Clauchrie Windfarm

EIA Report
Non-Technical Summary

SCOTTISHPOWER RENEWABLES

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Table of contents

Clauchrie Windfarm

Preface

1. This document is the Non-Technical Summary of the Environmental Impact Assessment Report (EIA Report) and has been prepared to accompany the planning application for the proposed Clauchrie Windfarm. The proposed Development is located approximately 5.5 km north east of Barrhill and 3.0 km south of Barr in South Ayrshire, centred on British National Grid Reference 229473, 588551as shown on **Figure 1** below.

2. The EIA Report comprises the following:

- Non-Technical Summary
- Volume 1: Written Statement:
- Volume 2: Figures:
- Volume 3: Landscape and Visual Impact Assessment Figures: and
- Volume 4: Technical Appendices.

3. Hard copies of this NTS are available free of charge from:

ScottishPower Renewables,
9th Floor ScottishPower House,
320 St Vincent Street,
Glasgow
G2 5AD

Email: clauchriewindfarm@scottishpower.com

4. Hard copies of the EIA Report may be purchased by arrangement from the above address for £1,000 per copy, or £15 per DVD/USB. The price of the hard copy reflects the cost of producing all of the Landscape and Visual photographs at the recommended size. As such, a DVD version is recommended.

5. A copy of the NTS and full EIA Report will be made available for download from the SPR corporate website at:

https://www.scottishpowerrenewables.com/pages/clauchrie_windfarm.aspx

6. A hardcopy of the EIA Report is available for viewing by the public during normal opening hours at the following locations:

- South Ayrshire Council, Burns House, Ayr, KA7 1UT;
- Dumfries & Galloway Council Headquarters, English Street, Dumfries, DG1 2DD;
- Barrhill Memorial Hall, Main Street, Barrhill, KA26 0RY
- Barr Village Hall, Stinchar Road, Barr, KA26 9TW
- Scottish Government Library, Victoria Quay, Edinburgh, EH6 6QQ

7. Comments in relation to the application for consent should be forwarded to the address below:

Energy Consents Unit,
5 Atlantic Quay,
150 Broomielaw,
Glasgow
G2 8LU

Email: representations@gov.scot

EIA Report Non-Technical Summary

1 Introduction

1. This Non-Technical Summary (NTS) summarises the Environmental Impact Assessment Report (EIA Report) for the proposed Clauchrie Windfarm. The EIA Report accompanies an application for planning permission under Section 36 of the 1989 Electricity Act. The proposed Development will constitute a Schedule 2 development as provided for by the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (the EIA Regulations).

2. Clauchrie Windfarm is referred to in this NTS and in the EIA Report as the "proposed Development". The proposed Development comprised 18 turbines up to 200 metres (m) in height from ground to blade tip when vertical, each turbine being around 5.6 megawatt (MW) in generating capacity. The overall generating capacity for the proposed Development will be in the region of 100 MW. The development will also include up to 25 MW of energy storage equipment.

3. The proposed Development occupies an area of 2971 hectares (ha) and is located approximately 5.5 km north east of the village of Barrhill and 3.0 km south of the village of Barr within South Ayrshire, as shown on **Figure 1** below.

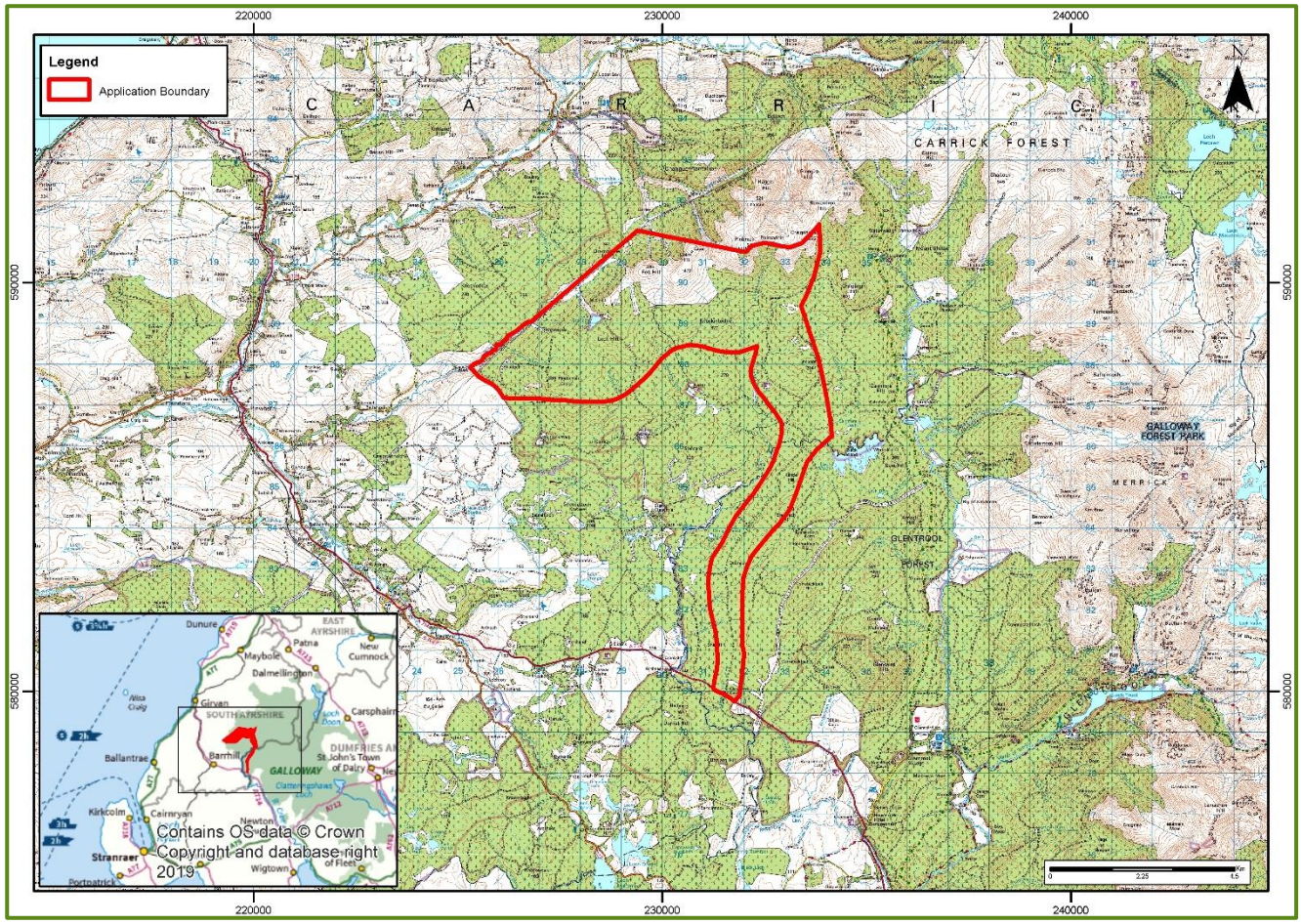


Figure 1 – Site Location Plan

4. Environmental effects of the proposed Development have been considered as part of an iterative design process and included within the Environmental Impact Assessment (EIA). The results of the EIA are presented within the EIA Report and summarised in this NTS. The EIA Report informs readers of the nature of the proposed Development, likely significant environmental effects

and measures proposed to protect the environment, during site preparation, construction and the operation of the proposed Development.

5. Assessments as reported in this EIA Report have been informed by work undertaken as part of the EIA process. Further details on the Site history and selection are provided in Section 3 of this NTS.

6. The proposed Development would produce between approximately 320 GWh of electricity annually. This equates to the annual power consumed by approximately 84,000 average UK households[1]. The proposed Development will contribute to the ambitious Scottish Government net-zero emissions targets which have recently been set down in law.[2]

7. ScottishPower is part of the Iberdrola Group, one of the world's largest integrated utility companies and a world leader in wind energy. ScottishPower now only produce 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 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.

8. ScottishPower Renewables (SPR) is at the forefront of the development of the renewables industry through pioneering ideas, forward thinking and outstanding innovation. The company's ambitious growth plans include offshore windfarms in East Anglia, part of leading the Group's international offshore development.

9. With over 40 operational windfarms, SPR manage all of its sites through its world leading Control Centre at Whitelee Windfarm, near Glasgow. SPR currently have five operational windfarms within the local area; Mark Hill, Kilgallioch, Arecleoch, Glen App and Dersalloch.

10. SPR already supports significant economic activity within the south west region supporting local business through our operational portfolio and this project would further enhance this. Furthermore, SPR has provided over £32m in funding to communities across the UK with a significant element of this (over £13m) being provided to a variety of groups in Dumfries and Galloway and South Ayrshire, including skills, employment, youth and education projects.

1.1 Environmental Impact Assessment

11. Under the *Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017* (hereafter referred to as the "EIA Regulations"), the proposed Development is considered likely to have significant effects on the environment and must undergo the process of Environmental Impact Assessment (EIA) and an EIA Report must be submitted with the application.

12. The EIA process is reported in the EIA Report, which describes the methods used to assess the beneficial and adverse environmental impacts predicted to result from the construction and operation of the proposed Development. Where appropriate, it also sets out mitigation measures designed to prevent, reduce and, if possible, offset any significant adverse environmental impacts. An assessment of residual effects, those expected to remain following implementation of mitigation and environmental protection measures, is also presented.

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

14. The EIA Report is supported by a Planning Statement which provides an assessment of the proposed Development against the relevant legislative and policy considerations, including national level energy policy, national planning policy and the relevant provisions of Dumfries and Galloway Council and South Ayrshire Council Local Development Plans.

[1] Calculated using the most recent statistics from the Department of Business, Energy and Industrial Strategy (BEIS) on annual UK average domestic household consumption.
[2] Climate Change (Emissions Reduction Targets) (Scotland) Act 2019

2 Site Selection and Design

2.1 Site Selection

15. The principles of the EIA process require that site selection and project design should be iterative and constraint-led, to ensure that potential negative environmental impacts, as a result of the proposed Development, are avoided or minimised, as far as reasonably possible. The main alternatives including design, turbine specification, location, size and scale have been considered for the proposed Development site.

16. The proposed Development application boundary is located across two local authorities - South Ayrshire Council and Dumfries and Galloway Council. The proposed access route from the A714, heading north, falls within Dumfries and Galloway Council, whereas the turbines and associated infrastructure of the windfarm itself would fall wholly within the administrative boundary of South Ayrshire Council.

17. A number of factors were considered when selecting the proposed Development site for windfarm development, including the following:

- there are no international or national statutory designations for landscape and nature conservation in, or within close proximity of, the turbine area of the Site;
- the Site is located within an area which the Local Development Plan has identified as having potential for windfarm development;
- initial desk-based studies and wind monitoring onsite suggest that there is likely to be a good wind resource and the Site is available for wind energy development;
- there are available options to connect the proposed Development onsite substation to the substation at the nearby Mark Hill Windfarm;
- it has good access from the public road network particularly for longer blades which allows consideration of larger turbines to make the best use of the expected wind resource;
- potential to use and upgrade much of the existing forestry track, especially along the access route, from the A714. As well as re-using some of the existing Forestry and Land Scotland borrow pits; and
- the Site is reasonably separated from the nearest residential properties.

2.2 Design Approach

18. The purpose of the windfarm is to harvest the energy of the wind and convert this to electricity. The process of turbine siting is a balance between maximising energy yield, and minimising potential for adverse environmental effects. The main environmental parameter affecting design is often landscape and visual effect, but other factors such as ornithology, noise and hydrogeological effects also carry considerable weight.

19. This combination of environmental, design and technical parameters has, through the iterative process of the environmental assessment, resulted in the proposed layout. It is considered that the proposal therefore represents an optimum fit within the technical and environmental parameters of the project. A range of layout options were refined through an iterative process of design and which is documented in more detail within **Chapter 3: Site Selection and Design.**

20. Based on analysis and field work observations, a design concept for the proposed Development was generated identifying the preferred areas for turbines within the Site. The key design objectives applied in developing the proposed Development were the following:

- avoid the ridgeline and upper eastern slopes at the north of the Site;
- limit proximity to closest residential receptors;
- limit impacts on priority peatland and carbon areas;
- respect other environmental constraints;
- create a scheme which maximises the potential of the Site to generate and store renewable energy; and
- use of the existing infrastructure (tracks and borrow pits on the Site) as far as practicably possible.

21. The main landscape and visual design factors and other considerations that were identified comprised the following:

- proximity to and visibility from residential properties as well as the settlements of Barrhill to the south west, Barr to the north, and Pinwherry and Colmonell to the west;
- visibility from the Merrick Wild Land Area to the east;
- a layout which achieves a reasonably balanced group of turbines when seen from key receptor locations in the surrounding landscape;
- consideration of the cumulative landscape and visual impacts from the proposed Development in addition to the Mark Hill Windfarm, as well as other nearby consented wind farms;
- proximity to Cairnderry chambered cairn, which is a Scheduled Monument; and
- cumulative noise impact.

22. The final layout has been informed by a robust EIA and design iteration process, considering potential environmental impacts and their effects, physical constraints, and commercial requirements. The information used to inform the design iteration process included consultation responses received, extensive baseline data and the impact assessment undertaken.

23. To minimise impacts on the Cairnderry Cairn the proposed temporary construction compound at the site entrance was relocated to increase separation distance between it and the Scheduled Monument, and road upgrade works are restricted to the far side of the existing access track. Noise modelling was undertaken for the proposed turbine layout at various stages on the design process to predict the likely sound level which would result from the proposed Development at nearby residential properties. During refinement and finalisation of the design, the maximum distances possible were employed between these properties and the proposed turbines. In regard to landscape and visual, the final layout appears well balanced from most viewpoints and partially mitigates concerns with regards to effects on visual receptors, including views experienced from the Merrick Wild Land Area. Turbines were relocated to lower elevations to prevent views from the lower lying 'core area' (i.e. the wildest area) of the Wild Land Area. It is considered that the layout has achieved a good compromise between high energy yield and potential environmental effects.

3 Proposed Development

24. The proposed Development will comprise 18 wind turbines of up to a maximum blade tip height of 200 m when vertical, giving a combined generating capacity in the region of 100 MW. The proposed Development includes associated infrastructure, comprising:

- turbine foundations;
- crane hardstands;
- transformer/switchgear housings;
- access tracks (existing, upgraded or new as required);
- watercourse crossings (existing, upgraded or new as required);
- underground electrical cabling;
- permanent control compound area including substation, control buildings, LIDAR remote sensing unit, external equipment and ancillary grid service equipment/energy storage;
- permanent anemometer mast;
- up to two temporary Power Performance Masts;
- close circuit television mast(s);
- communication mast(s);
- site signage;
- up to eight borrow pit search areas; and
- two temporary construction compound areas (with part of one proposed to become a recreational car park).

AT A GLANCE….

Number of Turbines: 18

Dimensions: Maximum height of 200m to blade tip

Generation Capacity: around 5.6 MW per turbine or total capacity in the region of 100 MW.

Energy Generated: Provide electricity for approximately 84,000 households

Principal Access: Off the A714 via the A75

25. The layout of the proposed Development is shown on **Figure 2** below.

26. The proposed Development would also require forest restructuring works to enable construction and operation of the windfarm.

27. It is proposed that a dual port strategy is considered for the delivery of the wind turbine components. The wind turbines would be delivered to the King George V (KGV) Dock in Glasgow, but with the possibility of using the port of Cairnryan. Where the KGV Dock is used the wind turbine components would transit via the motorway (i.e. M8, M74) and then onto the A75 and finally the A714, before accessing the Site.

28. The grid connection point for the proposed Development is subject to confirmation by the network operator/owner. The precise route of the grid connection cabling has not been fully determined. It is considered likely that the connection would be to the operational Mark Hill Windfarm. The grid connection would require consent under Section 37 of the Electricity Act 1989 which is the subject of a separate consenting process to this Section 36 application.

29. The proposed Development would include the provision of an energy storage facility within the control compound, with up to 25 MW of energy storage equipment. The facility would store excess power generated by the proposed Development and release power on to the grid when the output from the proposed Development falls due to decreased wind speed, increasing the sustainability of the power generated.

30. Following construction of the proposed Development, the temporary construction compound closest to the site entrance is proposed to be partially converted to a permanent car park for recreational users. The details of this would be agreed with Forestry and Land Scotland, with an access plan developed in consultation with Forestry and Land Scotland and the Access Officers at South Ayrshire Council and Dumfries & Galloway Council.

31. There is no proposal to limit the lifetime of the proposed Development. Therefore, the EIA Report considers the effects of the operational phase of the proposed Development, without limitation but uses 40 years where a defined period is required (i.e. to determine the carbon payback). Should consent be granted, it is anticipated that there would be a condition which would deal with the requirement to remove turbines if they became non-operational for a defined period of time.

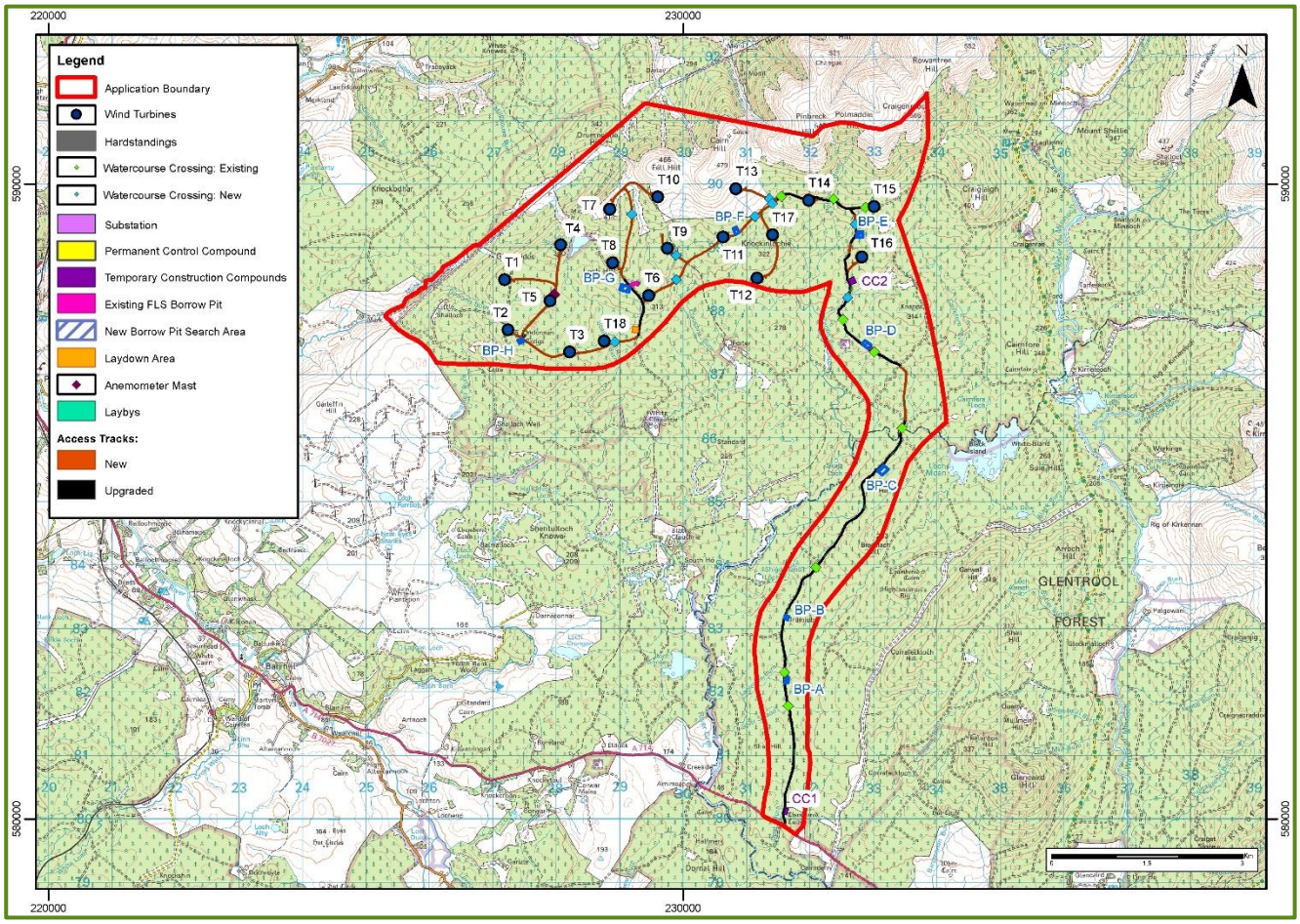


Figure 2 – Proposed Development Layout

3.1 Construction

32. The proposed Development would be constructed over a period of approximately 18 months, anticipated to commence between 2022 and 2023.

33. Construction working hours for the proposed Development would be 7am to 7pm Monday to Friday and 7am to 4pm on weekends. Out of necessity, due to weather conditions and health and safety requirements, some generally quiet activities may occur outside these specified hours.

34. Construction would include the principal activities detailed within the indicative construction programme in **Table 1** below.

Table 1 Indicative Construction Programme

Activity	Month Number																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Site establishment																		
Forestry felling																		
Access road upgrades																		
Construction of new access tracks and crane hardstandings																		
Turbine foundations																		
Substation building and electrical works																		
Energy storage compound and installation																		
Cable trenching and installation																		
Turbine delivery, erection and commissioning																		
Site reinstatement																		

4 Scoping & Consultation

36. The process of consultation is critical to the development of a comprehensive and balanced EIA Report. The purpose of pre-application consultation is to:

- ensure that statutory consultees and other bodies with a particular interest in the environment are informed of the proposal and provided with an opportunity to comment at an early stage in the EIA process;
- obtain baseline information regarding existing environmental site conditions;
- establish key environmental issues and identify potential effects to be considered during the EIA;
- identify those issues which are likely to require more detailed study and those which can be justifiably excluded from further assessment; and
- provide a means of confirming the most appropriate methods of assessment.

4.1 Statutory Consultation

37. A formal EIA Scoping Opinion was requested from the Scottish Ministers in March 2019 through the submission of an EIA Scoping Report. The EIA Scoping Report contained details of the Site baseline, the proposed Development, the proposed environmental impacts to be assessed in the EIA, and the assessment methodologies that would be used. The Scottish Ministers consulted with a variety of statutory and non-statutory consultees before providing an EIA Scoping Opinion in May 2019.

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

4.2 Public Consultation

39. Public consultation is seen as a key element of the Environmental Impact Assessment process. A programme of pre-application community engagement has been undertaken by SPR and has included various meetings, correspondence, Public Information Days and other discussions with the communities closest to the proposed Development site.

40. Two rounds of Public Information Days were held by SPR in May and August 2019 in the local community halls of the villages of Barr and Barrhill.

41. The Pre-Application Consultation Report which accompanies the submission details the findings of that work and illustrates the ways in which community engagement has helped identify potential issues arising from the emerging development proposal and, where appropriate, shape the final proposal which is now the subject of this application.

5 The Environmental Impact Assessment

42. The EIA considers the effects of the proposed Development during construction and operation on the following topics:

- landscape and visual (effects on the character of the landscape and views from agreed locations);
- hydrology, hydrogeology, geology and soils (the effects on surface water, groundwater, rocks and soils);
- ecology and biodiversity (the effects on protected habitats, flora and fauna, excluding birds);
- ornithology (the effects on birds and protected bird habitats);
- noise (effects on local properties from noise caused by the Proposed Development);
- archaeology and cultural heritage (effects on the integrity and setting of historic sites);
- access, traffic and transportation (effects from traffic travelling to, and from, the Proposed Development);
- socio-economics, tourism, and recreation (effects on the local and national economy, local tourism businesses, and recreation facilities); and
- other issues, such as aviation, shadow flicker, forestry, carbon balance and telecommunications.

43. A summary of the baseline conditions, the proposed mitigation, the resulting residual effects and the cumulative effects for each topic is provided below. Full details of the EIA for each of the topics are provided in Chapters 6 to 14 of the EIA Report.

6 Landscape and Visual

44. Chapter 6 of the EIA Report, Landscape and Visual Impact Assessment (LVIA), evaluates the effects of the proposed Development. The LVIA considers direct effects on the landscape, effects on how the landscape is perceived and the effect on visual amenity within the study area. Effects arising from the addition of the proposed Development to other windfarms in the area are also considered (cumulative effects). The LVIA has assessed the potential for significant landscape and visual effects over a 45 km study area focussing the detailed assessment within a 20 km area.

6.1 Baseline

45. The proposed Development is located predominantly within South Ayrshire within an area of expansively scaled plateau. It has a simple, large scale landform of broad, rounded hills and shallow basins that form a low, even and generally indistinct backdrop to smaller scale settled valleys. Landcover is dominated by coniferous forestry, and the landscape is sparsely settled. The proposed Development is located largely within the Landscape Character Type "Plateau Moorlands with Forestry and Windfarms" as identified in the South Ayrshire Landscape Wind Capacity Study (2018).

46. The proposed Development has been designed with a number of embedded mitigation measures in order to reduce the effects on landscape and visual receptors. The siting and design of the turbines aims to consolidate the development within an existing windfarm landscape, which considers the perspective and views of the turbines within the landscape.

6.2 Assessment

47. The effect of the proposed development on visual receptors, such as settlements, route corridors and visitor attractions was assessed using a combination of Zone of Theoretical Visibility (ZTV) maps and viewpoint analysis, where viewpoints are used to represent and assess the effect and geographic extent of effects from specific visual receptors such as settlements, transport and recreational routes. Visualisations of the proposed Development were produced from numerous representative viewpoints, as agreed with stakeholders, to help inform the assessment. The assessment also considered the impact of the proposed Development on designated sites including the Merrick Wild Land area, and on the Galloway Forest Dark Sky Park.

48. As the proposed turbines are above 150 m in height, they will be required to be lit with visible lighting to assist their detection by aircraft. To minimise light pollution from the turbine lighting, mitigation is being considered, in the form of an aviation lighting detection system whereby the aviation warning lights would only be activated when aircraft are detected in the vicinity of the development by a surveillance system. The assessment considered the visual effects of the aviation lighting on people within the Galloway Forest Dark Sky Park and other areas outside the buffer area of the Dark Sky Park which have low levels of background lighting.

49. The residential visual amenity assessment (RVAA) considered the impact of the proposed Development on three properties which are located at distances between 1.1 and 1.5 km from the Site. It considered the visual effect from the proximity of the turbines to the properties either in respect of the current situation or in respect of future predicted baseline resulting from proposed forestry felling.

6.3 Significance

50. The proposed Development was assessed as resulting in significant and long-term effects on views experienced from multiple receptors including: hill walkers in the Merrick uplands to the east of the Site; by hill walkers at Corserine; walkers on local path networks; cyclists and visitors to Kirriereoch picnic site; and motorists travelling on the A714 and B734.

51. No significant visual effects have been identified on residents of the main settlements in the study area, including the nearest villages of Barr and Barrhill, where there is limited visibility of the proposed Development due to the set-back position of the proposed turbines and intervening screening by steep valley sides and plantation forestry.

52. The Residential Visual Amenity Assessment found there would be significant effects on the setting of all three residential properties, however the effects are not considered to be at the 'threshold' of having an overwhelming or overbearing effect.

53. There would be a significant effect within localised areas of the South Ayrshire Scenic Area and across west facing slopes of the Merrick foothills in the Galloway Hills Regional Scenic Area. Cumulative effects of the proposed Development on the Scenic Area and Regional Scenic Area will occur primarily as a result of its cumulative effect with the operational windfarm landscape, rather than as new or additional effects with consented or application stage windfarms. Therefore, the additional effects of consented or application landscapes are assessed as not significant.

54. The assessment identified that the main cumulative effects of the proposed Development arise with respect to operational windfarms in the landscape. The proposed Development has been designed to avoid the open upland areas of the Pinbreck Hills to the north of the Site, with a focus on keeping the development within the forested plateau landscape, whilst also limiting the spread of the proposed turbines so they do not extend in front of the Merrick Wild Land Area backdrop. The cumulative effect of the proposed Development results in an easterly extension of the spread of windfarms in the landscape, extending towards the more elevated uplands that form the backdrop to the east. Although there is a significant level of existing, consented and application stage windfarm developments in this area of south-west Scotland, the cumulative LVIA assessment concludes

that there is considered to be capacity to accommodate the proposed Development in this landscape. The proposed Development fits with the strategy of concentrating development within or near existing or consented windfarm landscapes, which is preferable as it encourages clustering of windfarm developments within a landscape that is already influenced by windfarms.

55. The construction and operation of the proposed Development would result in a relatively low change to the strong overall character of the Merrick Wild Land Area. The 'wildness' of an area is a product of people's perceptual response to physical attributes in the landscape, and can include a degree of perceived naturalness, remoteness or a sense of solitude. These perceptual responses and physical attributes are encompassed in the term 'wild land qualities'. The proposed Development due to its location at approximately 5.8 km at the closest point, would result in only indirect effects on the perception of certain wildness qualities of the Wild Land Area. The assessment found that there will be limited significant effects due to increased influence of human elements visible from the range of the 'Awful Hand' and the western flanks of the Wild Land Area. Although the proposed Development will increase the intensity of visible human influences to the landscape viewed from the tops and outermost slopes of the Wild Land Area, it has no impact on the remoteness experienced from the lower-lying interior areas. The assessment does not find that the proposed Development would have an effect so severe or widespread as to undermine the integrity of the Merrick Wild Land Area as a whole.

56. A key finding of the assessment on aviation lighting is that they are considered unlikely to result in 'obtrusive' light, nor impede the expanse of night sky to the point of being intrusive. Generally this is because the aviation lights will be viewed relatively near the horizon, or even below the skyline from elevated viewpoints, so while they may have significant effects by breaking into the darkness as point features of light, appearing unusual and surprising in an otherwise dark landscape, they are not expected to result in obtrusive light that would harm the enjoyment of the night-skies or change the fundamental perception of the site and its surroundings. The aviation lighting of the proposed turbines would not be visible from any of the 10 dark sky viewing locations which are promoted by the Galloway Forest Dark Sky Park and similarly will not be visible from the core area of the Dark Sky Park due to the physical separation provided by the range of hills making up the western flanks of the Dark Sky Park.

57. Overall, the findings of the LVIA are that the proposed Development would result in a series of landscape and visual effects, which would be expected with any commercial wind energy development. Cumulative impacts of the proposed Development are primarily resulting from the interaction with operational windfarms and are generally not significant when considered with consented or application stage developments. Whilst the LVIA has identified some significant landscape and visual effects, it is considered that the landscape has the capacity to accommodate the effects identified.

7 Hydrology, Geology, Hydrogeology and Soils

58. Chapter 7 of the EIA Report considers matters relevant to hydrology, hydrogeology, geology and soils. The proposed Development has been assessed in relation to the potential impact it may have on these areas during the construction and operational phases.

59. Information on the study area was compiled using baseline data from desk study and field work. The assessment was undertaken considering the sensitivity of any receptors identified during the baseline study and considering any mitigation measures incorporated as part of the site design. The site design has largely avoided areas of deep peat, classed as being of a depth greater than 1 m.

7.1 Baseline

60. The majority of the proposed Development sits within the catchment area for the River Cree, with the far north, north west and west of the Site within the River Stinchar catchment.

61. The rock beneath the Site is sedimentary, forming a low productivity aquifer. Superficial deposits comprise variable thickness of hummocky glacial deposits and peat. Field surveys were undertaken to identify the extent of peat across the Site, with recordings varying from 0 to 3 metres, and was observed to be disturbed and modified by the forestry. The groundwater body

underlying the Site is classified as having a good overall status. Although habitats indicative of potential groundwater dependency have been identified onsite, these have been assessed as likely to be largely or entirely surface water fed. The private water supplies identified during desk and field study are assessed as being outwith influencing distance of the Site.

7.2 Assessment

62. The peat depth survey has identified peat across much of the proposed Development area, locally over 3 m thick but often thinner and sometimes absent. Through the iterative design process, areas of deep peat are avoided by all but two proposed turbine locations and most site infrastructure.

63. A peat slide risk assessment has identified negligible or low risks across the Site with the exception of a small number of localised points where a medium risk was identified, including points at the crane hardstanding for proposed Turbine 14.

64. Potential construction and operational effects include changes to the groundwater flow regime, excavation of and impact on peat deposits, the risk of siltation and pollution of watercourses resulting in adverse effects on water quality (including potential for pollution or sedimentation arising from forestry felling works or peat landslide), effects on the integrity of watercourse banks, compaction of soils, long-term effects on fluvial geomorphology, and effect on onsite and downstream flood risk.

65. The iterative design process for the proposed Development has ensured embedded mitigation, including appropriate buffering of sensitive watercourses, minimising the need for new watercourse crossings, and avoidance of areas of deep peat or elevated peat landslide risk in siting turbines. Standard good construction and design practice has also been considered as embedded mitigation, including detailed pre-construction site investigations, agreement and implementation of a Construction Environmental Management Plan, and appropriate design of watercourse crossings.

7.3 Significance

66. Potential effects on hydrological, geological and hydrogeological receptors, taking account of the above-noted embedded mitigation, have been assessed as negligible to minor, and not significant. However, some additional specific mitigation measures have been proposed to further reduce effects. These include: floating road construction for localised track segments, in order to avoid the requirement to excavate deep peat; appropriate management and re-use of peat onsite in accordance with a Peat Management Plan; minimising the requirement for dewatering; ensuring that working platforms are formed so that surface runoff drains away from watercourses; establishing and demarcating working areas and corridors; and implementing a Habitat Management Plan involving blocking of drains and removal of regenerating conifers to improve hydrological conditions on degraded peatland habitat

67. The significance of residual effects on hydrological, geological and hydrogeological receptors is considered to be minor or negligible and therefore not significant.

8 Ecology and Biodiversity

68. Chapter 8 of the EIA Report has considered the potential effects on the ecological features from the proposed Development (and cumulatively with other developments) associated with the construction and operation of the proposed Development. The assessment method followed the guidance detailed by the Chartered Institute for Ecology and Environmental Management (CIEEM, 2018).

69. An ecological desk study and subsequent field surveys were undertaken to confirm the presence of any statutory and non-statutory nature conservation sites, areas of ancient woodland and legally protected or otherwise notable species (i.e. those species of conservation concern).

8.1 Baseline

70. The proposed Development site is characterised by afforested upland, typical of this region of Scotland, with the majority of the area under commercial plantation forestry.

71. It was possible to scope out most species and habitats recorded in the relevant study areas for the assessment by virtue of their low conservation value, the type and frequency of field signs present, the small extent of the sensitive habitat, or the

negligible scale of potential effects. The Important Ecological Features (IEFs) taken forward for assessment were wet heath, dry heath, and bats.

8.2 Assessment

72. Wet heath and dry heath within the study area are considered to be of Local Nature Conservation Value and were both considered to be of "Bad" but "Stable" status. Impacts upon wet heath habitat during construction would be direct through habitat loss and indirect through a potential drying effect. With the application of good practice and environmental management techniques, including an appropriate drainage design, it is considered possible to reduce drainage impacts out to either side of infrastructure. Impacts on dry heath during construction would be direct only due to habitat loss and the overall effect has been limited through the design process.

73. During the operational phase there is potential for bat species to collide with turbine blades or to suffer 'barotrauma' when flying in close proximity to rotors. Embedded mitigation will include keyholing the turbines into the forestry with a buffer distance of 90 m which exceeds the minimum regulation requirements and helps ensure bats using the forest edge are at sufficient distance to reduce the risk of collision or 'barotrauma'.

74. Nyctalus bat species are considered to be of Council area Nature Conservation Value with a high population vulnerability within a Scottish context. The Site was assessed as having medium habitat risk with roost features present on site, but activity levels recorded as being very low, therefore the overall risk to Nyctalus was considered to be low.

75. Common and Soprano pipistrelle bat species are considered to be of Local Nature Conservation Value, with a medium population vulnerability. The Site was assessed as having medium habitat risk, with moderate activity levels recorded. Therefore, the overall risk to pipistrelles was considered to be low-medium.

8.3 Significance

76. No significant effects are predicted upon species or habitats as a result of the proposed Development, therefore no specific mitigation is required in addition to embedded mitigation and adoption of good practice measures (e.g. pollution prevention measures through the Construction Environment Management Plan).

77. Impacts on bat species will be barely perceptible following the standard in-built mitigation including the wide keyhole buffers. As a precaution, a Bat Mitigation and Monitoring Plan is being implemented to reduce the risk to bats during the operational phase of the development. This will include monitoring of bat activity on the site and carcass searches, with possible curtailment of specific turbines when weather conditions reach pre-defined thresholds.

9 Ornithology

78. Chapter 9 of the EIA Report considers the potential effects of the proposed Development on birds. It details the methods used to establish the bird species and populations present, together with the process used to determine their Nature Conservation Importance. The ways in which birds might be affected (directly or indirectly) by the construction and operation of the proposed Development are explained and an assessment is made with regards the significance of these effects.

9.1 Baseline

79. The Site is within 20km of three statutory designations that include ornithological features, however due to the distance of these from the Site these were scoped out of assessment with agreement from Scottish Natural Heritage and RSPB due to a lack of connectivity.

80. The ornithological assessment consisted of a desk based assessment and field surveys conducted from 2012 to 2019. Field surveys recorded the species assemblage and habitat usage across the survey area for both breeding and non-breeding birds.

9.2 Assessment

81. The main potential impacts of construction activities across the Site are the displacement and disruption of breeding, foraging and roosting birds as a result of noise and visual disturbances, or due to direct habitat loss. Displacement of nesting and foraging birds has the potential to extend beyond the construction phase into the operational phase.

82. Further potential operational impacts are the potential risk of collision with the turbines and potential for aviation lighting to increase the collision risk for nocturnal birds.

83. The Important Ornithological Features identified through the baseline surveys were black grouse, osprey and goshawk.

84. Black grouse are classified as Medium Nature Conservation Importance, however due to the distance of the proposed Development from identified lekking sites and the low activity recorded within the Site, the likelihood of impacts occurring is low.

85. Osprey are classified as Medium Nature Conservation Importance, however within the Site there is very limited foraging habitat and due to the distance from the closest nest site, impacts occurring to breeding or foraging osprey are unlikely.

86. Goshawk are classified as Medium Nature Conservation Importance and are considered likely to be accustomed to localised disturbance from forestry activities, therefore rather than territories being lost, pairs will likely be able to relocate.

9.3 Significance

87. No significant effects on birds or their habitats, either due to the proposed Development alone, or cumulatively with other developments, were predicted.

88. It is proposed that a breeding bird protection plan will be implemented, and pre-construction surveys undertaken as is standard to avoid the destruction or disturbance of any nest sites during construction, with appropriate species-specific restrictions around construction works.

89. During operation the implementation of a habitat management plan would increase the amount of native woodland coverage which would help to compensate for any habitat loss or displacement effects on black grouse.

10 Noise

90. Chapter 10 of the EIA Report presents an assessment of the potential construction and operational noise effects of the proposed Development on the residents of nearby dwellings. Noise would be emitted by equipment and vehicles used during construction of the proposed Development and by the turbines during operation. The level of noise emitted by the sources and the distance from those sources to the receiver locations are the main factors determining levels of noise at receptor locations.

10.1 Baseline

91. A background noise survey was undertaken, which involved collection of noise data from two dwelling locations with respect to the proposed turbine layout and the existing Mark Hill Windfarm. The survey provided data on the prevailing background noise levels during night and daytime hours with regards to wind and rain conditions. Reference was also made to background noise monitoring undertaken in support of the Mark Hill Windfarm planning application to provide data on noise levels excluding the Mark Hill turbines.

10.2 Assessment

92. A noise assessment was carried out in order to determine whether the proposed Development meets planning requirements in respect of operational noise from wind turbines. The assessment takes into account the methodologies set out within ETSU-R-97, T*he Assessment and Rating of Noise from Wind Farms* (1996) and the Institute of Acoustic document, *A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise*.

93. A noise limit of 40 dB L_{A90} was the consented daytime noise limit set for Mark Hill Windfarm and therefore was considered to be the appropriate upper limit for the proposed Development.

10.3 Significance

94. The results of the operational noise assessment indicate that noise levels, when considering the proposed Development in isolation, meet the relevant noise limits and no specific mitigation is required. The noise impact is, therefore, determined to be not significant.

95. The cumulative operational noise assessment indicates that there is a very limited risk that the combined impact of the proposed Development and Mark Hill Windfarm could result in turbine noise levels exceeding the noise limit imposed on Mark Hill Windfarm under specific wind speeds and directions. Whilst it is not expected this will occur in practice due to the level of conservatism applied to the predicted noise levels, mitigation measures will ensure that cumulative turbine noise levels will meet the relevant limits and ensure that the combined operational noise impact can be considered not significant. Noise mitigation for modern turbines is available whereby the rotor is slowed at certain wind speeds resulting in a reduction in noise.

96. Construction noise levels at neighbouring dwellings are expected to meet typical requirements in this regard and no specific mitigation measures are considered to be required other than that deemed necessary under normal best practice.

11 Archaeology and Cultural Heritage

97. Chapter 11 of the EIA Report considers the likely significant effects on cultural heritage associated with the construction and operation of the proposed Development. The chapter describes the results of a desk-based assessment and field surveys and draws on comments received during consultations. The assessment considers the potential effects on heritage assets within the Site and potential effects on the settings of heritage assets in the wider landscape.

11.1 Baseline

98. Nineteen heritage assets were identified within the Site. Two of these are burial cairns of prehistoric date assessed as being of high sensitivity. The remaining 17 assets are related to post-medieval, pre-improvement period agricultural use of the landscape and include former farmsteads and other associated buildings and structures, each assessed as being of low sensitivity, having been already adversely affected to a greater or lesser degree by the present land-use as commercial forestry.

99. Nine Scheduled Monuments (assessed as being of high sensitivity) have been identified within the wider landscape (within 10km), from which there is some degree of theoretical visibility of the proposed Development. In addition, there are seven Category B Listed Buildings, 12 Category C listed Buildings, one Conservation Area and 35 Non-Statutory Register sites, from which there is some degree of predicted theoretical visibility of the proposed Development.

11.2 Assessment

100. An assessment of the identified cultural heritage resource, and consideration of the current and past land-use, within and in the immediate vicinity of the Site, indicates that there is a low probability of previously unidentified archaeological remains of any date being present within the Site. The exception to this assessment is the area immediately around Cairnderry Chambered Cairn where the potential for further archaeological discoveries is assessed as being moderate to high.

11.3 Significance

101. No direct effects are predicted on any identified heritage assets within the Site. The potential for significant direct effects on buried archaeological remains is considered to be low or negligible, except in the vicinity of the Cairnderry Chambered Cairn.

102. To avoid potential direct effects on two heritage assets that lie in close proximity to the proposed Development infrastructure, mitigation is proposed in the form of fencing off or marking out of the asset during construction. An information board is also proposed which will provide archaeological interpretation of Cairnderry Chambered Cairn to help visitors understand the historical context and significance of the Scheduled Monument. The information board would be located within the proposed recreational car park, which will be formed from an area within the proposed temporary construction compound, close to the site entrance.

103. There is predicted to be an indirect effect on the setting of Cairnderry Chambered Cairn which will be a temporary and short term effect, of moderate significance, during the construction period.

104. An indirect, long-term effect of **moderate** significance, on the setting of Cairn Hill Cairn (11677), is predicted during the operational period.

105. A cumulative effect of **moderate** significance, on the setting of Cairn Hill Cairn (11677), is predicted from the addition of the proposed Development to a baseline that includes operational, consented and proposed developments.

12 Access, Traffic and Transport

106. Chapter 12 of the EIA Report considers the likely significant effects on receptors along the transport routes resulting from vehicle movements associated with the construction and operation of the proposed Development.

12.1 Baseline

107. The proposed Development would be accessed directly from an improved forest access junction on the A714. The existing access junction would be widened to accommodate the proposed turbines and construction traffic. Access to the A714 is available from the A75 trunk road network to the south.

108. A series of Automatic Traffic Count sites assessed the impact of construction traffic on the study area, recording baseline traffic flow in terms of vehicle class, traffic volume and average vehicle speeds.

109. Data on road traffic accidents across the study area was reviewed which indicated the majority of accidents are 'slight' in nature and that there are a limited number of heavy good vehicle incidents that occurred in the past three years on the A75 trunk road.

12.2 Assessment

110. During the 18 month construction period the traffic which will require access to the Site will be: staff transport; deliveries of construction equipment, materials and machinery; and abnormal load consisting of turbine components and heavy lift cranes.

111. It is proposed that King George V dock in Glasgow would be the primary port used for the delivery of turbine components, with access to Site going via the M8, M74, M6, A75 and the A714.

112. The peak of construction traffic activity was identified as being month 5 of the construction programme. The peak traffic flows associated with the proposed Development's construction phase results in an average of 102 movements per day (51 inbound and 51 outbound) of which 48 would be light vehicles and 54 by heavy good vehicles.

113. The total traffic movements are not predicted to increase by more than 10% on all of the study area, with the sole exception of the A714 in the vicinity of the Site access junction. The assessment indicates that there are no road capacity issues with the proposed Development and that ample spare capacity exists within the trunk and local road network.

12.3 Significance

114. The proposed Development will lead to increased traffic volumes on a number of roads in the vicinity of the proposed Development site during the construction phase. These will be of a temporary timescale and transitory in nature.

115. The assessment determined that, prior to the implementation of mitigation, only a moderate impact could be expected on road safety on the Newton Stewart bypass and A714 relating to the increase in heavy goods vehicles operating on the route. All other indicators suggested a slight or not significant effect on receptors within the study area.

116. Proposed mitigation will include a Construction Traffic Management Plan, convoy management points, and improved driver information.

117. With the implementation of appropriate mitigation, no significant residual effects are anticipated in respect of traffic and transport issues. The residual effects will occur during the construction phase only, they are temporary and reversible and therefore are all assessed to be slight or not significant. The proposed Development is not anticipated to cause any long-lasting detrimental transport or access issues.

13 Socio-Economics, Tourism and Recreation

118. Chapter 13 of the EIA Report evaluates the effects of the proposed Development on socio-economics, tourism and recreation.

13.1 Baseline

119. The socio-economic baseline suggests that the local area has a relatively older population than Dumfries and Galloway, South Ayrshire and Scotland in general, and that this trend is set to continue into the future. This suggest there is a relative lack of opportunities in the local area. Employment is relatively high in accommodation and food services, as well as manufacturing and construction.

120. The tourism sector in South Ayrshire and Dumfries and Galloway is relatively important compared to the Scottish average. However, there are a relatively small number of accommodation providers and tourist attractions nearby to the Site, with the main regional tourist attractions located over 20 km away, which suggests that the area surrounding the proposed Development does not have a significant tourism presence.

13.2 Assessment

121. On the basis of an installed capacity in the region of 100 MW, the assessment found that during the construction and development phase the proposed Development could generate up to £7.7 million and 116 job years (number of years of full-time employment) in Dumfries and Galloway and South Ayrshire, and £35 million and 542 job years in Scotland.

122. During the operational phase the proposed Development could annually generate up to £0.7 million and 9 jobs in Dumfries and Galloway and South Ayrshire, and £1.1 million and 15 jobs in Scotland as a whole.

123. There would also be benefits associated to the payment of community benefits and the opportunity for community investment which would support the development of local communities. It is expected that any proposed income streams could provide a long-term revenue which could be used to support community projects within South Ayrshire and Dumfries and Galloway. A range of options would be available to local communities who would have the flexibility to choose how the money is spent and prioritise it on the things which matter most to them.

124. In addition, there would be benefit from the proposed Development to the public sector from the payment of non-domestic rates (a tax on non-domestic property). The annual contribution resulting from the proposed Development is estimated to be up to £1.2 million. These non-domestic rates would support the delivery of local authority services across Scotland.

125. The proposed conversion of the temporary construction compound near to the site entrance to a permanent recreational car park is predicted to have a positive effect, potentially improving access to the local area for recreational users , including walkers, cyclists and equestrians.

13.3 Significance

126. It is expected that during the construction phase, the proposed Development would have a minor positive economic impact in Dumfries and Galloway and South Ayrshire, and a negligible positive impact in Scotland as a whole.

127. A review of existing evidence on the relationship between windfarm developments and the tourism economy found no evidence that negative effects should be expected. A specific assessment of the potential of the proposed Development on local tourism assets and accommodation providers also found that there were not expected to be any adverse impacts.

128. Overall, there were no significant adverse effects associated with the proposed Development, while there would some positive impacts linked to construction and operational expenditure, though they would also not be significant.

14 Other Issues

129. A number of other issues associated with windfarm development were considered in Chapter 14, including potential effects on aviation, telecommunications, forestry, shadow flicker and carbon balance.

14.1 Aviation

130. The installation of wind turbines has the potential to cause a variety of adverse effects on aviation interests during turbine operation, such as generation of unwanted returns on radar systems, and adverse effects on overall performance of Communications, Navigation and Surveillance (CNS) equipment.

131. The closest National Air Traffic Services (NATS) radar is located at Lowther Hill, and the nearest licensed aerodrome is Glasgow Prestwick Airport (GPA). The proposed Development's turbines are located within a MoD "red" low flying area, namely a high priority area, however the Site is clear of the A714 road line feature that low flying aircraft follow.

132. Following GPA's concerns regarding the possibility of the proposed Development being in line of sight of their radar facilities a Radar Line of Sight Assessment was undertaken for the two Primary Surveillance Radar facilities at GPA. The Radar Line of Sight Assessment concluded that several of the turbines are within line of sight of the two GPA Primary Surveillance Radar facilities. The assessment determined that the proposed Development will have no impact on the ability of the GPS radars to track aircraft across the windfarm and that any traffic potentially hidden by turbine clutter should be spotted by the GPA controller in enough time to take any necessary action.

133. As a precaution, to mitigate potential impacts of the proposed Development on the Glasgow Prestwick Radar, a surveillance system may be required to be deployed within the development area. This will be subject to further discussions with GPA.

134. As the proposed Development turbines would be in excess of 150 m to blade tip, they are required to be lit pursuant to *Article 222* of the *UK Air Navigation Order (ANO) 2016*, with medium intensity steady red aviation warning lights. To minimise light pollution from the turbine lighting, light minimisation strategies are being considered, including an aviation detection lighting system, with aviation warning lights only activated when aircraft are detected in the vicinity of the development.

135. In summary, through both consultation and assessment, it is concluded that the proposed Development, is unlikely to have a significant effect on aviation infrastructure, from either physical obstruction or radar interference.

14.2 Shadow Flicker

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

137. The study area within which properties could potentially be affected by shadow flicker covers a distance of 10 rotor diameters from each turbine and lies 130 degrees either side of north (relative to each turbine). In the case of the proposed Development this area extends to 1,500 m from each turbine.

138. A shadow flicker assessment was undertaken at the one residential property identified within the study area with potential to experience flicker effects. Realistic scenario calculations have shown that the maximum occurrence of shadow flicker amounts to approximately 4.6 hours per year, well within the accepted limits of shadow flicker, of either 30 minutes per day or less than 30 hours per year.

139. It is important to note that these results do not consider existing screening features such as vegetation, dwelling orientation and local mitigation measures such as blinds or curtains which would reduce potential effects further. Receptors may also be in rooms that are not generally used at the affected times, therefore, the amount of time when shadow flicker is actually 'experienced' will likely be significantly less than what has been predicted.

140. The residual effect of shadow flicker is therefore expected to be of no significance during the operational phase of the proposed Development.

14.3 Forestry

141. The proposed Development lies within existing commercial forestry plantation which is owned by Scottish Ministers and managed by Forestry and Land Scotland. This assessment considered the potential effects of the proposed Development on the existing forest resource.

142. The assessment considers the plans as a result of the proposed Development for felling, restocking and forest management practices. Areas of forestry crop are anticipated to be required to be felled to accommodate the construction and operation of the proposed Development. Where possible the proposed Development infrastructure will be 'keyholed' into the crops. A 90 m radius keyhole was adopted around each turbine location within woodland for construction, operation and environmental mitigation. Where this is not possible the crops will be felled back to the nearest wind firm edge or management boundary and restock planting will leave a keyhole around the proposed Development infrastructure.

143. The proposed windfarm felling plan advances felling within the study area by 298.7 hectares during Phase 1 of the existing Forest Plan. This is balanced by reduced felling in subsequent phases.

144. As a result of the construction of the proposed Development there would be a reduction in the area of conifer woodland and a small increase in broadleaf woodland (by 24.9 Ha), with a net loss of stocked woodland area overall. The area of stocked woodland in the study area would decrease by 121.6 hectares. In order to comply with the criteria of the Scottish Government's Control of Woodland Removal Policy, off-site compensation planting will be required.

145. The extent, location and composition of such planting is to be agreed with Scottish Forestry, considering any revisions to the felling and restocking plans prior to the commencement of operation of the windfarm.

14.4 Climate and Carbon Balance

146. Windfarms in upland areas tend to be sited on peatlands which hold stocks of carbon and so have the potential to release carbon into the atmosphere, in the form of CO_2 if the peat is disturbed.

147. In order to minimise the requirement for the extraction of peat, the site design process has avoided areas of deeper peat (>1 m) where possible. Where areas of deep peat cannot be avoided floating tracks are proposed rather than hard infrastructure.

148. The loss of carbon from the carbon fixing potential from plants and vegetation on peatland is small but is calculated for the area from which peat is removed and the area affected by drainage. The carbon stored in the peat itself represents a much larger potential source of carbon loss.

149. To calculate the carbon emissions attributable to the removal or drainage of peat from the Site as a result of the proposed Development, emissions occurring if the soil had remained in situ and undisturbed are subtracted from the carbon emissions occurring after removal or development-related drainage.

150. This is calculated using the Scottish Government Carbon Calculator online tool. The purpose of the 'carbon calculator' is to assess, in a comprehensive and consistent way, the carbon impact of windfarm developments. This is undertaken by comparing the carbon costs of windfarm developments with the carbon savings attributable to the windfarm.

151. The calculations of total CO_2 emission savings and payback time for the proposed Development indicates the overall payback period of a windfarm with 18 turbines with an average (expected) installed capacity of 5.6 MW per turbine would be approximately 2.8 years, when compared to the fossil fuel mix (the existing energy mix within the UK) of electricity generation.

152. The Site would in effect be in a carbon credit situation following this time period and can then claim to contribute to national objectives of reducing greenhouse gas emissions and meeting the 'net zero' carbon targets by 2045, therefore the Proposed Development is evaluated to have an overall beneficial effect on climate change mitigation.

14.5 Telecommunications

153. Wind turbines can potentially cause interference to telecommunication links through reflection and shadowing to electro-magnetically propagated signals including terrestrial fixed microwave links managed by telecommunications operators.

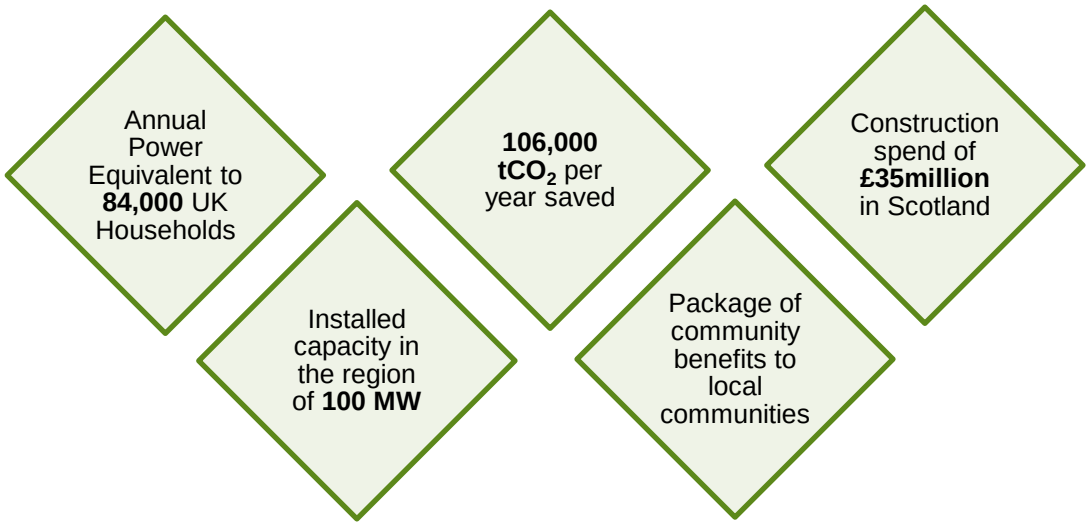
154. Telecommunications operators were consulted, and information requested for telecommunications links within close proximity of the Site. Ofcom's Spectrum Information System online tool was also consulted and showed no transmitters within 2 km of the proposed Development or links crossing the Site.

155. In summary, through consultation, it is concluded that the proposed Development, will have no effect on any telecommunication interests.

15 Benefits of the proposed Development

156. The proposed Development will deliver the following key benefits:

- Make a significant contribution to the attainment of the UK and Scottish Government policies of encouraging renewable energy development; and in turn contribution to the achievement of UK and Scottish Government targets for renewable electricity generation.
- Make a significant contribution to Scotland's net zero by 2045 target.
- The proposed Development would have a total capacity in the region of 100 MW, which would produce approximately 320 GWh of electricity annually (based on a 5.6 MW turbine), generating enough electricity to power the equivalent of around 84,000 average UK households.
- Provide a range of ancillary grid services to the National Grid such as energy storage which would provide back-up power to National Grid for the benefit of providing stability to the electricity supply network and meet our increasing demands for cleaner energy, a low carbon economy and provide for energy security.
- Efficient use of existing land and infrastructure such as access tracks.
- The offering of a package of community benefits to local communities including the opportunity for community investment which could be used to support community projects within South Ayrshire and Dumfries & Galloway.
- Enhancement of recreation within the Site during operation by the creation of a new recreational parking area and development of an Access Plan in consultation with Forestry and Land Scotland and the Access Officers at South Ayrshire Council and Dumfries and Galloway Council.
- Presentation of archaeological interpretation of the Cairnderry Chambered Cairn within the recreational car park.
- Increase in broadleaf woodland by 24.9 hectares.
- Savings in CO_2 emissions due to the replacement of other electricity sources over the lifetime of the windfarm which are approximately 106,000 tonnes of CO_2 per year compared to fossil fuel mix of electricity.
- Displacement of carbon-emitting generation after 2.8 years (carbon payback period).
- Total construction spend estimated at £122.4 million, with £7.7 million being spent in Dumfries & Galloway and South Ayrshire, and £35 million in Scotland.
- Total operational spend estimated at £2.7 million annually, with £0.7 million being spent in Dumfries & Galloway and South Ayrshire, and £1.1 million in Scotland.



16 Summary

157. This Non-Technical Summary of the EIAR provides an overview of the EIA undertaken for the proposed Development. Within Chapter 15 of the EIAR a schedule of mitigation can be found which details the environmental mitigation and good practice measures which the Applicant has committed to implement. It also provides a summary of the potential effects of the proposed Development during construction and operation phase and cumulatively with other developments in the local area.

158. Environmental constraints and considerations have been taken into account in the site layout and windfarm design. This has enabled potentially significant effects to be avoided. Further measures to prevent or reduce any remaining significant environmental effects are described within each environmental discipline Chapter of the EIA Report.

159. Mitigation measures as detailed in the EIA Report have been identified to protect the environment prior to, or during, construction and operation of the proposed Development.

160. Should the proposed Development receive consent from Scottish Ministers, SPR and their appointed contractors would be responsible for overseeing operations and ensuring that mitigation measures are implemented, and activities carried out in such a manner as to minimise or prevent effects on the environment. The appointed Principal Contractor would be supported by specialists such as an Ecological Clerk of Works to ensure that the mitigation measures are implemented effectively.

161. Throughout the design evolution of the proposed Development layout, a key driver was the consideration of potential landscape and visual effects on receptors and how the proposed Development would relate to the existing landscape character as well as existing windfarms in the landscape. In particular, regard was had to the scale and number of turbines proposed, cumulatively with existing windfarms in the area, in particular the adjacent operational Mark Hill Windfarm, and the impact on Merrick Wild Land Area. Particular regard was also given to the impact of the aviation lighting on the Dark Sky Park. The potential landscape and visual effects of the proposed Development has been considered extensively from key receptors. The resulting analysis has been an important input into the design process and in particular to the selection of the final layout of the proposed turbines. This has resulted in a design which limits the effects on views from the Merrick Wild Land Area, to its western flanks only, ensuring the proposed Development cannot be seen from the core area of the Wild Land Area.

162. Provided that the proposed mitigation measures are successfully implemented, the residual effects related to most environmental disciplines would not be considered significant effects in the context of the EIA Regulations with the exception of landscape and visual and cultural heritage.

163. All onshore windfarm development is likely to give rise to some significant landscape and visual effects. In the case of the proposed Development, the significant effects on landscape character and visual amenity would be contained within a relatively moderate area around the Site when compared with other wind farm developments of this scale. It is considered that the landscape is capable of accommodating the proposed Development, and that significant effects on the existing landscape character or visual amenity are relatively contained.

164. The proposed Development would represent an important environmental benefit in that it involves the generation of electricity from a renewable energy source that would reduce or avoid the use of fossil fuels through the contribution of electricity generated from other sources of energy. Burning fossil fuels produces carbon dioxide which contributes to global warming. The proposed Development has a payback time of approximately 2.8 years after which time it will contribute significantly to the ambitious National target for net-zero emissions by 2045 and which is based on the recognised 'Climate Emergency'[3].

165. Overall the proposed Development is considered an appropriately designed, and sensibly located windfarm which is in line with policies in the South Ayrshire and Dumfries and Galloway local development plans and conforms to national policy.

[3] https://www.gov.scot/publications/global-climate-emergency-scotlands-response-climate-change-secretary-roseanna-cunninghams-statement/

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