

HIBERNIAN WIND POWER LIMITED

**GROUSELODGE
WIND ENERGY PROJECT
COUNTY LIMERICK**

**ENVIRONMENTAL IMPACT STATEMENT
NON-TECHNICAL SUMMARY**

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ESB INTERNATIONAL

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INTRODUCTION

Scope

Hibernian Wind Power Limited, which is a wholly-owned independent subsidiary company of Electricity Supply Board (ESB), plans to develop Grouselodge Wind Energy Project at a site in the townland of Grouselodge, approximately 4 kilometres (km) north-west of Ardagh, Co. Limerick.

The wind farm will comprise six wind turbines, which will be used to harness the natural energy of the wind to generate electricity.

An application for a similar development comprising eight turbines was granted planning permission (Ref. No. P02/1857) by Limerick County Council in June 2003. Conditions included removal of two turbines. Following appeals, An Bord Pleanála granted planning permission (Ref. PL 13.203575) for a development comprising six turbines, with tower heights of up to 67 metres (m) and blade lengths of up to 40 m.

This application retains the number of turbines as permitted by An Bord Pleanála and differs from the previous application in respect of turbine locations and overall dimensions. The overall dimension from ground to blade tip is increased from 107 m to 120 m and reflects the technological advances that continue to occur in wind turbine design.

An examination of the likely significant impacts of the project on the environment was carried out and the results are presented in this Environmental Impact Statement (EIS). The conclusions of the EIS are contained in this Non-Technical Summary.

Background

Ireland has one of the best wind resources in the world but its exploitation has lagged developments elsewhere in Europe.

Renewable sources of energy, such as will result from the Grouselodge Wind Energy Project, offer sustainable alternatives to Ireland's dependency on fossil fuels, a means of reducing harmful greenhouse emissions and opportunities to reduce reliance on imported fuels. For these reasons, Irish and European policy supports the increased use of renewable energy.

Delays to date in advancing the permitted development at Grouselodge have arisen from the moratorium in respect of applications by wind farm developments for connections to the National Grid. However, this project is one of the limited number for which it is indicated that an offer of connection to the National Grid will be made shortly.

THE PROJECT

Project Output and Design

Each turbine will have a maximum overall ground to blade tip dimension of 120 m. This will comprise a tower height of up to 75 - 79 m and three blades, each with a blade rotor diameter of 82 - 90 m. A single-storey Control Building will be provided for electrical equipment.

All turbines will be located a minimum of 500 m from all dwellings other than those

of members of the landowner's family.

The basis of wind turbine operation is as follows:

- A yaw mechanism turns the turbines so that they face the wind
- The blades of the turbine rotate at a rate of once every 2 – 3 seconds.
- The rotation of the blades rotates a generator within a nacelle (housing) located at the turbine hub to produce the electrical power output.
- The electricity generated is fed via underground cables to electrical transformers where it is transformed to a higher voltage for supply to the National Grid.

Sensors are used to monitor wind direction and the nacelle is turned to line up with the wind. Power is controlled automatically as wind speed varies and the turbines are stopped at very high wind speeds to protect them from damage.

The wind turbines will be selected from a range of models that have been demonstrated successfully throughout Europe and certified to the highest standard. The contract for the wind farm will be open to international competition. Because sizes of wind turbines are particular to the design of individual manufacturers, the exact rating of the turbines cannot be specified at this stage without prejudice or favour to a particular manufacturer. However, the rated electrical output is expected to be approximately 15 megawatts (MW). The result of the tendering process will be the award of a contract for a particular model of wind turbine.

Construction will principally involve the following:

- Provision of turbine access tracks and cranepads and excavation and construction of reinforced concrete bases with cast-in steel foundation section for turbine towers.
- Erection by crane of the pre-fabricated turbine towers and the installation of turbines and rotor blades.
- Construction of a Control Building / Substation within a Switchyard and installation of underground ducts and cabling from each turbine to it.

The most significant requirement for materials for the project is for crushed stone. This will be sourced from the landowner's quarry, thereby eliminating a significant portion of the traffic usually associated with a development of this type.

It is expected that the project will generate approximately 50,000,000 kWh (units) of electricity per annum.

The connection that will be necessary for supply of power from the site to the National Grid does not form part of this project.

Alternatives

In the short - medium term at least, current and future demand for electricity generation capacity in Ireland will remain predominantly supplied by fossil fuel plants. However, renewable and alternative sources of power will play an increasingly important role in meeting power needs in the future and in Ireland wind energy currently represents by far the most significant viable option for electricity

generation from renewables.

The extent to which alternative sites have been examined is evident in Grouselodge being one of more than 15 sites nationally for which planning applications for wind farm development were made by Hibernian Wind Power. A wind farm development at Grouselodge has been determined as being viable. Amongst the factors that determine the suitability of this site are wind speed, favourable ground conditions for civil engineering construction, minimum interference with established land uses and the acceptable levels of environmental impacts.

The grant of permission for the previously proposed development has indicated that the site is suitable for a wind farm development from a planning perspective.

The proposed layout was developed recognising the planning history of the site and the requirements of both Limerick County Council and An Bord Pleanála to limit the development to six turbines. It has also taken on board the various constraints in the technical, planning, commercial and environmental aspects of the proposal, most notably that all wind turbines have a minimum separation of 500 m from all residences other than those of the landowner's family.

The proposal represents the most sympathetic arrangement possible for a wind energy development at the site.

Policy Context

Over the past decade energy and environment policies have been adopted and realigned to reflect new concerns at national and international levels, to address the new realities in these areas and provide a focus for future actions.

There is strong support for renewable energy development at European and national levels.

The development of renewable energy, including energy from wind, is a central aim of energy policy at European level. The EU Renewables Directive has targets regarding increasing the share of green electricity by 2010 and commits Ireland to the production of 13.2% of electricity demand from renewable energy sources by 2010.

Ireland's target under Kyoto is to limit a group of six greenhouse gases to 13% above 1990 levels in the period 2008 – 2012. The Government's commitment to develop renewable sources of energy is a core element of Ireland's Climate Change Strategy.

Sustainability is at the heart of Government's energy policy objectives and the Energy White Paper in 2007 outlined that the challenge of creating a sustainable energy future for Ireland. The underpinning Strategic Goals include accelerating the growth of renewable energy sources. A 2020 target of 33% of electricity consumption has been set for renewable energy with wind energy providing the pivotal contribution to achieving this target.

It is evident that there is a presumption in favour of wind farm developments.

The Limerick County Development Plan indicates policy areas in connection with wind energy development. The site at Grouselodge lies within the Category 1 area – Preferred Areas.

SIGNIFICANT IMPACTS OF THE DEVELOPMENT

The possible impacts of the development were examined. This was done by assessing the environment in terms of the existing conditions, the impact of the proposed development and the measures taken to mitigate these impacts.

Human Beings and Socio-economics

The proposed development will lead to employment during the construction stage.

It is envisaged that the project will involve an investment of about €20M and positive impacts are expected as regards input to the local economy. This will particularly arise during the construction phase when there will be requirements for plant and machinery and for construction materials. In the longer term there will be income to landowners from lease of lands with a knock-on effect to the local economy and an ongoing requirement for maintenance support, services and equipment.

The payment of local authority rates will provide indirect long-term benefit for the broader community.

The electricity generated by the proposal will make a significant contribution to national availability of electricity supplies, being equivalent to the annual consumption of about 10,000 homes in perpetuity.

Amongst the benefits of electricity generation from wind are considered to be its contribution to environmental sustainability and displacement of imported fossil fuels. The project will contribute to ensuring that adequate electricity supplies are available to support economic activity and growth in a manner fully compatible with Government energy and environmental policies.

All relevant health and safety legislation will be adhered to during all stages of the project from construction through to decommissioning. Extensive operational experience has shown that the health and safety record of wind turbines is exceptionally high, being better in most instances than other forms of electricity production. The basic technology to be employed in the project is well understood and is in an advanced state of development. It has been used successfully in many equivalent projects both nationally and internationally. There are no implications for health and safety.

Noise

Construction works that could give rise to off-site noise will effectively be limited to a small amount of earth moving, excavating and concreting. Noise levels resulting from construction of the wind farm were calculated for various distances from the site and it was concluded that noise levels will be well within the limits commonly imposed for construction sites.

Ambient noise conditions were measured at the site and in the surrounding area. Noise resulting from the operation of the wind turbines was predicted using computerised modelling and was assessed for all nearby residences in the context of recognised target noise levels derived from the on-site measurements. It was calculated that noise levels attributable to the turbines will be below target noise levels at all residences and there will be no discernible impact.

There is an increase in turbine noise level as wind speed increases. However,

ambient noise, the noise from wind in nearby trees and hedgerows, around buildings and over local topography, also increases with wind speed, but at a faster rate. Thus, at the nearest houses, noise from the turbines will be completely masked by ambient noise, particularly at high wind speeds. Ambient noise is low in calm conditions with wind speeds of 0 – 4 m/s and turbine noise could be more discernible. However, the turbines are not in operation in these conditions.

The turbines are sufficiently distant from dwellings that noise impacts of significance will not arise from the construction or operation of the wind farm.

Shadow Flicker

Wind turbines, as with trees or any other tall structure, can cast long shadows when the sun is shining and is low in the sky. If the sun is behind the rotor of a turbine a shadow that flicks on and off may be created through a window of a nearby house as the blades rotate.

This phenomenon, which is known as the shadow flicker effect and is generally only observed in the period after dawn and before sunset as the sun is rising and setting, lasts for just a short period and depends for its occurrence on a combination of many circumstances.

In this instance shadow flicker analysis has shown a potential for shadow flicker effect at a number of residences. The worst case predicted hours of occurrence is less than 30% of the recommended limit value. The probability of the simultaneous occurrence of all the required circumstances for shadow flicker is very low and it is considered highly unlikely that shadow flicker could cause a nuisance.

Nonetheless, Hibernian Wind Power Limited recognises that there may be concerns that a potential for nuisance exists and it undertakes that, in the event that nuisance does arise, it will install fully automatic shadow stop devices to eliminate the phenomenon.

Computer programming allows identification for each residence of the conditions under which each turbine could create shadow flicker. The automatic shadow stop devices will operate by stopping movement of the turbine blades when these conditions coincide with sunshine at the turbine being detected by light sensitive instrumentation.

Ecology

The site consists of two principal habitats, namely improved pasture grassland and coniferous forest, both of which are highly modified habitats that occur commonly in the region. The trees are on former blanket bog and this continues to the south of the site as old cutover bog that is now well vegetated. The loss of relatively small amounts of habitat would not be expected to have any significant impacts on the bird species in the area and impacts on the habitats surrounding the site, including cutover bog to the south, are not expected

No rare, threatened or legally protected plant species occurs within the site or its immediate environs. The fauna associated with the site is typical of the habitats present.

The species of highest conservation importance associated with the site is the hen harrier. The southern part of the site and adjoining areas to the east and south

provide foraging habitat for this species and for this reason such areas are included in a proposed new Special Protection Area (SPA) for hen harriers.

During operation of the wind farm, the presence of the turbines is unlikely to have any significant impacts on the bird species that occur within the site or in adjacent areas. At Grouselodge, there are no regular flight paths of potentially vulnerable birds.

There is a growing body of evidence to show that disturbance of raptors (birds of prey) at wind farms is negligible. It can be expected that the site will still attract foraging hen harriers and in fact habitat conditions after construction are likely to be more attractive due to the removal of conifers as the exposed bog vegetation will be a considerably more useful habitat. Overall, the impact on hen harriers is likely to be negligible or neutral in the long term, as the habitats on site are likely to become more useful for foraging.

Landscape

The main views of the wind farm occur from an area covering 15 km² to the east and north-east of the site, in particular from the R521 regional road and Kilcolman village. These views open up at a distance of 1–1.5 km from the site and the visual impact of the wind farm can be seen to be relatively high. However, despite the proximity of these views and the scale of individual turbines, it is felt that the overall image presented is not a negative one.

There are no known views from the west but there are limited views from the west-north-west and south-west from approximately 4 km distance, with moderate visual impact.

Beyond the main visual corridor, there are more views of the wind farm from the east and south-east. However, due to distance, limited access, and local topography and vegetation, the visual impact on these areas is insignificant or low.

Distant views of the wind farm occur to the north of the site only from elevated land at a distance of 6-7 km. Due to distance and the nature of the topography, the visual impact on these areas is low.

Whilst the general viewshed is wide, it has been found that visual impact is substantially reduced with distance and opportunities for viewing the wind farm from rural roads and properties are relatively few.

There will be changes to landscape character where open views occur along the roads and from properties up to 3 km from the site.

The nearest villages to the development are Ardagh, Shanagolden or Carrigkerry. There will be no impact on views from these.

There is no impact on the Views and Prospects listed in the Limerick County Development Plan.

Visual impacts on listed Scenic Drives will be low or very low.

Air Quality and Climate

Having no environmental emissions to atmosphere, the wind farm will have no direct impact on air quality in the area.

As well as impairing local air quality, long-range atmospheric transport of sulphur dioxide (SO₂) and nitrogen oxides (NO_x) can contribute to regional problems of acidification and eutrophication of soils and waters and to air pollution over a wide area. The Government has entered into agreements at EU and international level to control national emissions of these gases. It also has international obligations regarding carbon dioxide (CO₂) emissions, the primary greenhouse gas associated with global warming.

It is expected that the wind farm at Grouselodge will generate about 50,000,000 kWh of electricity per annum without leading to additional emissions of carbon dioxide, sulphur dioxide or nitrogen oxides. The development of renewable energy and, particularly in Ireland, wind energy with zero emissions is seen as an essential element in achieving reductions in emissions, while allowing continuing economic expansion.

Soils and Drainage

The proposed development does not involve any discharges to soil or groundwater nor is it located in an area of significant geological interest. Disturbance of vegetation cover during construction could lead to short-term generation of high suspended sediment loads in streams draining the area.

However, with proper control it is considered that there will be no significant adverse environmental impacts on soils beyond the areas involved in the constructed elements of the project, namely turbine foundations and access tracks.

An increase in run-off following rainfall will occur. However, the extent of the lands at the site that will be impacted by the development is so small relative to the total land area that this is insignificant.

Roads and Traffic

The locality has a network of country roads that serves a rural community that is reliant mainly on agriculture. These roads are used by this community for domestic and agricultural purposes.

Permanent access to the site will be via an existing entrance from a Third Class Road (L52105) that is accessed directly from the R521 (Foynes – Newcastle West) Regional Road.

Short-term effects will arise during the construction period when the total number of materials deliveries involving heavy commercial vehicles (HCVs) is estimated as being approximately 510. This is equivalent to an average daily traffic of less than 3 HCVs and this volume of additional traffic is very low. For wind farm developments the most significant source of additional traffic is usually trucks carrying stone fill. However, in this instance stone will be sourced from the quarry adjoining the site and there will be no additional traffic on the public road.

Rather than occurring uniformly throughout the construction period, traffic movements will peak on the six non-consecutive days on which concrete for turbine foundations will be delivered. Each foundation will be will involve up to 30 deliveries of concrete.

Delivery of wind turbine components will use special transporter vehicles. Public roads will be affected by these deliveries and appropriate traffic management

measures will be agreed in advance for delivery of turbine components.

For most of the construction period the additional traffic will be indiscernible.

Traffic arising during operation will be limited to occasional visits by light vehicles used during routine inspection and preventive maintenance. This will be indistinguishable from other traffic and there will be no significant impact in the long term.

Material Assets

In the event that the wind farm development leads to interference with television reception, all necessary measures will be undertaken by the developer to fully eliminate any negative impact.

There are no implications for air navigation and there will be no impact on the safety of air traffic.

The site location is not a significant tourism area in its own right and the wind farm is not anticipated to have any negative impacts on tourism. The local leisure and recreation interests are unlikely to be adversely affected by the development. All are of a type that have co-existed successfully with wind farms at other locations.

Independent research has shown that the presence of wind farms makes no difference to holidaymakers' enjoyment of their holiday and wind farms were not seen as having a detrimental effect on tourist visits.

Cultural Heritage

There are no known sites of archaeological potential or interest in the area of the development and no impact will thus arise. The proposed development does not impact on any recorded features or events of historical interest and it is not envisaged that the development will have any negative physical impact on any architectural sites.

General Issues & Interaction of Impacts

The wind farm will have no impacts in relation to surface waters, groundwaters, waste, infrastructure or other land uses.

There will be no significant interaction of impacts.

CONCLUSION

The equipment used will be of the most advanced technological design available. The most significant environmental impacts from the project have been examined and the best available control technologies have been applied in an integrated approach.

With the application of various mitigation measures, there are no impacts that are considered unacceptable within the context of the planning policy framework for assessing wind energy projects. It is therefore concluded that the proposed wind farm is supported by Government policy regarding the promotion of renewable energy and is consistent with planning guidance for the development of wind energy.