

Kilkenny County Development Plan

2008 - 2014

Appendix D:

Wind Energy
Development
Strategy 2007



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1 - Introduction

1.1 Terms of Reference

This Wind Energy Strategy has been compiled as a review and update of the CAAS (Environmental Services) Ltd. Wind Energy Study prepared for Kilkenny County Council in 2003.

This Strategy advances the information and recommendations of the previous Wind Energy Study for County Kilkenny as suggested by CAAS whilst also taking into account the “Wind Atlas of Ireland” published by Sustainable Energy Ireland in 2003 and the “Wind Energy Development Guidelines” (2006) recently published by the Department of the Environment, Heritage and Local Government. Furthermore, CAAS (Environmental Services) Ltd. have been employed under a consultative and mentoring role in the preparation of this strategy.

The objective of this report is to evaluate and analyse the potential wind energy resource within County Kilkenny, to define environmental and planning considerations for windfarm development and to make recommendations on how Wind Energy Resource Development Policy and Practice can be improved. This document will clarify the Council’s policy towards wind energy developments in the county and will form the basis for assessment of planning applications for wind energy development and will assist in the decision making process.

2. Evaluation Method

The study examines the potential for using and developing wind energy in County Kilkenny. It takes account of the relevant international, national and county policies as well as the principal environmental, planning and technical criteria that determine the feasibility of the existing environment to absorb windfarm developments.

Environmental evaluation criteria at county level include the spatial analysis of land uses, designated ecological areas and topography.

Land use planning criteria includes a review of the previous development control policies relating to wind energy development from the previous County Development Plan, the national policies such as the Governments “National Climate Change Strategy” and the Department of Environment, Heritage and Local Government “Guidelines on Wind Energy Development” (2006) are also taken into account. Other criteria embrace the international Kyoto commitment to reduce greenhouse gases by promoting the use of renewable energy sources and the EU Renewables Directive.

Technical criteria include wind speed, grid connection potential and site suitability (construction and operational) all of which are described

and mapped in Section 5. The most significant environmental and planning evaluation criteria are generally recognised as the extent of visibility or 'viewsheds', which raise significant concerns.

The "County Wind Energy Strategy" will address commercial large scale wind farms, small scale community based windfarm projects, and individual turbines for private use. The specific policies relating to these different types of wind energy developments are covered in Section 8.

3 - Renewable Energy Resources

Development of alternative energy sources is a priority at National and European level for both environmental and energy policy reasons. The context in Ireland is set by Government policies for the provision of electricity from renewable and indigenous sources¹ in line with official European and United Nations targets for reducing dependency on fossil fuels and emission of greenhouse gases.

It is acknowledged that Ireland has a wind resource which is among the richest in Europe. This is mainly concentrated in the mountainous and coastal areas where landscape quality and environmental designations are also of considerable significance. This, in many cases, leads to significant land use planning conflicts which require careful resolution.

3.1 Current Renewable Energy Situation in Ireland

3.1.1 E.U. Obligations

The EU target is an obligation addressed to Ireland in Directive 2001/77/EC “*On the promotion of renewable energy sources in the internal electricity market*” to put in place a programme to increase the consumption of electricity from renewable energy sources from approximately 4% in year 2002 to 13.2% by 2010.

Ireland will need to have approximately 1,432MW of renewable energy powered electricity generating plant operational and installed by the end of 2009 to achieve the 13.2% target addressed to Ireland in the “RES-E Directive”.²

3.1.2 National Response Required

The main aim of the Government’s National Wind Energy Strategy³ was to deliver the revised target of 500MW of renewable energy based electricity generating plant announced in the “Green Paper on Sustainable Energy”⁴ by 2005, the majority of which is to be supplied by wind energy.

By May 2006, the installed renewable generation capacity was approximately 850 MW, of which wind accounted for 575 MW⁵. The initiative in Alternative Energy Requirements⁶ in line with Government policies was announced in 1994 and originally intended to obtain 75MW of electricity from renewable sources by 1997. The rules of the competition encouraged large-scale wind farms and consequently, 10 windfarm projects were awarded in the event supplying a total of 73MW. There have been 6 no. AER competitions to date; AER 5 was

¹ National Plan 1994

² Renewable Electricity to 2010 - Dept. of Communications, Marine and Natural Resources, (2004)

³ Strategy for Intensifying Wind Energy Deployment, Renewable Energy Strategy Group, Government of Ireland (2000)

⁴ Dep. of Public Enterprise; Irish Government Publications, Dublin (1999)

⁵ Energy Green Paper (2006)

⁶ Dep. of Public Enterprise; Irish Government Publications, Dublin (2001)

launched in May 2001. The initial target set was 255MW. However, in light of the response received and to ensure that the target was met, contracts totalling some 363MW were offered to the market.

Technology	Capacity Cap (MW)	Capacity offered (MW)
Large Scale Wind	200	318.3
Small Scale Wind	40	35.795
Hydro (Small Scale)	5	0.949
Biomass (Inc. Landfill Gas)	10	8.008
Totals	255	363.052

Table 1: AER 5 Scheme

AER has seen development largely concentrated in the north-western (and mainly upland coastal) region of the country, as contracts have generally been based only on competitive generation (and not supply) of electricity. Liberalised third party access accounts for only 10% of wind energy, but has allowed some development away from the west coast, in other regions where supply factors are favourable.

The most recent Alternative Energy Requirement competition, AER 6, aimed to ensure that the 500MW target for renewables based electricity-generating capacity, established in the 1999 “Green Paper on Sustainable Energy” was reached by 2005.

In Ireland while development of renewable energy is a government policy, the application of this policy is project based, rather than plan based. Consequently, there can often be significant local opposition to new windfarms as a result of concerns in relation to visual impacts, noise generation and their effect on infrastructure.

3.2 Future Trends and Developments in Wind Energy

As a result of a very strong demand growth in energy requirements, the EU’s ambitious wind power target, and the existing rich wind energy resource in the country, windfarms in the future are likely to spread onshore and offshore in Ireland. Current typical onshore windfarms have a 5MW to 30MW capacity, and comprise of turbines of 800/3000kW in capacity. They are connected to distribution networks at 20kV or 38kV and the transmission network at 110kV. Likely offshore windfarms encompass a 150MW to 250MW capacity, with 5MW turbines. These are generally connected to transmission networks at 100kV or 220kV.

The international trend however, is towards producing ever-larger wind turbines. This is because a small number of large wind turbines on a location in a certain area, yields more output than a large number of smaller wind turbines, which is a critical factor in the more densely populated northern European market. This may not be as important (or even appropriate) in Ireland, which has more rural and sparsely populated regions, but it is unlikely that Ireland can resist the trend, as

mass-production economies of scale will dictate that only the larger turbines may be viable. At the moment many projects are planned in which the turbines have a capacity of 2/3 MW with rotor diameters of 70 to 90 metres and hub heights up to 80 metres. A 20% increase in turbine diameter and height can result in a 50% or more increase in electrical output.

Notwithstanding this trend towards larger windfarms and larger turbines, there have been recent new interests in very small (3-5 turbines) developments by farmers seeking alternative income sources. Some analysts believe that there will be a significant increase in the number of such applications.

Measures at the design stage will assist in solving visual and noise impacts of social concern. Similarly, appropriate land use planning considerations will support planners and operators of the Irish power system in the development control of an evident and necessary growth in the use of the wind energy resource.

4 - Strategic Considerations

4.1 International and National Framework for Renewable Energy

The following is a summary of key objectives for renewable energy identified in government policy documents, programmes and acts.

4.1.1 Green Paper on Sustainable Energy

The Green Paper on Sustainable Energy⁷ sets the following targets in Ireland:

- Increasing the percentage of Total Primary Energy Requirement (TPER) to be derived from renewable sources to 3.75% in 2005 from 2% in 2000
- Increasing the percentage of electricity generated from renewable sources from 6.3% in 2000 to 12.39% in 2005. This includes an extra installed capacity of 500MW of electricity generated from renewable sources.

4.1.2 The National Climate Change Strategy (2000)

The National Climate Change Strategy⁸ outlines the strategy to meet Ireland's commitment to limit the growth in greenhouse gas emissions to a 13% increase above 1990 levels by 2012. Some of the key points relating to renewable energy in the strategy include:

- The reduction of annual CO₂ emissions by 1 million tonnes by 2010 through increased deployment of renewable energy
- Review of rate and structure of Energy Taxes
- Fuel switching from coal to renewable energy

A review paper of the National Climate Change Strategy was published in 2006 which in essence is a discussion document on the implementation of the strategic aims to date. The document also provides updated information on the national renewable energy needs/commitments such as;

- The Irish Government has recently signalled its intention to set a new national renewable energy target of 15% by 2010⁹
- Ireland is required to ensure that 13.2% of gross national electricity consumption comes from renewable sources by 2010¹⁰
- Projections by Sustainable Energy Ireland show Irelands total energy needs growing by 38% between now and 2020 and total electricity generation growing by 27.5%¹¹

A Government Green Paper entitled "Towards a Sustainable Energy Future for Ireland" was published in October 2006. This paper

⁷ Dep. of Public Enterprise; Irish Government Publications, Dublin (1999)

⁸ Dep. of the Environment and Local Government; Irish Government Publications (2000)

⁹ National Climate Change Strategy Review Paper (2006)

¹⁰ Source: Directive 2001/77/EC

¹¹ Source: Sustainable Energy Ireland, Energy in Ireland 1990 – 2004.

indicated that an all island renewable energy target would be set in 2007.

4.1.3 The National Climate Change Strategy 2007 – 2012

Published in April 2007, the Government's revised National Climate Change Strategy for the period 2007 to 2012 follows on from the first national strategy and review in 2002 and takes account of the public consultation process which followed the further review in Ireland's "Pathway to Kyoto Compliance" (2006).

The new strategy aims to;

- i) Show clearly the measures by which Ireland will meet its 2008 – 2012 commitment
- ii) Show how these measures position us for the post 2012 period

National/European Targets

- Ireland is to reduce its greenhouse gas emissions by 17 million tonnes (Mt) of carbon dioxide equivalent in the period 2008 – 2012
- The European Union has committed itself to reducing its greenhouse gas emissions to 20% below 1990 levels by 2020

Energy Sector Targets

The new strategy outlines specific measures to be put in place across all economic sectors in order for Ireland to meet its national target above. The Energy Supply targets relevant to this wind energy development strategy include:

- 15% of electricity is to be generated from renewable energy sources by 2010 and 33% by 2020.
- Biomass is to contribute up to 30% of energy input at peat stations by 2015.

4.1.4 Strategy for Intensifying Wind Energy Deployment

The Government's "Strategy for Intensifying Wind Energy Deployment"¹² aims are:

- To deliver the revised target of 500MW of renewable energy based electricity generating plant announced in the Green Paper on Sustainable Energy, the majority of which will be supplied by wind energy.
- To integrate planning considerations incorporating resource studies and access to the national electricity grid.
- To promote wind energy projects in the form of Alternative Energy Requirements (AER) competitions to ensure the early delivery of additional electricity generating capacity from renewable energy sources.

¹² Strategy for Intensifying Wind Energy Deployment, Renewable Energy Strategy Group, Government of Ireland (2000)

4.1.5 The National Development Plan 2007 – 2013

Published in January 2007 the new National Development Plan has allocated a total investment of €267 million for sustainable energy (sub-programme) for the period 2007 – 2013. The main investment areas target:

- Renewable energy measures will focus on achieving Government targets for renewable energy production and meeting policy goals with regard to competitiveness, the environment, security of supply, R&D and the development of a sustainable All-Island energy market. The primary focus will be on the large-scale deployment of wind, the emerging potential and deployment of biomass and biofuels, preparatory action on ocean energy and deployment of other technologies such as solar and geothermal technologies. Deployment will be delivered through a range of supports including taxation, direct grant aid and other funding or support mechanisms;
- Energy efficiency measures aimed at establishing and maintaining an effective market structure, informing and empowering consumers to make strong energy efficiency choices. The overall objective of the proposed programme will be the achievement of an annual saving of at least 1% of energy use across the economy over the lifetime of the Plan. Increased energy efficiency will mitigate energy demand growth, reduce import dependence, contribute to carbon reductions and mitigate growth in the energy bill, for the economy and for the individual; and
- Integration and innovation measures will focus on integrating sustainable energy practices and structures into public policies and the development of regional and national infrastructure. There will be two sets of activities: the integration of national sustainable energy policy measures at a regional and city level, and the smaller-scale piloting and evaluation of sustainable energy technology options, including those in the renewable energy, energy efficiency and urban transport areas.

4.1.6 The Wind Energy Development Guidelines (June, 2006)

The recently published “Wind Energy Development Guidelines” by the Department of the Environment, Heritage & Local Government supersede the “Wind Farm Development Guidelines” of 1996. The new Guidelines aim to offer advice to Planning Authorities on planning for wind energy through the Development Plan process and in determining applications for planning permission. They also provide a sample methodology for the identification of suitable locations for wind energy development within their boundaries and the treatment of planning applications for wind energy development proposals. The guidelines are also to be used as a useful guide for developers and the wider public when considering wind energy developments.

4.1.7 Electricity Act (1999)

The Electricity Act (1999) sets out the following measures:

- Full deregulation of the market for electricity generated using renewable forms of energy as its primary source
- Priority dispatch of electricity generated from renewable energy sources
- Establishment of the Commission of Electricity Regulator with a duty to encourage research and development into methods of generating electricity using renewable, sustainable and alternative forms of energy

4.1.8 Kyoto Protocol

The Kyoto Protocol¹³ is an international treaty which indirectly contains Ireland's commitment to limit greenhouse gas emissions to a 13% increase over 1990 levels by 2008 – 2012 and which calls for research and development in the areas of renewable energy. Furthermore, the EU target of 12% of energy supply from renewable sources by 2010, enacted by the EC Directive 2001/77/EC on the promotion of electricity produced from renewable energy sources, converts a component of the Kyoto target into a requirement for Ireland to generate a minimum of 13.2% of its electricity from renewable energy sources by 2010 (a revised Government target of 15% by 2010 is now in place).

Finally, as a result of the Electricity Act the Government runs competitive tendering competitions (AER) for 15 year Power Purchase Agreements for the generation of electricity from renewable energy generating plants. Thus, the electricity market has been completely liberalised for green energy.

4.1.9 Bioenergy Action Plan for Ireland (March, 2007)

The new Government action plan has been launched as a comprehensive strategy to increase the deployment of renewable energy across three key sectors: transport, heat and electricity. Among the commitments in the Government Action Plan are:

- By 2020 a third of all electricity consumed in Ireland will come from renewable sources (i.e. wind, tidal, solar, etc.)
- All peat electricity power stations will be co-fired by 30% renewable material by 2015
- 12% of all residential and commercial heating will be powered by renewable sources (wood chips, solar, etc.)

The Bioenergy Action Plan is one element of a comprehensive renewable energy policy and a broader national energy policy. A White Paper on Energy is due to be published later in 2007 together with a revised National Climate Change Strategy.

¹³ United Nations Framework Convention on Climate Change (1997)

4.1.10 White Paper on Energy 2007 – 2020 (March, 2007)

Published in March, 2007, the new White Paper on Energy sets out the Governments Energy Policy Framework for the period 2007 to 2020. The White Paper sets out targets for renewable energy in the electricity, transport and heating sectors. As a result, by 2020 one third (33%) of electricity consumed in this economy will come from renewable sources.



5 - Considerations for Evaluation of Wind Energy in Kilkenny

5.1 Environmental Considerations

5.1.1 Ecological Designations

Existing ecological designations in Kilkenny County are shown on Map 9. These include Natural Heritage Areas (NHA), Special Areas of Conservation (SAC) and Special Protection Areas (SPA).

Natural Heritage Areas are mainly located in the environs of the Rivers Nore, Barrow and Suir. There are also a number of other NHAs dispersed throughout the County. The following are the locations of the existing and proposed NHAs and cSACs (indicated with #) in County Kilkenny:-

Site Code:	Site Name:	1/2" Map No:
002051	Archersgrove	51
000821	Ardaloo Fen	50
000400	Ballykeefe Woodland	50
000698	Barrow River Estuary	58
000827	Brownstown Wood	58
000830	Clohastia	51
#000831	Cullahill Mountain	44
000401	Dunmore Cave	51[<1ha]
001859	Dunmore Complex	50/51
000832	Esker Pits	51
000402	Fiddown Island	57
001858	Galmoy Fen	44
000403	Garryrickin Nature Reserve	57
000833	Grannyferry	58
000404	Hugginstown Fen	58
002094	Ice House near Inistioge, Co Kilkenny	58 [<1ha]
000836	Inchbeg	50
000837	Inistioge	58
000839	Kilkeasy Bog	58
000405	Kyleadohir Wood Nature Reserve	50
000842	Kylecorragh Wood	58
000406	Lough Cullin	58
001914	Lough Macask	50
#002137	Lower River Suir	57,58
000408	Mothel Church, Coolcullen	51 [<1ha]

000843	Mount Juliet	51
000844	Murphy's of the River	58
000845	Newpark Marsh	51
000409	Rathsnagadan Wood	58
000846	Red Bog, Dungarvan	51
#002162	River Barrow and River Nore	
002076	River Nore/Abbeyleix Wood Complex	44
#000849	Spa Hill and Clomantagh Hill	50
#000407	The Loughans	50
000410	Thomastown	51
000411	Tibberaghny Marshes	57
000855	Whitehall Quarries	51

NHAs are a national designation introduced by the Wildlife (Amendment) Act 2000, however these designations are not yet in force as the relevant legislation has not yet been enacted. Development within an NHA may be considered by the Minister and permitted for *'imperative reasons of overriding public interest'* including those of social or economic nature. In practice, development proposals within NHAs are typically refused or given consent with conditions.

Special Areas of Conservation cover the riverbanks of the Nore River, crossing the County in a north-south direction, as well as the western banks of the River Barrow and the eastern banks of the River Suir.

SACs have been created by the Habitats Directive (92/43/EEC) to enable the protection, conservation and, where possible and necessary, restoration of certain habitats and/or species. Designated SACs are compiled within a framework of protected areas – i.e. *Natura 2000*. Developments that may impact on priority habitats and/or species (rare habitats and species that have been given priority status in Ireland) may only be allowed for health and safety reasons whilst for non-priority habitats and/or species, reasons for granting permission may also include economic and social ones.

There are neither existing nor proposed Special Protection Areas (SPA) in County Kilkenny.

Whilst every individual project is considered on its own merits, windfarm developments proposed within the boundaries of any of the ecological designations mentioned above, have been typically refused. In practice, it is apparent that the scale, dimensions and characteristics of windfarm projects significantly affect the quality and integrity of designated natural areas. However, windfarm developments typically disturb only 2% of site terrain, thus disruption to the natural environment is minimal. It is considered that proper management during establishment and decommissioning of



windfarms will ensure negligible disturbance to a sites natural habitat. In conclusion, even though ecological designations represent key factors on planning terms, they could prove favourable for future windfarm developments.

5.1.2 Population Concentrations

The total population of County Kilkenny amounted to 87,394 persons in 2006¹⁴. While the total population increased by approximately 8.8% in the period 2002 – 2006, parts of the County experienced population decline. Growth was predominantly concentrated in eastern and south-eastern areas, and in the proximity to the main towns, particularly Kilkenny, Callan, Thomastown and the Waterford City Environs area (See Map 1).

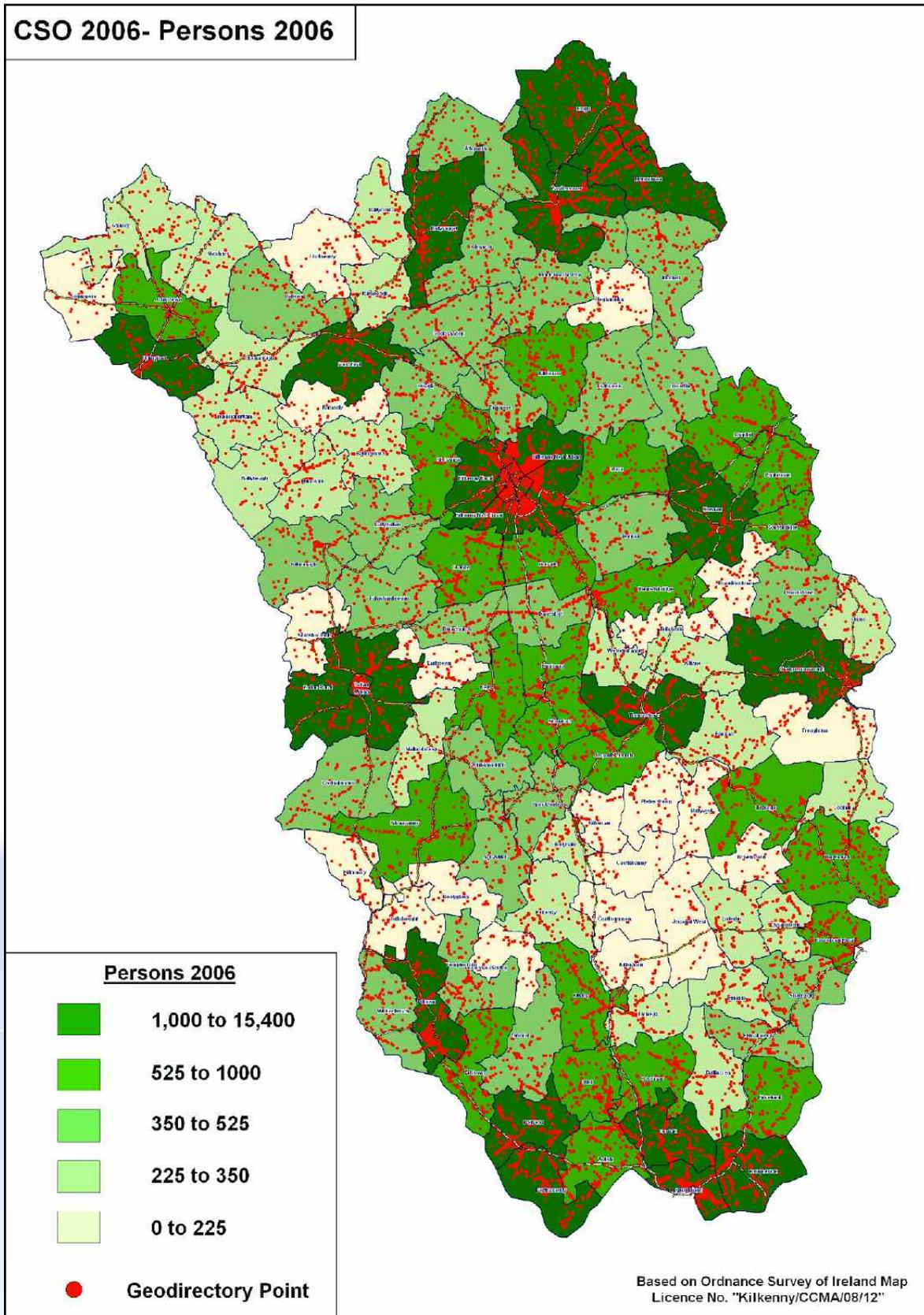
Kilkenny is a predominantly rural county with a strong pattern of independent towns and villages connected by the national and regional road network. There are a considerable number of smaller villages and settlement clusters with low population densities.

Approximately 60.28% of the population lived in a rural area in 2006 (Census, 2006 Preliminary Results) and the population increased more significantly in rural areas than in urban centres. These areas continue to experience severe development pressure. The share of population accounted for by urban centres remained stable, while that of the environs of the towns of Kilkenny, Callan, Thomastown, Castlecomer and Waterford City continue to rise.

As a result of the rural character of the County, the dispersed settlement pattern and the existing development pressure, it is likely that in many cases windfarm developments will lead to land use planning conflicts and significant local opposition, due mainly to concerns in relation to visual and landscape character as well as impacts due to noise generation.

¹⁴ Source: Census 2006 Preliminary Results (CSO)





Map 1: Population Density of Kilkenny (Source: Census 2006)

5.1.3 Landscape Sensitivity

Every landscape can be affected to some degree by new developments. For the purpose of development management, it is important to determine the extent of the land affected by the visual impacts of the proposed development.

It is reasonable to assume that any evaluation of the visual impact of a proposed development should have regard to whether the area of the visual impact has been kept to a reasonable minimum, so that actions by an individual do not impose disproportionate effects on the community as a whole.

To illustrate the extent and significance of the visual impact from windfarm developments, areas of potential visual impact around the locations of the current granted windfarm planning applications have been created (see Map 4). It is conservatively assumed that wind turbines are significantly visible from a distance not exceeding 5km. As the space between viewing location and wind turbines expand, their prominence decreases. For this analysis 15km is used as the maximum potentially visual extent – though in practice windfarms in elevated areas are plainly discernible at distances in excess of 20kms.

Further windfarm establishment is likely to increase the visual extent and, therefore, the visual impact of such developments throughout the county.

5. 2 Planning Considerations

5.2.1 Landscape Protection Policies

The County Development Plan 2002 designated a number of 'Areas of High Amenity' (See Map 9). These are areas in the county which have out-standing natural beauty and/or unique interest value.

The policy context recognises that measures will be taken to control all development within the Areas of High Amenity so as to exclude from them any development which would be prejudicial to their natural beauty and visual amenity.

It is also required that when development is permitted within 'Areas of High Amenity,' a very high standard of siting, design and landscaping will be required in order to ensure that the proposed development will be assimilated into the existing landscape.

The County Development Plan 2002 – 2008 also recognises that there is a need to protect and conserve views and prospects adjoining public roads and river valleys throughout the county where these views are of high amenity value. Policy measures to achieve these include:

- a) To preserve, improve and open up places or areas from which views or prospects of high amenity exist.



However, it is stated that in conserving views, it is not proposed that this should give rise to the prohibition of development along these routes but development, where permitted, should not seriously hinder or obstruct these views and should be designed and located to minimise their impact.

A **Landscape Character Assessment** study document has been prepared as part of the preparation of the Kilkenny County Development Plan 2008 – 2014. This should be read in conjunction with this Wind Energy Development Strategy.

5.3 Technical and Other Relevant Considerations

5.3.1 Wind Speed

The cost at which windfarms can generate (and in some cases, supply) electricity depends on many factors (access to grid, construction costs, planning considerations etc.), but wind speed is of course a critical factor. The viability of windfarms depends on these costs and the price which they are paid for the electricity. Given prices offered under the recent Alternative Energy Requirement 5th competition, wind speeds above 8.5m/s at 50m hub height are generally required. Future schemes may however enable some windfarms in favourable sites (close to consumer demand or where the windfarm will reinforce the grid) to be viable at lower wind speeds – perhaps down to 7m/s.

Elevation obviously has an impact on wind speeds, but is not all determining – for example wind energy at sea level on the west coast may be higher than at 300m elevation in the midlands. Furthermore construction, grid connection and maintenance costs may be higher at greater elevations and therefore affect viability.

Kilkenny's wind distribution presents generally an average of 7 to 7.5m/s of wind speed¹⁵. Through the results of the published "Wind Atlas of Ireland" (2003) it is now possible to identify and map the areas in the county where the greatest potential in economic and technical terms exist for wind energy developments.

5.3.2 ESB Grid Connection

110kV and 38kV electricity lines and substations are mapped to show the main route corridors of the ESB coverage (see Maps 7 & 8). Large windfarms produce large amounts of electricity which needs to be fed into the electricity network – this can be a constraint both in practical and cost terms to the location of large windfarms. In addition to grid connection, the transport of energy from the turbines to a substation, which connects to the grid, will usually require the establishment of ancillary infrastructure which may create additional visual impact. However, the new connection of the wind turbines to the substation

¹⁵ Wind map for Ireland (2001)

(and sometimes from the substation to the grid) generally uses underground cables, minimising the visual impact of overground cables carrying the electricity to the main grid.

The scale of modern larger windfarms can however ensure that grid connection cost (up to 10-15km) is generally not a significant constraint.

A separate planning permission is normally required for connection of the power lines to the national grid.

5.3.3 Noise

There are two sources of noise from wind turbines: the mechanical noise from the turbine and the aerodynamic noise from the blades. The former can be considerably reduced by appropriate engineering practice. The aerodynamic noise depends on the rotor speed, which in return depends on the wind speed.

In any case, noise levels emanating from proposed windfarm developments when measured at the nearest inhabited house should not exceed 40dB(A) (15 minute leq.¹⁶) at a wind speed of 5m/s and 45dB(A) (15 minute leq.) at wind speed in excess of 10m/s¹⁷. Measurements shall be made in accordance with I.S.O. Recommendations R.1996/1 "Acoustics-Description and measurement of Environmental Noise, Part 1:Basic qualities and procedures".

In general terms, and as a result of the typical population density of rural parts of County Kilkenny, it is likely that noise does not represent a major concern or case for objections. Nevertheless, noise impacts should be assessed in relation to the nature and character of the surrounding environment. Strategic measures should be taken to ensure a good acoustical design of turbines, in order to guarantee that there are no significant increases in ambient noise level at noise sensitive locations.

5.3.4 Access Roads

The development of an efficient strategic transport system in line with national policy is essential to the future economic social and physical development of County Kilkenny.

The Council's long-term objective is to implement the Government's strategy for National Roads within the County and to develop an integrated sustainable system of transport.

An integrated and enhanced road network based on the National Routes linked to Regional, County and Local Roads will offer major benefits to the County as a whole and to the regional and national economies, including:-

¹⁶ equivalent continuous noise level

¹⁷ Wind Farm Development Guidelines for Planning Authorities, Dept. of the Environment (1996)

- supporting links to the main urban areas, towns and ports in the Region
- improvement in road safety and maintenance of road capacity
- reducing isolation, improving the quality of life and fostering rural development, diversification, natural resource development and tourism

In the interest of proper planning and sustainable development, the County Development Plan states that the County Council will allow, among others, the development of new roads in large or strategic developments, particularly where associated with agribusiness, tourism and the need to promote rural resource development.

In any case, access roads to windfarm sites should be minimised. Windfarms availing of currently existing roads further reduce the footprint of the development on the proposed site. Therefore, the use of existing roads and farm tracks must be encouraged at all times, avoiding the construction of unnecessary roads. Where new access roads are required, unsealed surface (e.g. quarry screenings) over compacted surface should be applied to allow minimum disturbance of the proposed site.



6 - Evaluation

6.1- Typical Windfarm Impacts

Major windfarm impacts and concerns principally arise due to the visual impact of the wind turbines with the landscape.

- **Receiving Environment**

There are three typical scales of landscape enclosure in the Irish countryside – all occur within Co. Kilkenny.

Small-Scale Enclosures – these are provided by trees and field boundaries – such as hedgerows. These effectively cause objects up to 10m in height to become quickly screened at distances in excess of 300m (approx).

Medium-Scaled Enclosures – these are provided by local topographical features and variations – such as rivers and stream corridors, glacially formed features (eskers and drumlins) and features caused by gradual erosion of sedimentary and superficial deposits. These effectively cause objects up to 50m to become screened at distances in excess of 5 km from the object.

Large-Scaled Enclosures – topographical features of geographic origin – hills, mountains and plateaux, provide these. They are rarely less than 150m in height and screen objects throughout the landscape.

- **Turbine Impacts**

The height, colour and movement of turbines mean that they will generally be distinctive, conspicuous and contrasting within almost all Irish landscapes (the exception being within existing large-scale industrial environments - such as major ports). Visibility is limited only by the horizon (15 – 25km) or by large-scaled enclosures (See above). Weather conditions may play a significant role in limiting visibility during mist and cloud or heat haze. However, a significant impact is generally experienced within a radius of 10 to 15kms from the location, both in visual and landscape character terms.

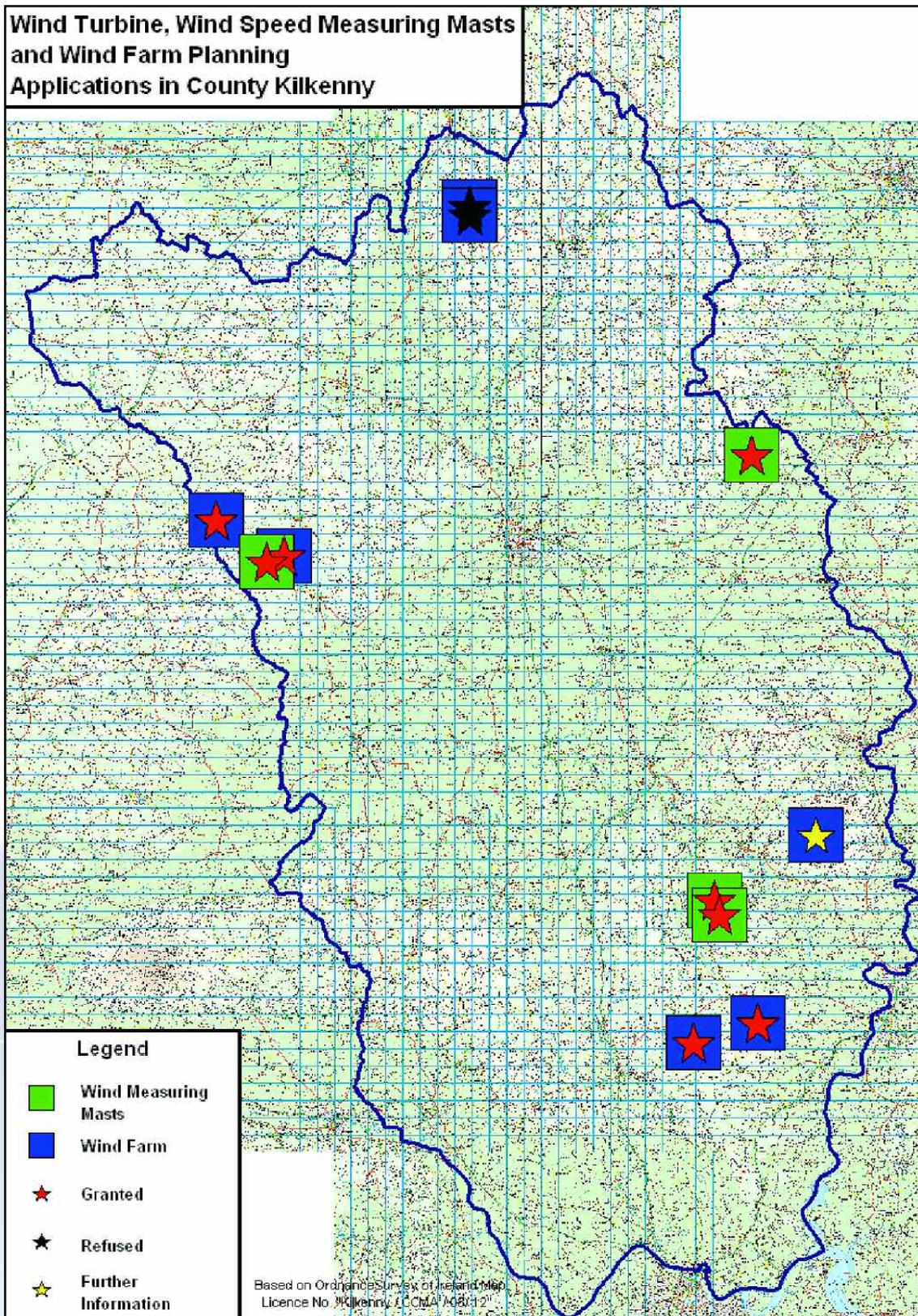
6.2. Existing and Emerging Trends

Nine planning applications for windfarm developments have been submitted to Kilkenny County Council to date since 1998 (see Table 2). Four windfarm developments have been granted permission in the county overall. Two are located west of Tullaroan and two northeast of Mullinavat.

The majority of the windfarms applications are located along the River Nore, to the south-east of the County (see Map 2). The proposed windfarms involve upland locations.

Reg. Ref	Applicant	Site/Townland	No. Turbines	Output (MW)	Status
05/1256	Art Generation	Foylature, Courtstown, Tullaroan	5	N/a	Granted
05/81	Ecopower Developments Ltd.	Ballymartin/Ballynalacken, Ballyouskill	5 turbines & 1 measuring mast	N/a	Refused
03/1585	Paul Martin	Ballymartin, Smithstown	3	N/a	Refused – But Granted after Appeal
03/1117	Ecopowers Developments Ltd.	Rahor Ballallog Guillkagh More, Brownstown	5	-	Refused –But Granted after Appeal
03/662	Ecopower Developments Ltd.	Ballymartin/Ballynalacken, Ballyouskill	5 turbines & 1 measuring mast	N/a	Refused
02/1072	ART Generation Ltd.	Ballybeagh	5	175 MW	Granted
01/1744	Wind Energy Developments c/o Rural Developments Consultants	Ballyvool	4	660 KW	Further Information
01/1328	Wind Energy Developments c/o Rural Developments Consultants	Ballyvool	1 wind measurement mast	N/a	Granted
01/937	Tom Tennyson	Bohilla	4	N/a	Refused
00/1510	Tom Tennyson	Bohilla	1 wind measurement mast	N/a	Granted
98/948	Pollution Free Electricity Ltd.	Ballygub New	4	N/a	Further Information (5/11/98 – No reply to date)

Table 2: Windfarm planning applications to date



Map 2: Proposed Wind Energy Developments – Recent Planning History

In addition, there have been 16 no. Pre-planning application enquiries recorded to date (See Table 3 below).

Reference number	Name	Townsland	Date lodged	Description
PC2456A	Glen Starr	Rahora	03/03/2001	Proposed windfarms.
PC1017	Ecopower Development	Cromwells Rd	09/07/2003	Possible Windfarm Re. FI
PC1022	Tommy Cook	Toorbeg	09/07/2003	Proposed Windfarm at Toorbeg
PC134	ESB International		15/08/2002	Windfarm at Ballygub, Inistioge
PC1347	Phil Keneally	Mullinavat	10/10/2003	Windfarm FI 03/1117 EIS Assessment
PC161	ART	Boggan	10/09/2002	Proposed Windfarm at Boggan, Co. Kilkenny
PC261	Michael McCabe	Brandon Hill, Graiguenamanagh	20/11/2002	Proposed Windfarm at Brandon Hill, Graiguenamanagh
PC302	P. Kenneally P. Bret	Ballyouskill	04/12/2002	Proposed Windfarm at Ballyouskill
PC319	Tommy Cullen	Dungarvan	06/12/2002	Proposed Windfarm at Dungarvan, Co. Kilkenny
PC65	Ecopower	Rahora, Mullinavat	17/05/2002	Proposed Windfarm site at Rahora, Mullinavat
PC700	Pierce Comerford	Coolgrainey	09/04/2003	Proposed windfarm
PC721	Paul Bowes	Paulstown	16/04/2003	Proposed windfarm
PC988	Philomena Kenneally	Listerlin	27/06/2003	Proposed windfarm at Listerlin
PC990	P. Blount	Moanteenmore	02/07/2003	Windfarm at Moanteenmore
PC3254	P. Brett	Ballyouskill/Ballylacken	10/09/2004	Windfarm
PC4245	Paul Bowes Pim De Ridder	Coorleagh	15/02/2005	Windfarm

Table 3: Windfarm pre-planning enquiries to date



7 - Analysis of Suitable Areas in Co. Kilkenny for Wind Energy Development

In accordance with the recommendations of the "Wind Energy Development Guidelines" (2006) in relation to the identification of suitable areas in the county for wind energy developments, this section of the strategy will adhere to the step-by-step methodology as suggested in Section 3.5 of the ministerial guidelines. The methodology will involve a sieve mapping analysis of the key environmental, landscape, technical and economic criteria which must be balanced in order to identify the most suitable locations in Kilkenny for wind energy developments.

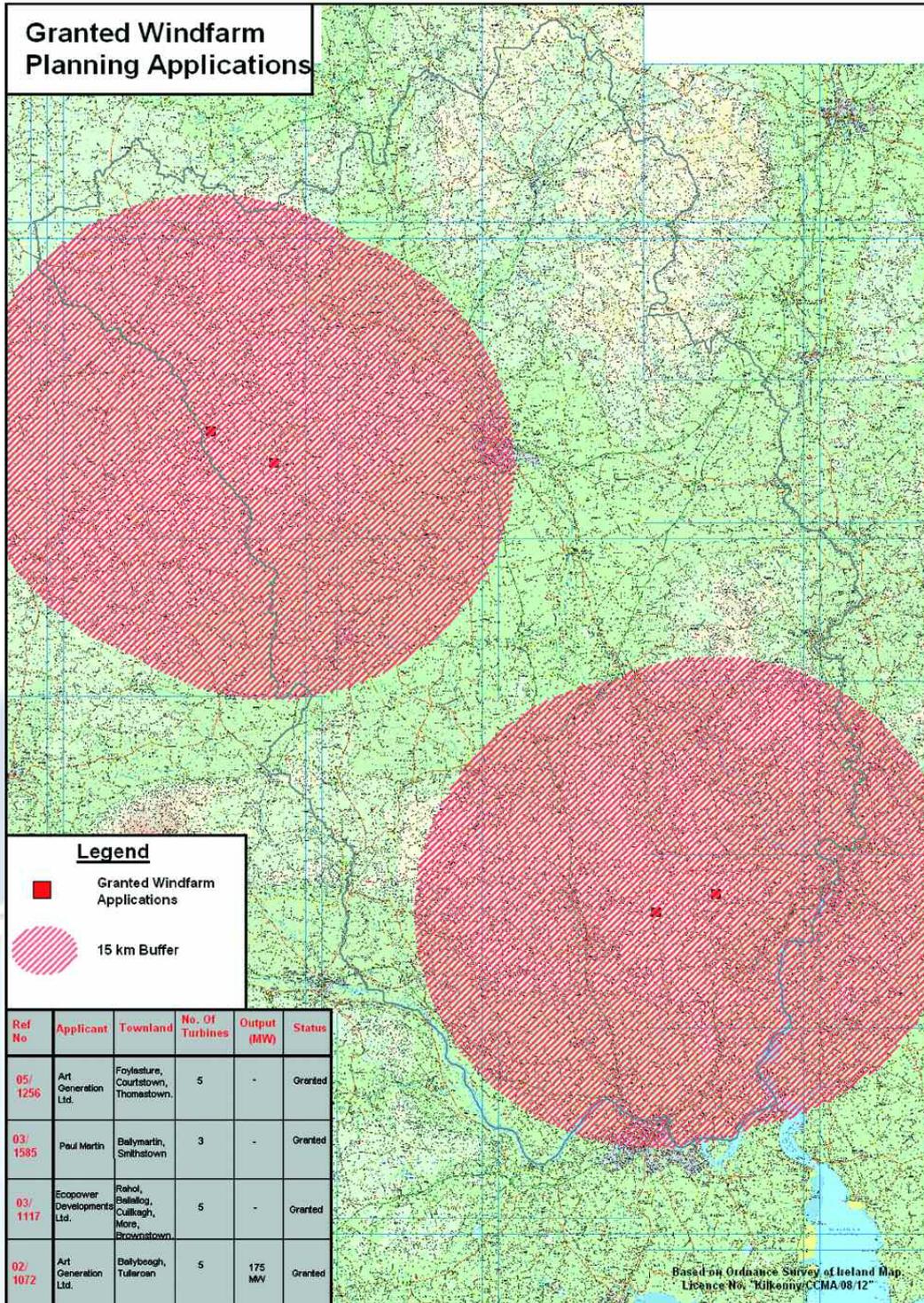
7.1 Step 1: Assessing the Wind Potential in the County using the 'Wind Atlas for Ireland'

In order to assess the potential wind energy product in the county, a number of maps have been prepared using the digital data available in the "Wind Atlas for Ireland" published in 2003.

In order to obtain the most accurate data from the wind atlas, it was decided to use the constrained wind data. In addition, it was decided to use the mean annual wind power density data at 75m above ground level (see Map 3). This map identifies areas in the county where commercial wind energy developments are most likely to operate due to the availability of an adequate wind energy resource.

7.2 Step 2: Map locations and Zone of Visual Influence of all permitted Wind Farms within the County as ‘Highly Suitable’

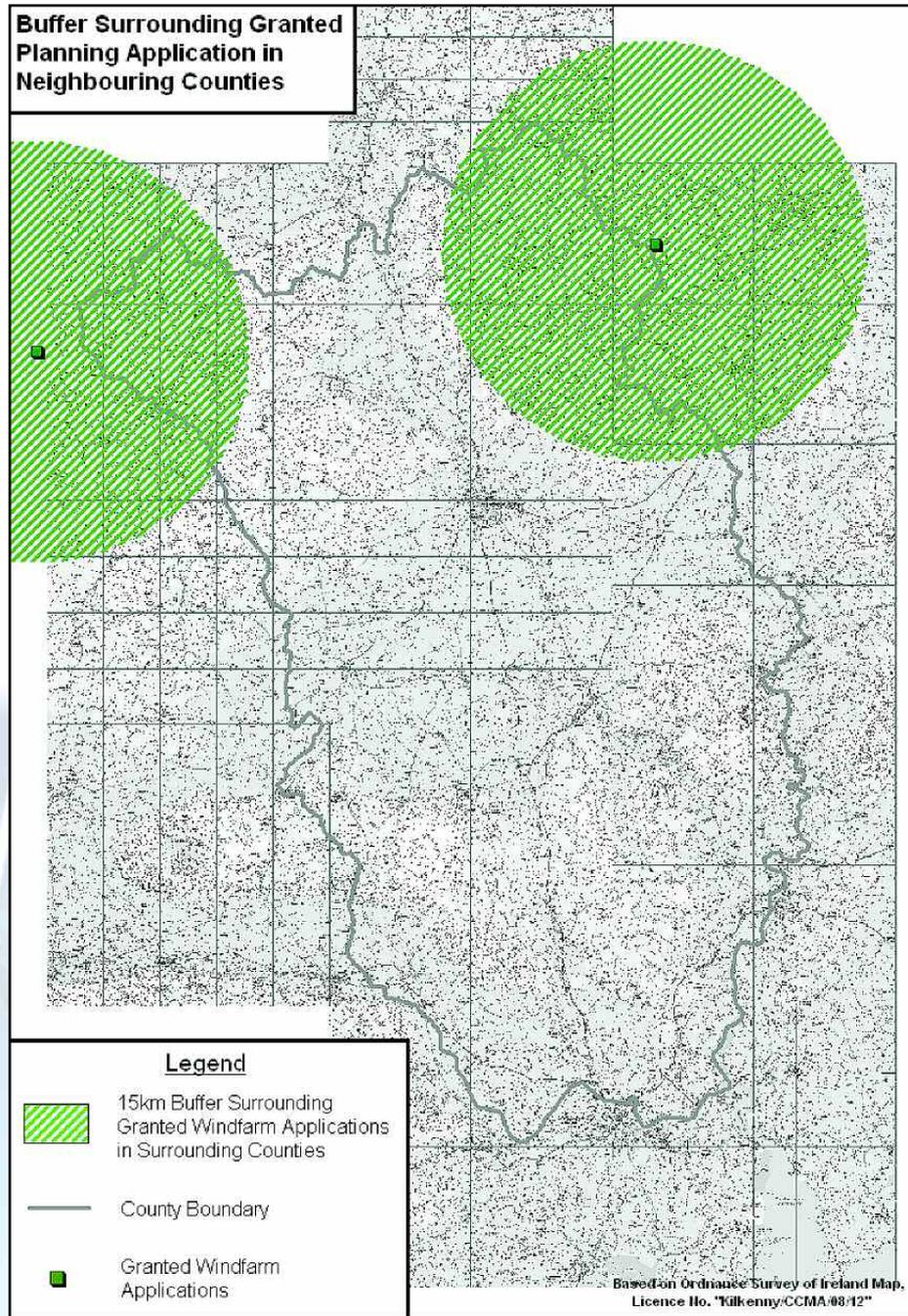
There are 4 no. planning applications granted for windfarm development in County Kilkenny. Two windfarms have been permitted in a location west of Tullaroan village and a further two windfarms have been granted northeast of Mullinavat. Their locations are identified in Map 4 below. A 15km zone of potential visual influence buffer has been marked around each of these windfarms.



Map 4: Location of Granted Windfarm Development & their Zone of Visual Influence

7.3 Step 3: Map the location of Zone of Visual Influence of all permitted Wind Farms in adjoining counties within 10km of the County as ‘Highly Suitable’

There is one planning application granted by North Tipperary County Council for a windfarm development in Lisheen comprising of 22 no. wind turbine generators. (Please note that the decision to grant permission has been appealed to An Bord Pleanala. No final decision has been reached at the time of writing).

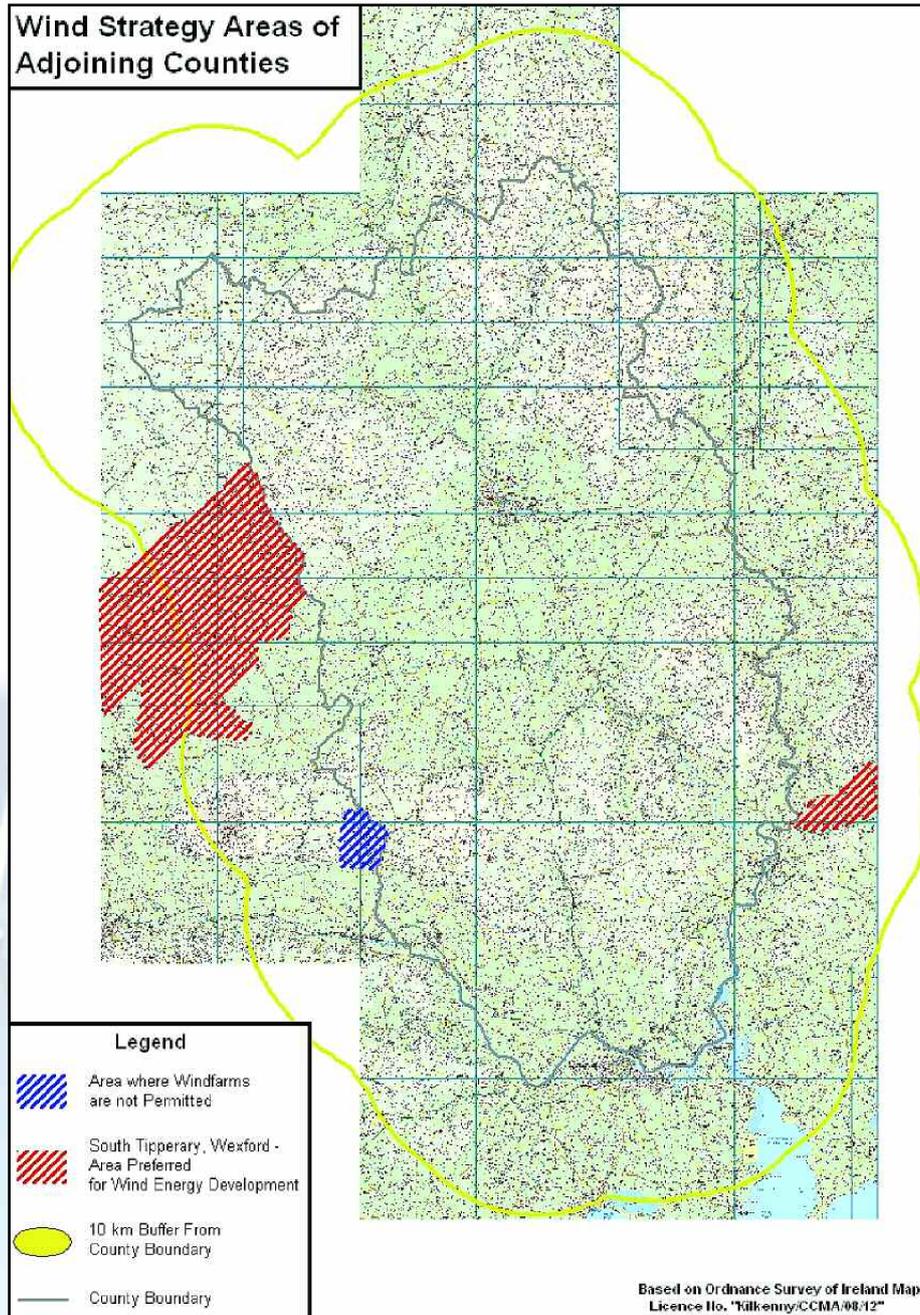


Map 5: Windfarm Applications Granted in Adjoining Counties & Zone of Visual Influence

7.4 Step 4: Map Wind Energy Strategy Areas of adjoining counties within 10kms of the County Boundaries as ‘Highly Suitable’

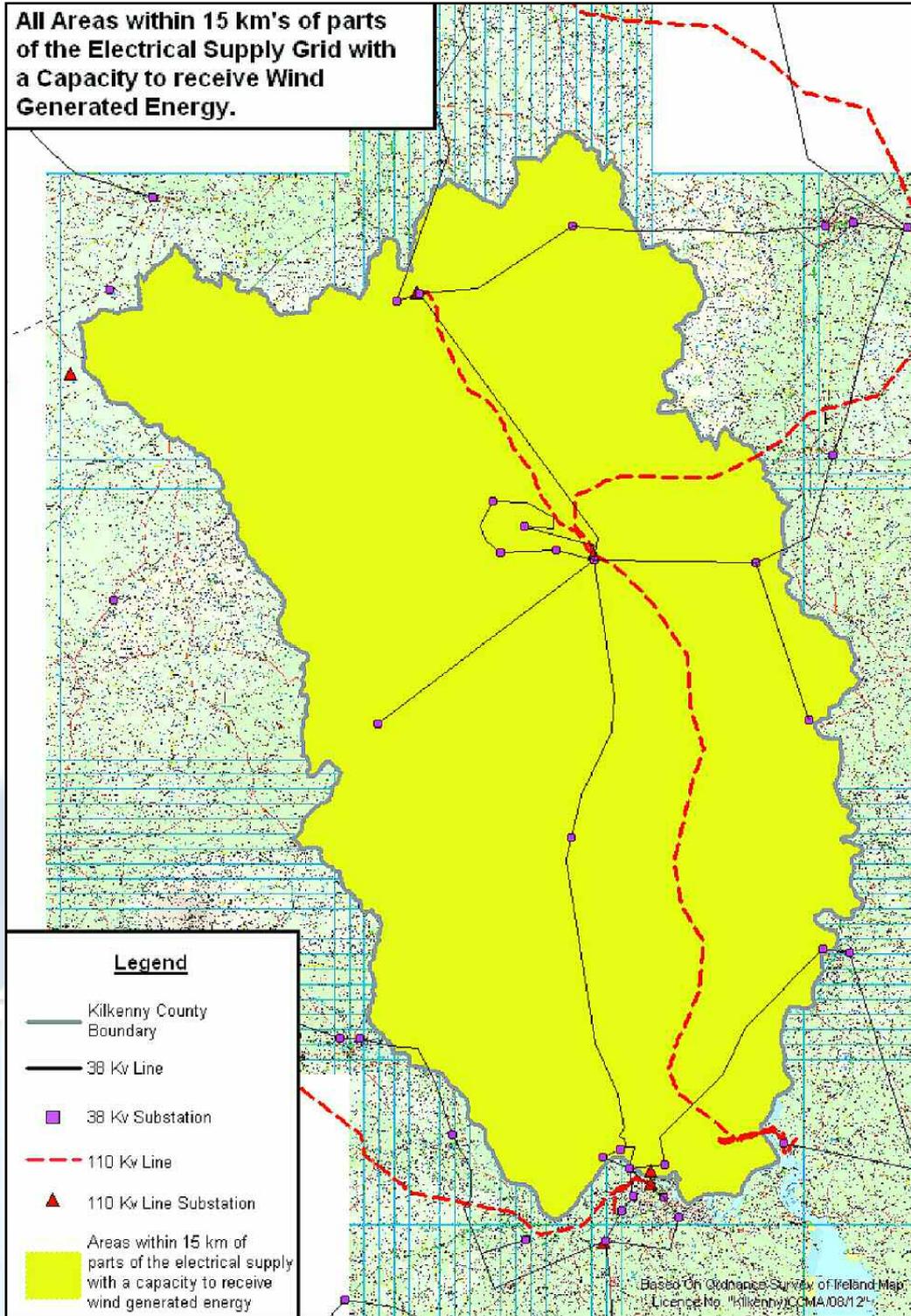
Below is a map which identifies both the preferred and non-preferred areas for wind energy developments in the adjoining counties. In terms of clarifying which adjoining local authorities have wind energy strategies in place, please note the following

- South Tipperary County Council – Wind Energy Strategy adopted in December, 2006
- North Tipperary County Council – Draft Wind Energy Strategy published in July, 2006
- Wexford County Council – Draft Wind Energy Policy published in December, 2006



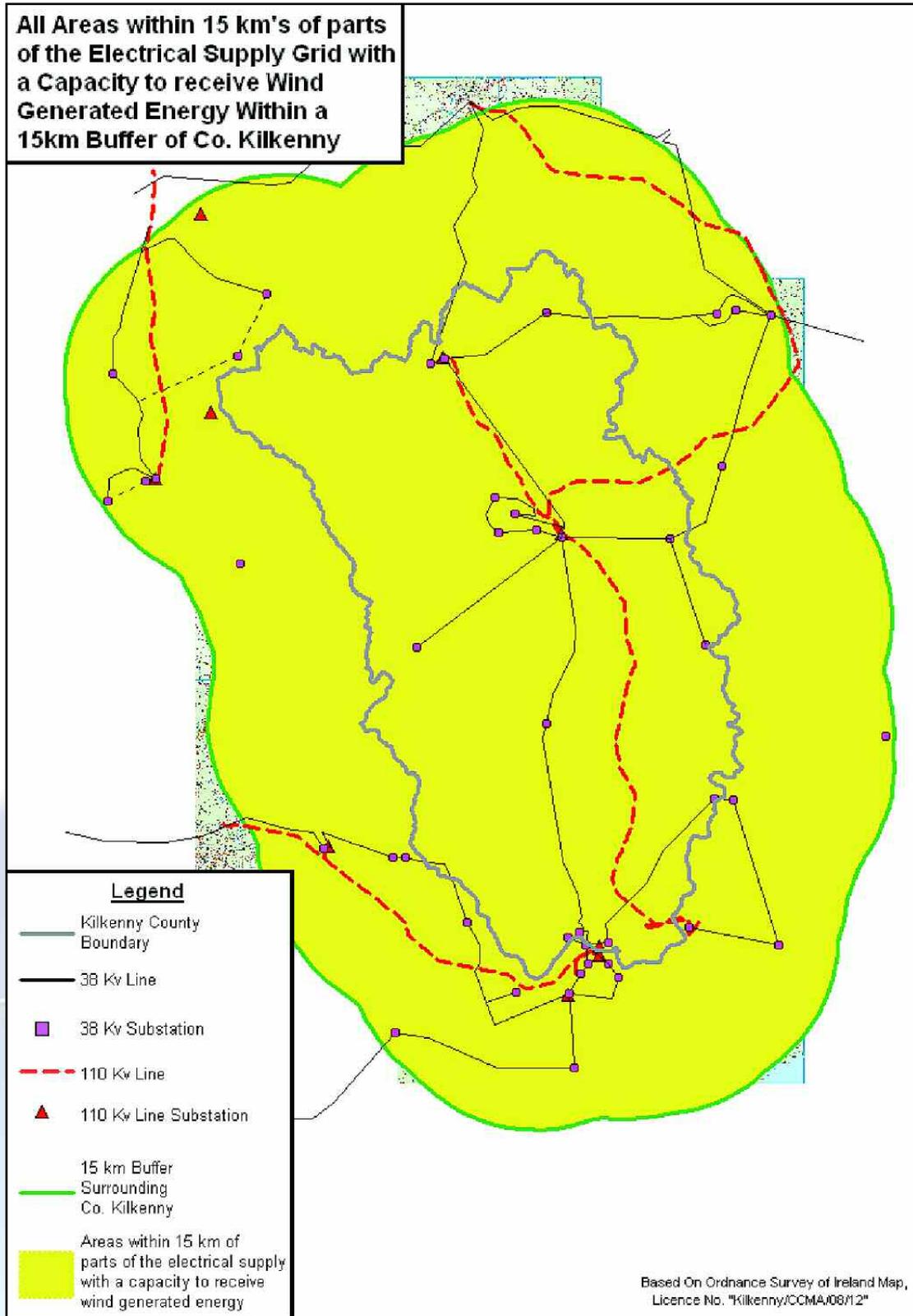
Map 6: Wind Energy Strategies in Adjoining Counties

7.5 Step 5 (a): Map areas within 15km of parts of the electrical supply grid with a capacity to receive wind-generated energy as being 'Highly Suitable'

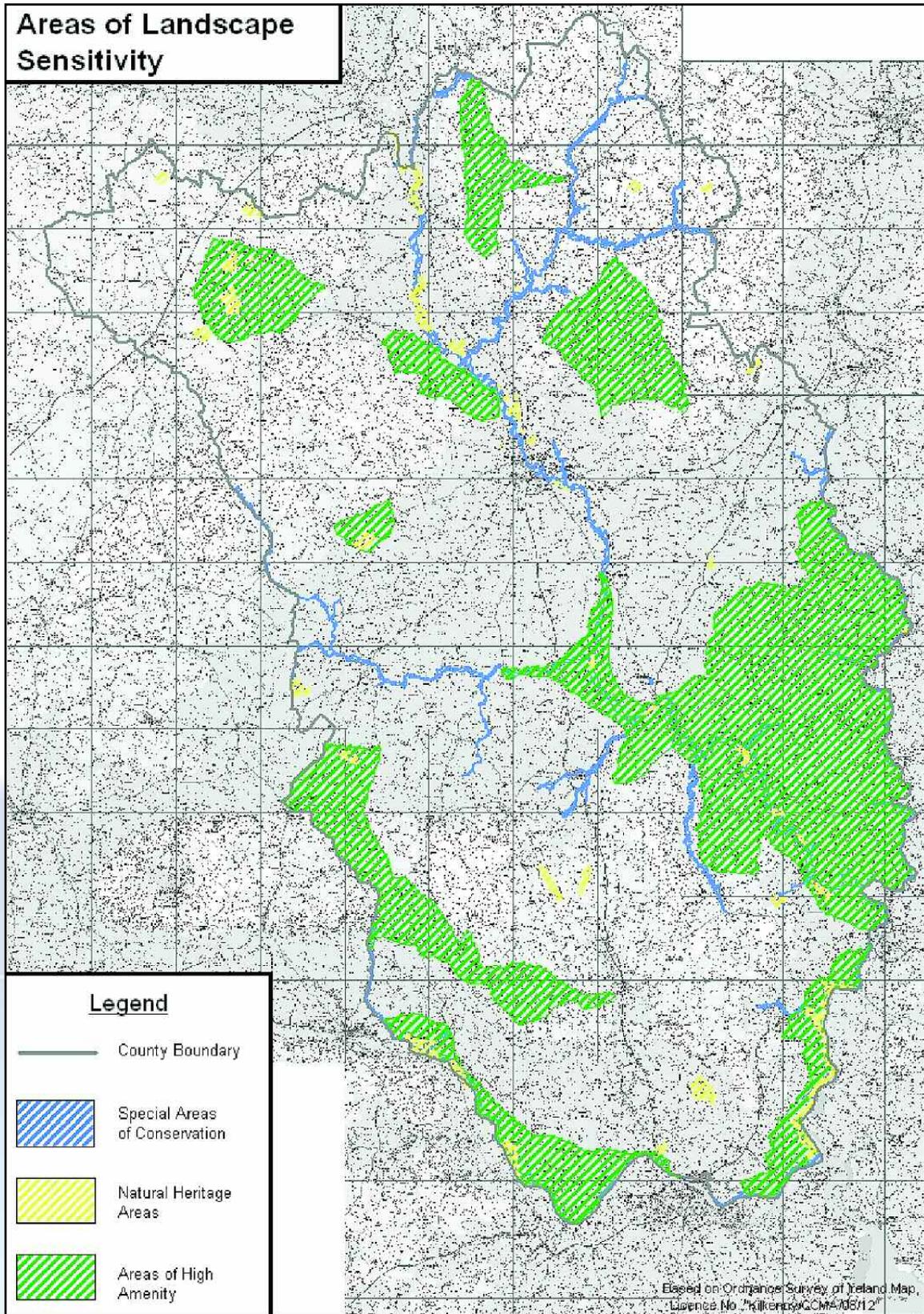


Map 7: Areas within 15km of the Electrical supply grid (substations)

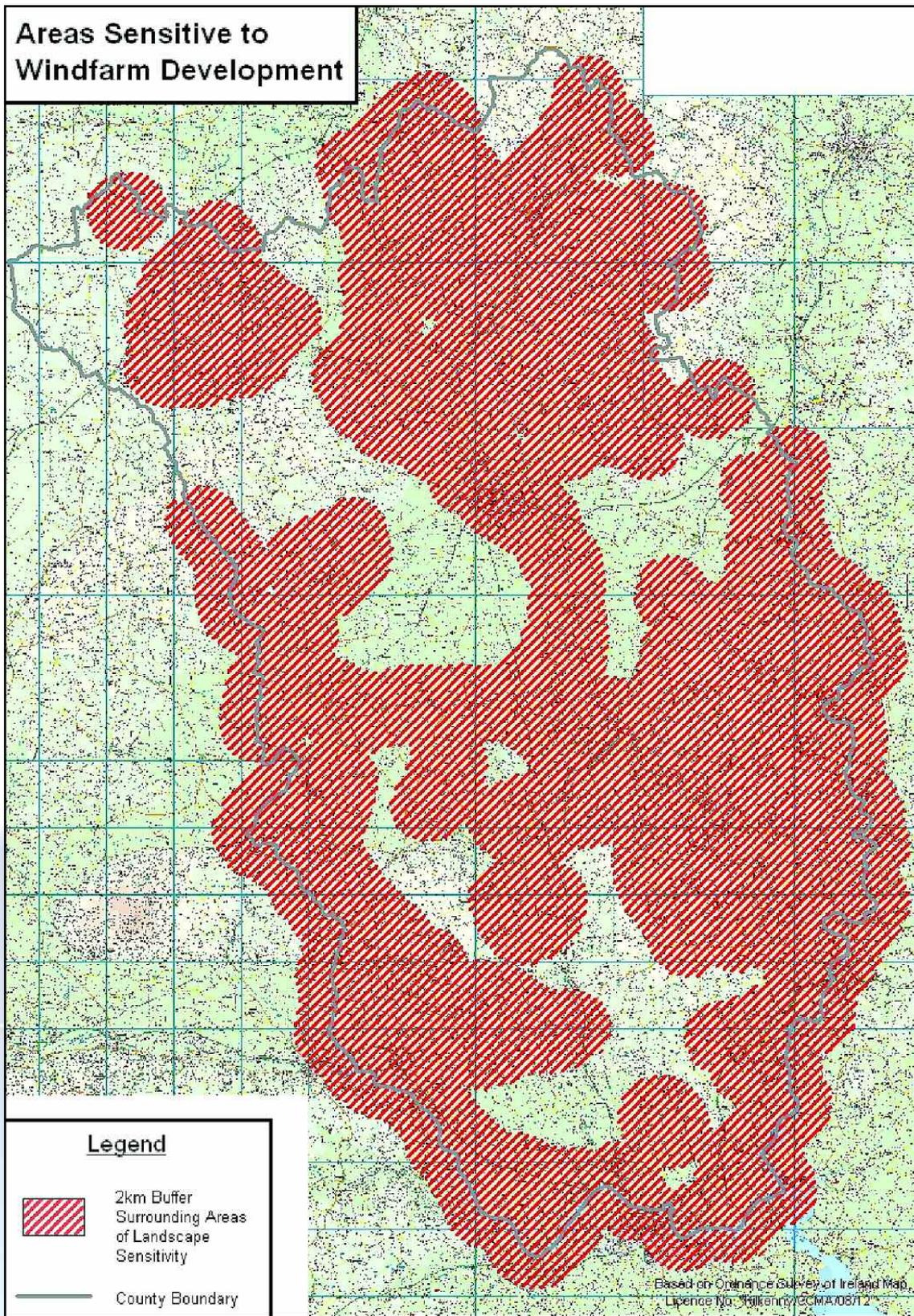
7.6 Step 5 (b): Map areas in adjoining counties within a 15km buffer of County Kilkenny with capacity to receive wind generated energy



Map 8: Areas within adjoining counties with electrical capacity to receive wind generated energy

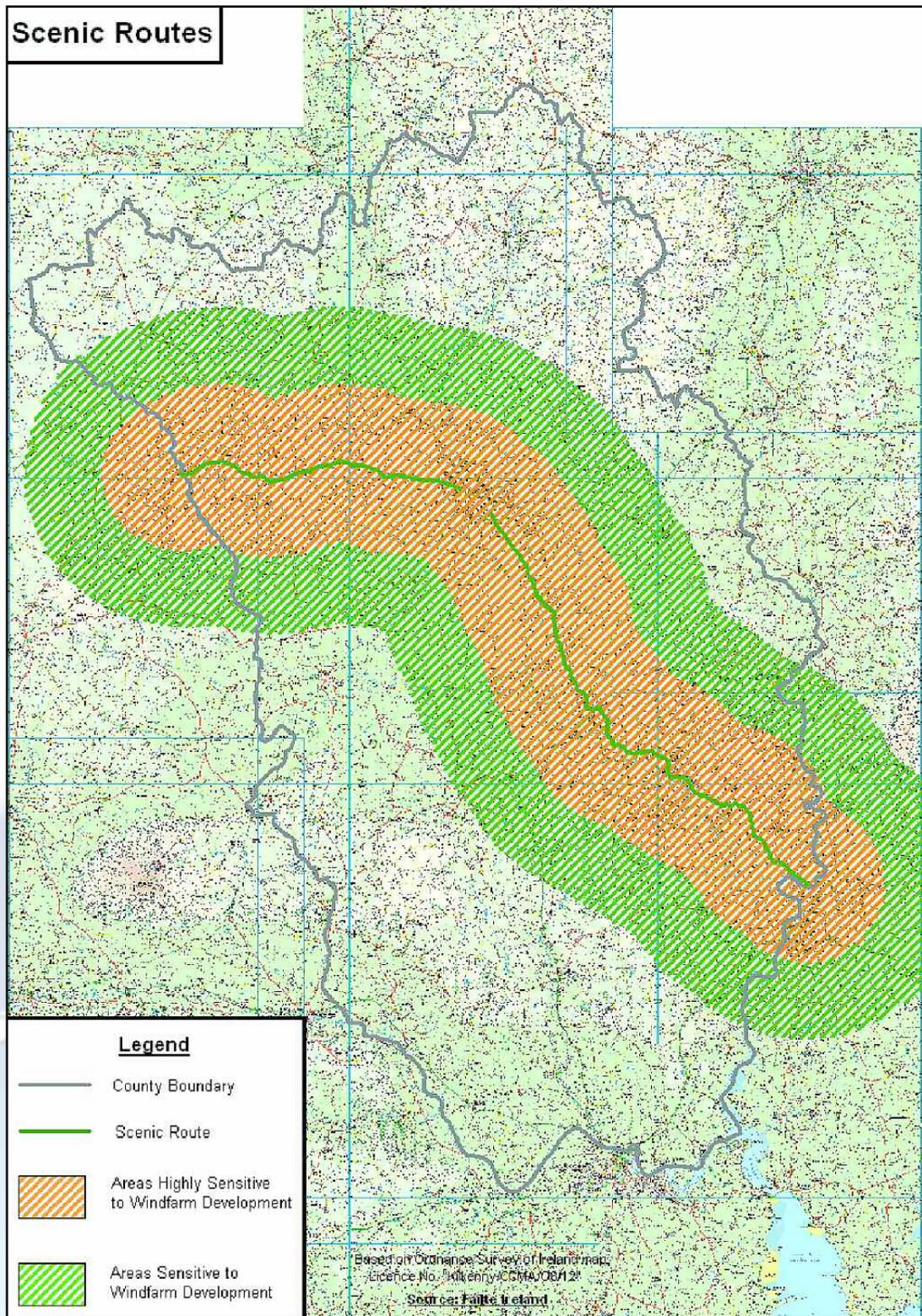


Map 9: Map identifying sensitive landscape areas in County Kilkenny

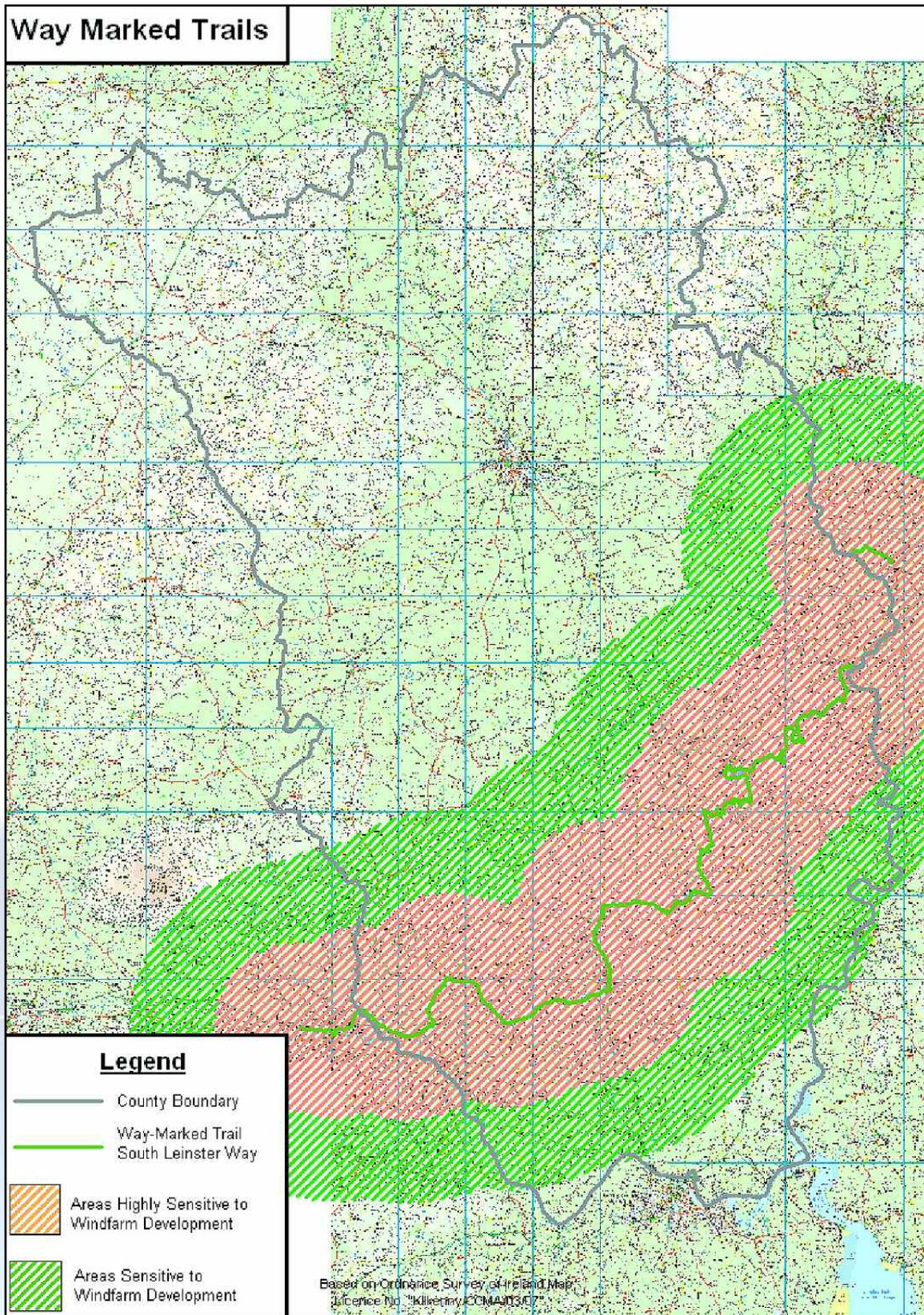


Map 10: Map showing a 2km buffer around sensitive landscape areas in County Kilkenny

7.8 Step 7: Map a zone within 5kms of all Scenic Routes and Way-Marked Trails as being “Highly Sensitive” and within 10kms as being ‘Sensitive’ to windfarm development

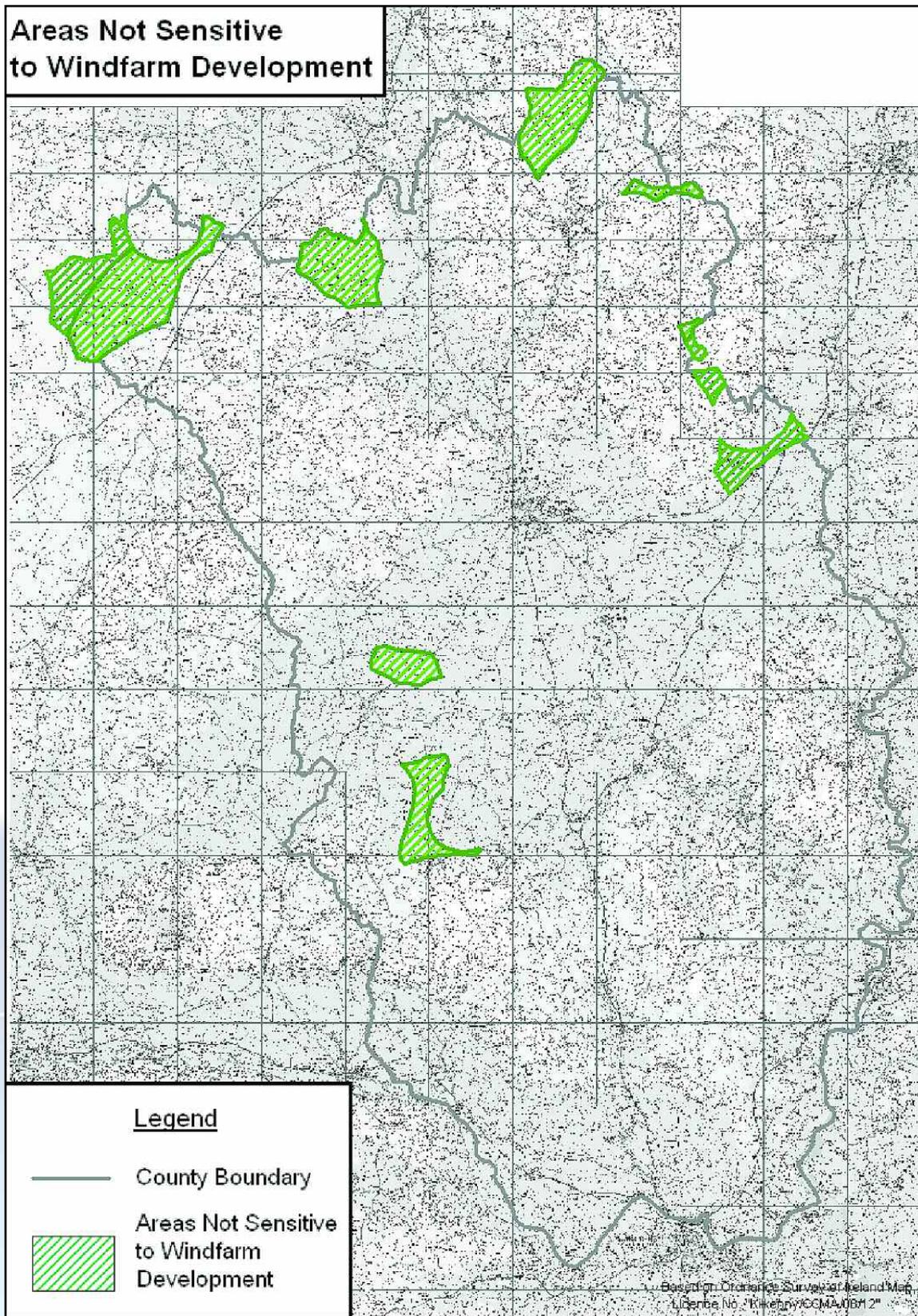


Map 11: Map of Scenic Routes in County Kilkenny (Source: Fáilte Ireland)



Map 12: Map showing Way Marked Trails in County Kilkenny

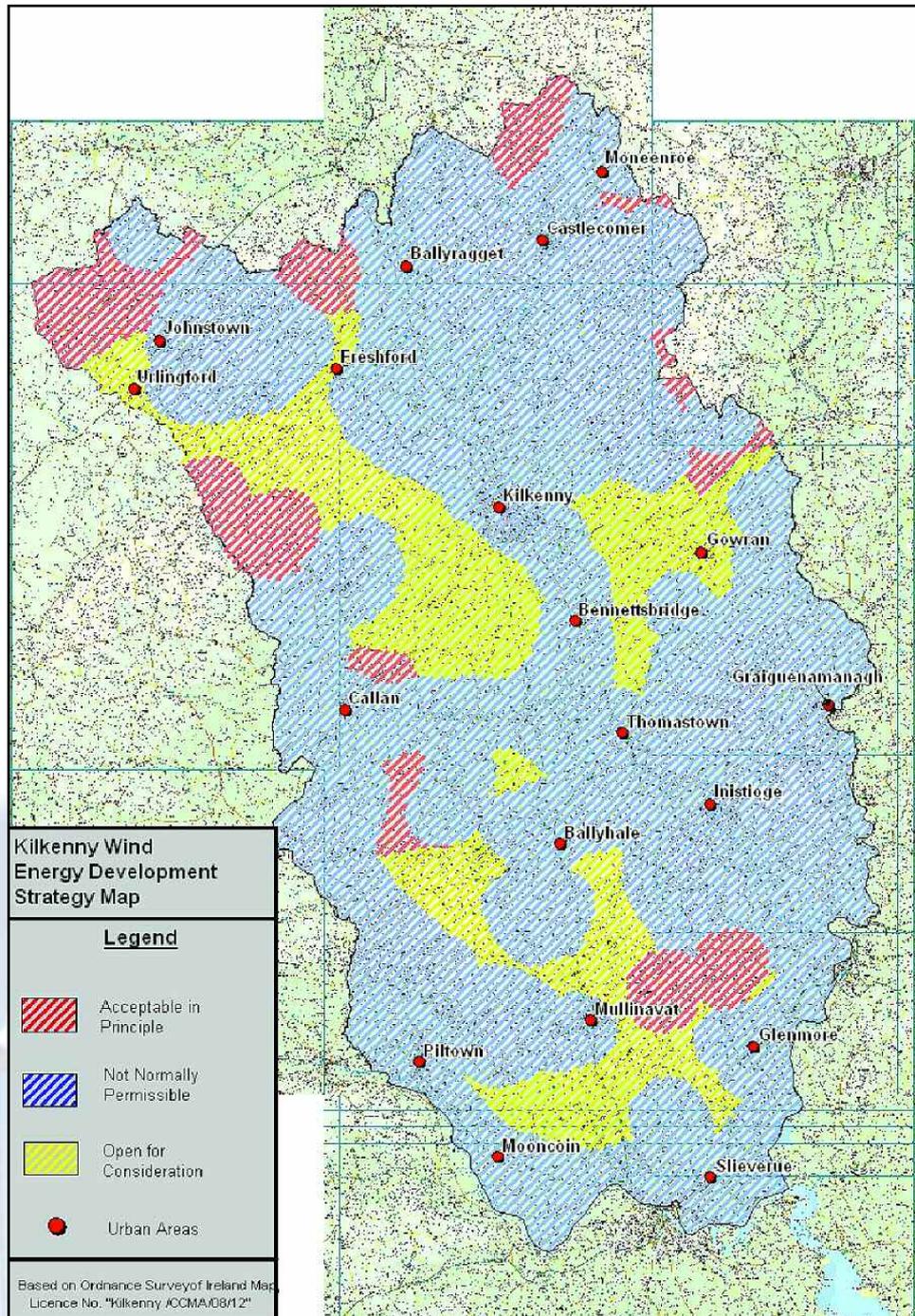
7.9 Step 8: Map all of the above criteria onto a final unified map



Map 13: Map of Non-Sensitive areas in the county to Windfarm Development

7.10 Step 9: Wind Energy Strategy Map for County Kilkenny

In order to take into account all of the earlier criteria and the precedence of existing windfarm developments granted permission in the county¹⁸, the following wind energy strategy map shall guide windfarm developments in the county.



Map 15: Kilkenny Wind Energy Development Strategy Map

¹⁸ After consultation with CAAS (Environmental Services) Ltd, a 2km buffer has been drawn around the four windfarm developments with an existing permission in the county

8 - Strategy for Co. Kilkenny

Kilkenny County Council recognises the need to support the development of renewable energy resources. There is likely to be an increase in the number of windfarm planning applications, both for a large and small numbers of turbines, in the immediate future. The Council's Wind Energy Development Strategy will manage the predicted expansion of this type of development in a 'plan-led' manner, while ensuring that Kilkenny contributes to national targets for renewable energy.

After consultation with CAAS (Environmental Services) Ltd., it is recommended that the implementation of this strategy should be carried out through a planned strategic basis. In order to facilitate this recommendation it is Council Policy to:

- Allow development in all areas highlighted as 'Acceptable in Principle'. All permissions shall have a 20 year life and it is anticipated that all windfarm sites within this Strategy Area will be intensified in the future by:-

- A) Taller turbines with larger swept areas
- B) Higher densities [closer spacing of turbines]
- C) More advanced technology with higher efficiencies of energy capture

- The boundaries of the current Strategy Areas will be reviewed once substantial wind energy development has occurred within them – with a view to extending the designated 'Acceptable in Principle' areas having regard to:

- D) The alteration to the landscape character of the area due to the proximity of established windfarm projects
- E) The requirements for alternative energy at that time
- F) The configuration and availability of grid connections

8.1 Large-Scale Wind Energy Developments

The clustering of large scale wind energy developments will in usual circumstances only be considered in the areas identified as being 'Acceptable in Principle' for Wind Energy Development. The rationale behind this policy is to minimise the visual impacts of such large scale developments in addition to effects on the environment of County Kilkenny as a whole, as well as to facilitate appropriate grid connections.

The County will benefit from the use of renewable energy resources while visual impacts and nuisances to the population are minimised, and the nature and character of its landscape maintained.

8.2 Small-Scale Wind Energy Developments

The Council recognises that there is growing interest in developing small-scale community based wind energy projects in rural areas, particularly as a

means to diversify the rural economy and thereby allowing the local community to benefit directly from the local wind energy resource. In order to provide guidance on this issue, such proposals;

- where there are no more than 5 no. turbines being proposed
- the total output is not greater than 5 megawatts
- the wind turbine heights do not exceed 30m above ground level measuring to the upper most tip of a vertically extended blade
- the availability of access to the electricity grid is suitably demonstrated

will normally be considered on a case-by-case basis in the policy areas identified as being 'Acceptable in Principle' and areas 'Open for Consideration' in the designated County Wind Energy Strategy Map, in addition to satisfying the necessary technical considerations including visual and noise impacts.

8.3 Individual Wind Turbines

It is recognised that landowners in rural areas may wish to harness wind energy for private use. This is considered a reasonable use of renewable natural resources that also provides opportunities to augment farm incomes.

Planning applications for individual wind turbines shall be considered on their merits subject to the general provisions of the Development Plan and to the specific guidance on individual wind turbines below:-

- Turbines shall be limited to 1 per holding
- Turbine height shall not exceed 20 metres measuring to the upper most tip of a vertically extended blade
- Turbines shall generally be coloured mid to dark grey and shall not contrast with surrounding colours.

8.3.1 Exempted Development – Micro Wind Energy Developments

The Department of Environment, Heritage and Local Government announced (March, 2007) new planning exemptions relating to micro wind turbine developments which will not require planning permission. The new exemptions are summarised as follows;

The construction, erection or placing within the curtilage of a house of a wind turbine will be exempt from planning permission requirements subject to the following conditions:

- The turbine shall not be erected on or attached to the house or any building or other structure within its curtilage
- The total height of the turbine shall not exceed 13 metres
- The rotor diameter should be 6 metres or less
- There should be a 3 metre minimum clearance between the lower tip of the rotor and the ground
- The minimum distance of a wind turbine from its nearest neighbouring boundary would equal the total height of the turbine plus 1 metre
- Noise levels must not exceed 43db(A) during normal operation, or in excess of 5db(A) above the background noise, whichever is greater, as measured from the nearest neighbouring inhabited dwelling

- Only one turbine is permitted within the curtilage of a house
- The turbine must be situated behind the front wall of the house
- All turbine components shall have a matt, non-reflective finish and the blade shall be made of material that does not deflect telecommunication signals.
- No sign, advertisement or object, not required for the functioning or safety of the turbine shall be attached to or exhibited on the wind turbine.

In the main, the conditions attached to the exemption for micro wind turbines are designed to ensure their safe installation and use.

Issues such as visual amenity, noise, vibration, possible structural damage, safety and poor installation mitigate against the inclusion of building mounted turbines as exempted development. Nevertheless, it will still be possible to apply for planning permission for such turbines in the normal way.

9 - Wind Energy Policy Context for the Designated County Wind Development Zones

The following are a set of indicative policies, specific to the landscape, topography and wind resources of County Kilkenny that will provide a framework for windfarm development plan review and assessment, notwithstanding the designations of the area.

- Recognise that wind energy is a potentially significant resource in the County
- Continue to facilitate appropriate development that respects the scale, character and sensitivities of the landscape and which complies with the National Guidelines on Wind Energy
- Encourage development (i.e. windfarms, access roads, powerlines and other ancillary development) on or adjacent to already man-altered sites such as forestry, peat workings, etc.
- Encourage windfarm development where its view sheds affect one single aspect of the landscape (such as enclosing valleys)
- Consider development that will not have a disproportionate effect on the existing character of the landscape in terms of location, design and visual prominence

9.1 Recommendations

In assessing development within the designated areas of County Kilkenny, the Council will seek to maximise the wind energy potential of such areas with appropriate accommodation of turbines from an electricity network, planning, environmental and landscape perspective.

This will help to minimise effects on local land uses and amenities, minimise visual impact by harmonising wind turbines with the landscape, obtain maximum yield by appropriate siting and layout, provide for best utilisation of the grid, and allow co-ordination with ESB National Grid (in terms of potential requirement of substation, etc.).

For individual applications it will be necessary for potential developers to show that they have optimised their development along the above lines.

Appendix A

Guidance Notes on Wind Energy Developments

Introduction

The following section has been compiled as a summary of the important issues outlined in the “Wind Energy Development Guidelines” (2006) published by the Department of the Environment, Heritage and Local Government. The Local Authority is required to have regard to these guidelines as part of its Wind Energy Strategy.

Pre-Application Consultation

Pre-application meetings can be a useful mechanism for improving the quality of subsequent planning applications for windfarm developments and limiting the necessity for seeking further information.

Consultations can;

- i) Highlight the Local Authority’s Development Plan objectives for Wind Energy in the county to potential developers
- ii) Suggest the need for specialist input where considered appropriate to the specific application

The guidelines also suggest that Developers should provide some details regarding their proposal (e.g. site location map, initial description of the development, any initial economic or market factors, sample zones of theoretical visibility) beforehand, in order to maximise the productivity of the pre-application meeting.

Wind Measuring Masts

Planning applications for wind anemometers and measuring masts are generally sought for a limited period only. The lifespan of such permissions generally do not extend beyond a 2 year period. Such a time frame is usually considered appropriate as it allows sufficient time to allow a wind resource analysis to be carried out at the specific site. Developers should note that planning applications for wind anemometers and measuring masts in areas of the county highlighted as ‘inappropriate’ for wind energy developments are unlikely to result in a favorable outcome. However, each application shall be dealt with on its own merits.

Access to the Electricity Grid

In addition to consultation with the Planning Authority and Statutory Bodies, Developers are advised to consult with the relevant electricity transmission or distribution grid operators who have responsibility for access to the local grid system in relation to the nature and location of proposed grid connections.

Where works required to connect the wind energy development to the local electricity transmission/distribution network are not exempt, it will be necessary to submit a planning application to the Planning Authority for such works. In such cases, Developers are advised to submit an integrated planning application that combines the grid interconnection information together with details of the proposed wind energy development.

Public consultation with the Local Community

Although not a mandatory requirement, Developers are encouraged to engage in public consultation/dialogue with the local community at an early stage when plans for a wind energy development are being considered. Ideally such consultation should be carried out before a planning application is submitted.

General Considerations in the Assessment of Wind Energy Planning Applications

Some of the following information may be required to be submitted for assessment of a proposed wind energy development;

- Ground conditions, including peat stability
- Site drainage and hydrological effects such as water supply and quality and watercourse crossings
- Size, scale and layout and the degree to which the wind energy project is visible over certain areas
- Potential impact of the project on natural heritage
- Potential impact of the project on the built heritage, including archaeological heritage
- Landscape issues
- Visual impact of ancillary development, such as access roads
- Local environmental impacts including noise, shadow flicker, electromagnetic interference, etc.
- Adequacy of local access road network to facilitate construction of the project and transportation of large machinery and turbine parts to site Wind Energy Strategy
- Information on any cumulative effects due to other projects, including effects on natural heritage and visual effects
- Information on the location of quarries to be used or borrow pits proposed during the construction phase and associated remedial works thereafter
- Disposal or elimination of waste/surplus material from construction/site clearance, particularly significant for peatland sites
- Decommissioning considerations

Does the Application require an Environmental Impact Assessment (EIA)

An Environmental Impact Assessment is mandatory for wind energy developments that exceed the following thresholds;

- 1) The proposal involves more than five turbines

or

- 2) The development will have a total output greater than 5 megawatts.

However, the Planning Authority **retain** the option to request an EIA be submitted for a smaller wind energy development should it be considered that significant environmental impacts may reasonably result.

Information required in an EIS

Developers are advised to consult with the Environmental Protection Agency publication "Guidelines on the information to be contained in an Environmental Impact Statement" (2003).

Aesthetic Considerations in Siting, Layout & Design of Wind Farm Developments

Developers are strongly advised to refer to Chapter 6 of the "Wind Energy Development Guidelines" (2006) in relation to the above. Wind Energy Developments in particular can impose significant visual footprints on the overall physical landscape and so in choosing a particular location and design for a proposed development, developers should satisfy themselves that they are compliant in so far as is

reasonable with Government and Local Authority guidance and policy on such issues.

Important issues include;

- The siting of Wind Energy Developments (location, topographic profile, sectional profile, composite relationships)
- Spatial extent and scale
- Cumulative effect
- Spacing
- Layout
- Heights

Chosen Site Specifics



Landscape Character Types – (Key Characteristics and Acceptable Principles for Wind Energy Development types)

Other factors of importance highlighted include;

- Landscape impact of Wind Energy Development Construction
- Landscape impacts of associated development (incl. control building and substation compound, fencing, connection to electricity providers, roads/tracks)
- Turbine colour
- Turbine maintenance
- Turbine transformers
- Landscape impact of Wind Energy Development operation and decommissioning
- Estimation of likely degree of impact on landscape (incl. landscape sensitivity, visual presence of the wind energy development, aesthetic impact of the wind energy development on its landscape context, significance of the impact)