Rigged Hill Windfarm Repowering

Non-Technical Summary

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SCOTTISHPOWER RENEWABLES

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Non-Technical Summary

NTS.1 Introduction

1. This Non-Technical Summary (NTS) summarises the Environmental Statement (ES) which accompanies the application for planning permission to "repower" the Operational Rigged Hill Windfarm, which is situated approximately 6 km southwest of Limavady, in County Antrim Derry/Londonderry as shown on Figure NTS-1. Repowering is the process of the removal of older, first generation wind turbines and their replacement with modern machines, which are generally quieter, and capable of producing more electricity, more efficiently.

2. ScottishPower Renewables (UK) Ltd (referred to as 'the Applicant'), is part of the ScottishPower group of companies operating in the UK under the Iberdrola Group, one of the world's largest integrated utility companies and a world leader in wind energy. ScottishPower now only produces 100% green electricity – focusing on wind energy, smart grids and driving the change to a cleaner, electric future. The company is investing over £4m every working day in 2019 to make this happen and is committed to speeding up the transition to cleaner electric transport, improving air quality and over time, driving down bills to deliver a better future, quicker for everyone.

3. Planning permission is being sought for the decommissioning of the Operational Rigged Hill Windfarm and the subsequent erection and operation of up to seven wind turbines (referred to as 'the Development'). The Development is located within the Causeway Coast and Glens Borough Council (CCGBC) administrative area in Northern Ireland. The Site is identified in Figure NTS -1 and NTS-2. The Development, will have an installed capacity of around 28-29 Megawatts (MW) and will also include an ancillary Energy Storage Unit.

4. Consent for the initial Operational Rigged Hill Windfarm was granted by the Department of the Environment for Northern Ireland and was constructed in 1995. To date, the Operational Rigged Hill Windfarm has made an important contribution to Northern Ireland's Renewable Energy targets and low carbon objectives, and the Applicant is seeking to secure and build on this contribution by repowering the scheme. International, European, UK and Northern Irish energy policy all provide a framework and targets for the development of more renewable energy.

5. The Environmental Statement (ES) presents information on the identification and assessment of the potential significant environmental effects of the Development and reports the findings of the Environmental Impact Assessment (EIA), which has been undertaken in accordance with the Planning (Environmental Impact Assessment) Regulations (Northern Ireland) 2017 (the EIA Regulations). The ES comprises the following documents:

- This Non-Technical Summary;
- The main report (Volume 1);
- Supporting figures (Volume 2); and
- Technical Appendices (Volume 3).

6. These documents inform readers of the nature of the Development, likely environmental effects and measures proposed to protect the environment during each phase of the Development. The sections in this NTS summarise the chapters in the main report, using the same numbering.

7. The Development will comprise the following phases:

- Decommissioning of Operational Rigged Hill Windfarm (initial phase of the Development);
- Construction of the Development (likely to occur in tandem with the above phase);
- Operation of the Development; and
- Decommissioning of the Development (final phase).

NTS.2 Environmental Impact Assessment

8. The EIA Regulations list developments for which an EIA is required where there are likely to be significant effects on the environment by virtue of factors such as the nature, size or location of the development proposal. Windfarms of the scale of the Development typically require EIA, and the Applicant decided that an EIA should be carried out and is submitting this ES as part of the planning application.

9. The ES has been prepared following a systematic approach to EIA and project design, with knowledge of the potential effects being used to change the design so as to reduce those effects. The main stages to EIA are:

- Scoping (which is a formal process of asking relevant organisations for their opinion on what should be included in the EIA) and ongoing consultation, including consideration of responses from all parties and how these responses should be addressed;
- Technical environmental assessments - including baseline studies, input to the design process, identification of potential significant environmental effects and identification of measures to reduce undesirable effects;
- Preparation of the ES; and
- Submission of the planning application and ES.

10. The process of scoping and pre-application consultation is critical to the development of a comprehensive and balanced ES. The request for a Scoping Opinion was submitted to the CCGBC in August 2017. The request was accompanied by the Scoping Report which described the Development, the proposed EIA methodology and the key areas to be 'scoped in' or 'scoped out' of any further assessment. The document was also sent to a range of consultees as agreed in advance with the Council by the authors of the ES. A copy of the Scoping Report is included as Technical Appendix A2.1. The Scoping Opinion was issued by the Council and received on 26th January 2018, a copy of which is included as Technical Appendix A2.2. This included agreement on excluding from the ES, assessment of effects on certain receptors or features, where it was agreed there was no potential for significant effects.

11. The applicant held three rounds of Public Information Days (PIDs) for the Development, on the 24th and 25th August 2017, then on the 6th and 7th of July 2019, at the Roe Valley Arts and Cultural Centre in Limavady and Garvagh Community Building, and a final exhibition on 26th June 2019 at the Roe Valley Arts and Cultural Centre in Limavady. The aim of the first round of information days was to invite comments and obtain feedback in the early design stages to ensure that local considerations helped to inform design decisions. The aim of this second round was to present the final design reached following the rigorous EIA process.

12. Environmental effects have been assessed in chapters of the ES, broadly with one chapter per technical discipline, generally representing a type of receptor of potential effects (e.g., birds). The assessments in each chapter follow a similar, systematic approach, to identify any effects that may be significant in the context of the EIA Regulations. The approach includes establishing the "baseline", this being the current state of the environment, to which the Development will be added. This identifies the key receptors, including how sensitive they are to the sort of change that might be caused by the Development. The potential size (or magnitude) of change caused by the Development is then assessed, and the sensitivity and magnitude are considered together to form a conclusion on significance. Effects can be desirable (or "positive", or "beneficial"), or undesirable (or "negative", or "adverse"). Mitigation is proposed where possible to prevent significant undesirable effects. The final, proposed effects are those after mitigation has been applied, and are "residual effects".

13. In accordance with the EIA Regulations, the assessment has considered 'cumulative effects'. These are effects that result from cumulative changes caused by past, present or reasonably foreseeable actions together with the Development.

NTS.3 Proposal for the Repowering of the Operational Rigged Hill Windfarm

14. The layout of the Development is shown on Figure NTS-2. The Development will comprise of the following main components:

- Decommissioning of the existing 10 turbines;
- Removal and restoration of the existing substation building and compound in accordance with the Outline DCEMP and Draft HMP;
- Removal and restoration of other redundant infrastructure in accordance with the Outline DCEMP and Draft HMP;
- The erection of seven three bladed horizontal axis wind turbines of up to 137 m tip height;
- Turbine foundations;
- Construction of approximately 4.82 km of new access tracks;
- Upgrade of approximately 1.75 km of existing access tracks;
- Construction of temporary and permanent hardstanding areas for each turbine to accommodate turbine component laydown areas, crane hardstanding areas and external transformers and/or switchgears;
- Temporary construction compound/laydown areas (some areas may be reinstated temporarily if required for future operational and decommissioning purposes);
- Turning heads and passing places incorporated within the site access infrastructure;

- New road junction with Terrydoo Road;
- Five new water crossings;
- Meteorological Mast;
- Buried underground electrical and communication cables;
- Substation, with roof mounted solar panels, and associated compound, including windfarm and grid connection operating equipment;
- Energy Storage Units;
- Removal of self-seeded trees in east of the Site;
- Associated ancillary works; and
  Micrositing allowance of 50 m deviation from the indicative design footprint.

15. A micrositing allowance of 50 m deviation (in all directions) from the indicative design footprint, subject to infrastructure remaining within the planning application red line boundary, has also been requested. Being able to move some elements of infrastructure nearer the time of construction, means that any unfavourable ground conditions or unforeseen environmental constraints can be further avoided at the request of an on-site ecologist or archaeologist.

Wind Turbines

16. The seven turbines will have a height from base to tip of up to 137 m, but the specific make and model is not yet fixed. The turbines will be of a typical modern, three blade, horizontal axis design, light grey in colour and the finish of the tower and blades will be semi-gloss and semi-matt respectively.

17. The final choice of turbines will be guided by an assessment of the wind conditions and will take account of the available technology at the time of construction. It is likely that turbines of c. 4 MW capacity may be available at the size proposed. For the purposes of the assessments a “candidate turbine” has been selected based on the precautionary principle of assessing the worst-case scenario.

18. Turbines are typically of a variable speed type, so that turbine rotor speed will vary according to the energy available in the wind. Turbines of the size proposed typically have a rotational speed of between 9 and 19 revolutions per minute (rpm), depending on variations in wind speed, generating power for all wind speeds between c. 4 metres per second (m/s) (approximately 8 miles per hour) and c. 25 m/s (approximately 50 miles per hour). At wind speeds greater than c. 25 m/s, which are very unusual, the turbines will automatically shut down for self-protection.

19. The turbines are computer controlled to ensure that at all times, the turbine faces directly into the wind to ensure optimum efficiency. The rotors of all seven turbines will rotate in the same direction relative to the wind direction.

20. Each wind turbine needs an area of compacted stone adjacent to the turbine base, known as a hardstanding. This is used principally by the crane for the erection of the turbine.

Access to the Development

21. The Operational Rigged Hill Windfarm has historically been accessed through the Cam Forest north of the Site. This operational access is due to be replaced, independently of the Development, with a new access track entering the Site from the west, off Terrydoo Road and extending up Rigged Hill which is currently the subject of a planning application, the EIA for the Development has treated this as a new access track and site entrance, for the purposes of the environmental assessment process and these elements form part of the description of the Development. The turbines are expected to arrive in Northern Ireland at either Belfast, Larne or Derry/Londonderry options have been left open at this time, and the potential effects of transporting them and other materials is set out in section NTS-12 and Chapter 12 of the ES.

22. Where possible, the access tracks serving the Operational Rigged Hill Windfarm will be kept, utilised and upgraded as necessary to access the proposed turbine positions. These will be supplemented by new access tracks where required. Tracks required to access new elements of the Development will be retained throughout the operational life of the Development to enable maintenance of the turbines and replacement of any turbine components. In total, approximately 4.82 km of new access tracks will be required, with approximately 1.75 km of existing track requiring localised widening.

Grid Connection

23. Underground cabling, laid where possible alongside the new access tracks, will link the turbine transformers to the onsite substation building. Where existing track is being re-used, the cables will be laid in a cable trench alongside the existing track.

24. It is likely that a new connection to the electrical grid will be required to accommodate the Development, because it will generate more electricity than the Operational Rigged Hill Windfarm. Based on initial discussions with Northern Ireland Electricity (NIE), it is possible that the Development substation would be connected to the Agivey 'cluster' substation, which is approximately 9 km south-east of the site. The final route selection will be determined by NIE.

Energy Storage Unit

25. The Energy Storage Unit will be located within the substation compound. The units are likely to consist of containers each approximately 6.0 m x 25 m x 2.2 m high.

26. The energy storage technology favoured today is lithium-ion (Li-ion) batteries, which have characteristics that make them suitable for being connected to the grid. The final selection of energy storage technology used will be based on the latest technology available at the time of construction.

Initial Decommissioning / Construction Phase

27. The construction phase of the Development will run in parallel with the initial decommissioning of the Operational Rigged Hill Windfarm and take approximately 8 months in total, depending on the final layout and weather conditions. In general, working hours for decommissioning / construction activity will be from 07:00 to 19:00 throughout the week, with reduced working hours at weekends.

28. The first phase of the Development will comprise the decommissioning and removal of the existing turbines, external transformers and wind monitoring masts from the Site. It is anticipated that the turbines and external transformers will be carefully dismantled and transported offsite, possibly for resale in the second hand market.

29. The turbines will be located across the summit of Rigged Hill, however the land taken by the turbines and other infrastructure is a very small proportion of this, and substantial efforts have been made to re-use existing infrastructure rather than using new land. During the initial decommissioning/construction phases, the total land-take required for the Development will be 8.19 ha, including the 2.11 ha of land used by the Operational Rigged Hill Windfarm. Towards the end of these phases, around 0.98 ha of land would be reinstated.

30. The Applicant will appoint an Infrastructure Contractor who will have overall responsibility for management, including environmental management, on the construction site. The Infrastructure Contractor will ensure the decommissioning/construction activities are carried out in accordance with the mitigation measures outlined in the ES and as required by the planning permission, such as the Outline Decommissioning and Construction Environmental Management Plan included in the ES as Technical Appendix A3.1. The services of specialist advisors will be retained as appropriate, such as an archaeologist and ecologist, to be called on as required to advise on specific environmental issues.

Site Restoration

31. A draft Habitat Management Plan, included in the ES as Technical Appendix A3.2 and the Outline Decommissioning and Construction Environmental Management Plan (**Technical Appendix A3.1**), set out measures for soil management and restoration. Site restoration will involve the restoration of track and hardstanding verges and the temporary decommissioning and construction compound to provide a natural ground profile. Restoration will be undertaken at the earliest opportunity to minimise storage of turf and other materials.

Operational Phase

32. During the operational phase of the Development, turbine and infrastructure maintenance will be ongoing and regular. This is expected to continue to employ approximately 2 or 3 people on a permanent basis for regular operational and maintenance activities.

33. No time limits are proposed on the operational lifespan for the Development. In the event that the Development requires to be decommissioned, the process would be similar to the decommissioning of the Operational Rigged Hill Windfarm. Given the fewer number of turbines in the repowered scheme, the potential effects arising from its future decommissioning will be less

than the effects arising as a result of the initial decommissioning of the existing turbines alone. The initial decommissioning/construction phase therefore represent the worst-case parameters for environmental assessment purposes.

NTS.4 Site Selection and Design

34. The Operational Rigged Hill Windfarm was constructed in 1995 and, whilst the turbines currently perform well, replacement of the existing turbines with newer turbines would increase the renewable energy generation capacity from 5 MW to around 28-29 MW.

35. Repowering an existing windfarm not only increases renewable energy generation capacity, but also leads to lesser environmental effects compared to constructing a similar development on a new site. For example, when compared with a site of similar scale elsewhere that does not currently have windfarm development, repowering an existing site would have lesser landscape and visual effects as the wind turbines are already a feature in the landscape. Likewise, existing infrastructure such as hardstandings and access tracks can be reused, reducing the overall footprint of new infrastructure serving the Development. Therefore, repowering allows the Development to benefit from the use of the existing infrastructure, whilst also reducing associated environmental effects.

36. The Site layout design has evolved through a series of changes, to avoid or minimise potential effects, including effects on views, hydrology, peat, ecology and fisheries, ornithology, noise and archaeological features. Technical criteria such as wind speed, prevailing wind direction, existing infrastructure, topography and ground conditions were considered during the design process, in response to guidance documents, and survey findings and responses from consultees. Overall it is considered that the proposal represents an optimum fit within the technical and environmental parameters of the project.

NTS.5 Legal and Policy Framework

37. Chapter 5 of the ES sets out legislative planning and policy background to the application. This includes the local development plan, which is the Northern Area Plan (2016), and other material considerations, such as regional planning policy and guidance for Northern Ireland. These policies are relevant to the determination of the application by Council decision-makers, and a compliance assessment of the Development with these policies is set out in the Planning Statement that accompanies the application (but which is not part of the ES).

38. The Northern Ireland Investment Strategy 2011-2021 highlights the importance of renewable sources in electricity generation. The long-term targets are emphasised, underlining that the UK Climate Change Act 2008[2] legislated for an 80% mandatory cut in the UK's carbon emissions by 2050 (compared to 1990 levels), with a target of 35% by 2025. A recent amendment to the UK Climate Change Act (dated 26th June 2019), to be introduced from July 2019 onwards, commits the UK to a reduction in greenhouse gases by 100% lower than the 1990 baseline, following the declaration of a "*Climate Emergency*" by the UK Government.

39. The Onshore Renewable Energy Action Plan 2013-20203 considers the contribution of onshore renewable technologies to the 40% renewable energy target by 2020 and recognises the impact that onshore wind has on the electricity network in Northern Ireland. The Development will contribute towards meeting the Northern Irish key renewable targets through the repowering of the Operational Rigged Hill Windfarm which will result in an increased overall generating capacity as well as securing continuity of renewable energy provision.

NTS.6 Landscape and Visual

40. Chapter 6 of the ES presents a Landscape and Visual Impact Assessment for the Development. The assessment of landscape and visual effects has been carried out to identify the significant effects that are likely to arise as a result of the Development. It has considered the effects on landscape and visual receptors, as well as the cumulative effect of the Development in addition to and in combination with other windfarm developments. The process involved identifying those

[1] Northern Ireland Executive (2015). Investment Strategy for Northern Ireland 2011 – 2021. Available online at: https://www.infrastructure-ni.gov.uk/publications/investment-strategy-northern-ireland-2011-2021 [Accessed on 07/07/2017]

[2] UK Government. The Climate Change Act 2008 https://www.legislation.gov.uk/ukdsi/2019/9780111187654

[3] Department of Enterprise, Trade and Investment (2013). Onshore Renewable Electricity Action Plan. Available online at: https://www.economy-ni.gov.uk/articles/onshore-renewable-electricity-action-plan [Accessed on 07/07/2017]

receptors with the potential to be significantly affected and assessing the potential effects that the decommissioning of Operational Rigged Hill Windfarm and the construction and operation of the Development would give rise to. The significance of these effects has been assessed through combining the sensitivity of each receptor with a prediction of the magnitude (size) of change that would occur as a result of the Development.

41. The Development is located between Temain Hill and Boyd's Mountain in an upland area. The western slopes of the upland rise steeply and relatively evenly from the pastoral low-lying area to the west with the steepest of these forming the western flank of Donald's Hill. To the east of Rigged Hill, the slopes are gentler and less even.

42. The Study Area for the Development covers a radius of 30 km and, within this area, those receptors with the potential incur significant effects (as agreed with consultees through the EIA Scoping process) have been assessed in detail. This has included one landscape element, four landscape character areas (LCAs), three designated landscape areas and 19 representative viewpoints. Photomontages have been prepared for the viewpoints, with the exception of Viewpoint 18 which lies at a range of approximately 26 km, and the figures also include a wireline of the Development on its own and a wireline with all other cumulative developments. These visualisations have helped assist in the assessment process.

43. In respect of effects on landscape elements, the assessment found no significant effects would arise. The losses of rough grass moorland as a result of the initial decommissioning of Operational Rigged Hill Windfarm and construction of the Development would comprise only a small proportion of a much wider landscape element and would occur in an area where operational windfarms are currently sited.

44. In respect of effects on landscape character, the assessment found there would be significant effects within a localised 2 km radius of the Development where views are obtained during the combined decommissioning and construction phases and the operational phase of the Development. These effects would arise within the Binevenagh Landscape Character Area (LCA) and the Roe Basin LCA, where they lie within the area defined as the Immediate Landscape Setting (0 to 2 km radius). The effects on landscape character would be moderated by the existing presence of the Operational Rigged Hill Windfarm which would be replaced by the Development. Not all areas within this 2 km radius would incur significant effects owing largely to the screening effect of landform and forestry. Beyond 2 km, no significant effects on LCAs are predicted.

45. In respect of landscape designations, the assessment found that the effects on the Binevenagh and Sperrin Areas of Outstanding Natural Beauty (AONBs) and the Dog Leap Historic Garden would be not significant. The effects would be not significant on all other designated areas in the Study Area during the decommissioning of Operational Rigged Hill Windfarm and the construction and operational phases of the Development.

46. In respect of effects on visual amenity, the assessment found that six of the 19 viewpoints assessed, and seven of the visual receptors assessed, would be subject to significant effects. These viewpoints and principal visual receptors are listed below:

- Viewpoint 1: Terrydoo Road;
- Viewpoint 2: Temain Road to Aghansillagh and Temain Hill;
- Viewpoint 3: Edenmore Road, Limavady;
- Viewpoint 5: Drumsurn, Beech Road;
- Viewpoint 6: Ringsend;
- Viewpoint 19: B66, west of Ringsend;
- Drumsurn;
- Ringsend;
- Limavady;
- B68;
- B70;
- National Cycle Network (NCN) route 93; and
- Ulster Way Long Distance Route (LDR).

47. The viewpoints would mostly be affected as a result of their close proximity to the Development, with all viewpoints undergoing significant effects lying within 7 km of the Development. All viewpoints beyond this range, and many others within this range from where views are not available or are restricted, would not incur a significant effect as a result of the Development.

48. For the assessment of cumulative effects, the most relevant windfarms are operational, and these form part of the baseline. The assessment of the Development in addition to the cumulative situation is, therefore, largely covered by the main assessment as this takes into account all the operational windfarms.

49. Significant cumulative effects were found to arise only from the consideration of operational, consented and under construction windfarms, from Viewpoint 6: Ringsend, in views from a 5 km section of the B66 when travelling west, and in views from the section of road between Ringsend and north of the Garvagh Forest.

50. In summary, the Development would give rise to limited significant effects on landscape character during the decommissioning/construction and operational phases contained within approximately 2 km of the site. Not all areas within this 2 km radius would incur significant effects owing largely to the screening effect of landform and forestry. It would give rise to some significant effects on visual amenity out to approximately 7 km, but while landscape and visual receptors beyond the 7 km radii may be affected by the influence of the Development, these effects would not be significant. All effects during the initial decommissioning/ construction phases of the Development would be short term and reversible and all effects during the operation of the Development would be permanent and reversible.

51. This illustrates that the locations identified where there are likely to be significant visual effects are all representative of close to middle range views. Effects beyond this range are unlikely to be significant.

NTS.7 Hydrology, Geology and the Water Environment

52. Chapter 7 of the ES evaluates the effects of the Development arising from the construction/decommissioning and operational phases on the hydrology, hydrogeology and geology resource within and surrounding the Site. The hydrological and hydrogeological assessment for the Development was based on a desk study, site surveys, and consultation with the CCGBC, Northern Ireland Environmental Agency (NIEA), Northern Ireland Water and the Drinking Water Inspectorate.

53. The River Roe and Tributaries Special Area of Conservation (SAC) and Area of Special Scientific Interest (ASSI) is the only statutory designated site within the study area that is hydrologically connected to the Development. Although the designation is defined as high sensitivity, the potential impacts have been assessed as negligible.

54. None of the Development infrastructure has been assessed as being at risk from flooding.

55. Four private water supplies are located within the catchment of Development infrastructure, though all lie beyond 250 m of any Development infrastructure and as such fall outside the distance that the NIEA recommends should be assessed.

56. A total of 1111 peat probes were sunk during two phases of investigation, in a Study Area covering the wider area of land considered for Development during the EIA Scoping stage. Pockets of deep peat, 1.5 m or greater, were recorded within land restricted to the east of the Site. Peat depth generally varied across the remainder of the Study Area with thicknesses in the region of 0.5 m or less dominating the western Site area. The final layout has been designed to avoid the deepest areas of peat.

57. Standard, good-practice measures will be implemented to minimise the potential for effects such as pollution, erosion or changes to groundwater and surface water flows at the Development to occur. These established and effective measures are included in the Outline Decommissioning/Construction Environmental Management Plan (Technical Appendix A3.1) and the accompanying Water Construction and Environment Management Plan (Technical Appendix A7.2) which will form part of this document and which the Applicant will be committed to undertake through conditions of the planning consent.

58. The potential disturbance of peat presents a medium-low risk in the eastern Site area between turbines 2 and 3. Specific mitigation included in the draft Habitat Management Plan (Technical Appendix A3.2) and good practice measures are proposed to compensate for potential peat disturbance and reduce the effect to low, which is not significant in terms of the EIA Regulations. During the decommissioning / construction and operational phases of the Development, a number of established good practice measures will be put in place to minimise peat disturbance, peat stability, and loss and compaction of soils. With effective and well managed mitigation measures in place, no significant residual effects on geology and peat are predicted as a result of the Development.

NTS.8 Ecology and Fisheries

59. Chapter 8 of the ES considers the potential for effects on ecological and fishery features. A range of surveys were carried out in accordance with good practice and following advice from consultees. These were used to identify "Important Ecological Features", following the approach set out in relevant professional guidance. These features included sites protected for their nature conservation interest, specific habitats (Blanket bog, Wet modified bog, Dry modified bog, Wet dwarf shrub heath, Running water and Gorse scrub), certain fisheries features (River Roe and Tributaries) and certain protected species (Badger and Bats).

60. The Site is not within or adjacent to any sites that are designated for nature conservation, however there are four internationally designated sites within 15 km. The Carn / Glenshane Pass SAC and Binevenagh SAC have no pathways for potential effects, however the River Roe and Tributaries and Lough Foyle SAC both have an indirect hydrological connection to the Site via the Castle River.

61. There are 18 nationally designated sites within 15 km. Three of these have an indirect hydrological connection to the Site via the Castle River; River Roe and Tributaries ASSI, Roe Estuary ASSI and Lough Foyle ASSI.

62. The layout of the Development has been designed to avoid effects on blanket bog (which is active peat) and other habitats of highest ecological value, but there will be some small-scale effects on blanket bog in locations that cannot be avoided (e.g. existing roads with acute bends). With this exception, the Development will take place on the existing infrastructure of the Operational Rigged Hill Windfarm, and on habitats of lower ecological value. Direct impacts on habitats will be offset by the restoration of 43.4 ha of degraded blanket bog as well as habitat improvements to a further 24 ha of grassland to improve biodiversity, as set out in Technical Appendix A3.2 Draft Habitat Management Plan. This will result in a slight positive effect on habitats and active peat in the medium-term.

63. A badger sett was identified 40 m from a section of the proposed main access track, at this distance and given the type of construction activities required for the track there is not considered to be a risk of direct or indirect impacts on the badger sett or its underground tunnels. The Site is used by Leisler's bat on a regular basis, and the risk of collision-related fatalities during the operation of the Development could be moderate. It is possible to reduce the operation of turbines during periods of highest risk to reduce the effect, which is detailed within **Technical Appendix A8.4 Bat Mitigation Report**.

64. There are desktop records of other protected mammals in the surrounding area, but none are expected to use the Site on a regular basis. Smooth newts and common lizards were not observed during walkover surveys, and are unlikely to be present in significant numbers, no detailed surveys are required. No habitat suitable for the protected marsh fritillary was found.

65. Subject to the successful implementation of the proposed mitigation measures, which will be monitored by a qualified ecologist during construction, the Development will have neutral or slight-positive effects on all Important Ecological Features. Therefore, the Development will not cause any significant negative effects on designated sites, habitats, legally protected species, or any other features of ecological importance.

NTS.9 Ornithology

66. Chapter 9 of the ES presents an ornithological impact assessment of the Development. A baseline survey was used to collect data and inform an assessment of potential effects of the Development due to collision, disturbance and/or displacement of birds.

67. A review of the ornithological data and designated sites was undertaken for the Development and wider hinterland up to 10 km. The Site is not located within a protected area for birds. The closest area designated for the protection of birds is the Lough Foyle Special Protection Area (SPA), 10 km north west of the Site.

68. Baseline ornithology monitoring was undertaken to establish the distribution and abundance of bird populations in the vicinity of the Site. The baseline bird data provided information used to inform the design of the windfarm layout and assess potential effects of the Development due to collision, disturbance and/or displacement of birds. Monitoring during the breeding, wintering and migration seasons were completed during a five-year period (2014 – 2019).

69. Key target breeding species (including snipe, hen harrier, long-eared owl, merlin, kestrel, buzzard, sparrowhawk and raven) were recorded breeding within 1 km of the Operational Rigged Hill Windfarm. Through the design process, the majority of

these have been avoided by applying appropriate buffers. A similar range of breeding and wintering target species were also recorded in the wider hinterland.

70. Predicted effects on birds during the initial decommissioning/construction phases are negligible to moderate, prior to mitigation, on the basis of observed field data and findings, published information and research and best practice guidance. The majority of species are avoided by appropriate buffer distances to turbines (**Technical Appendix A9.1)** in order to avoid disturbance, displacement or collision risks.

71. Two hen harrier nests were located to the north and east of the operational turbines, outside the site boundary. Surveys have shown that the locations of these nests have moved over the years following patterns of forestry felling, and have shown hen harrier habituation to the existing operational turbines. Despite this, a spatial restriction has been placed around the nest locations and as a consequence, the turbine layout was altered to avoid disturbance of the nests.

72. Disturbance and displacement effects on hen harrier, snipe, skylark and meadow pipit were assessed as being moderate or moderate-minor, prior to mitigation and/or implementation of set-backs. Proposed measures to reduce these effects to a not-significant level are proposed in a construction mitigation strategy, including measures such as avoiding work in the bird breeding season where practicable, and checking for nesting birds in advance of decommissioning and construction activities and via habitat management.

73. There are considered to be no specific cumulative or independent operational effects on individual birds or territories as a result of the Development and implemented mitigation measures. There are fewer turbines proposed and the collision risk, based on metrics of individual repowered turbines, for key species including for hen harrier, are marginally lower than in the is currently the case.

74. Mitigation and best practice is also proposed in the form of pre-construction checks for breeding birds and avoidance of nest disturbance during the decommissioning/construction phase, and measures are set out in the Draft Habitat Management Plan, included in the ES as **Technical Appendix A3.2**, during the operational phase which are proposed to further encourage habituation of birds to the windfarm. A bird monitoring programme has been outlined to help increase understanding of effects during the operational phase of the Development.

75. Following implementation of mitigation, no significant effects on ornithology are predicted.

NTS.10 Noise

76. Chapter 10 of the ES presents an assessment of the effects of noise due to the Development.

77. During decommissioning of the Operational Rigged Hill Windfarm and construction of the Development, noise may result from the use of plant and machinery to carry out activities. However, as the Development consists of the repowering of an existing windfarm, a number of elements of the existing site infrastructure such as access tracks will be reused, thereby minimising the amount of construction works required. In addition, due to the large separation distances from the Site to the nearest noise sensitive receptors, no significant construction or decommissioning effects are anticipated. Notwithstanding this, best practice mitigation measures will be adopted to manage noise emissions, including restrictions on working hours during the initial decommissioning, and construction phases of the Development.

78. During operation, wind turbines can generate noise from the machinery housed within the turbine and from the movement of blades through the air. Modern turbines are designed to minimise noise and planning conditions are used to ensure compliance with specified noise limits. The assessment of operational noise has been undertaken in accordance with the recommendations of ETSU-R-97 *The Assessment and Rating of Noise from Wind Farms (1996)*, the method of assessing wind turbine noise recommended by Northern Ireland Executive guidance, and following the current best practice methods described in the Institute of Acoustics' *Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind turbine Noise (2013)*. It has been shown that noise due to the Development, including consideration of cumulative noise effects arising from the Development in combination with other windfarms and wind turbines, would comply with the requirements of ETSU R-97 at all receptor locations.

79. The Development includes an energy storage facility. Such facilities emit relatively low levels of noise. The energy storage facility is likely to include for a number of containerised modules, with the primary noise sources being the air conditioning units used to regulate the temperature of the storage system. Given this, coupled with the substantial (approximately 2 km)

separation distance between the energy storage facility and the closest noise-sensitive receptors, no significant effects are anticipated.

80. Should the proposed Development require to be decommissioned in the future, any noise produced is likely to be of a similar nature to that during the initial decommissioning/construction phases, although the duration of decommissioning will be shorter than that of the decommissioning/construction phase. Any legislation, guidance or good practice relevant at the time of decommissioning would be complied with.

NTS.11 Archaeology and Cultural Heritage

81. The assessment of archaeological and cultural heritage effects has taken into account both potential direct effects arising from proposed construction activities as well as indirect (primarily visual) effects on the settings of cultural heritage assets. Consultation has been undertaken with the Historic Environment Division of the Northern Ireland Department for Communities.

82. The assessment was informed by a Desk-Based Assessment (DBA) which aided understanding of impacts on known (buried) archaeological remains within the Site, and the potential for unknown (buried) archaeological remains to be present. The DBA revealed that the Site has limited archaeological potential due to the exposed upland moorland nature and the existing operational windfarm located within the Site Boundary. Should unrecorded archaeological remains occur within the Development, these are most likely to relate to post-medieval agricultural utilisation of uplands area, although earlier, isolated findspots could occur. Unknown post-medieval remains, if present, would likely survive near extant farmsteads along lower elevations rather than the exposed areas where the turbines are to be located. As the cartographic coverage is good and has likely identified many of the archaeological remains, the potential for unrecorded post-medieval remains to survive is low. However, if unknown (buried) archaeological remains are present within the footprint of the Development, the remains would be likely to suffer damage. Mitigation is proposed for potential effects on unknown archaeological remains, in the form of a qualified archaeologist watching the initial digging activity into undisturbed portions of the Development footprint so as to identify any remains that may be present at the earliest opportunity and record their features prior to any damage occurring.

83. Within the Site Boundary there are 14 cultural heritage assets**.** These heritage assets consist of crop marks and agricultural buildings, primarily from the post-medieval period. The main access track within the Development has the potential to directly affect a possible cropmark site. Mitigation is recommended in the form of a watching brief during construction to ensure that if this cropmark site is present, it can be recorded and documented ensuring preservation by record. No further mitigation is required for known archaeology within the Site.

84. The assessment considered the potential effect of the turbines in relation to the setting of heritage assets beyond the Site. This included consideration of designated heritage assets out to 5 km from the Development as well as additional Scheduled Monument beyond 5 km at the request of the Historic Environment Division of the Northern Ireland Department for Communities. No significant indirect effects on the setting of heritage assets were identified in line with EIA Regulations.

85. The cumulative effect of the Development considers where the Development, in combination with other windfarm developments, has the potential to affect heritage assets. As the Development is a replacement of the Operational Rigged Hill Windfarm, the change in the upland landscape context, in which the Development is sited, would be slight consisting of a small increase in the scale of turbines which constitutes a change of negligible magnitude and is not significant in terms of EIA Regulations.

NTS.12 Access, Traffic and Transport

86. Chapter 12 of the ES sets out the effect that decommissioning/construction traffic would have on the road network, and the consequent effects that that could have on people and communities nearby.

87. Potential effects associated with windfarm development are presented in two key forms: those from the transport of wind turbine components, and those as a result of the import of construction material, equipment and personnel.

88. **Technical Appendix A12.1: Abnormal Load Route Assessment** sets out potential routes for the turbine components, which are typically longer and/or wider than conventional heavy goods vehicles (HGVs) and are therefore referred to as “abnormal”, to reach the site from a suitable port. Routes from the ports of Larne, Belfast and Derry/Londonderry have been assessed and found to be suitable, subject to minor, temporary alterations to street furniture (such as chevron signs, bollards, etc.). These components would be transported with an escort vehicle as standard practice, to help ensure safe passage.

89. There are three options for the likely haul route for HGVs currently under consideration; from either Foyle Port at Derry/Londonderry, from Belfast Port, and from Larne Port.

90. The proposed option from Foyle Port is to take the A2 east towards the Site. The proposed route from Belfast Port is to use the M2, and approaching the Site using Ringsend Road. The route from Larne Port is to use the A36 west towards Ballymena, and approach the site using Ringsend Road.

91. Current traffic flows on these roads have been estimated from measured data and projected forward to an anticipated construction start date, to provide "baseline" traffic flows. The amount of traffic that will be generated by the initial decommissioning/construction phases of the Development and potential effects on people and nearby communities were assessed as negligible and therefore not significant.

92. A detailed traffic management plan (TMP) will be prepared and agreed with the relevant authorities, this will contain detailed information on the expected delivery vehicles, routes, improvement works required, timings and details of the escort and management procedures to be implemented for the duration of the initial decommissioning/construction phases.

93. Beyond overarching best practice measure which would be outlined within the TMP, no specific mitigation measures are proposed, as no significant effects during the decommissioning and construction phases of the Development have been identified during the assessment.

94. No significant effects related to operational phase traffic will occur due to the minimal traffic that would be generated during that phase of the Development.

NTS.13 Socio-economics, Tourism, Recreation and Land Use

95. The potential effects of the decommissioning/construction and operation phases of the Development on socio-economics, tourism and recreation and land-use have been identified and assessed in Chapter 13 of the ES following the desk-based collection of data, site visits and consultation with local stakeholders. The range of potential receptors to be considered was deduced through consultation and use of maps, provided in support of Chapter 6 of the ES, which define those areas from which the Development turbines would and would not be visible.

96. During the decommissioning/construction and operational phases, the effects of the Development on tourism and recreation receptors (Cam Forest, Gortnamoyagh Forest and Springwell Forest) would be negligible, as a result of the absence of direct effects and the very limited visual effects. It is noted that during the initial decommissioning/construction phases that a moderate and therefore significant effect, albeit temporary, in terms of recreational amenity is concluded at The Views Self Catering Cottage, and largely relates to the visual effects associated with the construction activity. During the operational phase the effect would be negligible and not significant.

97. The Ulster Way Long Distance Walking Route currently runs through the Site amongst the operational turbines, this will need to be temporarily diverted during the decommissioning/construction phase, resulting in a moderate effect during this phase as a result of the direct, temporary, effect of the diversion, and the limited visual effects. Following the initial decommissioning/construction phases, the Ulster Way will be reopened and a new circular walking route will join up to the footpaths within Cam Forest to create a new circular walking route with the Development being part of this experience.

98. Land use effects of the Development during the decommissioning/construction phase within the Site would be minor, with effects arising from a temporarily increased land-take and ceasing of agriculture within the construction site. During the operational phase, the land value would increase as a result of the Development, resulting in a minor beneficial effect on land use within the Site.

99. In advance of the decommissioning/construction phase, the Applicant will hold a series of meet-the-buyer events as early as possible, allowing local contractors to learn about opportunities to bid for contracts, time to upskill and time to prepare prior to bidding. The Applicant has significant experience in organising these types of events and has a good understanding of the local area's capacity given that it currently operates Rigged Hill Windfarm. It was estimated that Causeway Coast and Glens could secure contracts worth £1.5 million which is equivalent to 7% of capital expenditure and bring wider benefits estimated to be worth £6.7 Million to Northern Ireland. Effects on the economy during decommissioning/construction would be minor, both direct and indirect, and positive, due to the creation of job opportunities and subsequent spending of income in the local

area and within Northern Ireland as a whole. This effect would last for the duration of the decommissioning/construction phases.

100. Once operational, the Development will require routine maintenance and servicing. It is estimated that the Causeway Coasts and Glens area could secure 38% of operation and maintenance contracts worth £0.3 million annually. It is estimated that turnover generated by the operation and maintenance could support 2 jobs in Causeway Coast and Glens and be worth £10.6 million over an illustrative 30-year period to Northern Ireland. Given the long duration of the operational phase, effects on the economy during operation would be minor, both direct and indirect, and positive, due to the creation of job opportunities and subsequent spending of income in the local area and within Northern Ireland as a whole.

101. In addition, the Development will bring direct contributions to the local economy in the form of business rates and land lease payments, contributing towards lowering the levelised cost of electricity to the consumer and contributing to low carbon economy policy goals. It is estimated that the Development could contribute £0.3 million annually to public finances. Over a 30 year period this would be expected to contribute £9.4 million, although the actual contribution would depend on variables such as the actual energy generation of the Development.

102. Cumulatively, together with other proposed windfarm developments in the region, if these are progressed, the effects would be positive and of minor significance at the level of Causeway Coast and Glens and also Northern Ireland.

NTS.14 Other issues

103. Chapter 14 of the ES considers a number of other issues associated with windfarm development, including potential effects on telecommunications and utilities, shadow flicker, aviation and radar, human health, climate change, and in-combination effects associated with the interrelationships between ES chapters.

Telecommunications and Utilities

104. Operators of telecommunication links were contacted during the EIA, a number of links were found to be operating in the area and suitable separation distances were implemented between the links and turbines to ensure that the Development would not interfere with the links. No disruption to television reception is anticipated following the switch over to digital broadcasting. Utilities, such as power lines, along road sides would be managed through the decommissioning/construction phases in consultation with their operators. Where any modification to utilities is required to ensure continued function, this will be carried out using normal procedures, which are well developed for such operations. Consequently, no significant effects on telecommunications and utilities are anticipated.

Shadow Flicker

105. Shadow flicker is the effect of light levels in a sun-lit room dramatically varying down and up as a result of the shadow of a turbine blade covering the whole window as the blade moved across the sunlight, and this can cause a nuisance through a narrow window opening. Current guidance states that shadow flicker is unlikely to be a significant effect at distances greater than 10 rotor diameters (1,200 m in the case of the Development). No dwellings are located within 10 rotor diameters and as a result no significant shadow flicker effects are predicted.

Aviation and Radar

106. Aviation effects from the operation of wind turbines can include:

- Physical obstructions;
- Generation of unwanted returns on Primary Surveillance Radar (PSR); and
- Adverse effects on overall performance of Communications, Navigation and Surveillance (CNS) equipment.

107. Consultation with aviation operators was undertaken, with a response only from the Ministry of Defence. It requested infra-red lighting (which is not visible) be fixed to the turbines to allow the turbines to be seen with night-vision equipment. It is proposed that all turbines be lit with infra-red light compliant with MOD requirements. The turbines of the Operational Rigged Hill Windfarm are within radar line of sight of Belfast International Airport's radar, and have been accommodated to date by both the airport and air traffic controllers. The Operational Rigged Hill Windfarm is not in radar line of sight of Belfast City Airport's radar while the City of Derry Airport does not currently have radar facilities. The turbine locations will be added to aviation maps prior to construction, to ensure aviation safety protocols are followed. Therefore, potential effects on aviation as a result of the Development will be negligible.

Human Health

108. Effects on human health have been considered in context of Traffic and Transport, Noise, Residential Amenity, Shadow Flicker and Health and Safety at Work. The effects are summarised below:

- Traffic and Transport and Noise have been assessed in chapters 12 and 10 of the ES, respectively, with no significant effects identified;
- Residential Amenity is assessed in Chapter 6 of the ES. As the Development would replace the Operational Rigged Hill Windfarm, the change in setting of local properties would be slight and a negligible magnitude of change. The effect on residential amenity is therefore considered to be negligible which is not significant in terms of EIA Regulations;
- As noted above, no significant shadow flicker effects are predicted to occur; and
- The Development will be constructed and operated in accordance with relevant health and safety legislation and good construction practice, and following this, no significant effects on human health are anticipated.

109. Key detriments to human health, including mental health aspects associated with changes to amenity as a result of the Development, have been considered, concluding that the Development is unlikely to negatively affect people's health and wellbeing in its widest sense. As a result, no significant effects on human health are predicted for any phase of the Development.

Climate Change

110. A climate change assessment has been carried out focusing on the potential effect the Development could have on the climate, through the emission, or saving of emissions, of carbon dioxide or other 'greenhouse' gases. Site-specific information was used, based on field observations, and other reference sources such as Government statistics. Emissions of carbon dioxide from the Development occur principally from the manufacture and construction of the turbines, and from the use of a small amount of electricity from the grid to operate the windfarm's 'standby' functions when the wind speed is low and the turbines are not generating electricity. The total emissions of carbon dioxide are estimated at almost 32,000 tonnes of carbon dioxide over the life of the Development.

111. Savings of carbon dioxide arise principally from the generation of electricity from the Development, such that generation from other sources (which emit carbon dioxide) are offset. The estimates of savings depend on the assumption of which source of electricity is displaced, and the savings range from 20,000 to 70,000 tonnes of carbon dioxide per year. The large area of habitat proposed for improvement (c. 72 ha, as set out in the draft Habitat Management Plan, **Technical Appendix A3.2**) as part of the Development also contributes to carbon savings across the operational phase.

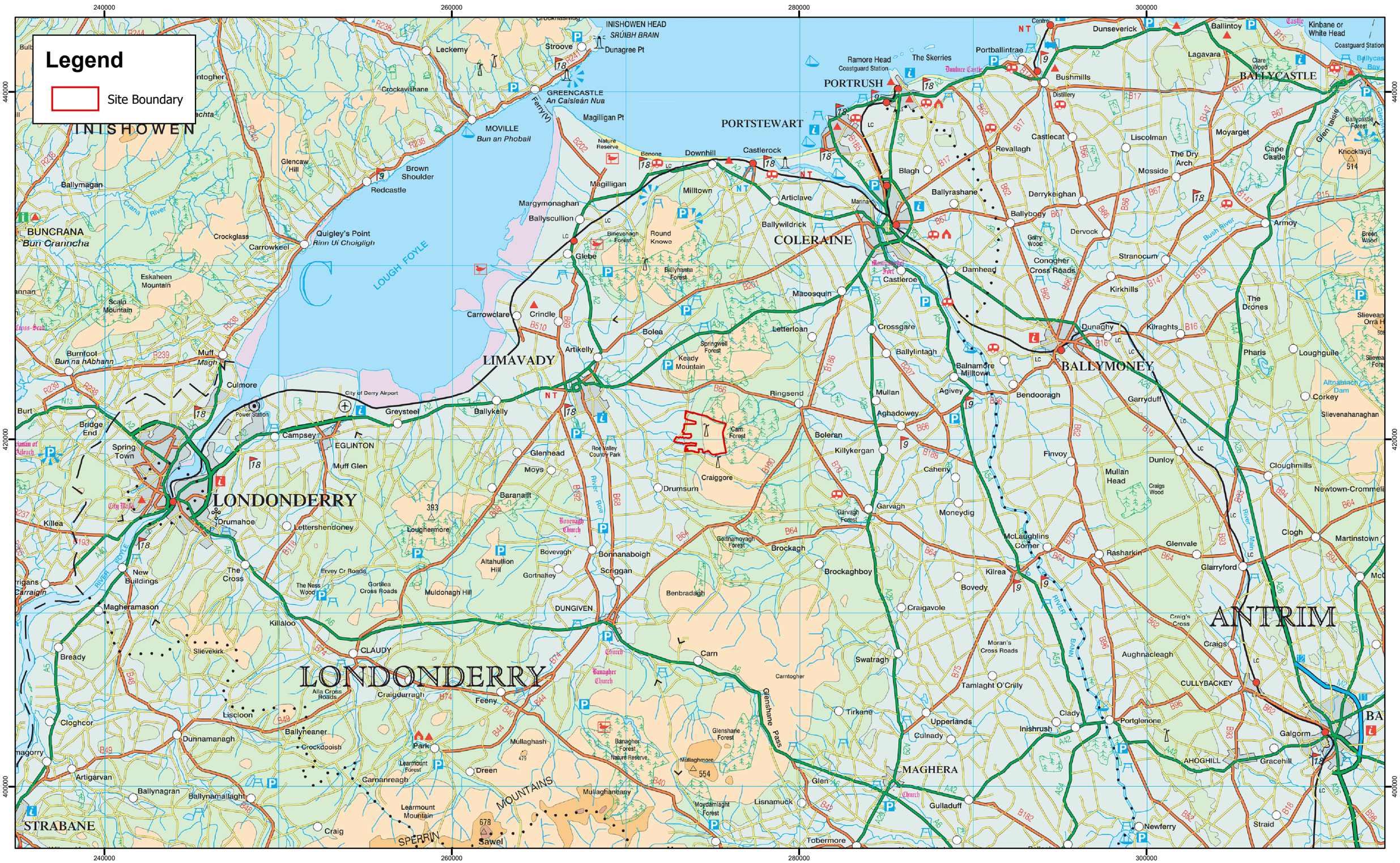
112. Comparing the savings to the emissions, the Development is expected to 'pay back' its total carbon emissions in between 0.5 and 1.5 years of operation. Given the Development will operate for substantially longer than this, the carbon dioxide emissions savings would be a positive net benefit of the Development to reducing climate change. The cumulative effect of the Development with other UK renewables generation is considered to be a fundamental change in the climate effects of UK energy supply, which is a major, positive, effect.

Interrelationships

113. Interrelationship effects may occur where two or more effects arise that have the potential to have an effect on the same receptor during any particular phase of a development. An effect taken in isolation may not have a significant effect on a receptor, but where several effects are considered in an interrelated manner, the resultant combined effect may be considered significant, depending on the nature of the effects. For the decommissioning/construction phase, potential interrelationship effects, not already considered elsewhere in the ES, include visual and traffic-related effects on local residents. For the operational phase, potential interrelationship effects not already considered elsewhere in the ES include visual and increased turbine noise effects on local residents. These are each considered for individual or groups of properties, and the combined effect is considered in comparison to the largest individual effect, to conclude if the additional effect is significant. Where the additional effect would be described as a "material" or "fundamental" change to residential amenity, this would be assessed as significant. In all cases, the additional effects were assessed as either negligible or minor, and not significant in terms or the EIA Regulations.

NTS.15 Summary

114. Chapter 15 of the ES provides a summary of the effects from each ES chapter, and also summarises the mitigation measures proposed, for ease of reference.



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SCOTTISHPOWER RENEWABLES

0 2.5 5 10 km

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Rigged Hill Windfarm Repowering

Site Location

Figure NTS-1

Drawing Number:	Datum	Projection
2607-REP-078	TM65	TM
Scale @ A3 1:200,000	Drawing produced by Arcus Consultancy Services	

2607-REP-078 Fig01 Site Location

272000 274000 276000

420000

BALLYAVELIN NORTH

Legend

- Proposed Turbine Location
- Site Boundary
- Meteorological Mast Location
- Access Track
- Construction Compound
- Substation

TERRYDOO WALKER

TERRYDOO CLYDE

CARNET

LITTLE DERRY

AGHANSILLAGH

TERRYDOO ROAD

TEMAIN ROAD

LISLANE ROAD

BM 105.72 BM 121.74 BM 107.52 BM 96.18 BM 88.16 BM 81.19 BM 133.59 BM 128.34 BM 163.20 BM 180.73 BM 198.01 BM 215.75 BM 233.38

Waterfall Ford Weir Spr Wind Turbine Mast

1 2 3 4 5 6 7

0 0.13 0.25 0.5 km

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SCOTTISHPOWER RENEWABLES

Rigged Hill Windfarm Repowering

Site Layout

Figure NTS-2

Drawing Number:	Datum	Projection
2607-REP-079	TM65	TM
Scale @ A3 1:12,500	Drawing produced by Arcus Consultancy Services	

2607-REP-079 Fig02 Site Layout

Legend

- Proposed Turbine Location
- Site Boundary
- Meteorological Mast Location
- Existing infrastructure to be retained and reused
- New Infrastructure
- Redundant Infrastructure to be restored

274000 276000

420000

TERRYDOO WALKER

TERRYDOO CLYDE

LITTLE DERRY

AGHANSILLAGH

TERRYDOO ROAD

TEMAIN ROAD

LISLANE ROAD

Waterfall

Ford

Weir

Woodburn

Spr

Rigged Hill

Wind Farm

Mast

Wind Turbine

1 2 3 4 5 6 7

BM 121.74 BM 107.52 BM 96.18 BM 88.16 BM 81.19 BM 128.34 BM 113.59 BM 163.20 BM 180.73 BM 198.01 BM 215.75

124.6 126.7 126.9 126.4 127.1 127.1 112.9 109.7 99.7 102.0 92.1 90.3 87.5 86.7 79.5 98.9 103.5 135.4 147.6 157.8 168.9 178.4 189.5 205.5 220.1 238.1

0 0.13 0.25 0.5 km

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Rigged Hill Windfarm Repowering

Site Layout Comparison

Figure NTS-3

Drawing Number:	Datum	Projection
2607-REP-080	TM65	TM
Scale @ A3 1:10,000	Drawing produced by Arcus Consultancy Services	

2607-REP-080 Fig03 Site Layout Comparison

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