Griffin Wind Farm

Environmental Statement: Non-Technical Summary Amendment



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1 INTRODUCTION

This is a Non-Technical Summary of the Amended Griffin Wind Farm Environmental Statement. It has been prepared on behalf of GreenPower (Griffin) Ltd to accompany a formal application to amend the application for consent (including the Environmental Statement) relating to the proposed Griffin Wind Farm, submitted to the Scottish Ministers by GreenPower (Griffin) Limited on 27 April 2004.

The Amendment to the application is for consent to develop a wind farm of up to 68 wind turbines (previously 82) of up to 3MW each and associated infrastructure on properties known as Griffin, Scotston and Ballinloan, in Perthshire, Scotland, called the Griffin Wind Farm. The location is shown in Figure A.

The Application is for consent under Section 36 of the Electricity Act 1989. The Application also seeks a direction from Scottish Ministers for deemed consent under Section 57(2) of the Town and Country Planning (Scotland) Act 1997. The Environmental Statement, which accompanies the Application, fully complies with appropriate EIA Regulations.

Due to the size of the project exceeding 50MW generating capacity the final consent is issued by Scottish Ministers. The local authority, Perth and Kinross Council have a formal role as a statutory consultee in the decision making process.

GreenPower (Griffin) Limited is a company established specifically to develop Griffin Wind Farm. It is a Scottish company and is part of a group of companies engaged in wind and hydro projects throughout Scotland. An affiliated company, GreenPower Developments Ltd, has been appointed to project manage the production of the Environmental Statement. GreenPower Developments Ltd is based in Alloa, Clackmannanshire.

In order to ensure environmental impact assessments are objective a number of independent external consultants were employed to conduct them. These consultants each covered an environmental topic, namely:

- Ecology including vegetation, protected mammals and birds;
- Hydrology;
- Landscape and Visual;
- Archaeology and Cultural heritage;
- Noise.

GreenPower Developments Ltd also undertook evaluations for the topics of aviation and telecommunications, access and emission reductions.

A number of volumes comprise the full Environmental Statement. These are:

- Amended Environmental Statement;
- Amended Environmental Statement: Non-Technical Summary;
- Amendment to the Environmental Statement: Appendices;
- Amended Environmental Statement: Figures;
- Environmental Statement: Main Report (April 2004);
- Environmental Statement: Appendices (April 2004);
- Environmental Statement: Figures (April 2004);
- Environmental Statement: Cumulative Landscape and Visual Impact Assessment (April 2004).

This Non-Technical Summary presents a simple summary of the results and conclusions of the Environmental Statement. This Amended Environmental Statement: Non Technical Summary replaces the original Environmental Statement: Non-Technical Summary (April 2004).

1.1 Document Availability

The complete set of Environmental Statement volumes, including the amendment documents, is available for viewing at the following locations:

Location	Opening ¹	Address	Tel No.
Scottish Executive Library	Mon – Thurs 0830 – 1700 Fri 0830 - 1630 By appointment only.	Saughton House, Broomhouse Drive, Edinburgh EH11 3XD	0131 244 4547
Aberfeldy Library	Mon Closed Tues 1000 1200; 1400 - 1600; 1830 - 2000 Wed 1400 - 1600; 1830 - 2000 Thurs 1000 - 1200; 1400 - 1600; 1830 - 2000 Fri 1400 - 1600 Sat 1000 - 1230	Bank Street, Aberfeldy PH15 2BB	01887 820475
Birnam Library	Mon 1800 – 2000 Tues Closed Wed 1400 - 1600; 1800 – 2000 Thurs Closed Fri 1000 – 1200 Sat 1000 - 1200	Station Road, Birnam PH8 0DS	01350 727971
Council Offices Perth	Mon - Fri 0845 - 1700	Pullar House, 35 Kinnoull Street Perth	01738 475300
Council Offices Pitlochry	Mon – Fri 0900 - 1700	26 Atholl Road, Pitlochry PH16 5BX	01796 474909
Pitlochry Library	Mon Closed Tues Closed Wed 1000 - 1200; 1400 – 1700 Thurs 1400 - 1600; 1800 – 2000 Fri 1400 - 1700; 1800 – 2000 Sat 0930 - 1230	26 Atholl Road, Pitlochry PH16 5BX	01796 474919

¹ These opening times are indicative only and believed to be correct at the time of publication.

Introduction

A Needs and Benefits document has also been prepared to accompany the amended application², setting out the needs for and benefits of the amended proposed development.

The Needs and Benefits document and the Non-Technical Summary volume of the Environmental Statement are available free of charge from GreenPower on request. The complete set of Environmental Statement (April 2004) volumes is available from GreenPower for £10 on CD^3 or for £200 as a printed set⁴. The documentation relating to the Amended Griffin Wind Farm is available free of charge to all those who purchased the April 2004 Environmental Statement set. Otherwise, The Amendment is available for £10 on CD^3 or for £200 as a printed set⁴.

All queries regarding content or availability of any of the Griffin Wind Farm Environmental Statement volumes should be directed to the Project Manager, GreenPower Developments Ltd (see contact details, inside-cover page).

1.2 Site Description

The site for Griffin Wind Farm (called the "Development Site") falls within a number of properties that includes Griffin Forest Estate, Ballinloan Forest Estates, Ballinloan Farm and Scotston Forest Estates, which lie between Aberfeldy and Dunkeld in Perthshire. The Development Site is shown in Figure B.

The Development Site is a mixture of commercial forestry, upland heather moorland and grassland. Elevation varies from around 220 to 529m above sea level. Commercial conifer plantation of Sitka Spruce predominates, with some smaller areas of pines, larches and firs and some broad-leaved species. There are a number of open moorland areas primarily on higher hills with mostly rank heather. Moorland in the lower areas comprises a patchwork mixture of semi-improved grassland and areas of rank heather and wet rushy pasture. There are also small areas of semi-natural water habitat - small burns and their tributaries, and four lochs north of the Development Site.

Landform is characterised by three parallel ridgelines, with a general trend of northwest to south east, gradually descending towards Strathbraan. The western ridge extends from Creag a' Mhadaidh (529m) through Creag a' Bhealaidh to Craig Tombane (383m) to the south. The central ridge extends south-easterly from Meall Reamhar (506m) to Ben Salachill (423m) to lower ground south. Between western and central ridges lies Ballinloan Burn. To the west of Creag a' Mhadaidh land falls towards Loch Creagh at Tombane Burn, rising to a further low ridgeline before descending to Glen Cochill. To the east of the central ridge landform falls to Pitleoch Burn then rises to a higher ridgeline beyond the site boundary within Craigvinean Forest, extending and then dropping south easterly towards Strath Braan.

Public access is currently possible on a number of forestry and farm tracks. The tracks within Scotston and Ballinloan Forests do not currently connect with tracks within Griffin Forest and there is no connection between Forest tracks and Ballinloan Farm. Vehicular access is restricted, but access on foot is not.

The Development Site and much surrounding areas were formerly managed for grouse and sheep. Within the Forest Estates named above, earliest commercial woodland plantings started in 1980. The entire conifer plantation is a first rotation crop. The upland moorland and grassland parts of Ballinloan Farm are managed for sheep farming.

² The Needs and Benefits document does not comprise part of the Environmental Statement and is a new document – there was no Needs and Benefits document to accompany the original application.

³ CD-ROM for personal computer.

⁴ Whilst stocks last.

Environmental Statement Amendment: Non-Technical Summary

An informal agreement exists between Griffin Forest owners and Perth and Kinross Countryside Trust covering a cycle route from Dunkeld to Aberfeldy. This route enters Griffin Forest from the south east. A small amount of informal recreational walking takes place, mainly within Griffin Forest involving circular walks around Loch Kennard. Some fishing occurs on Loch Kennard, although the Loch is not currently actively stocked. There is currently deer stalking within forestry areas, which includes let shootings and culling.

A 132kV electricity pylon line runs within the western edge of the Development Site. Four wind monitoring masts are installed as part of an ongoing wind resource monitoring programme..

1.3 The Proposed Amended Griffin Wind Farm

The Amendment proposes:

- A reduction in the number of turbines from 82 to 68;
- 6 turbines now have a hub height of up to 67m (there was previously 1 turbine at 70m) and an upper blade tip height of up to 114m (unchanged for the previous turbine with a 70m hub, but now reduced for the additional 5 shorter turbines);
- 62 turbines now have a hub height of up to 77m (there were previously 81 turbines at 80m) and an upper blade tip height of up to 124m (which is unchanged);
- A reduced and revised track route to serve the amended turbine locations;
- Revised wind monitoring mast locations;
- An alternative additional location for the grid connection.

The proposed Amended Griffin Wind Farm consists of up to 68 wind turbines (previously 82) and associated infrastructure. Each turbine will be capable of generating up to 3MW and the peak output from the Wind Farm will be up to 204MW. The construction works will also involve temporary facilities. Construction is expected to take 18-22 months. The layout of the wind turbines, the tracks and other facilities are shown in Figure B.

The Amended layout design utilises turbines with a tower height of up to 77m (previously 80m) and a upper blade tip height of 124m (unchanged). A small number of turbines have been assigned a reduced tower height of up to 67m and an upper blade tip height of 114m to achieve a better landscape fit when viewed from certain viewpoints. A diagram showing a typical wind turbine is shown in Figure C.

The Wind Farm will be connected to the electricity network on the existing 132kV overhead transmission line that runs up Glen Cochill along the western edge of the Site. A contract has been signed for connection to the grid at up to 216MW capacity and this ensures that the Griffin Wind Farm is capable of being built upon receipt of consent. Furthermore, the export of power from Griffin does not require any upgrades of the overhead power line. All electrical connections on the site and to the power line will be installed underground using buried cable. One electricity pylon will be replaced. The Wind Farm will require substation and control room facilities and buildings to house these, designed and located to minimise local environmental impact. The location of these is shown in Figure B.

Tracks shall be of a similar form to normal forestry tracks but slightly wider (5m). The electricity cables will mainly be installed in trenches running alongside the tracks. Track variations shall be made for turning long loads and to allow for passing places for general traffic, as required. Sufficient quantities of suitable stone are available on site for building these access facilities.

Vegetation and topsoil removed during construction operations will be used to reinstate the margins of all excavations and formations as far as is practicable, to minimise visual impact on the surrounding landscape. Woodland will be cleared for installation of the equipment and to improve wind flow.

Up to six wind monitoring masts will be erected for the lifetime of the Wind Farm to provide independent wind measurements.

Introduction

The construction of the project requires transportation of large turbine components under escort, together with associated electrical equipment, construction plant and general site traffic. It is proposed that concrete shall be batched on site, a process which, has the advantage of significantly reducing overall vehicle movements. Access is proposed from the A826 in Glen Cochill. The route for construction traffic, particularly the large turbine components, to reach the site entrance(s) is from the A9, using the A822 Strathbraan road, then turning northwards onto the A826. The availability of stone and aggregate within the Site and the proposal to batch concrete on Site serve to reduce traffic as far as is reasonably practicable.

Wind turbines need specialist maintenance. At Griffin Wind Farm, an operations and maintenance team of 12 staff will be employed. The size of the Griffin project will lead to these staff being employed on a full time basis. In addition 2 full time rangers will be employed to manage land management issues, access, recreation and to support environmental education (on and off site).

The lifetime of the project is predicted to be 25 years. At the end of this lifetime several options will exist. One is to continued operation. Another is to refurbish or replace the turbines and continued operation. A third is to decommission the Wind Farm. Any extension of operations beyond 25 years would be subject to a further planning application. This application presumes decommissioning will be the option taken.

2 METHODOLOGY

2.1 Project Design & Environmental Impact Assessment

The process of designing a wind farm and assessing potential environmental effects is highly complex. The design of the project informs the need for environmental assessment and in turn the environmental assessment informs the project design.

GreenPower favours a staged approach to project design as follows and as illustrated in **Diagram 1**:

- Stage 1 involves identification of a potential site and the initial evaluation to decide whether it is suitable or not suitable for a wind farm. The outcome is used to stimulate further debate and inform early assessment work;
- Stage 2 starts with scoping environmental issues and concludes with a first revised design, taking into account of desk based information and views of key consultees;
- Stage 3 involves increasingly refined assessment of technical requirements and environmental sensitivities. A key outcome at the end is defining an overall constraints map5.
- Stage 4 takes as a starting point a well-defined constraints map and detailed environmental and technical information. These are treated as design pressures which inform the final project design. A number of alternate design concepts may be explored, which satisfy site design philosophy and which work with, rather than against, the constraining factors.

The flowchart in **Diagram 1** is indicative only. In practice, each stage may overlap and will be considerably more complicated than indicated here.

2.2 Mitigation: Avoid, Reduce, Compensate & Enhance

The process of avoiding or reducing environmental impacts to an acceptable level is called mitigation. GreenPower deals with potential environmental effects in a sequential manner, in order of preference, as outlined below:

- Avoid where possible project design and operation seeks to avoid creating an impact in the first place. In this way we consider our final wind farm design to have inherent mitigation built in;
- Reduce where it is not possible to completely avoid an impact, measures are taken to reduce its magnitude;
- Compensate the final stage is to identify potential compensation which for example balances the negative effect of habitat loss in one location with habitat restoration in another;

GreenPower is also committed to enhancing the environment wherever possible.

2.3 Griffin Wind Farm Design

The Griffin site was originally assessed against criteria such as land use, the wind resource, proximity to the electricity grid, public roads, dwellings and settlements, and potential visual effects. The evaluation indicated that the site had suitability for wind power and could potentially host a significant wind farm (greater than 100MW).

⁵ In this context, a constraint is used to include both places or entities sensitive to change and those where development would be unacceptable.

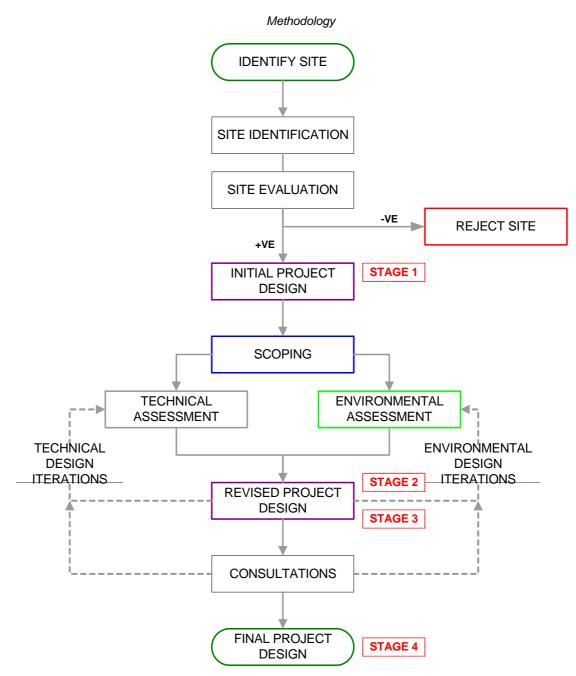


Diagram 1: Project design flowchart.

GreenPower consulted with a wide range of organisations to determine the scope of works required for the environmental assessments. Consultation with the public was also carried out by means of public exhibitions, press releases, radio interviews and public meetings.

GreenPower held a series of public exhibitions. Three exhibitions were held as follows:

Dalguise Village Hall	Aberfeldy Town Hall	Amulree Community Hall
10 th December 2003	11 th December 2003	12 th December 2003

These exhibitions were staffed with at least 6 GreenPower staff on each day to answer questions. It is estimated that in excess of 300 visitors passed through the exhibitions over the three days.

In response to discussions within the community, GreenPower extended the exhibition period to ensure that as many people as possible could view the exhibition material. These were held at:

Aberfeldy Locus Centre	Birnam Institute
16 th – 21 st January 2004	26 th – 28 th January 2004

The process briefly outlined above lead by stages to the final Griffin Wind farm design as shown in Figure B. From the earliest stages of project development the environmental sensitivities identified by various assessments and evaluations have played a strong role in influencing project design. These sensitivities are shown as a combined layer over the site layout plan in Figure D. The shaded areas indicate sensitivities, where either development would be unacceptable or where additional care may be required in the construction or operation of the wind farm.

2.3.1 The Amendment

The submission of the application for consent for Griffin Wind Farm prompted a period of statutory consultation. Based on the feedback of this consultation, GreenPower is proposing this amendment to the application to, wherever it can, address the concerns expressed. It should be noted however that the majority of the statutory consultees expressed no concerns regarding the application submitted in April 2004.

The majority of the concerns expressed related to potential landscape and visual effects, but also include concerns regarding the setting of some Scheduled Monuments (relating to archaeology) and the potential effect on sensitive bird species.

The design changes encompassed in the Amendment may be summarised as follows

- Redesign of the layout in the north west portion of the western group to further mitigate potential adverse effects to residents at Trochry;
- Removal of 4 turbines at the southern end of the western group to further mitigate potential adverse effects to residents around Borelick (west of Trochry);
- Removal of a further 3 turbines and the redesign of the layout in the northern portion of the central group of turbines to address ecological concerns and improve views of the wind farm from Birnam Hill;
- Removal of another 6 turbines from the southern end of the central group of turbines to further mitigate potential adverse effects to residents at Trochry;
- Removal of another 2 turbines at the southern end of the eastern group of turbines to improve views of the wind farm from Birnam Hill;
- Assignation of a lower (67m) hub height for some turbines to improve views of the wind farm from Birnam Hill by reducing skylining effects.

In addition, the amendment to the size of the wind turbine specified in the application (reduction in hub height from 80m to up to 77m with no change to the upper tip height) was necessitated due to the likely availability of the preferred turbine unit. Also, an amendment is being made to the number and location of permanent meteorological masts (from 4 to 6) for technical reasons in the light of the revised turbine locations, additional wind analysis and commercial requirements.

3 ENVIRONMENTAL IMPACT ASSESSMENTS

3.1 Ecological Impact Assessments

The following ecological impact assessments have been carried out in relation to the Griffin Wind Farm.

- Vegetation;
- Protected Mammals;
- Birds.

An assessment was performed and included in the Environmental Statement (April 2004) and an additional assessment has been undertaken in relation to the Amended Proposed Development. In comparison to the original application, the amendment proposals, including the reduction in turbine numbers and track length is predicted to result in a reduction in ecological effects.

The assessments identified a range of potential environmental impacts, but suggested measures to avoid or minimise them. These include:

- Limitations on working areas (in some cases for breeding seasons) and methods;
- An Ecological Watching Brief;
- Pre-construction surveys in potentially sensitive areas (e.g to check for presence of Otters);
- Further survey work before, during and after construction;
- The development of an Environment Management Plan to protect and enhance the natural habitats on the site in the longer term;
- A Site Environmental Management Procedure should be in place during construction and operation and an ecologist should advise throughout;
- Careful restoration should take place, both on moorland areas and where woodland is cleared.

The ecological assessments concluded that design of the project had already avoided or reduced many of the potential impacts. The overall conclusions of the original Environmental Statement remain unchanged in light of the amendment. If these additional measures are carried out the remaining impacts from the Amended Griffin Wind Farm would be reduced to a low level and in some areas habitat improvement could be achieved

3.2 Hydrology Impact Assessment

An assessment was performed and included in the Environmental Statement (April 2004) and an additional assessment has been undertaken in relation to the Amended Proposed Development of the potential effects on water, including streams, ground water and private drinking water supplies. The assessment suggested the following measures:

- Careful construction methods should be used in hydrologically sensitive areas and some specialist techniques will be required;
- A survey of private water supplies and a risk assessment should be agreed with the Council, drafted and carried out before construction commences;
- A Rapid Response Plan for handling effects on drinking water supplies would be required.

The Hydrology Impact Assessment (amended) considers that the suite of standard and specific mitigation measures which was proposed in the Environmental Statement (April 2004) remains sufficient to reduce all of the potential hydrological impacts to a level of minor or less, which is judged to be acceptable for the Amended Proposed Development.

3.3 Landscape and Visual Impact Assessment

An assessment was performed and included in the Environmental Statement (April 2004) and an additional assessment has been undertaken in relation to the Amended Proposed Development. Both Landscape and Visual Impact Assessments examined the potential for impacts of the project both on the overall landscape and for its effect on views up to 30km from the site.

The assessment in relation to the original application (April 2004) concluded that the final design had responded to the setting and landscape in a positive way. The landform on and around the site contained the views of the wind farm and as a result there are limited views of the project. The highest level of landscape effects are confined to a small (5-7km) radius around the project, where changes will be evident, but the character of the area will be retained. The assessment also concluded that visual effects are limited to patches of visibility in relatively small areas in close proximity to the Development Site, mainly on some short stretches of the A822 and A826. Where any woodland is removed for the project, the land should be restored in such a way as to enhance landscape and nature conservation value.

Figure E indicates the pattern of visibility for the amended proposed development, figure F provides an illustration of the potential view of the wind farm from within Strathbraan and Figure G illustrated the change in the design of the development when viewed from the same location.

The assessment of the Amendment states the summary and conclusions of the LVIA for the submitted proposal (April 2004) are still valid, however the revised proposal incorporates further mitigation measures to effectively address identified concerns regarding landscape and visual effects within Strathbraan and in views from the summit of King's Seat, Birnam Hill within the River Tay NSA. The overall conclusion of this landscape and visual assessment is therefore that the amended proposal would give rise to a small number of significant landscape and visual effects of limited extent, which are considered to be acceptable.

3.4 Archaeology and Cultural Heritage Impact Assessment

An assessment was performed and included in the Environmental Statement (April 2004) and an additional assessment has been undertaken in relation to the Amended Proposed Development. The assessments have been carried out on archaeological interest within the site and features of cultural heritage. Whilst there are a number of archaeological remains within the site it concluded that the project design had evolved to avoid the archaeological features and that if an archaeologist maintained a watching brief of construction activities, then any new features that were found during construction could be avoided or recorded.

Historic Scotland had indicated concerns in relation to the original proposed development (April 2004) regarding the setting of a number of important archaeological sites (Scheduled Monuments). Additional assessment has been carried out on these sites and removal of turbines close to the Salachill Scheduled Monument has been made to address these concerns.

3.5 Noise Impact Assessment

An assessment was performed and included in the Environmental Statement (April 2004) and an additional assessment has been undertaken in relation to the Amended Proposed Development. The Noise Impact Assessment (amended) shows that some slight exceedences of the day-time noise limits may occur under worst case conditions at one location. Where this is found to occur in practice, turbine management measures will be put in place to reduce noise levels to below the noise limits by slowing the turbine rotors to below the standard speed for wind speeds and directions where exceedences are found to occur.

As described in Griffin Wind Farm Environmental Statement (April 2004): Main Report Chapter 12, levels of infra-sound from wind turbines are significantly below perception thresholds for this kind of noise. There is no reliable evidence of any adverse effects occurring below this threshold.

4 OTHER EVALUATIONS

4.1 Infrastructure and Telecommunications

An assessment was performed and included in the Environmental Statement (April 2004). It investigated the potential for effects on telecommunications links, civil and military aviation and television broadcast. The assessment concluded that there were no identified effects and that if disruption to television reception were experienced then technical solutions exist to remedy and remove the effects.

No objections were raised to the submission of the Application (April 2004) and this is not expected to change in light of the amendment.

4.2 Access

An assessment was performed and included in the Environmental Statement (April 2004) regarding potential effects on public access as well as the potential for access enhancements. The main potential effects occur during construction where some route diversion may be required to maintain safety. These effects are of limited duration and during operation of the wind farm there should be no restrictions on access other than where maintenance works are underway. These effects could be dealt with by providing information to users of the site and maintaining alternate routes.

The amendment proposed no change to the access assessment previously submitted.

4.3 Emissions

An Emission Reductions evaluation was carried out (April 2004) and it was estimated that the Griffin Wind Farm could reduce UK emissions of CO_2 by up to 600,000 tonnes per annum. The reduction in the proposed installed capacity of the Amended Griffin Wind Farm to 204MW will reduce the likely emissions reduction by approximately 40,000 tonnes of CO2 to approximately 560,000 tonnes of CO2 per annum.

5 SUMMARY OF EFFECTS AND MITIGATION

5.1 Avoiding or Reducing Impacts

The design of the Wind Farm has evolved to avoid or minimise environmental effects. There is further potential, during construction and throughout the lifetime of the project to further reduce the effects of the project and in some cases to make a positive contribution to the environment.

The Amendment addresses concerns raised during the statutory consultation process, further mitigating potential effects on the setting of important archaeological sites (Scheduled Monuments) and, particularly, further mitigating potential effects on residents and users of the A822 in Strathbraan.

The environmental consultants have proposed and GreenPower has agreed to a range of management measures to further deal with these potential effects.

5.2 Conclusions of the Environmental Statement

A summary of the overall conclusions of the Environmental Statement is as follows:

- It is concluded that the wind farm design has been arrived at with due consideration for potential environmental effects. The final project design embodies a range of measures to avoid or reduce impacts on sensitive receptors. Inherently, it represents a very high standard of development design, and addresses the various environmental sensitivities represented within this Environmental Statement;
- The Amendment has contributed to further reduce effects on residents and road users in Strathbraan and adopts a precautionary approach in relation to impacts on sensitive bird species;
- It is concluded that the only significant residual effects after environmental safeguarding has been taken into account are landscape and visual in nature, the former being confined to approximately a 5-7km radius from the Development Site, where broad landscape may be altered, but fundamental landscape character will be retained; the latter being limited to patches of visibility in relatively small areas in close proximity to the Development Site;
- All other potential effects arising from the project, can be reduced to minor or negligible significance, provided the recommended environmental procedures are adopted;
- It is concluded that the wind farm will provide positive global environmental gain through displacement of greenhouse gas emissions as a result of its operations.