FORCE 9 ENERGY

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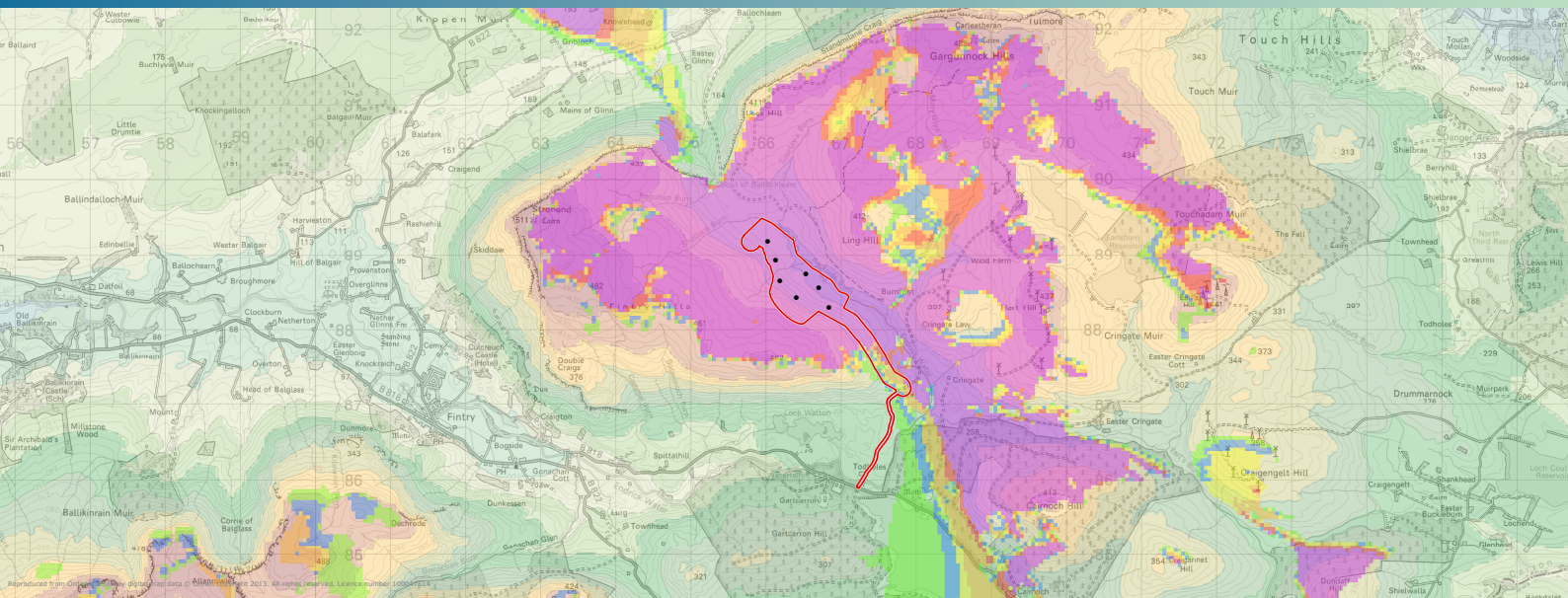
Craigton and Spittalhill Wind Farm Environmental Statement

Non-Technical Summary

November 2013



Craigton and Spittalhill Wind Farm
Environmental Statement
Non-Technical Summary

Prepared by LUC
on behalf of
Force 9 Energy

November 2013

Preface

This Environmental Statement (ES) has been prepared in support of an application for planning permission to construct and operate the seven turbine Craigton and Spittalhill Wind Farm. The Development is located approximately 12km south-west of Stirling and 7.5km to the east of Balfron, and lies wholly within the Stirling Council area.

The ES comprises the following documents:

- Volume I: Main Text and Figures
- Volume II: Appendices

The ES has been prepared by LUC and supporting sub-consultants. In addition, the ES is accompanied by a Non-Technical Summary, Planning Statement, Design and Access Statement and Pre-Application Consultation (PAC) Report.

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

Force 9 Energy LLP and EDF Energy ER

c/o 272 Bath Street

Glasgow

G2 4JR

The Non-Technical Summary is available free of charge. A hard copy of the ES and accompanying documents costs £250. In addition, all documents are available in an electronic format (as PDFs for screen viewing only) on CD/DVD for £2.

The ES and accompanying documents are available for viewing by the public during normal opening hours at the following locations:

Fintry Sports and Recreation Club
Kippen Road
Fintry
Glasgow
G63 OYA

Planning and Building Standards
Stirling Council
Municipal Buildings
8-10 Corn Exchange Road
Stirling
FK8 2HU

Howietown Fishery
Stirling
FK7 9QH

The documents will also be made available on-line at http://pabs.stirling.gov.uk/online-applications/

Comments in relation to the Planning Application should be forwarded to the Stirling Council Planning Environment Services department at the address above. Alternatively, comments can be made via Stirling Council's online planning portal.

Non-Technical Summary

Introduction

1.1 Force 9 Energy is applying to Stirling Council for planning permission to construct and operate Craigton and Spittalhill Wind Farm (hereinafter referred to as 'the Development'). The site, (hereinafter referred to as 'the Development Area' as shown on **Figure 1**) is located approximately 12km south-west of Stirling and approximately 7.5km to the east of Balfron.

1.2 As the Development will have a generating capacity of under 50 megawatts (MW), Force 9 Energy is applying to Stirling Council for planning permission under the Town and Country Planning (Scotland) Act 1997, as amended[i]. The application is categorised as a 'Major Development' under the Town and Country Planning (Hierarchy of Development) (Scotland) Regulations 2009[ii] on the basis that the capacity of the Development will be over 20MW.

1.3 Force 9 Energy is a dedicated wind farm development company with offices in Scotland and England and with a focus on the UK market. To date, Force 9 Energy has taken six developments through planning, four of which will have been consented without appeal or public inquiry, one of which was consented on appeal, and one of which was refused after public inquiry. Force 9 Energy is continuing to expand its wind farm development portfolio in response to the Government's targets for energy generation from renewable sources, and is currently awaiting determination of a further four wind farm planning applications.

1.4 Force 9 Energy has a joint development agreement with EDF Energy Renewables (EDF). Through the agreement, Force 9 Energy leads on the development process of wind farm proposals up to the start of construction. Should a wind farm be consented, EDF will take the lead during construction and subsequently own and operate the wind farm.

1.5 The application is accompanied by this Environmental Statement (ES) which has been undertaken in accordance with the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011[iii] ('the EIA Regulations'). 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 the EIA** of the ES.

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

1.7 The ES has been prepared by LUC on behalf of Force 9 Energy. LUC produced the following ES chapters:

- Chapter 1: Introduction;
- Chapter 2: Approach to the EIA;
- Chapter 3: Site Selection and Design Strategy (with input from Force 9 Energy)
- Chapter 4: Development Description (with input from Grontmij and Force 9 Energy)
- Chapter 5: Planning Policy Context;
- Chapter 6: Landscape and Visual Amenity;
- Chapter 13: Socio-Economics;
- Chapter 14: Other Issues (with input from Mouchel and The Wind Consultancy Service)
- Chapter 15: Summary.

1.8 A number of sub-consultants undertook specialist assessments as follows:

- **Hayes McKenzie** undertook the noise assessment;

- **Mouchel** undertook the geology, hydrology and hydrogeology assessment, Borrow Pit Assessment, Peat Stability Assessment and Carbon Balance Assessment ;
- **MacArthur Green** undertook the ecology and ornithology assessments;
- **CgMs** undertook the archaeology and cultural heritage assessment;
- **Grontmij** undertook the access, traffic and transport assessment.

Environmental Impact Assessment

1.9 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. The ES presents information on the identification and assessment of the likely environmental effects of the proposed Development. **Major** or **moderate** effects are considered to be significant in the context of the EIA Regulations[1].

1.10 The scope of the EIA was informed by the Scoping Opinion provided by Stirling Council in October 2012 and includes responses from Scottish Natural Heritage (SNH), the Scottish Environment Protection Agency (SEPA), Historic Scotland and Transport Scotland. These responses have been presented in **Chapter 2: Approach to the EIA**.

Site Selection and Design Strategy

1.11 The site at Craigton and Spittalhill was selected by Force 9 Energy for a number of reasons, including the following:

- it has a good wind resource and is available for wind energy development;
- there are no international or national natural heritage or landscape designations within the Development Area;
- the Development Area is at distance from the nearest residential receptors;
- there are no radar or other technical constraints associated with the Development Area;
- there are grid connection options available;
- there is good access to the Development Area for construction traffic and turbine deliveries; and
- the landscape is, in part, defined by the existence of the nearby Earlsburn Wind Farm.

1.12 Wind farm design must balance technical, economic and environmental considerations, with the iterative EIA process acting as a tool to further refine the design process to achieve the most appropriate balance. In addition the design of a wind farm is driven by the key objective of positioning turbines so that they capture the maximum energy possible within a suitable area determined by environmental and technical constraints.

1.13 The overall aim of the design strategy was to create a wind farm with a cohesive design that relates to the surrounding landscape, in line with appropriate published guidance[iv]. The inherent nature of wind turbines as tall, modern structures means that the form of the wind farm as a whole is important, and a clear design strategy is necessary. The strategy therefore considered the appearance of the wind farm as an object or composition in the landscape as the primary factor in generating the layout.

1.14 The objectives of the design strategy were as follows:

[1] This is the case for all topic chapters with the exception of Access, Traffic and Transport, Noise and Other Issues.

- to produce a layout that would relate well to its landscape setting and appear contained within its extents;
- to develop a layout that would appear cohesive and well considered from all aspects;
- to develop a layout that seeks to match the perceived scale of the turbines, and the scale of the overall Development, with the scale of the landscape;
- to develop a layout that relates to other wind farms in the local area as well as being coherent it its own right;
- to develop a layout that fulfils the above objectives whilst respecting other environmental constraints including ecological, hydrological and ground conditions (including peat) related constraints identified during the EIA process.

1.15 As a consequence of the EIA process, there have been a number of modifications to the initial design layout, to avoid or minimise environmental effects without compromising the overall design strategy. These modifications have been made as a result of the findings of the baseline survey work and consultation undertaken with consultees and the public and include:

- a reduction in the number of turbines and turbine grouping moved to the south-east of the Development Area to reduce landscape and visual effects. Visibility from the settlements of Kippen and Gargunnock removed as a consequence.
- minor adjustments (generally between 30m to 50m) to positions of all turbines following peat probing survey and hydrological walkover survey in order to establish an appropriate buffer in relation to watercourses and to avoid areas of potentially deeper peat.

1.16 These modifications have included the relocation and reduction in the number of turbines to:

- minimise the visual effects of the Development in views from the wider landscape;
- avoid construction activity in areas of potentially deeper peat; and
- minimise the number of watercourse crossings required and ensure appropriate buffer distances between surface waters and turbine bases and associated infrastructure.

1.17 Design changes made as a consequence of the key constraints to site design are considered to be mitigation which is 'embedded' in the design. Further details of the design strategy can be found in **Chapter 3: Site Selection and Design Strategy** of the ES.

Development Description

1.18 As shown on **Figure 2**, the main components of the proposed Development are:

- seven wind turbines (including external transformers) of up to 125m (to tip) height, with a maximum combined output of 21 megawatts (MW);
- crane hardstandings;
- onsite underground electrical cables;
- a control building;
- a permanent meteorological mast;
- a temporary site construction compound/laydown area;
- two areas from which rock for wind farm construction will be won (borrow pits);
- approximately 5km of onsite access tracks.

1.19 A single permanent freestanding meteorological mast will be erected to aid performance monitoring of the wind turbines and to gather meteorological data throughout the lifetime of the Development. The mast will be of a lattice design and will have a maximum height of 80m. The proposed location of the mast is shown on **Figure 2**.

1.20 It is proposed that the Development Area will be accessed via the existing Earlsburn Wind Farm access track which connects to the B818 road in the vicinity of Todholes to the south.

Full details of the assessment of effects on the local road network are provided in **Chapter 12: Access, Traffic and Transport** of the ES**.**

1.21 A new access track will be constructed to facilitate access to the turbines and other infrastructure locations as shown on **Figure 2**. The new track will branch-off from the existing Earlsburn Wind Farm access track at a point just before it crosses the Endrick Water. In total, approximately 5km of new onsite access track will be constructed.

1.22 The Development will be connected to the national electricity grid. The grid connection will be subject to a separate consenting process and will be made via a new line, which would typically be a wooden pole type line running from the location of the control building to the grid connection point.

1.23 Electrical power from the turbine transformers will be transferred to the electricity distribution system through a switchgear unit, housed within the control building. The control building will be located in the north of the Development Area as shown on **Figure 2**.

1.24 Subject to the granting of planning permission, it is anticipated that the construction of the Development will take place over 12 months. The operational life of the Development is 25 years. At the end of the 25 year operational period, the Development will either be decommissioned, or an application made for consent to extend its operational life. It is estimated that decommissioning the Development, given its size, will take approximately 6 months.

Landscape and Visual Amenity

1.25 The landscape and visual amenity assessment considered the potential effects of the Development on the landscape and visual resources of the Development Area and the surrounding study area during construction, operation and decommissioning. More details on the assessment are provided in **Chapter 6: Landscape and Visual Amenity** of the ES.

1.26 The study area for the assessment was defined as 35km from the outermost turbines of the Development in all directions, as recommended in current guidance for turbines of 100 m to blade tip or higher[v] and in agreement with Scottish Natural Heritage (SNH), Stirlingshire Council and Loch Lomond and The Trossachs National Park Authority (LLTNPA). To consider cumulative effects of the Development in relation to other schemes in the wider area, wind farms within 35km of the Development have been included for the purposes of modelling and detailed assessment, as agreed with Stirling Council, SNH and LLTNPA. To assess the likely effect of the Development on visual amenity, fifteen viewpoints have been identified across the 35 km study area, and agreed through consultation with the local authorities covering the study area, SNH and LLTNPA.

1.27 The method for assessment included field survey, computer modelling, mapping and photography. Field survey work was carried out between May 2012 and October 2013, and records were made in the form of field notes and photographs. Evaluation of the theoretical extent to which the wind farm would be visible across the study area was undertaken by establishing a Zone of Theoretical Visibility (ZTV) using specific computer software designed to calculate the theoretical intervisibility between the wind farm and its surroundings. The ZTV was calculated to show the number of turbines visible to blade tip or hub height.

1.28 The study area includes many different Landscape Character Types (LCTs) from lowland and urban areas to high plateaux and hills. The Development Area lies within a locally designated landscape, the Fintry, Gargunnock and Touch Hills Area of Great Landscape Value (AGLV, Stirling). The 35 km study area also contains three National Scenic Areas (NSAs) and a number of other local landscape designations. Settlements within 5km of the proposed Development are located within the low lying ground of the surrounding valleys, including Fintry and Kippen. Dispersed farmsteads and individual or small groups of residential properties are located close to roads within the Carron Valley to the south and the Forth Valley to the north of the Development Area.

1.29 During the construction phase, it is predicted that there will be a major landscape and visual effect on the Development Area relating to excavations and track construction, the presence of

tall cranes and partially built towers whilst turbines are being erected. This effect, however, will be temporary and not significant following restoration and reinstatement measures.

1.30 Once operational, a major effect is predicted on the landscape resource of the Development Area itself, and a moderate landscape effect to the landscape character of the Fintry, Gargunnock and Touch Hills area of the Lowland Hills LCT. The Fintry, Gargunnock and Touch Hills AGLV locally designated landscape will experience change for the area around the Backside Burn, but the reasons for designation of the AGLV as a whole will not be affected. A significant (moderate) landscape effect on the Carse West of Stirling area of the Flat Valley Floor LCT within the Forth Valley to the north is anticipated.Moderate, and therefore significant visual effects are predicted for five of the 15 representative viewpoints during operation, all of which are located within approximately 10 km of the proposed Development. Minor or negligible visual effects are predicted for the remaining ten viewpoints. No significant visual effects are predicted on views from settlements, users of local roads around the Development Area or on walkers and cyclists using the Rob Roy Way and National Cycle Network 7 during operation.

1.31 Significant (major) cumulative landscape effects have been identified for the Development Site and the Fintry, Gargunnock and Touch Hills area of the Lowland Hills LCT. No significant cumulative visual effects have been identified in the assessment.

1.32 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.

Noise

1.33 Once operational, wind farms 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.

1.34 Noise will also be generated during the construction phase of the Development from the operation of a range of construction plant and machinery and from construction traffic. This will be temporary in nature, during the 12 month construction period. Details of the noise assessment are provided in **Chapter 7: Noise** of the ES.

1.35 The study area for the assessment included residential dwellings located in the vicinity of both the Development and the proposed construction traffic routes. Due to the location of the Craigton and Spittalhill Wind Farm, and the consequent low levels of predicted turbine noise at the nearest residential properties, which are more than 1km from the Development, it was considered that, in accordance with government guidance, baseline noise measurements were not required. The assessment also considered the cumulative noise effects of the Development in combination with other nearby developments.

1.36 The noise assessment concluded that it is unlikely that noise levels at the nearest residential properties will exceed accepted limits during both the construction period and all operational conditions. Cumulative noise effects are either negligible or meet agreed cumulative noise limits.

1.37 Good practice measures will be implemented to minimise noise from construction activities and noise levels will be monitored during construction. A noise control plan will be prepared by the contractor for incorporation into the Environmental Management Plan (EMP).

Geology, Hydrology and Hydrogeology

1.38 The geology, hydrology and hydrogeology assessment has considered the potential effects of pollution incidents, erosion and sedimentation and modification of surface water drainage patterns, in addition to modification to groundwater levels and flows, compaction of soils and peat instability during construction and operation of the Development. More details on the assessment are provided in **Chapter 8: Geology, Hydrology and Hydrogeology** of the ES.

1.39 The study area for the assessment has been defined as the Development Area, and the surrounding area of the Fintry Hills and Ling Hill. In addition, using a catchment based study approach, the assessment has also considered downstream locations to the mouth of Endrick Water to Loch Lomond. The assessment was informed by consultation with Scottish Water and Stirling Council and field surveys, which were undertaken between October and December 2012.

1.40 Designations within 5km of the Development Area which relate to hydrology, geology and soils include Endrick Water Special Area of Conservation (SAC) and Special Site of Scientific Interest (SSSI) and Double Craigs SSSI. Endrick Water SAC and SSSI are located 5.1km downstream of the site, 1.2km south-west of the site at its nearest point, and are primarily designated for their fish populations and presence of nationally rare plant species. Double Craigs SSSI is located approximately 1.7km south-west of the Development Area and is designated for its volcanic geology and undisturbed upland plant species. The majority of the Development Area is covered by peat with a depth of 0.5 to 1.5m, although peat probing undertaken to inform the assessment identified that the average depth across the Development Area is less than 1m. The site lies in the upper catchment of the Endrick Water, with the Backside Burn and its tributaries draining the northern site area. The Development Area is not a source zone for public water supply, with the water supply in this area being sourced from the Carron Valley Reservoir.

1.41 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. The 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). 50mbuffers were applied around water features shown on OS mapping 1:10,000 in addition to 20m buffers being applied to water features identified onsite.

1.42 The presence of peat within the Development Area also formed a key design layout consideration. Informed by the peat probing survey, the design process minimised the location of turbines and infrastructure within areas of deeper peat, typically 1.5m or more. The design process also sought to minimise the number of watercourse crossings required. During construction of the Development, it is predicted that there will be significant effects (moderate) in terms of erosion /loss of soil, sedimentation of surface waters and modifications to surface water drainage through peat failure. It is proposed that, to mitigate the effects of erosion and sedimentation, careful management and monitoring of construction activities, especially in zones close to watercourses, will be undertaken, to reduce the likelihood of erosion /soil loss and sedimentation of surface waters.

1.1 The Peat Stability Assessment highlighted 7 small areas of initial stability concern, with detailed assessment undertaken at these areas to gain more understanding of ground characteristics to inform appropriate mitigation measures

1.2 including the avoidance of heavy loads on slopes. As a result of the implementation of these measures, residual effects of minor significance are predicted in relation to erosion and sedimentation and peat stability.

1.3 No significant operational or cumulative effects are predicted.

Ecology

1.4 The ecology assessment considered the potential effects of the Development on designated areas, terrestrial habitats, aquatic habitats and protected species. More details of the assessment are provided in **Chapter 9: Ecology** of the ES.

1.5 Desk studies were undertaken for the Development Area during summer 2012 with the aim of identifying statutory and non-statutory designations up to 5km from the Development Area. Field surveys were also carried out to establish habitat type and distributions and the presence of badgers, bats, fish, otter and water vole.

1.6 There are no designated sites of nature conservation within the Development Area. However, there are two designated sites within 5km of the Development Area, including Endrick Water SAC and SSSI and Double Craigs SSSI.

1.7 The Development Area covers a range of habitat types including modified bog, marshy grassland and semi-improved acid grassland. In relation to protected species, no signs of badger presence were recorded during field surveys, with the Development Area considered generally unsuitable for the species due to its general wetness and overall lack of suitable shelter/cover. No bat roosts were identified during surveying and as a result, the potential effects on bats were 'scoped out' of the assessment following consultation with SNH. Otter surveys identified two old otter spraints in the north-east of the Development Area. It is believed that otter utilise the Development Area for commuting and foraging purposes. No signs of water vole presence were recorded during surveying. Electrofishing was undertaken at four sites across the Development Area to establish the extent of the fish population. Four brown trout were recorded which represented a low density. No other fish species were recorded.

1.8 It is not anticipated that there will be significant effects on designated sites, habitats or protected species during construction and operation of the Development.

1.9 In order to mitigate further any non-significant effects on designated sites and protected species, a Species Protection Plan (SPP) is proposed during construction, and will be agreed with Stirling Council and SNH. The SPP will detail measures to protect otter and will include pre-construction surveys and good practice measures. Environmental Management and Pollution Prevention Plans (EM&PPP) will also serve to reduce effects caused by potential pollution incidents. To ensure compliance with the measures above, an Ecological Clerk of Works (ECoW) will be present onsite during construction. During operation of the Development, the SPP and EM&PPP will be implemented in full.

1.10 It is not considered likely that any significant cumulative effects shall arise.

Ornithology (Birds)

1.11 The assessment of potential effects on ornithology (birds) considered effects relating to direct habitat loss during construction, displacement of birds as a result of indirect habitat loss, habitat modification, death or injury through collision and cumulative effects. Particular attention has been paid to species of high or moderate conservation status ('target species') including greylag goose, osprey and black grouse. More details on the assessment are provided in **Chapter 10: Ornithology** of the ES.

1.12 The study area for the assessment comprised the Development Area and appropriate survey buffers as recommended by SNH Guidance[vi]. In addition, the assessment was also informed by a Collision Risk Analysis Area (CRAA) which comprised a survey buffer of 250m in all directions from each turbine. The purpose of the CRAA was to inform collision risk modelling. A desk study was undertaken to collate existing bird records and/or data, along with consultation with Stirling Council, SNH and the Central Raptor Study Group and field surveys. All field surveys were undertaken between March 2011 and August 2012.

1.13 There are no statutory nature conservation designations relating to ornithological interests within the Development Area. The nearest designation is the Lake of Menteith SSSI which is

designated for pink-footed goose. Within 20km of the Development Area, there are 10 designated sites, most of which are designated for non-breeding birds.

1.14 Vantage point surveys identified that osprey was the most frequent target species recorded during the survey period; nine flights were recorded, of which seven passed through the CRAA. Greylag geese was the second most frequently recorded target species during vantage point surveys; seven flights were recorded during the survey period with all flights passing through the CRAA. The largest flock recorded consisted of 16 greylag geese. In addition, four osprey flights were recorded within 2km of the Development Area. No osprey nests were found within the Development Area or 2km survey buffer. Black grouse lek surveys identified a lek within the Development Area which contained four lekking males. In addition, a single black grouse observation was made during vantage point surveys and consisted of five birds. Breeding bird surveys recorded 16 species within a 500m buffer, most of which consisted of passerine (perching birds).

1.15 During construction, it is considered likely that activities will displace black grouse from foraging areas, and this is considered to represent an effect of moderate significance. It is proposed therefore that black grouse lekking surveys will be undertaken during the construction phase. If any leks are identified, it is proposed that a 500m disturbance buffer shall be implemented, and no work shall be undertaken in these areas for a period of one hour before or after dawn. Supplementary feeding will also occur during the construction period. It is predicted that the implementation of this mitigation shall result in a residual effect of minor significance.

1.16 During operation of the Development, pre-mitigation, it is predicted that an effect of moderate significance will occur in relation to black grouse collision and displacement. The implementation of mitigation measures, including a Habitat Management Plan (HMP) for black grouse and the planting of 30 hectares of scattered woodland for black grouse foraging, will reduce the significance of these effects to minor.

1.17 No significant effects are predicted for greylag geese, osprey and other non-target species during construction and operation of the Development.

1.18 Cumulative effects of the Development on birds have been predicted as negligible.

Archaeology and Cultural Heritage

1.19 An archaeology and cultural heritage assessment was carried out to investigate the potential physical and setting effects of the Development on archaeological and cultural heritage assets. More details on the assessment are provided in **Chapter 11: Archaeology and Cultural Heritage** of the ES.

1.20 Archaeology and 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.

1.21 The assessment was based on three study areas; inner, middle and outer study areas, which consisted of the Development Area, 5km from the Development Area, and 10km from the Development Area respectively.

1.22 For the Development Area, data has been gathered to identify any potential physical effects on assets. Data has been gathered for the middle study area to identify potential setting effects on all designated assets within 5km of the Development Area. In addition, data has been gathered for the outer study area to identify potential setting effects on Inventory Battlefields, World Heritage Sites and Inventory Gardens and Designed Landscapes (IGDL).

1.23 The method of assessment included desk based data collection and field surveys. Field surveys of the inner study area were undertaken in November and December 2012. Assets with potential setting effects in the middle and outer study areas were visited during good visibility from October to December 2012.

1.24 There are no designated assets within the inner study area. Within the middle study area there are 19 Scheduled Monuments. There are also 19 Listed Buildings within the middle study, three of which are category 'A' listed, and three Conservation Areas; Fintry, Kippen West and Kippen. Moreover, there are three Inventory Gardens and Designed Landscapes within the outer study area.

1.25 During construction, an effect of moderate significance is predicted on an upstanding banked enclosure which lies approximately 5m from the proposed new access track. To prevent inadvertent damage to the asset during construction, the upstanding banked enclosure will be marked out prior to works commencing in its vicinity. Following the implementation of this mitigation, the significance of the effect will be reduced to negligible. Whilst there is a predicted effect of minor significance on sub-surface remains within the construction footprint, the implementation of mitigation measures will reduce this effect to negligible.

1.26 During operation of the Development, it is predicted that there will be residual effects of minor significance on the setting of two cairns at Stronend, a cairn at Carleatheran, two cairns at Todholes, a motte at Keir Knowe, a Category A Listed house at Gribloch, the Inventory Garden and Designed Landscape of Cardross House and the Priory of Inchmahome.

1.27 No significant cumulative effects are predicted.

Access, Traffic and Transport

1.28 The access, traffic and transport assessment considered the potential effects of construction and operational traffic, associated with the Development, on the local road network. It identified the likely volume of traffic that will be generated during construction and operation and the subsequent effect this will have on the local road network. More details on the assessment are provided in **Chapter 12: Access, Traffic and Transport** of the ES.

1.29 The study area for the assessment was 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, and includes the B818, A872 and the M9 motorway. The method of assessment included a combination of desk-based study, field surveys and consultation with statutory consultees.

1.30 Although the M9 motorway was included in the study area, the likely effects have not been considered within the assessment as it is not anticipated that the effect of the additional traffic generated by the Development on the M9 will be significant.

1.31 The B818 is a typical rural road which accommodates a two-way traffic flow; however, the width of the road narrows to single track in certain places and Heavy Goods Vehicles (HGVs) may need to slow to pass each other. The B818 is generally well maintained and is not used by a large number of vehicles. The A872 runs along the western periphery of Denny and is a wide single carriageway which is considerably more trafficked that the B818 and is suitable for HGVs. The M9 motorway is a strategic route in Scotland and forms part of the Scottish Trunk Road Network.

1.32 During construction of the Development, turbine components and materials will be delivered to the Development Area. Some materials will be transported by HGVs and turbine components will need to be transported on vehicles capable of carrying 'abnormal loads' (vehicles longer than 17m and/or more than 4m wide). It is proposed that turbine components will arrive into Grangemouth Port and will then be transported north along the M9. The abnormal load vehicles will then follow the A872 towards Denny before following the B818 westwards to the Development Area. All abnormal loads will be escorted to the Development Area by police vehicles and will be timed to avoid peak traffic periods on the local road network. All other vehicles bound for the Development Area, including HGVs, are assumed to approach the A872 from the M9. Staff working at the Development Area have been assumed to be accommodated locally in Denny or the surrounding area of Stirling, therefore it has been assumed that 50% of staff cars and Light Goods Vehicles (LGVs) will affect the A872 and 100% the B818.

1.33 The assessment has determined that there will be no significant effects on the local road network during construction. However, a Traffic Management Plan (TMP) will be implemented, in agreement with the Police and Roads Authorities, for the construction works.

1.34 Once operational, wind farms typically generate very low levels of traffic. It is estimated that the Development will generate no more than two vehicle movements per week for the purposes of maintenance, repairs and servicing, and therefore this does not represent a significant effect.

1.35 No cumulative effects have been identified in terms of other construction projects that could run concurrently with the proposed development.. Should such circumstances arise, liaison will take place between the contractors appointed for the affected project(s) and the police and the Roads Authority in the development of the construction TMP.

Socio Economics

1.36 This assessment considered the potential effects of construction and operation of the Development on direct employment and indirect economic benefits, public access and recreation and tourism. More details on the assessment are provided in **Chapter 13: Socio-Economics** of the ES.

1.37 With respect to potential effects of the Development on employment and indirect economic benefits and tourism, the assessment considered potential effects at the Stirling Council administrative level. In addition, the assessment focused on the Development Area in terms of direct effects on public access and the Development Area and surrounding area with regard to effects on recreation. The cumulative assessment of effects considered the socio-economic effects of the construction and operation of schemes within 35km of the Development Area, as identified in **Chapter 6: Landscape and Visual Amenity** of the ES.

1.38 The Stirling Council administrative area had an estimated population of 90,770 in 2011, which accounted for 1.7% of Scotland's population as a whole[vii]. The employment rate from July 2011 to June 2012 was 70.8% compared to 70.9% for Scotland as a whole[viii]. In addition, the sector which employed the highest proportion of workers in the Stirling Council area is 'Professional Occupations' (employing 22.5% of people aged 16+).

1.39 There are no Rights of Way (RoW) or Core Paths within the Development Area. Within 200m of the Development area, however, lies one RoW and one Core Path. Both the RoW and Core Path originate at the access to Cringate on the unclassified road which links the B818 and Easter Cringate and lie to the east of the Development Area.

1.40 The existing Earlsburn Wind Farm access track, which branches off the B818 in the vicinity of Todholes, is used by walkers to access the wind farm and surrounding hills. Approximately 1km of the Earlsburn Wind Farm access track is within the Development Area.

1.41 Visitor attractions within the vicinity of the Development Area include Culcreugh Castle and the villages of Fintry and Balfron which provide a base for visitors wishing to explore the surrounding countryside and hills. Tourist attractions in the wider area include historical landmarks such as Stirling Castle, the Wallace Monument, and the Bannockburn Heritage Centre.

1.42 During construction of the Development it is anticipated that 1-3 FTE (full-time equivalent) jobs will be created. This is considered to represent an effect of temporary minor (positive) significance.

1.43 It is likely that there will be some local employment generated as an indirect result of the construction of the Development. It is considered that indirect employment as a result of the Development will have a temporary effect of minor positive significance to the local economy.

1.44 It is anticipated that there will be no access to the Development Area for informal recreational purposes for the duration of the construction period, and the existing Earlsburn Wind Farm access track is likely to be closed to pedestrians for extended periods during the construction phase. Given the extensive scope for informal recreation in the surrounding area, and informal nature of recreational activity, it is not anticipated that there will be significant effects as a

result of the temporary closure of the track, and the Development will not affect public access or recreational activity in the wider area. Users of the nearest RoW and Core Path may be adversely affected in terms of visual amenity, noise and dust nuisance during construction; however, this will be temporary and intermittent in nature and of temporary minor significance. The Development will not prevent visitors accessing the identified attractions and popular points of interest during construction or operation and effects on tourism will be negligible.

1.45 Once operational, the Development will require a small team of personnel to service, maintain and operate it. It is predicted that 1 FTE job will be created during the lifetime of the Development (25 years). It is likely that there will be some indirect economic benefits as an indirect result of the operation of the Development. This represents an effect of negligible (positive) significance.

1.46 The effect that changes in views will have on recreational activity will depend on the personal opinion of the viewer, however, there will be no restrictions on access to the Development Area during operation of the Development and public access via the Earlsburn Wind Farm access track will resume. Therefore, the effect on public access and recreation during operation is assessed as negligible.

1.47 No significant cumulative effects are predicted.

Other Issues

1.48 The assessment of the potential effects of the Development on aviation and defence, telecommunications, television reception and dust has been undertaken primarily through desk based study and consultation. Further details of the assessment are provided in **Chapter 14: Other Issues** of the ES.

Aviation and Defence

1.49 The Ministry of Defence (MOD) was consulted on the scoping stage wind farm design by Force 9 Energy in January 2011. The MOD responded confirming no objections to the project in February 2011. The Civil Aviation Authority (CAA) has raised no concerns about the Development and Glasgow Airport was consulted on the proposal on 20th August 2012. Although at the time of writing there has been no response to the consultation request from the airport, computer modelling has been used to establish if there is any line of sight between the Glasgow airport radar and any wind turbines on site. This has confirmed that turbines will not be in the scope of the Glasgow airport radar and should not therefore affect the radar. The predicted effect of the operation of the Development on radar is therefore considered not significant.

Telecommunications

1.50 There are no telecommunication links within the vicinity of the Development Area, and the predicted effect of operation of the Development on telecommunications is considered not significant.

Television Reception

1.51 The online BBC Wind Farm Tool suggests there are no properties which may experience interference to their television reception once the Development is operational. Effects on television reception will be confirmed following an onsite survey should issues arise. The installation of satellite television or upgrades of the current antenna systems would be the most appropriate and effective form of mitigation at these properties. The predicted effects of the Development on television reception are considered not significant.

Dust

1.52 The movement of vehicles as they transport equipment and goods to the Development Area 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.

1.53 Force 9 Energy is committed to adopting good practices for dust management during construction, thereby controlling and reducing any potential effects. With adherence to these good practice measures, the predicted dust effects will be temporary and will not be significant.

1.54 No significant cumulative effects are predicted in relation to aviation and defence, telecommunications, television reception and dust effects.

Carbon Balance

1.55 The purpose of Craigton and Spittalhill Wind Farm is to generate electricity from a renewable source of energy, offsetting the need for power generation from the combustion of fossil fuels. Consequently, the electricity that will be produced by the Development results in a saving in emissions of carbon dioxide (CO_2) with associated environmental benefit.

1.56 The carbon balance assessment has calculated that the expected payback time (the length of time for the Development to become a 'net avoider', rather than a 'net emitter' of carbon dioxide emissions) will be approximately 24 months. This is based on the assumption that backup generation capacity of 5% will be required. With a 25 year operational life, this would mean that the Development would save over twelve times the carbon emissions generated making a positive net contribution to reducing carbon dioxide emissions.

Summary

1.57 The EIA for the proposed Development been carried out in accordance with regulatory requirements and guidance on good practice. The findings of the surveys undertaken, in addition to extensive consultation, have informed the design process and, as a result, design changes have been introduced to reduce effects on the surrounding landscape, hydrological regime and taking into account local ground conditions.

1.58 Prior to committed mitigation, significant effects are predicted in relation to landscape and visual amenity, ornithology, archaeology and cultural heritage and geology, hydrology and hydrogeology. However, there is scope to mitigate most of the predicted significant effects and many effects are therefore not significant following the proposed mitigation. With the exception of temporary effects during construction, all significant residual effects are associated with landscape and visual amenity, and cannot be avoided in their entirety given the inherent nature of wind farm development.

1.59 Overall, this EIA 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.

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[ii] The Town and Country Planning (Hierarchy of Development) (Scotland) Regulations 2009, Available [online] at: http://www.legislation.gov.uk/ssi/2009/51/contents/made, Last accessed on: 12/12/2012

[iii] The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011, Available [online] at: http://www.legislation.gov.uk/ssi/2011/139/contents/made, Last accessed on: 12/12/2012

[iv] Scottish Natural Heritage. (2009). Siting and Designing windfarms in the landscape (Version 1), Chapter 5

[v] Scottish Natural Heritage. (2006). Visual Representation of Windfarms: Good Practice Guidance

[vi] Scottish Natural Heritage. (2010). Survey methods for use in assessing the impacts of onshore windfarms on bird communities. SNH.

[vii] General Registry Office for Scotland (GRO Scotland), (2011), 'High Level Summary of Statistics Trends' Available [online] at: http://www.gro-scotland.gov.uk/statistics/at-a-glance/high-level-summary-of-statistics-trends/index.html, Last accessed on: 16/11/2012

[viii] NOMIS Official Labour Market Statistics for Scotland (2011), 'Labour Market Profile: Stirling', Available [online] at: http://www.nomisweb.co.uk/reports/lmp/la/2038432150/report.aspx#tabempunemp, Last accessed on: 16/11/2012.

Craigton & Spittalhill Wind Farm

FORCE 9 ENERGY

Location Plan

- Turbine layout
- Site Boundary
- Land Ownership Boundary

Figure 1

Map Scale @ A3:1:75,000

LUC

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Craigton & Spittalhill

FORCE 9 ENERGY

Development Layout

- Turbine Location
- Site Boundary
- Existing Track
- Access Track
- MetMast
- Control Building
- Construction Compound
- Crane Hardstanding
- Borrow Pit Search Area

Figure 2

Map Scale @ A3:1:15,000

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