduction of GHG through the displacement of conventional electricity generation in terms of carbon balance and contribution to Net Zero (Chapter 14: Climate Change and Carbon Balance).

Minor beneficial effects and also anticipated both in employment and GVA terms in the context of local and national economies as well.