

Contents

Part 1. Defining a Wind Energy Strategy for Co. Wexford

	page
1.1 Introduction	4
1.2 Location	4
1.3 Purpose	4
1.4 Background	5
1.5 Policy context	5
2.0 General Policy Statement	
2.1 Objectives	6
2.2 Methodology	6
3.0 Locational Framework	7
4.0 Constraints Identified in defining Suitability of Areas for Wind farm Development	
4.1 Commercial Constraints	7
4.2 Landscape and Environmental Constraints	8
4.3 Landscape Designations	8
4.4 Environmental Designations	9
5.0 Wind Farm Development Areas Identified in County Wexford	10
6.0 Development Control Standards for Wind Farms	
6.1 Towns and Villages	11
6.2 Dwelling Houses	11
6.3 Boundary	11
6.4 Shadow Flicker	11
6.5 Cumulative Impacts	11
6.6 Archaeology	11
6.7 Bird Migratory Routes	11
6.8 Fencing	12
6.9 Noise	12
6.10 Environmental Monitoring	12
6.11 Roads	12
6.12 Aquifers	13
6.13 Ancillary Structure and Equipment	13
6.14 Grid Connection	13
6.15 Electromagnetic Interference	13
6.16 Aeronautical Safety	13
6.17 Financial Contributions	14
6.18 Safety Aspects	14
6.19 Construction Phase	14
6.20 Decommissioning	15

Part 2. Guidelines on Wind Farm Development Constraints

7.0 Preparatory Consultations

7.1 Pre-planning Consultations	16
7.2 Pre-Application Discussion and Consultation	16

8.0 Siting and Design of Wind Farms

8.1 Introduction	17
8.2 Hill and Flat Farmyard	17
8.3 Transitional Marginal Landscapes	17
8.4 Urban / Industrial	17
8.5 Coast	18

9.0 Guidelines in the Preparation of a Planning Application

9.1 Information Required in an EIS	18
9.2 Information Required for all Wind Farm Planning Applications	19

10.0 Individual Wind Turbines

10.1 Potential	21
10.2 Design	21
10.3 Development Control Standards	22
10.4 Educational Value	22

Bibliography	23
---------------------	-----------

Part 1.0 Defining a Wind Energy Strategy for Co. Wexford

1.1 Introduction

Europe is a global hub for wind energy development and Ireland is one of Europe's best endowed countries for wind resource development. Although the western counties boast the greatest wind resource, Co. Wexford can make a meaningful contribution to reducing our dependence on imported fuels while enhancing the local economy. This contribution can include both wind farm development and involvement in the broader research and manufacturing areas.

As public interest grows, from developers and concerned citizens alike, the value of a formal wind strategy is becoming clear.

Subsequently, the Wind Energy Strategy, *Planning Guidelines, Department of the Environment Heritage and Local Government*, 2006, emphasised the importance of wind energy and looked to maximise wind resource potential within a proper planning structure.

1.2 Location

Wexford is essentially a low-lying county. Bounded on the north by outliers of the Wicklow Mountains and on the west by the Blackstairs, the great bulk of the county lies below the 100m contour. It also boasts a long coastline with a remarkably rich environmental heritage.

While these attributes make for a beautiful county they do suggest that the potential for wind farm development is somewhat limited. This makes the need for a balanced wind strategy all the more pressing.

1.3 Purpose

Wexford County Council acknowledge that wind farms, if sited inappropriately, may have a negative impact on their local environment. This *Strategy* is a statement of the Council's intention to take positive control of the development of wind farms in County Wexford. With this strategy, negative visual and environmental impacts can be minimised while the sustainable exploitation of this energy resource is promoted. This balance has been achieved by reviewing the various landscapes of the county and assessing their ability to absorb wind farm developments. The primary criteria used in this exercise are visual and environmental impacts.

2.0 General Policy Statement

2.1 Objectives

Wexford Council recognises the need to reduce dependence on fossil fuels for energy generation, and supports the development of renewable resources. Because there is a strong correlation between areas suitable for wind energy generation and vulnerable, sensitive coastal and upland landscapes the County Council seeks to strike a balance between the benefits of renewable energy developments and negative impacts on our rich environment.

2.2 Methodology

Having regard to the policy context, the methodology used in the identification of suitable areas for wind farm development in this strategy, has been carried out using the recommended criteria in the Wind Energy Strategy ,Planning Guidelines (DOEHLG 2006).

Step 1

Using the Wind Atlas for Ireland (Sustainable Energy Ireland 2003) a wind speed map was prepared for County Wexford. In consultation with the Special Planning Committee an average wind speed of 8.4m/s at 75 metres was chosen as an optimum wind speed for a wind farm.

Step 2

The areas with appropriate wind speeds were overlaid with the sensitive landscape maps (County Development Plan) and the existing and proposed ecological zones (NHA's, SPC's, SPA's etc.) as designated by the National Parks and Wildlife Service.

These maps were used to aid in the identification of potential areas for wind farm development. The strategy whilst not ruling out development in all designated areas, sought to strike a balance between the benefits of renewable energy developments and the possible negative impacts on environmentally sensitive areas.

Step 3

Access to the electricity and transmission grids was considered essential for the economic viability of wind farms. The main ESB power lines in the county were overlaid on the combined maps and areas where access was feasible were then selected (notwithstanding steps 1& 2) for inclusion in areas open to consideration or preferred areas.

2.0 General Policy Statement

2.1 Objectives

Wexford Council recognises the need to reduce dependence on fossil fuels for energy generation, and supports the development of renewable resources. Because there is a strong correlation between areas suitable for wind energy generation and vulnerable, sensitive coastal and upland landscapes the County Council seeks to strike a balance between the benefits of renewable energy developments and negative impacts on our rich environment.

2.2 Methodology

Having regard to the policy context, the methodology used in the identification of suitable areas for wind farm development in this strategy, has been carried out using the recommended criteria in the Wind Energy Strategy Planning Guidelines (DOEHLG 2006).

Step 1

Using the Wind Atlas for Ireland (Sustainable Energy Ireland 2003) a wind speed map was prepared for County Wexford. In consultation with the Special Planning Committee an average wind speed of 8.4m/s at 75 metres was chosen as an optimum wind speed for a wind farm.

Step 2

The areas with appropriate wind speeds were overlaid with the sensitive landscape maps (County Development Plan) and the existing and proposed ecological zones (NHA's, SPC's, SPA's etc.) as designated by the National Parks and Wildlife Service.

These maps were used to aid in the identification of potential areas for wind farm development. The strategy whilst not ruling out development in all designated areas, sought to strike a balance between the benefits of renewable energy developments and the possible negative impacts on environmentally sensitive areas.

Step 3

Access to the electricity and transmission grids was considered essential for the economic viability of wind farms. The main ESB power lines in the county were overlaid on the combined maps and areas where access was feasible were then selected (notwithstanding steps 1 & 2) for inclusion in areas open to consideration or preferred areas.

3.0 Locational Framework

Based on the recommendations of the Wind Energy Strategy, Guidelines for Planning Authorities 2006 the suitability of areas in the county for wind farm development as follows:

Areas Open for Consideration:

These areas are considered suitable for wind farm development, subject to the proper planning and sustainable development of the area. Applications for planning permission will be treated on their own merit with the developer having a responsibility to demonstrate that any proposed wind farm development will have a minimum impact on the environment.

Areas that are Not Normally Permitted

These areas are identified as particularly unsuitable for wind farm development because of the potential adverse impacts on the environmental, cultural or residential amenities of the area.

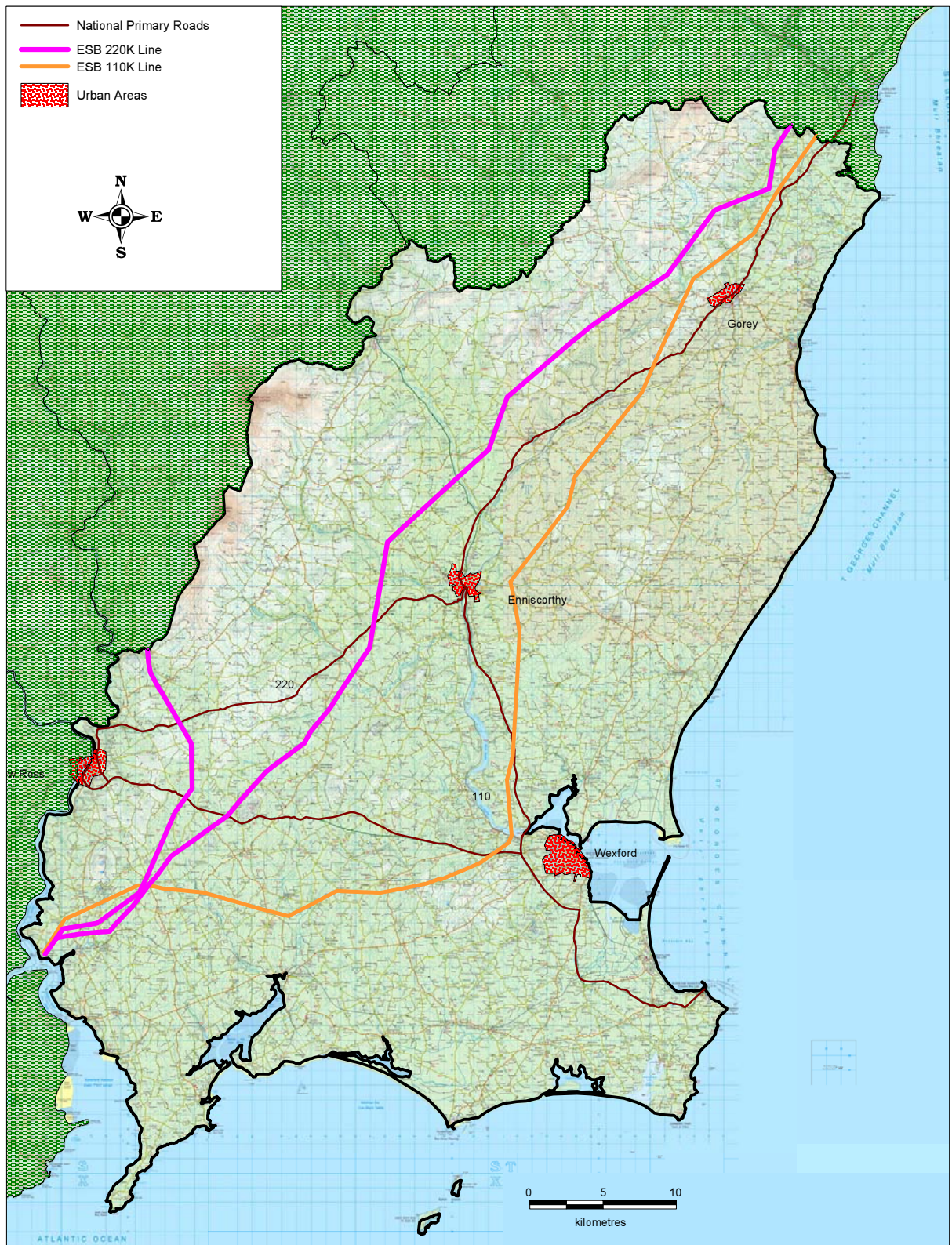
4.0 Constraints identified in defining suitability of areas for Wind Farm Development

4.1 Commercial constraints

An adequate wind resource is the first prerequisite for a viable wind farm. This can only be accurately assessed by monitoring the local wind regime for at least one year and comparing it with relevant, accurate long-term data. As an interim measure a reasonable estimate of the wind resource can be obtained from the Irish Wind Atlas. This was published in 2003 by Sustainable Energy Ireland. An average *predicted* wind speed of 8.4m/s at 75m is taken as being the standard wind speed required for a wind farm. Typically this data lies within 5-7% of *measured data*. This level of accuracy is sufficient to define the most viable areas for wind farm developments.

It will be noted from Wind Atlas maps that the highest concentration of viable wind speeds are in the north, northwest and southeast. Because of environmental constraints some of these areas are excluded from wind farm development.

An economical grid connection can be another constraint to viability. Line capacity is currently inadequate in Co. Wexford.



ESB Power Lines in Wexford

© Ordnance Survey Ireland. All rights reserved. Licence number Wexford CCMA 9802/Wexford County Council

County Development Plan 2007-2013

Drawn by: FB

Checked by: JPL

Date: 15.11.2006

Map No: 1

4.2 Landscape and Environmental Constraints

Two groups of environmental constraints were used in preparing the wind farm development areas. These are the landscape designations as implemented by Wexford County Council and wildlife designations as implemented by the National Parks and Wildlife Service. (see map 2)

Landscape designations

Sensitive Landscapes

Normal Landscapes

Robust Landscapes

Vulnerable Ridges

Coastal Policy Zones

Wildlife designations

Proposed National Heritage Areas (pNHAs),

Candidate Special Areas of Conservation (cSACs)

Special Protection Areas (SPAs),

Nature Reserves

4.3 Landscape designations

Sensitive Landscapes

Sensitive Landscapes cover 416km² out of a total county area of 2390km². The finest of these include the Blackstairs on the Co. Carlow border and the outliers of the Wicklow Mts in the north of the county. In the context of a largely flat Co. Wexford these are regarded as being of Outstanding Natural Beauty. . However as a strong correlation between areas suitable for wind energy generation and vulnerable and sensitive landscapes, the County Council seeks to strike a balance between the benefits of renewable energy developments and negative impacts on our rich environment. Therefore wind farm developments will be permitted in sensitive designated landscapes within the ‘areas open to consideration’ as identified on map 5.

Vulnerable Ridges

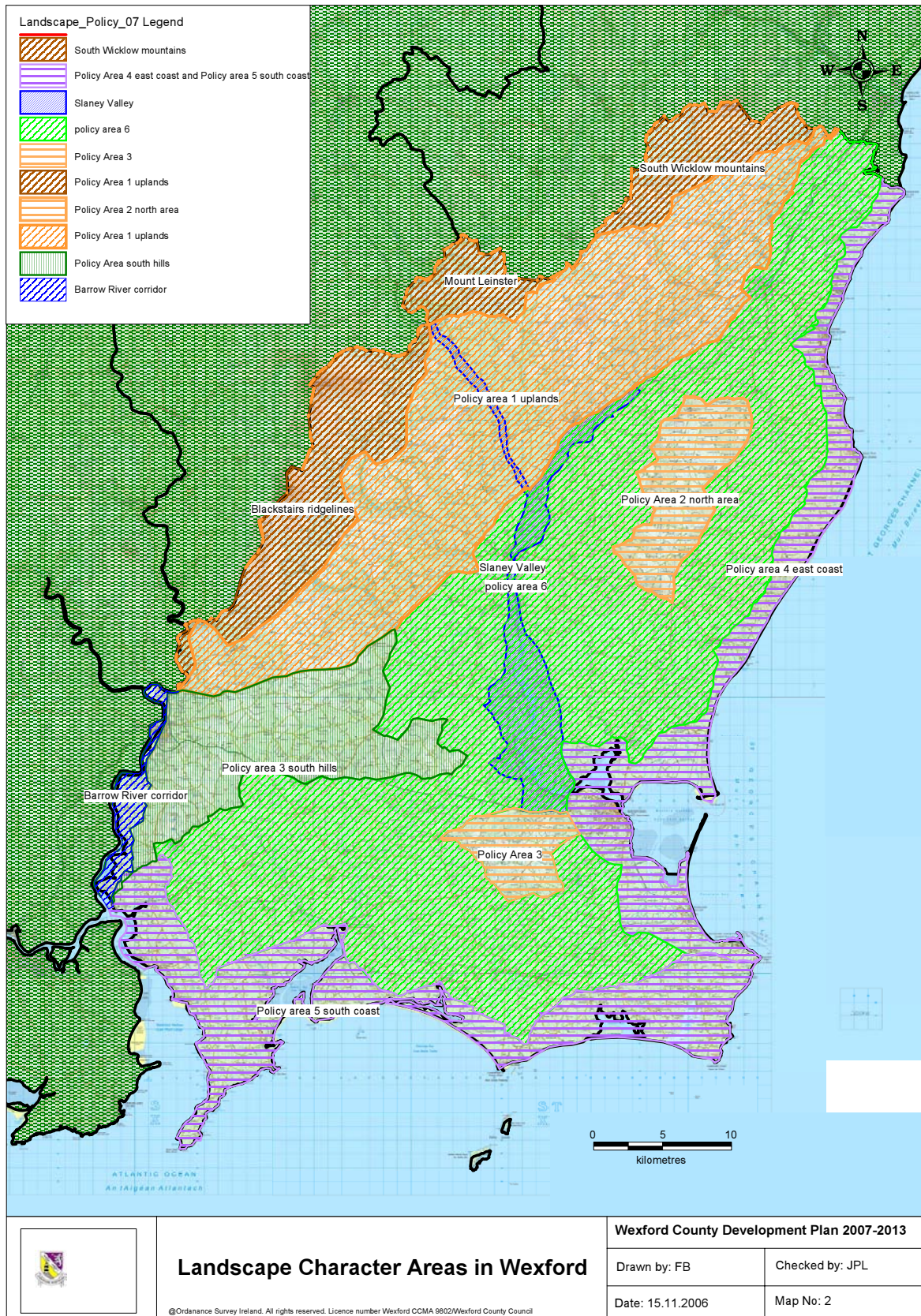
These are associated with the Sensitive Landscapes in upland areas and Wind farm development will generally not be allowed on these ridges.(see map 5)

Normal Landscapes

The great bulk of the county belongs in this category. It also provides the least potential for wind farm development because of lower wind speeds

Robust Landscapes

These are urban and industrial landscapes. Wind farm developments will generally not normally be permitted in these areas as the 1 kilometre exclusion zone will prohibit such developments. However individual turbines will be considered in industrial landscapes and educational institutes (see section 10)



Robust Landscapes

These are urban and industrial landscapes. Wind farm developments will generally not normally be permitted in these areas as the 1 kilometre exclusion zone will prohibit such developments. However individual turbines will be considered in industrial landscapes and educational institutes (see section 10)

Coastal Policy Zones

Theses have been included in the assessment. Although the Co. Wexford coastline runs to 250km, it has proven difficult to consider wind farm development over extensive coastal areas. This is due to the great environmental wealth which epitomises the south coast while much of the remainder supports intensive amenity developments. Wind farm development is confined to a 13km strip along the east coast. A development-free buffer of at least 500m from the rear of sand dune systems will apply.

4.4 Environmental Designations

National Heritage Areas (pNHAs),

Notwithstanding a number of existing wind farms lying within pNHA boundaries further development will be discouraged within National Heritage Areas. (see map 3)

Special Areas of Conservation (cSACs)

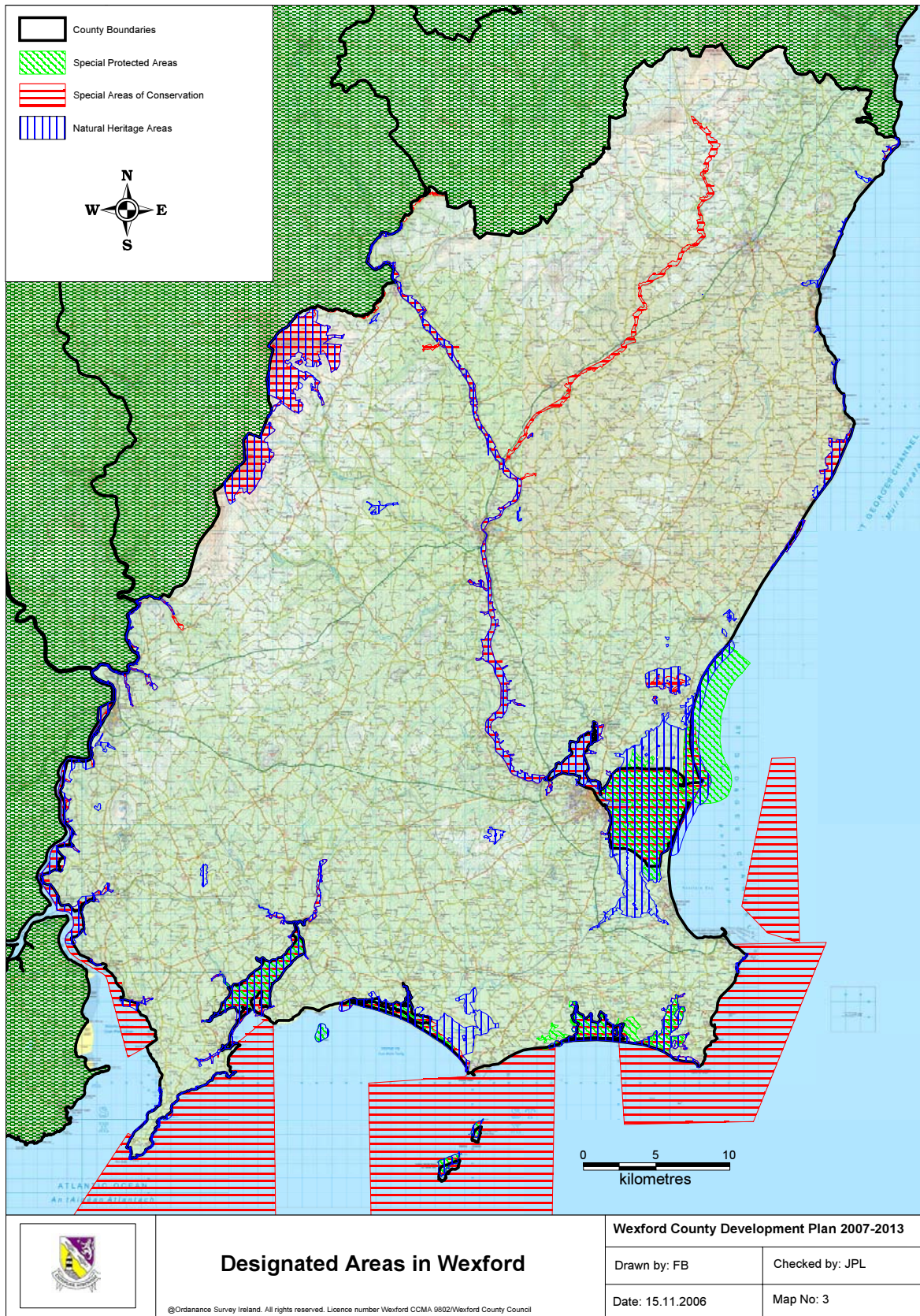
Notwithstanding a number of existing wind farms lying within cSAC boundaries further development will be discouraged within Special Areas of Conservation. (see map 3)

Special Protection Areas (SPAs)

Winds farm developments will be discouraged within Special Protection Areas (see map 3)

Nature Reserves

Winds farm developments will not be allowed within Nature Reserves



5.0 Wind Farm Development Areas Identified in County Wexford

As a result of the county-wide assessment the following development areas have been identified.

Areas Open for Consideration

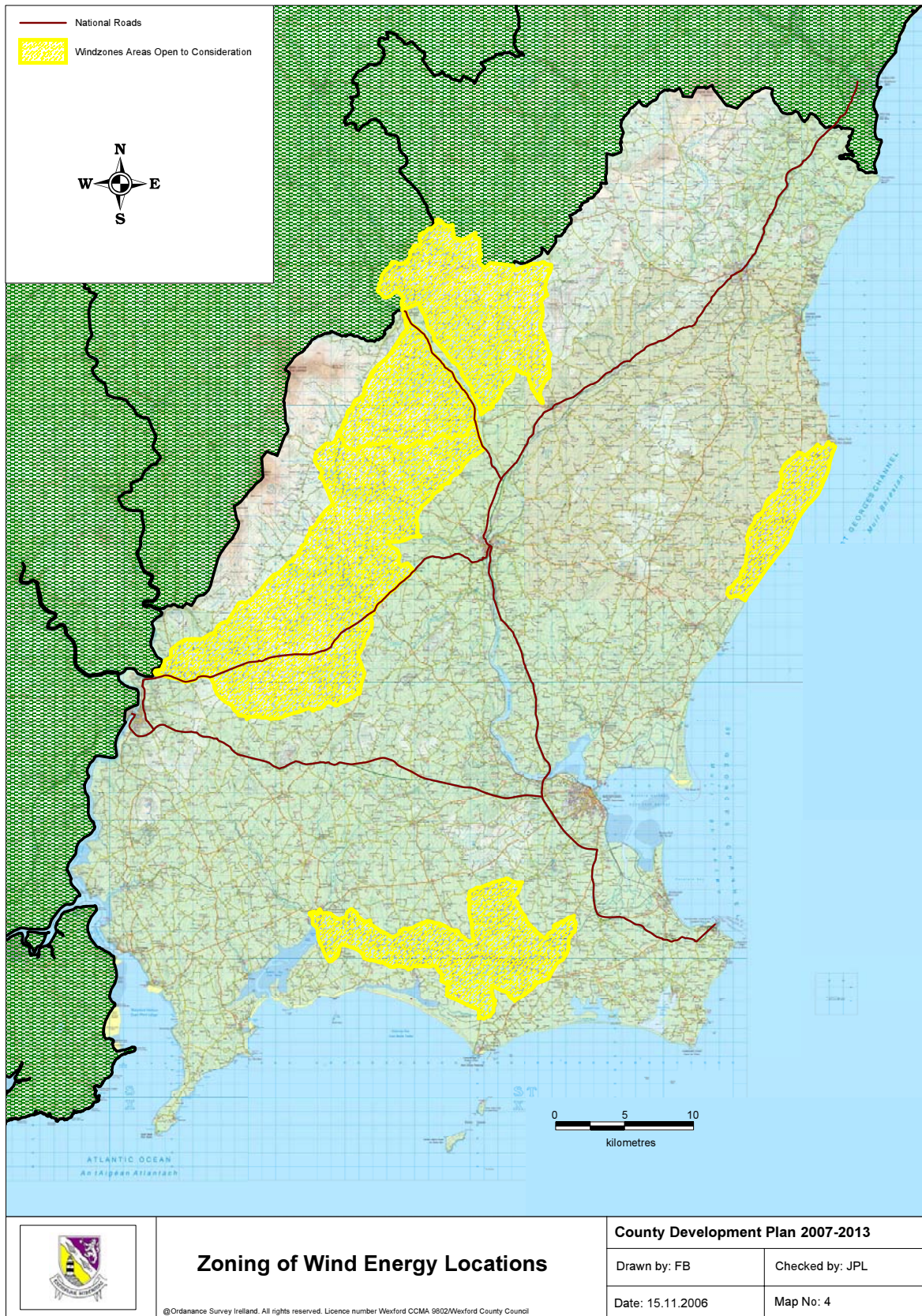
These areas may be suitable for wind farm development and should normally be granted planning permission unless specific local planning circumstances would support a decision to refuse permission in the context of the County Development Plan.

The areas identified as *Areas Open for Consideration areas* lie as follows: (see map 4)

- 1) Both sides of the N80 to Bunclody
- 2) Running contiguous with southern boundary of the Preferred Areas south to some distance beyond the N30 near Clonroche.
- 3) In the south of the county from Cleristown to Bridgetown.
- 4) In the east of the county from Cahore to Ballyvaldon.

Areas that are Not Normally Permitted

The remainder of the county is identified as areas where wind farm developments would not normally be permitted. (see map 4)



6.0 Development Control Standards for Wind Farms

6.1 Towns and Villages

An exclusion zone of 1000 metres will apply to all established towns and villages. This is to facilitate the continued growth, development and investment into these existing settlements.

6.2 Dwelling Houses

Turbines shall be not be permitted to located within 500m of any existing or permitted dwelling house (except where the written consent of those persons affected by this condition is given). A planning application for a dwelling house will be considered up to a distance of 250 metres of an existing or permitted turbine.

6.3 Boundary

Turbines will be permitted to within a distance of not less than 250 metres of the boundary of an adjacent landholding. The impact of proposed wind farms on the development potential of adjacent sites will be considered.

Turbines will be permitted to within a distance of not less than 125 metres of the boundary of a National or Regional road and a railway.

6.4 Shadow Flicker

An assessment of the theoretical shadow flicker shall be prepared for all dwellings within 600m of any turbine. A further assessment shall indicate the likely level of shadow flicker based on anticipated meteorological constraints. If required, mitigating measures shall be proposed and agreed with the Planning Authority.

6.5 Cumulative Impacts

In order to preserve the spatial, scenic and rural integrity of the areas open to consideration the cumulative effect will be taken into account so as to avoid multiplicity of wind farms in these areas.

6.6 Archaeology

Turbines will not normally be permitted within 150 metres of an ancient monument. An archaeological assessment will be required for all sites within close proximity to Recorded Monuments. Relocation of turbines to minimise impacts to the archaeological heritage will be permitted if necessary. This will be subject to agreement with the planning authority.

6.7 Bird Migratory Routes

Wind Turbines will not be permitted within the known flight path of migratory wild fowl.

6.8 Fencing

Shall generally be permitted around the substation and not on any other part of the site unless agreed as part of a rehabilitation programme for on site vegetation. The fencing shall then be permitted for the length of time required to ensure recovery of the vegetation.

6.9 Noise

Permitted maximum noise levels at noise sensitive residences shall be:

45 dB(A) Leq (A) from the nearest machine between the hours of 0800 and 2000, Monday to Sunday and 43 dB Leq (A) at all other times

To allow for reliable measurements Leq levels can be converted to L90 levels (for wind farm noise) with the relationship; $L90 = Leq - 3$

Once commissioned the development will be monitored. In the event that the monitoring shows that any turbine is exceeding its projected noise levels and is having a detrimental noise impact, mitigating measures shall be agreed with the Local Authority.

6.10 Environmental monitoring

Environmental monitoring may be required in particular sites where there are concerns in relation to specific environmental matters such as impacts on wildlife or where a specific condition has been attached to a grant of planning permission.

6.11 Roads

Access roads within the site shall be unsurfaced and shall be located and constructed so as to minimise their visual impact. If the development is decommissioned they shall be removed, unless an alternative use for them has been agreed in advance with the Planning Authority.

Prior to commencement of development details of access openings to the site shall be agreed with the Planning Authority.

Prior to commencement of development the developer shall submit and agree with the Planning Authority proposals in relation vehicle types and use of public roads during the construction phase.

Site road embankments and associated areas shall be contoured and seeded to the satisfaction of the Planning Authority after construction.

Surface damage to public roads created during the construction phase shall be reinstated to the satisfaction of the Planning Authority.

6.12 Aquifers

The developer shall have a responsibility to demonstrate that any proposed development will not have significant impacts upon aquifers.

6.13 Ancillary structures and equipment

No structures other than wind turbines, substation, monitoring mast and other essential ancillary installations will be permitted.

The planning application shall include all details of all such installations and shall be provided to the Planning Authority as part of the planning process.

Suitable landscaping proposals to reduce substation its visibility shall also be submitted.

All wind monitoring masts require planning permission. These are typically for a 40m or 50m mast required to monitor on-site wind speeds over 1-2 years.

If a permanent, hub height mast is required, permission will be considered only if the developer demonstrates that it is necessary for the economical operation of the wind farm.

6.14 Grid Connection

While the grid provider is responsible for grid connections, details of likely routes shall be included with the planning application. Connections within the wind farm will be laid underground.

6.15 Electromagnetic interference

The potential electromagnetic interference of any proposal shall be assessed by the applicant in consultation with the relevant bodies prior to submission of any application.

Proposals shall include measures to monitor the effects of the development on telecommunications and procedures to remedy any interference when the wind farm becomes operational.

6.16 Aeronautical safety

All proposals shall be referred to the Irish Aviation Authority for their comments and recommendations prior to the submission of any planning application.

6.17 Financial contributions

In accordance with the Development Contribution Scheme the developer shall pay Wexford County Council a levy in accordance with the Development Contribution Scheme.

In order to ensure the satisfactory completion of the development the developer shall pay a deposit or bond the amount of which will be decided by the Planning Authority.

6.18 Safety Aspects

The developer shall submit a maintenance agreement to be agreed with the Planning Authority to ensure the turbines do not deteriorate to a degree where they may pose a hazard to public safety.

Where proposals are located within 300m of existing and proposed National Primary and Secondary Routes, it is recommended that the applicant consult with the National Roads Authority, prior to making an application, in order to agree a setback distance from the road.

In the case of all other public roads, proposed wind farms within 250 metres of the road, shall be subject to the agreement of the Council's Roads Department.

6.19 Construction Phase

All liquids and hydrocarbons stored on site during construction shall be stored in a waterproof bunded area.

Silt traps shall be provided to intercept silt laden water from the site during construction.

All ancillary construction equipment shall be removed from the site within one month of final completion.

Prior to commencement the developer shall agree with the Planning Authority details of the redistribution of any excess spoil generated during the construction phase.

If on-site borrow pits are to be used during the construction phase the details shall be agreed with the Planning Authority beforehand. This may involve a separate planning application.

6.20 Decommissioning

It is the desire of the Planning Authority to facilitate the development of sustainable wind energy developments. An automatic condition that all such developments must decommission after a given number of years will be imposed on all planning permissions.

However, if any turbine has been non-operational continuously for 12 months it shall be decommissioned by the developer. If the wind farm development is deemed to be operating unsatisfactorily the Planning Authority reserve the right to have it decommissioned.

In the cases of wind farms that can be demonstrated to the satisfaction of the Planning Authority to be operating satisfactorily it may at the discretion of the planning authority to extend the lifetime of that planning permission.

Part 2. Guidelines on Wind Farm Development Constraints

An adequate wind resource is the primary constraint in developing a wind farm. As mentioned above, Part 1, 4.1, some indication of likely wind speeds can be extracted from the *Irish Wind Atlas*. However, at least one year's measured data is required before a project can be developed. This will entail erecting a 40m or 50m wind monitoring mast within the site and recording data for a minimum of 12 months. Planning permission, usually for 2 years, is required for this mast.

7.0 Preparatory Consultations

Before any substantive design work is undertaken a number of consultations are advised.

7.1 Pre-planning Consultations

Before any substantive design work is undertaken it is essential to discuss development proposals with the Planning Authority at an early stage. Many issues can be resolved by timely discussions. Visual impacts are particularly important and advice on the choice of viewshed reference points (VRPs) will be required. These will be part of the Landscape Impact Assessment which will be required as part of the planning application, (see Appendix 1 of the *Draft Planning Guidelines*).

In the case of small wind farms, with outputs of less than 5MW, an EIS is not required, (although the Planning Authority retain the option of requesting one if they believe it is warranted). It is advisable at this stage to confirm with the Planning Authority their requirements to ensure all aspects are adequately covered when the planning application is finally lodged.

7.2 Pre-Application Discussion and Consultation

It is always wise to discuss proposed wind farm developments within the local community. This may well reduce local fears that are frequently founded on inaccurate information. A formal Information gathering is advisable where large wind farms are proposed.

Although future Co. Wexford wind farm developments are likely to lie outside NPWS designated sites (e.g pNHAs, cSAC and SPAs) it is advisable to consult the National Parks and Wildlife Service of wind farm proposals early in planning stage.

8.0 Siting and Design of Wind Farms

8.1 Introduction

The comprehensive guidelines on the Siting and Design of Wind Energy Development provided in the Department of the Environment's *Draft Planning Guidelines* ought to be consulted by all would-be developers at an early stage in their project. An overview is provided below.

Chapter 5 of the *Guidelines* cover the following areas:

- Siting and location
- Spatial extent and scale
- Cumulative effect
- Spacing of turbines
- Layout of turbines
- Height of turbines

The *Guidelines* also provides a comprehensive overview of siting turbines in specific landscapes. A number of these, Hilly and flat farmland, Transitional marginal land, Urban/industrial and Coast are relevant to Co. Wexford and are addressed below.

8.2 Hill and flat farmland .

Developments must be scaled in sympathy with the scale of the landscape. For example, a large wind farm development stretching over a patchwork of numerous small fields is inappropriate. Likewise, turbine spacing must reflect the scale of the landscape. For example, regular spacing is appropriate in a landscape with a regular field pattern, and visa versa. Wind farm layout must also be arranged in sympathy with the landscape, e.g a layout on a long ridge or plateau will be linear while a clustered layout should be used on a hilltop. A balance with the underlying landscape must also be found in relation to turbine height. Large scale landscapes will tend to support higher turbines. The temptation to increase hub height in marginal sites must be avoided unless the scale of the landscape is sufficiently large to accommodate them. The cumulative effect of several wind farms is greatest in upland areas. On low-lying lands the effects may be reduced substantially by hedgerows, tree lines and buildings.

8.3 Transitional marginal landscapes


These landscapes typically include upland or lowland areas which are farmed extensively with some regeneration of natural vegetation allowed. In Co. Wexford these are far less common than Intensively farmed upland.

As these landscapes tend to quite irregular it follows that turbine arrangement, spacing and layout must also be irregular. In most marginal upland areas turbine heights will not appear uniform in height.

8.4 Urban/industrial

Because Co. Wexford has a long, albeit limited industrial history, the siting of turbines in industrial areas cannot be ruled out. In this respect the county is fortunate in having a substantial proportion of its industrial infrastructure located near the coast where the wind resource is reasonable. (These have not yet been included in to the Development Areas)

The siting and layout of turbines in industrial areas must take into consideration the scale of the area. A large wind farm beside a small industrial complex is not appropriate. Generally speaking



industrial infrastructure is arranged in an orderly fashion, although elements within it may be quite varied in size and form. Therefore wind farm layouts should be regular.

8.5 Coast

As mentioned above, (Part 1, 1.2 & 4.2), only a relatively small area of coastline is suitable for wind energy development. Layouts must conform to the local landscape character; this will vary from being relatively uniform near the coast and irregular some distance away. Note must also be taken of the buffer zone within which development will not be permitted.

9.0 Guidelines in the Preparation of a Planning Application

Before making a planning application all of the preparatory work outlined above, in addition to any site specific requirements as advised by the Planning Authority, will have been completed.

9.1 Requirement for an Environmental Impact Assessment (EIA)

An environmental impact assessment is required for wind energy developments which contain more than 5 turbines or output more than 5MW, (Section 176 of the 2000 Act, Article 93 and Schedule 5 Part 1 of the 2001 Regulations). However, the Planning Authority retain the option to request an EIA for smaller wind farms if they believe significant environmental impacts may result.

Information required in EIS

This is provided in **Guidelines on the information to be contained in Environmental Impact Statement** (EPA 2003).

9.2 Information Required for all Wind Farm Planning Applications

Minimum information required for sub-threshold developments

Because of the nature of wind farm developments substantial data is required to accompany all planning applications regardless of size. This is outlined below.

Text

1. Detailed description of development
2. Assessment of local archaeology, flora and fauna, geology, landscape, noise, soils, watercourses and aquifers.
3. Description of likely impact of the development on the above
5. Description of Mitigation measures proposed
6. Including turbine coordinates
7. Including turbine coordinates and distances from centre of wind farm
8. Must include background noise monitoring figures for at least five days
9. Must include trial pits and reports at each turbine location

Illustrations

1. Location map using 1:50000 Discovery Series map
2. Layout map using 1:10560 or 1:2500 maps. Turbine co-ordinates to be included.
3. Layout plan at a scale of 1:10560 or 1:2500
4. Turbine details at a scale not less than 1:200
5. Turbine pad and standing details, scale as above
6. Sub-station compound not less than 1:200
7. Site roads, typical sections at not less than 1:25
8. Map showing local archaeological sites, not less than 1:10560
9. Wildlife habitat map, not less than 1:10560
10. Discovery Series map showing any environmental designations within 3km of site and Landscape
11. Discovery Series map showing any landscape designations within 10km of site (may be combined with above)
12. Discovery Series maps showing the location of aquifers within 10 km of the proposed site.
13. Discovery Series map showing VPRs (Viewpoints from which photographs were taken to generate photomontages, (all photos and photomontages to be taken using a 70mm lens)
14. Discovery Series map showing ZTV (Zone of theoretical visibility. May be combined with VPR map)
15. Set of photomontages based on visibility of half blade length,



Appendices

1. Technical description of proposed turbine type (maximum dimensions must be provided)
2. Shadow flicker data
3. Baseline noise data
4. Photomontage data, (viewpoint co-ordinates, included angle, direction)

10.0 Individual Wind Turbines

10.1 Potential

Throughout this report, the term "wind energy development" refers to commercial wind farms. But, as a clean and renewable source of electricity, wind energy appeals as much to our sense of environmental responsibility and independence as to its a business potential.

A small wind turbine in a farmyard in County Wexford could meet most or all of the farm's electricity needs, or as a backup electricity supply. It is clean and independent of global oil prices.

A small wind turbine, on a low mast, has minimal visual impact, but can reduce local air pollution. In this section, we deal with developments consisting of one wind turbine on a mast no more than

18 metres in height. Larger wind turbines may be considered in industrial locations with the developer having a clear responsibility to demonstrate that the development will not have any negative impacts on adjacent buildings or property.

10.2 Design

Small turbines are available in Ireland, varying in power from 100 Watts to 20 kW. Below 1 kW, a turbine is used primarily for experimental, educational or providing a minimal power source in remote locations. The power requirements of an average household could be met by a turbine in the range 2.5kW-6kW. Such turbines can be supported on masts as low as 7-15 metres in height.

A 15-18 metre mast can support turbines ranging from 2.5 kW to 15kW, these can be used for small business applications.

The supporting towers are either guyed steel tubes or free-standing or guyed lattice towers. Steel tubes create a minimal visual intrusion but do require a site area of up to 50m x 50m which may need to be taken out of production.

A small wind turbine starts producing electricity at speeds of about 3 metres per second. The faster the wind speed, the more electricity produced. In mainland Europe where wind generation is substantially more advanced than in Ireland, a net-metering system is used which involves interconnection to and operation in parallel with the electricity grid. Unfortunately this is not yet available in Ireland. However, there are other options for example; battery charging, direct heating or hybrid technologies which allow a combination of power sources and storage to work together.

A combination of wind, diesel and battery storage is one such system. Small wind turbines are also often combined with solar-energy systems (usually photovoltaic cells, converting sunlight directly into electricity). These hybrid setups are worth considering and ought to be encouraged.

10.3 Development Controls Standards

Turbines shall generally be limited to 1 per holding

Turbine height shall not exceed 25 metres measuring to the uppermost tip of a vertically extended blade

Turbines shall generally be coloured mid to dark grey and shall not contrast with surrounding colours.

Small individual turbines are not restricted by the Wind Farm Development Areas identified in the Strategy.

10.4 Educational Value

The installation of small wind turbines should be encouraged in Wexford's schools.

A low cost wind turbine can help promote environmental awareness among primary school children and provide a centrepiece for a school community.

In secondary schools, small wind turbine developments can be integrated into the science, maths, technologies, geography, business studies and even art course work. This has the added social benefit of increasing technical and innovative skills in the new work force.

Self-supporting lattice masts without guy wires are available for small turbines: such a mast, surrounded by a security fence, would be the safest and most space-efficient method for use in schools.

Bibliography

Architectural Heritage Protection: Guidelines for Planning Authorities Department of the Arts, Heritage, Gaeltacht and the Islands & Department of the Environment and Local Government. 2001

Attitudes towards the development of Wind Farms in Ireland Sustainable Energy Ireland. 2003

County Development Plan Wexford County Council. 2001

Guidelines for Planning Authorities. Department of the Environment and Local Government. 2006

European Best Practice for Wind Energy Development. EWELA London.

Framework and Principles for the Protection of the Archaeological Heritage Department of the Arts, Heritage, Gaeltacht and the Islands. 1999

Green Paper on Sustainable Development Department of Communications, Marine & Natural Resources

Guidelines on the Information to be contained in Environmental Impact Statements CAAS. EPA.2003

National Biodiversity Plan Department of the Arts, Heritage, Gaeltacht and the Islands. 2002

National Climate Change Strategy Ireland Department for the Environment and local government October. 2000

Planning for Wind Power. Guidelines for project developers and local planners Friends of the Earth. 1995

Regional Planning Guidelines South-East Regional Authority. 2004

Sustainable Development: A strategy for Ireland Department of the Environment. 1997

Wind Energy: A Policy for County Kerry in Renewable Energy Policy Kerry County Council. 2002

Wind Energy and Spatial Planning Procedures. PREFDAC European Seminar, Brest, France. 2002

Wind Farm Development. Guidelines for Planning Authorities DOE. Stationary Office, Dublin. 1996