

Small Scale 20kW Wind Turbine

Paradise Farm
Horton-in-Craven
North Yorkshire
BD23 3JT

320120700P

Design and Access Statement July 2012



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1. Introduction

This report contains a design and access statement for the proposed installation of a 20kW wind turbine at Paradise Farm. It is written to provide supplementary information to the planning application, landscape assessment and detailed drawings.

The following sections describe the site, the background and proposal, local and planning policy and the recently adopted National Planning Policy Framework, how they apply as well as specific assessments relevant to this application. It is not a definitive document and should be read in conjunction with all the additional information supplied with the planning application. In order to achieve the aim of the report it is divided into the following sections.

Background

This section describes the location, the current energy requirements and reasons for selecting a renewable energy source.

Proposal

This section details the proposal for the wind turbine, including details regarding the specification of the turbine, energy output, noise and shadow impact and colour proposals.

Installation

This section describes what is required for the installation of the proposed turbine in terms of earthworks, additional plant and equipment, supporting works and maintenance works.

Alternative Energy Solutions

This section details the alternative energy solutions that have been looked at in terms of the energy production for the business. It highlights the continued reliance on fossil fuels for energy generation and draws attention to the reliance on this within the UK.

Planning Policy Assessment

This section details local planning policy and National Planning Policy Framework and sets out whether the proposed turbine meets with these policies. It particular references policies pertaining to developmental planning, renewable energy and where applicable any specific policies regarding wind turbines.

Consultations

This section details any consultations that have taken place in relation to the proposed installation of a Wind Turbine at this site.

2. Background

The proposed site is near to Paradise Farm, Horton-in-Craven, North Yorkshire. It is a lowland area comprising of reclaimed pastures and meadows interspersed with some woodland. The A59 passes approx 1.5km to the South of the site but the site is not visible from the highway.

Paradise Farm is a dairy farm with the power to run the farm currently provided via the National Grid. The owner of the farm wishes to reduce their carbon footprint and generate their own electricity.

Paradise Farm, being a dairy farm has extremely high energy usage. The power to run the milking machines, pumping the milk and the bulk cooled storage of the milk is currently provided via the National Grid. A small scale 20kw wind turbine will help reduce the reliance on mains electricity consumption of the power intensive farm operation. The average annual use for the farming enterprise is 120,000 units. A turbine of this size will not produce enough power to completely power the dairy operation, however it will help reduce the reliance on mains electricity consumption during peak periods. At other periods the wind turbine may produce a surplus of electricity which will be fed back into the national grid.

There is also an issue in this area with interrupted electricity supplies. Several times a year the power supply will fail and leave the dairy element of the farm reliant on diesel powered generators to meet the demands. As with any dairy production process the product is a just in time product and therefore these power supply interruptions can be critical to the business.

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3. Proposal

The proposal is to construct a single wind turbine with a hub height of 20.5m and a blade length of 6.55m from the hub, giving an overall blade tip height of 27m. The turbine specification has a rated output of 20kw giving an estimated annual output of 41MWh. Appendix A contains drawings of the dimensions of the proposed turbine and the power rating curves for the proposed turbine.

The proposal has been scaled in order to minimise the visual impact upon the surrounding countryside and noise impact on neighbouring properties and therefore does not produce a constant surplus of electricity. This demonstrates a balance has been sought between the size of the turbine and thus the energy savings for the farm enterprise and the visual impact of siting a turbine in a rural setting.

Colour

The turbine tower and base kit are all mild steel hot dip galvanised, which is grey in colour. The colour can be selected as necessary to compliment the surrounding landscape and mitigate the visual impact of the turbine. The turbine housing is of the same material and also grey in appearance. The blades and cone are all made of fibre glass and the standard colour for these is matt grey but can also be changed if required. The most neutral effect for turbines of this size is often matt grey on a galvanised tower. A combination of colours can be used for mast and blades if this is deemed necessary.

Noise

Due to the size of the C & F Green Energy 20kW wind turbine there is no requirement for the turbine itself to have a gearbox. Therefore the generation of noise and vibration from this type and size of turbine is minimal and due to the noise of the turbine blades cutting through the air. An assessment of the noise generation of the 50kW turbine is included in Appendix C. Operational noise from wind farms is assessed following the procedure set out in standard European guidance: ETSU-R-97, The Assessment and Rating of Noise from Wind Farms. This specifies limits on the levels of wind farm noise that are considered acceptable at the nearest occupied properties. These are set relative to the existing background noise levels at the houses, which were measured as part of the baseline surveys. The guidance for noise levels from wind turbines as set out in ETSU-R-97 are as follows:

- Max 37dB(A) or 5dB(A) above background noise level.
- ETSU-R-97 provides for a relaxation of the noise limit for those with a financial interest in the turbine to 45dB(A).

Given that the nearest residential dwelling, that of the farm owner, to the turbine is a distance of over 190m away from the proposed site **no significant** adverse noise effects are predicted for the 20kW turbine given the noise assessment provided for this turbine.

Shadow Flicker

Shadow Flicker occurs when the sunlight on rotating Wind Turbines react in such a way that a moving shadow is cast on the ground or stationary objects. The Shadow Flicker effect can be seen when the shadow passes across a specified location that falls within the range of the Wind Turbine Shadow. The factors that need to be in place for Shadow flicker to occur are listed below:-

- The receptor must be in range of a shadow from the Wind Turbine.
- This shadow must be of an intensity that is deemed to be strong enough to create Shadow Flicker effect.
- The sun must be shining and not obscured by clouds or fog or any other intervening objects.
- The Turbine must be operational in that the blades are rotating.
- The blades must be perpendicular to the receptor in order for the shadow to be cast through the rotating blades.
- The receptor must not be obscured by any intervening structure.
- The Turbine must track the sun at exactly the same rate as it moves across the sky.

If **ALL** of the above criteria are met Shadow Flicker will potentially occur at a receptor and this is referred to as the "worse case scenario".

Shadow Flicker Assessment Methodology

Within the UK at present there are no prescribed guidelines for the assessment of Shadow Flicker or limits for the acceptable exposure to Shadow Flicker. This is largely due to the underdeveloped onshore Wind Turbine Industry within the UK. It is prudent to seek guidance from countries with a more developed and experienced Onshore Wind Turbine industry. General guidance from within Europe recognises that Shadow Flicker impacts reduce with distance and will only occur when the sun is low in the sky. On Shore Wind Farm Guidance states that "only dwellings within 130 degrees either side of North relative to a Turbine can be affected and the shadow can only be experienced within 10 rota diameters (RD) of the Wind Turbine".¹ It is recognised that at distances beyond 10 RD the intensity of the shadow is reduced significantly so as not to be noticeable when moving across a stationary object. The exposure limits it is generally recommended that Shadow Flicker should not exceed 30 hours per year in total or 30 minutes in any one single day². The Shadow Flicker recommendations are based on research by Predac, a European Union sponsored organisation promoting best practice in energy use and supply and draws on experience from Belgium, Denmark, France, The Netherlands and Germany. The limits should only be applied to occupied properties.

¹ Update of UK Shadow Flicker Evidence Base, Department of Energy and Climate Change, March 2011

² The shadow flicker recommendations are based on research by Predac, a European Union sponsored organisation promoting best practice in energy use and supply which draws on experience from Belgium, Denmark, France, the Netherlands and Germany.

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Analysis

There are dwellings that falls within 10RD of the proposed site (See Figure 1) and therefore shadow flicker is **not** a concern with this application.

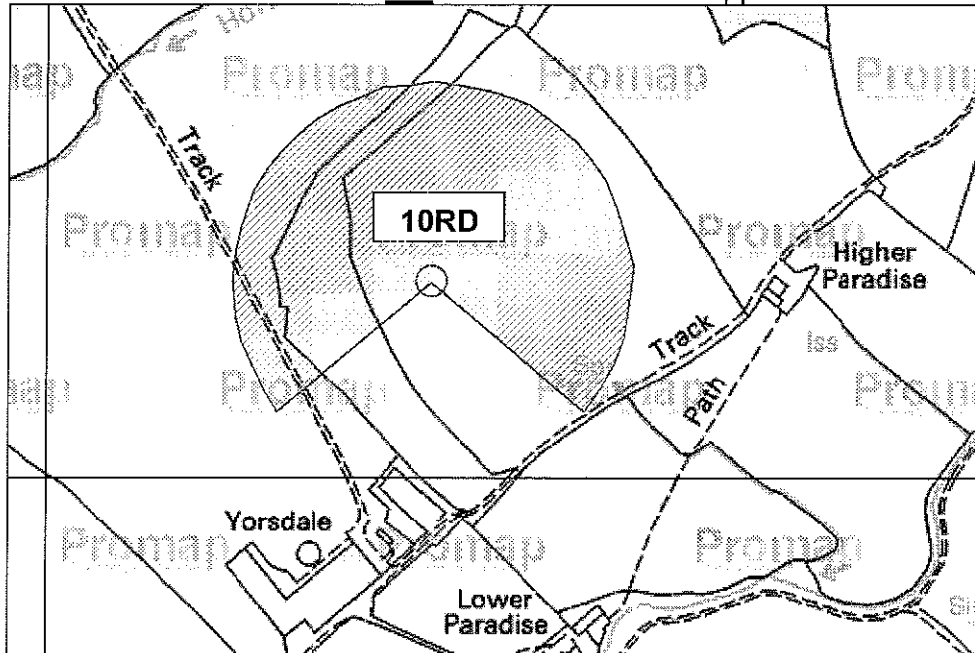


Figure 1: Area of Potential Shadow Flicker

4. Installation

The turbine will be installed at the site shown in Appendix B which is approximately 225m from Paradise Farm. The land is lowland pastureland and is used for agricultural purposes. Access to the site is from the farm lane to running to the south of the site. The size of the foundation for this turbine is will vary depending upon the allowable soil pressure, details are included in Appendix A.

The site is located to the North of Paradise Farm. The farm has had considerable development carried out in recent years and therefore additional ground disturbance is unlikely to have any detrimental effect on the immediate landscape around the farm. The cable from the site of the turbine will run underground to Paradise Farm. An excavator will be required to carry out the excavation telehandler crane will be required to erect the turbine negatating the need for any hard standing. All excavations will be reinstated and landscaped in keeping with the surrounding ground. As the site is close to a local road network and an access track runs very close to the site there is no requirement for a permanent track for installation or maintenance purposes. The company supplying the turbine will maintain it annually to ensure the turbine is running smoothly and efficiently at all times.

5. Crime Prevention

During the construction phase of the development, all measures to secure the site, all associated materials, plant, and equipment will be made in order to prevent theft or vandalism. Once erected it is unlikely that the turbine will be involved in any crime issues and as it is securely fixed to a large concrete foundation and therefore it is unlikely to attract thieves.

6. Alternative Energy Solutions

This section details the alternative energy solutions that have been looked at and deemed insufficient for this site in terms of the energy production and the continued reliance on fossil fuels. At present 76% of UK energy is produced from fossil fuels and 16% from nuclear. Only 7% of the UK energy production is from renewable or other sources of which 3% is from wind power³.

Present Arrangement (Mains Electricity)

The current arrangement is for the farm to continue using mains electricity. Although there is a suitable mains supply to the farm its continuing use of this from the national grid will continue to use the finite resources.

Hydro Power

Hydro power has been installed on a small scale at farms across the region, but it is often only enough to supplement existing energy requirements and not sufficient to completely replace existing supplies. However, there is no suitable significant water source for this type of energy generation Paradise Farm.

Solar/PV Cells

The use of Solar Power for electricity generation is becoming increasingly more prevalent as the costs of the installation decreases and the efficiency of the PV cells improves. It is often only enough to supplement existing energy requirements and not sufficient to completely replace existing supplies. It would not provide a viable efficient replacement to the energy requirements at Paradise Farm.

The uptake in commercial PV has then been further upset by the uncertainty in the Feed in Tarrifs that are constantly being reviewed by the government. With another reduction in the tariff due in August 2012 investment in this technology is less attractive.

³ UK Energy in Brief 2011, Department of Energy and Climate Change (DECC), 2011

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7. Planning Policy Assessment

This section considers the local and national planning policies and how the proposal meets within these policies. The following policies have been considered.

National Planning Policy Framework

The recently released National Planning Policy Framework (NPPF) contains the latest Government advice on combating climate change and indicates in section 10 that planning plays a key role in helping to reduce greenhouse gas emissions by supporting the delivery of renewable and low carbon energy. When determining planning applications local planning authorities should not require applicants for energy development to demonstrate the overall need for renewable or low carbon energy and should recognise that even small scale projects can provide a valuable contribution to cutting greenhouse gas emissions. In the section on decision taking, it is stated that local planning authorities should apply the presumption in favour of sustainable development.

The NPPF also states that applications for planning permissions must be determined in accordance with the development plan unless materials considerations indicate otherwise.

The Ribble Valley District Wide Local Plan contains policies dealing with renewable energy proposals including wind energy.

Policy ENV24 indicates a general presumption in favour of renewable energy proposals provided that such developments do not cause unacceptable harm to interests of acknowledged importance

Policy ENV25 indicates that proposals for renewable energy schemes will be considered with reference to specific issues including the local and wider benefits the proposal may bring and the fact that certain renewable energy resources can only be harnessed where the resource occurs.

The proposal meets satisfactorily with Policy ENV26 and it is believed that the site lends itself to the use of wind energy and the visual impact on the landscape is justifiable due to the limited number of viewpoints where the turbine has a significant impact.

In the case of the present proposal the benefits of wind energy are well documented and wind turbines by their very nature need to be in an area where they will function most efficiently, or as policy ENV25 states they are harnessing the wind resource where it occurs.

In the case of the present proposal the effect of the wind turbine on the character and appearance of the area is considered to be outweighed by the benefits in the provision of a renewable and sustainable energy resource. The Council is requested to support the proposed development in accordance with the recommended presumption in favour of sustainable development.

8. Consultations

Ribble Valley Borough Council

A screening opinion (3/2011/1022P) was requested (See Appendix D) and it was determined that an Environmental Impact Assessment would not be required for this application. However the screening opinion requested the following:

- A visual impact assessment and noise impact assessment. – This has been included as a separate document as part of this application.
- It was determined that a ZTV was required as part of this application and suggested by the LPA that a radius of 8km would be sufficient. However in order to meet with recommended guidance a 10km radius ZTV was produced.
- The ZTV was produced with a 10km radius and the LPA officer consulted, as requested in the screening opinion, as to where the viewpoints should be taken from. A selection of 8 photomontages from various viewpoints have been selected and an LVIA of these carried out.
- A cumulative assessment of consented wind developments within a 10km radius.

9. Environmental Statement

This statement has been informed by a desk study to obtain relevant information under the following headings in which the information, relating to the various headings, was recorded during the site survey and from land classification maps.

Ornithological

The proposed turbine is not located close to any buildings, trees or hedgerows where the indigenous bird population would use as a habitat or feeding area. There are no known migratory bird paths over the area and in any event, migratory birds would fly at a much greater height than 27 metres, the height of the turbine. There would be very little chance therefore of bird strike. Ground nesting and ground foraging birds would not be adversely affected by a single turbine of such a minor scale as the ground take would be insignificant at 5m x 5m for the base.

Bats

No trees, hedgerows or buildings which have potential to support roosting bats were identified as being significantly close to the site for the development. The turbine would not result in the removal or destruction of hedgerows or buildings where bats might feed or use these features as navigational aids, therefore it is concluded that the proposed turbine would not adversely affect the bat species. The turbine has been sited in accordance with Natural England's recommendation contained in TIN51. This advises that turbines be positioned

such that there is a 50m buffer around trees and hedges, as these provide a foraging ground for bats. The turbine is to be situated 60m from the nearest tree (a single tree in the middle of the same field as the turbine) and over 100m from any line of trees or hedges.

Botanical

The land and area on which the turbine would be located has no special landscape designation such as SSSI and is used for pasture. The turbine would be located on pasture land which is grazed daily and its construction would result in the loss of grazing land only. There would be no adverse impact therefore on the flora of the local area.

Landscape

The landscape issues with regard to the effect of the proposed turbine on the local area have been assessed separately within this application.

Recreational Users

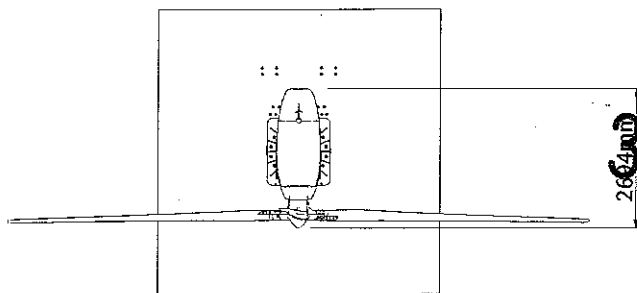
The main recreational use affected by the turbine will be users of local footpaths and bridleways. The consideration of these has been assessed separately within this application in the Landscape Assessment.

10. Summary

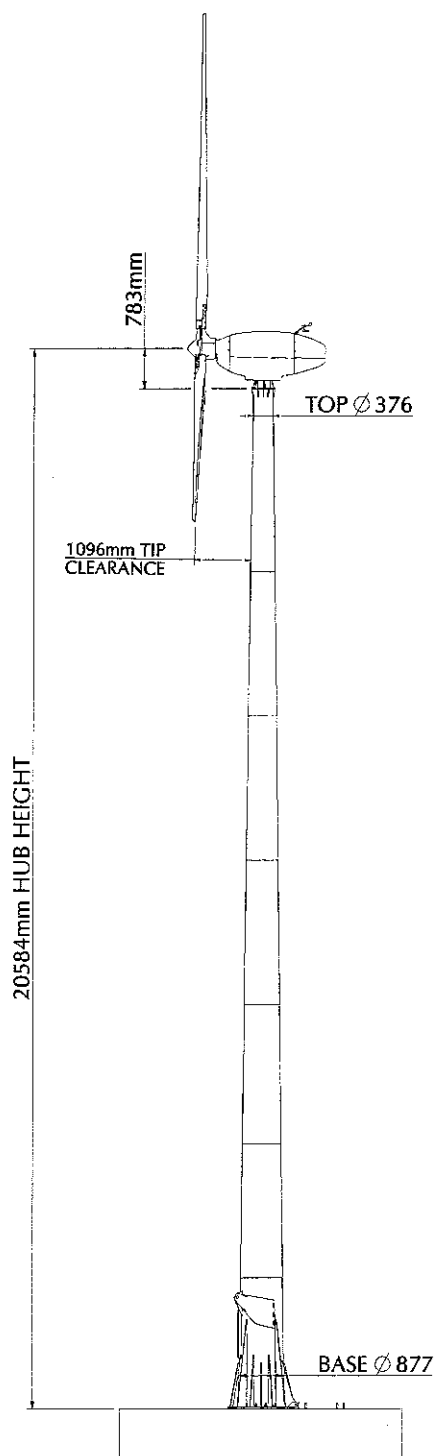
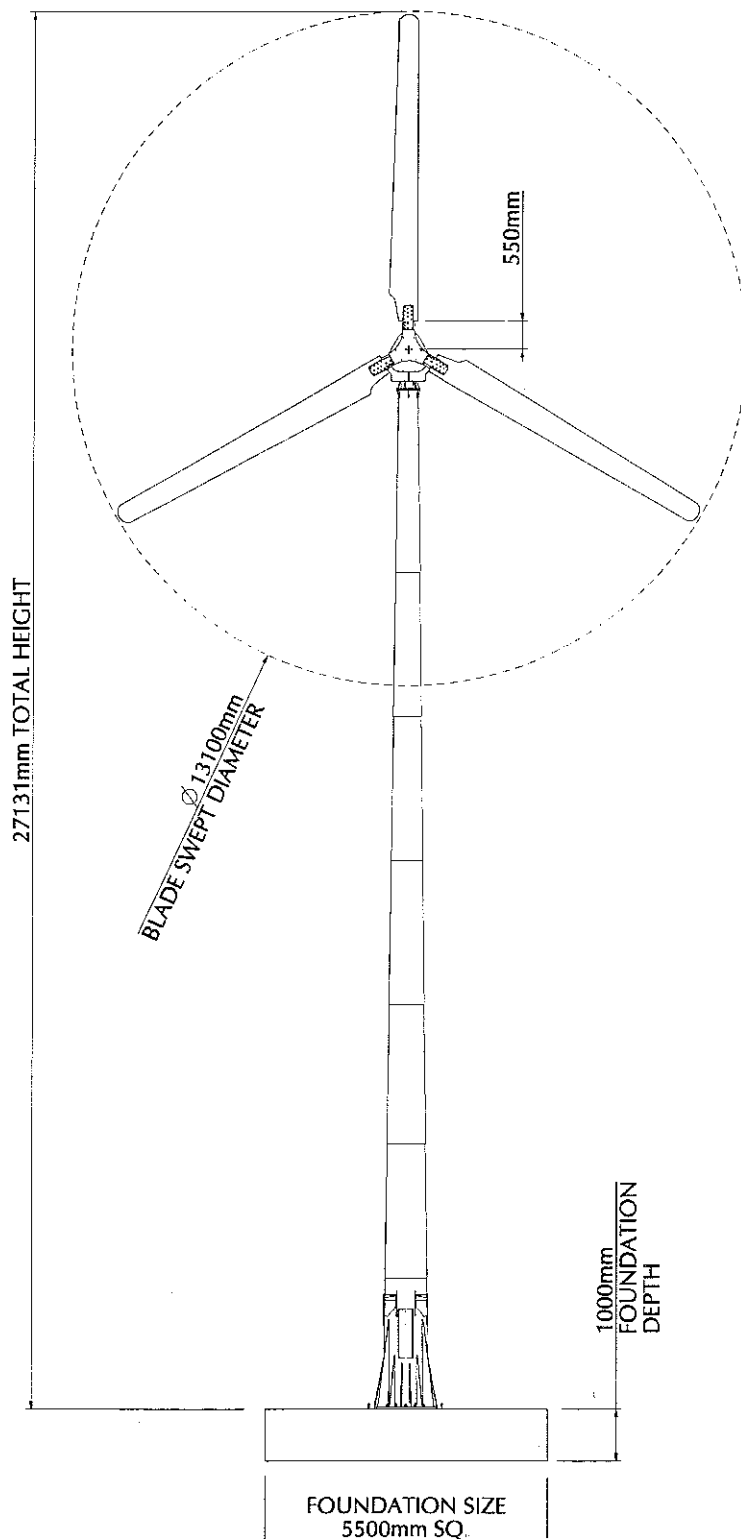
This document has examined the various effects of the proposed development on landscape character residential amenity and the business and environmental need of the development. It has been concluded that the development will cause no undue harm to interests of acknowledged importance. It should be read in conjunction with all other documentation attached to this application.

Given the size of the turbine will not fully cover the electrical energy requirements of the farm the proposal has demonstrated a balance has been sought between the size of the turbine and the visual impact of siting a turbine in a rural setting. Therefore officers are requested to seriously consider supporting this application given the issues discussed surrounding the NPPF and policies ENV24, ENV25 and ENV26.

Appendix A – 20kW Wind Turbine, 20m



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OVERALL DIMENSIONS FOR CF20 TURBINE:
20kW GENERATOR / 20m MAST / 6m BLADES

C&F Green-Energy		CF20 All Dimensions in mm	
DESCRIPTION:	OVERALLS / PLANNING	QTY PER UNIT	-
MATERIAL:	Mast: S275 Galv	SCALE:	1:100
DRAWN:	C O'Neill	PAINT:	-
CHECKED:	-	FINISH:	-
DATE:	17-Feb-11	SHEET:	1 OF 1

Diamond Renewables
Experts in Renewable Energy
Annual estimated energy performance

Site Details; Paradise Farm

Postcode=BD23 3JT

Terrain = Gently undulating countryside, fields with crops, fences or low boundary hedges and few trees

Tower height = 20m

Turbine = CF 20, Blade diameter 13m

NOABL Windspeed Database Query Results for the 1km grid square SD8551

Wind speed at 10m agl (in m/s)

4.2	4.8	5.7
4.7	4.9	5.4
4.7	4.8	5.1

Blank squares indicate areas outside the land area of the UK - i.e. areas at sea or of neighbouring countries.

agl = above ground level.

Squares surrounding the central square correspond to wind speeds for surrounding grid squares.

Wind speed at location at 10m	4.9 (VN10)
*Correction factor category 2, hub height 20m	(cf)1.11
(VN10) 4.9 x (cf) 1.13	5.5 m/s
C & F 20 annual energy performance (units)	41,730

* Correction factor derived from a combination of the topography and hub height.

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SPECIFICATION SHEET

Rotor Diameter 13.1 m

Hub Height

20 m

TOWER Required Height.

Max. Power

20 kW

An. Yield @ 5 m/s

47,500 kWh

Rated Wind Speed

9.0 m/s

Min active wind speed

1.5 m/s

Cut out wind speed

30m/s

Annual Carbon Saving

26 - 30 Tonnes

Noise @ 5 m/s at 60m

35 dBA

Max RPM

90 rpm

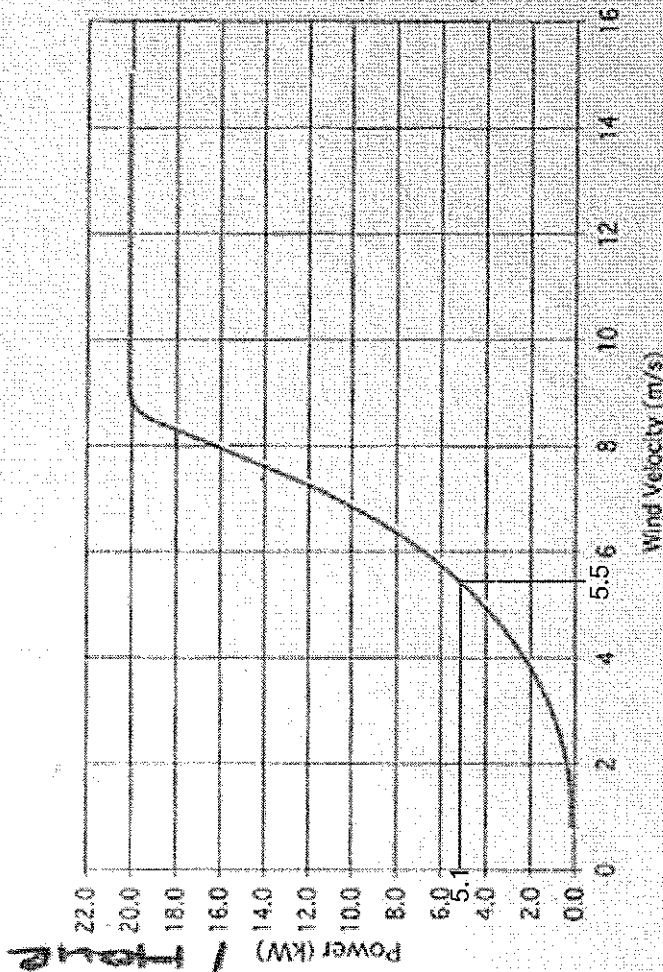
Method of Installation

Hydraulic Tilt Installation

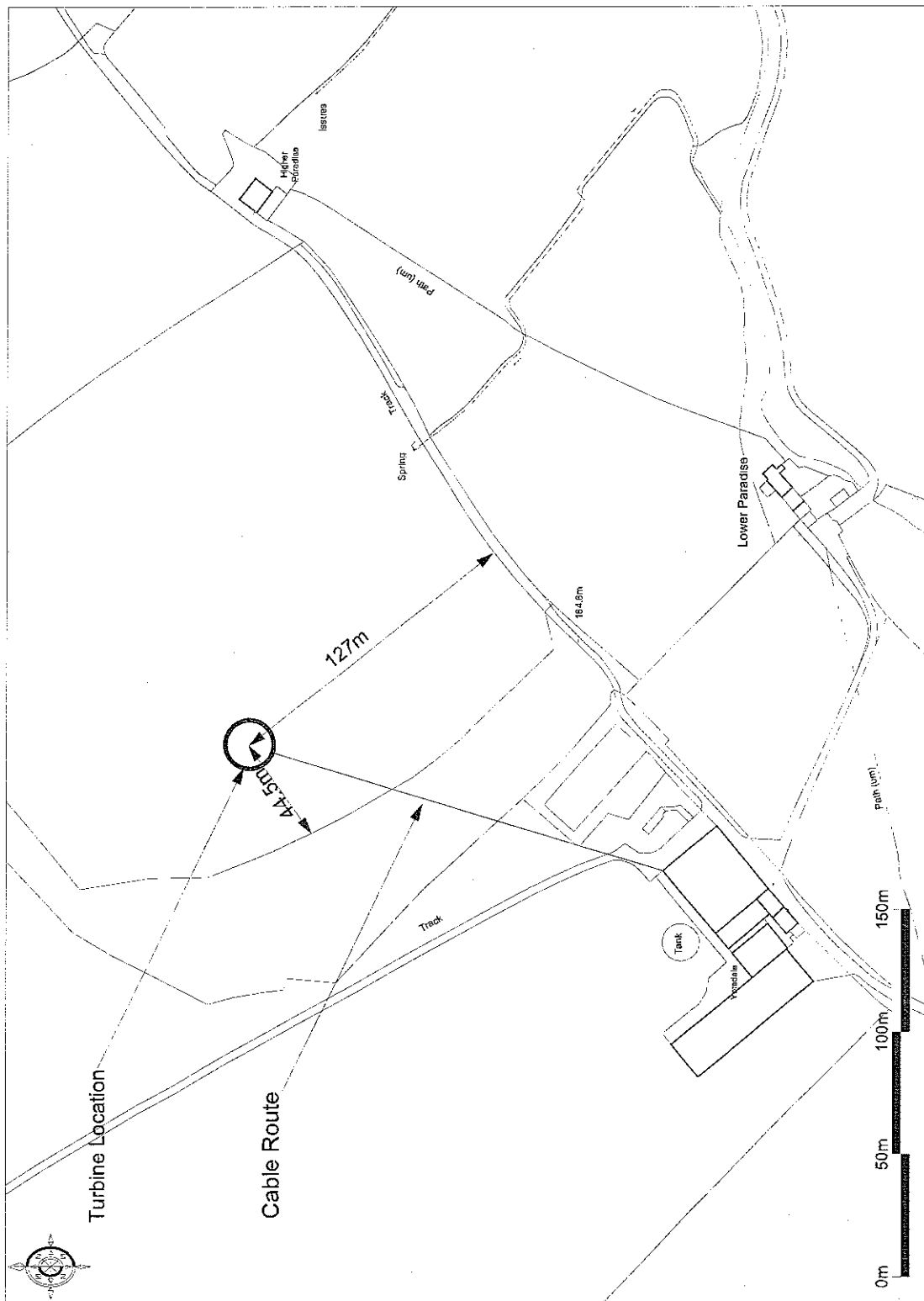
GSM Controlled as Standard

Single Phase / Three Phase

CF 20



Appendix B – Site Location & Cable Route



Ordnance Survey © Crown Copyright 2012. All rights reserved. Licence number: 100020449. Plot of Site - 11580



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Appendix C – Noise Assessment



Acoustic Report

Fire enclosure testing
Envelope design review
Acoustics

Air sealing
Thermographic surveying
Equipment supply

Summary of Acoustic Measurements

CF20-20m mast

C&F Facility, Co. Galway

23rd Sept 2010

Report Version 1.0

Prepared for:
C&F Green Energy

Assessed by:
Martyn Bailey MSc MIOA



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Introduction

The following report is based upon measurements taken by C&F Green Energy. The measurements have been assessed by Stroma technology Ltd and comply with the requirements of BS EN 61400 – 11: 2003.

Test Details

Wind Turbine Model: CF20
Max Output: 20KW
Rotor Diameter: 12.8m
Mast Height: 20m
Location: C&F Facility, Athenry, Co. Galway
Date of tests: 9th August - 13th Sept
SLM: Larson Davis 824 with narrow band module

Test Setup

All acoustic measurements were conducted in accordance with IEC 61400-11:2002. The BWEA have also published a standard that addresses wind turbine noise assessment and the acoustic measurement technique is largely based on the IEC standard. The output data are presented in the format requested by the BWEA standard since this is typically most appropriate for planning purposes in the UK

The microphone is located downwind at ground level facing the turbine at a distance of 26.4m which is the mast height plus the rotor radius. The microphone is placed on a piece of plywood and covered with a hemispherical wind shield. Acoustic and wind data are recorded while the wind turbine is active and also when shut down so that background noise can be assessed.

Acoustic measurements were taken as 1 minute Leq A-weighted readings. All measurements were recorded with 1/3 octave definition.

Wind velocity was measured using an anemometer on a 15m pole. Presented data are scaled to the height of the rotor axis.

Results

As specified in the BWEA standard, the 1/3 octave acoustic levels for all measurements were analysed to identify any tonal contribution. In this respect, no tonal content was present.

Several key metrics are required by the BWEA standard

These are:

Key BWEA Metrics	
Sound Power at 8m/s	87.5 dBA
Sound Power vs Velocity slope	3.1 dBA / (m/s)
Sound Pressure at 8m/s	
Distance 25m	51.5 dBA
Distance 60m	44.0 dBA

In Figure 1, the acoustic data is presented as a function of nacelle height wind speed. Data are presented for both the background noise and the combined turbine & background noise cases. A linear regression is performed on both sets of data.

In Figure 2, the A-weighted sound pressure level of the wind turbine is adjusted to account for background noise and presented as a function of velocity.

In Figure 3, the A-weighted sound power level is presented as a function of wind speed.

In Figure 4, a contour plot shows the relationship of sound pressure to wind speed and distance. The distance here is measured from the centre of the mast. The data for this plot is derived from an interpolation where spherical propagation is assumed.

Finally, on the last page of the report, the above data are presented in the recommended BWEA format. The stated power level and field plot have been adjusted to account for an uncertainty penalty of 1.5dBA.

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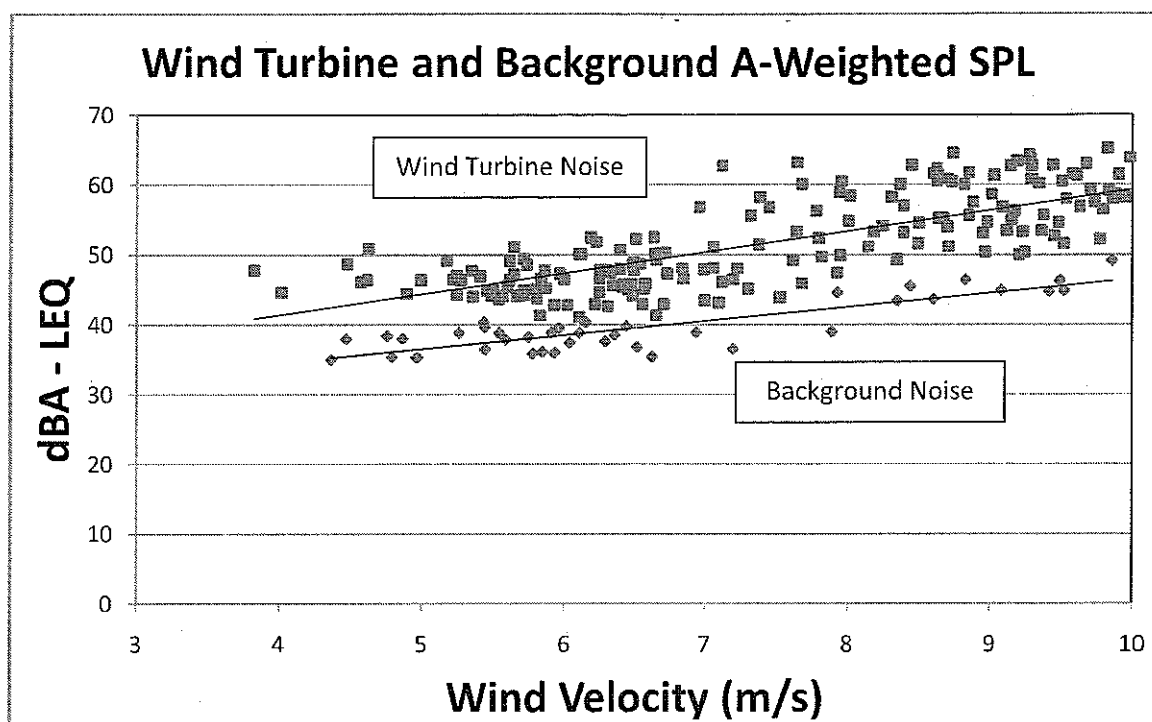


Figure 1: Wind turbine and background noise data as a function of nacelle height wind velocity.

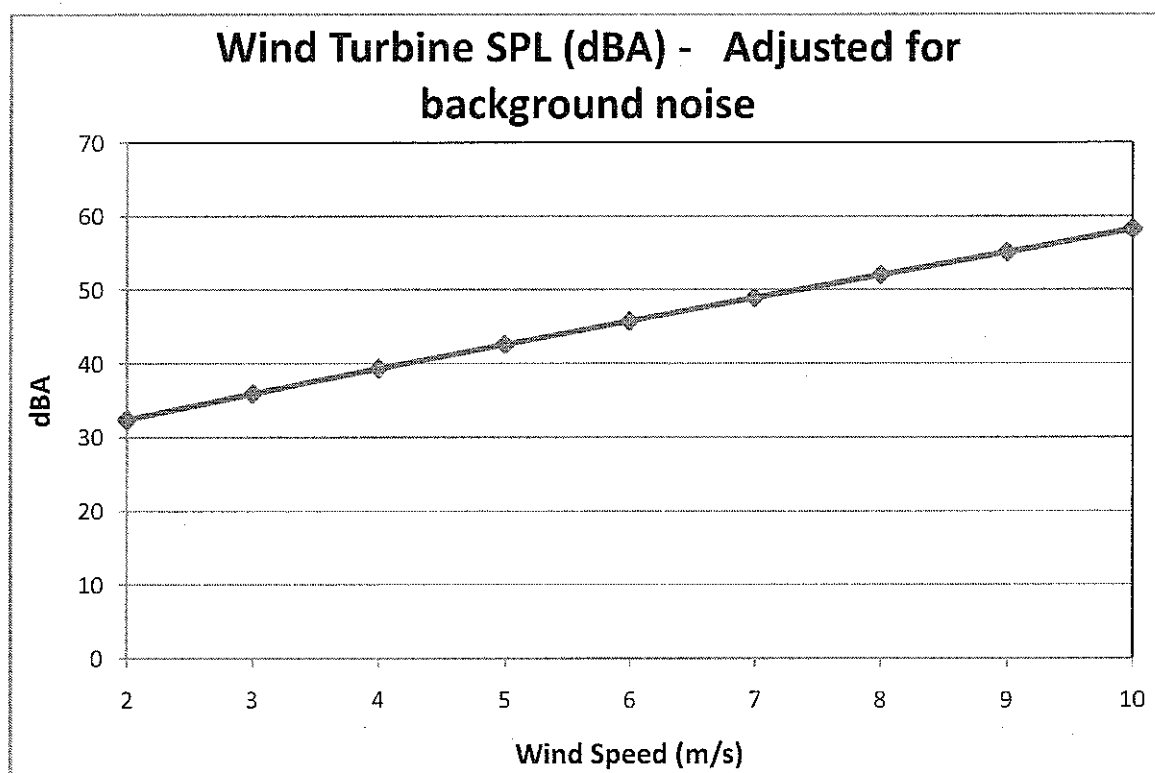


Figure 2: A-Weighted Sound Pressure Level as a function of nacelle height wind velocity.

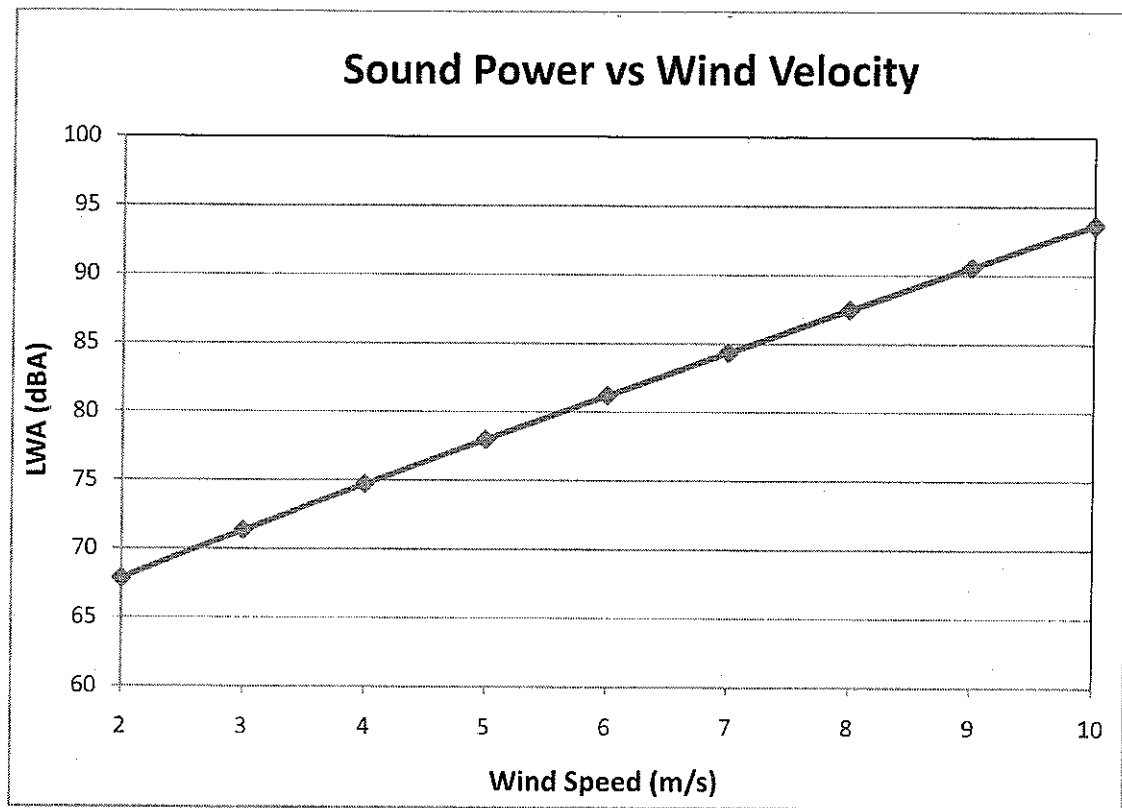


Figure 3: A-Weighted Sound Power Level as a function of nacelle height wind velocity.

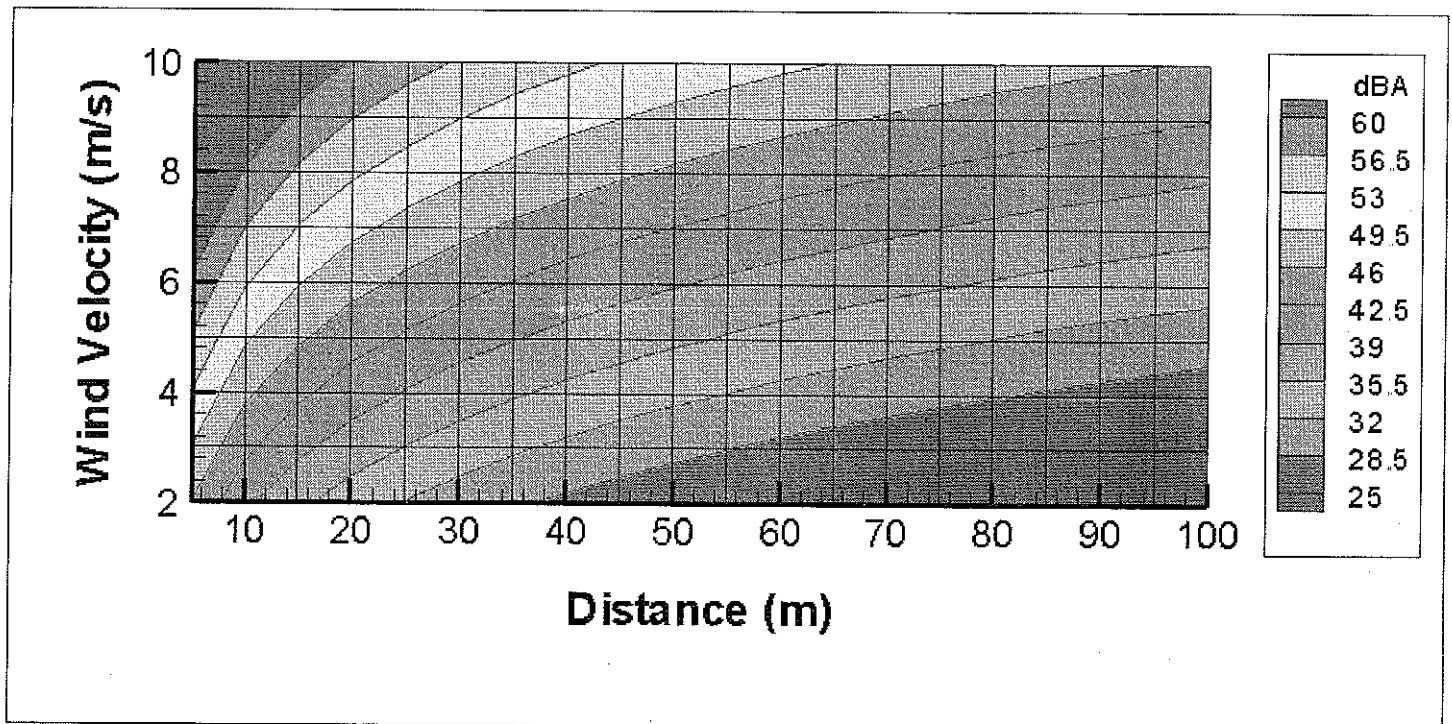
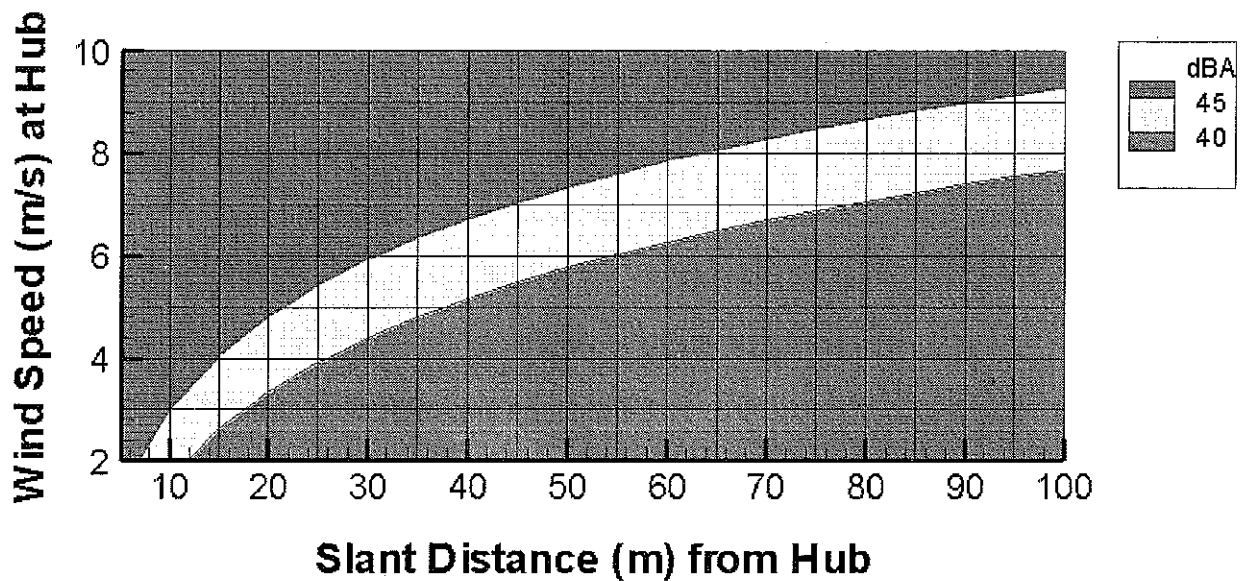


Figure 4: A-Weighted Sound Pressure Level as a function of wind velocity and distance from turbine.

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Acoustic Noise Levels

Turbine Make:	C&F Green Energy	Model	CF20
NOISE EMISSION LEVEL			NOISE PENALTY
Sound Power $L_{Wd,8m/s}$	88.95 dB(A)	Noise Slope (dB/m/s)	3.09
			NO

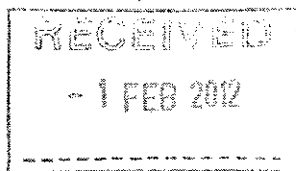


C&F Test Site, Galway

Issued by Stroma Technology
September 2010

Appendix D – Ribble Valley Council Screening Opinion (50kw Turbine).

NOTE: The current 20kw proposal is significantly reduced in size and scale from the original.



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**RIBBLE VALLEY BOROUGH COUNCIL**

please ask for: Graeme Thorpe
direct line: 01200 414520
email: graeme.thorpe@ribblevalley.gov.uk
my ref:
your ref: 3/2011/1022/P
date: 31 January 2012

Council Offices
Church Walk, Clitheroe
Lancashire BB7 2RA

Tel: 01200 425111
Fax: 01200 414488
DX Clitheroe 15157
www.ribblevalley.gov.uk

Dear Mr Paul Mason,

RE – Request for a Screening Opinion under Regulation 5 of the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulation 2011.

Proposal: Proposed 50kW Wind Turbine on a 30m Mast.
Site Address: Land at Paradise Farm, Horton-in-Craven, Skipton, Yorkshire, BD23 3JT

I write in reply to the above request received at our offices on the 6 December 2011. Following my assessment of the information provided in respect of the above development, I now write to inform you of the Local Planning Authority's formal screening opinion under the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 2011.

I can confirm that the local planning authority is of the view that the development proposals fall within Section 3 (i) of Schedule 2 of the Regulations, Installations for the harnessing of wind power for energy production (wind farms).

On the basis of the limited information provided with your Screening Opinion request under Section 5 of the regulations, the Local Planning Authority have carried out a full screening opinion to ascertain whether there is a need for an Environmental Impact Assessment.

In assessing the applicable thresholds and criteria of Schedule 2, whilst the development proposed involves the installation of only ONE turbine, the hub height of the turbine will exceed 15 metres. This therefore requires an assessment of the proposal in relation to Schedule 3.

The selection criteria for screening within Schedule 2 development considers that the following must be assessed,

1. Characteristics of development,
2. Location of development, and
3. Characteristics of the potential development.

Having assessed the scheme in relation to the above, the Local Planning Authority have concluded that an Environmental Impact Assessment will not be necessary in relation to this proposal as,

- The turbine is considered to be an acceptable and appropriate scale and size for such a location,
- It will not create a cumulative impact with other turbines,
- It will not significantly affect the existing land use,
- It can be removed once it is no longer required,
- It is a sufficient distance from the adjacent A O N B so as not to be of significant visual detriment,
- A sufficient distance from the adjacent P R O W so as not to be of significant visual detriment to users, and
- Due to the Grade of the agricultural land on which the turbine will be sited (Grade 4), it is not envisaged that the proposed development will adversely affect ecology in the nearby vicinity

However, prior to the formal submission of a full application for the development, I would like to bring your attention to the importance of the following relevant Local Plan Policies, any detailed information likely to be required with any such application and a couple of concerns raised by the Environmental Health Department

The site in question lies within land designated as 'Open Countryside' within the Districtwide Local Plan, and as such Policy ENV3 is considered relevant. This Policy notes that *'In the open countryside outside the AONB and areas immediately adjacent to it, development will be required to be in keeping with the character of the landscape area and should reflect local vernacular, scale, style, features and building materials.'*

Policies ENV24, ENV25 and ENV26 are also relevant as they consider schemes for Renewable Energy and Wind Energy. Policy ENV24 states *'the Borough Council will support the development of renewable energy schemes provided it can be shown that such developments would not cause unacceptable harm'*, and Policy ENV25 states that *'in assessing proposals for renewable energy schemes, the Borough Council will have particular regard to the following issues,*

- i *The immediate and wider impact of the proposed development on the landscape, and AONB in particular the need to protect features and areas of natural, cultural, historic and archaeological interest;*
- ii *the measures that would be taken, during and after construction, to minimise the impact of the development on local land use and residential amenity;*
- iii *the local and wider benefits the proposal may bring; and*
- iv *the fact that certain renewable energy resources can only be harnessed where the resource occurs.*

More specific to Wind Energy, Policy ENV26 states that *'The Borough Council will approve proposals for wind turbine generators providing:*

- i *the visual impact of the proposal on the wider landscape is justifiable;*
- ii *the proposal does not harm any wildlife habitat or area of historical or architectural importance;*
- iii *the degree of nuisance caused by noise and shadow flicker to nearby residential amenities, agricultural operations, recreational areas or the function of the countryside is minimal;*
- iv *the proposal does not interfere with electromagnetic signals;*
- v *the design, colour layout and scale of turbines and ancillary structures including access roads must be appropriate to the character of the area;*
- vi *connections to electrical grids and sub stations etc. must be acceptable in the landscape setting;*
- vii *adequate restoration and after use provision must be made;*

viii suitable parking facilities should be provided where appropriate.

Development proposals within or close to the Area of Outstanding Natural Beauty, sites of special scientific interest, local nature reserves, or scheduled ancient monuments will not be allowed, unless:

- i the proposal cannot be better located outside such statutory designated areas;
- ii the proposal is acceptable in environmental and landscape terms; and
- iii any adverse environmental impacts as far as practicable have been mitigated.

Bearing this in mind, the main guidance I can offer is that given the development may be slightly visible from the Forest of Bowland Area of Outstanding Natural Beauty, the proposed siting of the turbine must be considered acceptable in environmental, visual and landscape terms, it must have minimal impact on users of the adjacent Public Rights of Way, the proposal must not harm any wildlife habitat and the design, colour and scale of the turbine and ancillary structures including access roads must be appropriate to the character of the area. As such, we recommend siting the turbine as close to the property/group of buildings to which the turbine will be associated with, and also recommend considering mitigating the visual impact of the turbine by additional planting. In addition, a Phase One Habitat Survey will also help to identify the optimum site for the mast and rule out any potential ecological impacts

In order to form a visual assessment, I would also recommend submitting a Landscape Visual Assessment, with the key components of the assessment should include:

- a) Detailed description of the full extent of the proposed wind turbine works,
- b) Zone of Theoretical Visibility Map - This should cover an area of up to 8km radius and show the zone of theoretical visibility (ZTV) of the proposed turbine at full height.
- c) Visualisations - Approximately 8 photomontages from a range of viewpoints within a 3 – 4km radius of the proposed turbine. It is recommended that the selected viewpoints be agreed jointly with the local authorities. I am happy to advise on the suitability of viewpoints
- d) Assessment of the site and wider landscape's sensitivity and capacity to wind energy development. The *Landscape Sensitivity to Wind Energy Development in Lancashire, February 2005*, study (Lancashire County Council) should be helpful for this work, and can be found at the following website address <http://www.lancashire.gov.uk/environment/landscape/landscapewind/index.asp>
- e) Assessment of impacts on landscape character, landscape value, landscape amenity and landscape fabric. Further guidance on this is available in the *Guidelines for Landscape and Visual Impact Assessment, 2002* (Institute for Environmental Assessment and the Landscape Institute). The County Council's landscape character assessment can be found at the following website address <http://www.lancashire.gov.uk/environment/landscape/landscapecharacass/cover.asp>
- f) Assessment of visual impacts
- g) Assessment of cumulative impacts with operational and consented wind energy development.
- h) Possible mitigation of impacts
- i) Assessment of the proposals against the key tests of planning policy.

With regards to potential noise impact of the turbine, the Head of Environmental Health Services has considered and evaluated the information submitted in relation to the request for a screening opinion for a 50 Kw wind turbine to serve Paradise Farm, Horton

in Craven. He considers this to be a significant wind turbine and in extrapolating the noise levels supplied it would seem to indicate that the proposed development would not meet the recommended guidance guidelines by a substantial margin as follows;

- It would appear likely that external noise levels at nearest residential properties not associated with the application will be at best between 53 and 56 dB (A) and when one uses the noise levels indicated in the report, could be as high as 70 - 74 dB (A).

As such the above does not meet the recommended levels of;

- ETSU Guidance: 'In low noise environments, wind turbine noise should be limited to an absolute level within 35 - 40 dB (A), and
- PPG 24: 'Wind turbine noise should not exceed a night time maximum of 43dB(A)'

This would not be acceptable at planning application stage so I would recommend investigating this further

Finally, the Lancashire Historic Landscape Character Type of this area is classified as 'Ancient Enclosure', and I have attached a copy of the definition and typical components associated with such a landscape. I would therefore recommend contacting Doug Moir at LCC (Archaeology Planning Officer) on 01772 531734, to see whether this particular site may need further investigation.

I trust that these comments are helpful, however should you wish to discuss the matter further please do not hesitate to contact me on the above direct line or e-mail address

Yours sincerely,



GRAEME THORPE
SENIOR PLANNING OFFICER

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Acoustic Report

Fire enclosure testing
Envelope design review
Acoustics

Air sealing
Thermographic surveying
Equipment supply

Summary of Acoustic Measurements

CF20-20m mast

C&F Facility, Co. Galway

23rd Sept 2010

Report Version 1.0

Prepared for:
C&F Green Energy

320120700P

Assessed by:
Martyn Bailey MSc MIOA



Introduction

The following report is based upon measurements taken by C&F Green Energy. The measurements have been assessed by Stroma technology Ltd and comply with the requirements of BS EN 61400 – 11: 2003.

Test Details

Wind Turbine Model: CF20
Max Output: 20KW
Rotor Diameter: 12.8m
Mast Height: 20m
Location: C&F Facility, Athenry, Co. Galway
Date of tests: 9th August - 13th Sept
SLM: Larson Davis 824 with narrow band module

Test Setup

All acoustic measurements were conducted in accordance with IEC 61400-11:2002. The BWEA have also published a standard that addresses wind turbine noise assessment and the acoustic measurement technique is largely based on the IEC standard. The output data are presented in the format requested by the BWEA standard since this is typically most appropriate for planning purposes in the UK.

The microphone is located downwind at ground level facing the turbine at a distance of 26.4m which is the mast height plus the rotor radius. The microphone is placed on a piece of plywood and covered with a hemispherical wind shield. Acoustic and wind data are recorded while the wind turbine is active and also when shut down so that background noise can be assessed.

Acoustic measurements were taken as 1 minute Leq A-weighted readings. All measurements were recorded with 1/3 octave definition.

Wind velocity was measured using an anemometer on a 15m pole. Presented data are scaled to the height of the rotor axis.

Results

As specified in the BWEA standard, the 1/3 octave acoustic levels for all measurements were analysed to identify any tonal contribution. In this respect, no tonal content was present.

Several key metrics are required by the BWEA standard.
These are:

Key BWEA Metrics	
Sound Power at 8m/s	87.5 dBA
Sound Power vs Velocity slope	3.1 dBA / (m/s)
Sound Pressure at 8m/s	
Distance 25m	51.5 dBA
Distance 60m	44.0 dBA

In Figure 1, the acoustic data is presented as a function of nacelle height wind speed. Data are presented for both the background noise and the combined turbine & background noise cases. A linear regression is performed on both sets of data.

In Figure 2, the A-weighted sound pressure level of the wind turbine is adjusted to account for background noise and presented as a function of velocity.

In Figure 3, the A-weighted sound power level is presented as a function of wind speed.

In Figure 4, a contour plot shows the relationship of sound pressure to wind speed and distance. The distance here is measured from the centre of the mast. The data for this plot is derived from an interpolation where spherical propagation is assumed.

Finally, on the last page of the report, the above data are presented in the recommended BWEA format. The stated power level and field plot have been adjusted to account for an uncertainty penalty of 1.5dBA.

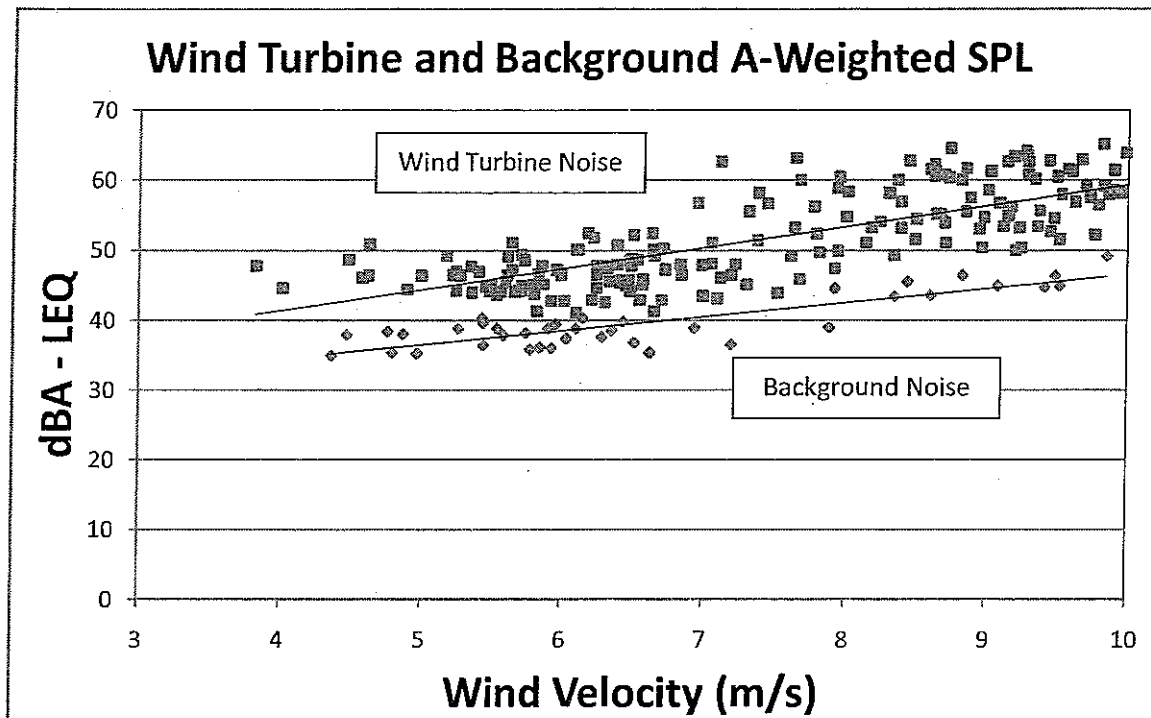


Figure 1: Wind turbine and background noise data as a function of nacelle height wind velocity.

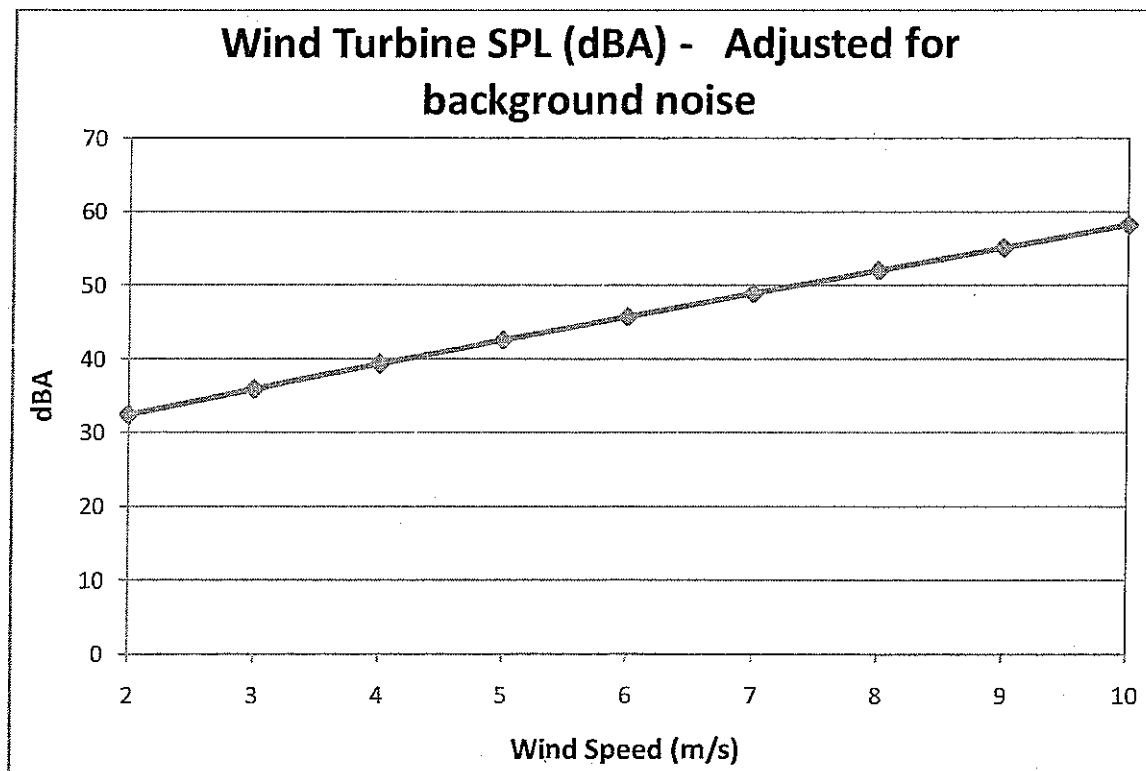


Figure 2: A-Weighted Sound Pressure Level as a function of nacelle height wind velocity.

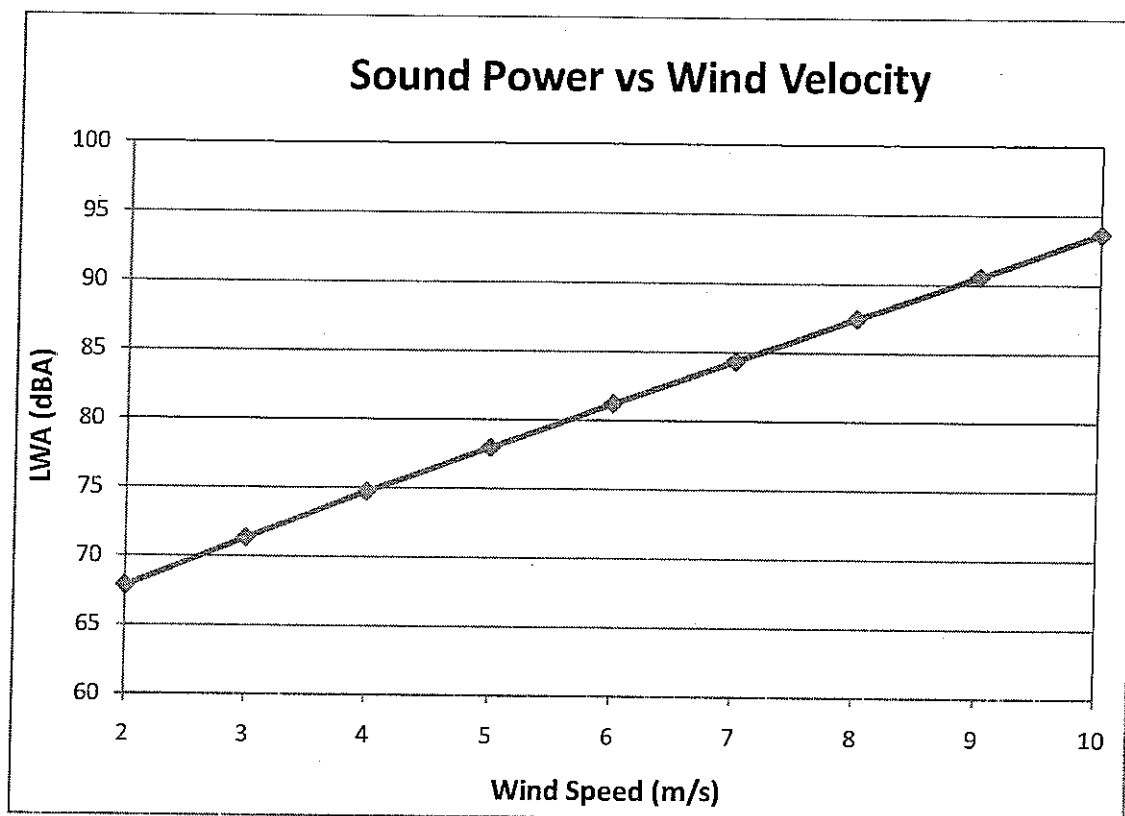


Figure 3: A-Weighted Sound Power Level as a function of nacelle height wind velocity.

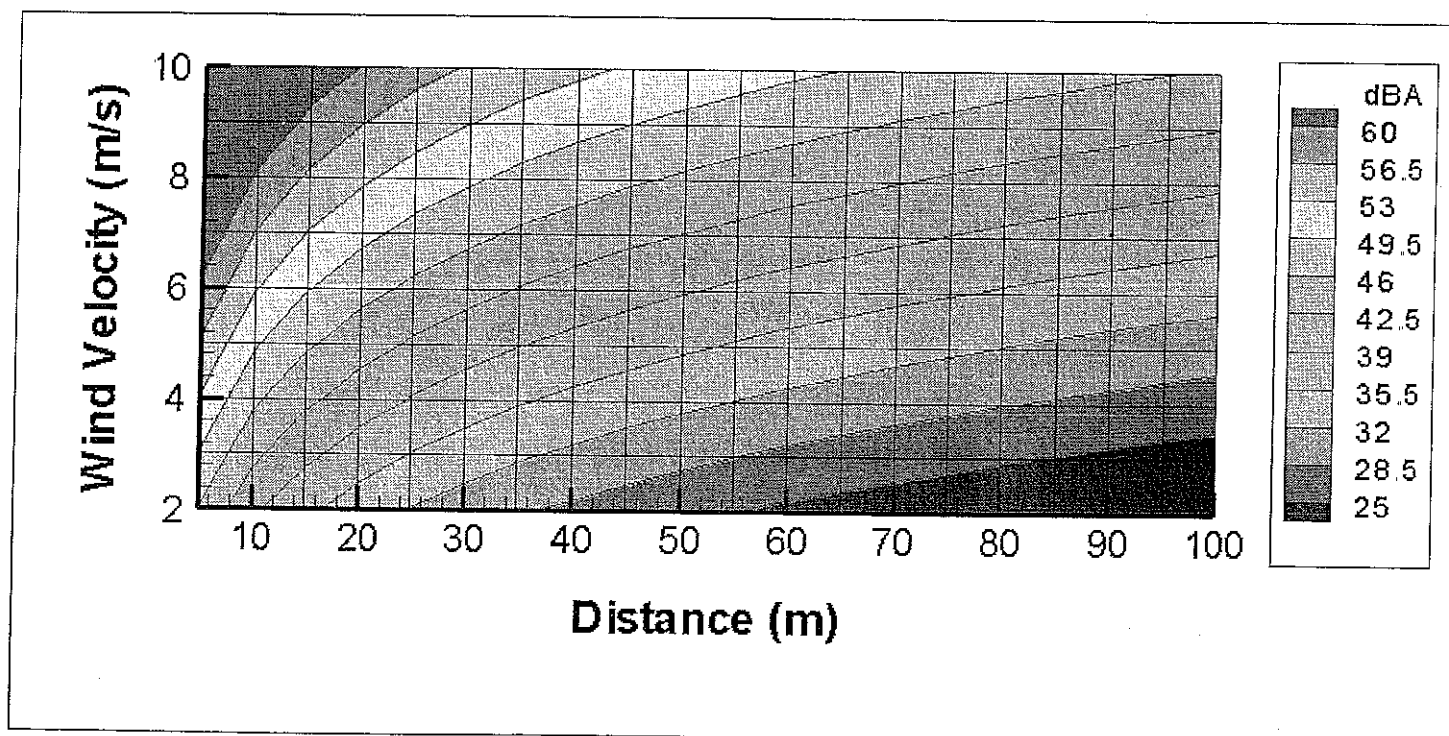
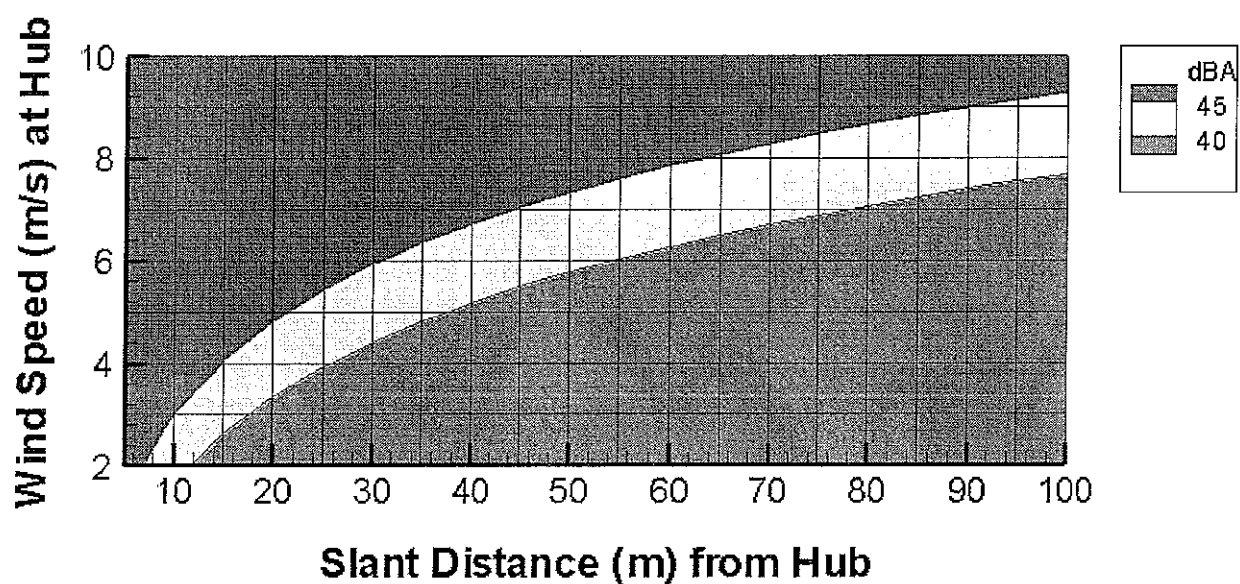


Figure 4: A-Weighted Sound Pressure Level as a function of wind velocity and distance from turbine.

Acoustic Noise Levels

Turbine Make:	C&F Green Energy	Model	CF20
NOISE EMISSION LEVEL			
Sound Power $L_{Wd,8m/s}$	88.95 dB(A)	Noise Slope (dB/m/s)	3.09
NOISE PENALTY			
NO			



C&F Test Site, Galway

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