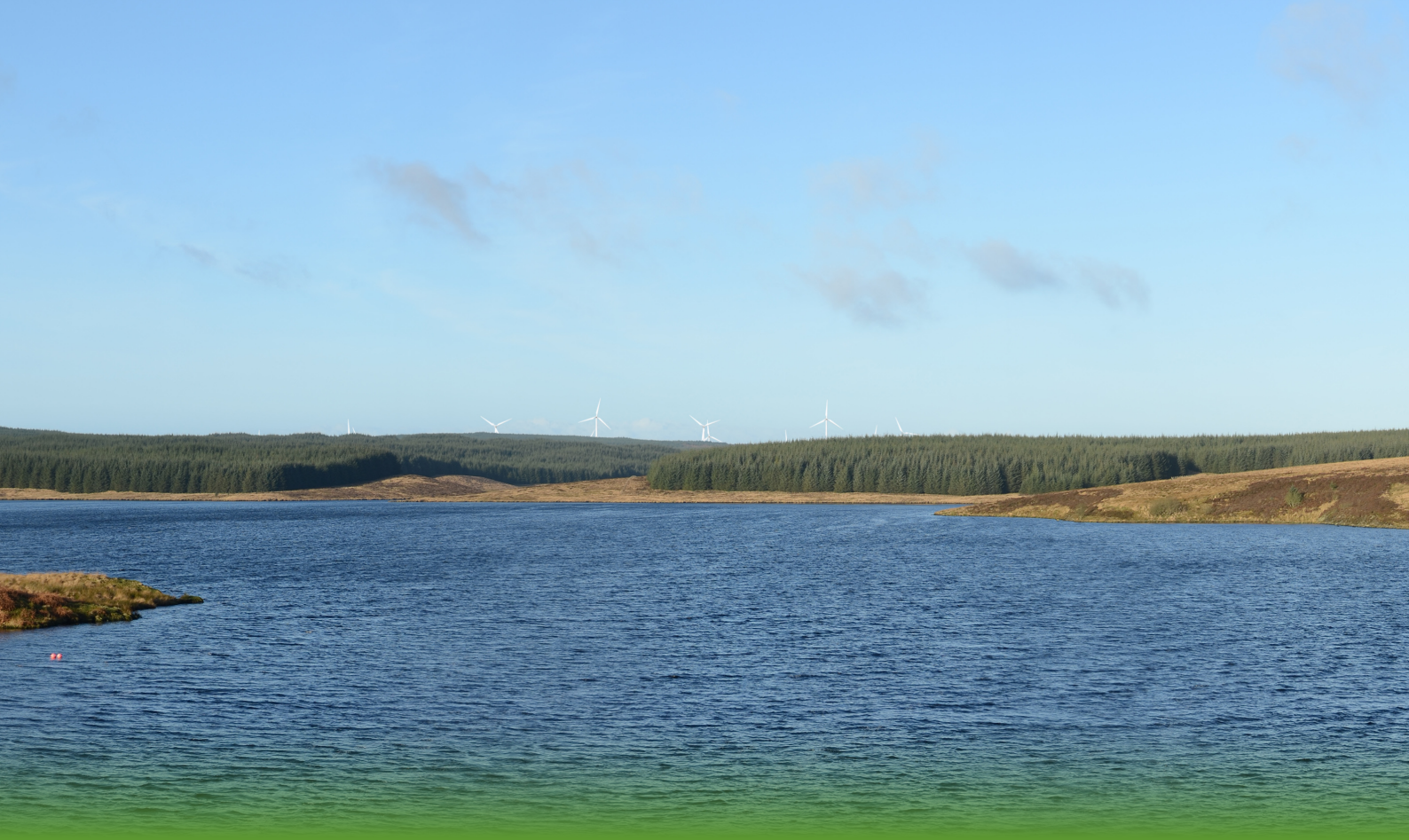

Glen App Windfarm

Environmental Statement

Non - Technical Summary

September 2012

SCOTTISHPOWER RENEWABLES

Glen App Windfarm
Environmental Statement
Non-Technical Summary

Prepared by
LUC
on behalf of
ScottishPower Renewables

September 2012

Preface

This Non-Technical Summary been prepared in support of the Glen App Windfarm Environmental Statement (ES) and planning application to construct and operate the 14 turbine Glen App Windfarm in South Ayrshire. The Development is approximately 4.5 kilometres (km) north-east of Cairnryan and 12km north-east of Stranraer and 6km south of Ballantrae.

The Environmental Statement comprises a Written Statement, volume of Figures and volume of Appendices and is accompanied by a Planning Statement, Design and Access Statement and Pre-Application Consultation Report.

Copies of the full ES and accompanying documents, or further information on the Development may be obtained from:

ScottishPower Renewables (UK) Limited
Glen App Windfarm Project Team
4th Floor
1 Atlantic Quay
Glasgow
G2 8JB

Or by emailing: info@glenappwindfarm.co.uk

A hard copy of the Environmental Statement Volumes 1, 2 and 3 and the associated documents costs £300. In addition, all documents are available in an electronic format (as PDF for screen viewing only) on CD/DVD for £20. Further copies of the Non-Technical Summary are available free of charge.

The Environmental Statement and associated documents are available for viewing by the public during normal opening hours at the following locations:

Girvan Library	Ballantrae Library	Stranraer Library
Montgomerie Street	The Hall	North Strand Street
Girvan	Ballantrae	Stranraer
KA 26 9HE	KA26 0NB	DG9 7LD

Comments in relation to the Planning Application should be forwarded to the address below:

South Ayrshire Council
Burns House
Burns Statue Sq
Ayr
KA7 1UT

Or by emailing: planning.development@south-ayrshire.gov.uk

The image on the cover of this document is adapted from a photomontage view of Glen App Windfarm as will be seen from the Penwhirn Reservoir. This photomontage was generated as Viewpoint 3 in Chapter 6 of the Glen App Windfarm Environmental Statement. A photomontage is a visualisation which superimposes an image of a proposed development upon a photograph or series of photographs. Photomontages are generated using computer software and used to illustrate the appearance of the proposed windfarm in the landscape.

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Non-Technical Summary

1.1 Introduction

1. ScottishPower Renewables (UK) Ltd (hereafter referred to as 'SPR'), is applying to South Ayrshire Council for planning permission to construct and operate Glen App Windfarm (hereafter referred to as 'the Development'). The area within the red line boundary (see **Figure 1**) is hereafter referred to as 'the Development Area'. The centre of the Development Area is approximately 4.5 kilometres (km) north-east of Cairnryan and 12km north-east of Stranraer. The northern extent of the Development Area is approximately 6km south of Ballantrae.

2. As the Development will have a generating capacity of under 50 megawatts (MW), SPR is applying to South Ayrshire Council for planning permission under the Town and Country Planning (Scotland) Act 1997, as amended (Ref.1-1). The application is categorised as a 'Major Development' under the Town and Country Planning (Hierarchy of Development) (Scotland) Regulations 2009 (Ref.1-2) on the basis that the installed capacity of the Development will be over 20MW.

3. SPR is part of Iberdrola, the world's largest wind energy developer, with an operating portfolio of over 14,000MW (as of June 2012). SPR is responsible for progressing Iberdrola's onshore wind and marine energy projects in the UK and Ireland, and offshore windfarms throughout the world; managing the development, construction and operation of all (current and potential) projects. Securing its position at the forefront of the renewable energy industry, SPR became the first UK developer to reach an installed generating capacity of 1,000MW in 2011, in addition to being awarded a second Queen's Award for Enterprise for Sustainable Development. With a pipeline including 10,000MW of offshore wind, and the 10MW world-first tidal energy array in the Sound of Islay, SPR is firmly committed to the responsible development of renewable energy.

4. The application is accompanied by the Environmental Statement (ES) that has been undertaken in accordance with the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011) ('the EIA Regulations') (Ref.1-3). The ES presents information on the identification and assessment of the likely environmental effects of the Development. Further details of the statutory requirements for Environmental Impact Assessment (EIA) are set out in **Chapter 2: Approach to Environmental Impact Assessment** of the ES.

5. This Non-Technical Summary (NTS) summarises the findings and conclusions of the ES.

6. The ES has been prepared by LUC on behalf of SPR. LUC also produced the following ES chapters:

   - Planning Policy Context;
   - Landscape and Visual Amenity;
   - Ecology;
   - Socio-Economics, Tourism, Recreation and Land Use;
   - Other Issues.

7. A number of sub-consultants undertook further specialist assessments as follows:

- **Mott MacDonald** undertook the Hydrology, Hydrogeology and Peat Stability, Access, Traffic and Transport and Carbon Balance assessments;
- **Haworth Conservation Ltd** undertook the Ornithology assessment;
- **Hoare Lea Acoustics** undertook the Noise assessment;
- **CFA Archaeology** undertook the Cultural Heritage assessment;
- **Pager Power** provided expert advice on telecommunications and aviation.

1.2 Renewable Energy Policy

8. The UK Government and the Scottish Government are committed to ensuring that an increased proportion of electricity is generated from wind power and other renewable energy sources. Improvements in technology and rising fossil fuel costs have resulted in the cost of wind power converging towards the costs of conventional sources of electricity. Further growth in the wind energy sector can therefore be expected.

9. Scotland in particular has a significant wind resource. The report 'Scotland's Renewable Resource 2001' considered a range of available renewable energy technologies examining associated development constraints and costs. The key conclusion in relation to onshore wind development was that the resource is widespread and is the cheapest of the technologies considered and on the basis of cost, onshore wind energy can be expected to contribute to the bulk of near-term government targets.

10. The Climate Change (Scotland) Act 2009 aims for an 80% reduction in Scotland's greenhouse gas emissions by 2050 and includes an interim target of a 42% reduction by 2020 (compared to 1990 levels). In 2007 the Scottish Government set a target for the supply of 50% of Scotland's electricity from renewable sources by 2020, and in May 2011 revised its targets and now aims to provide 100% of Scotland's electricity generation from renewable sources by 2020.

1.3 Environmental Impact Assessment

11. EIA involves the compilation, evaluation and presentation of any potentially significant environmental effects resulting from a proposed development, to assist the consenting authority, statutory consultees, and wider public in considering an application. Early identification of potentially adverse environmental effects also leads to the identification and incorporation of appropriate mitigation measures into the scheme design to avoid, reduce and, if possible, remedy potentially significant adverse environmental effects.

1.4 Development Area Selection and Design

12. The Development Area is being proposed by SPR for a number of reasons:

- it has a good wind resource;

- it is located within the 'broad area of search' for windfarm development identified in the Addendum to the Ayrshire Joint Structure Plan Technical Report TR03/2006, Guidance on the Location of Windfarms within Ayrshire (October 2009);
- it can accommodate turbines and associated infrastructure outwith sites designated for their natural or heritage interests;
- it is accessible for construction traffic and turbine deliveries.

13. Windfarm design must balance technical and environmental considerations, with the iterative EIA process acting as a tool to further refine the design process to achieve the most appropriate balance.

14. The overall aim of the design strategy was to create a windfarm with a cohesive design that relates to the surrounding landscape whilst taking account of the environmental characteristics of the site, for example, priority habitats and key ornithological species, cultural heritage features and hydrological resources.

15. The main components of the Development considered in the early design stage were the turbines, given their form as tall man-made structures potentially visible within a wide area. From the outset, the proximity of the Development Area to the Glen App and Galloway Moors Special Protection Area (SPA), designated for its breeding hen harriers, was also a key influence on the design. The optimum layout of a windfarm is also influenced by a range of technical criteria. Generally, turbines are arranged at a set distance apart to minimise the effect of turbulence. This set distance varies from site to site and between turbine models (on the manufacturer's recommendation).

16. Informed by the emerging design of the turbine layout, other infrastructure features such as the access tracks were subsequently designed as was the felling and restocking design taking account of the same onsite environmental parameters that informed the turbine locations.

17. Further details of the design strategy can be found in **Chapter 3: Development Area Selection and Design Strategy** of the ES. The sections below also outline the key design modifications introduced in relation to each specialist topic area.

1.5 The Development Proposal

18. A site layout plan is shown in **Figure 2**. The main components of the proposed Development comprise:

- 14 turbines of up to 126.5m in height to blade tip, with a maximum combined output of 32.2 megawatts (MW);
- a total of 13.2km of permanent access tracks including existing upgraded tracks, passing places, turning areas and watercourse crossings;
- crane hardstandings;
- one permanent meteorological mast;
- onsite underground electrical and communication cables;
- one substation/control compound including a control building, substation building and transformers/electrical equipment;

- site signage;
- installation of close circuit television and communication masts;
- planting of 49.8ha of native broadleaved tree species.

19. In addition to the above components of the operational Development, construction of the Development will also require:

- 0.9km of temporary access tracks;
- felling of trees to accommodate turbines and associated infrastructure;
- the creation of up to three temporary onsite borrow pits for the extraction of stone;
- a temporary construction compound/laydown area;
- up to five temporary power performance analysis masts (PPA masts).

20. The main access to the Development Area will be from the A77 road via an existing hard surfaced private road at Haggstone as shown in **Figure 1** (hereafter referred to as 'Main Access'). The Main Access will serve construction traffic entering the site including abnormal load vehicles delivering wind turbine components and will be permanent. Permanent access will also be taken from the A77 via an existing track near Mark, for 4x4 and light goods vehicles only (hereafter referred to as the 'Mark Access').

21. The Development Area is currently predominantly planted with commercial forestry. To accommodate the Development, localised felling of trees will be required. The turbines proposed within forested areas will be 'keyholed' into the trees. Keyholes will vary between 77.5m radius and 134.2m radius based on a requirement to maintain a buffer between the edge of the turbine blade swept area and the trees to minimise the collision risk to bats. Potential areas for compensatory planting within the site have been investigated in detail and the proposed planting areas are detailed in the ES.

22. Subject to the granting of planning permission, it is anticipated that the construction of the Development will take place over an 18 month programme.

23. The operational life of the Development is 25 years. Following this, an application may be submitted to retain or replace the turbines, or the turbines could be decommissioned.

24. The turbines will connect into the control building and substation via onsite underground cables. At the substation, the voltage will be stepped up for transmission to the national electricity network (the 'grid'). The connection from the on-site substation to the national grid will be via an overhead line supported on wood poles or an underground cable.

25. The Development will connect to the national grid via the operational ScottishPower Energy Networks substation at Arecleoch Windfarm, which is located approximately 12km to the north-east of the Development substation.

1.6 Scoping and Consultation

26. The purpose of scoping and pre-application consultation is to:

- ensure that consultees 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;
- provide a means of confirming the most appropriate methods of assessment.

1.6.1 Scoping

27. Scoping is undertaken at the outset of the assessment process according to the guidance provided in Planning Advice Note (PAN) 58: Environmental Impact Assessment (Ref.1-5).

28. The scope of the EIA was informed by the Scoping Opinion provided by the Scottish Government in March 2011[1] and the consultation responses received from key consultees including Scottish Natural Heritage (SNH), Historic Scotland (HS), South Ayrshire Council, and the Scottish Environment Protection Agency (SEPA).

29. The request for a scoping opinion formed the basis for early consultation with a number of organisations, who were asked for relevant information, opinions on the scheme and views on the proposed assessment methodologies.

30. In addition to the consultees contacted by the Scottish Government during the formal scoping process, topic area specialists engaged in further consultation and contacted a number of other stakeholders to obtain background information to further inform the EIA and allow them the opportunity to raise any concerns that they might have in relation to the Development.

1.6.2 Consultation

31. The process of consultation is critical to the development of a comprehensive and balanced ES. Views of the key statutory and non-statutory consultees serve to focus the environmental studies and to identify key specific issues which may require further investigation.

32. Public consultation is a key element of the environmental assessment process. The following public consultation was carried out:

- Public Information Days (PIDs) were held between 23rd and 26th May 2011 in Kirkcolm, Stranraer, Cairnryan and Ballantrae to provide information to local residents, and to gain feedback on the proposals. A second round of PIDs were held in Kirkcolm, Cairnryan and Ballantrae between the 26th and 28th of March 2012 to allow further findings of the environmental survey work and the final turbine design of the Development to be presented.
- The Public Information Days were advertised in local newspapers, posters were put up in venues in local communities, and leaflets describing the

[1] When Scoping was undertaken for the Development, it was proposed that the total output of the Development would exceed 50 megawatts (MW) and that an application would therefore need to be made to the Scottish Government under Section 36 of the Electricity Act (1989).

proposals and advertising the events were sent to nearby properties and to surrounding community councils.

- Consultation letters were issued to all Community Councils whose area is within or adjoins the land where the Development is situated.

- Members of the project team also attended local Community Council meetings to provide an update on project progress.

33. The information available at the PIDs included plans of the proposed Development layout, information boards explaining the key potential environmental effects, and photomontages to illustrate anticipated views. Representatives of LUC and SPR were also available to provide additional information and answer queries. A computer laptop equipped with Windfarm software was also available, allowing members of the public to see views from requested locations. Attendees were invited to complete feedback forms to provide input to the ongoing progression of the proposals. Information received at PIDs was fed back to the assessment team and incorporated into the assessment process.

1.7 Landscape and Visual Amenity

34. The landscape and visual impact assessment (LVIA) considered the effect that the Development will have on the landscape and on the people who view that landscape.

35. The study area for the assessment was defined as 35km from the outermost turbines of the Development in all directions, as recommended by current good practice guidance for turbines of 100m to blade tip or higher. The study area for the identification of windfarms included in the assessment of cumulative effects extended to 60km radius in accordance with relevant guidance from SNH. To assess likely effects on visual amenity during operation of the proposed Development, 15 viewpoints were selected for detailed review; these were agreed in consultation with SNH, South Ayrshire Council and Dumfries and Galloway Council.

36. The Development Area is located at the coastal edge of an undulating plateau that occupies much of the south-western part of South Ayrshire and north-western part of Dumfries and Galloway. Whilst the Ayrshire Scenic Area includes a small part of the Development Area, the turbines are not located within this designated area. The 35km radius study area contains three Regional Scenic Areas (RSAs) but no nationally designated landscapes. The closest settlements include Cairnryan, Stranraer, Kirkcolm and Ballantrae, and there are also a number of individual residences in proximity to the Development Area.

37. The overall aim of the design strategy was to design a windfarm that represented an optimum landscape ‘fit’ within the technical and environmental parameters of the project and the Development Area. As wind turbines are tall man-made structures, the initial design objectives considered their size and location, with emerging turbine layouts tested from key views around the Development Area. During the iterative design process, turbines were removed to reduce visual effects, for example, on views from the Glen App Valley, whilst consideration was also given to the siting of associated infrastructure, such as the visibility of Borrow Pit 1 from the A77 road.

38. During the construction phase, it is anticipated that there will be significant effects on the local landscape of the Development Area relating to felling works,

excavations and track construction, and the presence of tall cranes and partially built towers, whilst turbines are being erected. Effects will, however, be temporary and will not be significant following restoration and reinstatement measures which will be implemented through the Construction Method Statement.

39. Once operational, there will be major effects on the landscape of the Development Area and a locally significant effect on the '*Plateau Moorland with Forest'* (major) and '*Upland Fringe*' (moderate) Landscape Character Types (LCTs) within which the Development is located. Significant visual effects are predicted for six of the fifteen viewpoints (one with predicted 'major' effects, and five with predicted 'moderate' effects) and minor or negligible effects are predicted for the remaining nine viewpoints. It is important to note that the viewpoint locations with the clearest views of the Development were identified. These locations therefore represent the 'maximum case' views rather than typical views across the study area. Significant visual effects are also predicted locally on the Rhins Coast RSA, from the settlement of Kirkcolm, from the A716 road and from the residential property of Little Laight. No significant effects are predicted from other identified settlements, routes and residential properties within the study area.

40. The cumulative assessment of the proposed Development, in combination with other existing and planned windfarms, predicts a locally significant cumulative effect on the '*Plateau Moorland with Forest'* but not on wider landscape character. No significant cumulative visual effects, effects on settlements, routes or residential properties are predicted.

41. Measures to reduce landscape and visual effects were predominantly achieved through the design of the Development, although effects during construction will be further minimised through site restoration measures in accordance with good practice.

1.8 Hydrology, Hydrogeology, Geology and Peat

42. The assessment of effects on hydrology, hydrogeology, geology and peat has considered the potential effects of pollution risk and of erosion and sedimentation on surface water and groundwater, and on public and private water supplies, in addition to flood risk during operation of the Development and potential effects upon peat hydrology during construction and operation of the Development.

43. The study area for the assessment spanned five catchments; Penwhirn Burn and Reservoir, the Water of App and three smaller catchments that drain the western side of the Development Area, discharging directly into Loch Ryan which is a designated Marine Conservation Area (MCA).

44. Several watercourses cross the Development Area and there are some areas of standing water. The Development Area is also extensively covered by artificial drainage channels which were installed originally to improve ground for forest planting. The majority of the Development Area is covered by peat with a depth of 0.5 to 2m, although peat probing undertaken to inform the assessment identified isolated areas of deeper peat.

45. The hydrology, hydrogeology and peat distribution within the Development Area influenced the design of the turbine and infrastructure layout to avoid and/or minimise potential effects on these receptors where possible. Application of a minimum distance for the location of infrastructure from watercourses is the principal means by which surface hydrology can be protected (and therefore any

dependent ecology or water supplies). Due to downstream designations, including the MCA and a Drinking Water Protection Zone, 50m buffers were applied to all watercourses to minimise the risk of potential effects due to changes in runoff or sedimentation. This buffer distance is very precautionary as it is in excess of the 10m buffer distance required by SEPA's Pollution Prevention Guideline 5 as well as the 10-20m recommendation stated in the Forest and Water Guidelines.

46. The presence of peat within the Development Area also formed a key design consideration. Informed by the peat probing survey, the design process minimised the location of turbines and associated infrastructure within areas of deeper peat (>2m). The design process also sought to minimise the number of watercourse crossings required. The final layout includes four water crossings (of which two are existing crossings).

47. During construction and operation of the windfarm, established good practice measures will be applied in relation to pollution risk, sediment management and management of surface runoff rates and volumes. These will form part of the Construction Management Plan (CMP) to be implemented for the Development. SPR is committed to implementing these measures which form an integral part of the design/construction process. With the adoption of additional mitigation measures to protect private water supplies and peatland hydrology, no significant effects are predicted.

1.9 Ecology

48. The ecological assessment considered potential effects on terrestrial and aquatic ecology, including habitat loss and disturbance to protected species.

49. Desk studies were undertaken to search for statutory and non-statutory designations within 10km of the Development Area and for available species records within 2km of the Development Area. Field surveys were carried out to establish habitat types and distributions and the presence of otters, water voles, bats, red squirrel and badgers, with the study area being determined by species type.

50. There are no statutory designated sites for nature conservation within the Development Area and five designated nature conservation sites within 10km of the Development Area. With regards to non-statutory designations, four blocks of Semi-Natural Ancient Woodland are located in proximity to the northern boundary of the Development Area. The main habitat types within the Development Area are coniferous plantation woodland, blanket bog, and marshy grassland.

51. In relation to protected species, no otter resting sites were recorded within the Development Area, and only limited evidence was recorded within the wider study area. Water vole occur across the study area and whilst fish were recorded on the Water of App and on the Loan of Turchloy, existing culverts create a barrier to movement, resulting in a reduced diversity of fish species. No evidence of badger was identified by the field survey and given the sub-optimal nature of habitats, limited bat activity was recorded. Both the squirrel survey results and the historical records show the presence of red and grey squirrels within the Development Area.

52. The final Development layout included a number of design modifications to reduce ecological effects. This included siting turbines over 250m from the main areas of blanket bog habitat and proposing water crossings which will allow the

free passage of otters and water voles. With respect to bats, buffers have been placed around features that may be used for commuting and foraging in accordance with standard advice from Natural England, and endorsed by SNH.

53. No significant effects are predicted on designated nature conservation sites as the Development Area has no connectivity with these sites. Whilst the proposed Main Access runs past one area of Semi-Natural Ancient Woodland, using an existing track, no trees from these woodland blocks will be removed and no significant effects are predicted.

54. In relation to protected species, given the limited evidence of otter, effects on this species are considered unlikely. Whilst the proposed Main Access track will cross two burns where water voles were identified, the closest burrows were over 60m away, and the use of crossings which allow for the free passage of mammals means that there will be only very limited loss of suitable water vole habitat and therefore that the construction effect on water voles is not predicted to be significant. As the Development will only cross two burns; neither of which supports salmonid, effects on fish are not predicted to be significant. Given the sub-optimal nature of habitats for bats and the proposals to key-hole rather than clear fell woodland, the effects of both construction and operation of the Development on bats are not predicted to be significant. As red squirrel evidence was generally absent from the central sections of the Development Area, where the infrastructure is located, effects on red squirrel are not predicted to be significant.

55. Good practice construction measures will be identified in the CMP and an Ecological Clerk of Works (ECoW) will oversee construction, in particular ground breaking works and turf stripping, to ensure that measures with regards to ecology are implemented.

1.10 Ornithology

56. The assessment of potential effects on birds (ornithology) considered potential effects relating to direct and indirect habitat loss, collision risk and felling and future replanting. Particular attention has been paid to species of high or moderate conservation importance ('target species'). These include raptors (including hen harrier, peregrine, merlin, kestrel, buzzard, raven and goshawk), moorland breeding birds (including curlew) and black grouse.

57. The study area for species other than hen harrier was the Western Southern Uplands and Inner Solway Natural Heritage Zone, with the exception of hen harrier where the study area comprised the Glen App and Galloway Moors SPA. The assessment was informed by a desk study undertaken to collate existing bird records and/or data, consultation with SNH and the Royal Society for the Protection of Birds (RSPB) and field surveys. The surveys were undertaken over the period 2010 to 2012[2].

58. The Development Area adjoins the Glen App and Galloway Moors SPA and Site of Special Scientific Interest (SSSI), which is designated for its importance to breeding hen harriers. With respect to breeding activity, in 2010, one pair of hen harriers was recorded within the study area with a further four recorded in 2011. However, none of these nests were recorded within the Development Area. In 2012, hen harriers were observed approximately 2km from the Development

[2] An additional breeding bird survey, focussed predominantly on hen harriers, was undertaken in 2012. This provided additional data on the distribution of breeding hen harriers in relation to the Development.

Area but there was no indication of any nesting attempt within the Development Area.

59. In 2011, there was confirmed breeding by one pair of peregrines and one pair of barn owls and possible breeding by one pair of short-eared owls. None of these breeding records was within the Development Area boundary. The field surveys recorded a low number of moorland breeding birds and no black grouse.

60. Most flight activity in 2010 and 2011 comprised buzzards, kestrels and ravens. In total, 153 flights by hen harriers were recorded during 2010 and 2011. The vast majority of the flight activity was over the moorland adjacent to the Development Area with little activity over the forest within the Development Area.

61. One of the initial objectives of the design strategy was to develop a layout which minimised effects on hen harrier, the qualifying species of the SPA. During the early design process, a 500m buffer from the boundary of the SPA was applied in accordance with the minimum disturbance free distance recommended by SNH. This has been maintained as a minimum distance between turbines and the SPA throughout the design iteration process. Further to the application of this buffer, as the findings from the surveys became available, these were used to further inform the windfarm layout. Turbines were removed from the Development design to take account of ornithological findings.

62. As construction of the windfarm is programmed to last for approximately 18 months, disturbance from construction activities could affect one or possibly two bird-breeding seasons. Pre-construction surveys for breeding birds will be carried out to inform any requirements for mitigation during construction, whilst the ECoW will be present to establish and maintain appropriate disturbance free buffer zones throughout the construction period.

63. Given the design modifications introduced, collision risk calculations do not indicate any significant effects for any of the target species, for the windfarm in isolation and cumulatively with other relevant windfarm schemes. Given this, and the proposed construction practices, no significant effects on ornithology are predicted.

64. In recent years, both the breeding population and productivity of hen harriers within the Glen App and Galloway Moors SPA have declined. SPR propose to implement monitoring of the breeding population of hen harriers within the Development Area and an area to the north and north-east within the SPA. Monitoring would include the identification of any breeding attempts and subsequent surveillance to assess factors influencing breeding productivity. The duration and frequency of the monitoring programme will be discussed and agreed with SNH.

1.11 Noise

65. Once operational, windfarms may emit two types of noise. Aerodynamic noise relates to the movement of the rotating blades through the air, and mechanical noise may emanate from components within the nacelle of a wind turbine, where the rotor blades meet. However, modern turbine designs have evolved to ensure that mechanical noise radiation from wind turbines is negligible. Aerodynamic noise is usually only perceived when wind speeds are fairly low; in higher winds, aerodynamic noise is generally masked by the normal sound of wind blowing through trees and around buildings.

66. Noise will also be generated during the construction phase of the Development from the operation of a range of construction plant and machinery and

construction traffic. This will be temporary in nature, during the 18 month construction period.

67. The study area for the assessment included residential dwellings located in the vicinity of both the Development and the proposed construction traffic routes. The analysis of construction noise effects was undertaken in accordance with accepted guidance that provides methods for predicting construction noise levels on the basis of reference data for the emissions of typical construction plant and activities. Operational noise levels were assessed in line with government guidance on assessing noise from wind turbines, which compares predicted operational noise levels with the existing background noise levels.

68. The Development is located in an area of relatively low population density. The noise environment in the surrounding area is generally characterised by 'natural' sources, such as wind disturbed vegetation and birds. Other sources of noise include intermittent distant commercial aircraft as well as water flow noise from the Water of App and traffic travelling on the A77 road. Background noise monitoring was conducted in October and November 2011 at seven noise monitoring locations agreed with the Environmental Health Departments of both Dumfries and Galloway Council and South Ayrshire Council as being representative of the background noise environment around the Development Area.

69. During the early stages of the design process, an approximate 1km buffer distance was applied between turbines and residential properties and this has been maintained throughout the design process. Noise levels were calculated for progressive turbine layouts and the final application layout reviewed to confirm compliance with the limits set out in government guidance.

70. It is not considered likely that noise levels during construction will exceed acceptable limits at residential properties. Notwithstanding this, SPR is committed to following accepted guidance and to using methods for minimising noise from construction activities. Given the compliance of the Development with government limits for operational noise, both in isolation, and in combination with other windfarms, no significant operational noise effects are predicted.

1.12 Cultural Heritage

71. Cultural heritage assets include sites, features and areas with statutory and non-statutory designations, including Scheduled Monuments; Listed Buildings; Conservation Areas; Gardens and Designed Landscapes (Inventory and Non Inventory status); Non Statutory Register sites and other historic environment interests. The assessment considered direct effects, such as removal of, or damage to, features within the Development Area, and indirect effects on the setting of designated features in the surrounding landscape.

72. The study area for direct effects comprised the Development Area. A wider study area, extending to 10km from the outermost turbines was defined as the study area for the identification of cultural heritages assets whose settings may be affected by the Development. A desk based assessment of cultural heritage records was followed by a walkover survey of the Development Area and site visits to the wider area.

73. The known features within the Development Area included four Scheduled Monuments ranging in date from the Early Bronze Age, through the medieval period and into the 18th and 19th centuries. The nearby settlement of Cairnryan is designated as a Conservation Area and the north of the village is designated

as an Outstanding Conservation Area. The East Rhins Archaeologically Sensitive Area (ASA) lies directly to the south of the site. The ASA is a regional designation and contains many Scheduled Monuments and other archaeological sites. The closest Garden and Designed Landscape (GDL) is Loch Ryan House, which is located within 1km of the south-west Development Area boundary.

74. The presence of cultural heritage features within the Development Area influenced the layout design primarily through seeking to avoid direct effects on designated and non-designated features. For example, the construction compound and the access to the construction compound have both been sited to avoid the location of cairns of archaeological interest and the turbine and track layout have also been designed to avoid further archaeological sites, although these now lie within mature forestry and may well have been damaged or destroyed by forestry ploughing and planting.

75. Whilst there is a predicted direct effect of minor significance on surviving remains of a former farmsteads field system from replanting, following implementation of mitigation measures, there will be no residual effects. There are no predicted significant effects on the setting of any cultural heritage features during operation of the Development in isolation. Whilst a cumulative effect of minor significance is predicted on the collective setting of the group of Scheduled Monuments within the East Rhins ASA, arising from the Development when added to other operational, consented or application windfarm developments in the local vicinity, the Development only makes a small contribution to this. No significant effects on cultural heritage are predicted as a result of construction or operation of the Development.

1.13 Access, Traffic and Transport

76. The assessment of access, traffic and transport considers the potential effects of construction and operational traffic associated with the Development on the road network and other road users, on road infrastructure condition and on community receptors[3].

77. The study area for access, traffic and transport has been defined as the public road network in the vicinity of the Development which will be used as access routes by traffic bound for the Development; this includes the A77, A75 and A751 trunk roads. It is not anticipated that any vehicles will need to use any minor local roads near the Development Area. The assessment has been undertaken as a combination of desk-top study, field survey and in consultation with statutory agencies in line with current good practice and policy advice.

78. Effects associated with traffic generated by the Development will be most pronounced in the vicinity of the accesses to the Development Area; as vehicles travel away from the Development, they will split across the wider road network. The A77 local to the Development is considered to be between Stranraer and Turnberry. As a trunk road, it is typically well maintained and of a good standard. Community receptors on this section of the A77 have been identified within Stranraer, Cairnryan, Ballantrae and Girvan. The A75 local to the Development is considered to be between Stranraer and Castle Kennedy and is again well maintained and of a good standard. Additional community receptors have been identified within Stranraer. No community receptors were identified on the A751. All roads within the study area typically operate well below their design capacity.

[3] Community receptors are defined as areas where local people are likely to be more aware of changes in traffic flow (e.g. areas of high pedestrian movement, schools, playgrounds or hospitals.

79. During construction, turbine components and construction materials will be delivered to the Development Area. Some materials will be transported by Heavy Goods Vehicles (HGVs) and turbine components need to be transported on vehicles capable of carrying 'abnormal loads' (vehicles longer than 17m and/or wider than 4m). It is proposed that turbine components will be landed at the Port of Ayr and then transported southwards to the A77 road. Abnormal load vehicles will then follow the A77 southwards to the Development Area. All other vehicles bound for the Development Area are expected to originate from the north and south of the Development Area, from concrete plants, quarries and settlements, and approaching the Development Area on the identified trunk roads.

80. Once operational, windfarms typically generate very low levels of traffic. It is estimated that the Development will generate less than ten vehicle movements per day for the purposes of maintenance, repairs and servicing.

81. Prior to mitigation, minor effects are predicted upon traffic flow and road users and road infrastructure condition during construction for the Development in isolation. The implementation of a Traffic Management Plan (TMP) and the monitoring and repair of any damage attributable to the transport activities relating to the Development will, however, reduce the significance of these effects to negligible. A cumulative effect of moderate significance on traffic flow and road users is predicted during construction should the other schemes considered in the cumulative assessment be constructed at the same time as the Development. It is considered very unlikely that the construction phases of the schemes assessed would overlap in reality and implementation of the TMP, and liaison with relevant authorities and other developers if required, would reduce the residual effect to minor. No significant residual effects in relation to access, traffic and transport are predicted from traffic generated by the Development.

1.14 Socio-Economics, Tourism, Recreation and Land Use

82. The assessment of the potential social and economic effects of the proposed Development considered potential effects in relation to employment and economic benefits, tourism, recreation and public access, and land use.

83. With respect to employment and wider economic benefits, the assessment considered effects within the South Ayrshire and Dumfries and Galloway administrative areas. Direct effects on public access and land use were considered for the Development Area and effects on recreation were considered for the Development Area and the adjacent land in South Ayrshire and Dumfries and Galloway. The cumulative assessment considers effects within 35km of the Development Area given the potential link between recreation and tourism effects and visual effects. Desk based information sources were used to assess the likely scale of effects, supplemented by consultation with local stakeholders.

84. Within both South Ayrshire and Dumfries and Galloway, there is a high concentration of jobs within the 'skilled trades' and 'elementary occupations'[4], compared with the total for Scotland as a whole. The unemployment rate is currently higher than the national average in South Ayrshire and lower than the national average in Dumfries and Galloway.

85. Visitor attractions in the vicinity of the Development Area include Castle Kennedy and Gardens, and Penwhirn Reservoir which is fished for brown trout between March and September. The ferry port at Cairnryan is used for ferries travelling to and from Northern Ireland. The Glenapp Estate currently supports a diverse

[4] These usually require a short period of formal experience-related training to perform mostly routine tasks.

range of land uses including livestock farming, stalking and shooting, commercial and residential properties, as well as the forestry within which it is proposed to locate the Development. Whilst the Development Area is not currently used for any formal recreational activities, the Loch Ryan Coastal Path is located within the Development Area and crosses/corresponds to the Main Access and the Mark Access tracks respectively.

86. Research commissioned by SPR found that employment opportunities for local people are currently greatest during the construction and installation of windfarm infrastructure, including enabling works, site clearance, the development of borrow pits, the creation of access tracks, the building of turbine foundations, the digging of cable trenches and cable laying, and control centre and substation construction. It is anticipated that a temporary workforce averaging 67 people at any one time will be employed during the 18 month construction period and that it is likely that there will also be some local employment generated as an indirect result of the construction of the Development. This could include supply chain spin-offs for local businesses relating to the transportation of labour and materials. Personnel will also be employed during the operational phase of the Development to maintain and operate the windfarm. As a result of the skills research commissioned, SPR is involved in discussions with various educational institutions in south-west Scotland to help ensure that individuals and businesses have the necessary skill sets to maximise opportunities arising from the investment that the Development would bring to the area.

87. There will be no visibility of the Development from Glenapp Castle and limited visibility from the grounds of the associated Garden and Designed Landscape. There will be no visibility of the Development from Castle Kennedy and Gardens. A number of the viewpoints selected for the landscape and visual assessment are of relevance to recreation and tourism and significant visual effects are predicted for seven of these. Whilst the effect of changes of views will depend on the personal opinion of the viewer, there is no evidence to suggest that, once operational, the Development will discourage people from visiting the local area. SPR is committed to maintaining public access during construction where possible; however, if deemed necessary, the Loch Ryan Coastal Path may be closed temporarily during the construction phase, for example the upgrade of the Mark access track would likely require a closure of three to four weeks. Suitable signage and controls will be adopted that are compliant with Health and Safety Regulations and best practice. During the operational phase of the Development, public access to the Development Area will be fully reinstated

88. Once operational, the current use of the Development Area as a commercial forestry plantation will continue. The Development will help to sustain the economic viability of the Glenapp Estate, which currently provides employment for a number of local people, and will enable the Estate to further diversify its existing activities.

89. No significant effects are predicted on land use or tourism or on public access and recreation as a result of construction or operation of the Development. SPR will continue to seek to secure positive benefits for the local economy by working with others to identify training opportunities for local people in the skills required for windfarm operational and maintenance roles.

1.15 Other Issues

90. This section summarises the findings of the assessment of the potential effects of the Development on aviation and defence, television reception, dust, and air quality. The findings of the Carbon Balance Assessment are also discussed.

91. Wind turbines can potentially cause interference to telecommunication links. Whilst consultation with the relevant telecommunications operators in the area confirmed that there is one communication link crossing the Development Area, no effects on this link are predicted.

1.15.1 Aviation and Defence

92. Once operational, windfarms can potentially affect navigation and surveillance systems (including radar).

93. The Development Area is approximately 18km from a military base at West Freugh and the proposed turbines are likely to be in line of sight of the Ministry of Defence (MoD) Primary Surveillance Radar (radar) at that facility.

94. Whilst the MoD raised initial concerns in their response to the Scoping Report that the Development is located within the radar line of site, it has been ascertained that the usage of the Danger Areas which utilise the radar is limited and it is not predicted that any effect which the Development will have on the radar would be significant. SPR has endeavoured to consult with the MoD in relation to this issue but has not received a response; SPR will continue to seek dialogue with the MoD.

1.15.2 Television (TV) Reception

95. Wind turbines have the potential to interfere with television broadcasting systems causing viewers to experience a degraded picture quality or loss of reception.

96. The Development Area is located in the Border TV region and television transmission for homes near the Development Area is likely to be provided by the Caldbeck Transmitter group. The digital switchover for the Border TV region was completed in 2009.

97. The BBC online tool reported that no properties are likely to be affected by wind turbines in this location. This was reported on the basis of a central grid reference for the Development Area. However, more detailed computer modelling has identified that there are ten properties where there may be theoretical interference. Whilst this effect is unlikely to be significant, any issues experienced by residents as a consequence of the Development would be mitigated through the installation of satellite television or upgrades of the current antennae systems.

1.15.3 Dust

98. The movement of vehicles as they transport equipment and goods to site is the most likely source of dust during the construction period. The level and distribution of emissions will vary according to factors such as the duration of dust-generating activity and weather conditions.

99. Whilst it is anticipated that three properties in proximity to the Development Area could potentially be affected by dust emissions, SPR is committed to adopting good practices for dust management during construction, thereby controlling and reducing any potential effects on the potential receptors identified. On this basis, no significant effects are predicted.

1.15.4 Air Quality

100. During construction, the operation of equipment, staff transport, construction vehicles and machinery will result in atmospheric emissions of waste exhaust gases containing nitrogen oxides (NOx), fine particles (PM_{10}) and other pollutants. The quantities emitted will depend on engine type, vehicle age, service history and fuel composition.

101. Temporary effects on local air quality due to exhaust emissions are considered not to be significant as the increase in traffic will not cause any exceedance of air quality standards either at the Development Area or within the wider South Ayrshire and Dumfries and Galloway area.

1.15.5 Carbon Balance

102. A carbon balance assessment has been undertaken which demonstrates that the Development will 'payback' any carbon dioxide (CO_2) emitted during construction and operation within 24 months of operation. Beyond this period, the windfarm will make a positive net contribution to CO_2 emissions savings. Therefore, the carbon offset by the Development will contribute positively to meeting Scotland's targets for reducing greenhouse gas emissions.

1.16 Summary

103. The EIA of the proposed Development was carried out in accordance with regulatory requirements and guidance on good practice. The Development has been located in a 'broad area of search' for windfarm development as identified by South Ayrshire Council (Ref.1-4).

104. The overall aim of the design strategy was to create a windfarm with a cohesive design that relates to the surrounding landscape, whilst taking account of the environmental characteristics of the site.

105. The findings of the surveys undertaken as part of the EIA, in addition to extensive consultation, have informed the design process and, as a result, a number of significant design changes have been introduced to reduce effects on surrounding receptors including local residences, and both natural and cultural heritage features.

106. Overall, the ES shows that, given the iterative design process, and with the committed good practice measures and proposed mitigation in place, most potential environmental effects associated with the construction and operation of the Development can be avoided or minimised. Therefore, In terms of the EIA Regulations, it is considered that the Development will not have significant adverse effects on the environment with the exception of a limited number of landscape effects. In all cases the predicted effects of the Development are long-term (persisting for the life of the Development) but reversible, such that following decommissioning these effects will no longer be present.

107. The Development would represent an important environmental benefit in that it involves the generation of electricity from a renewable energy source that will reduce or avoid the use of fossil fuels. Burning fossil fuels produces carbon dioxide which contributes to global warming. The Development has a payback time of 24 months. Beyond this period, it will make a positive net contribution to CO_2 emissions savings for the remainder of its 25 year operational period. Therefore, the carbon offset by the Development will contribute positively to meeting Scotland's targets for reducing greenhouse gas emissions. The

proposed Development will also lead to beneficial effects in relation to its employment creation during construction.

References

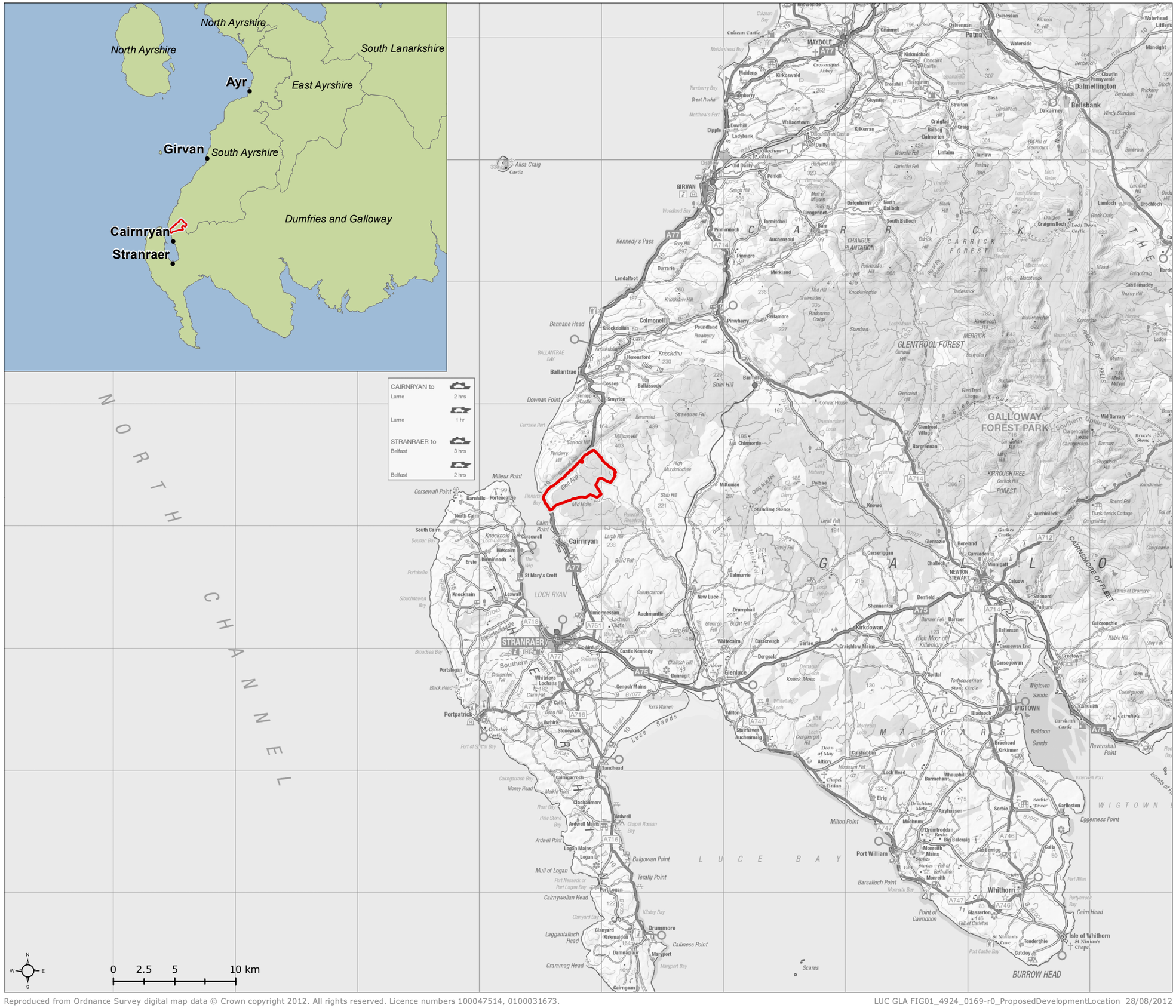
Ref.1-1 The Town and Country Planning (Scotland) Act 1997, as amended

Ref.1-2 The Town and Country Planning (Hierarchy of Development) (Scotland) Regulations 2009

Ref .1-3 The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011

Ref.1-4 Addendum to the Ayrshire Joint Structure Plan Technical Report TR03/2006, Guidance on the Location of Windfarms within Ayrshire (October 2009)

Ref.1-5 Scottish Executive Development Department, 1999, Planning Advice Note 58: Environmental Impact Assessment



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SCOTTISHPOWER RENEWABLES

Glen App Windfarm

Development Area Location

Development Area Boundary

Figure 1

Map Scale @ A3:1:300,000

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SCOTTISHPOWER RENEWABLES

Glen App Windfarm

Proposed Development Layout

- Development Area Boundary
- Turbine
- Access Track (Upgraded)
- Access Track (New)
- Haul Road (Temporary Track)
- O and M Building / Substation
- Construction Compound
- Borrow Pit Search Area
- Borrow Pit Extraction Area
- Crane Hardstanding Area
- Met Mast Hardstanding Area
- Passing Place
- Turning Area
- Permanent Met Mast
- Power Performance Assessment (PPA) Mast
- Access Point
  1. Main Access
  2. Mark Access
- Indicative Native Broadleaved Compensatory Planting (49.8 ha)

Figure 2

Map Scale @ A3:1:20,000

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