



Laois County Council
Comhairle Chontae Laoise

APPENDIX 5:
WIND ENERGY STRATEGY

Laois County Development Plan
2017-2023

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1. INTRODUCTION

1.1 Introduction

One of Ireland's greatest natural resources is wind. The country has one of the most advantageous wind regimes in Europe suitable for the production of electricity especially during the winter months when energy demand is at its highest. Over the course of the last decade in particular, there has been a growing interest in the development of wind farming to harness this valuable and renewable resource.

While the western and south-western seaboard counties boast the optimum wind resources, County Laois also has a certain potential in this area notwithstanding its inland location.

1.2 Background

Ireland [and by extension County Laois] is at a cross-roads concerning the future of energy. The challenges of climate change resulting from increasing greenhouse gas emissions need to be tackled effectively, strategically and urgently. Recent studies have contributed to growing awareness and knowledge of the problem, its long-term socio-economic consequences and have stressed the need for decisive and immediate action.

An integrated approach to climate and energy policy is needed given that energy production and use are primary sources of greenhouse gas emissions. Ireland's increasing dependence on energy imports threatens its security of supply and implies higher prices. Ireland is currently the most import dependent country in the European Union for energy. Approximately 86% of the national energy requirement is imported at a cost of c. **€6.25 bn/annum**. In contrast, boosting investment in renewable energy and new technologies has wide-reaching benefits and will play a fundamental part in the government's strategy for growth and expansion of the green energy sector.

Moreover, the greater use of renewable energy resources as a direct substitute for imported fossil fuels will lead to significant savings on the national fuel bill, greater security of supply and a reduction in the potential for serious economic impacts due to external factors which might affect energy prices. Renewable energy sources are largely indigenous, are not reliant on the future availability of conventional sources of energy, and their predominantly decentralised nature reduces vulnerability to volatile energy supply. Consequently they will comprise a key element of a sustainable energy package going forward.

Limiting greenhouse gas emissions is seen as vital in controlling global warming which is one of the most important environmental issues currently being addressed by the European Union. The promotion of renewable energy will play a significant part in achieving this target.

As public debate surrounding the topic increases, from developers, legislators, officials and concerned citizens alike, the need for and value of a formal renewable energy strategy for County Laois has become clearly established.

1.3 Terms of Reference

Planning has a key role to play in the development of renewable energy in County Laois by facilitating the appropriate siting, establishment and operation of renewable energy sites in ways that balance the environmental, social, and economic benefits with any demonstrated impacts particularly those of a landscape and amenity variety.

The objectives of this report are to evaluate and analyse the potential renewable energy resource within County Laois, to outline the key environmental and planning considerations for such development and to make recommendations as to how renewable energy resource development policy and practice can be improved.

Ultimately, this document will clarify the Council's policy towards renewable energy developments in the county, form the basis for a more streamlined assessment of planning applications and ultimately assist in the decision making process of the Planning Authority.

2. CONTEXT, CAPACITY, VALUE

2.1 Evolving National and European Context

Renewable energy development will be a vital part of Ireland's strategy to tackle two major challenges facing the country today-ensuring a secure supply of energy and combating climate change. In recent years Ireland has become heavily dependent on the importation of fossil fuels in order to meet its energy needs, with fossil fuels accounting for 96% of all energy consumed nationally as recently as 2006.

The high dependency on energy imports is risky and as a result, Ireland is currently extremely vulnerable both in terms of meeting future energy needs and ensuring price stability. Accordingly, the Department of Communications, Energy and Natural Resources' [DCENR] energy policy has been moving towards greater levels of self-sufficiency, with renewable energy being a key part of the **Governments Energy Policy framework 2007-2020**. Additionally, in the context of the current global economic downturn and a time of increasing uncertainty over world energy prices, the further exploitation of indigenous renewable resources will be crucial if Ireland is to meet its renewable energy targets, secure energy supply, decouple economic growth from environmental pollution and re-power Ireland's economy.

Ireland's need to support renewable energy also stems from its international commitments under the Kyoto protocol and the **European Directive 2002/77/EC** to tackle greenhouse gas emissions and air pollution. A new **Directive on the Promotion of Renewable Energy Sources** came into effect in June 2009, which will establish a binding target of 20% of overall EU energy consumption coming from renewable sources by 2020 as well as a binding 10% minimum target for energy from renewable resources in the share of transportation fuels. The Irish target under the

directive is for renewable resources to account for **16%** of total energy consumption by 2020. Failure to meet the EU targets could result in EU sanctions being imposed.

At a basic level the new Directive legally obliges each EU Member State to:

- [a] ensure that its 2020 target is met and
- [b] introduce "appropriate measures" and outline them in a National Renewable Energy Action Plan - designed to ensure that the Member State meets its interim trajectory.

The "appropriate measures" include ensuring that grid-related measures and administrative and planning procedures are sufficient to achieve the target. The European Commission will be able to initiate infringement proceedings if a Member State fails to introduce "appropriate measures" to enable it to meet its interim trajectory, or if a Member State fails to submit its National Action Plan on time. Thus it is critical that industry stakeholders and state-bodies work together to support the delivery of renewables and the associated infrastructure required in order to meet national targets.

2.2 Government and EU Policy

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

2.3 National Energy Efficiency Action Plan 2009-2020

The purpose of this Action Plan is to identify policies and measures that have the potential to contribute towards the national target of 20% energy efficiency savings by 2020. It builds upon the Energy Efficiency Action Plan that was submitted to The European Commission in 2007 as part of Ireland's obligations under the

Energy Services Directive [ESD] which requires member states to deliver energy savings of 9% by 2016.

The Action Plan contains 90 actions, measures and programmes which will each play their part in securing a more sustainable energy future for Ireland. Of the 90 actions, **five** stand out as having key importance for the delivery of the national target:

- Roll out of a multi-annual National Insulation **Programme for Economic Recovery** to assist homeowners substantially reduce their energy bills,
- Support to businesses to increase competitiveness through tax allowances for energy-efficient technologies,
- Introduction of an **Energy Demand Reduction Target**,
- Encouragement of public sector towards purchasing only green goods and services as part of target to reduce energy usage in the public sector by 33%,
- Development of an electric vehicle deployment strategy to provide for a minimum of 10% of national passenger car and light commercial fleet being electrically powered by 2020.

2.4 The Grid Development Strategy 2007-2025

This strategy recognises that one of the biggest challenges facing the energy sector in Ireland is the development of a high voltage transmission grid to meet the country's demand for more economical, reliable and environmentally friendly electric power.

Key actions include:

- Creation of a high capacity, efficient, reliable link between generation, and demand centres,
- Doubling in capacity of bulk transmission grids,

- Upgrading 2,300 kms of the existing network,
- Constructing 1,150 kms of new circuits,
- Balanced grid development in each region,

Total investment of €4 billion in national infrastructure of which **€310 million** is earmarked for the Midlands Region.

2.5 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, published in 2000 and reviewed in 2002, and takes account of the public consultation process which followed the further review in Ireland's "Pathway to Kyoto Compliance" (2006).

The purpose of the strategy aims is twofold:

- to indicate the measures by which Ireland will meet its 2008-2012 commitment and
- to show how these measures position Ireland for the post 2012 period and to identify the areas in which further measures are being researched and developed to enable the eventual 2020 target to be achieved.

The Strategy shows, sector by sector, that the range of existing and additional measures which have already been developed will reduce Ireland's greenhouse gas emissions by over **17 million tonnes** of carbon dioxide equivalent in the period 2008-2012.

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. For example, the targets set in the **Energy Supply** sector relevant to this renewable energy development strategy include:

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

The *National Climate Change Adaptation Framework (2012)* provides a strategic policy focus to ensure adaptation measures are taken across different sectors and levels of government to reduce Ireland's vulnerability to the negative impacts of climate change. The aim of this Framework is to ensure that an effective role is played by all stakeholders in putting in place an active and enduring adaptation policy regime. The governance structure provides for climate change adaptation to be addressed at national and local level. Similar to the approach being taken at EU level in the *White Paper on Adaptation*, it is intended to follow a two-phased approach to adaptation in Ireland.

2.6 The National Development Plan 2007–2013

The National Development Plan 2007-2013 sets out the economic and social investment priorities for the next seven years to deliver on the overall vision of a better quality of life for all. The Plan fully reflects the strategic role of energy in underpinning the overall economic and social objectives.

Over the seven year period of the National Development Plan, the **Energy Programme** will entail some €8.5 billion in investment in energy funded in part by the Exchequer, by the Energy Semi-State bodies and from other non-public sources. The investment will underpin the overall strategic objective to ensure security of energy supply at the most competitive cost together with environmental sustainability.

The Energy Programme comprises three elements

- **Strategic Energy Infrastructure Programme.**

Over €1.25 billion will be invested in key strategic energy infrastructure projects including new electricity interconnection, improved gas interconnection and strategic reserve capacity.

- **Sustainable Energy Sub-Programme**

A minimum of €276 million will be invested in the sustainable energy sector over the period of the NDP in support of the targets for sustainable energy including renewable energy, energy efficiency and innovation. This investment will underscore the strategic goals for sustainable energy.

- **Semi-state Energy Companies Sub-Programme**

The semi-state energy companies including Bord Gais, ESB, Bord na Mona and Eirgrid will build on the progress made under the last NDP by investing over €7 billion mainly in the electricity and gas transmission and distribution networks, in new and modernized power generation and in wind energy projects. This major investment programme will enhance security of energy supply and will support regional development and competitiveness and all-island co-operation.

2.7 Bio-Energy Action Plan for Ireland 2007

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

Among the commitments in the Government Action Plan are:

- By 2020 a third of all electricity consumed in Ireland will come from

renewable sources (such as solar, wind, tidal etc.)

- 12% of all residential and commercial heating will be powered by renewable sources (wood chips, solar, etc.)

2.8 White Paper on Energy 2007-2020

Published in March, 2007, the new White Paper entitled “Delivering a Sustainable Energy Solution for Ireland” sets out the Governments Energy Policy Framework for the period 2007 to 2020 to deliver a sustainable energy future for Ireland. The White Paper sets out the Governments comprehensive action-oriented Energy Policy Framework to 2020 under the following strategic goals:

- Security of Supply,
- Sustainability of Energy and
- Competitiveness of Energy Supply.

The underpinning strategic goals are:

- Ensuring that electricity supply consistently meets demand,
- Safeguarding the physical security and reliability of gas supplies to Ireland,
- Enhancing the diversity of fuels used for power generation,
- Delivering electricity and gas to homes and businesses over efficient, reliable and secure networks,
- Creating a stable attractive environment for hydrocarbon exploration and production,
- Being prepared for energy supply disruptions,
- Addressing climate change by reducing energy related greenhouse gas emissions,
- Accelerating the growth of renewable energy sources,

- Facilitating Delivering an integrated approach to the sustainable development and use of bio-energy resources,
- Providing for increased competition and consumer choice in the energy market,
- Ensuring that the regulatory framework meets the evolving energy policy challenges.

By 2020 it is envisaged that one third (**33%**) of electricity consumed in the Irish economy will come from renewable sources.

2.9 The National Bio-fuel Obligations Scheme 2010

The NBOS obliges all road transport fuel suppliers to use bio-fuel in the fuel mix to ensure that bio-fuel represents 4% per annum of their annual fuel sales. This percentage will increase over time. This bio-fuel obligation will provide an important incentive to domestic bio-fuel production over the coming years.

The Government has set a target of 10% of all vehicles on the road to be electric vehicles by 2020. In order to achieve this the Government is taking a broad range of initiatives around Electric Vehicles, including signing Memoranda or Understanding with a number of motor manufacturers, committing to a large scale national roll out of Electric Vehicle Infrastructure and appropriate supports for the customer. The size and geography of Ireland make the country uniquely suitable for Electric Vehicles, and the Government is ensuring that Ireland becomes an early test centre for this technology, and that it takes full advantage of the potential benefits associated with using electricity from renewable sources in transport.

2.10 The Wind Energy Development Guidelines, DoEHLG, 2006 [currently under review]

The DoEHLG published Wind Energy Development Guidelines in 2006 for the

purpose of guiding Local Authorities in the preparation of a strategy or plan led approach towards the sensitive siting of these developments.

The guidelines, which supersede the 1996 version, are designed to ensure consistency of approach to wind energy developments throughout the country and to provide clarity to prospective developers and local communities alike. 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 have been the subject of a targeted review since 2013 to encompass detailed guidance in relation to noise, proximity and shadow flicker and address issues that have caused increasing concern in relation to wind turbine development.

Circular Letter PL 20-13 Review of Wind Energy and Renewable Energy Policies in Development Plans issued to all planning authorities stating that a number of policy initiatives were under review including:

- Focused review of the wind energy development guidelines,
- Renewable energy export policy and development framework.

Specifically the draft targeted review of the 2006 guidelines proposes the following;

- Setbacks from turbines and curtilage of noise sensitive properties in the vicinity,
- Noise sensitive properties include residential properties, residential institutions, schools etc
- Areas of special amenity may also be defined as noise sensitive,

- A noise limit to be attached in noise sensitive properties (for one or more properties),
- Exceptions to noise limits if residents give written consent to satisfaction of the planning authority,
- Exceptions to setback from turbines & curtilage of noise sensitive properties if the written consent of local residents is forthcoming and to the satisfaction of the planning authority.

2.11 The Planning and Development [Strategic Infrastructure] Act 2006 as amended

This legislation provides for the streamlining of the planning process for certain types of major energy, transport and environmental infrastructure of strategic importance. The new consent procedures apply to, among other things, major electricity transmission lines and interconnectors, strategic gas infrastructure development, power stations, wind farms, liquified natural gas facilities and gas storage facilities.

The new procedures will ensure an enhanced service, with greater flexibility, full and robust decision-making, public participation and more definitive time-frames in terms of key infrastructure delivery on the ground.

2.12 Sustainable Energy Ireland Wind Atlas 2003

SEI, the national energy authority promotes and assists the supply of energy in an environmentally and economically sustainable manner. The promotion and technology research associated with wind energy is a part of the overall brief carried by SEI. In 2003, a wind atlas for the whole of Ireland was released and records the available wind resource for each county. The wind atlas was used to inform this study.

The study represents meaningful progress forward from previous ESBI studies as it provides information in a user friendly graphic format to assist the developer in choosing a suitable location for a wind farm. Specifically, the critical information presented in the wind atlas relates to locations and access to the electricity grid together with measurement of windspeed at varying heights above ground level.

2.12 Current Capacity

As of March 2015 Ireland has an installed wind power nameplate capacity of 2,230 megawatts (MW). This compares to a total of 1,026 MW in 2009 [see map 1 below].

In 2014, the year-long average capacity factor, or actual electricity generation rate from the entire nation's installed capacity was approximately 30% of the time, with higher dependability in the gustier Winter months and lower in the Summer. In 2014 wind provided approximately 700 MW of electricity on average. In 2015 wind turbines generated 23% of Ireland's average electricity demand, one of the highest electric grid penetration values in the world. Ireland's 188 wind farms, are almost exclusively onshore, with only the 25MW Arklow Bank Wind Park situated offshore as of 2015.

The most important locations for wind energy production output are counties Cork, Donegal and Kerry while the largest individual production sites are in counties Cork, Galway, Donegal, Offaly and Tipperary,

Map No. 1: Installed National Wind Capacity- November 2009



2.13 Projected Capacity

In order to reach EU 2020 renewable energy targets it is assumed that **7,800 MW** will need to be installed and operational by that year on the island of Ireland [c. 6,500,MW in Ireland and c. 1,300 MW in Northern Ireland).

In addition to the large scale wind farms, there is also expected to be circa 4,500 Microgeneration installations [single turbine units] across the island of Ireland over the next number of years with a capacity of approximately 38.5 MW (c. 34MW in Ireland and c. 4.25MW in Northern Ireland).

**Map No. 2 Projected National Wind Capacity-
November 2009**



Ensuring the security of energy supply is also a key part of the Irish Government's recent **Framework for Sustainable Economic Revival**. Having regard to the current economic downturn, the framework acknowledges the need to put the energy/climate change agenda at the heart of Ireland's economic renewal.

2.14 Economic Value

Increasing the share of national energy consumption from renewable sources will deliver significant benefits for the electricity customer, the local economy and society. Recent volatility in fossil fuel prices has demonstrated that regions with a high dependence on energy imports are exposed to a parallel level of risk. This volatility makes it difficult for investors in the economy to make reliable long term forecasts of their energy costs. The most effective way to reduce this volatility is to increase the share of energy costs that are predictable and locally based. This will lead to lower and more stable long term energy costs. As other regions move to stabilise their long term energy costs it is essential that Ireland continues to increase relative competitiveness in this area. It is estimated that between 25 and 30% of capital investment in renewable energy is retained in the local economy. This typically flows to companies in construction, legal, finance and other professional services.

3. RENEWABLE ENERGY IN COUNTY LAOIS

To date the renewable energy sector in County Laois has been dominated by wind energy developments.

The bulk of the activity so far has been in the following three places:

- an upland area in the south-east of the county near the county boundaries with Carlow and Kilkenny where 8 no. turbines with an output of c. 21 MW have been installed.
- a low-lying area part of which is a former industrial peatland in the south-west of the county straddling the county boundaries of Kilkenny and Tipperary, where 4 no. turbines with an output of c. 10 MW have been installed and there is a valid permission [under **PI Ref 14/139**] for an additional 2 no. turbines. In effect, this site is part of the much larger Lisheen 1 & 2 Wind Farm in County Tipperary [comprising 30 no. turbines] and Bruckana Wind Farm in Counties Kilkenny and Tipperary [comprising 16 no. turbines].
- an upland area at Cullenagh Mountain roughly between Abbeyleix and Portlaoise in the centre of the county where there is a valid permission under **PI Ref 13/268** for 18 no. turbines with a projected output of c. 45 MW. This has yet to be constructed.

In addition, there have been three successful applications for single wind energy turbine projects on individual sites throughout the county. These are related to the existing uses on the sites in question including industrial, [Portlaoise], commercial [Mountrath] and agricultural [near Ballybrittas].

4. METHODOLOGY

This section presents the methodology used to inform the wind energy strategy for County Laois.

The methodology has been **primarily** informed by a number of considerations including the **amount of existing and approved capacity in the county to date, the potential of other renewable energy options including solar, available wind data and transmission network, settlement patterns and population densities of the county as well as the relevant environmental, tourism promotion and landscape policies in the draft Laois County Development Plan 2017–2023.**

Reference is also made to the wind energy strategies of adjoining counties and the *DoEHLG Planning Guidelines for Wind Energy Development for Planning Authorities 2006* currently under review.

4.1 Wind Resource Mapping

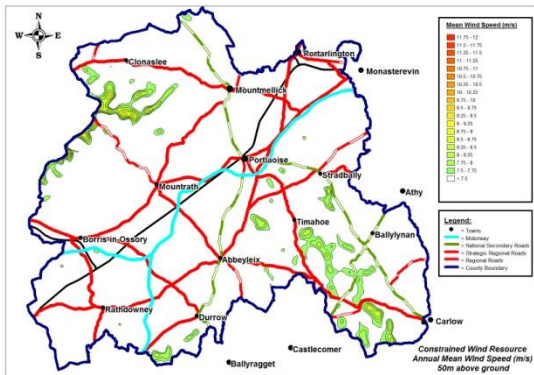
The available wind speed is a critical factor in determining the location and commercial viability of prospective sites.

The Sustainable Energy Ireland (SEI) Wind Atlas 2003 was utilised to extract data on constrained wind resources for County Laois. The SEI Wind Atlas provides information on wind speeds modeled at 50m, 75m and 100m. Generally the areas considered economically viable have wind speeds above 7.5 metres per second at 75 m height turbine height above ground level.

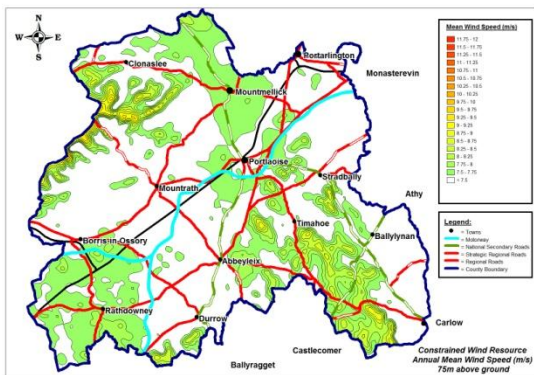
While elevation obviously has an impact on wind speeds, it is not the sole determining factor-construction, grid connection and maintenance costs may be higher at greater elevations and therefore affect viability.

Due to advances in technology and economies of scale, there is now increasing scope for development of wind energy at much lower elevations than heretofore. For example, Bord Na Mona is proceeding with ambitious plans for sections of its worked out boglands in a number of locations throughout the country. Many of these sites are in relatively low-lying locations.

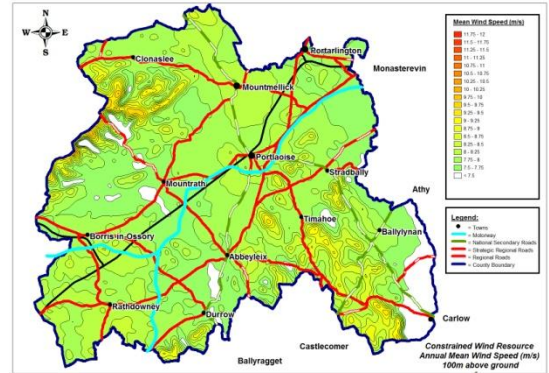
Map No.4: Mean Wind Speed at 50 ms over Ground level in County Laois



Map No. 5: Mean Wind Speed at 75 ms over Ground level in County Laois



Map No. 6: Mean Wind Speed at 100 ms over Ground level in County Laois



4.2 Transmission Network

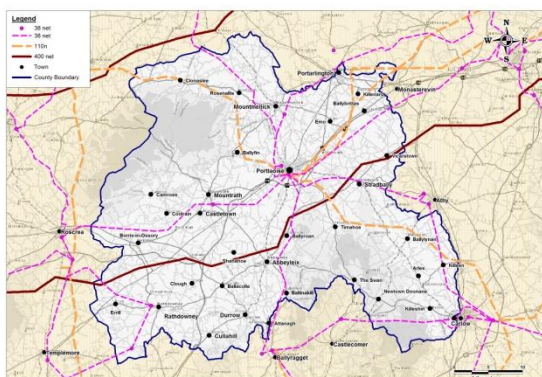
Access and proximity to the transmission network is another key factor in identifying potential areas for wind farm developments. For the large, commercial operations, the end product in the form of electricity needs to be fed into the national grid and this can be a notable constraint both in practical and cost terms regarding the viability and location of the project.

There are a number of large electricity transmission lines running approximately north to north east across County Laois. Proximity to these lines is a significant consideration for the siting of commercial windfarms in the county.

In addition, a major upgrade of the grid line between County Laois and County Kilkenny was approved by An Bord Pleanála under strategic infrastructure legislation in 2014.

Separate to the grid connection, the transport of electricity from the turbines to a substation, which connects to the grid, will usually require the establishment of ancillary infrastructure which may cause separate additional visual impact although undergrounding of services, albeit more costly, usually lessens this impact.

Map 7: Transmission Network in County Laois



4.3 Settlement Patterns and Population Densities

In Census 2011 the population of County Laois was **80,559** an increase of 20% on Census 2006, a growth rate which was the highest in the country with County Laois, for the first time, outperforming counties such as Dublin, Kildare and Wicklow, the traditional leaders in this regard.

The aggregate urban population is also steadily increasing in line with regional and national trends. According to Census 2002, 33% of the county population lived in urban areas. By Census 2006, this had risen to 40% and it rose again to 47% by Census 2011.

In the context of a declining agricultural base and net rural outward migration, the trend towards increased urbanisation is likely to continue, even allowing for the recent downturn in the economy.

Nonetheless, Laois remains a predominantly rural county with a dispersed settlement pattern. As a result, it is likely that in many cases wind farm 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. However, by their nature, wind farms traditionally have gravitated towards more elevated, isolated locations which usually coincide with lower

population densities, however may conflict with landscape and visual amenity policies.

4.4 Designated Areas

Existing ecological designations provided under European and National legislation in County Laois are shown on Map 9.

These include Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and Natural Heritage Areas (NHAs). There are 30 NHAs, 7 SACs and 2 SPAs in County Laois located predominantly in upland areas and in the environs of the main watercourses.

Special Areas of Conservation 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 sites*.

Special Protection Areas are strictly protected sites classified in accordance with article 4 of the EU Birds Directive [79/409/EEC] for rare and vulnerable birds and for regularly occurring migratory species.

Natural Heritage Areas are a national designation introduced by the Wildlife (Amendment) Act 2000.

The following are the locations of the existing and proposed SACs, SPAs and NHAs in County Laois:-

Special Areas of Conservation (SACs) in County Laois (as identified on Map No. 8)

Site Name	Site Code	½" Map Number
River Barrow And River Nore	002162	
Clonaslee Eskers and Derry Bog	000859	38
Lisbigney Bog	000869	44
Mountmellick	002141	
Slieve Bloom Mountains	000412	38/44
Coolrain Bog	002332	
Knockacollier Bog	002333	
Ballyprior SAC	00256	

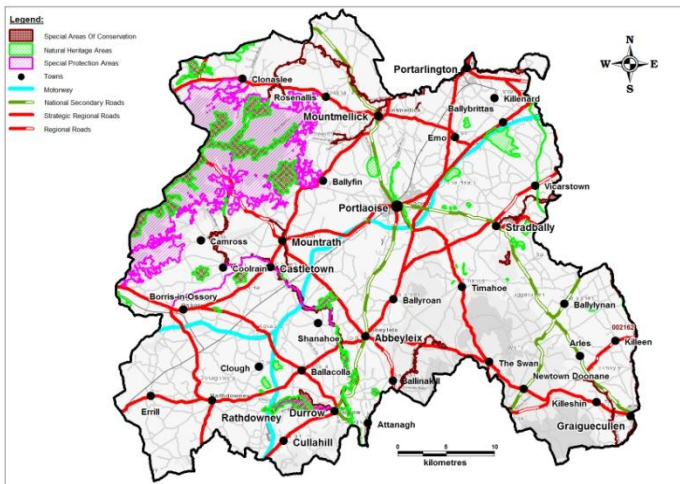
**Special Protection Areas (SPAs) in County Laois
(as identified on Map No. 8)**

Site Name	Site Code	Main habitat or species
SlieveBloom Mountains	00416	Whooper Swan, Corncrake, Hen Harrier, Merlin, Peregrine.
River Nore	004233	Kingfisher

Natural Heritage Areas (NHAs) in County Laois (as identified on Map No. 8)

Site Name	Site Code	Main habitat or species
Annaghmore Lough Fen	000413	Calcareous fen with willow and birch scrub
Ballylynan	000857	Grassland, wet meadows
Barrow Valley At Tankardstown Bridge	000858	River, canal, grassland, marsh
Clonaslee Eskers And Derry Bog	000859	Esker, raised bog
Clonreher Bog	2357	Raised bog
Cloppook Wood	000860	Ash/hazel woodland, limestone hill
Coolacurragh Wood	000862	Birch/alder woodland, fen peat
Coolrain Bog	000415	Midland raised bog (with Knockacollier Bog, these two bogs are the most southerly intact examples of true Midland Raised Bogs in the country)
Cuffsborough	000418	Grassland used by Greenland White-fronted geese
The Curragh And Goul River Marsh	000420	Wet meadow, river, winter feeding site for Greenland White-fronted Geese
Delour River Nr Lacca Manor	000864	Oak/birch woodland, river, wet grassland
Derries Wood	000416	Disturbed raised bog, disused gravel pit, conifer plantation, lake, reedbed, important insect populations
Dunamaise Woods	001494	Limestone hills, oak/ash woodland
Emo Court	000865	Semi-natural mixed (oak/ash with beech) woodland, lake, parkland, amenity grassland
Forest House Wood	000874	
Grand Canal	002104	Canal, wetland, grassland
Grantstown Wood and Lough	000417	State-owned nature reserve. Lake in transition through fen to alder/willow. Important invertebrate fauna
Kilteale Hill	000867	Limestone hill, hazel/ash woodland
Knockacollier Bog	000419	Midland raised bog, Birch and alder woodland. One of the few intact bogs south of the Slieve Blooms
Lisbigney Bog	000869	Raised bog
Mannin Wetland	00868	Species-rich fen
Monaincha Bog/ Ballaghmore Bog	00652	Raised bog
Ridge Of Portlaoise	000876	Esker ridge, ash/hazel woodland, species-rich grassland, disused gravel pits
River Barrow And River Nore	002162	River, wetland, woodland
River Nore/Abbeyleix Woods Complex	002076	River, site for Freshwater Pearl Mussel (international importance), Twaite Shad (Vulnerable), wet grassland, mixed deciduous woodland of great antiquity and species diversity, with specimen oak
Rock of Dunamaise	000878	
Shanahoe Marsh	001923	
Slieve Bloom Mountains	000412	Old Red Sandstone mountains, mountain blanket bog, Peregrine Falcon, Hen harrier, red grouse
Stradbally Hill	001800	
Timahoe Esker	000421	Esker ridge, Hazel/Ash woodland

Map 8: Environmental Designations in County Laois



4.5 Landscape Character Types in County Laois

Landscape policies and designations in the Laois County Development Plan 2011-2017 and in the draft Laois County Development Plan 2017-2023 have informed revisions to this draft Wind Energy Strategy 2017-2023.

These include defined Landscape Character Areas and Views and Prospects Worthy of Preservation.

Landscape Character Types are distinct types of landscape that are relatively homogenous in character. They are generic in nature in that they may occur in different localities throughout any defined area. Nonetheless, where they do occur, they commonly share similar combinations of geology, topography, land cover and historical landuse. For example, blanket bog uplands are distinct landscape character types and are recognisable as such whether they occur in County Laois or other counties.

County Laois has been divided into 7 LCT's:

- Hills and Upland Areas
- Lowland Agricultural Areas

- River Corridors and Lakes
- Mountain Areas
- Peatland Areas
- Urban Fringe Areas
- Rolling Hill Areas

The main areas that were under consideration for wind energy development during the last county development plan were mainly in the following landscape type areas:

- Hills and Upland Areas
- Peatland Areas
- Rolling Hill Areas

There was a presumption against wind energy development in the LCT 4: Mountain Areas.

The following policies relate to the main landscape character types in question.

LCT 1: HILLS AND UPLAND AREAS

Although lacking in terms of dramatic peaks, hills and uplands are a prominent feature of the county, particularly in the north-west and south-east. From the tops of these hills panoramic views of the lowland landscapes of Laois and adjacent counties are gained. The hills also act as orientating features. The Seven Hills, Cullenagh, Cullahill, Fossy Mountains and the upland areas around Swan, Luggacurren and Wolfhill are prominent by virtue of landmarks at their summits as well as their topography: A church at Wolfhill acts as a prominent local landmark.

The hills and uplands form important historic features with an abundance of archaeological features and contain evidence of human settlement extending back 9,000 years.

There is extensive mono-type afforestation and marginal agriculture in these areas. Field systems and the enclosures associated with

them are generally absent in this landscape. New dwellings are comparatively few with much of the older stock abandoned and derelict.

These hills and uplands represent considerable potential in terms of tourism development. However, at present they are somewhat isolated as separate entities. Linking the most important sites by way-marked trails would be a valuable addition allowing further appreciation of the landscape in a sensitive manner.

The Wind Energy Strategy has identified these upland areas for consideration in terms of future wind energy development. Any such development must be carefully sited to minimise negative impacts. The siting and design of wind energy proposals shall be in accordance with the *Planning Guidelines for Wind Energy Development for Planning Authorities [DoEHLG, 2006]* and the County Laois Wind Energy Strategy.

GENERAL RECOMMENDATIONS

1. To preserve and enhance the rich heritage assets of these LCT's which provide visible evidence of all four key phases of the County's history.
2. To have due regard to the positive contribution that views across adjacent lowland areas and landmarks within the landscape make to the overall landscape character.
3. To respect the remote character and existing low-density development in these LCTs.
4. To implement improvements to the visitor attractions of these areas.
5. To further define popular walking routes such as Cullahill Mountain and create new routes to additional areas of interest.
6. To continue and encourage the improved management of field boundaries such as

hedgerows and stone walls and hunting copses/wooded copses.

7. To maximise the potential amenity value of water bodies within this LCT.

8. Facilitate the development of sustainable rural industries that encourage interaction between urban and rural landscapes and dwellers, for example farmer's markets.

LCT 5: PEATLAND AREAS



Topography is strikingly flat, geology is generally Carboniferous Limestone (type varies according to specific location) and landcover is raised bog much of which is now exhausted and being considered for alternative uses including afforestation, amenity and wind energy.

The Lisheen site in County Tipperary [south-west of Rathdowney] clearly shows the potential of using disused cutaway bogland for developing wind energy. In addition to planning applications in counties Kilkenny and Tipperary, there have been two planning applications to Laois County Council for wind farm

developments adjacent to Lisheen on the extensive Bord Na Mona boglands between Rathdowney, County Laois, Johnstown, County Kilkenny and Templeouhy, County Tipperary.

This landscape type could be more accurately described as a specific habitat rather than a landscape type per se. In its original state, the undisturbed raised bog is peat based and supports a dense growth of birch scrub with gorse and heather as an under-storey. Manual turf cutting in some areas will have left a somewhat untidy exposed peat surface, with scarce vegetation. Commercially harvested peatland areas are generally devoid of vegetation and present as an evenly exposed surface of peat. Such a man made landscape has a sterile and indeed industrial character. Pockets of rough grazing and scrubland also exist in this landscape character area.

In terms of location, some of the larger peatland areas are in close proximity to the larger urban settlements such as Cul na Mona between Portlaoise, Abbeyleix and Mountrath. Others are in more remote, sparsely populated place, for example in the south-west of the county.

GENERAL RECOMMENDATIONS

1. To recognise the importance of peatlands for ecology, history, culture and for alternative energy production.
2. To conserve valuable habitats including any European and national designations.
3. Introduce design guidance in respect of commercial forestry in order to integrate this landuse into the landscape.
- 4 Design of all single one-off houses to be fully compliant with Rural House Design Guidelines.

LCT 7: ROLLING HILL AREAS



Undulating with variable topography usually ranging from 70 metres to 90 metres. Geology comprises Silurian greywackes and slates with Old Red Sandstone at lower elevations.

Overall, this is a complex landscape incorporating several elements within a rolling landform. Land cover reflects this complexity with tillage and pasture agriculture, pockets of wetlands and raised bog, small coniferous plantations and occasional deciduous copses. Varied enclosures include hedgerows with significant amounts of trees and some post and wire fencing. Settlement is quite frequent though commonly dispersed. Considerable evidence of new one-off house building in the vicinity of settlements.

GENERAL RECOMMENDATIONS

1. To promote agricultural practices to create a sustainable rural economy.
2. Provide incentives for smaller rural/family farms to manage their land to avoid loss of hedgerows and field patterns.
3. To conserve valuable habitats including any European and national designations.
4. Diversify the urban fringe by developing mixed-use amenity areas, which will create a

landscape buffer creating a transition between urban and rural areas.

5. Define the urban fringe with planting of native species and mixed woodland to tie into existing rural landscape.

6. Design of all single one-off houses to be fully compliant with Rural House Design Guidelines.

7. Maintain and enhance the 18th and 19th century estate landscapes and associated parkland & woodland to develop them as a tourism resource.

8. Reflect the 18th and 19th century field patterns in the scale of new development.

9. Restoration of historic boundaries, walls to original standard with coursing and materials to match existing.

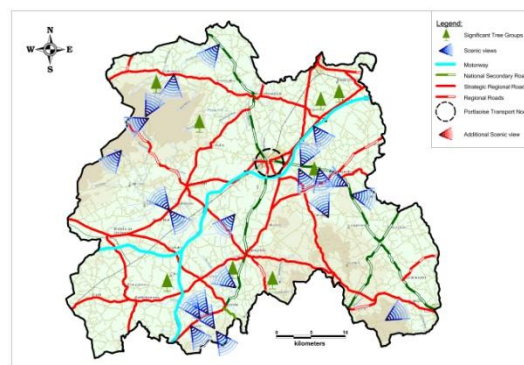
4.7 Views and Prospects Worthy of Preservation

The draft County Development Plan deems that the following views and prospects in County Laois are worthy of preservation.

Table 2: Views and Prospects worthy of Preservation

Map REF	No./MAP	LOCATION
001		Killeshin/Rossmore
002		The Windy Gap
003		Aharney
004		Slieve Bloom Mountains
005		Rock of Dunamaise
006		Grange, Mountmellick
007		The Heath
008		Raheen
009		Kilamuck
0010		Raheenleagh
0011		Castletown
0012		Clonaslee

Map 9: Views and Prospects to be Preserved in County Laois



4.8 Archaeology

Generally, archaeological impacts associated with wind energy developments are site specific and are usually examined as part of the accompanying EIS. Generally, whilst not precluding wind energy development, the visual impact of wind farms on such sites and archaeological landscapes should be carefully considered.

4.9 Recreation, Tourism and Amenity

Consideration was also given to areas within the County that are of significant importance for recreation or tourism. Typically, these areas are attractive due in large part to their high quality environment, scenic value, natural heritage designations and archaeological resources and are therefore considered to be much more sensitive to windfarm developments, for example the Slieve Bloom Mountains and Cullahill Mountain.

4.10 Landslide Susceptibility.

The issue of landslide risk associated with windfarm developments is very topical considering recent events on sites in Counties Kerry [April 2007] and Galway [October 2003].

Landslides may be a risk at slopes of 4 degrees, depending on peat depth. However, slope is only one parameter in identifying areas of potential landslide susceptibility. In addition, other factors such as type of soil (mineral or peat), depth of soil, underlying bedrock, aspect and weather patterns can all contribute to landslide susceptibility.

The Geological Survey of Ireland advised that some very preliminary mapping could be undertaken but that landslide risk assessment is required on a site by site basis and policy should reflect the importance of undertaking adequate modeling, risk assessment and mitigation at planning application stage.

4.11 Wind Energy Strategies in Adjoining Counties

The wind energy strategies for Counties Carlow, Kildare, Kilkenny, North Tipperary, and Offaly were examined as part of the methodology and those areas within those counties identified as being favourable towards wind energy development immediately adjoining County Laois are highlighted.

The purpose of this exercise is to put the evolving situation in County Laois into a wider regional context.

5. WIND ENERGY STRATEGY FOR COUNTY LAOIS-AREA CLASSIFICATIONS

Arising out of the preceding methodology-in particular, superimposing the wind data maps with the other designation maps, taking into account the amount of existing and approved wind energy developments-the suitability of County Laois in terms of wind energy generation can be subdivided into four distinct area classifications.

The **four** area classifications, as indicated on map no. 1.6.5, are as follows:

STRATEGIC AREAS

Areas deemed eminently suitable for windfarm development and reserved for such purposes. Applies to useable areas that have economically viable wind speeds, have no designations, are sparsely populated, are in close proximity to a grid connection and have the ability to absorb wind development.

It is considered that there are no such areas in County Laois.

The most optimum wind regime for commercial wind energy in County Laois is in the Slieve Bloom Mountains. However this area is being excluded for the following reasons.

- It is one of the most designated parts of the county in terms of Natura 2000 sites, NHAs, and Views and Prospects,
- It offers major tourism and leisure potential,
- Part of the Slieve Blooms lie in County Offaly and its Wind Energy Strategy has excluded the Slieve Blooms for similar considerations.

AREAS NOT OPEN FOR CONSIDERATION

These are areas identified as particularly unsuitable for windfarm development. This category is used for areas which due to their scenic, ecological or tourism values are unable to accommodate development of this type.

Along with the Slieve Bloom Mountains and Cullahill Mountain, the other key area recommended for inclusion in this category are “The Seven Hills of Laois” a series of hills eg Rock of Dunamaise, Corrigeen Hill that extend in a north-south trajectory between Portlaoise and Stradbally.



These areas enjoy extensive designations. With reference to the Slieve Blooms, this is one of the two SPA sites in the County. It also contains extensive SAC and NHA land classification and is a location for considerable tourist and leisure activity. The “Seven Hills” coincide with an NHA and They also offer major tourism potential focused mainly on the Rock of Dunamaise while Cullahill Mountain is adjacent an SAC of the same name and also offers major tourism potential.

PREFERRED AREAS

Having regard to the landscape character assessment policies, amendments have been made to the areas to reflect these policies.

Preferred Areas are deemed suitable for wind energy development **unless** specific local planning circumstances within the context of the development plan support a decision to refuse. The category is used for areas that have a relatively low sensitivity to wind development, have a viable wind regime, avoid most designations, are sparsely populated and are in close proximity to a grid connection and an approved or built wind farm.

One such area has been identified in County Laois and comprises Bord Na Mona cutaway bog sites and lands adjacent at:

1. Area straddling the Laois, Tipperary, Kilkenny border between **Rathdowney** and Templetohy and due northeast of the recently completed windfarm site at Lisheen, County Tipperary and Bruckana, County Kilkenny.

This preferred area does not have NHA, SAC or SPA designations and is located within LCT 5 Peatland Areas.



The Lisheen and Bruckana sites and the Mount Lucas site between Daingean and Walsh Island in County Offaly clearly show the potential of using disused cutaway bogland for developing wind energy.



AREAS OPEN FOR CONSIDERATION

Having regard to the landscape character assessment policies amendments have been made to the areas to reflect these policies.

Applications in these areas will be treated on their merits with the onus on the applicant to demonstrate why the development should be granted permission.

5.1 Individual Turbine Developments

Apart from the commercial production of wind energy, there is growing interest among the residential, agricultural and commercial sectors in the utilization of wind energy for private use at a more local, stand-alone level throughout the county.

Depending on the turbine size, the available wind speeds and the nature of the site, a wind turbine could supply upwards of 70% of the energy needs of a home, farm or business resulting in major cost savings.

Already there have been **3 no.** successful planning applications for single turbine installations in County Laois, one each for an industrial site [Portlaoise], business park [Mountrath] and farm [Courtwood]. Similar type applications are likely at any location in the county.

Micro renewable generation for domestic, agricultural and light industrial activities are now exempted development subject to criteria detailed in Statutory Instrument No. 83 of 2007, as amended and No.256 of 2008, as amended.

5.2 Suggested Policy for Wind Energy Developments in County Laois

WES 1: Development of Renewable Energy Generation

It is the policy of the Council to support, in principle and in appropriate scales and locations, the development of wind energy resources in County Laois. The future sustainable development of the County is dependent on a secure supply of energy. There is a need to promote the development of

renewable energy to reduce dependency on fossil fuels and to comply with national and European policies with regards to renewable energy resources and to address the challenge of climate change. It will be an objective of the Council to ensure the security of energy supply by accommodating the development of wind energy resources in appropriate areas and at appropriate scales in the county.

WES 2: Development of Low Carbon Economy

Laois County Council will seek to promote itself as moving towards becoming a low carbon County by 2018 as a means of attracting inward investment to the County and the wider Midlands region.

WES 3: County Partnership Approach

Laois County Council will seek to promote wind energy in appropriate sites in the County and will work with agencies such as the Laois County Development Board, I.D.A, Enterprise Ireland to encourage investment in research and technology associated with windfarms and other renewable energy technology.

WES4: Community Involvement and Gain

Laois County Council will seek to promote community involvement and require community benefit where possible in proposed windfarm developments.

5.3 Specific Area Policies

Three area classifications [there are no Strategic Areas] have been recommended for windfarm development in County Laois and specific policies pertaining to each are presented below:

WES 5: Preferred Areas

These areas are considered suitable for windfarm development because of sufficient

wind speeds, access to grid network, and established patterns of enquiries.

Projects within these areas must demonstrate conformity with existing and approved wind farms to avoid visual clutter, be developed in line with the Planning Guidelines in terms of siting, layout and environmental studies. Proximity to a Special Area of Conservation or Special Protection Area will require a Habitats Directive Assessment under Article 6 of the Habitat Regulations.

WES 6: Areas Open for Consideration

Wind energy applications in these areas will be evaluated on a case by case basis subject to viable wind speeds, environmental resources and constraints and cumulative impacts.

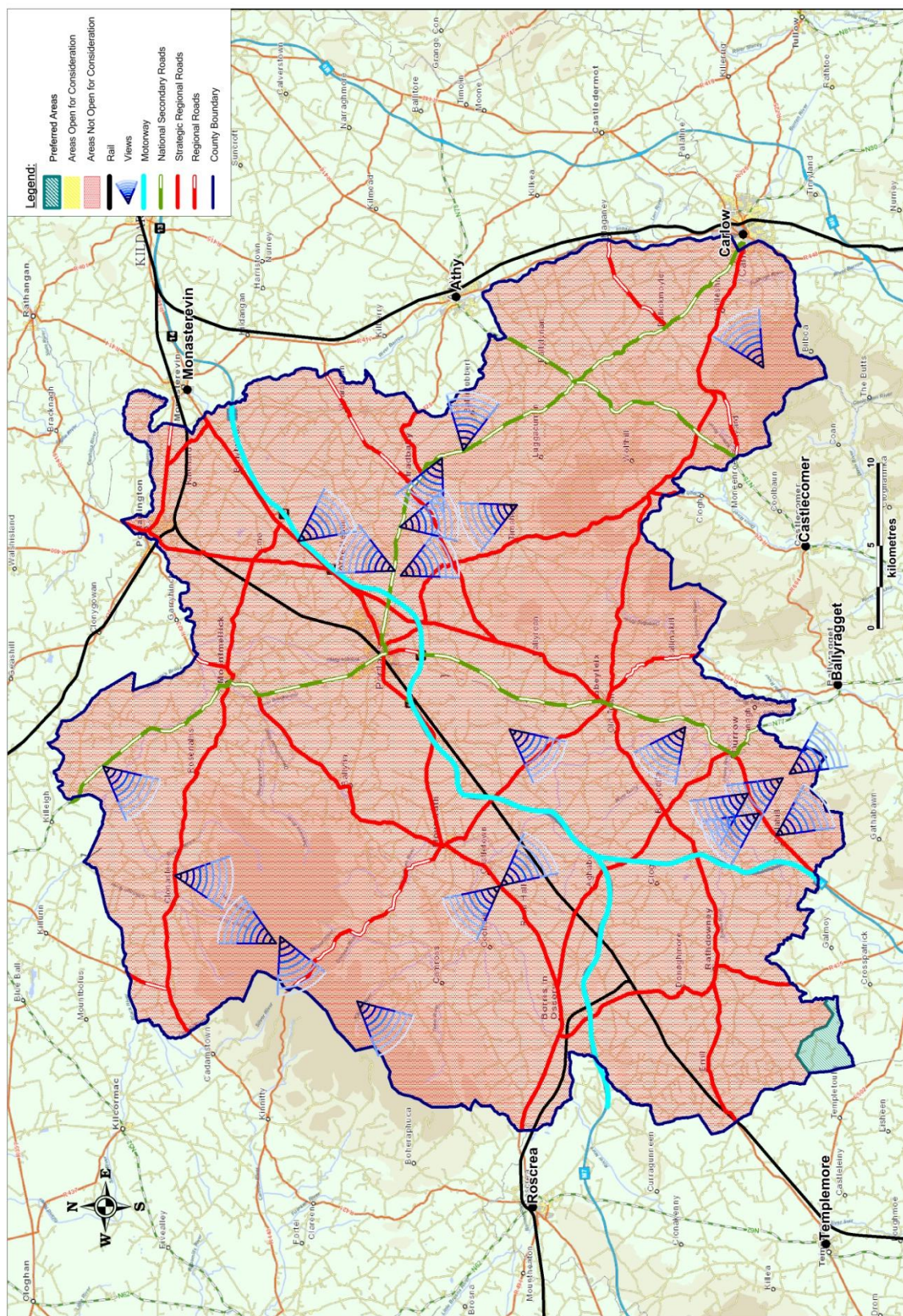
WES 7: Areas Not Open for Consideration

These areas are not considered suitable for wind farm development due to their overall sensitivity arising from landscape, ecological, recreational and/or cultural and built heritage resources as well as their limited wind regime.

WES 8: Single Turbine Sites

It is the policy of the Council to facilitate, where appropriate, small scale wind energy development by residential, industrial and agricultural producers to help meet the immediate needs of the development being provided / reduce their reliance on fossil fuels, and subject to the following criteria being met:

1. The energy will be primarily generated to be used on the site and within the site boundary,
2. Noise and visual impacts including shadow flicker will not be significant on nearby residents.



6. DEVELOPMENT CONTROL STANDARDS FOR WIND FARMS IN COUNTY LAOIS

6.1 Buffer Zones

Ensure a setback distance of 1.5 kms of wind turbines from schools, dwellings, community centres and all public roads in all areas open for consideration for windfarm development.

6.2 Boundary

The impact of proposed wind farms on the development potential of adjacent sites will be considered.

Turbine distances from the boundaries of adjacent landholdings will be assessed on a case by case basis.

6.3 Shadow Flicker

An assessment of the theoretical shadow flicker shall be prepared, further assessment shall indicate the likely level of shadow flicker based on anticipated meteorological constraints. If required, mitigating measures shall be proposed.

6.4 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.

6.5 Archaeology

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.

6.6 Bird Migratory Routes

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

6.7 Fencing

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.

6.8 Noise

Permitted maximum noise levels at noise sensitive residences shall be in compliance with noise specifications of the DoEHLG "Wind Energy Guidelines". 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.

6.9 Environmental Monitoring

Environmental monitoring will be required in sites adjacent to sensitive or vulnerable areas such as European Sites.

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.

6.10 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.

6.11 Aquifers

The developer shall have a responsibility to demonstrate that any proposed development will not have significant impacts upon aquifers, groundwater or drinking water.

6.12 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.

6.13 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.

6.14 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.

6.15 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.

6.16 Financial Contributions

In accordance with the Development Contribution Scheme the developer shall pay Laois 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.

6.17 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 in close proximity to Motorways, 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 setbacks for wind farms shall be subject to the agreement of the Council's Roads Department.

6.18 Single Turbine Developments

Many single turbine developments may be exempt under the Local Government Planning and Development Regulations, in particular under S.I. 83 of 2007, as amended [for residential development] and under S.I. 256 of 2008, as amended [for agricultural and commercial development].

For single turbine development proposals {inclusive of single turbine developments which generate energy for use within the site and feedback in to the grid on a tariff basis as in the UK}, the development control standards as indicated above will not necessarily apply as such likely impacts as noise and shadow flicker are generally less significant than in the case of the larger, commercial type windfarm developments.

Proposals for single turbine developments will be assessed on a case by case basis.

6.19 Decommissioning of associated infrastructure at end of life.

A planning application for any renewable energy infrastructure [including wind] must be accompanied by a full and complete set of plans and condition on how the site shall be restored to its original condition at end of life. This should be accompanied by a bond, payable by the developer to the planning authority; the sole purpose of this bond shall be to enable the removal of any and all associated infrastructure with the granted development at the end of the developments term of existence.

7. GUIDELINES ON WIND FARM DEVELOPMENT CONSTRAINTS IN COUNTY LAOIS

An adequate wind resource is the primary constraint in developing a wind farm. As mentioned above, 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.

7.1 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.

In the case of small wind farms, with outputs of less than 5MW, an EIS is not formally 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 County Laois wind farm developments are likely to lie outside NPWS designated sites (for example NHAs, SACs and SPAs), nonetheless it is advisable to consult the National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht in relation to wind farm proposals early in planning stage.

Regarding potential impact on aviation flight paths, early consultation with the Irish Aviation Authority is also recommended.

7.3 Siting and Design of Wind Farms

The comprehensive guidelines on the Siting and Design of Wind Energy Development provided in the DoEHLG's Planning Guidelines [currently under review] ought to be consulted as a matter of course by all would-be developers at an early stage in their project. An overview is provided below.

Section 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 are relevant to County Laois and are addressed below.

7.3.1 Hilly 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 vice versa. Wind farm layout must also be arranged in sympathy with the landscape, for example 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 the buffer effects of hedgerows, tree lines and buildings.

7.3.2 Transitional Marginal Landscapes

These landscapes typically include upland or lowland areas which are farmed extensively with some regeneration of natural vegetation allowed. 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.

7.3.3 Urban/Industrial

County Laois has a long and varied industrial history and the siting of turbines in industrial areas can be increasingly considered in the context of reducing energy costs, particularly for high volume power consumers. 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 also be regular.

7.4 Requirement for an Environmental Impact Statement (EIS)

An environmental impact statement is required for wind energy developments which contain more than 5 turbines or output more than 5MW (Section 176 of the 2000 Act as amended, Article 93 and Schedule 5 Part 1 of the 2001 Regulations as amended). However, the Planning Authority retains the option to request an environmental impact statement for smaller wind farms if it considers significant environmental impacts may occur.

The type of information required in an EIS is set out in the Regulations.